X(3872) ve Diğer Hadronik Moleküllerin İncelenmesi

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ÖNSÖZ

Bu projede $X(3872)$ mezonunun ve ağır kuark simetri eşleri incelenmiştir. Mezonları incelemek için tedirgemeye dayanmayan bir yönteme ihtiyaç vardır. KRD toplam kuralları, bu yöntemlerden biridir. $X(3872)$ mezonu ve eşleri, KRD toplam kuralları kullanılara incelenmiştir. Ayrıca, $X(3872)$ mezonunu moleküler ve $c\bar{c}$ bileşenlerini içerecek şekilde incelemeye olanak sunacak olan bir etkin alan kuramı geliştirilmiş, ve bu etkin alan kuramının spektrumu, $X(3872)$ mezonunun ve eşlerinin izospin yapıları ve radyatif bozunmaları incelenmiştir.

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3 d'nin bir fonksiyonu cinsinden gizli tılsım 2^{++} sektörünün özellikleri. $C_{0X}(d)$ denklem (109)'den belirlenmiş olup hesaplar $\Lambda = 1.0$ GeV için yapılmıştır. Giydirilmiş çarmonyum durumu $\chi_{c2}(2P)$'nin kütlesi ise BRK'nda $m^{\rm exp}_{\chi_{c2}} = 3927.2$ MeV olarak alınmıştır. 44

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1. ÖZET

Standart mezonlar, bir kuark bir tane de anti kuarktan oluşan bağlı durumlardır. Ancak, son senelerde gözlemlenen bazı mezonların kimi özelliklerini bu basit resimle açıklamaya çalışıldığında, kimi sorunlarla karşılaşılmaktadır. Bundan dolayı, bu yeni gözlemlenen mezonların, kuark-anti-kuark çiftlerinden daha karışık durumlar olduğu düşünülmektedir. Bu egzotik durumlardan birisi de $X(3872)$ mezonudur. kütlesinin $D^0\bar{D}^{*0}$ eşiğine olan yakınlığından dolayı, D ve D^* mezonlarından oluşan bir molekül olduğu düşünülmektedir.

Mezonları incelemek için, tedirgemeye dayanmayan yöntemlere ihtiyaç vardır. Bu yöntemlerden birisi, KRD toplam kurallarıdır. Bu projede, KRD toplam kuralları kullanılarak, iki vektör kuark-anti-kuark yapısından oluşabilecek, gizli tılsım içeren olası egzotik durumlar incelenmiştir (İP1 ve İP2).

$X(3872)$ mezonu, çoğunlukla bir molekül olsa bile içinde ihmal edilemeyecek kadar büyük bir $c\bar{c}$ yapısı olma ihtimali yüksektir. Molekülleri incelemek için en ideal yöntem etki alan kuramlarıdır. c kuarkın ağır olduğu da göz önüne alınında, D mezonlarının olası bağlı durumları, ağır kuark etkin alan kuramları kullanılarak incelenebilir. $X(3872)$'nin olası $c\bar{c}$ bileşenini göz önüne almak için, D mezonlarının etkin Lagranjiyanına $c\bar{c}$ durumlarının etkileri de eklenmiştir (İP3). Bu elde edilen yeni etkin alan kuramının öngördüğü spektruma, $c\bar{c}$ katkısının etkisi incelenmiş (İP4) ve $X(3872)$ mezonunu ve ağır kuark eşinin ışınımsal bozunmalarının olası $c\bar{c}$ bileşenine duyarlılığı incelenmiştir. (İP5)

Anahtar Kelimeler: Mezon Molekülleri, KRD Toplam Kuralları, Etkin Kuramlar

2. ABSTRACT

Conventional mesons are bound states made up of a quark and an anti quark. Some of the properties of some mesons observed in the recent years can not easily be explained using this simple picture. For this reason, these newly observed mesons are though to have a more complicated structure. One of these exotic states is the $X(3872)$ meson. Due to the proximity of its mass to the $D^0\bar{D}^{*0}$ threshold, it is believed to be a molecule of D and D^* mesons.

To study mesons, a non-perturbative method is necessary. One of these non-perturbative methods is the QCD Sum rules. In this project, states composed of two vector quark-anti-quarks containing hidden charm are studied (İP1 and İP2).

Even if $X(3872)$ meson is dominantly a molecule, it probably contains a non-negligible $c\bar{c}$ component. The ideal framework to study meson molecules is the effective theory framework. Taking into account that the c quark is heavy, possible bound states of the D mesons can be studied using heavy quark effective theory. To study the possible $c\bar{c}$ admixture of the $X(3872)$, effective theory of D mesons is extended with $c\bar{c}$ states (İP3). The effects on the spectrum of the newly added $c\bar{c}$ states is analyzed (İP4) and also the radiative decays of $X(3872)$ and its heavy quark symmetry partner is analyzed for their sensitivity to the possible $c\bar{c}$ component.

Keywords: X(3872), Meson Molecules, QCD Sum Rules, Effective Theories

3. GİRİŞ

Yakın zamanlarda deneylerde gözlemlenen kimi mezonların özelliklerini anlamak için mezonların standart kuark-anti-kuark tasvirlerinin ötesine gitme gerekliliği doğmuştur. Yeni gözlemlenen bu mezonlardan birisi de $X(3872)$ mezonudur. İlk olarak KEKB çarpıştırıcısındaki BELLE dedektöründe, J/ψ bozunum sürecinde çarmonyuma benzer bir durumun üretildiği gözlenmiştir (Choi vd., 2003). KEKB çarpıştırıcısındaki Bell dedektöründe yapılan gözleme göre, bu durum $\pi^4\pi^- J/\psi$'ye bozunur ve kütlesi $m = 3872.0 \pm 0.6 MeV$'dir. Bu durumun paritesi ise ancak 2013 yılında LHCb tarafından $P = +$ olarak belirlenmiştir (Aaij vd., 2014).

Kuark-anti-quarktan oluşan bir mezon olarak açıklamaya çalışırsak, $X(3872)$ mezonu, $2P$ çarmonyum durumudur. 2P çarmonyumun kütlesi ise Segovia vd. (2013) ve Ortega vd. (2010)'da 3947 MeV olarak, Ebert vd. (2011)'de ise 3906 MeV olarak öngörülmüştür. $X(3872)$'nin kütlesinin, $D^0\bar{D}^{*0}$ eşiğinin hemen altında olduğu düşünülürse, $m_X - m_{D^0} - m_{D^{*0}} = -0.16\ MeV$, $X(3872)$ büyük oranda, gevşekçe bağlı bir $D\bar{D}^*$ durumu olarak açıklanabilir.

$X(3872)$'nin, kuark-anti-kuark resminde açıklaması zor olan bir başka özelliği ise, $J/\psi\pi\pi$ ve $J/\psi\pi\pi\pi$ bozunmalarıdır. Bu bozunmalardaki pionlar, ρ ve ω ara durumlarının bozunması ile ortaya çıkarlar. $J/\psi\rho$ ve $J/\psi\omega$ geçiş genliklerinin oranı ise

$$\left|\frac{A(X(3872) \to J/\psi\rho)}{A(X(3872) \to J/\psi\omega)}\right| = 0.27 \pm 0.02 \tag{1}$$

olarak elde edilmiştir (Hanhart vd., 2012). Bu kadar büyük bir izospin bozunumunu kuark-anti-kuark resminde açıklamak oldukça zordur. Oysa, moleküler resimde, $D^{(*)0}$ ve $D^{(*)\pm}$ kütleleri arasındaki farktan dolay, büyük bir izospin bozunumu doğal olarak gelmektedir (Gamermann vd., 2010).

Diğer taraftan, $X(3872)$'nin radyatif geçişlerine bakıldığında, $\psi(2S)\gamma$ ve $J/\psi\gamma$ son durumlarına dallanma oranları

$$R_{\psi\gamma} = \frac{Br(X \to \psi(2S)\gamma)}{Br(X \to J/\psi\gamma)} = 2.46 \pm 0.64 \pm 0.29 \tag{2}$$

olarak gözlenmiştir (Aaij vd. (2014) ve Aubert vd. (2009)). $\psi(2S)\gamma$ son durumunun faz uzayı $J/\psi\gamma$ son durumunun faz uzayından çok daha küçüktür. Bu oranı moleküler resimde açıklamak kolay değilken, kuark-anti-kuark resminde $X \to \psi(2S)$ geçişi, radyatif $\Delta l = 1$ geçişi olarak doğal olarak açıklanabilir.

Son olarak, pp çarpışmalarında, $X(3872)$ mezonunun oluşma oranı, $\psi(2S)$'in 1/20'si kadar ölçülmüştür (Takizawa vd., 2013). Bu oranı sadece moleküler resme bakarak açıklamak güçken, moleküler durumun %5 oranında çarmonyum içerdiği kabul edilirse, kolayca açıklanabilir.

$X(3872)$ mezonunu moleküler resimde açıklamak için Nieves vd. (2012)'da bir ağır kuark etkin kuramı önerilmiştir. Ağır kuark etkin kuramlarda, kuarkın kütlesi sonsuz kabul edilir. c kuark, KRD skalasına, $\Lambda_{QCD} \simeq 150\ MeV$, göre oldukça ağır bir kuark olduğu için, geçerli bir yaklaşımdır. Bu limitte, c ve c kuarktan daha ağır olan b kuarklar arasında bir fark kalmaz. Dolayısıyla c kuark sektöründeki sonuçlar, yaklaşık olarak b kuark sektöründe de geçerli olacaktır. Ayrıca, ağır kuark limitinde, ağır kuarkın spini, sistemin dinamiğini (dolayısıyla kütlesini) etkilemez. Bu durumda, bir tane c, bir tane $\bar{c}$ içeren sistemlerin, ağır kuarkların spinleri göz önüne alındığında, birbirleri ile dejenere dört farklı durum içermesi gerekir. Bu durumların J^{PC} kuantum sayıları 0^{++}, 1^{++}, 2^{++} ve 1^{-+} olarak karşımıza çıkar.

Hidalgo-Duque vd. (2013)'da ise, ağır kuark simetri limitinde ortaya çıkan bu eşler, etkin kuramlar kullanmak yerinde, doğrudan KRD kullanılarak incelenmiştir. Bu çalışmada, ayrıca, KRD toplam kuralları kullanarak bu sistemleri incelemek için kullanılabilecek bir akım da önerilmiştir.

Bu projede, Hidalgo-Duque vd. (2013)'da önerilen akım, KRD toplam kuralları kullanılarak, $X(3872)$ ve $J^{PC} = 0^{++}$ ve 2^{++} olan eşleri incelenmiştir. Bölüm 4.'de KRD toplam kuralları kısaca tanıtılmış, akımların nasıl seçildiğinden bahsedilmiş ve sonuçlarımız sunulmuştur.

Ancak Nieves vd. (2012)'deki modelde, $X(3872)$ sadece bir molekül olarak göz önüne alınmıştır. Yukarıda da değinildiği gibi, $X(3872)$'yi sadece bir molekül olarak tasvir etmenin sorunları vardır. Bölüm 5.'te, Nieves vd. (2012)'de tanımlanan etkin model $c\bar{c}$ durumları da eklenerek genişletilmiştir. Bu genişletme, ilk olarak, basitleştirmek amaçlı olarak izospin limitinde yapılmış, ve bu bileşenin eşlere etkisinin ne olduğu incelenmiş, ayrıca radyatif bozunmalar da bu genişletilmiş model de incelenerek, radyatif geçişlerin $c\bar{c}$ bileşenine duyarlı olduğu gözlemlenmiştir. Daha sonra, izospin bozunma etkileri de modele eklenmiştir.

4. KRD TOPLAM KURALLARI VE X(3872) VE EŞLERİ

Bu ekte, İP 1 ve İP 2'de KRD toplam kurallarının kullanılması üzerine elde edilen sonuçlar tartışılmaktadır.

4.1 KRD Toplam Kuralları ile Spektrum Hesabı

KRD toplam kuralları kullanılarak spektrum elde etmek için

$$\Pi = i \int d^4x e^{ipx} \langle 0|\mathcal{T} j(x) j^\dagger(0)|0\rangle \tag{3}$$

şeklinde tanımlanan bir bağdaşıklık fonksiyonu incelenir. Burada $j(x)$, kuark ve gluon alanlarından oluşan, ve vakuma uygulandığı zaman incelenmek istenen hadronu yaratabilen bir operatördür. $p^2 > 0$ durumu için ise, bağdaşıklık fonkiyonunda, operatörlerin arasına, birim operatörünün hadron durumları üzerinden toplamı şekilde yazılmış ifadesi yerleştirilirse, bağdaşıklık fonksiyonu

$$\Pi = \sum_h \langle 0|j|h(p)\rangle \frac{1}{p^2 - m_h^2} \langle h(p)|j^\dagger|0\rangle + \text{çoklu hadron durumları} \tag{4}$$

şeklinde yazılabilir. Buradan da görülebileceği üzere, bağdaşıklık fonksiyonunun tekillikleri, bize j operatörü tarafından yaratılabilen hadronların spektrumunu verecektir.

$-p^2 \gg \Lambda_{QCD}^2$ durumunda ise, bağdaşıklık fonksiyonuna katkının büyük çoğunluğu, $x \sim 0$ bölgesinden gelecektir Colangelo vd. (2010). Bu durumda, iki operatörün çarpımı, operatör çarpım açılımı (OPE) kullanılarak ifade edilebilir:

$$\mathcal{T} j(x) j^\dagger(0) = \sum_d C_d(x) O_d \tag{5}$$

burada $C_d(x)$ tedirgeme kuramı ile hesaplanabilen katsayılar, ve O_d ise, kütle boyutu d olan yerel işlemcilerdir. Çarpımın bu ifadesinin Fourier dönüşümü yapılırsa, bağdaşıklık fonksiyonu

$$\Pi = \sum_d C_d^f(p) \frac{\langle O_d \rangle}{p^d} \tag{6}$$

şeklinde yazılabilir. Burada $\langle O_d \rangle$, tedirgeme kuramı ile hesaplanamayan vakum yoğuşmalarıdır (d=0 hariç). Toplamdaki $d = 0$ terimi, birim operatöre karşılık gelir, ve bağdaşıklık fonksiyonuna, tedirgeme kuramı ile hesaplanabilen katkıları içerir. Toplamdaki diğer katkılar $\langle \bar{q}q \rangle$ $(d = 3)$; $m_q \langle \bar{q}q \rangle$

$(d = 4)$, $\langle G_{\mu\nu}G^{\mu\nu}\rangle$ $(d = 4)$, $\langle \bar{q}g\sigma Gq\rangle$ $(d = 5)$ olarak yazılabilir. Buradaki önemli sonuçlardan birisi, $d = 1$ ve $d = 2$'ye karşılık gelen işlemcilerin olmamasıdır. Bu ise, aslında sonsuz bir toplam olan bu ifadenin, çabuk yakınsamasını sağlar.

Toplam kurallarını elde etmek için, 4 ile 6 denklemlerini eşitlememiz gerekir. Ancak bu iki ifade, farklı p^2 değerleri için elde edilmiştir. Bu iki bölgeyi eşitlemek için, bağdaşıklık fonksiyonunun spektral gösterimi kullanılabilir:

$$\Pi(p^2) = \int_0^\infty \frac{\rho(s)}{s - p^2} + p^2 \text{ cinsinden polinomlar} \tag{7}$$

$\rho(s)$ spektral yoğunluğu, denklem 4 kullanılarak hesaplanabilir, ve denklem 7 içine yerleştirilerek, 4'den $p^2 < 0$ bölgesinde de bağdaşıklık fonksiyonu için bir ifade elde edilebilir. Denklem 4'den elde edilen spektral yoğunluğa $\rho^{phen}(s)$, denklem 6'den elde edilene de $\rho^{QCD}(s)$ dersek,

$$\int_0^\infty ds\frac{\rho^{phen}(s)}{s - p^2} + \text{polinomlar} = \int_0^\infty ds\frac{\rho^{QCD}(s)}{s - p^2} + \text{polinomlar} \tag{8}$$

olarak yazabiliriz.

Buradaki polinomlardan kurtulmak için, iki tarafın da yeterince türevini alabiliriz. Ancak, genel olarak polinomların kaçıncı derece olduğunu bilmediğimiz için, sonsuz defa türev almayı içeren, Borel dönüşümünü yapabiliriz. Bu dönüşümün temel etkisi, polinomlardan kurtulurken, aynı zamanda

$$\frac{1}{s - p^2} \to e^{-\frac{s}{M^2}} \tag{9}$$

dönüşümünü de yapar. Buradaki M^2 Borel parametresidir. Bu dönüşümden sonra, hadronik özellikler ile, KRD parametreleri arasındaki ilişkiyi

$$\sum_h |\langle 0|j|h(p)\rangle|^2 e^{-\frac{m_h^2}{M^2}} + \text{çoklu hadron durumları} = \int_0^\infty \rho^{QCD}(s)e^{-\frac{s}{M^2}} \tag{10}$$

olarak elde edebiliriz. Bu denklemde hala sonsuz tane bilinmeyen parametre bulunmaktadır. Ama dikkat edilirse, $e^{-\frac{m_h^2}{M^2}}$ çarpanından dolayı, sol tarafa asıl katkıyı küçük kütlelere sahip hadronlar getirecektir. Bu yaklaşımı daha da iyi bir hale getirmek ve çoklu hadron durumlarının katkılarını da parametrize edebilmek için, genelde, kuark hadron dualitesi denen bir yaklaşım kullanılır. Bu yaklaşıma göre, $s > s_0$ için $\rho^{phen}(s) \simeq \rho^{QCD}(s)$ olmalıdır. $s > s_0$ için, $\rho^{phen}(s)$, daha ağır durumların

ve çoklu hadron durumlarının katkılarını içerir. Dolayısıyla, yukarıdaki ifadeyi,

$$|\langle 0|j|h_t(p)\rangle|^2 e^{-\frac{m_{h_t}^2}{M^2}} = \int_0^{s_0} \rho^{QCD}(s) e^{-\frac{s}{M^2}} \tag{11}$$

olarak yazabiliriz. Buradaki h_t, j operatörü tarafından yaratılabilen en düşük kütleli hadrondur. Literatürdeki toplam kuralları bu şekilde analiz edilir.

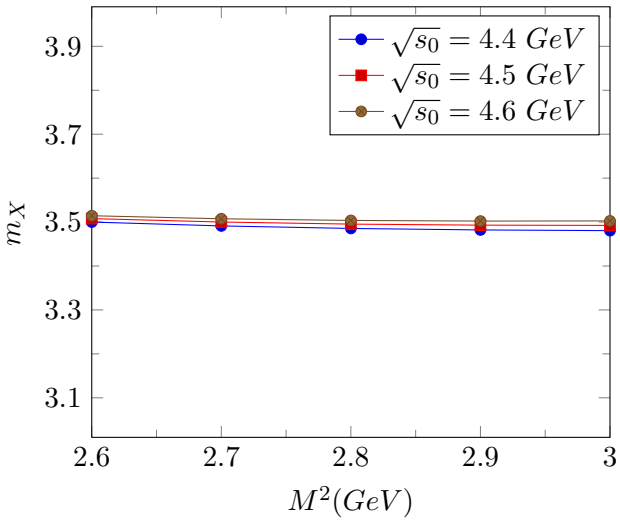
4.2 $j(x)$ Öperatörünün Seçimi

Bir önceki bölümde de değinildiği gibi, hadron tayfının analiz etmek için en önemli niceliklerden birisi, vakumdan, ilgilenilen hadronu yaratmak için seçilecek olan $j(x)$ operatörüdür. Seçilen oparatörün yapısı, incelenecek olan mezonun yapısına ne kadar benzer ise, toplam kurallarından elde edilen sonuçların o kadar güvenilir olacağı düşünülmektedir. Bu durumda, eğer düşünüldüğü gibi, $X(3872)$'nin içinde $c\bar{c}$ bileşeni de varsa, bu durumda, seçilen operatörde de böyle bir bileşenin olması gerektiği düşünülebilinir. Ancak, bu durumda da şöyle bir sorunla karşılaşılabilinir: seçilen operatörün içinde, çarmonyum yaratabilecek bir kısım olduğundan, bu operatör vakumdan, moleküllere ek olarak bütün çarmonyumları da yaratabilir. İncelenen egzotik mezonla aynı quantum sayılarına sahip en düşük kütleli çarmonyum ise, egzotik durumdan daha hafiftir. Bu sebeple de Denklem 10'e, incelenemeye çalışılan egzotik hadrondan daha fazla katkı verebilir.

Bu olası problemin gerçekten sorun olup olmadığını incelemek için, Matheus vd. (2009) makalesindeki X(3872) için elde edilen toplam kuralları yeniden incelenmiştir. Bu makalede, X(3872)'yi yeniden yaratmak için

$$J_\mu(x) = \sin(\theta) j_\mu^{(4u)}(x) + \cos(\theta) j_\mu^{(2u)}(x) \tag{12}$$

şeklinde bir operatör tanımlanmıştır. Burada, $j_\mu^{(4u)}$, mezon molekülleri gibi, iki kuark, iki anti-quark içeren durumları yaratırken, $j_\mu^{(2u)}$ kuark-anti-quark içeren durumları yaratmaktadır. Yaptıkları analiz sonucunda, X(3872)'yi doğru tasvir edebilmek için, $5^\circ < \theta < 13^\circ$ olması gerektiğini iddia etmektedirler. θ'nın bu değerinde ise $m_X = (3.77 \pm 0.18)\ GeV$ olarak bulmaktadırlar. Ancak, θ için, bu kadar küçük bir değerin seçilmesi, seçtikleri operatörün, $j_\mu^{(2u)} \propto \bar{c}\gamma_\mu\gamma_5 c$ olması anlamına gelir, ki bu operatör $\chi_{c1}(1P)$'yi incelemek için kullanılabilirken, X(3872) gibi, içerisinde uyarılmış $\chi_{c1}(2P)$ durumunu içeren durumlar için güvenilir sonuçlar vermesi şüphelidir.



Şekil 1. Matheus vd. (2009)'daki Şekil 3'ün düzeltilmiş hali

Bu iddiamızı ispatlamak için Matheus vd. (2009) makalesindeki denklemleri kullanarak elde ettikleri sonuçları elde ettik. Ancak, dikkat edilmesi gereken bir nokta, Matheus vd. (2009) makalesindeki denklemler 27-31'de bulunan β integralinin alt limiti β_{min} ve üst limiti β_{max}'tır. Makalede yazıldığı şekliyle, integraller hesaplandığı zaman, makaledeki sonuçlar elde edilmekle beraber, integral bölgesinde $\beta_{min} > \beta_{max}$ olabilmektedir. Bu ifadeler hesaplandığında görülmüştür ki, $\beta_{min} > \beta_{max}$ olduğu durumlar, integrale katkı vermemelidir. Bu durumu sağlamak için, integralin içerisine basamak fonksiyonu $\theta(\beta_{max} - \beta_{min})$ yerleştirildiğinde ise, sayısal değerler değişmektedir. Matheus vd. (2009)'deki Şekil 3, bu düzeltme ile yeniden çizildiğinde ise Şekil 1. elde edilmektedir. Bu durumda, Matheus vd. (2009)'deki toplam kurallarının kütle öngörüsü ise, $m_X = 3.50 \pm 0.02$ olarak bulunmaktadır. Kütlenin M^2'den bağımsız olması gerektiği düşünüldüğünde, düzeltmeden sonra elde edilen sonuçların, M^2 için belirlenen bölgede, M^2'ye neredeyse hiç bağlı olmadığı görülmüştür. Ayrıca, Matheus vd. (2009)'deki kütle öngörüsü ise X(3872)'nin kütlesi ile tutarlı değildir. Yukarıda da değinildiği gibi, $\chi_{c1}(1P)$ durumunun kütlesi öngörülmektedir.

Bu gibi sorunlarla karşılaşmamak için, seçilen $j(x)$ operatörünün, $\bar{c}c$ operatörünü içermemesi gerekir.

Olası $j(x)$ operatörünü belirlemek için, kuark modellerinden faydalanılabilir. X(3872)'nin molekül

resminde,

$$|X(3872)\rangle = \frac{1}{\sqrt{2}}\left(|D\bar{D}^*\rangle - |\bar{D}D^*\rangle\right) \tag{13}$$

olarak yazılabilir. Kuarkları açıkça gösterecek olursak

$$|X(3872)\rangle = \frac{1}{\sqrt{2}}\left(|((c\bar{q})(0)(\bar{c}q)(1))(1)\rangle - |((\bar{c}q)(0)(c\bar{q})(1))(1)\rangle\right) \tag{14}$$

olarak gösterilebilir. Bu gösterimde, parantez içindeki 0 ve 1 sayıları, önlerindeki parantezin içindeki parçacıkların toplam spinini göstermektedir. Mesela $(c\bar{q})(1)$, c ve $\bar{q}$ quarklarının toplam spinlarinin bir (1) olduğu durumu temsil etmektedir. Yukarıdaki durumda her bir $|((c\bar{q})(0)(\bar{c}q)(1))(1)\rangle$ durum, olası dört kuark durumları Hilbert uzayında bir baz oluşturmaktadır. Bu bazda $c\bar{q}$ ve $\bar{c}q$ durumlarının tam bir spini var. Bir başka olasu baz seçimi ise, $c\bar{c}$ ve $q\bar{q}$ durumlarının belirli bir spine sahip olduğu $|((c\bar{c})(s)(q\bar{q})(s'))(J)\rangle$ olarak seçilebilir. Burada s, $c\bar{c}$ sisteminin toplam spini, s', $q\bar{q}$ sisteminin toplam spini, J ise, sistemin toplam spinini temsil etmektedir[1]. Bu iki baz arasındaki dönüşüm, $9j$ sembolleri yardımıyla yapılabilir, ve bu durumda

$$|X(3872)\rangle = |((c\bar{c})(1)(q\bar{q})(1))(1)\rangle \tag{15}$$

olarak elde edilir.

Denklem 15'ten de görülebileceği üzere, $X(3872)$ durmunun moleküler resminde, içerdiği tılsım kuarkların toplam spini 1 ve hafif kuarkların da toplam spini 1'dir. Bu iki spin toplam spin 1 olacak şekilde bir araya gelmiştir. İki tanem spin-1 sistem, toplam spin 0, 1 veya 2 olacak şekilde de bir araya gelebilir. Spin etkileşmelerinden kaynaklı olası farklar dışında, bunlar aslında aynı özelliklere sahip sistemlerdir. Toplam spini 0 ve 2 olan diğer durumlara $X(3872)$'nin eşleri denir.

Denklem 15'ten yola çıkarak, 111T706 nolu proje kapsamında yapılan Hidalgo-Duque vd. (2013)'te, $X(3872)$ mezonunun ve eşlerinin incelenmesi için

$$j_{\mu\nu} = \bar{Q}^a \gamma_\mu Q^b \bar{q}^b \gamma_\nu q^a \tag{16}$$

akımının kullanılması önerilmiştir. Burada $Q = c$ olarak alınmıştır, a ve b renk indeksleridir. $j_{\mu\nu}$ akımındaki $\bar{Q}^a \gamma_\mu Q^b$, toplam spini 1 olan bir $Q\bar{Q}$ durumu yaratabilir, $\bar{q}^b \gamma_\nu q^a$ ise, toplam spini 1 olan bir $q\bar{q}$ durumu yaratabilir.

[1]Temel durumlara bakıldığı için, sadece $l = 0$ durumları düşünülmüştür. Bu durumda $J = S$ olacaktır.

İki tane spin-1 durum bir araya getirildiği zaman, oluşan sistemin olası toplam spin değerleri 0, 1 ve 2'dir. Denklem 16'deki akım, bütün olası durumları yaratabilir. Spin, Poincare simetrisinin indirgenemez gösterimlerine karşılık gelir. Denklem 16'daki akımı Poincare simetrisi altında indirgenemez akımlara ayrıştırabiliriz:

$$j_{\mu\nu} = j^{2+}_{\mu\nu} + j^{1+}_{\mu\nu} + j^{0+}_{\mu\nu} \tag{17}$$

Burada

$$\begin{aligned} j^{2+}_{\mu\nu} &= \mathcal{P}_{2\mu\nu}{}^{\alpha\beta} j_{\alpha\beta} \equiv \frac{1}{2}\left(g_{\alpha\mu}g_{\beta\nu} + g_{\beta\nu}g_{\alpha\mu} - \frac{1}{2}g_{\mu\nu}g_{\alpha\mu}\right) j_{\alpha\beta} \\ &= \frac{1}{2}\left(j_{\mu\nu} + j_{\nu\mu} - \frac{1}{2}g_{\mu\nu}j_{\alpha}{}^{\alpha}\right) \qquad (18) \\ j^{1+}_{\mu\nu} &= \mathcal{P}_{1\mu\nu}{}^{\alpha\beta} j_{\alpha\beta} \equiv \frac{1}{2}\left(g_{\alpha\mu}g_{\beta\nu} - g_{\alpha\nu}g_{\beta\mu}\right) j_{\alpha\beta} \\ &= \frac{1}{2}\left(j_{\mu\nu} - j_{\nu\mu}\right) \qquad (19) \\ j^{0+}_{\mu\nu} &= \mathcal{P}_{0\mu\nu}{}^{\alpha\beta} j_{\alpha\beta} \equiv \frac{1}{4}g_{\mu\nu}j^{\delta}_{\delta} \qquad (20) \end{aligned}$$

Bu akımlardan $j^{2+}_{\mu\nu}$, $J^{PC} = 0^{++}$, $J^{PC} = 1^{++}$ ve $J^{PC} = 0^{++}$ durumlarını; $j^{1+}_{\mu\nu}$, $J^{PC} = 1^{++}$ ve $J^{PC} = 1^{-+}$ durumlarını, $j^{0+}_{\mu\nu}$ ise $J^{PC} = 0^{++}$ durumunu yaratabilir, ve bu durumları incelemek için kullanılabilir.

4.3 Bağdaşıklık Fonksiyonlarının Fenomenolojik İfadeleri

Denklemler 18-20'daki işlemciler kullanılarak yazılabilecek bağdaşıklık fonksiyonlarının hadronlar cinsinden ifadesine bakalım.

4.3.1 $j^{2+}_{\mu\nu}$ ile yazılan Bağdaşıklık Fonksiyonunun Fenomenolojik İfadesi

Yukarıda da değinildiği gibi, $j^{2+}_{\mu\nu}$ akımı, vakumdan, J^{PC} değerleri 2^{++}, 1^{++} ve 0^{++} olan durumları yaratabilir. Karşılık gelen matris elemanları:

$$\begin{aligned} \langle 2^{++}|j^{2++}_{\mu\nu}|0\rangle &= \lambda_2^{2^{++}}\epsilon_{\mu\nu} \qquad (21) \\ \langle 1^{++}|j^{2++}_{\mu\nu}|0\rangle &= \lambda_2^{1^{++}}\left(\epsilon_\mu p_\nu + \epsilon_\nu p_\mu\right) \qquad (22) \\ \langle 0^{++}|j^{2++}_{\mu\nu}|0\rangle &= \lambda_2^{0^{++}}\left(\frac{p_\mu p_\nu}{p^2} - \frac{1}{4}g_{\mu\nu}\right) \qquad (23) \end{aligned}$$

olarak yazılabilir. Bu matris elemanları yazılırken, $j^{2+}_{\mu\nu}$'nin, simetrik, yani $j^{2+}_{\mu\nu} = j^{2+}_{\nu\mu}$ ve izsiz, yani $g^{\mu\nu} j^{2+}_{\mu\nu} = 0$, olduğu kullanılmıştır. Bu matris elemanlarında kullanılan $\epsilon_{\mu\nu}$, ve ϵ_{μ}, sırasıyla spin-2 ve spin-1 parçacıklarının polarızasyon tensörleridir, ve p ise, akım parafından yaratılan durumun momentumudur. Spin-2 bir parçacığın polarizasyon tensörü, simetrik, $\epsilon_{\mu\nu} = \epsilon_{\nu\mu}$, momentuma dik, $\epsilon_{\mu\nu} p^{\mu} = 0$, ve izsiz, $g^{\mu\nu}\epsilon_{\mu\nu} = 0$ olarak tanımlanır. Spin-1 parçacığın polarizasyon tensörü ise, mentumuna diktir $\epsilon_{\mu} p^{\mu} = 0$. Ayrıca, bu polarizasyon tensörleri $\epsilon_{\mu\nu}\epsilon^{\mu\nu} = 1$ ve $\epsilon_{\mu}\epsilon^{\mu} = -1$ olacak şekilde boylamlandırılırlar.

Akımların bu matris elemanlarını kullanırsak ve denklem 4, $j^{2+}_{\mu\nu}$ akımından elde edilen bağdaşıklık fonksiyonu için:

$$\begin{aligned}
\Pi^{(2)}_{\mu\nu\alpha\beta} &= i\int d^4x e^{ipx}\langle 0|\mathcal{T} j^{2+}_{\mu\nu}(x) j^{2+\dagger}_{\alpha\beta}(0)|0\rangle \\
&= \sum_h \frac{\langle 0|j^{2+}_{\mu\nu}|h(p)\rangle\langle h(p)|j^{2+}_{\alpha\beta}|0\rangle}{p^2 - m_h^2} \\
&= \frac{(\lambda_2^{2^{++}})^2}{p^2 - m^2_{2^{++}}} \sum_s \epsilon_{\mu\nu}\epsilon^*_{\alpha\beta} \\
&+ \frac{(\lambda_2^{1^{++}})^2}{p^2 - m^2_{1^{++}}} \sum_s \left(\epsilon_{\mu} p_{\nu} + p_{\mu}\epsilon_{\mu}\right)\left(\epsilon^*_{\alpha} p_{\beta} + p_{\alpha}\epsilon^*_{\beta}\right) \\
&+ \frac{(\lambda_2^{0^{++}})^2}{p^2 - m^2_{0^{++}}} \left(p_{\mu}p_{\nu} - \frac{1}{4} g_{\mu\nu}\right)\left(p_{\alpha}p_{\beta} - \frac{1}{4} g_{\alpha\beta}\right)
\end{aligned} \tag{24}$$

yazılabilir (bu ifadede, sadece en belli J^{PC} kuantum sayılarına sahip hadronlardan, en düşük kütleli olan mezon gösterilmiştir). Burada $m_{J^{PC}}$, kuantum sayıları J^{PC} olan mezonun kütlesi, ve toplamlar, yine ilgili mezonun spin durumları üzerinden toplamlardır. Spin toplamlarını yapmak için, spin-2 mezon için

$$\begin{aligned}
&\sum_s \epsilon_{\mu\nu}\epsilon^*_{\alpha\beta} \\
= \; &\frac{1}{2}\left[\left(g_{\mu\alpha} - \frac{p_{\mu}p_{\alpha}}{p^2}\right)\left(g_{\nu\beta} - \frac{p_{\nu}p_{\beta}}{p^2}\right) + \left(g_{\nu\alpha} - \frac{p_{\nu}p_{\alpha}}{p^2}\right)\left(g_{\mu\beta} - \frac{p_{\mu}p_{\beta}}{p^2}\right)\right. \\
&\left. -\frac{2}{3}\left(g_{\mu\nu} - \frac{p_{\mu}p_{\nu}}{p^2}\right)\left(g_{\alpha\beta} - \frac{p_{\alpha}p_{\beta}}{p^2}\right)\right]
\end{aligned} \tag{25}$$

ve spin-1 mezonlar için

$$\sum_s \epsilon_{\mu}\epsilon^*_{\nu} = -\left(g_{\mu\nu} - \frac{p_{\mu}p_{\nu}}{p^2}\right) \equiv -g^{\perp}_{\mu\nu} \tag{26}$$

ifadeleri kullanılabilir. Üç yeni Lorentz yapısını

$$\begin{aligned}
\kappa^{22}_{\mu\nu\alpha\beta} &= \sum_s \epsilon_{\mu\nu}\epsilon^*_{\alpha\beta} \\
&= \frac{1}{2}\left[g^\perp_{\mu\alpha}g^\perp_{\nu\beta} + g^\perp_{\nu\alpha}g^\perp_{\mu\beta} - \frac{2}{3}g^\perp_{\mu\nu}g^\perp_{\alpha\beta}\right] \qquad (27)\\
\kappa^{21}_{\mu\nu\alpha\beta} &= \sum_s (\epsilon_\mu p_\nu + p_\mu\epsilon_\nu)\left(\epsilon^*_\alpha p_\beta + p_\alpha\epsilon^*_\beta\right) \\
&= -\left(g^\perp_{\mu\alpha}p_\nu p_\beta + g^\perp_{\mu\beta}p_\nu p_\alpha + g^\perp_{\nu\alpha}p_\mu p_\beta + g^\perp_{\nu\beta}p_\mu p_\alpha\right) \qquad (28)\\
\kappa^{20}_{\mu\nu\alpha\beta} &= \left(\frac{p_\mu p_\nu}{p^2} - \frac{1}{4}g_{\mu\nu}\right)\left(\frac{p_\alpha p_\beta}{p^2} - \frac{1}{4}g_{\alpha\beta}\right) \qquad (29)
\end{aligned}$$

olarak tanımlarsak, bağdaşıklık fonksiyonunu

$$\Pi^{(2)}_{\mu\nu\alpha\beta} = \frac{(\lambda_2^{2^{++}})^2}{p^2 - m^2_{2^{++}}}\kappa^{22}_{\mu\nu\alpha\beta} + \frac{(\lambda_2^{1^{++}})^2}{p^2 - m^2_{1^{++}}}\kappa^{21}_{\mu\nu\alpha\beta} + \frac{(\lambda_2^{0^{++}})^2}{p^2 - m^2_{0^{++}}}\kappa^{20}_{\mu\nu\alpha\beta} \qquad (30)$$

şeklinde yazabiliriz. Buradaki bir problem, bağdaşıklık fonksiyonu işlemci çarpım açılımı cinsinden hesaplandığı zaman, buradaki farklı parçacıkların katkılarının hesaplanmasıdır. Bu problemi ise tanımlanan κ yapılarının, birbirlerine dikliklerini kullanarak aşabiliriz:

$$\kappa^{2i}{}_{\mu\nu\alpha\beta}\kappa^{2j;\mu\nu\alpha\beta} = 0 \;\text{ eğer } i = j \text{ değil ise} \qquad (31)$$

Böylece, her bir J^{PC} kuantum sayısına sahip olan mezonların bağdaşıklık fonksiyonuna katkısı

$$\frac{(\lambda_2^{2^{++}})^2}{p^2 - m^2_{2^{++}}} = \frac{1}{5}\kappa^{22}_{\mu\nu\alpha\beta}\Pi^{(2)\mu\nu\alpha\beta} \qquad (32)$$

$$\frac{p^2(\lambda_2^{1^{++}})^2}{p^2 - m^2_{1^{++}}} = \frac{1}{6p^2}\kappa^{21}_{\mu\nu\alpha\beta}\Pi^{(2)\mu\nu\alpha\beta} \qquad (33)$$

$$\frac{(\lambda_2^{0^{++}})^2}{p^2 - m^2_{0^{++}}} = \frac{16}{9}\kappa^{20}_{\mu\nu\alpha\beta}\Pi^{(2)\mu\nu\alpha\beta} \qquad (34)$$

olarak elde edilir.

4.3.2 j^{1+}_μ ile yazılan Bağdaşıklık Fonksiyonunun Fenomenolojik İfadesi

j^{1+}_μ akım için

$$\Pi^{(1)}_{\mu\nu\alpha\beta} = i\int d^4x e^{ipx}\langle 0|\mathcal{T}j^1_{\mu\nu}(x)j^{1\dagger}_{\alpha\beta}(0)|0\rangle \qquad (35)$$

şeklinde tanımlanan bağdaşıklık fonksiyonu

$$\Pi^{(1)}_{\mu\nu\alpha\beta} = \frac{\langle 0|j^1_{\mu\nu}|1^{++}(p)\rangle\langle 1^{++}(p)|j^{1\dagger}_{\alpha\beta}|0\rangle}{p^2 - m^2_{1^{++}}} + \frac{\langle 0|j^1_{\mu\nu}|1^{-+}(p)\rangle\langle 1^{-+}(p)|j^{1\dagger}_{\alpha\beta}|0\rangle}{p^2 - m^2_{1^{-+}}} \tag{36}$$

olarak yazılabilir. Denklem 36'deki matris elemanlarını

$$\langle 0|j^1_{\mu\nu}|1^{++}\rangle = \lambda_1^{1^{++}}\left(p_\mu\epsilon_\nu - p_\nu\epsilon_\mu\right) \tag{37}$$

$$\langle 0|j^1_{\mu\nu}|1^{-+}\rangle = \lambda_1^{1^{+-}}\epsilon_{\mu\nu\alpha\beta}p^\alpha\epsilon'^\beta \tag{38}$$

olarak tanımlayabiliriz. Buradaki p mezonun momentumu, ve $\epsilon^{(\prime)}$, ilgili mezonun polarizasyon tensörüdür. Bu matris elemanlarını, bağdaşıklık fonksiyonu ifadesinde yerine koyup, olası bütün polarizasyonlar üzerinden toplam alırsak,

$$\begin{aligned}\Pi^{(1)}_{\mu\nu\alpha\beta} &= \frac{(\lambda_1^{1^{++}})^2}{p^2 - m^2_{1^{++}}}\sum_s\left(p_\mu\epsilon_\nu - p_\nu\epsilon_\mu\right)\left(p_\alpha\epsilon^*_\beta - p_\beta\epsilon^*_\alpha\right)\\ &\quad+\frac{(\lambda_1^{1^{-+}})^2}{p^2 - m^2_{1^{-+}}}\sum_s\epsilon_{\mu\nu\bar\mu\bar\nu}p^{\bar\mu}\epsilon'^{\bar\nu}\epsilon_{\alpha\beta\bar\alpha\bar\beta}p^{\bar\alpha}\epsilon'^{\bar\beta *}\end{aligned} \tag{39}$$

elde ederiz.

$j^{2+}_{\mu\nu}$ durumunda olduğu gibi, yeni Lorentz yapılarını

$$\begin{aligned}\kappa^{1+}_{\mu\nu\alpha\beta} &= \sum_s\left(p_\mu\epsilon_\nu - p_\nu\epsilon_\mu\right)\left(p_\alpha\epsilon^*_\beta - p_\beta\epsilon^*_\alpha\right)\\ &= -\left(p_\mu p_\alpha g^\perp_{\nu\beta} - p_\mu p_\beta g^\perp_{\nu\alpha} - p_\nu p_\alpha g^\perp_{\mu\beta} + p_\nu p_\beta g^\perp_{\mu\alpha}\right)\end{aligned} \tag{40}$$

$$\begin{aligned}\kappa^{1-}_{\mu\nu\alpha\beta} &= \sum_s\epsilon_{\mu\nu\bar\mu\bar\nu}p^{\bar\mu}\epsilon'^{\bar\nu}\epsilon_{\alpha\beta\bar\alpha\bar\beta}p^{\bar\alpha}\epsilon'^{\bar\beta *}\\ &= -p^2\left(g^\perp_{\mu\beta}g^\perp_{\nu\alpha} - g^\perp_{\mu\alpha}g^\perp_{\nu\beta}\right)\end{aligned} \tag{41}$$

olarak tanımlarsak, bağdaşıklık fonksiyonu

$$\Pi^{(1)}_{\mu\nu\alpha\beta} = \frac{(\lambda_1^{1^{++}})^2}{p^2 - m^2_{1^{++}}}\kappa^{1+}_{\mu\nu\alpha\beta} + \frac{(\lambda_1^{1^{-+}})^2}{p^2 - m^2_{1^{-+}}}\kappa^{1-}_{\mu\nu\alpha\beta} \tag{42}$$

olarak yazılır. Bu durumda da, $\kappa^{1+}_{\mu\nu\alpha\beta}\kappa^{1-;\mu\nu\alpha\beta} = 0$ olduğunu kullanarak, $J^{PC} = 1^{++}$ ve $J^{PC} = 1^{-+}$ durumlarının katkılarını ayırt edebiliriz:

$$\frac{(\lambda_1^{1^{++}})^2}{p^2 - m^2_{1^{++}}} = \frac{1}{12}\kappa^{1+}_{\mu\nu\alpha\beta}\Pi^{(1)}_{\mu\nu\alpha\beta} \tag{43}$$

$$\frac{(\lambda_1^{1^{-+}})^2}{p^2 - m^2_{1^{-+}}} = \frac{1}{12}\kappa^{1-}_{\mu\nu\alpha\beta}\Pi^{(1)}_{\mu\nu\alpha\beta} \tag{44}$$

4.3.3 $j^{0+}_{\mu\nu}$ ile yazılan Bağdaşıklık Fonksiyonunun Fenomenolojik İfadesi

$j^{0+}_{\mu\nu}$ akımı, vakumdan sadece $J^{PC} = 0^{++}$ durumlarını yaratabildiğinden, sadece 0^{++} parçacıklarının katkısı vardır. Akımın matris elemanını

$$\langle 0|j^0_{\mu\nu}|0^{++}\rangle = \lambda_0^{0^{++}} g_{\mu\nu} \tag{45}$$

olarak tanımlarsak, bağdaşıklık fonksiyonunu

$$\Pi^{(0)}_{\mu\nu\alpha\beta} = \frac{(\lambda_0^{0^{++}})^2}{p^2 - m^2_{0^{++}}} g_{\mu\nu} g_{\alpha\beta} \tag{46}$$

olarak elde ederiz. İndeksleri sadeleştirmek için, aynı seçersek,

$$\frac{(\lambda_0^{0^{++}})^2}{p^2 - m^2_{0^{++}}} = \frac{1}{16} \Pi^{(0)}_{\mu\nu\alpha\beta} g^{\mu\nu} g^{\alpha\beta} \tag{47}$$

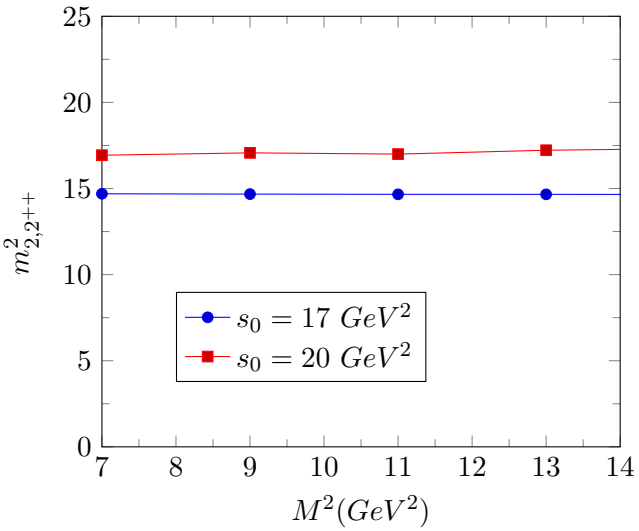
elde ederiz.

4.4 KRD Toplam Kuralları ile Spektrumun Sayısal Analizi

Denklemler 32, 33, 34, 43, 44 ve 47'den de görüleceği üzere, spektrumu elde etmek için, bağdaşıklık fonksiyonunun KRD parametreleri cinsinden hesaplanması gerekmektedir. Bu hesabın nasıl yapılabileceği, önceki bölümlerde kısaca açıklanmıştır. Elde edilen analitik sonuçlar ise, ekte verilmiştir. Denklem 16'da verilen akımın kullanılmasının bir avantajı da, bu akımdan elde edilen işlemci çarpımına, kuark kondensatının katkı vermemesidir. Bu sayede denklem 6'deki açılımda, $d = 3$ terimi de katkı vermez.

Önceden de değinildiği gibi, bağdaşıklık fonksiyonunu hesaplamak için, yoğuşmaların ve kuark kütlelerinin sayısal değerlerine ihtiyaç duyulmaktadır. Bağdaşıklık fonksiyonunun bağlı olduğu yoğuşmalar ve diğer parametreler $m_c = 1.4\ GeV^2$, $m_u = m_d = 0$, $\langle \bar{u}u\rangle = \langle \bar{d}d\rangle = \langle \bar{q}q\rangle = (-0.243\ GeV)^3$, $\langle \bar{q}\sigma Gq\rangle \equiv m_0^2 \langle \bar{q}q\rangle$, $m_0^2 = 0.8\ GeV^2$, $\frac{1}{4\pi^2}\langle g_s^2 G^2\rangle = 0.012\ GeV^4$ olarak alınmıştır.

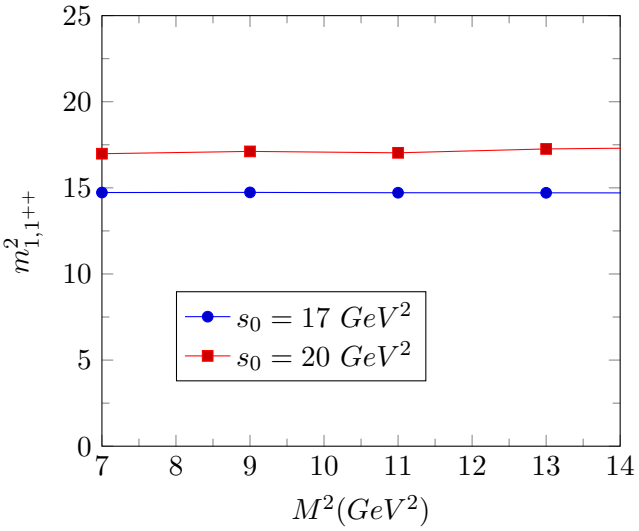
Sayısal öngörülerde bulunabilmek için belirlenmesi gereken diğer iki parametre ise, Borel parametresi (veya kütlesi) ve süreklilik eşiğidir. Borel parametresi fiziksel bir parametre değildir, ve öngörülerin bu parametreye bağlı olmaması gerekir. Genelde literatürde kullanılan s_0 değeri ilgilenen hadronun kütlesi yaklaşik m ise, $s_0 \simeq (m + 0.5\ GeV)^2$ olarak alınır. Bu çalışmada, $X(3872)$ için bu



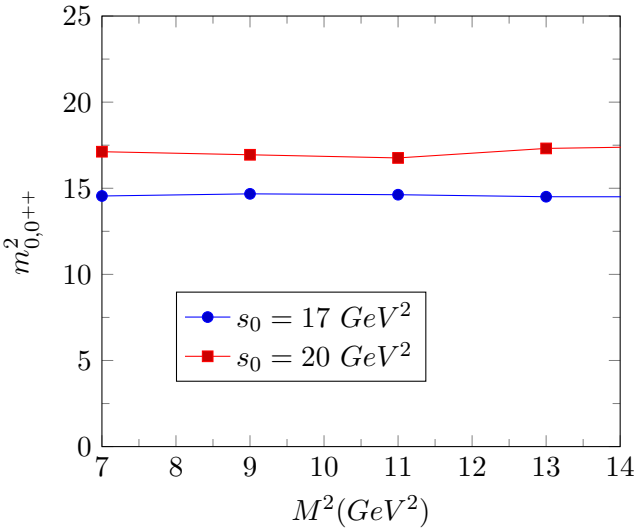
Şekil 2. $\Pi^{(2)}_{\mu\nu\alpha\beta}$ bağdaşıklık fonksiyonundan elde edilen, $J^{PC} = 2^{++}$ kuantum sayılarına sahip mezon'un kütle karesi öngörüsünün, farklı s_0 değerleri için Borel parametresine bağlılığı

$s_0 \simeq 19\ GeV^2$ değerine karşılık gelir. s_0 değerindeki hafif sapmaların, sonuçları ne kadar değiştireceğine de bakmak için, analizler $s_0 = 20\ GeV^2$ ve $s_0 = 17\ GeV^2$ değerleri için yapildi. Kütle öngörüleri, bu s_0 değerlerinde, $7\ GeV^2 < M^2 < 14\ GeV^2$ için çizdirildiğinde, $\Pi^{(2)}_{\mu\nu\alpha\beta}$'dan elde edilen $J^{PC} = 1^{++}$ ve $J^{PC} = 0^{++}$ parçacıkları için olan ve $\Pi^{(1)}_{\mu\nu\alpha\beta}$'dan elde edilen $J^{PC} = 1^{-+}$ parçacığı için olan toplam kurallarının s_0 ve M^2'deki değişmelere çok bağlı olduğu görüldü. Dolayısıyla, bu toplam kurallarından bir öngörü elde edilemedi. Diğer toplam kurallarının öngörüleri ise şekiller (2.)-4.)'da gösterilmiştir.

Şekillerden de görülebileceği gibi, bu parçacıklar için öngörülerimiz, ağır kuark simetrisinin de öngördüğü gibi, neredeyse birbirleri ile dejeneredir, ve kütleleri: $m^2 = 16 \pm 1.5\ GeV^2$ olarak belirlenmiştir. $X(3872)$'nin kütlesinin deneysel değeri $m^2_{X(3872)} = 15.0\ GeV^2$ olduğu düşünülürse, elde ettiğimiz sonuçlar, $X(3872)$ için tutarlıdır. Ayrıca, $X(3872)$'nin $J^{PC} = 0^{++}$ kuantum sayılarına sahip eşi olabilecek bir başka parçacık, $X(3915)$, $m_{0^{++}} = 15.25\ GeV^2$ olarak gözlenmiştir. (Nieves vd., 2012)'de, $X(3872)$'in $J^{PC} = 2^{++}$ olan eşinin kütlesi ise $m^2_{2^{++}} = 16.0\ GeV^2$ olarak öngörülmüştür. Her ne kadar elde ettiğimiz sonuç, bu değerler ile tutarlı olsa da hata paylarımızın büyüklüğü, kütle farkları ile ilgili kesin bir şey söylememize imkan vermemektedir.



Şekil 3. $\Pi^{(1)}_{\mu\nu\alpha\beta}$ bağdaşıklık fonksiyonundan elde edilen, $J^{PC} = 1^{++}$ kuantum sayılarına sahip mezon'un kütle karesi öngörüsünün, farklı s_0 değerleri için Borel parametresine bağlılığı



Şekil 4. $\Pi^{(0)}_{\mu\nu\alpha\beta}$ bağdaşıklık fonksiyonundan elde edilen, $J^{PC} = 1^{-+}$ kuantum sayılarına sahip mezon'un kütle karesi öngörüsünün, farklı s_0 değerleri için Borel parametresine bağlılığı

5. ETKİN KURAMLAR İLE X(3872) MEZONUNUN VE EŞLERİNİN İNCELENMESİ

5.1 Öncül Mertebede Etkin Lagranjiyanlar

Projede İP 3'ün içeriğini oluşturan bu kısımda tek ağır kuark içerikli mezonların kontak etkileşimlerini ve bu mezonların çarmonyum (daha genel olarak kuarkonyum) ile etkileşimlerini karakterize eden Lagranjiyanlar tanımlandı. Ağır kuark spin simetrisinin (AKSS) dikte ettiği tek ağır kuark içerikli vektör ve psödoskaler mezon alanlarının uygun kombinasyonu ile tanımlanan matris alanları aşağıdaki gibi kurulur (Grinstein vd., 1992).

$$\begin{aligned} H_a^{(Q)} &= \frac{1+\not{v}}{2}\left(P^{*(Q)}_{a\mu}\gamma^\mu - P^{(Q)}_a\gamma_5\right), \qquad v\cdot P^{*(Q)}_a = 0, \\ H^{(\bar{Q})a} &= \left(P^{*(\bar{Q})a}_\mu\gamma^\mu - P^{(\bar{Q})a}\gamma_5\right)\frac{1-\not{v}}{2}, \qquad v\cdot P^{*(\bar{Q})a} = 0. \end{aligned} \tag{48}$$

Burada $H^{(Q)}$ ve $H^{(\bar{Q})}$ matris alanları, belli bir v hızındaki psödoskaler mezon P, psödoskaler antimezon $\bar{P}$ ve bunların vektör AKSS eşleri P^*, $\bar{P}^*$'ı yok eder. a indisi izospine işaret eder, örneğin psödoskaler ağır-mezon için izospin çiftlisi: $P_a^{(Q)} = (Q\bar{u}, Q\bar{d})$ şeklindedir.

Parite ve yük eşleniği altında, yük eşlenik için kullanılan temsil $\mathcal{C}P_a^{(Q)}\mathcal{C}^{-1} = P^{(\bar{Q})a}$ ve $\mathcal{C}P^{*(Q)}_{a\mu}\mathcal{C}^{-1} = -P^{*(\bar{Q})a}_\mu$ olmak üzere

$$H^{(Q,\bar{Q})}(x^0,\vec{x}) \to \gamma^0 H^{(Q,\bar{Q})}(x^0,-\vec{x})\gamma^0, \qquad v^\mu \to v_\mu \tag{49}$$

$$\mathcal{C}H_a^{(Q)}\mathcal{C}^{-1} = c\,H^{(\bar{Q})at}\,c^{-1}, \qquad \mathcal{C}\bar{H}^{(Q)a}\mathcal{C}^{-1} = c\,\bar{H}_a^{(\bar{Q})t}\,c^{-1} \tag{50}$$

şeklinde dönüşen matris alanları $H_a^{(Q)}$ ve $H^{(\bar{Q})a}$, ağır spin $\otimes$ SU(2)$_V$ izospin simetrisi altında ise aşağıdaki gibi dönüşürler (Grinstein vd., 1992).

$$H_a^{(Q)} \to S_Q\left(H^{(Q)}U^\dagger\right)_a, \qquad H^{(\bar{Q})a} \to \left(UH^{(\bar{Q})}\right)^a S_{\bar{Q}}^\dagger. \tag{51}$$

Hermitsel eşlenik alanlar

$$\bar{H}^{(Q)a} = \gamma^0[H_a^{(Q)}]^\dagger\gamma^0, \qquad \bar{H}_a^{(\bar{Q})} = \gamma^0[H^{(\bar{Q})a}]^\dagger\gamma^0, \tag{52}$$

olarak tanımlıdır ve bahsedilen simetriler altında dönüşümleri

$$\bar{H}^{(Q)a} \to \left(U\bar{H}^{(Q)}\right)^a S_Q^\dagger, \qquad \bar{H}_a^{(\bar{Q})} \to S_{\bar{Q}}\left(\bar{H}^{(\bar{Q})}U^\dagger\right)_a. \tag{53}$$

ile verilir (Grinstein vd., 1992).

Yeterince düşük enerjilerde ağır kuark içerikli mezon molekülleri arasındaki etkileşimler kontak etkileşim ve tek pion değiş-tokuşu olmak üzere iki tiptir. Proje kapsamında yapılan hesaplamalar için yalnızca öncül mertebe (ÖM) etkileşimler dikkate alındığından, etkilerinin alt öncül mertebede olduğu bilinen (Nieves vd., 2012; Valderrama , 2012) tek piyon değiş-tokuşu katkısı ihmal edilmiştir. AKSS'nin bir sonucu olan ÖM $P^{(*)}\bar{P}^{(*)} \to P^{(*)}\bar{P}^{(*)}$ saçılmasını temsil eden Lagranjiyan (AlFiky vd., 2006)

$$\begin{aligned}
\mathcal{L}_{4H} &= C_A \,\mathrm{Tr}\left[\bar{H}^{(Q)a} H_a^{(Q)} \gamma_\mu\right] \mathrm{Tr}\left[H^{(\bar{Q})a} \bar{H}_a^{(\bar{Q})} \gamma^\mu\right] \\
&+ C_A^\tau \,\mathrm{Tr}\left[\bar{H}^{(Q)a} \vec{\tau}^{\,b}_{\cdot a} H_b^{(Q)} \gamma_\mu\right] \mathrm{Tr}\left[H^{(\bar{Q})c} \vec{\tau}^{\,d}_{\cdot c} \bar{H}_d^{(\bar{Q})} \gamma^\mu\right] \\
&+ C_B \,\mathrm{Tr}\left[\bar{H}^{(Q)a} H_a^{(Q)} \gamma_\mu \gamma_5\right] \mathrm{Tr}\left[H^{(\bar{Q})a} \bar{H}_a^{(\bar{Q})} \gamma^\mu \gamma_5\right] \\
&+ C_B^\tau \,\mathrm{Tr}\left[\bar{H}^{(Q)a} \vec{\tau}^{\,b}_{\cdot a} H_b^{(Q)} \gamma_\mu \gamma_5\right] \mathrm{Tr}\left[H^{(\bar{Q})c} \vec{\tau}^{\,d}_{\cdot c} \bar{H}_d^{(\bar{Q})} \gamma^\mu \gamma_5\right] \qquad (54)
\end{aligned}$$

ile verilir. Burada $\vec{\tau}^{\,b}_{\cdot a}$ izospin uzayındaki Pauli matrislerine işaret ederken, $C_{A,B}^{(\tau)}$ hafif çeşniden bağımsız düşük enerji sabitleridir (DES). Bu DES'lerinin aynı zamanda ağır çeşniden de bağımsız olduğu varsayılmıştır. Ayrıca, Lagranjiyanın içerdiği alan ve parametrelerin boyutları için (Manohar vd., 201) çalışmasına bakılabilir.

$I = 0$ ve $I = 1$ izospin kanalları düşünülürse denklem (54)'deki DES'leri C_{0A}, C_{0B} ve C_{1A}, C_{1B} olmak üzere dört tanedir ve her kanal için ayrı ayrı aşağıdaki ilişki yazmak mümkündür.

$$C_{0\phi} = C_\phi + 3C_\phi^\tau, \qquad C_{1\phi} = C_\phi - C_\phi^\tau, \qquad \phi = A, B \quad . \qquad (55)$$

(54)'deki Lagranjiyandan Lippmann-Schwinger denklemini çözmek için rölativistik olmayan normalizasyonda kuantum mekaniksel potansiyeller elde edilmelidir. Söz konusu normalizasyon için Feynman genlikleri, T^{FT}, aşağıda verilmiştir.

$$V^{\mathrm{QM}}\left[D^{(*)}\bar{D}^{(*)} \to D^{(*)}\bar{D}^{(*)}\right] = \frac{T^{\mathrm{FT}}\left[D^{(*)}\bar{D}^{(*)} \to D^{(*)}\bar{D}^{(*)}\right]}{\sqrt{2M_{D^{(*)}} 2M_{\bar{D}^{(*)}} 2M_{D^{(*)}} 2M_{\bar{D}^{(*)}}}} = -\frac{\mathcal{L}_{4H}}{4} \qquad (56)$$

Proje kapsamında kurulmak istenen etkin modeli genel hatları ile incelemek için, öncelikli olarak $X(3872)$'nin izospin simetrik limitine bakılmıştır. Denklem (54)'den elde edilen izoskaler $\left[D^{(*)}\bar{D}^{(*)} \to D^{(*)}\bar{D}^{(*)}\right]$

potansiyelleri ise (Nieves vd., 2012)'te

$$V^{\rm QM}(1^{++}) = C_{0A} + C_{0B} \tag{57}$$

$$V^{\rm QM}(0^{++}) = \begin{pmatrix} C_{0A} & \sqrt{3}\,C_{0B} \\ \sqrt{3}\,C_{0B} & C_{0A} - 2\,C_{0B} \end{pmatrix}, \tag{58}$$

$$V^{\rm QM}(1^{+-}) = \begin{pmatrix} C_{0A} - C_{0A} & 2\,C_{0B} \\ 2\,C_{0B} & C_{0A} - C_{0B} \end{pmatrix}, \tag{59}$$

$$V^{\rm QM}(2^{++}) = C_{0A} + C_{0A}\,. \tag{60}$$

olarak bulunmuştur. Burada, pion değiş-tokuş etkilerinin alt-öncül mertebede sınırlı kalması gibi parçacık çiftlenim-kanalı etkileri de alt-öncül mertebededir (Nieves vd., 2012; Valderrama , 2012). Bu sebeple, fenomenolojik analizlerde 0^{++} ve 1^{+-} potansiyallerinin köşegen olmayan elemanları sıfır alınmıştır(Guo vd., 2013; Hidalgo-Duque vd., 2013). Ancak tam ağır kuark limitinde ($m_Q \to \infty$) psödoskaler ve vektör ağır-hafif mezonlar dejenere hale geldiklerinden çiftlenim-kanalı etkileri dikkate alınmalıdır. Bu limitte, matrislerin köşegenleştirilmesiyle iki farklı özdeğer elde edilir. Bunlar hafif serbestlik derecelerinin $s_l = 0$ ve 1 spin konfigürasyonları ile ilişkili olan $(C_{0a} - 3C_{0b})$ ve $(C_{0a} + C_{0b})$'dir. Bu da ağır kuark limitinde fazlaca dejenere moleküler durumun ortaya çıkmasına sebep olur (Baru vd., 2016; Hidalgo-Duque vd., 2013).

Yukarıda bahsedilen etkileşimlere katkı getirebilecek kuarkonyum durumlarını ele almak için öncelikle incelenecek moleküler durumların kuantum sayılarıyla uyuşan kuarkonyum durumları belirlenmelidir. Bir ağır kuark–antikuark bağlı durumu temsili olarak $n\,^{2s+1}l_J$ ile ifade edilir. Burada n radyal kuantum sayısı, l yörüngesel açısal momentum, s spin ve J toplam açısal momentuma işaret eder. Parite ve yük eşleniği ise $P = (-1)^{l+1}$ ve $C = (-1)^{l+s}$ ile verilir. Örneğin $X(3872)$'nin J^{PC} kuantum sayıları 1^{++}'dır ve bu kuantum sayılarına sahip kuarkonyum durumu $n\,^3P_1$ durumudur. Çift pariteli ($l = 1$) $P-$dalga olan bu multiplet aşağıdaki matris alanı ile tanımlanır (Casalbuoni vd., 1993) ($\epsilon_{0123} = +1$):

$$J^\mu = \frac{1+\not{v}}{2}\left(\chi_2^{\mu\alpha}\gamma_\alpha + \frac{i}{\sqrt{2}}\epsilon^{\mu\alpha\beta\gamma}\chi_{1\gamma}v_\alpha\gamma_\beta + \frac{1}{\sqrt{3}}\chi_0(\gamma^\mu - v^\mu) + h^\mu\gamma_5\right)\frac{1-\not{v}}{2} \tag{61}$$

Bu multipletin hız dört-vektörü ile çarpımı sıfır olup ($J_\mu v^\mu = 0$), içeriğindeki $\chi_2^{\mu\alpha}$ ($J^{PC} = 2^{++}$), χ_1^μ ($J^{PC} = 1^{++}$), χ_0 ($J^{PC} = 0^{++}$) ve h^μ ($J^{PC} = 1^{+-}$) alanları $\chi_{QJ}(nP)$ ve $h_Q(nP)$ kuarkonyum

alanlarını yok eder. Tensör ve vektör alanlar v^μ'ye ortogonaldir ve tensör alan hem simetrik hem de izsizdir. Parite ve yük eşlenik simetrileri altında J^μ'nün dönüşümü aşağıda verilmiştir.

$$J^\mu(x^0,\vec{x}) \xrightarrow{P} \gamma^0 J_\mu(x^0,-\vec{x})\gamma^0, \qquad v^\mu \xrightarrow{P} v_\mu \tag{62}$$

$$J^\mu \xrightarrow{C} cJ^{\mu t}c \tag{63}$$

Hermitsel konjüga alan ise $\bar{J}_\mu$

$$\bar{J^\mu} = \gamma^0 J^{\mu\dagger}\gamma^0, \tag{64}$$

olarak tanımlıdır ve ağır kuark/anti-kuark dönmeleri altında

$$J_\mu \to S_Q J_\mu S_{\bar{Q}}^\dagger, \qquad \bar{J}_\mu \to S_{\bar{Q}} \bar{J}_\mu S_Q^\dagger \tag{65}$$

şeklinde dönüşür.

Yukarıda tek ağır kuark içerikli moleküler durumlar ve kuarkonyum durumları için alan multipletleri tanımlandığından, yeterince düşük enerjilerde kontak etkileşime gelebilcek katkı yazılabilir. $Q\bar{Q}$ $n\,^{2s+1}P_J$ kuarkonyum–$P^{(*)}\bar{P}^{(*)}$ geçişi için, öncül mertebede AKSS ile uyumlu yalnızca tek bir terim söz konusudur (Colangelo vd., 2004).

$$\mathcal{L}_{HHQ\bar{Q}} = d\,\mathrm{Tr}[H^{a(\bar{Q})}\bar{J}_\mu H_a^{(Q)}\gamma^\mu] + d\,\mathrm{Tr}[\bar{H}^{a(Q)}J_\mu H_a^{(\bar{Q})}\gamma^\mu] \tag{66}$$

Burada iki ağır-hafif mezon $S-$dalgada ağır-ağır duruma yani kuarkonyuma çiftlenmektedir. Dolayısıyla matris elemanları bunların relatif momentumlarına bağlı değildir. Bunu şu şekilde görebiliriz: Belli bir izospin durumu için, moleküler durumlar ve kuarkonyum durulmarı arasındaki olası geçişler, AKSS ve rotasyonel değişmezlik kullanılırsa aşağıdaki matris elemanları ile tasvir edilebilir (Formülasyonda karışıklık olmaması için izospin indisi kullanılmamıştır).

$$\langle n^{2s+1}l_{J'}|H^{QCD}|(s_Q s_l)J\rangle = \delta_{J,J'}\delta_{s,s_Q}\langle nl||H^{QCD}||s_l\rangle \tag{67}$$

Burada J, sitemin toplam spini $s_Q = 0,1$ ve $s_l = 0,1$ ise sırasıyla ağır kuar-antikuark ve hafif kuar-antikuark çiftinin spinidir. Yukarıdaki eşitlik ağır-kuark alt sisteminin spini s_Q'nun korunumlu olduğunu ifade eder. J ve s_Q'nun korunumlu olması açısal momentumun $(\vec{J} - \vec{s_Q})$ da korunumlu olduğu anlamına gelir. Moleküler durum düşünüldüğünde tek pariteli matris alanlarının etkileşimleri

hesaba katıldığından açısal momentum hafif serbestlik derecelerinin spin toplamına eşittir. Kuarkonyum durumunda ise $L = 1$'dir. Böylece $\vec{J} - \vec{s_Q}$ korunumu yalnızca $s_l = L = 1$ matris elemanından katkı geleceğini ifade eder.

$$\langle n^{2s+1} l_{J'} | H^{QCD} | (s_Q s_l) J \rangle = \delta_{J,J'} \delta_{s,s_Q} \langle nl || H^{QCD} || s_l \rangle \tag{68}$$

Diğer taraftan denklem (66)'teki d parametresi boyutu $E^{-1/2}$ olan ve bilinmeyen bir DES'dir. Söz konusu parametrenin aynı zamanda radyal kuantum numarası n'ye bağımlılığı da olabilir ancak proje kapsamında kurulan bu etkin modelde ihmal edilmiştir. Modelin içerdiği diğer parametreler ise, bazıları henüz deneysel olarak doğrulanamayan ancak potansiyel kuark modeller gibi teorik yaklaşımlarla hesaplanan kuarkonyum kütleleridir. Denklem (66)'ün içerdiği tensörel, vektörel ve skaler alanların cinsinden açılırsa aşağıdaki ifade elde edilir.

$$\begin{aligned} \mathcal{L}_{c\bar{c}} &= -2\sqrt{2}d \left[-\sqrt{2}\chi_1^{\dagger\eta} \left(P\bar{P}_\eta^* - P_\eta^* \bar{P} \right) - \sqrt{3}\chi_0^\dagger \left(P\bar{P} + \frac{1}{3} P_\eta^* \bar{P}^{*\eta} \right) \right. \\ &+ \left. h^{\dagger\eta} \left(P\bar{P}_\eta^* + P_\eta^* \bar{P} \right) + i\epsilon_{\alpha\mu\rho\eta} v^\alpha h^{\dagger\mu} P^{*\rho} \bar{P}^{*\eta} + 2\chi_2^{\dagger\rho\eta} P_\rho^* \bar{P}_\eta^* \right] + h.c. \end{aligned} \tag{69}$$

Burada $P^{(*)}\bar{P}^{(*)}$ izospin sıfır iki mezon durumunu yok eder. Hesaplarda kullanılan izospin temsili $\bar{u} = |1/2, -1/2\rangle$ ve $\bar{d} = -|1/2, +1/2\rangle$ olmak üzere, örneğin tılsımlı mezonlar için alan kombinasyonu

$$|00> = -\frac{1}{\sqrt{2}} \left(D^{0(*)} \bar{D}^{0(*)} + D^{+(*)} D^{-(*)} \right). \tag{70}$$

şeklinde olur.

Rölativistik olmayan normalizasyonda genliğin temsili

$$V_{c\bar{c}}^{\mathrm{QM}} \left[\Psi_{c\bar{c}}(2P) \to D^{(*)} \bar{D}^{(*)} \right] = \frac{T^{\mathrm{FT}} \left[\Psi_{c\bar{c}}(2P) \to D^{(*)} \bar{D}^{(*)} \right]}{\sqrt{2 \overset{\circ}{m}_{c\bar{c}} \, 2M_{D^{(*)}} 2M_{\bar{D}^{(*)}}}} = -\frac{\mathcal{L}_{c\bar{c}}}{2\sqrt{2}} \tag{71}$$

şeklinde olup, $\Psi_{c\bar{c}}$, $\chi_{cJ}(2P)$ ve $h_c(2P)$ çarmonyum durumuna karşılık gelirken $\overset{\circ}{m}_{c\bar{c}}$ ortak yalın kütleyi

temsil eder. Denklem (69)'den $\left[\Psi_{c\bar{c}}(2P) \to D^{(*)}\bar{D}^{(*)}\right]$ geçiş genlikleri aşağıdaki gibi bulunur.

$$V_{c\bar{c}}^{\mathrm{QM}}(1^{++}) = d \qquad \chi_{c1}(2P) \to [D\bar{D}^*]_+ \tag{72}$$

$$V_{c\bar{c}}^{\mathrm{QM}}(0^{++}) = -\frac{d}{2}\begin{pmatrix}\sqrt{3}\\ 1\end{pmatrix} \qquad \begin{pmatrix}\chi_{c0}(2P) \to D\bar{D}\\ \chi_{c0}(2P) \to D^*\bar{D}^*\end{pmatrix} \tag{73}$$

$$V_{c\bar{c}}^{\mathrm{QM}}(1^{+-}) = -\frac{d}{\sqrt{2}}\begin{pmatrix}1\\ 1\end{pmatrix} \qquad \begin{pmatrix}h_c(2P) \to [D\bar{D}^*]_-\\ h_c(2P) \to D^*\bar{D}^*\end{pmatrix} \tag{74}$$

$$V_{c\bar{c}}^{\mathrm{QM}}(2^{++}) = d \qquad \chi_{c2}(2P) \to D^*\bar{D}^* \tag{75}$$

Diğer taraftan kontak etkileşimlerden dolayı Lippmann-Schwinger denklemi kötü tanımlı bir ultraviyole davranış gösterir. Bu da regülarizasyon ve renormalizasyon gereksinimi yaratır. Yapılan hesaplarda Gaussal regülatör kullanılmıştır (detaylı bilgi için, (Epelbaum vd., 2008)'deki çalışmaya bakılabilir)

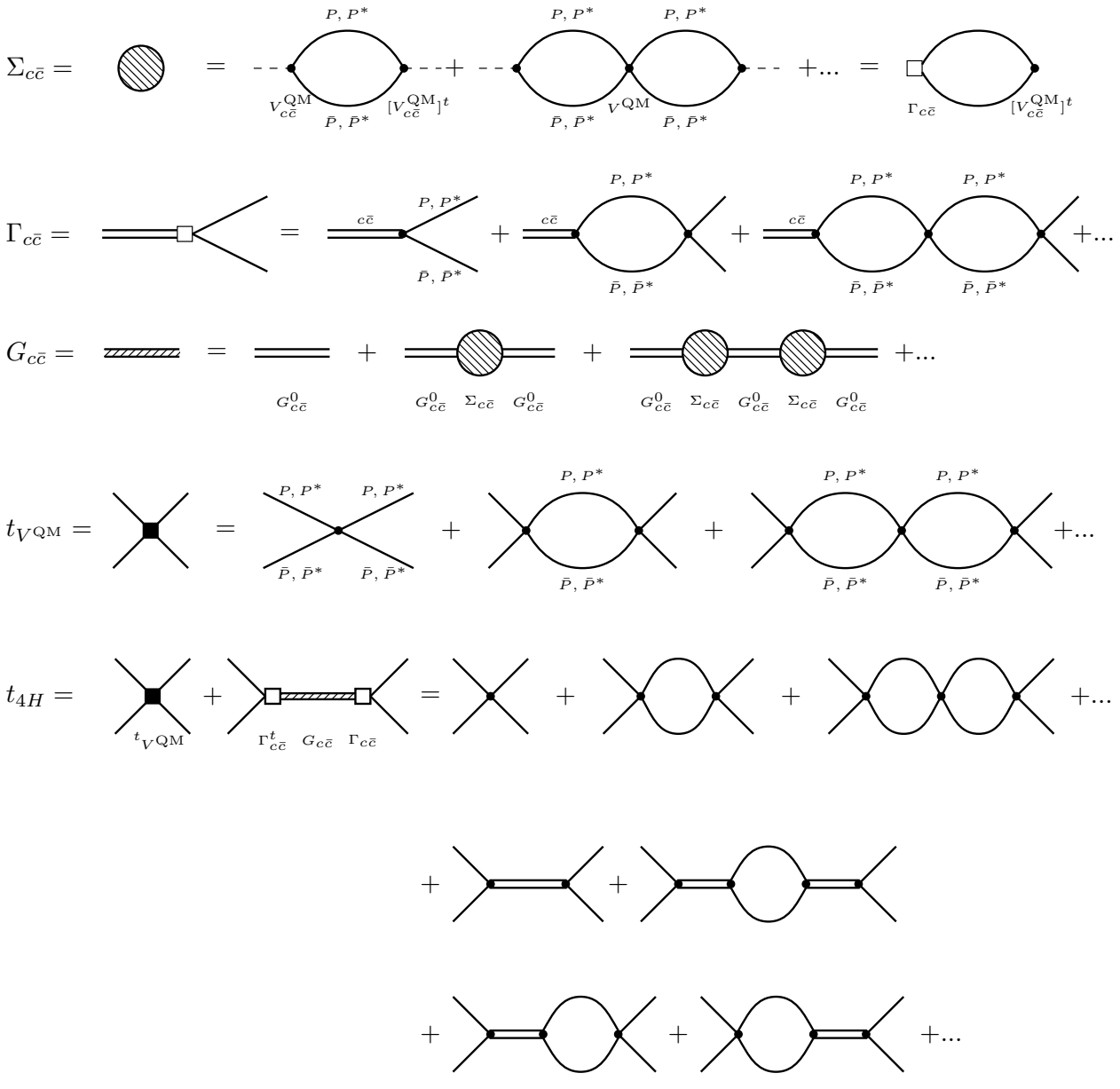
$$\langle \vec{p}\,'; D^{(*)}\bar{D}^{(*)}|V_{\Lambda}^{\mathrm{QM}}|\vec{p}; D^{(*)}\bar{D}^{(*)}\rangle = C_{0H}\ f_{\Lambda}(\vec{p}\,')f_{\Lambda}(\vec{p}) \tag{76}$$

$$\langle \vec{p}; D^{(*)}\bar{D}^{(*)}|V_{c\bar{c};\Lambda}^{\mathrm{QM}}|\Psi_{c\bar{c}}(2P)\rangle \propto d\ f_{\Lambda}(\vec{p}) \tag{77}$$

Burada $f_{\Lambda}(\vec{p}) = e^{-\vec{p}^{\,2}/\Lambda^2}$ şeklinde olup, C_{0H}, (57)–(60) denklemlerindeki izoskaler DES'lerini temsil eder. Regülatördeki Λ parametresi kesilim ölçeğini temsil eder. Seçilecek değer ya da değerler durumların dalga sayısından büyük ancak aynı zamanda AKSS'sini koruyacak kadar da küçük olmalıdır. Aksi taktirde teori kısa menzilli dinamiklere ait detaylara duyarlı hale gelecektir. Buradaki hesaplar için kesilim ölçeği olarak, (Nieves vd., 2012; Hidalgo-Duque vd., 2013) çalışmalarında olduğu gibi, Λ = 0.5–1 GeV değerleri tercih edilmiştir.

5.2 Kütle spektrumu

Projede İP 4'ün içeriğini oluşturan bu kısımda elde edilen etkin Lagranjiyan kullanılarak çarmonyum katkısının parçacık spektrumu üzerine etkisi incelenmiştir. Ayrıca, etkileşim süreçleri için modelin getirdiği rezonans durumlarının geçiş olasılıkları ve bağlaşım sabitleri de elde edilmiştir.



Şekil 5. çarmonyumun içsel enerjisi $\Sigma_{c\bar{c}}$, giydirilmiş çarmonyum–$D^{(*)}\bar{D}^{(*)}$ köşe fonksiyonu $\Gamma_{c\bar{c}}$, tam kuarkonyum propagatörü $G_{c\bar{c}}$, kısmi mezonik $t-$matris, $t_{V^{\rm QM}}$ ve son olarak tam mezonik $t-$matris t_{4H}'ın diyagramsal gösterimi.

Öncelikle moleküler bileşenlerin ve yalın $Q\bar{Q}$ durumunun bir karışımı olarak ele alınan fiziksel durumların, eşik civarında analiz edilebilmesi için Lippmann-Schwinger denkleminin çözülmesi lazım.

n tane kanalı moleküler tipte ve tek bir kanalı kuarkonyum olan $n+1$ boyutlu çiftlenim kanalının olduğu J^{PC} sektörü için $t-$matris (Baru vd., 2010)

$$\langle \vec{p}\,'|T(E)|\vec{p}\rangle = F_\Lambda(\vec{p}\,')\begin{pmatrix} \left[t_{V^{\rm QM}} + \Gamma_{c\bar{c}} G_{c\bar{c}} \Gamma^t_{c\bar{c}}\right]_{n\times n} & \left[\dfrac{\Gamma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\right]_{n\times 1} \\ \left[\dfrac{\Gamma^t_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\right]_{1\times n} & \left[\dfrac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\right]_{1\times 1} \end{pmatrix} F_\Lambda(\vec{p}) \tag{78}$$

olarak yazılabilir. Diyagramsal olarak matrisin içerdiği elemanlar şekil. 5.'te verilmiştir. Burada form faktörlerin Gaussal matrisi aşağıdaki gibidir.

$$F_\Lambda(\vec{p}) = \begin{pmatrix} \mathrm{Diag}\left[f_\Lambda(\vec{p})\right]_{n\times n} & 0 \\ 0 & 1 \end{pmatrix}, \tag{79}$$

Diğer taraftan $Q\bar{Q}$ etkilerini içermeyen kısmi mezonik $t-$matris $t_{V^{\rm QM}}$

$$t_{V^{\rm QM}} = \left(1 - V^{\rm QM} G_{\rm QM}(E)\right)^{-1} V^{\rm QM} \tag{80}$$

şeklindedir. Burada $V^{\rm QM}$ kerneli kuantum mekaniksel kontak potansiyel, $G_{\rm QM}(E)$ Gaussal form faktörle regülarize edilmiş köşegen mezonik ilmek fonksiyonudur. Keyfi bir E enerjisi için

$$\begin{aligned} G_{\rm QM}(E) &= \int \frac{\mathrm{d}^3\vec{q}}{(2\pi)^3} \frac{e^{-2\vec{q}^{\,2}/\Lambda^2}}{E - M_1 - M_2 - \vec{q}^{\,2}/2\mu + i0^+} \\ &= -\frac{\mu\Lambda}{(2\pi)^{3/2}} + \frac{\mu k}{\pi^{3/2}}\phi\left(\sqrt{2}k/\Lambda\right) - i\frac{\mu k}{2\pi}e^{-2k^2/\Lambda^2}\ , \end{aligned} \tag{81}$$

şeklinde tanımlanır (Albaladejo vd., 2013). $\mu^{-1} = M_1^{-1} + M_2^{-1}$, $k^2 = 2\mu(E - M_1 - M_2)$ ve $\phi(x)$ Dawson integrali olup aşağıda verilmiştir.

$$\phi(x) = e^{-x^2}\int_0^x e^{y^2}\mathrm{d}y\ . \tag{82}$$

Burada dalga sayısı k, E'nin çok-değerli bir fonksiyonudur ve eşikteki dallanma noktası $E = M_1 + M_2$'dir. $(E - M_1 - M_2)$'nin temel argümanı $[0, 2\pi[$ aralığında alınmalıdır. $k\phi(\sqrt{2}k/\Lambda)$ fonksiyonu eşiğin üstünde gerçel E için herhangi bir süreksizlik göstermez ve $G_{\rm QM}(E)$, ik teriminden dolayı çok-değerli bir fonksiyon haline gelir. Esasında $G_{\rm QM}(E)$ iki Riemann kabuğuna sahiptir. İlkinde $0 \leq \mathrm{Arg}(E - M_1 - M_2) < 2\pi$ olmak üzere $E > (M_1 + M_2)$ için $G^I_{\rm QM}(E + i\epsilon) - G^I_{\rm QM}(E - i\epsilon) =$

$2i\,\mathrm{Im}G^{I}_{\mathrm{QM}}(E+i\epsilon)$ şeklinde bir süreksizlik mevcuttur. İkincisinde ise $2\pi \leq \mathrm{Arg}(E-M_1-M_2) < 4\pi$ olmak üzere, eşiğin üstünde ve gerçel enerjiler için $G^{II}_{\mathrm{QM}}(E\mp i\epsilon) = G^{I}_{\mathrm{QM}}(E\pm i\epsilon)$ ilişkisi elde edilir.

Denklem (78)'daki rölativistik olmayan yalın $G^0_{c\bar{c}}$ ve giydirilmiş $G_{c\bar{c}}$ kuarkonyum propagatörleri ise

$$G^0_{c\bar{c}}(E) = \frac{1}{E- \overset{\circ}{m}_{c\bar{c}}}, \qquad G_{c\bar{c}}(E) = \frac{1}{E- \overset{\circ}{m}_{c\bar{c}} -\Sigma_{c\bar{c}}(E)} \tag{83}$$

şeklindedir. Burada $\Sigma_{c\bar{c}}$ kuarkonyumun mezon ilmekleri ile indüklenen içsel enerjisi

$$\Sigma_{c\bar{c}}(E) = \left[V^{\mathrm{QM}}_{c\bar{c}}\right]^t G_{\mathrm{QM}}(E)\Gamma_{c\bar{c}}(E) \tag{84}$$

ve $\Gamma_{c\bar{c}}$ giydirilmiş köşe fonksiyonudur.

$$\Gamma_{c\bar{c}}(E) = \left(1 - V^{\mathrm{QM}}G_{\mathrm{QM}}(E)\right)^{-1} V^{\mathrm{QM}}_{c\bar{c}} \tag{85}$$

Ayrıca denklem (78)'da verilen $t-$matris Lippmann-Schwinger denkleminin bir çözümü olarak da yazılabilir.

$$\langle \vec{p}\,'|T(E)|\vec{p}\rangle = F_\Lambda(\vec{p}\,')\left(\hat{V}^{-1} - \hat{G}(E)\right)^{-1} F_\Lambda(\vec{p}) \tag{86}$$

$$\hat{V} = \begin{pmatrix} V^{\mathrm{QM}} & V^{\mathrm{QM}}_{c\bar{c}} \\ \left[V^{\mathrm{QM}}_{c\bar{c}}\right]^t & 0 \end{pmatrix}, \qquad \hat{G}(E) = \begin{pmatrix} G_{\mathrm{QM}}(E) & 0 \\ 0 & G^0_{c\bar{c}}(E) \end{pmatrix} \tag{87}$$

Bunun yanı sıra, tam $(n\times n)-$mezonik $t-$matris enerji bağımlı etkin bir potansiyelle kurulan Lippmann-Schwinger denkleminin çözümü olarak da elde edilebilir (Baru vd., 2010).

$$\begin{aligned} \langle \vec{p}\,'|t_{4H}(E)|\vec{p}\rangle &= f_\Lambda(\vec{p}\,')\left[t_{V^{\mathrm{QM}}} + \Gamma_{c\bar{c}}G_{c\bar{c}}\Gamma^t_{c\bar{c}}\right] f_\Lambda(\vec{p}) \\ &= \left(f^{-1}_\Lambda(\vec{p})\left[-G_{\mathrm{QM}}(E) + V^{-1}_{\mathrm{eff}}(E)\right] f^{-1}_\Lambda(\vec{p}\,')\right)^{-1} \end{aligned} \tag{88}$$

$$\begin{aligned} V_{\mathrm{eff}}(E) &= V^{\mathrm{QM}} + V^{\mathrm{QM}}_{c\bar{c}}G^0_{c\bar{c}}(E)\left[V^{\mathrm{QM}}_{c\bar{c}}\right]^t \\ &= V^{\mathrm{QM}} + \frac{V^{\mathrm{QM}}_{c\bar{c}}\left[V^{\mathrm{QM}}_{c\bar{c}}\right]^t}{E- \overset{\circ}{m}_{c\bar{c}}} \end{aligned} \tag{89}$$

Tüm çiftlenim kanalı etkilerinin dikkate alındığı bu tam ağır kuark limitinde etkin potansiyel $V_{\mathrm{eff}}(E)$'in, $(C_{0a}-3C_{0b})$ ve $(C_{0a}+C_{0b})+d^2/(E- \overset{\circ}{m}_{c\bar{c}})$ olmak üzere iki farklı özdeğeri vardır. Bu özdeğerler, V^{QM}

potansiyelininki gibi hafif serbestlik derecelerinin $s_l = 0$ ve $s_l = 1$ kombinasyonlarına karşılık gelir. AKSS'nin dikte ettiği yalnızca $s_l = 1$ konfigürasyonuna gelen kuarkonyum katkısı iki potansiyelin özdeğerleri karşılaştırılarak görülebilir. Kuarkonyum durumunun getirdiği ekstra etkileşimin çekici ya da itici olması, E enerjisinin yalın kuarkonyum kütlesi $\overset{\circ}{m}_{c\bar{c}}$'ın altında ya da üstünde olmasına bağlıdır. Dolayısıyla yapılacak analizler için seçilecek kuarkonyum kütleleri niceliksel olmasa bile niteliksel olarak büyük önem arz eder.

Geçiş matrisinin elde edilmesiyle Lippmann-Schwinger denklemi çözülüp, bağlı durumlar ve rezonanslar elde edilebilir. Dinamik olarak üretilen mezon durumları, kompleks enerji düzleminde ($E-$düzlemi), saçılma genliklerinin tekillikleri olarak ortaya çıkar. Birinci Riemann kabuğu (BRK) üzerinde saçılma genliğinin tekillikleri, eşiğin altında, gerçel eksen üzerinde görülür ve bağlı durum olarak yorumlanır. Gerçel eksenin altında ve eşiğin üstünde, ikinci Riemann kabuğunda (İRK) bulunan tekillikler ise, rezonans olarak tanımlanır. Durumun kütlesi ve genişliği, kompleks enerji düzlemi üzerindeki tekilliğin pozisyonundan bulunabilir. İRK'nda elde edilecek tekillikler eşlenik tekillikler olarak karşımıza çıkar. Bunlardan biri İRK'nun dördüncü çeyreğinde, diğeri ise birinci çeyreğinde lokalize olur ve sırasıyla rezonans parçacık ve anti-rezonans parçacık olarak isimlendirilir. Yapılan çalışmanın sonuçlarında, İRK'nun birinci çeyreğinde bulunan tekilliklere çizelge ve şekillerde yer verilmemiştir. Yine de parçacık spektrumunda bulunduğunu belirtmekte fayda vardır.

$$T_{ij} \quad \sim \quad \frac{g_i g_j}{E - E_R} \tag{90}$$

Rezonans enerjisi E_R, durumun kütlesi M_R ve genişliği Γ_R cinsinden $E_R = M_R - i\Gamma_R/2$ olarak ifade edilir.İlgili kanala olan bağlaşım ise g_a $(a = i, j)$ ile gösterilmiştir.

5.2.1 1^{++} ve 2^{++} mezon molekülleri

Daha önce de bahsedildiği üzere, $X(3872)$ etkin alan teorisi kapsamında incelendiğinde bazı AKSS eşlerinin de spektrumda gözlenmesi beklenmektedir. Özellikle de, (57) ve (60) denklemlerinden anlaşılacağı gibi, 1^{++} ve 2^{++} sektörleri için etkileşim aynıdır. Bu iki sektör için yazılan moleküler etkileşim hafif serbestlik derecelerinin $s_l = 1$ konfigürasyonuna karşılık gelir. AKSS sonucu kuarkonyum katkısının yalnızca bu konfigürasyonu etkilediği düşünülürse söz konusu durumları incelemek, kurulan etkin teorinin daha iyi anlaşılabilmesini sağlar.

İzoskaler 1^{++} ve 2^{++} sektörlerinde, denklem. (78)'da verilen kabuk üzerindeki $t-$matris aşağıdaki gibi ifade edilebilir.

$$T(E) = \frac{\Sigma_{c\bar{c}}}{1 - G^0_{c\bar{c}}\Sigma_{c\bar{c}}} \begin{pmatrix} f^2_\Lambda(E) \left[(d\, G_{\rm QM})^{-2} - \dfrac{1 - G^0_{c\bar{c}}\Sigma_{c\bar{c}}}{G_{\rm QM}\Sigma_{c\bar{c}}} \right] & f_\Lambda(E)\, (d\, G_{\rm QM})^{-1} \\ \\ f_\Lambda(E)\, (d\, G_{\rm QM})^{-1} & 1 \end{pmatrix} \tag{91}$$

Burada kabuk üzeri $f_\Lambda(E) = \exp\left\{-2\mu(E - M_1 - M_2)/\Lambda^2\right\}$ ile verilir ve $C_{0X} = C_{0A} + C_{0B}$ olmak üzere kuarkonyumun içsel enerjisi,

$$\Sigma_{c\bar{c}}(E) = \frac{d^{\,2}\, G_{\rm QM}(E)}{1 - C_{0X}\, G_{\rm QM}(E)} \tag{92}$$

olarak bulunur. 1^{++} ve 2^{++} sektörleri arasındaki tek fark, mezon ilmek fonksiyonu $G_{\rm QM}(E)$, çarmonyum yalın propagatörü $G^0_{c\bar{c}}$ ve Gaussal form faktörlerin bağlı bulunduğu yalın çarmonyum kütleleridir. Söz konusu nicelikler için 1^{++} ve 2^{++} sektörlerine karşılık gelecek şekilde kullanılan kütle gösterimleri sırasıyla $M_1 = M_D$, $M_2 = M_{D^*}$, $\overset{\circ}{m}_{\chi_{c1}}$ ve $M_1 = M_2 = M_{D^*}$, $\overset{\circ}{m}_{\chi_{c2}}$ şeklindedir. $d \neq 0$ için $T(E)$'nin tekillikleri giydirilmiş propogatörün tersinin sıfır olduğu noktalara karşılık gelir.

$$G_{c\bar{c}}(E_R)^{-1} = 0 \leftrightarrow 1 - G^0_{c\bar{c}}(E_R)\Sigma_{c\bar{c}}(E_R) = 0, \qquad E_R = M_R - i\Gamma_R/2 \tag{93}$$

$d \to 0$ limitinde ise $t-$matris aşağıdaki forma indirgenir.

$$\lim_{d\to 0} T(E) = \begin{pmatrix} f^2_\Lambda \frac{C_{0X}}{1 - C_{0X} G_{\rm QM}} & 0 \\ 0 & 0 \end{pmatrix} \tag{94}$$

Tekilliğin civarında, karşılık gelen Riemann kabuğunda aşağıdaki ilişki elde edilebilir.

$$\frac{\Sigma_{c\bar{c}}(E)}{1 - G^0_{c\bar{c}}(E)\Sigma_{c\bar{c}}(E)} \sim \frac{1}{E - E_R}\, \frac{\Sigma^2_{c\bar{c}}(E_R)}{1 - \Sigma'_{c\bar{c}}(E_R)}, \qquad \Sigma'_{c\bar{c}}(E_R) = \left.\frac{d\Sigma_{c\bar{c}}(E)}{dE}\right|_{E=E_R} \tag{95}$$

Mezon-karşıtmezon ve yalın çarmonyum durumları için bağlaşımlar ise,

$$g_1^2 = \frac{\Sigma^2_{c\bar{c}}(E_R)}{1 - \Sigma'_{c\bar{c}}(E_R)}\, \frac{f^2_\Lambda}{d^{\,2}\, [G_{\rm QM}(E_R)]^2} = \frac{\Sigma'_{c\bar{c}}(E_R)}{1 - \Sigma'_{c\bar{c}}(E_R)}\, \frac{f^2_\Lambda}{G'_{\rm QM}(E_R)} \tag{96}$$

$$g_2^2 = \frac{\Sigma^2_{c\bar{c}}(E_R)}{1 - \Sigma'_{c\bar{c}}(E_R)} = \frac{(E_R - \overset{\circ}{m}_{c\bar{c}})^2}{1 - \Sigma'_{c\bar{c}}(E_R)} = -\frac{1}{1 - \Sigma'_{c\bar{c}}(E_R)}\, \frac{1}{G^{0\prime}_{c\bar{c}}(E_R)} \tag{97}$$

ile ifade edilebilir. Burada türev temsilleri aşağıdaki gibidir.

$$G'_{\rm QM}(E_R) = \left.\frac{dG_{\rm QM}(E)}{dE}\right|_{E=E_R}, \qquad G^{0\prime}_{c\bar{c}}(E_R) = \left.\frac{dG^0_{c\bar{c}}(E)}{dE}\right|_{E=E_R} \tag{98}$$

Her ne kadar proje iş paketlerine dahil edilmese de, yukarıda bahsedilen durumları incelerken bunların olasılıksal yorumları da dikkate alınmıştır. Bu yorum ilk olarak döteronu bir nötron ve bir protonun bağlı durumu olarak ele almak için Weinberg tarafından öne sürülmüştür (Weinberg , 1963, 1965). Dalga fonksiyonlarının kendileri gözlenebilir olmadığından, hadronik bir durumun tam olarak doğasını saptamak zordur. Bir dalga fonksiyonunun en büyük Fock bileşenlerine ilişkin öngörülerin model bağımlılığı vardır. Weinberg tarafından öne sürülen kompozitlik koşulu moleküler bir durum için, hadron-hadron bileşenlerinin ilişkisini modelden bağımsız olarak belirlemek maksadıyla kullanılır. Ancak, bu yalnızca bağlı durumlar için geçerlidir. Rezonanslar içinse söz konusu ilişki kompleks sayıları içerir, dolayısıyla olasılıksal öngörüden ziyade kompozit yapıyı oluşturan durumların dalga fonksiyonundaki ağırlığı tartışılabilir. Kompozitlik koşulunun olasılıksal yorumu aşağıdaki toplam kuralına dayanır (Hyodo , 2013; Sekihara vd., 2015; Garcia-Recio vd., 2015).

$$-1 = \sum_{ij} g_i g_j \left(\delta_{ij} \left[\frac{\partial G_i^{II}(E)}{\partial E} \right]_{E=E_R} + \left[G_i^{II}(E) \frac{\partial V_{ij}(E)}{\partial E} G_j^{II}(E) \right]_{E=E_R} \right) \tag{99}$$

Yukarıdaki denklemden $\sum_i \tilde{X}_i$ ve $\tilde{Z}$'nin sanal kısımlarının birbirini yok ettiği açıkça görülmektedir. Bu eşitlik, İRK'nun dördüncü çeyreğinde lokalize olan bir tekilliğin rezidüleri ile sağlanır. Tekillik, çiftlenim-kanalı için yazılan Lippmann-Schwinger denkleminin $t-$-matrisi çözümüne ($T^{-1} = -G + V^{-1}$) aittir. Söz konusu toplam kuralında, $G^{II} \leftrightarrow G^{I}$ yer değiştirmesi yapılırsa, denklem bağlı durumlar için de geçerli olur. Bu kez tekillik, eşiğin altında, BRK'nın gerçel eksenlerinde lokalize olacaktır. Burada kompozit bir parçacık için hadron-hadron bileşeninin ağırlığını tanımlamak mümkündür.

$$X_i = {\rm Re}\tilde{X}_i = {\rm Re}\left(-g_i^2 \left[\frac{\partial G_i^{II}(E)}{\partial E} \right]_{E=E_R} \right) \tag{100}$$

(Aceti vd., 2014) ve (Gamermann vd., 2010) makalelerindeki analizler ele alınırsa, bağlı durumlar için $\tilde{X}_i$ niceliği gerçeldir ve durumu, i kanalında bulma olasılığı ile ilişkilidir. Rezonanslar içinse, $\tilde{X}_i$, i kanalının dalga fonksiyonunun karesi ile alakalıdır. Bir faz yorumuyla, bağlı durumlar için kendiliğinden gerçel olan dalga fonksiyonunu tasvir eder. Dolayısıyla rezonans durumunun bileşimindeki

mezon-baryon kanalının ağırlığının bir ölçüsü olarak kullanılabilir (Aceti vd., 2014; Sekihara vd., 2015). X_i foplamının birden sapması, $S-$dalga potansiyelin enerji bağımlılığı ile ilişkilidir.

$$\sum_i X_i = 1 - Z, \tag{101}$$

Burada Z aşağıdaki gibi tanımladır.

$$Z = \mathrm{Re}\tilde{Z} = \mathrm{Re}\left(-\sum_{ij} \left[g_i G_i^{II}(E) \frac{\partial V_{ij}(E)}{\partial E} G_j^{II}(E) g_j \right]_{E=E_R} \right). \tag{102}$$

ve alan renormalizasyon sabiti olarak adlandırılan $\tilde{Z}$, genel olarak kompleks olduğu halde rezonanslar için bile iyi tanımlıdır. Çünkü renormalize iki-nokta fonksiyonunun rezidüsüne karşılık gelir (Hyodo vd., 2012). $\tilde{X}_i$ iki-cisim bileşeninin bir bağlı durumda bulunma olasılığı olarak yorumlanabilirken, bir rezonans durumunda bu yorum yapılamaz. Yine de, kanal dalga fonksiyonunun toplam normalizasyona katkısını temsil ettiği için, $\tilde{X}_i$ kompozitliği rezonansın yapısı ile ilgili önemli bir bilgi içerecektir. Her tip genlik için geçerli olmasa da, bir hadronun dalga fonksiyonunda özel bir bileşenin bulunma olasılığını ölçmek $\tilde{X}_i$'nin mutlak değerine karşılık gelir (Guo vd., 2016). Söz konusu olasılıksal yorum yalnızca, $i.$ kanalın eşiğine karşılık gelen $M_{i,\mathrm{th}}$ için $\mathrm{Re}(E_R) > M_{i,\mathrm{th}}$ durumunda geçerlidir.

Proje kapsamında yapılan bu çalışmada, V^{QM} ve $V_{c\bar{c}}$ potansiyellerinin enerji bağımlılığı olmadığından $\langle \vec{p}\,'|T(E)|\vec{p}\rangle$'nin tekilliklerinin rezidüleri aşağıdaki eşitliği sağlar.

$$-\sum_i g_i^2 \left(\frac{\partial \left[\hat{G}_i(E)/F_{\Lambda\, i}^{-2} \right]}{\partial E} \right)_{E=E_R} = 1 \tag{103}$$

Bu denklem $f_\Lambda(E)$ form faktör matrisinin düşük enerji bağımlılığından dolayı tam olarak doğru olmasa da etkin olarak oldukça iyi bir yaklaşımdır. Denklemde ilmek fonksiyonları ($G_i(E)$) uygun BRK ya da İRK'nda hesaplanmalıdır.

Eğer hesapları denklem (88)'daki tam mezonik $t-$matris için yaparsak, t_{4H}'nin enerji bağımlı etkin bir potansiyeli olduğundan X_i ve Z, iki-cisim moleküler bileşenlerin ağırlığı ve dışarı atılan temel bileşenler yani kuarkonyum bileşenlerinin ağırlığı ile ilişkili olacaktır.

1^{++} ve 2^{++} sektörleri dikkate alındığında denklem (103) sağlanmaktadır.

$$\begin{aligned} g_1^2 \left(\frac{d\left[G_{\mathrm{QM}}(E)/f_\Lambda^2\right]}{dE} \right)_{E=E_R} + g_2^2 \left(\frac{d\, G_{c\bar{c}}^0(E)}{dE} \right)_{E=E_R} &= \frac{\Sigma'_{c\bar{c}}(E_R)}{1-\Sigma'_{c\bar{c}}(E_R)} - \frac{1}{1-\Sigma'_{c\bar{c}}(E_R)} + \cdots \\ &= -1 + \cdots \end{aligned} \tag{104}$$

Burada, form faktörlerin yarattığı düşük enerji bağımlılığından dolayı yukarıdaki denkleme gelen düzeltmeler $\mathcal{O}\left(\frac{f'_\Lambda(E_R)/f_\Lambda(E_R)}{G'_{\rm QM}(E_R)/G_{\rm QM}(E_R)}\right)$ mertebesinde ihmal edilmiştir. Olasılıksal yoruma gelince, molekül-molekül kanalı için geçiş matrisi $T(E) = -G^{-1}_{\rm QM}(E) + V_{\rm eff}$ olarak verilir. Saf molekül durumunda, toplam kuralı yalnızca ilgili kanalın form faktörüne ve ilmek fonksiyonuna bağlıdır. Moleküler olasılığa gelen katkı ise, etkin potansiyel cinsinden aşağıdaki gibi elde edilir.

$$g_1^2 \left(\frac{d\left[V_{\rm eff}^{-1}(E)/f_\Lambda^2\right]}{dE} \right)_{E=E_R} = \frac{1}{1-\Sigma'_{c\bar{c}}(E_R)} + \mathcal{O}\left(\frac{f'_\Lambda(E_R)/f_\Lambda(E_R)}{V_{\rm eff}^{-1\prime}(E_R)/V_{\rm eff}^{-1}(E_R)} \right) \tag{105}$$

Böylece, 1^{++} ve 2^{++} sektörleri için moleküler olasılık $\hat{X}$ ve çarmonyum olasılığı $\tilde{Z}$ tanımlanabilir. Tekillik $E_R = M_R - i\Gamma_R/2$ gibi bir rezonans noktasına yerleşirse, bu olasılıksal yorum yerini ilgili kanalın dalga fonksiyonundaki ağırlığı yaklaşımına bırakır.

$$\tilde{X} = -\frac{\Sigma'_{c\bar{c}}(E_R)}{1-\Sigma'_{c\bar{c}}(E_R)}, \qquad \tilde{Z} = \frac{1}{1-\Sigma'_{c\bar{c}}(E_R)} \tag{106}$$

ve $\Sigma'_{c\bar{c}}(E_R)$,

$$\Sigma'_{c\bar{c}}(E_R) = \frac{G'_{\rm QM}(E_R)(E_R - \mathring{m}_{c\bar{c}})^2}{d^2 G^2_{\rm QM}(E_R)} \tag{107}$$

ile verilir. İki bağlaşım sabiti arasındaki ilişki

$$g_2 = d\,\frac{g_1}{f_\Lambda}\,G_{\rm QM}(E_R) \tag{108}$$

şeklinde bulunur. Denklemden de kolayca görüleceği üzere, rezonans çarmonyum durumuna ilmek fonksiyonları yoluyla çiftlenmektedir.

Diğer taraftan, kurulan modelde çarmonyum kütleleri dışında (bu kütleler potansiyel kuark modellerce hesaplanabilmektedir) iki serbest parametre vardır. Bunlar C_{0X} ve d DES'leridir. $X(3872)$'nin, $D\bar{D}^*$ eşiği altında BRK'na yerleşen bir 1^{++} bağlı durumu olduğu varsayımıyla bu iki parametre birbirleri ile aşağıdaki gibi ilişkilendirilebilir.

$$C_{0X} = \frac{1}{G^I_{\rm QM}(M_X)} - \frac{d^2}{M_X - \mathring{m}_{\chi_{c1}}} \tag{109}$$

Böylece, d parametresine bağlı olacak şekilde C_{0X} kontak etkileşim parametresi sabitlenmiş olur. Dolayısıyla incelenen sektörler için geriye $d, \mathring{m}_{\chi_{c1}}$ ve $\mathring{m}_{\chi_{c2}}$ olmak üzere üç serbest parametre kalır.

5.2.2 $X(3872)$ ve $\chi_{c1}(2P)$ için nümerik sonuçlar

Etkin alan teorisi kapsamında burada kurulan modelde en büyük belirsizlik yalın $\chi_{c1}(2P)$ durumunun kütlesidir. Bu çarmonyum durumunun kütlesini 3947.4 MeV (Ortega vd., 2010; Segovia vd., 2013) ile 3906 MeV (Ebert vd., 2011) aralığında hesaplayan bir çok çalışma vardır. Öte yandan giydirilmiş $\chi_{c2}(2P)$ kütlesi deneysel olarak ölçülmüş ve $m_{\chi_{c2}}^{\rm exp} = 3927.2$ MeV olarak bulunmuştur. Ölçüm sonucu ile bahsedilen çalışmaların sonuçları kıyaslandığında en yakın değeri öngören (Ebert vd., 2011) çalışmasıdır. Bu yaklaşımla yalın $\chi_{c1}(2P)$ durumunun kütlesi ise $\mathring{m}_{\chi_{c1}}$= 3906 MeV olarak bulunmuştur. Bu sebeple proje kapsamında yapılan tüm hesaplar için 1^{++} yalın çarmonyum durumunun kütlesi bu değere sabitlenmiştir.

Ayrıca, burada yalın kütleden kasıt, düşük enerji sabiti d'nin sıfır olduğu durumdaki kütledir ve kurulan model çerçevesinde moleküler duruma olan bağlaşım ile renormalize edilecektir. Başka bir değişle yalın kütlenin kendisi fiziksel bir gözlenebilir değildir. Etkin teorilerin sonlu bir UV regülatör bağımlılığı olduğundan fiziksel çarmonyum ve yalın çarmonyum kütleleri arasındaki fark sonlu bir renormalizasyondur. Dolayısıyla yalın çarmonyum kütlesi renormalizasyon şemasına bağlı olduğundan kütleler arasındaki fark UV kesilim ölçeğine bağlı olur. Burada ele aldığımız çalışmada ise asıl problem, kuark model ölçeği ile etkin alan teorisi ölçeğini eşleştirmek olacaktır. Bu kapsamda, yapılan çalışmada fiziksel olarak motivasyonu olan ölçek aralığı düşünülerek iki farklı kesilim ölçeği kullanılmıştır. Beklentimiz UV regülatör bağımlılığının düşük enerji sabitlerince absorbe edilerek sonuçların daha yumuşak bir ölçek bağımlılığı ihtiva etmesidir.

Farklı d değerleri için 1^{++} gizli tılsım tekilliklerinin özellikleri tablo 1'de verilmiştir. $X(3872)$'nin kütlesi $M_X = 3871.69$ MeV alınarak BRK'na sabitlenmiş ve böylece C_{0X} parametresi d cinsinden belirlenmiştir. $\chi_{c1}(2P)$ tekilliği ise İRK'na yerleşmiştir. Tüm hesaplar $\Lambda = 1.0$ GeV için yapılmış olup tek ağır kuark içerikli D mezonları içinse $M_D = 1867.24$ MeV ve $M_{D^*} = 2008.63$ MeV kütle değerleri kullanılmıştır. Burada kontak düşük enerji sabitinin UV regülatör bağımlılığı vardır ($C_{0X} = C_{0X}(\Lambda)$) ve bu bağımlılık mezon ilmek propagatörünce $G_{\rm QM}$ yok edilmelidir ki rezonans kütleleri, rezonans genişlikleri, mezon-mezon saçılma uzunlukları gibi gözlenebilirler UV regülatöründen bağımsız hale gelsin. Bu sebeple söz konusu hesaplar kesilim ölçeğinin 500 MeV'lik değeri için de yapılmıştır (Table 2). $X(3872)$'nin kütlesi için kullanılan metod sayesinde UV'den bağımsızlık

sağlansa bile, bahsedilen tablolar karşılaştırıldığında bu rezonansın $D\bar{D}^*$ mezon çiftine bağlaşımında rezidüel bağımlılık mevcuttur. C_{0X}'in kesilim ölçeğine olan bağımlılığı, $X(3872)$'nin kurulan modeldeki kütle tanımından dolayı d parametresini de bağımlı kılar. Dolayısıyla Λ'nın 1 ve 0.5 GeV değerleri için niteliksel olarak benzer sonuçlar verir. Bu rezonansın mezon-molekülü olasılıkları $(\tilde{X}_{X(3872)})$ kıyaslanarak görülebilir.

Denklem (109)'nin bir sonucu olarak, $X(3872)$'nin kütlesi $M_X = 3871.69$ MeV'e sabitlenirken moleküler olasılık ve $D\bar{D}^*$ bağlaşımı d ile azalır. Çünkü burada ele alınan UV-kesilim şeması gereği $G^I_{\rm QM}(M_X)$ yalnızca üniter logaritmalardan sorumlu olup DES'lerinden bağımsızdır ve bu da bahsedilen fiziksel nicelikleri belirleyen $\Sigma'_{c\bar{c}}(E_R)$'nin $1/d^2$ ile ölçeklendirilmesine neden olur. Öte yandan, giydirilmiş çarmonyum durumu $\chi_{c1}(2P)$'nin kütle ve genişliğinin önemli ölçüde d bağımlılığı vardır. Bu DES'nin değeri, $\tilde{X}_{X(3872)} > 0.57$'yi sağlayacak kadar değiştirildiğinde, tekillik eşiğin üstünde İRK'nda kalır ve genişliği hızlı bir artış gösterir (şekil 6.'in üst sol paneli). d'nin C_{0X}'i sıfır yapan değerinde $(d^{\rm crit})$, $\chi_{c1}(2P)$ durumunun kütlesi eşiğin altında ve oldukça büyük bir bozunum genişliğine sahip olacak şekilde lokalize olur. BRK ve İRK eşiğin altında bağlantısız olduğundan böyle sanal durumlar ilgisiz hale gelir (şekil 6.'de üst sağ ve orta sol paneller). Kontak operatörün sıfır olduğu durum için tekillik pozisyonu denklemi aşağıdaki gibi ifade edilir.

$$E_R = \mathring{m}_{\chi_{c1}} + \left(M_X - \mathring{m}_{\chi_{c1}}\right) \frac{G_{\rm QM}(E_R)}{G^I_{\rm QM}(M_X)}, \qquad E_R = M_R - i\Gamma_R/2 \tag{110}$$

Yukarıdaki denklemin $E_R = M_X$ için çözümleri İRK'nda ancak eşiğin altında mevcuttur. Kontak DES'nin pozitif olduğu durum için tekillik pozisyonu denkleminin çözümleri yalnızca $M_R < \mathring{m}_{\chi_{c1}}$ değerleri için vardır ve böyle bir durumda tekillik hızla gerçel eksene doğru hareket eder.

$$\frac{C_{0X}}{d^2}\left(\left(M_R - \mathring{m}_{\chi_{c1}}\right)^2 + \frac{\Gamma_R^2}{4}\right) \leq |M_R - \mathring{m}_{\chi_{c1}}| \tag{111}$$

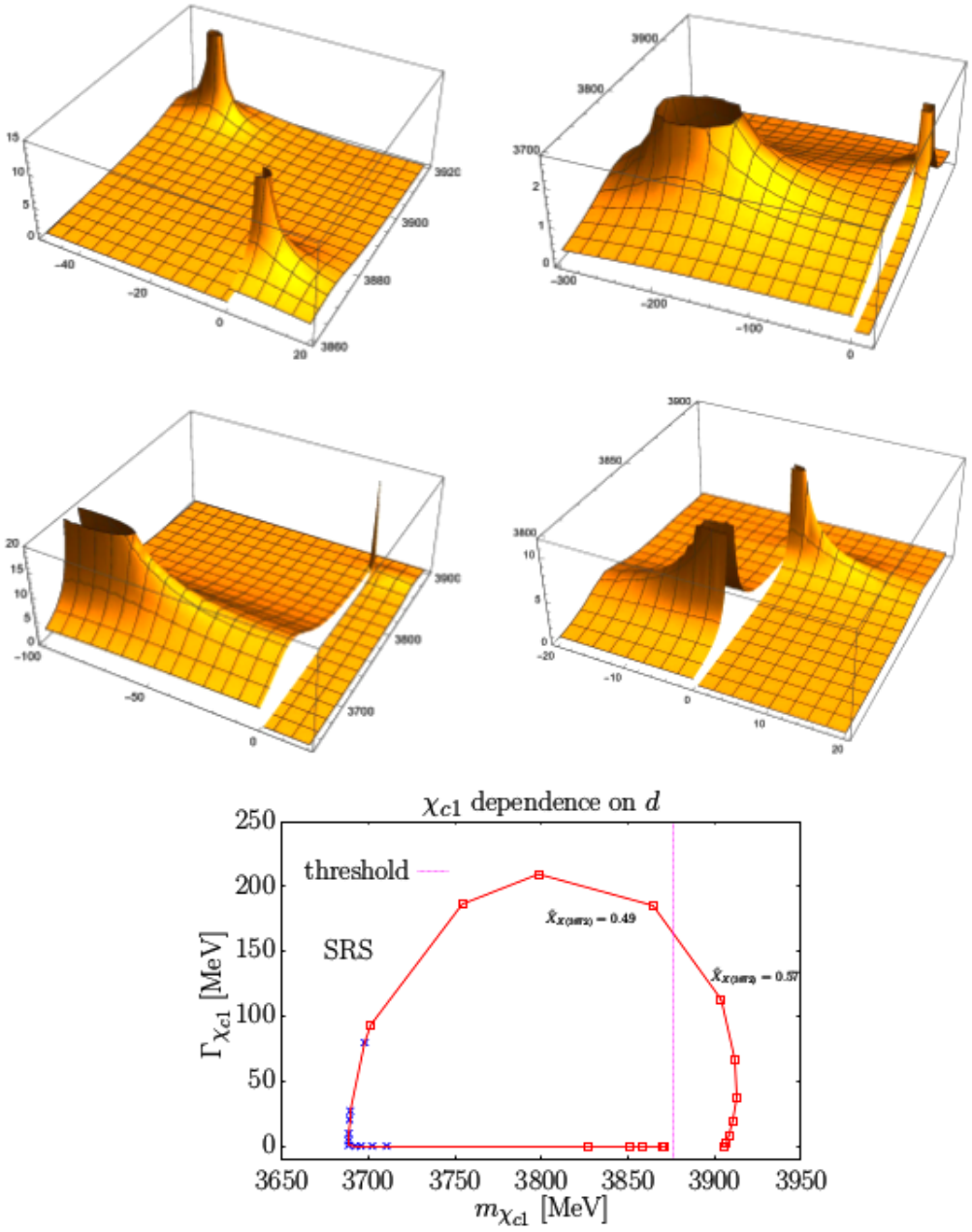
Tekillik, İRK'nda gerçel eksene ulaşmışsa (şekil 6.'de ortada, sağdaki grafik), aşağıdaki denklemin çözümünden elde edilir.

$$|M_R - \mathring{m}_{\chi_{c1}}|^2 \left(\frac{1}{G^I_{\rm QM}(M_X)} - \frac{1}{G^{II}_{\rm QM}(M_R)}\right) = d^2\,|M_R - \mathring{m}_{\chi_{c1}}| \left(1 - \frac{|M_R - \mathring{m}_{\chi_{c1}}|^2}{|M_X - \mathring{m}_{\chi_{c1}}|^2}\right) \tag{112}$$

$G^I_{\rm QM}(M_X) \neq G^{II}_{\rm QM}(M_X)$ olduğundan M_R ve M_X birbirinden farklıdır. Dikkate alınması gereken d'nin bu davranışı, şekil 6.'in alt panelinde gösterilmiştir. $d = 0.377825$ fm$^{1/2}$ için, İRK'nun üst ve

Tablo 1 d'nin bir fonksiyonu olarak, 1^{++} gizli tılsım tekilliklerinin özellikleri verilmiştir. $X(3872)$'nin kütlesi $M_X = 3871.69$ MeV alınarak BRK'na sabitlenmiş ve böylece C_{0X} parametresi d cinsinden belirlenmiştir. $\chi_{c1}(2P)$ tekilliği ise İRK'na yerleşmiştir. Tüm hesaplar $\Lambda = 1.0$ GeV için yapılmış olup, $d^{\,\mathrm{crit}}(\Lambda = 1\,\mathrm{GeV}) = \sqrt{\frac{M_X - \mathring{m}_{\chi_{c1}}}{G^I_{\mathrm{QM}}(M_X)}} = 0.370\ \mathrm{fm}^{1/2}$ şeklindedir.

d [$\mathrm{fm}^{1/2}$]	C_{0X} [fm^2]	$g_{D\bar{D}^*}^{X(3872)}$ [$\mathrm{GeV}^{-1/2}$]	$\tilde{X}_{X(3872)}$	$(m_{\chi_{c1}}, \Gamma_{\chi_{c1}})$ [MeV]	$g_{D\bar{D}^*}^{\chi_{c1}}$ [$\mathrm{GeV}^{-1/2}$]	$\lvert\tilde{X}_{\chi_{c1}}\rvert$	$\tilde{Z}_{\chi_{c1}}$
0.	-0.789	0.90	1	(3906.0,0)	0.	0.	1.
0.05	-0.774	0.89	0.98	(3906.6, 1.9)	$0.01 + 0.16\,i$	0.02	$0.99 + 0.01\,i$
0.1	-0.731	0.87	0.92	(3908.2, 7.9)	$0.03 + 0.31\,i$	0.06	$0.96 + 0.05\,i$
0.15	-0.659	0.83	0.84	(3910.5, 19.2)	$0.07 + 0.44\,i$	0.14	$0.92 + 0.11\,i$
0.20	-0.559	0.78	0.75	(3912.4, 37.8)	$0.14 + 0.56\,i$	0.23	$0.87 + 0.19\,i$
0.25	-0.429	0.73	0.66	(3912.0, 67.0)	$0.24 + 0.65\,i$	0.36	$0.82 + 0.31\,i$
0.30	-0.271	0.68	0.57	(3903.9, 112.8)	$0.38 + 0.73\,i$	0.55	$0.77 + 0.50\,i$
0.35	-0.084	0.63	0.49	(3864.5, 185.2)	$0.63 + 0.85\,i$	> 1	$0.70 + 1.01\,i$
$d^{\,\mathrm{crit}}$	0.000	0.61	0.46	(3798.3, 209.4)	$0.93 + 1.09\,i$	> 1	$0.53 + 2.12\,i$
0.375	0.020	0.61	0.46	(3754.4, 186.4)	$1.21 + 1.37\,i$	> 1	$0.29 + 3.66\,i$
0.3775	0.031	0.61	0.46	(3701.6, 93.5)	$2.19 + 2.39\,i$	> 1	$-0.44 + 12.27\,i$
0.40	0.132	0.59	0.43	(3827.1, 0) İRK'nda	0.96	$\tilde{X}_{\chi_{c1}} < 0$	2.07
0.45	0.376	0.55	0.37	(3850.9,0) İRK'nda	0.63	$\tilde{X}_{\chi_{c1}} < 0$	1.52
0.5	0.649	0.51	0.32	(3858.4,0) İRK'nda	0.51	$\tilde{X}_{\chi_{c1}} < 0$	1.36
1.0	4.963	0.29	0.11	(3869.7, 0) İRK'nda	0.21	$\tilde{X}_{\chi_{c1}} < 0$	1.08
2.0	22.217	0.15	0.03	(3871.3, 0) İRK'nda	0.10	$\tilde{X}_{\chi_{c1}} < 0$	1.02
$d \gg d^{\,\mathrm{crit}}$	$\sim \frac{d^2}{\mathring{m}_{\chi_{c1}} - M_X}$	$\mathcal{O}(\frac{1}{d^2})$	$\mathcal{O}(\frac{1}{d^2})$	$(M_X - \mathcal{O}(\frac{1}{d^2}), 0)$ İRK'nda	$\mathcal{O}(1/d^2)$	$\tilde{X}_{\chi_{c1}} = -\mathcal{O}(\frac{1}{d^2})$	$1 + \mathcal{O}(1/d^2)$



Şekil 6. $J^{PC} = 1^{++}$ sectörü: Üst ve orta paneller, $d = 0.20, d^{\text{crit}}, 0.3775$ ve 0.40 fm$^{1/2}$ için kompleks enerji E'nin (MeV) bir fonksiyonu olan $|T_{11}(E)|$ [fm^2] geçişine ait BRK ($\text{Im}(E) > 0$) ve İRK'nun ($\text{Im}(E) < 0$) alt yarı düzlemleri; Alt panel: $\chi_{c1}(2P)$'nin kütle ve genişliklerinin d'ye olan bağımlılıkları (kutucuklar Tablo1 1'deki verileri yansıtırken, çarpı işaretleri d'nin [0.3776-0.3785] fm$^{1/2}$ değerleri için elde edilen sonuçları yansıtmaktadır). Tüm hesaplarUV regülatörünün $\Lambda = 1$ GeV olduğu değer için yapılmıştır.

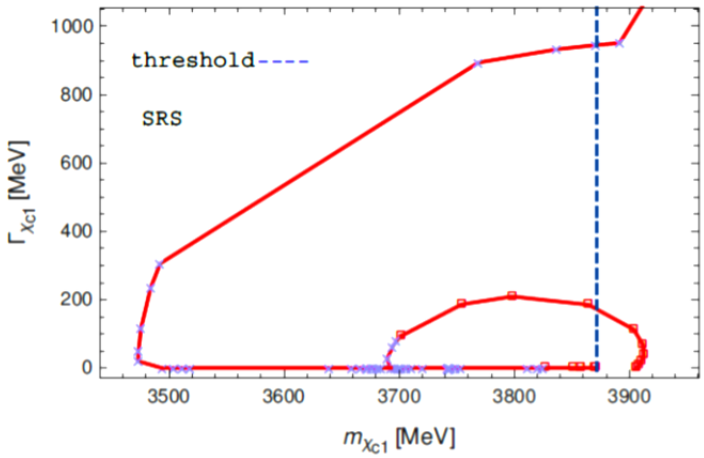
alt enerji düzleminde bulunan konjüga çiftler gerçel eksene ulaşır (rezonansın kütle değeri yaklaşık 3688 MeV'dir.) ve d'nin değerini artırdıkça yine reel eksende zıt yönlere doğru hareket ederler. Şekil 6.'te, enerji düzleminin alt yarısında bulunan tekilliğin konjüga çifti olan ve üst yarı düzleme yerleşen tekillik verilmemiştir.

Söz konusu bu tekillik karşılaşma noktasından ($d = 0.377825$)sonra eşiğin bulunduğu noktanın aksi yönüne doğru hareket eder. d'nin değeri yeterince artırıldığındaysa hızlıca sonlu bir genişlik kazanmaya başlar ($d = 0.377854$), yeni bir konjüga çift ortaya çıkar ve bu çiftlerin gerçel kısımları eşiğe yaklaşır. Ancak eşiğe yaklaşılan durumlar için genişlik oldukça büyüktür. Örneğin, $d = 0.39$ için genişlik yaklaşık 900 MeV kadardır. Sonuç olarak bu tekilliğin gerek reel eksene yakın olup eşikten uzaklaştığı, gerekse eşiğe yakın olup genişliğinin görece çok büyük olduğu her iki durumu için de deneysel olarak gözlenir etkiler söz konusu değildir.

Enerji düzleminin alt yarısında lokalize olup gerçel eksene ulaşan diğer eş ise eşiğe doğru hareket eder. Burada tekillik, birbiriyle bağlantılı olan BRK ve İRK'nda, eşiğe fazlasıyla yakın olduğundan, moleküler bileşeni ve $D\bar{D}^*$ bağlaşımı $\mathcal{O}(1/d^2)$ ölçeğinde olmasına karşın, saçılma gözlenebilirlerinde dikkate değer etkilere sahip olabilir. Bahsedilen bu konjüga çiftin hareketi şekil 7.'da verilmiştir. Aynı durum $d > d^{\text{crit}}$ limitinde ağırlıklı olarak bir çarmonyum şeklinde ortaya çıkan $X(3872)$ durumu için de gerçekleşir. Söz konusu limitte her iki tekilliğin de baskın olarak çarmonyum durumu oluşu, $X(3872)$'nin kütlesini sabitleyip d değerini artırdıkça kütle lokalizasyonunun bozulmaması için D ve $\bar{D}^*$ mezonları arasındaki kontak kuvvatin artan itici bir kuvvet haline gelmesiyle açıklanabilir. Bu güçlü itici kuvvet rezonansa gelen moleküler katkıyı absorbe eder. Yalın çarmonyum kütlesinin daha büyük ya da daha küçük değerleri içinse sonuçlar niteliksel olarak benzerdir. Aynı miktarda çarmonyum bileşeni için, daha büyük ya da daha küçük d değerlerine ihtiyaç duyulur.

Tablo 2 d'nin bir fonksiyonu olarak, 1^{++} ve 2^{++} gizli tılsım tekilliklerinin özellikleri verilmiştir. $X(3872)$'nin kütlesi $M_X = 3871.69$ MeV alınarak BRK'na sabitlenmiş ve böylece C_{0X} parametresi d cinsinden belirlenmiştir. $\chi_{c1}(2P)$ tekilliği ise İRK'na yerleşirken $\chi_{c2}(2P)$ kütlesi $m^{\rm exp}_{\chi_{c2}} = 3927.2$ MeV değerinde BRK'nda sabitlenmiştir. Tüm hesaplar $\Lambda = 1.0$ GeV için yapılmış olup, $B_{X_2} = M_{X_2} - 2M_{D^*} - i\frac{\Gamma_{X_2}}{2}$ ve $d^{\,\rm crit}(\Lambda = 0.5\,{\rm GeV}) = \sqrt{\frac{M_X - \mathring{m}_{\chi_{c1}}}{G^I_{\rm QM}(M_X)}} = 0.580$ fm$^{1/2}$ şeklindedir.

		$X(3872)$		$\chi_{c1}(2P)$			$\chi_{c2}(2P)$			X_2		
d [fm$^{1/2}$]	C_{0X} [fm^2]	$g^{X(3872)}_{D\bar{D}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$	$(m_{\chi_{c1}}, \Gamma_{\chi_{c1}})$ [MeV]	$g^{\chi_{c1}}_{D\bar{D}^*}$ [GeV$^{-1/2}$]	$\tilde{Z}$	$g^{\chi_{c2}}_{D^*\bar{D}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$	$\mathring{m}_{\chi_{c2}}$ [MeV]	B_{X_2} [MeV]	$g^{X_2}_{D^*\bar{D}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$
0	-1.94	1.05	1	(3906, 0)	0	1	0	0	3927.2	-4.8	1.10	1
0.1	-1.88	1.04	0.98	(3906.7, 1.5)	$0.06 + 0.13\,i$	$0.99 + 0.01\,i$	0.66	0.0	3927.7	-3.9	1.00	1.00
0.2	-1.71	1.02	0.93	(3908.8, 6.3)	$0.13 + 0.24\,i$	$0.96 + 0.05\,i$	1.26	0.02	3928.9	-1.7	0.73	0.99
0.3	-1.42	0.98	0.86	(3912.3, 15.6)	$0.21 + 0.33\,i$	$0.92 + 0.11\,i$	1.77	0.03	3930.9	-0.0 İRK'nda	$-0.08\,i$	> 1
0.4	-1.02	0.93	0.78	(3917.5, 31.9)	$0.30 + 0.40\,i$	$0.87 + 0.21\,i$	2.16	0.05	3933.2	-8.3 İRK'nda	$-0.69\,i$	> 1
0.5	-0.50	0.87	0.69	(3925.4, 61.2)	$0.41 + 0.45\,i$	$0.77 + 0.37\,i$	2.44	0.06	3935.7	$-10.6 - \frac{102.6\,i}{2}$	$0.05 + 0.49\,i$	$0.53 + 0.01\,i$
$d^{\rm crit}$	0.0	0.83	0.62	(3938.6, 102.6)	$0.51 + 0.51\,i$	$0.57 + 0.56\,i$	2.60	0.07	3937.8	$27.7 - \frac{181.9\,i}{2}$	$0.26 + 0.55\,i$	$0.77 - 0.25\,i$
0.7	0.88	0.77	0.53	(3809.7,0) İRK'nda	0.38	1.36	2.74	0.08	3940.7	$107.9 - \frac{187.8\,i}{2}$	$0.37 + 0.57\,i$	$0.94 - 0.12\,i$



Şekil 7. d parametresinin değiştirilmesi ile İRK'ndaki konjüga çiftlerin E enerji düzlemindeki hareketleri. Tüm hesaplar $\Lambda = 1$ GeV için yapılmış ve İRK'nun alt yarı düzlemi gösterilmiştir.

5.3 Çarmonyumun Işınımsal Geçişleri

Projede İP 5'in içeriğini oluşturan bu kısımda çarmonyum bileşeninin ölçülebilmesi için $X(3872)$'nin ışınımsal bozunumlarından gelen deneysel veri kullanıldı. X'in bir fotonla bir J/ψ ya da $\psi(2S)$ son durumlarına dallanma oranları oranı

$$R_{\psi\gamma} = \frac{B_r(X \to \psi(2S)\gamma)}{B_r(X \to J/\psi\gamma)} = 2.46 \pm 0.64 \pm 0.29 \tag{113}$$

olarak ölçülmüştür. Vektör mezon baskınlığı kullanılarak ve dominant bileşenin $D^0\bar{D}^{*0}$ olduğu varsayılarak $X(3872)$'nin $\rho J/\psi$ ve $\omega J/\psi$ karışımından oluştuğu göz önünde bulundurulup, parçacığın $\psi(2S)\gamma$ ve $J/\psi\gamma$'ya olan dallanma fraksiyonları oranı 4×10^{-3} (Swanson , 2004). Deneysel veriden oldukça düşük olan bu değer moleküler öngörüler için dezavantajlı görünür. Ancak bir miktar çarmonyum durumunun moleküler duruma katkılanmasıyla deneysel oran açıklanabilir (Badalian vd., 2012; Mehen vd., 2011; Wang vd., 2011; Eichten vd., 2006; Dong vd., 2011). $X(3872)$'nin içerdiği $2P$ çarmonyum durumu sayesinde bozunum ağırlıklı olarak $J/\Psi\gamma$ yerine $\Psi(2S)\gamma$'ya olur. %5–12 civarında bir $\bar{c}c$ karışımı parçacığın dominant olarak molekül olan doğasıyla çelişmeden deneysel veriyi açıklar (Dong vd., 2011). Bu oran $X(3872)$'nin $p\bar{p}$ çarpıştırıcılarında 1/20 olan $\psi(2S)$ oranı için de geçerlidir. Söz konusu üretim oranı rezonansın içinde olan çarmonyum bileşeninin yaklaşık

%5 alınmasıyla açıklanabilir (Takizawa vd., 2013).

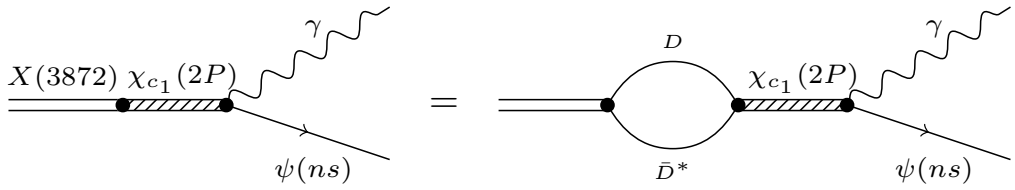
(Dong vd., 2011)'deki iddianın geçerliliği, etkin alan teorisi çerçevesinde, (Guo vd., 2015)'da gözden geçirilmiştir. Burada, önceki iddiaların aksine, ışınımsal bozunumların $X(3872)$'nin doğasıyla ilgili bir sonuç çıkarmaya olanak sağlamadığı belirtilmiştir. (Dong vd., 2011)'nin bulguları niteliksel olarak teyit edilmiş ve gözlemlenen oranın $X(3872)$'nin dominant moleküler doğasıyla uyumsuzluk içinde olmadığına kanaat getirilmiştir. Ayrıca, söz konusu rezonansın ışınımsal bozunumları için kısa-menzilli katkılarla uzun-menzilli katkıların benzer bir öneme sahip oldukları öne sürülmüştür. Söz konusu çalışmada, üçgensel $DD^{(*)}\bar{D}^{(*)}$ ve $D\bar{D}^{*}$ ilmeklerinden gelen katkılar hesaplanmıştır. Değiştirilmiş minimal çıkarım tasviri $\overline{\rm MS}$ için $\mu = M_X/2, M_X, 2M_X$ ölçekleri kullanılmıştır. (Guo vd., 2015)'daki çalışmanın tablo 2'deki sonuçları, μ ölçeğine ve $X(3872)$'nin kütlesine bağlı olarak aşağıdaki gibi ifade edilebilir.

$$\Gamma^{\rm loops}(X(3872) \to J/\psi\gamma) = \left(9.7 + 19.9 \log \frac{2\mu}{M_X}\right) (r_x r_g)^2 \,[\text{keV}] \quad (114)$$

$$\Gamma^{\rm loops}(X(3872) \to \psi(2S)\gamma) = \left(3.8 + 1.6 \log \frac{2\mu}{M_X}\right) (r_x r_g')^2 \,[\text{keV}] \quad (115)$$

Yukarıdaki denklemler, bahsedilen çizelgedeki her bir bozunum için, $\mu = M_X/2$ ve $\mu = 2M_X$, ölçeklerindeki sonuçları vermek üzere ayarlanmıştır. İnterpole eden fonksiyon $\psi(2S)\gamma$ modundaki durum için oldukça iyi çalışırken, $\mu = M_X$ ölçeğindeki $J/\psi\gamma$ bozunumu için %15 oranında bir hata payı mevcuttur. Yukarıdaki ifadelerde, $r_x = g_{XD\bar{D}^*}/(0.97\ \text{GeV}^{-1/2})$, $r_g = g/(2\ \text{GeV}^{-3/2})$, $r_g' = g'/(2\ \text{GeV}^{-3/2})$ olarak tanımlıdır ve g, g' spin simetrik $J/\psi D^{(*)}\bar{D}^{(*)}$ ve $\psi(2S)D^{(*)}\bar{D}^{(*)}$ bağlaşım sabitlerine karşılık gelir. Proje kapsamında yapılan çalışmada, $\Lambda = 1$ ve 0.5 GeV için $g_{XD\bar{D}^*} = 0.90\ \text{GeV}^{-1/2}$ ve $1.05\ \text{GeV}^{-1/2}$ olarak bulunmuştu (tablo 1 ve tablo 2). Dolayısıyla, (Guo vd., 2015)'da alınan bağlaşım sabiti değeri ile nitel açıdan uyumludur. Tılsımlı mezonların J/ψ ve $\psi(2S)$'ye olan bağlaşım sabitleri doğrudan ölçülemez. Söz konusu çalışmada, g için alınan $2\ \text{GeV}^{-3/2}$ değeri (Guo vd., 2011; Colangelo vd., 2004)'deki model tahminlerine dayanır. g' için olan öngörü ise, (Dong vd., 2011)'nin analizlerindeki $g'/g \sim 1.67$ değerini elde etmek için bu şekilde alınmıştır.

$\Gamma(X(3872) \to \psi(nS)\gamma)$ bozunumuna gelen ilmek katkıları, özellikle J/ψ modunda önemli bir ölçek bağımlılığı gösterir. (Guo vd., 2015)'da hesaplanan $X(3872)$'nin $\psi(2S)\gamma$ ve $J/\psi\gamma$'ya dallanma oranları oranı $[0.14 - 0.39](g^{'}/g)^2$ aralığındadır. Bu değerler (Swanson , 2004)'nin bulgularına göre



Şekil 8. $\chi_{c1}(2P)$ çarmonyum ara durumu yoluyla $X(3872) \to \psi(nS)$ geçişi için bozunum mekanizması.

yüksek olsa da $\psi(2S)$ kanalı hala baskındır. Yine de bu, $X(3872)$'nin bozunumları için kısa-menzilli katkıların önemli olduğu anlamına gelir.

Herhangi bir fiziksel genliğin ölçek bağımlılığı olmaması gerektiğinden, denklem (114) ve (115)'teki bağımlılık, üçlü köşe terimi katkısındaki karşılık gelen varyasyonla giderilmelidir.

Bu proje kapsamında sunulan modelde ise, üçlü köşe terimi için Feynman diyagramı şekil 8.'te verilmiştir. Yukarıdaki diyagramdan hem $\Gamma\left[X(3872) \to \chi_{c1}(2P)\right]$ ve $\Gamma\left[\chi_{c1}(2P) \to \Psi(nS)\gamma\right]$ bozunumları hesaplanmalıdır. Çarmonyumun ışınımsal geçişleri için $P(l=1)$ durumundaki $Q\bar{Q}$ parçacığının $S(l=0)$ durumuna geçişi incelemenlidir. Spin bağımlı etkileşimler göz ardı edildiğinde spin teklisi $n\,^1l_J$ ve spin üçlüsün^3l_J tek bir multipletle $(n\,^1l_J)$ ifade edilebilir. $l=1$ durumu için AKSS ile uyumlu matris alanı daha önce ifade edilmişti. $l=0$ için, üçlü $(s=1)$ toplam açısal momentumu $j=1$ olan tek bir duruma çöker. Böylece matris alanı aşağıdaki gibi yazılabilir (Jenkins vd., 1993).

$$\hat{J} = \frac{1+\not{v}}{2}\left(\Psi_\mu \gamma^\mu - \gamma_5 \eta\right)\frac{1-\not{v}}{2} \tag{116}$$

Burada v^μ yine multipletle ilişkili dört-hıza işaret ederken, Ψ_μ ve η spin 1 ve spin 0 alanlara karşılık gelir. Çarmonyumun $2P \to 1S, 2S$ ışınımsal geçişlerini incelemek karışım parametresi d üzerine sınırlandırmalar getirmemizi sağlayacak. Dipolar yaklaşım çerçevesinde söz konusu geçişler için etkileşim Lagranjiyanı (Casalbuoni vd., 1993)

$$\mathcal{L}_\gamma = \delta(n)\,\mathrm{Tr}\left(\bar{J}_\mu(2P)\hat{J}(nS)\right)v_\nu F^{\mu\nu} + h.c. \tag{117}$$

$$= \delta(n) v^\nu F_{\mu\nu}\left\{2\eta_c^\dagger h_c^\mu + 2\chi_{2c}^{\mu\sigma}\Psi_\sigma^\dagger(nS) + \frac{2\chi_{0c}}{\sqrt{3}}\Psi^{\mu\dagger}(nS) - i\epsilon^\mu_{.\sigma\alpha\beta}\Psi^\sigma(nS)v^\alpha\chi_{c1}^\beta\right\} \tag{118}$$

ie verilir. Burada n, $\hat{J}(nS)$ multipletinin içeriğindeki 0^{-+} ve 1^{--} çarmonyum durumlarının radyal kuantum sayısını temsil eder. $F^{\mu\nu}$ elektromanyetik tensör olup, $\delta(n)$ ağır çeşni bağımlılığı olan

$[E^{-1}]$ boyutunda bir parametredir. Yukarıdaki Lagranjiyan parite ve yük eşleniğini korur ve AKSS dönüşümleri altında değişmezdir. Buradan $\chi_{c1}(2P) \to \Psi(nS)\gamma$ E1 geçişi elde edilebilir (Casalbuoni vd., 1993).

$$\Gamma\left[\chi_{c1}(2P) \to \Psi(nS)\gamma\right] = \frac{\delta^2(n)}{3\pi} E_\gamma^3 \frac{M_{\Psi(nS)}}{m_{\chi_{c1}}} \tag{119}$$

Yukarıdaki denklemde E_γ fotonun enerjisini temsil eder. (Barnes vd., 2005) çalışmasındaki ifadeler karşılaştırıldığında $\delta(n)$ parametresini radyal dalga fonksiyon cinsinden yazmak mümkündür.

$$\delta(n) = \left(\frac{16\alpha\pi}{27}\right)^{\frac{1}{2}} \langle nS|r|2P\rangle, \qquad \langle nS|r|2P\rangle = \int_0^{+\infty} drr^2 R_{nS}(r) r R_{2P}(r) \tag{120}$$

Dalga fonksiyonun normalizasyonu ise

$$\int_0^{+\infty} drr^2 R_{nL}(r) R_{n'L}(r) = \delta_{nn'} \tag{121}$$

şeklindedir.

Böylece üçlü köşe teriminin büyüklüğü, şekil 8.'de gösterilen Feynmann diyagramına göre, aşağıdaki gibi elde edilir.

$$\Gamma\left[X(3872) \to \Psi(nS)\gamma\right] = \frac{(M_X - \mathring{m}_{\chi_{c1}})^2}{(M_X - m_{\chi_{c1}})^2 + \frac{\Gamma_{\chi_{c1}}^2}{4}} \times \frac{1}{1 - \Sigma'_{c\bar{c}}(M_X)} \times \frac{\delta^2(n)}{3\pi} E_\gamma^3 \frac{M_{\Psi(nS)}}{M_X} \tag{122}$$

Burada, $E_\gamma = (M_X^2 - M_{\Psi(nS)})/(2M_X)$ şeklindedir. Yukarıda verilen denklemdeki ilk faktör giydirilmiş $\chi_{c1}(2P)$ durumunun genişliği büyümeğe başladığında ve $M_X - \mathring{m}_{\chi_{c1}}$ ile kıyaslanabilir hale geldiğinde, 1'den farklıdır. $1/(1 - \Sigma'_{c\bar{c}}(M_X))$ faktörü ise $\tilde{Z}_{X(3872)} = 1 - \tilde{X}_{X(3872)}$ yani çarmonyum olasılığına karşılık gelir ve $X(3872)$'nin, fiziksel dalga fonksiyonundaki kompakt bileşeni bulma olasılığı olarak tanımlanabilir. $\delta(nS)$ değerleri (Barnes vd., 2005)'de, rölativistik olmayan potansiyel model kullanılarak elde edilen 2P E1 ışınımsal geçişleri için verilen çizelge 3'teki genişliklerden hesaplanabilir. Buradan, denklem 122'deki son faktör $\delta(1S) = 0.046$ GeV^{-1} ve $\delta(2S) = 0.38$ GeV^{-1} matris elemanları kullanılarak aşağıdaki gibi elde edilir.

$$\frac{\delta^2(n)}{3\pi} E_\gamma^3 \frac{M_{\Psi(nS)}}{M_X} = \begin{cases} 70 \text{ keV}, & 2S \\ 56 \text{ keV}, & 1S \end{cases} \tag{123}$$

Hesaplarda $M_{J/\psi} = 3096.92$ MeV ve $M_{\psi(2S)} = 3686.11$ MeV olarak alınmıştır.

Denklem 122'deki yaklaşım, renormalizasyon tasvirine bağlıdır ve bu bağımlılık mezon ilmek katkılarının ölçek bağımlılığı ile yok edilmelidir. Burada, söz konusu niceliği hesaplamak için $\Lambda = 1$ GeV UV kesilimi kullanılırken, (Guo vd., 2015)'un yazarları $\mu = M_X/2, M_X, 2M_X$ ölçeklerini baz alıp hesapları $\overline{\text{MS}}$ tasvirinde boyutsal regülarizasyon kullanarak yapmışlardır. Bu çerçevede, iki-mezon ilmek fonksiyonunun tanımına dikkat edilmelidir ve aşağıdaki gibi tanımlanan $G^{\overline{MS}}(s,\mu)$ ilmek fonksiyonu ile $G_{\text{QM}}(E)/\left(4M_D M_{D^*} e^{-k^2/\Lambda^2}\right)$ kıyaslanmalıdır.

$$\begin{aligned} G^{\overline{MS}}(s,\mu) &= i\int \frac{d^4q}{(2\pi)^4}\frac{1}{q^2-M_D^2}\frac{1}{(P-q)^2-M_{D^*}^2} \\ &= \overline{G}(s) + \frac{1}{16\pi^2}\left\{-2 + \frac{1}{M_D+M_{D^*}}\left(M_D \log\frac{M_D^2}{\mu^2} + M_{D^*}\log\frac{M_{D^*}}{\mu^2}\right)\right\} \end{aligned} \tag{124}$$

Yukarıdaki ifadede, P^μ toplam dört momentumdur ($P^2 = s$) ve $\overline{G}(s) = G^{\overline{MS}}(s,\mu) - G^{\overline{MS}}(s = (M_D + M_{D^*})^2, \mu)$ olarak tanımlı fonksiyon, sonlu olmakla birlikte ölçekten bağımsızdır. Bu karşılaştırmadan, BRK'na ve $s = M_X^2$ civarına bakılarak M_X mertebesindeki μ ölçeğinin 1 GeV'den çok daha büyük bir UV kesilimine karşılık geldiği anlaşılır.

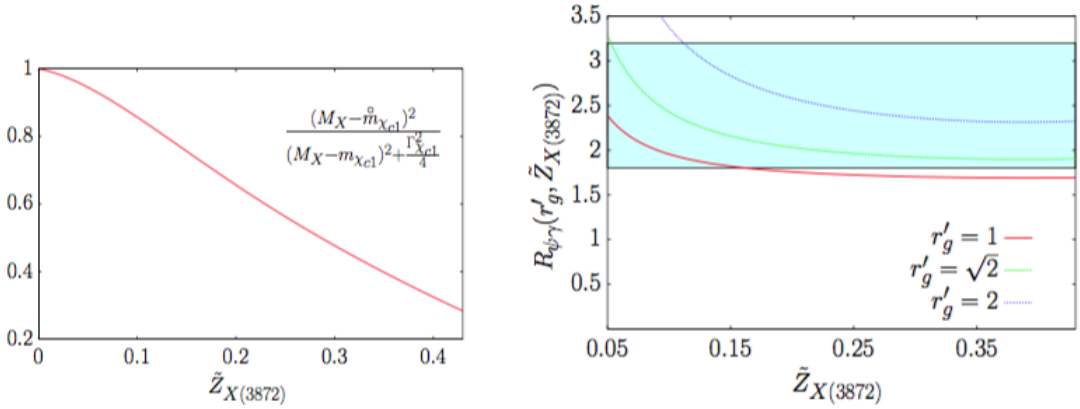
$X(3872)$'yi tanımlamak için (Nieves vd., 2012; Hidalgo-Duque vd., 2013)'te verilen etkin alan teorisi kapsamında kesiliminin büyüklüğünü artıramayız. Çünkü böyle bir durumda AKSS kırılmış olur ve üçlü köşe terimiyle ilgili tahminimiz gerçekçi olmaz. Ancak, (Guo vd., 2015)'da hesaplanan tılsımlı mezon ilmek katkısını $\mu \sim 1$ GeV olarak ölçeklendirip tekrar hesaplayabiliriz. Bu ölçeğe göre, $\psi(2S)\gamma$ kanalı için genlik hesabı kararlı olup aşağıdaki gibi ifade edilirken,

$$\Gamma^{\text{loops}}(X(3872) \to \psi(2S)\gamma) \sim 2.7(r_x r_g')^2\,[\text{keV}] \text{ at } \mu = 1 \text{ GeV}, \tag{125}$$

denklem (115)'teki $X(3872) \to J/\psi\gamma$ bozunumuna gelen hadron ilmek katkısının 1 GeV mertebesindeki ölçek için 1 keV'den çok daha küçük olduğu varsayılmıştır. Sonuç olarak $X(3872)$'nin ışınımsal bozunumları için dallanma fraksiyonları oranı burada kurulan model kapsamında, aşağıdaki gibi yazılabilir.

$$\begin{aligned} R_{\psi\gamma}(r_g', \tilde{Z}_{X(3872)}) &= \left.\frac{B_r(X\to\psi(2S)\gamma)}{B_r(X\to J/\psi\gamma)}\right|_{\text{loops + counter}-\text{term of Fig. 8.}} \\ &\sim \frac{70\tilde{Z}_{X(3872)} \times f(\tilde{Z}_{X(3872)}) + (1-\tilde{Z}_{X(3872)})2.7{r_g'}^2}{56\tilde{Z}_{X(3872)} \times f(\tilde{Z}_{X(3872)})} \end{aligned} \tag{126}$$

$f(\tilde{Z}_{X(3872)})$, 122'deki giydirilmiş ve yalın çarmonyum propagatörlerinin karesidir ve şekil 9.'nin sol panelinde çarmonyum olasılığına göre değişim grafiği verilmiştir. Çarmonyum katkısının 0.05'ten daha küçük olduğu durumlar için $X(3872) \to J/\psi\gamma$ modunun da dikkate alınması gerektiğinden $R_{\psi\gamma}$ için yapılan bu yaklaşım yalnızca $\tilde{Z}_{X(3872)} > 0.05$ için geçerlidir. Ayrıca yapılan hesaplarda $\psi(2S)\gamma$ bozunumundaki mezon ilmekleri ve üçlü köşe terimi arasındaki girişimlerden (kuark-ilmek) gelen katkı da ihmal edilmiştir. Buradaki çalışmanın amacı niceliksel olarak keskin değerler elde etmekten ziyade kurulan model çerçevesinde $X(3872)$'nin ve AKSS eşlerinin dinamiklerinin nasıl değişeceğini belirlemektir. Dolayısıyla bahsedilen katkıların getireceği ekstra parametreler analizi bulanıklaştıraktır Şekil 9.'nin sağ panelindeyse, $R_{\psi\gamma}(r'_g, \tilde{Z}_{X(3872)})$ oranının $X(3872)$'nin çarmonyum



Şekil 9. $R_{\psi\gamma}$ oranındaki $f(\tilde{Z}_{X(3872)(3872)})$ fonksiyonunun çarmonyum olasılığı ile değişimi (sol panel). $g'/g = 1, \sqrt{2}$ ve 2 değerleri için $X(3872)$'nin ışınımsal geçişlerinin dallanma fraksiyonları oranının, rezonansın çarmonyum içeriği ile olan değişimi (sağ panel).Grafikteki mavi bant, bu oran için ön görülen deneysel aralığı göstermektedir (Aaij vd., 2014). Tüm hesaplamalar $\Lambda = 1$ GeV kesilim ölçeği için yapılmıştır.

olasılığı $\tilde{Z}_{X(3872)}$ ile değişimi verilmiştir. Elde edilen sonuç $\psi(2S)D^{(*)}\bar{D}^{(*)}$ bağlaşım sabitinin farklı değerleri için deneysel bantla birlikte sunulmuştur. (Dong vd., 2011)'deki bağlaşım sabitleri oranı için verilen bulgular ($g'/g > 1$) dikkate alındığında, $X(3872)$'nin $\tilde{Z}_{X(3872)} = 0.1 - 0.3$ aralığında bir çarmonyum oranına sahip olduğu görülür. g'/g oranı 2 mertebesindeyse parçacık daha büyük oranda bir çarmonyum ihtiva eder. Ancak bu durumda $J/\psi\pi^+\pi^-$ ve $J/\psi\pi^+\pi^-\pi^0$ on durumlarına

bozunum fraksiyonları oranı için deneysel veriden gelen değeri elde etmek zorlaşır.

Işınımsal bozunumlardan gelen bu sonuçlar dikkate alındığındaysa, karışım parametresi $d(\Lambda = 1\text{GeV})$ için 0.1-0.25 $\text{fm}^{1/2}$ aralığı tanımlanabilir. d'nin bu aralığında, tablo 1'den $X(3872)$'nin mezon molekülü olasılığının 0.9-0.65 aralığında olduğu görülebilir. Ayrıca giydirilmiş çarmonyum durumu $\chi_{c1}(2P)$'nin 10-65 MeV aralığında bir genişlik ve %6-40 oranında $D\bar{D}^*$ bileşeniyle 3910-3925 MeV civarında bir kütleye sahip olması gerektiği sonucuna varılır.

5.4 2^{++} gizli tılsım sectörü için nümerik sonuçlar

Burada İP 5 kapsamında elde edilen sonuçların kurulan modelin kütle spektrumunu nasıl etkilediği tartışıldı. Daha önce de belirtildiği üzere, $X(3872)$'nin BRK'nda lokalize olan bir 1^{++} durumu olduğu varsayılıyorsa AKSS'nin doğası gereği parçacığın 2^{++} sektöründe bir eşi olması gerekir. Ayrıca burada kurulan etkin teori söz konusu parçacıkların etkileşimlerinin aynı olduğunu söyler. Her iki parçacık için çarmonyum katkısının yarattığı etkin potansiyelleri birbirlerine bağlı olarak ifade etmek mümkündür. $X(3872)$'nin kütlesi ve $D^*\bar{D}^*$ eşiğinde bunlar aşağıdaki gibi tanımlanabilir.

$$V_{\text{eff}}^{1^{++}}(E = M_X) = \frac{1}{G_{\text{QM}}(M_X)} \tag{127}$$

$$\begin{aligned} V_{\text{eff}}^{2^{++}}(E = 2M_{D^*}) &= V_{\text{eff}}^{1^{++}}(E = M_X) + d^2 \left(\frac{1}{2M_{D^*} - \mathring{m}_{\chi_{c2}}} - \frac{1}{M_X - \mathring{m}_{\chi_{c1}}} \right) \\ &= V_{\text{eff}}^{1^{++}}(E = M_X) + d^2 \left(\frac{(2M_{D^*} - M_X) - (\mathring{m}_{\chi_{c2}} - \mathring{m}_{\chi_{c1}})}{(2M_{D^*} - \mathring{m}_{\chi_{c2}})(\mathring{m}_{\chi_{c1}} - M_X)} \right) \end{aligned} \tag{128}$$

Burada $(2M_{D^*} - M_X) \sim m_\pi > (\mathring{m}_{\chi_{c2}} - \mathring{m}_{\chi_{c1}})$ ilişkisinden dolayı, $D^*\bar{D}^*$ eşiği civarında $V_{\text{eff}}^{2^{++}}(E) - V_{\text{eff}}^{1^{++}}(E = M_X) > 0$ olur. Bununla birlikte $C_{0X} = 0$ $(d = d^{\text{crit}})$ için 2^{++} sektöründeki etkileşim iticidir.

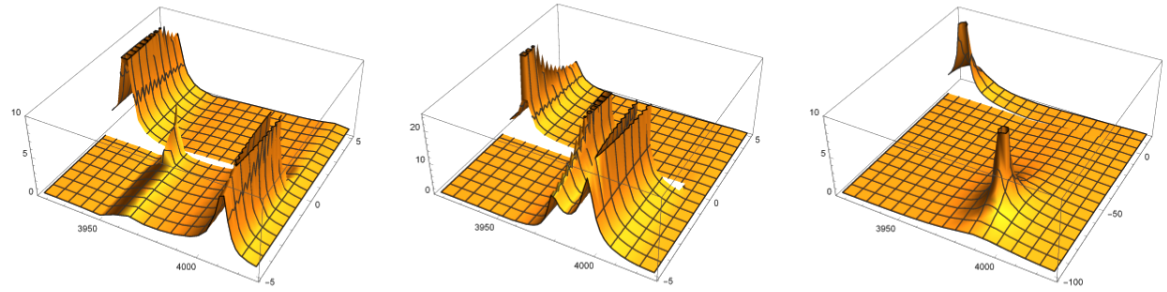
Söz konusu sektör için yapılan analizlerde, giydirilmiş çarmnyum kütlesi $m_{\chi_{c2}}$ deneysel olarak elde edilmiş değarine (3927.2 MeV) sabitlenmiştir. Yapılan hesapların sonuçları tablo 3'te verilmiştir. Sonuçlar incelendiğinde giydirilmiş ve yalın çarmonyum kütleleri arasında yalnızca birkaç MeV'lik bir fark olduğu görülmektedir. Dolayısıyla $D^*\bar{D}^*$ ilmeklerinin çarmonyum tekillikleri üzerine az denilebilecek bir etkiye sahip oldukları söylenebilir. Ayrıca, C_{0X} DES'ni negatif hale getiren d değerleri için $\Sigma_{c\bar{c}}(m_{\chi_{c2}}^{\text{exp}}) < 0$ olduğundan, bu bölgede $\mathring{m}_{\chi_{c2}} > m_{\chi_{c2}}^{\text{exp}}$ ilişkisi geçerlidir. d arttıkça

Tablo 3 d'nin bir fonksiyonu cinsinden gizli tılsım 2^{++} sektörünün özellikleri. $C_{0X}(d)$ denklem (109)'den belirlenmiş olup hesaplar $\Lambda = 1.0$ GeV için yapılmıştır. Giydirilmiş çarmonyum durumu $\chi_{c2}(2P)$'nin kütlesi ise BRK'nda $m_{\chi_{c2}}^{\rm exp} = 3927.2$ MeV olarak alınmıştır.

d [fm$^{1/2}$]	$\tilde{X}_{X(3872)}$	$g_{D^*\bar{D}^*}^{\chi_{c2}}$ [GeV$^{-1/2}$]	$\tilde{X}_{\chi_{c2}}$	$\mathring{m}_{\chi_{c2}}$ [MeV]	$M_{X_2} - 2M_{D^*} - i\frac{\Gamma_{X_2}}{2}$ [MeV]	$g_{D^*\bar{D}^*}^{X_2}$ [GeV$^{-1/2}$]	$\tilde{X}_{X_2}$
0.	1	0.0	0.0	3927.2	-5.6	0.97	1.
0.05	0.98	0.27	0.01	3927.8	-4.5	0.90	0.996
0.10	0.92	0.51	0.02	3929.6	-1.8	0.67	0.991
0.15	0.84	0.69	0.04	3932.2	-0.0 İRK'nda	$-0.12\,i$	> 1
0.20	0.75	0.82	0.05	3935.2	-6.4 İRK'nda	$-0.76\,i$	> 1
0.22	0.71	0.86	0.06	3936.4	-21.2 İRK'nda	$-1.24\,i$	> 1
0.25	0.66	0.90	0.06	3938.3	$-28.3 - \frac{72.9}{2}\,i$	$0.23 - 0.65\,i$	$0.47 + 0.32\,i$
0.30	0.57	0.95	0.07	3941.2	$-31.2 - \frac{162.8}{2}\,i$	$0.03 + 0.67\,i$	$0.48 - 0.04\,i$
0.35	0.49	0.96	0.07	3943.8	$-59.5 - \frac{312.6}{2}\,i$	$0.30 + 0.71\,i$	$0.52 - 0.39\,i$

$X(3872)$'nin AKSS eşi olan moleküler $X_2(4012)$ durumu, $2M_{D^*}$ eşiğine yaklaşır ve $d > 0.15$ fm$^{1/2}$ iken İRK'na geçer. d'nin değeri daha da artırıldıkça, gerçel eksen boyunca eşikten hızla uzaklaşır. Şekil 10.'da gösterildiği üzere, $X_2(4012)$ tekilliği yalın çarmonyum tekilliğinin bir kopyasıyla karşılaşır ve yeni tekillik $d > 0.22$ fm$^{1/2}$ için sanal düzlemin derinliklerine ulaşır.

$X(3872)$'nin ışınımsal bozunumları üzerine yapılan hesaplamalar dikkate alındığında $\Lambda = 1$ GeV için karışım parametresi d'nin 0.1 – 0.25 fm$^{1/2}$ aralığında olması beklenir. Bu durumda moleküler $X_2(4012)$ tekilliği eşiğin üstünde İRK'nda lokalize olur. Başka bir değişle parçacık denesel olarak gözlenemeyebilir, yani gerçek bir KRD (Kuantum Renk Dinamiği) durumu değildir. Bu yorum, literatürdeki etkin teorilerce (Nieves vd., 2012; Hidalgo-Duque vd., 2013; Guo vd., 2013) deneysel olarak saptanması gereken bu parçacığın henüz neden bulunmadığına dair bir açıklama getirebilir. Son olarak, $\Lambda = 0.5$ GeV için yapılan hesapların sonuçları tablo 2'de mevcuttur ve bulgular niteliksel olarak 1 GeV'lik sonuçlarla benzerdir.



Şekil 10. Gizli tılsım $J^{PC} = 2^{++}$ sectörü. $d = 0.20$ fm$^{1/2}$ (sol), $d = 0.22$ fm$^{1/2}$ (orta) ve $d = 0.25$ fm$^{1/2}$ (sağ) için kompleks enerji 'nin bir fonksiyonu olarak $|T_{11}(E)|$'nin BRK'u ($\mathrm{Im}(E) > 0$) ve İRK'u ($\mathrm{Im}(E) < 0$) gösterilmiştir. İlk iki grafikte 3927.2 MeV'e lokalize olan BRK'nda bir tekillik ($\chi_{c2}(2P)$) ve İRK'nda gerçel eksende eşiğin altında iki tekillik görülmektedir. Soldaki (sağdaki) grafikte, 1010.9 (3996.0) MeV'e lokalize olan tekillik $X_2(4012)$'ye karşılık gelirken, 3959.5 (3978.1) MeV'deki yalın χ_{c2} tekilliğinden dolayı ortaya çıkar. Sağ grafikte ise, BRK'nda $\chi_{c2}(2P)$ tekilliği ve İRK'nda sanal düzlemin derinliklerinde ikinci bir tekillik görülür. Tüm hesaplamalr $\Lambda = 1$ GeV UV kesilim ölçeğinde yapılmıştır ve Riemann kabuklarının yarı düzlemleri gösterilmiştir.

5.5 1^{++} ve 2^{++} gizli alt sektörleri

Etkin alan teorisi kapsamında 1^{++} durumunun 2^{++} sektöründe ağır kuark spin eşi olduğu gibi, alt ve tılsım sektörlerde etkileşim Lagranjiyanındaki bağlaşım sabitlerinin ağır kuarkın kütlesinden bağımsız olduğu varsayılırsa, söz konusu parçacıkların alt sektörde aynı kuantum sayılarına sahip eşleri vardır (Guo vd., 2013). Tablo 4'te , (Guo vd., 2013)'de yapılan çalışmada öngörülen gizli alt eşler 1^{++} ve 2^{++}'nın kütleleri ve parçacık veri grubu tarafından belirlenen botomonyum durumlarının kütleleri derlenmiştir. X_b ve X_{b2} durumları da tıpkı $X_2(4012)$ durumu gibi henüz gözlenmemiştir. Proje kapsamında yapılan hesaplamalar hem kesilim ölçeğinin 1 GeV olduğu hem de 0.5 GeV olduğu durum için yapılmıştır. $\Lambda = 1$ GeV'lik durumda bağlanma enerjileri daha büyük olduğundan bu duruma odaklanılmıştır. Ancak her iki ölçek için de yapılan hesaplar tablo 5, tablo 6 ve tablo 7'te verilmiştir.

Yapılan hesaplarda, tablo 4'te verilen $3P$ durumlarıyla eşleşecek şekilde $m_{\chi_{bJ}}$ giydirilmiş kuarkonyum kütleleri seçilerek, yalın kütleler $\overset{\circ}{m}_{\chi_{b1}}$ ve $\overset{\circ}{m}_{\chi_{b2}}$ sabitlenmiştir. Öte yandan, ağır kuark limitinde,

Tablo 4 Bazı gizli alt durumların kütleleri ve kütle eşikleri. Kullanılan izospin ortalama $B-$mezon kütleleri: $M_B = 5279.40$ MeV ve$M_{B^*} = 5324.83$ MeV (Olive vd., 2014). X_b ve X_{b2} (Guo vd., 2013) çalışmasında öngörülen $X(3872)$'nin ağır-kuark spin-çeşni eşleridir. Kütlelerdeki hata payları ağır kuark simetri kırınımından gelmektedir. $\chi_{bJ}(nP)$ durumlarının kütleleri parçacık veri grubundan alınmıştır. Son olarak, $\chi_{b2}(3P) - \chi_{b1}(3P)$ kütle yarılması 8-12 MeV aralığında MeV (Kwong vd., 1988; Motyka vd., 1998; Segovia vd., 2016) olup hesaplamalarda 10 MeV olarak alınmıştır.

1^{++}			2^{++}		
durum	kütle	$B\bar{B}^*$ eşiği	durum	kütle	$B^*\bar{B}^*$ eşiği
X_b ($\Lambda = 1$ GeV) (Guo vd., 2013)	10539^{+25}_{-27}	10604.2	$X_{b2}(\Lambda = 1$ GeV) (Guo vd., 2013)	10584^{+25}_{-27}	10649.7
X_b ($\Lambda = 0.5$ GeV) (Guo vd., 2013)	10580^{+9}_{-8}		$X_{b2}(\Lambda = 0.5$ GeV) (Guo vd., 2013)	10626^{+8}_{-9}	
$\chi_{b1}(1P)$	9892.78 ± 0.40		$\chi_{b2}(1P)$	9912.21 ± 0.40	
$\chi_{b1}(2P)$	10255.46 ± 0.55		$\chi_{b2}(2P)$	10268.65 ± 0.55	
$\chi_{b1}(3P)$	10512.1 ± 2.3		$\chi_{b2}(3P)$	$10522.1^{\dagger}$	

molekül ve kuarkonyum bileşenlerindeki karışımın hem çeşni hem de $Q\bar{Q}$'ın radyal kuantum sayısından bağımsız olduğu varsayılmıştır. Bu yaklaşım tüm katkıları içermese bile, en azından nitel olarak, kuarkonyum-molekül konfigürasyonu karışımının X_b ve X_{b2} durumları üzerine etkileri ile ilgili bir fikir edinmemize olanak sağlar. Ayrıca karışım parametresi için bir aralık belirlemek adına, $X(3872)$'nin ışınımsal bozunumu analizinde elde edilen sonuçlardan yararlanılabilir ($d(\Lambda = 1GeV)$ için 0.1-0.25 $\text{fm}^{1/2}$ aralığında olmalıdır).

Tablo 4'teki 1^{++} ve 2^{++} sektörlerine ait tekillikler incelendiğinde her iki sektör için de d bağımlılığının benzer olduğu görülür. $\chi_{b1}(3P)$ [$\chi_{b2}(3P)$] durumu için, yalın-giydirilmiş kuarkonyum kütle farkı 5-25 [5-20] MeV mertebesindedir. Giydirilmiş durumun mezon molekülü içeriği ise %10–20 [%5–10] aralığındadır. Öte yandan, $X(3872)$'deki moleküler bileşen %65'ten daha büyükse, alt sektördeki çeşni simetrik eşler X_b ve X_{b2} durumları var olmalı ve yakın zamanda deneysel olarak gözlenmelidir.

$\Lambda = 0.5$ GeV'lik UV kesilim ölçeği için yapılan hesaplar tablo 7'de verilmiş olup sonuçlar niteliksel olarak benzerdir. $X(3872)$'nin %65'ten daha büyük bir moleküler bileşen içermesi durumunda, bağlanma enerjileri 1GeV'lik kesilime oranla daha düşük olsa bile, bu ölçekte de X_b ve X_{b2} durum-

Tablo 5 d'nin bir fonksiyonu olarak 1^{++} gizli alt sektörünün özellikleri. $\Lambda = 1.0$ GeV UV ölçeği seçilmiş ve $C_{0X}(d)$ denklem 109 kullanılarak belirlenmiştir. Ayrıca giydirilmiş botomonyum $\chi_{b1}(3P)$ durumunun kütlesi BRK'nda $m^{\rm exp}_{\chi_{b1}} = 10512.1$ MeV olarak alınmıştır.

d [fm$^{1/2}$]	$\tilde{X}_{X(3872)}$	$g^{\chi_{b1}}_{B\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}_{\chi_{b1}}$	$\mathring{m}_{\chi_{b1}}$ [MeV]	$E_{X_b} - M_B - M_{B^*}$ [MeV]	$g^{X_b}_{B\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}_{X_b}$
0.	1	0.0	0.0	10512.1	-65.9	2.30	1.
0.05	0.98	0.98	0.09	10515.0	-60.7	2.04	0.91
0.10	0.92	1.46	0.20	10521.4	-47.6	1.55	0.80
0.15	0.84	1.59	0.24	10527.8	-30.8	1.11	0.77
0.20	0.75	1.57	0.23	10532.6	-13.1	0.69	0.80
0.25	0.66	1.49	0.21	10536.1	-0.1	0.16	0.96
0.30	0.57	1.40	0.18	10538.5	$4.9 - \frac{68.2}{2}\,i$	$0.05 - 0.26\,i$	$0.43 + 0.16\,i$
0.35	0.49	1.29	0.16	10540.2	$44.8 - \frac{181.4}{2}\,i$	$0.12 + 0.28\,i$	$0.55 - 0.21\,i$

ları var olmalıdır. En düşük oranda moleküler bileşen içeren $X(3872)$ senaryosu içinse, bahsedilen durumlar karşılık gelen eşiklerine görece yakın olarak İRK'nda ortaya çıkacaklardır. Bu iki rezonans bağlı durumlar olarak kalırlarsa, kuarkonyum bileşenleri $b\bar{b}\,3^3P_{1,2}$ oldukça küçük ($\leq 5\%$) olacaktır. $\Lambda = 1$ GeV durumunda, bu rezonansların kuarkonyum olasılıkları daha da büyüyebilir (%10-20). Tekillikler İRK'nda ortaya çıkarsa, bunların moleküler içerikleri büyük oranda azalmış olacaktır.

Tablo 6 d'nin bir fonksiyonu olarak 2^{++} gizli alt sektörünün özellikleri. $\Lambda = 1.0$ GeV UV ölçeği seçilmiş ve $C_{0X}(d)$ denklem 109 kullanılarak belirlenmiştir. Ayrıca giydirilmiş botomonyum $\chi_{b2}(3P)$ durumunun kütlesi BRK'nda $m^{\rm exp}_{\chi_{b2}} = 10522.1$ MeV olarak alınmıştır.

d [fm$^{1/2}$]	$\tilde{X}_{X(3872)}$	$g^{\chi_{b2}}_{B^*\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}_{\chi_{b2}}$	$\mathring{m}_{\chi_{b2}}$ [MeV]	$E_{X_{b2}} - 2M_{B^*}$ [MeV]	$g^{X_{b2}}_{B^*\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}_{X_{b2}}$
0.	1	0.0	0.0	10522.1	-66.2	2.31	1.
0.05	0.98	0.69	0.02	10523.4	-62.5	2.17	0.98
0.10	0.92	1.20	0.06	10526.9	-52.3	1.82	0.94
0.15	0.84	1.50	0.10	10531.3	-37.2	1.37	0.91
0.20	0.75	1.64	0.11	10535.7	-19.4	0.90	0.90
0.25	0.66	1.67	0.12	10539.5	-3.1	0.41	0.93
0.30	0.57	1.64	0.11	10542.5	$-18.0 - \frac{37.4}{2}\,i$	$0.16 - 0.28\,i$	$0.46 + 0.75\,i$
0.35	0.49	1.59	0.11	10545.0	$27.1 - \frac{195.1}{2}\,i$	$0.09 + 0.28\,i$	$0.57 - 0.15\,i$

5.6 $X(3872)$'nin izospin yapısı

Yine İP 5'in içeriğini oluşturan bu kısımda çarmonyum bileşeninin ölçülebilmesi için uygun olan başka bir bozunum süreci dikkate alındı. Söz konusu bozunum süreci ile ilgili deneysel veri $X(3872)$'nin izospin–0 ve izospin–1 son durumlarına olan bozunumlarından gelir. Parçacığın $J/\psi\pi^+\pi^-$ ve $J/\psi\pi^+\pi^-\pi^0$ son durumlarına bozunma oranları oranı Belle ekibi tarafından ölçülmüştür (Abe vd., 2005).

$$\frac{Br(J/\psi\pi^+\pi^-\pi^0)}{Br(J/\psi\pi^+\pi^-)} = 1.0 \pm 0.4 \pm 0.3. \tag{129}$$

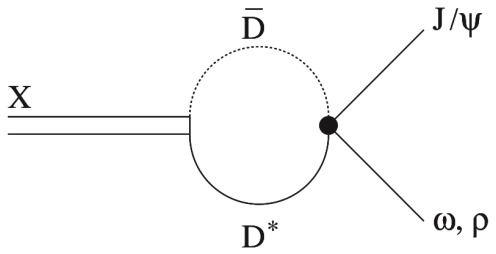
Aynı oran için BABAR, $1.0 \pm 0.8 \pm 0.3$ sonucunu bulmuştur (del Amo Sanchez vd., 2010). Üç pionlu son duruma olan bozunum sanal bir ρ mezonu ile gerçekleşirken iki pionlu son durum sanal bir ω ile gerçekleşir. ρ ve ω mezonları arasındaki faz uzayı farkı dikkate alındığında, üretim genliği oranı

$$\left|\frac{A(J/\psi\rho)}{A(J/\psi\omega)}\right| = 0.27 \pm 0.02 \tag{130}$$

olarak bulunur (Hanhart vd., 2012). Böyle büyük bir izospin ihlali, moleküler yaklaşımda $X(3872)$'nin dalga fonksiyonundaki $D^0\bar{D}^{*0}$ ve D^+D^{*-} bileşenleri arasındaki kütle farkıyla doğal olarak açıklanabilir (Gamermann vd., 2010).

Tablo 7 d'nin bir fonksiyonu olarak 1^{++} ve 2^{++} gizli alt sektörüne ait tekilliklerin özellikleri. $C_{0X}(d)$ parametresi denklem (109)'den belirlenmiş ve hesaplar $\Lambda = 0.5$ GeV için yapılmıştır. Ayrıca giydirilmiş $\chi_{b1}(3P)$ ve $\chi_{b2}(3P)$ durumlarının kütleleri BRK'nda 10512.1 ve 10522.1 MeV olarak alınmıştır. X_b ve X_{b2} tekillikleri $B_{X_b} = M_{X_b} - M_B - M_{B^*} - i\frac{\Gamma_{X_b}}{2}$ ve $B_{X_{b2}} = M_{X_{b2}} - 2M_{B^*} - i\frac{\Gamma_{X_{b2}}}{2}$, ile belirlenmiştir. Son olarak $C_{0X} = 0$ ve $\Lambda = 0.5$ GeV için karışım parametresi $d^{\,\mathrm{crit}}(\Lambda = 0.5\,\mathrm{GeV}) = 0.580$ fm$^{1/2}$ şeklindedir

		$\chi_{b1}(3P)$			X_b			$\chi_{b2}(3P)$			X_{b2}		
d [fm$^{1/2}$]	$\tilde{X}_{X(3872)}$	$g^{\chi_{b1}}_{B\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$	$\mathring{m}_{\chi_{b1}}$ [MeV]	B_{X_b} [MeV]	$g^{X_b}_{B\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$	$g^{\chi_{b2}}_{B^*\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$	$\mathring{m}_{\chi_{b2}}$ [MeV]	$B_{X_{b2}}$ [MeV]	$g^{X_{b2}}_{B^*\bar{B}^*}$ [GeV$^{-1/2}$]	$\tilde{X}$
0	1	0	0	10512.1	-24.2	2.43	1	0	0	10522.1	-24.2	2.44	1
0.1	0.98	2.60	0.01	10512.8	-22.3	2.21	0.99	4.91	0.0	10522.6	-22.6	2.24	1.0
0.2	0.93	4.85	0.03	10514.7	-16.9	1.65	0.97	9.32	0.02	10523.8	-17.7	1.74	0.99
0.3	0.86	6.56	0.06	10517.4	-8.9	0.96	0.95	13.04	0.03	10525.8	-10.3	1.08	0.97
0.4	0.78	7.72	0.08	10520.4	-0.8	0.30	0.96	15.92	0.04	10528.2	-2.1	0.43	0.97
0.5	0.69	8.42	0.10	10523.6	$3.2 - \frac{48.2\,i}{2}$	$0.02 + 0.20\,i$	$0.57 + 0.07\,i$	17.99	0.06	10530.7	$-13.7 - \frac{30.3\,i}{2}$	$-0.06 + 0.20\,i$	$0.55 + 0.52\,i$
d^{crit}	0.62	8.72	0.10	10526.0	$41.6 - \frac{63.6\,i}{2}$	$0.14 + 0.21\,i$	$0.82 - 0.12\,i$	19.13	0.06	10532.8	$35.6 - \frac{71.2\,i}{2}$	$0.12 + 0.21\,i$	$0.86 - 0.09\,i$
0.7	0.53	8.87	0.11	10529.1	$81.5 - \frac{43.3\,i}{2}$	$0.19 + 0.14\,i$	$0.90 - 0.06\,i$	20.13	0.07	10535.7	$78.1 - \frac{46.9\,i}{2}$	$0.18 + 0.15\,i$	$0.93 - 0.04\,i$



Şekil 11. $D\bar{D}^*$ ara durumu yoluyla, $X(3872) \to J/\psi\omega(\rho)$ geçişi için bozunum mekanizması.

$X(3872)$'nin yukarıda bahsedilen izospin ihlalini açıklayabilmek için iki farklı senaryo söz konusudur. Bunlardan ilki, rezonans bozunumunun izospin simetrisini kırması, diğeri ise rezonansın iyi-tanımlı bir izospin kuantum sayısına sahip olmamasıdır. Burada kurulan model çerçevesinde ikinci senaryo dikkate alınmıştır. Kontak etkileşimler için tam Hamiltonyeni ele aldığımızda, V^{QM} potansiyeli izospin simetrisini korurken kinetik operatör korumaz. Başka bir değişle Hamiltonyen izospin operatörüyle komütatif değildir. Dolayısıyla, Hamiltonyenin özdurumları aynı zamanda izospin operatörünün özdurumları olmak zorunda değildir. Bu da iyi-tanımlı izospin için gerekli koşulun sağlanmadığı anlamına gelir. 1^{++} durumu için, çiftlenim kanalı uzayında moleküler potansiyel denklem 54'den aşağıdaki gibi elde edilir.

$$V^{\mathrm{QM}}(1^{++}) = \frac{1}{2}\begin{pmatrix} C_{0X}+C_{1X} & C_{0X}-C_{1X} \\ C_{0X}-C_{1X} & C_{0X}+C_{1X} \end{pmatrix} \tag{131}$$

Proje kapsamında, $X(3872)$'nin ışınımsal bozunumlarını açıklayabilmek için kurulan model çerçevesinde, deneysel veriyi açıklık getirebilen çarmonyum bileşeni miktarı belirlendi. Bu model aynı zamanda söz konusu rezonansın izospin simetrisi kırınım etkilerini içerecek şekilde genişletilebilir. 1^{++} sektörü için, çarmonyum kanalının da dahil edildiği ilgili kanallar

$$J^{PC} = 1^{++} : \left\{ \frac{1}{\sqrt{2}}\left(|D^0\bar{D}^{*0}\rangle - |D^{*0}\bar{D}^0\rangle\right), \frac{1}{\sqrt{2}}\left(|D^+\bar{D}^{*-}\rangle - |D^{*+}\bar{D}^-\rangle\right), \chi_{c1}(2P) \right\} \tag{132}$$

şeklindedir.

Tüm çiftlenim kanalı etkilerinin hesaba katıldığı tam ağır kuark limitinde etkin potansiyel $V_{\mathrm{eff}}(E)$'nin iki farklı özdeğeri vardır:

$$(V_{\mathrm{eff}})_{1,2} = (1/2)[(C_{0X}+C_{1X}+d^2G^0_{c\bar{c}}(E)) \pm \sqrt{(C_{0X}+C_{1X})^2 + d^4(G^0_{c\bar{c}})^2}] \tag{133}$$

Bunlar $I = 0$ ve $I = 1$ kombinasyonlarına karşılık gelir. Etkileşimin itici ya da çekici tipte oluşu yine E enerjisinin kuarkonyumun yalın kütlesi $\overset{\circ}{m}_{c\bar{c}}$'ın üstünde ya da altında olmasına bağlıdır.

İzovektör 1^{++} sectörü için kabuk üzerinde denklem (78)'da verilen $t-$matris aşağıdaki gibi bulunur.

$$
\begin{aligned}
T_{11}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f^2_{\Lambda}(E)\left(\frac{(1/2)(C_{0X}+C_{1X})-C_{0X}C_{1X}G_{22}}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}+G^0_{c\bar{c}}G^{-1}_{11}\right)\right]\\
T_{12}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f^2_{\Lambda,\Lambda'}(E)\frac{(1/2)(C_{0X}-C_{1X})}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}\right]\\
T_{13}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f_{\Lambda}(E)(d\,G_{\rm QM})^{-1}\right]\\
T_{21}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f^2_{\Lambda,\Lambda'}(E)\left(-\frac{1}{2}\frac{d^2G_{11}G^0_{c\bar{c}}(C_{0X}-C_{1X})}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}\right)\right]\\
T_{22}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f^2_{\Lambda'}(E)\left(\frac{(1/2)(C_{0X}+C_{1X})(1-d^2G_{11}G^0_{c\bar{c}})-C_{0X}C_{1X}G_{11}}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}\right)\right]\\
T_{23}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f_{\Lambda'}(E)\frac{1}{2}\frac{dG_{11}(C_{0X}-C_{1X})}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}\right]\\
T_{31}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f_{\Lambda}(E)\frac{dG_{11}\left((1/2)(C_{0X}+C_{1X})-C_{0X}C_{1X}G_{22}\right)}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}\right]\\
T_{32}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}\left[f_{\Lambda'}(E)\frac{1}{2}\frac{dG_{11}(C_{0X}-C_{1X})}{\Sigma_{c\bar{c}}\Delta_{\rm QM}}\right]\\
T_{33}(E) &= \frac{\Sigma_{c\bar{c}}}{1-G^0_{c\bar{c}}\Sigma_{c\bar{c}}}
\end{aligned}
\tag{134}
$$

Yukarıdaki geçiş matrisi, tüm izospin kanallarının dikkate alınması sebebiyle, denklem (91)'da verilenden farklıdır. Burada $C_{iX} = C_{iA} + C_{iB}$ ve $\Delta_{\rm QM} = \det[1 - {\rm V_{QM}G_{QM}(E)}]$ olup, form faktörler $f_\Lambda(E)$ ve $f'_\Lambda(E)$ sırasıyla nötral ve yüklü D mezonlarının ilmek fonksiyonlarına aittir, daha açık ifadesi ise $f_\Lambda(E) = \exp\left\{-2\mu(E - M_1 - M_2)/\Lambda^2\right\}$ ile verilir. Kuarkonyumun içsel enerjisi ise denklem (92)'dan farklı olarak

$$\Sigma_{c\bar{c}}(E) = \frac{d^{\,2}\,G_{11}(E)}{\Delta_{QM}}\left[1 - \frac{1}{2}(C_{0X} + C_{1X})\,G_{22}(E)\right] \tag{135}$$

şeklinde elde edilir. Her iki denklemde de içsel enerji d^2 ile orantılıdır ancak yukarıdaki denklem hem nötral hem de yüklü D mezonlarının ilmek fonksiyonları ($G_{11}(E)$ ve $G_{22}(E)$) ile parametrize edilir. Mezon ve yalın çarmonyum kütleleri için $M_1 = M_{D^0,D^+}$, $M_2 = M_{D^{0*},D^-}$, ve $\overset{\circ}{m}_{\chi_{c1}}$ kullanılmıştır. $d \neq 0$ durumunda $T(E)$'nin tekillikleri giydirilmiş çarmonyum propagatörünün tersinin sıfır olduğu

noktalarda lokalize olmuştur.

$$G_{c\bar{c}}(E_R)^{-1} = 0 \leftrightarrow 1 - G^0_{c\bar{c}}(E_R)\Sigma_{c\bar{c}}(E_R) = 0, \qquad E_R = M_R - i\Gamma_R/2 \tag{136}$$

Yalnızca izoskaler kanalın dikkate alındığı durum için tekillik pozisyonu denkleminin formu aynı olsa da, çarmonyumun içsel enerjisi ifadesinin söz konusu iki durum için farklı olduğu unutulmamalıdır. Ayrıca, $\det[1 - \hat{\mathrm{V}}\hat{\mathrm{G}}(\mathrm{E_R})] = 0$ denkleminin çözümleri de tekilliklerin bulunması için kullanılabilir. $d \to 0$ limitinde başka bir değişle çarmonyum katkısının olmadığı limitte ise, $t-$matris aşağıdaki denkleme indirgenebilir.

$$\lim_{d\to 0} T(E) = \frac{1}{2}\begin{pmatrix} f^2_\Lambda\,(C_{0X} + C_{1X} - 2C_{0X}C_{1X}G_{22}) & f^2_{\Lambda,\Lambda'}\,(C_{0X} - C_{1X}) & 0 \\ f^2_{\Lambda,\Lambda'}\,(C_{0X} - C_{1X}) & f^2_{\Lambda'}\,(C_{0X} + C_{1X} - 2C_{0X}C_{1X}G_{11}) & 0 \\ 0 & 0 & 0 \end{pmatrix} \tag{137}$$

Diğer taraftan tekillik civarında, rezonansın mezon-antimezon ve yalın çarmonyum durumlarına bağlaşımları

$$g_1^2 = \frac{f^2_\Lambda}{G'_{11}}\left[\frac{\Sigma'_{c\bar{c}}(E_R)}{1-\Sigma'_{c\bar{c}}(E_R)} - \frac{1}{1-\Sigma'_{c\bar{c}}(E_R)}\frac{(C_{0X}-C_{1X})^2\,d^2\,G^2_{11}\,G'_{22}}{4\,\Delta^2_{\mathrm{QM}}}\right] \tag{138}$$

$$g_2^2 = f^2_{\Lambda'}\,\frac{1}{1-\Sigma'_{c\bar{c}}(E_R)}\,\frac{(C_{0X}-C_{1X})^2\,d^2\,G^2_{11}}{4\,\Delta^2_{\mathrm{QM}}} \tag{139}$$

$$g_3^2 = -\frac{1}{1-\Sigma'_{c\bar{c}}(E_R)}\,\frac{1}{G^{0\prime}_{c\bar{c}}(E_R)} \tag{140}$$

şeklindedir. Burada $G'_{ii}(E_R)$ ve $G^{0\prime}_{c\bar{c}}(E_R)$

$$G'_{ii}(E_R) = \left.\frac{dG_{ii}(E)}{dE}\right|_{E=E_R}, \qquad G^{0\prime}_{c\bar{c}}(E_R) = \left.\frac{dG^0_{c\bar{c}}(E)}{dE}\right|_{E=E_R} \tag{141}$$

olarak tanımlıdır. Bu tanım denklem (103)'daki toplam kuralını $\mathcal{O}\left(\frac{f'_\Lambda(E_R)/f_\Lambda(E_R)}{G'_{ii}(E_R)/G_{ii}(E_R)}\right)$ mertebesinde sağlamaktadır.

$$\begin{aligned} g_1^2\left(\frac{d\left[G_{11}(E)/f^2_\Lambda\right]}{dE}\right)_{E=E_R} &+ g_2^2\left(\frac{d\left[G_{22}(E)/f^2_{\Lambda'}\right]}{dE}\right)_{E=E_R} \\ &+ g_3^2\left(\frac{d\,G^0_{c\bar{c}}(E)}{dE}\right)_{E=E_R} = -1 + \cdots \end{aligned} \tag{142}$$

İhmal edilen düzeltmelerse, yine $4H$ potansiyelindeki düşük enerji bağımlılıklarından gelir. Buradan yola çıkılarak 1^{++} sektöründeki moleküler $\tilde{X}_{D^0\bar{D}^{*0}}, \tilde{X}_{D^+\bar{D}^{*-}}$ ve çarmonyum $\tilde{Z}$ olasılıkları (genel olarak rezonansın dalga fonksiyonundaki ağırlıkları) aşağıdaki gibi tanımlanabilir.

$$\tilde{X}_{D^0\bar{D}^{*0}} = -\frac{\Sigma'_{c\bar{c}}(E_R)}{1-\Sigma'_{c\bar{c}}(E_R)} + \frac{1}{1-\Sigma'_{c\bar{c}}(E_R)} \frac{(C_{0X}-C_{1X})\, d^2\, G_{11}^2\, G'_{22}}{4\,\Delta_{\mathrm{QM}}^2} \tag{143}$$

$$\tilde{X}_{D^+\bar{D}^{*-}} = -\frac{1}{1-\Sigma'_{c\bar{c}}(E_R)} \frac{(C_{0X}-C_{1X})\, d^2\, G_{11}^2\, G'_{22}}{4\,\Delta_{\mathrm{QM}}^2} \tag{144}$$

$$\tilde{Z} = \frac{1}{1-\Sigma'_{c\bar{c}}(E_R)} \tag{145}$$

Yukarıdaki denklemde moleküler olasılıklar toplamı ($\tilde{X}$) form olarak denklem (106)'teki ile aynıdır ancak çarmonyumun içsel enerjisinin türevi $\Sigma'_{c\bar{c}}(E_R)$, denklem (107)'ten farklı olarak

$$\Sigma'_{c\bar{c}}(E_R) = \frac{G'_{11}(E_R)(E_R - \mathring{m}_{c\bar{c}})^2}{d^2 G_{11}^2(E_R)} + \frac{(C_{0X}-C_{1X})\, d^2\, G_{11}^2\, G'_{22}}{4\,\Delta_{\mathrm{QM}}^2} \tag{146}$$

şeklindedir. Dolayısıyla toplam moleküler olasılığın tanımı form olarak aynı olsa da niceliksel olarak farklılık gösterecektir.

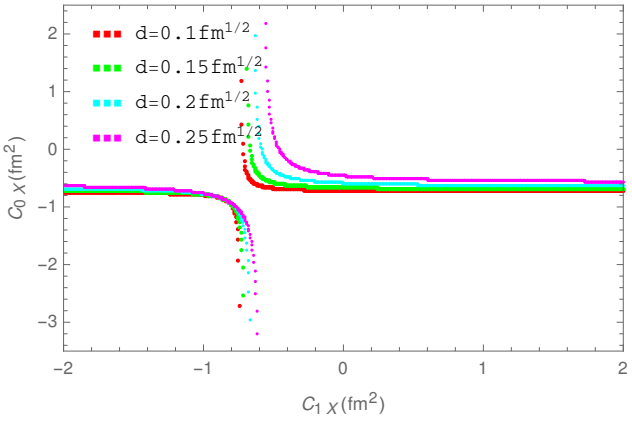
Bağlaşımlar arasında ise aşağıdaki ilişkiyi yazmak mümkündür.

$$g_1^2 = \frac{f_\Lambda^2}{G'_{11}} \left(\frac{\Sigma'_{c\bar{c}}(E_R)}{1-\Sigma'_{c\bar{c}}(E_R)} - \frac{g_2^2\, G'_{22}}{f_{\Lambda'}^2} \right), \qquad g_3 = d\, \frac{g_1}{f_\Lambda}\, G_{11}(E_R) \tag{147}$$

Yukarıdaki denklemden açıkça görüldüğü gibi rezonansın çarmonyuma olan bağlaşımı, farklı şekilde olsa da yine mezonik ilmek fonksiyonları yoluyladır.

1^{++} sektöründe, izospin ihlali göz önünde bulundurulduğunda simetrik durumdan farklı olarak teoride fazladan bir serbest parametre daha ortaya çıkar. Kontak operatör(ler) ve karışım parametresi arasında, $X(3872)$ rezonansının kütlesini sabitleyerek simetrik durum için yazılan denklem (109)'deki gibi açık bir ilişki yazılamaz. Şekil 12.'den görüleceği üzere farklı d değerleri için kontak parametreler arasındaki ilişki niceliksel olmasa bile niteliksel olarak aynıdır.

Yalnızca moleküler resmin dikkate alındığı (Guo vd., 2014) çalışmasında deneysel olarak gözlenen ihlal miktarının ele alınan etkin teori ile tutarlı oduğu bulunmuştur. Burada kurulan model içinse benzer bir hesap yaparak $X(3872)$'nin $I=0$ ve $I=1$ kanallarına olan dallanma oranları oranı elde



Şekil 12. Karışım parametresi d'nin farklı değerleri için C_{0X} ve C_{1X} kontak parametrelerinin değişimi. Burada $X(3872)$'nin kütlesi sabitlenmiş ve UV kesilim ölçeği 1 GeV olarak alınmıştır.

edilebilir. Söz konusu kanallar için dalaga fonksiyonları izospin bazında aşağıdaki gibi ifade edilebilir.

$$\begin{aligned} |I=0\rangle &= \frac{\tilde{X}^{1/2}}{\sqrt{2}}\left(|D^0\bar{D}^{*0}\rangle + |D^+\bar{D}^{*-}\rangle\right) + \tilde{Z}^{1/2}\,|\chi_{c1}(2P)\rangle \\ |I=1\rangle &= \frac{1}{\sqrt{2}}\left(|D^0\bar{D}^{*0}\rangle - |D^+\bar{D}^{*-}\rangle\right) \end{aligned} \tag{148}$$

Olası izospin kanalları için genlikler aşağıdaki gibi parametrize edilebilir.

$$\mathcal{M}[D\bar{D}^*(I=0)\to J/\psi\omega] = g_\omega \tag{149}$$

$$\mathcal{M}[D\bar{D}^*(I=1)\to J/\psi\rho] = g_\rho \tag{150}$$

$$\mathcal{M}[\chi_{c1}(2P)(I=0)\to J/\psi\omega] = g_{\omega'} \tag{151}$$

Yukarıdaki son genlik $\chi_{c1}(2P)$ çarmonyum aracılığı iledir ve Okubo-Zweig-Iizuka (OZI) kuralından dolayı baskılanmıştır. Bu sebeple yapılan hesaplarda buradan gelecek katkı ihmal edilmiştir. Böylece $X(3872)$'nin $I=0$ ve $I=1$ izospin kanalları için genlik oranı,

$$R_x = \frac{1}{\tilde{X}^{1/2}}\frac{g_\rho}{g_\omega}\left(\frac{g_1G_{11}-g_2G_{22}}{g_1G_{11}+g_2G_{22}}\right) \tag{152}$$

olarak bulunabilir. Buradaki oran, karışım durumunda toplam moleküler olasılık birden küçük olacağından $1/\tilde{X}^{1/2}$ ile büyür. (Hanhart vd., 2012)'deki çalışmada ise moleküler olasılık birdir. Tek bilinmeyen nicelik g_ρ/g_ω oranı ise, (Hidalgo-Duque vd., 2013) çalışmasında da açıklandığı üzere,

$g_\rho - g_\omega = -\sqrt{2} g_\phi$ şeklinde olan $SU(3)$ bağıntısı kullanılarak belirlenebilir. Yine OZI kuralından $g_\rho, g_\omega \gg g_\phi$ ilişkisinden dolayı $X(3872)$'nin $J/\psi\phi$'a olan bozunumu ihmal edilirse, söz konusu oran $g_\rho/g_\omega \simeq 1$ olarak alınabilir.

Tablo 8 d'nin bir fonksiyonu olarak, 1^{++} gizli tılsım tekilliklerinin özellikleri verilmiştir. $X(3872)$'nin kütlesi $M_X = 3871.69$ MeV alınıp BRK'na sabitlenmiş ve parçacığın izospin ihlali içeren süreçlerinden gelen deneysel veri kullanılarak C_{0X} ve C_{1X} parametreleri d cinsinden belirlenmiştir. $\chi_{c1}(2P)$ tekilliği ise İRK'na yerleşmiş ve moleküler ağırlıklı olan $m_{X'}$ kütlesi çiftlenim kanalı etkileriyle yaratılmıştır. Tüm hesaplar $\Lambda = 1.0$ GeV için yapılmıştır.

d [fm$^{1/2}$]	C_{0X} [fm^2]	C_{1X} [fm^2]	$g^{X(3872)}_{D^0\bar{D}^{*0}}$ [GeV$^{-1/2}$]	$g^{X(3872)}_{D^+\bar{D}^{*-}}$ [GeV$^{-1/2}$]	$\tilde{X}^{D^0\bar{D}^{*0}}_{X(3872)}$	$\tilde{X}^{D^+\bar{D}^{*-}}_{X(3872)}$	$\tilde{Z}^{\chi_{c1}}_{X(3872)}$	$(m_{X'}, \Gamma_{X'})$ [MeV]	$(m_{\chi_{c1}}, \Gamma_{\chi_{c1}})$ [MeV]
0.	-0.7307	-0.3855	0.3133	0.2395	–	–	0.	–	(3906.0,0)
0.05	-0.7216	-0.3507	0.3127	0.2393	0.9516	0.0446	0.0036	(3851.7,0)	(3906.0,1.98)
0.1	-0.6945	-0.2457	0.3109	0.2387	0.9409	0.0444	0.0145	(3822.5,0)	(3905.8,7.39)
0.15	-0.6494	-0.0689	0.3080	0.2377	0.9237	0.0440	0.0321	(3650,0)	(3905.4,14.99)
0.2	-0.5865	0.1824	0.3042	0.2363	0.9006	0.0435	0.0558	–	(3905.2,24.93)

Tablo 8'de $X(3872)$'nin izospin ihlalinden gelen deneysel verinin 1^{++} gizli tılsım sektörü üzerindeki etkileri verilmiştir. Saf moleküler durumda çiftlenim kanalı etkileri ikinci bir rezonans yaratmak için yetersiz kalırken, çarmonyumun katkılanmasıyla söz konusu rezonans İRK'nda ancak eşiğin altında sanal eksene yakın bir şekilde ortaya çıkar. Çarmonyum katkısının artırılmasıyla eşikten bir hayli uzaklaşan bu rezonans $d = 0.1656$ fm$^{1/2}$ değerinde $m_{X'} = 1932$ MeV kütlesindedir. Karışım parametresinin değeri daha da artırılınca bu tekillik gözden kaybolur. Diğer taraftan, çarmonyum miktarının artırılmasıyla giydirilmiş $\chi_{c1}(2P)$ durumunun kütlesi azalır ve genişliği artar. $d = 0.3$ fm$^{1/2}$ için bu rezonansın kütlesi 3902 MeV olurken genişliği yaklaşık 60 MeV'dir. Söz konusu karışım $X(3872)$'deki çarmonyum olasılığını ise %12'ye kadar artırır.

Bu bölümde verilen $X(3872)$'nin izospin yapısı için elde edilen sonuçlar yayına dönüştürülmek üzere hazırlık aşamasındadır.

6. SONUÇ

Bu projede, öncelikle $X(3872)$ mezonu ve ağır kuark eşleri KRD toplam kuralları kullanılarak incelenmiştir. Bu incelem sonucuda, 0^{++}, 1^{++}, ve 2^{++} durumlarının hepsinin kütlesi $m^2 = 16.0 \pm 1.5\ GeV^2$ olarak bulunmuştur. Her ne kadar bulduğumuz sonuçlar deneysel sonuçlar ile tutarlı olsa da, hata payının büyüklüğü, gerek kuramsal olarak $X(3872)$'nin kütlesinin $D^0 D^{*0}$ kütle toplamından büyük olup olmadığı, gerekse eşlerinin kütlesinin $X(3872)$'nin kütlesinden büyük olup olmadığını söylemeye imkan tanımamaktadır. Bu belirsizlik, KRD toplam kurallarının analizinden kaynaklı bir belirsizliktir. Proje kapsamında, literatürde genelde yapılan analiz yapılmış olsa da, alternatif analiz yöntemleri de önerilmektedir (ör. Leinweber (1997)). Ayrıca doğrudan kütle hesabı yerine, kütle farklarının doğrudan elde etmek için yöntemler denenebilir.

Ayrıca, yine proje kapsamında, $X(3872)$'nin ve eşlerinin özelliklerini ve bu özelliklere olası $c\bar{c}$ bileşeninin etkilerini incelemek için etkin bir alan kuramı geliştirilmiştir. Bu etkin alan kuramı kullanılarak, $X(3872)$'nin eşlerinin spektrumu incelenmiş, ve radyatif bozunmaların, $X(3872)$ ve eşlerinin çarmonyum içeriğine duyarlı olduğu gösterilmiştir. İleride, bu radyatif bozunmaların daha hassas ölçülmesi, çarmonyum içeriğinin daha hassas olarak belirlenmesini sağlayabilir.

$X(3872)$'nin çarmonyum içeriğini incelemek için, $X(3872)$ nin bozunmları yanında, oluşum mekanizmaları da incelenebilir[2].

Bunlara ek olarak, geliştirilen etkin kuram, deneysel olarak gözlemlenmiş diğer egzotik hadronlara da uygulanabilir.

Proje Çıktıları

Projeden çıkan yayınlar:

E. Cincioglu, J. Nieves, A. Ozpineci and A. U. Yilmazer, "Quarkonium Contribution to Meson Molecules," Eur. Phys. J. C **76** (2016) no.10, 576

Projeden çıkan metni yayınlanmış bildiriler:

E. Cincioglu, J. Nieves and A. Ozpineci, "X(3872) and its charmonium content in Heavy Quark limit," EPJ Web Conf. **129** (2016) 00022.

[2]Proje ekibinin, bu konuda 2017-1 doneminde bir ARDEB-1001 başvurusu bulunmaktadır

Projeden çıkmış tezler Doktora tezi, "Mezon Moleküllerine Kuarkonyum Katkısı," Elif Cincioğlu, (Tez danışmanı: A. U. Yılmazer, Yardımcı Tez Danışmanı: A. Ozpineci) Ankara Üniversitesi, Kasım 2016

Projeden çıkacak hazırlık aşamasındaki yayınlar:

1. KRD toplam kuralları ile elde ettiğimiz sonuçların sunulduğu bir yayın
2. $X(3872)$ ve eşleri için elde ettiğimiz etkin kurama izospin bozunması eklediğimizde değişen etkilerin bulundupu bir yayın

Projeden çıkacak hazırlık aşamasındaki tezler

Doktora tezi, "X(3872)'nin perturbatif olmayan yöntemlerle incelenmesi," (Tez danışmanı: Hasan Gümüş, Yardımcı Tez Danışmanı: A. Ozpineci), Ondokuz Mayıs Üniversitesi, 2017

Proje desteği ile yapılan organizasyonlar:

"Hadron Fiziği Kış Okulu, " 25-29 Ocak 2016, Organizatörler: A. Özpineci, G. Erkol

Ek A KRD Toplam Kurallarının Analitik İfadeleri

Denklemler (32-34), (43-44) ve (47), Borel dönüşümü uygulanarak, kütle toplam kurallari elde edilebilir. Bunun için bu denklemlerin sağ taraflarının Borel dönüşmüş hallerine ihtiyaç vardır. Spektral dönüşmüş hallerini kullanarak, sağ taraflarının borel dönüşmüş halleri

$$\Pi_{i,J^{PC}} = \int_{4m_c^2}^{\infty} ds\tilde{\rho}_{i,J^{PC}}(s,M^2)e^{-\frac{s}{M^2}} \tag{153}$$

olarak yazilabilir. Buradaki i indeksi, hangi akımın bağdaşıklık fonksiyonu olduğunu gösterirken, J^{PC}'de, yazılan ifadenin karşılık geldiği parçacığın kuantum sayılarını gösterir. Elde edilen $\tilde{\rho}$ fonksiyonları aşağıda gösterilmiştir[3]. Dikkat edilmesi gereken bir nokta, $\tilde{\rho}(s,M^2)$ ifadelerinin, M^2 bağlılıklarından dolayı, spektral yoğunluğa karşılık gelmediğidir. Spektral yoğunluğu elde edebilmek, ve yüksek kütleli durumların katkısını çıkarmak için şu ifade kullanılabilinir:

$$\int_{4m_c^2}^{\infty} ds(M^2)^n f(s)e^{-\frac{s}{M^2}} = \int_{4m_c^2}^{\infty} F_n(s)e^{-\frac{s}{M^2}}, \quad n>0. \tag{154}$$

Burada

$$F_n(s) = \frac{1}{\Gamma(n)}\int_{4m_c^2}^{s}\int du(s-u)^{n-1}f(s) \tag{155}$$

olarak tanımlanmıştır.

$$\begin{aligned}
\rho_{2,2^{++}}(s,M^2) = &-\frac{63M^{10}m_c^{10}\sqrt{s-4m_c^2}}{128\pi^6 s^{13/2}} - \frac{63M^{10}m_c^8\sqrt{s-4m_c^2}}{640\pi^6 s^{11/2}} \\
&-\frac{5\langle g^2G^2\rangle M^6 m_c^6\sqrt{s-4m_c^2}}{3072\pi^6 s^{9/2}} - \frac{27M^{10}m_c^6\sqrt{s-4m_c^2}}{1280\pi^6 s^{9/2}} \\
&+\frac{35M^8 m_c^8\sqrt{s-4m_c^2}}{1024\pi^6 s^{9/2}} - \frac{9\langle g^2G^2\rangle M^6 m_c^4\sqrt{s-4m_c^2}}{1024\pi^6 s^{7/2}} \\
&+\frac{9M^{10}m_c^4\sqrt{s-4m_c^2}}{1280\pi^6 s^{7/2}} + \frac{7M^8 m_c^6\sqrt{s-4m_c^2}}{1024\pi^6 s^{7/2}} \\
&-\frac{\langle g^2G^2\rangle M^6 m_c^2\sqrt{s-4m_c^2}}{768\pi^6 s^{5/2}} - \frac{33M^8 m_c^4\sqrt{s-4m_c^2}}{2048\pi^6 s^{5/2}}
\end{aligned}$$

[3]Proje sonuç raporunun yazımı sırasında, son kontrollerimizi yaparken, hesaplarımızda bir hata bulduk. Sunduğumuz sonuçlar bu hatanın düzeltilmiş sonuçlarıdır. Ancak, proje sonuç raporunun son teslim tarihine yaklaştığımızdan, aşağıdaki ifadeleri daha sade bir halde yazamadık. Sonuç raporuna düzeltme verildiği taktirde, bu ifadeleri daha sade bir hale getirebileceğimizi düşünüyoruz

$$-\frac{5\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^6}-\frac{189M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^8}$$

$$+\frac{105M^8m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^6}-\frac{13\langle g^2G^2\rangle M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^5}$$

$$+\frac{9M^{10}m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^5}-\frac{27M^8m_c^6\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^2\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^3}+\frac{3M^8m_c^4\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^3}$$

$$+\frac{3M^8m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{\langle g^2G^2\rangle M^6m_c^{10}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^{12}}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^8m_c^{14}}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{25M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{49\langle g^2G^2\rangle M^6m_c^{10}}{3072\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{585M^8m_c^{14}}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{135\langle g^2G^2\rangle M^6m_c^{12}}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{63\langle g^2G^2\rangle M^6m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{549M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{135\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{\langle g^2G^2\rangle M^6m_c^8}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$-\frac{51\langle g^2G^2\rangle M^6m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{585M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{9\langle g^2G^2\rangle M^6m_c^8}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}+\frac{27M^8m_c^{12}}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{35\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{\langle g^2G^2\rangle M^6m_c^{10}}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{15\langle g^2G^2\rangle M^6m_c^8\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$-\frac{45\langle g^2G^2\rangle M^6m_c^{12}}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{3M^8m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{49\langle g^2G^2\rangle M^6m_c^{10}}{3072\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{135M^8m_c^{14}}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{25M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135\langle g^2G^2\rangle M^6m_c^{12}}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{63\langle g^2G^2\rangle M^6m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{585M^8m_c^{14}}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{549M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{\langle g^2G^2\rangle M^6m_c^8}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{135\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{585M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{51\langle g^2G^2\rangle M^6m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{27M^8m_c^{12}}{64\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$-\frac{35\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{9\langle g^2G^2\rangle M^6m_c^8}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^8\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}+\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{200\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1200M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1475\langle g^2G^2\rangle M^6m_c^{18}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4425M^8m_c^{20}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7725M^8m_c^{16}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2575\langle g^2G^2\rangle M^6m_c^{14}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{175\langle g^2G^2\rangle M^6m_c^{12}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{525M^8m_c^{14}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^8m_c^{12}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5475M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1825\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{8825\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2525\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{17625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1575M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10125M^8m_c^{16}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3375\langle g^2G^2\rangle M^6m_c^{14}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3525M^8m_c^{20}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1175\langle g^2G^2\rangle M^6m_c^{18}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3825M^8m_c^{18}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1275\langle g^2G^2\rangle M^6m_c^{16}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{725\langle g^2G^2\rangle M^6m_c^{12}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2175M^8m_c^{14}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^2}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8 m_c^{12} s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{925\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2775M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3525M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1175\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{20325M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{6775\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{11175M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10725M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3575\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7175M^8 m_c^{14}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4625\langle g^2G^2\rangle M^6 m_c^{12}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{7825\langle g^2G^2\rangle M^6 m_c^{16}}{48\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{14275M^8 m_c^{18}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4600M^8 m_c^{16}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5975\langle g^2G^2\rangle M^6 m_c^{14}}{12\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3275\langle g^2G^2\rangle M^6 m_c^{10} s}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925M^8 m_c^{12} s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{34175M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{24425\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1075M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{9875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{42675M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4925M^8 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3275\langle g^2G^2\rangle M^6 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4925M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3275\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{275\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2475M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{21075M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{20575\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{28825M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1675\langle g^2G^2\rangle M^6 m_c^{10}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^8 m_c^{12}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{21225M^8 m_c^{18}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{13225\langle g^2G^2\rangle M^6 m_c^{16}}{192\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{104775M^8 m_c^{16}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{22925\langle g^2G^2\rangle M^6 m_c^{14}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3875\langle g^2G^2\rangle M^6 m_c^{12}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{17625M^8 m_c^{14}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2475M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1675\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{13725\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{60375M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{54675M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{37075\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{20475M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{4825\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{10475\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{14475M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{45\langle g^2G^2\rangle M^6 m_c^8}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{455\langle g^2G^2\rangle M^6 m_c^{12}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^8 m_c^{16}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{515\langle g^2G^2\rangle M^6 m_c^{10}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{2475M^8 m_c^{14}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{225M^8 m_c^{12}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{25\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{225M^8 m_c^{14}\sqrt{s-4m_c^2}}{32\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^8\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^8 m_c^{12}\sqrt{s-4m_c^2}}{64\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{7425M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{1185\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{205\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{3825M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{425\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{425\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{3825M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{135\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^8}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^8\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{723\langle g^2G^2\rangle M^6m_c^{20}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{15\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{575\langle g^2G^2\rangle M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2169M^8m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1279\langle g^2G^2\rangle M^6m_c^{16}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3450M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3837M^8m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{307\langle g^2G^2\rangle M^6m_c^{14}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{439\langle g^2G^2\rangle M^6 m_c^{12} s^4}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{921M^8 m_c^{16} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{\langle g^2G^2\rangle M^6 m_c^{10} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{439M^8 m_c^{14} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{9883\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6M^8 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1651\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{29649M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{3329\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{9906M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3329M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{2955\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{8195\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{8865M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{19957\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{24585M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4231\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{19957M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4231M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{7765\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{131\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7765M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{131\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{393M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{200\langle g^2G^2\rangle M^6 m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{131M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1475\langle g^2G^2\rangle M^6 m_c^{18}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1200M^8 m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2575\langle g^2G^2\rangle M^6 m_c^{14} s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4425M^8 m_c^{20}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{175\langle g^2G^2\rangle M^6 m_c^{12} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7725M^8 m_c^{16} s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525M^8 m_c^{14} s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8 m_c^{12} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1875M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1825\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5475M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{8825\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2525\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2625\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{17625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2603\langle g^2G^2\rangle M^6m_c^{20}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1575M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{275\langle g^2G^2\rangle M^6m_c^{18}s}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7809M^8m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{4519\langle g^2G^2\rangle M^6m_c^{16}s^2}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{825M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{898\langle g^2G^2\rangle M^6m_c^{14}s^3}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{13557M^8m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{31\langle g^2G^2\rangle M^6m_c^{12}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2694M^8m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{\langle g^2G^2\rangle M^6m_c^{10}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{279M^8m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9871\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{6573\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{88839M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{1091\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{59157M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{9819M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{9M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4085\langle g^2G^2\rangle M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{26645\langle g^2G^2\rangle M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{36765M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{8917\langle g^2G^2\rangle M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{79935M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{1149\langle g^2G^2\rangle M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{26751M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10341M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{2935\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{9M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{247\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26415M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{741M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{247\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{247\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2223M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3375\langle g^2G^2\rangle M^6 m_c^{14}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{741M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1175\langle g^2G^2\rangle M^6 m_c^{18}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10125M^8 m_c^{16}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1275\langle g^2G^2\rangle M^6 m_c^{16}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3525M^8 m_c^{20}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{725\langle g^2G^2\rangle M^6 m_c^{12} s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3825M^8 m_c^{18}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2175M^8 m_c^{14} s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^2}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8 m_c^{12} s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{925\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1175\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2775M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3525M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6775\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{20325M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{11175M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3575\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10725M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{650\langle g^2G^2\rangle M^6 m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1685\langle g^2G^2\rangle M^6 m_c^{18}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{5850M^8 m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1945\langle g^2G^2\rangle M^6 m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{15165M^8 m_c^{20}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{565\langle g^2G^2\rangle M^6 m_c^{12}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{17505M^8 m_c^{16}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5085M^8 m_c^{14}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{135M^8 m_c^{12}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{675M^8 m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2075\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{135M^8 m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{235\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{18675M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2115M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{8675\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2695\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{78075M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{24255M^8 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7225\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{135M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3575\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{65025M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{32175M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{715\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{6435M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4625\langle g^2G^2\rangle M^6 m_c^{12}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{7825\langle g^2G^2\rangle M^6 m_c^{16}}{48\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{7175M^8 m_c^{14}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{5975\langle g^2G^2\rangle M^6 m_c^{14}}{12\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{14275M^8 m_c^{18}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3275\langle g^2G^2\rangle M^6 m_c^{10} s}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4600M^8 m_c^{16}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{24425\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4925M^8 m_c^{12} s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{34175M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{9875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1075M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3275\langle g^2G^2\rangle M^6 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{42675M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3275\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4925M^8 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{275\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4925M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{2475M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{20575\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{21075M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{28825M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{117\langle g^2G^2\rangle M^6 m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{93\langle g^2G^2\rangle M^6 m_c^{14} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{39\langle g^2G^2\rangle M^6 m_c^{12} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{\langle g^2G^2\rangle M^6 m_c^8 s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{21\langle g^2G^2\rangle M^6 m_c^{10} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{43\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{\langle g^2G^2\rangle M^6 m_c^8 s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{675\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{227\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{\langle g^2G^2\rangle M^6 m_c^8 s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{199\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{415\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{415\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{83\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1675\langle g^2G^2\rangle M^6m_c^{10}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{13225\langle g^2G^2\rangle M^6m_c^{16}}{192\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2475M^8m_c^{12}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{22925\langle g^2G^2\rangle M^6m_c^{14}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{21225M^8m_c^{18}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{3875\langle g^2G^2\rangle M^6m_c^{12}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{104775M^8m_c^{16}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{17625M^8m_c^{14}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1675\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{13725\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2475M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{37075\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{60375M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{54675M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{4825\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{10475\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{20475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{305\langle g^2G^2\rangle M^6m_c^{12}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{14475M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{10\langle g^2G^2\rangle M^6m_c^{14}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{35\langle g^2G^2\rangle M^6m_c^{10}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^8 s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{5\langle g^2G^2\rangle M^6 m_c^8 s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{235\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{115\langle g^2G^2\rangle M^6 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{35\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{5\langle g^2G^2\rangle M^6 m_c^8 s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{45\langle g^2G^2\rangle M^6 m_c^8}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{455\langle g^2G^2\rangle M^6 m_c^{12}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{225M^8 m_c^{16}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{515\langle g^2G^2\rangle M^6 m_c^{10}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{2475M^8 m_c^{14}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{225M^8 m_c^{12}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{25\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{225M^8 m_c^{14}\sqrt{s-4m_c^2}}{32\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{225M^8 m_c^{12}\sqrt{s-4m_c^2}}{64\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{45\langle g^2G^2\rangle M^6 m_c^8\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{1185\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{7425M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{225M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{205\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{425\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{3825M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{3825M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{425\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{135\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{45\langle g^2G^2\rangle M^6 m_c^{8}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}+\frac{15\langle g^2G^2\rangle M^6 m_c^{8}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{8}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{2603\langle g^2G^2\rangle M^6 m_c^{20}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{15\langle g^2G^2\rangle M^6 m_c^{8}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{275\langle g^2G^2\rangle M^6 m_c^{18}s}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{7809M^8 m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{4519\langle g^2G^2\rangle M^6 m_c^{16}s^2}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{825M^8 m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{898\langle g^2G^2\rangle M^6 m_c^{14}s^3}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{13557M^8 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{31\langle g^2G^2\rangle M^6 m_c^{12}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2694M^8 m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{\langle g^2G^2\rangle M^6 m_c^{10}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{279M^8 m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9871\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{9M^8 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{6573\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{88839M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1091\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{59157M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9819M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{4085\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{26645\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{36765M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{8917\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{79935M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{1149\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{26751M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{10341M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{2935\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{247\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{26415M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{247\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{741M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{247\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2223M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{741M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{117\langle g^2G^2\rangle M^6 m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{93\langle g^2G^2\rangle M^6 m_c^{14} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{39\langle g^2G^2\rangle M^6 m_c^{12} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{\langle g^2G^2\rangle M^6 m_c^8 s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{21\langle g^2G^2\rangle M^6 m_c^{10} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{43\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{\langle g^2G^2\rangle M^6 m_c^8 s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{227\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{675\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{199\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{\langle g^2G^2\rangle M^6 m_c^8 s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{415\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{415\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{723\langle g^2G^2\rangle M^6 m_c^{20}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{83\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{575\langle g^2G^2\rangle M^6 m_c^{18} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2169M^8 m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1279\langle g^2G^2\rangle M^6 m_c^{16} s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3450M^8 m_c^{20} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3837M^8m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{307\langle g^2G^2\rangle M^6m_c^{14}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{439\langle g^2G^2\rangle M^6m_c^{12}s^4}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{921M^8m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{\langle g^2G^2\rangle M^6m_c^{10}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{439M^8m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9883\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1651\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{29649M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3329\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{9906M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3329M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2955\langle g^2G^2\rangle M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{8195\langle g^2G^2\rangle M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8865M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19957\langle g^2G^2\rangle M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{24585M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4231\langle g^2G^2\rangle M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19957M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4231M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7765\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{7765M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{131\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{393M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{650\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1685\langle g^2G^2\rangle M^6m_c^{18}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{5850M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1945\langle g^2G^2\rangle M^6m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15165M^8m_c^{20}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{565\langle g^2G^2\rangle M^6m_c^{12}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{17505M^8m_c^{16}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5085M^8m_c^{14}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{135M^8m_c^{12}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{15\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{675M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{135M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2075\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{235\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{18675M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{8675\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2115M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2695\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{78075M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{24255M^8 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{135M^8 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7225\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3575\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{65025M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{715\langle g^2G^2\rangle M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{32175M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{305\langle g^2G^2\rangle M^6 m_c^{12}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6435M^8 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{10\langle g^2G^2\rangle M^6 m_c^{14}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35\langle g^2G^2\rangle M^6 m_c^{10}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^8 s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^6 m_c^8 s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{115\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{235\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^8 s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{105M^8 m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6 s^6}-\frac{5\langle g^2G^2\rangle M^6 m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6 s^6}$$

$$+\frac{9M^{10}m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6 s^5}-\frac{13\langle g^2G^2\rangle M^6 m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6 s^5}$$

$$+\frac{3\langle g^2G^2\rangle M^6 m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6 s^3}-\frac{27M^8 m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6 s^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{14}ln(2)}{512\pi^6 s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{3M^8 m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6 s^3}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{12}ln(2)}{256\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8 m_c^{16}ln(2)}{256\pi^6 s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10}ln(2)}{1024\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^8 m_c^{14}ln(2)}{128\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8 m_c^{12}ln(2)}{512\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^8 m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{12}ln(2)}{256\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^8 m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{10}ln(2)}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{405M^8 m_c^{14}ln(2)}{256\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{135M^8 m_c^{12} ln(2)}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{135M^8 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{8} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{15\langle g^2G^2\rangle M^6 m_c^{8} ln(2)}{512\pi^6 s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{45M^8 m_c^{16} ln(2)}{256\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{512\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8 m_c^{14} ln(2)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8 m_c^{12} ln(2)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{405M^8 m_c^{14} ln(2)}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^8ln(2)}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{450\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15\langle g^2G^2\rangle M^6m_c^8ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{465\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2700M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1395M^8m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{165\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{495M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{45M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1035\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3105M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{975\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{2925M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5055\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15165M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2025M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{225\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{405M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675M^8m_c^{16}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{225M^8m_c^{20}ln(2)}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{12}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1350M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{7875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5475\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{16425M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{425\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{3375M^8m_c^{14}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{8925M^8m_c^{18}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2475M^8m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{675M^8m_c^{12}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1525\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{50775M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{17325M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{225\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{16425M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{15075M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{975\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{675M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3575\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{16425M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{325\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{60225M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1575M^8m_c^{18}ln(2)}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1125M^8m_c^{16}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3075\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^8m_c^{14}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{775\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{13725M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3825M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{425\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2025M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^8 ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{1575M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4725M^8 m_c^{16} ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{105\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8 m_c^{14} ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8 m_c^{12} ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{735\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{105\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{285\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{6075M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}+\frac{75\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$-\frac{45\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}-\frac{45\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{195\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{45\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{400\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1170M^8 m_c^{22} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2400M^8 m_c^{20} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2250M^8 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{450M^8 m_c^{16} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{150M^8 m_c^{14} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5895\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4380\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{17685M^8 m_c^{18} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4295\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{26280M^8 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{12885M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{675\langle g^2G^2\rangle M^6 m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1890M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6075\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{2025M^8 m_c^{20} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{9015\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18225M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4245\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{27045M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12735M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1075\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1890M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3225M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{30M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15\langle g^2G^2\rangle M^6 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{90M^8 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{450\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{465\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2700M^8 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1395M^8 m_c^{20} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{165\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035M^8 m_c^{16} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{495M^8 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^8 m_c^{12} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5175\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1035\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15525M^8 m_c^{14} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^8 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2925M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6675\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{20025M^8 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1065\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{3195M^8 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{675\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2025M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{135\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{580\langle g^2G^2\rangle M^6m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{405M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1100\langle g^2G^2\rangle M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5220M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{200\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9900M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{200\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1800M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1800M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6790\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{8820\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{61110M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3990\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{79380M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{560\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{35910M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1050\langle g^2G^2\rangle M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5040M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6650\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{9450M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{9030\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{59850M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3990\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{81270M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{560\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{35910M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1350\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5040M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{20\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{12150M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{180M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{60\langle g^2G^2\rangle M^6 m_c^{16} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{540M^8 m_c^{18} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{90M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^8 m_c^{16} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8 m_c^{20} ln(2)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} s ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1350M^8 m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8 m_c^{14} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{7875M^8 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5475\langle g^2G^2\rangle M^6 m_c^{12} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{16425M^8 m_c^{14} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1020\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1575M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{690\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{9180M^8 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{60\langle g^2G^2\rangle M^6 m_c^{14} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6210M^8 m_c^{20} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{540M^8 m_c^{16} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{120\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1080M^8 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{23625M^8 m_c^{14} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1230\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^8 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{30\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{11070M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{270M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3975\langle g^2G^2\rangle M^6 m_c^{14} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2715\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{35775M^8 m_c^{16} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{24435M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3675\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{4725M^8 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1050\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{33075M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{9450M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{210\langle g^2G^2\rangle M^6 m_c^{12} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1890M^8 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{375\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{425\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{3375M^8 m_c^{14} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{8925M^8 m_c^{18} ln(2)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2475M^8 m_c^{16} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1525\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{675M^8 m_c^{12} sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{50775M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{17325M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{975\langle g^2G^2\rangle M^6 m_c^{10} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{16425M^8 m_c^{12} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{15075M^8 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{675M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{3575\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16425M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{60225M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{45\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{18\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{30\langle g^2G^2\rangle M^6 m_c^{14} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{225\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{45\langle g^2G^2\rangle M^6 m_c^8 s^{7/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{411\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{69\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^8 s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{255\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{325\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1575M^8 m_c^{18} ln(2)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^8 m_c^{16} ln(2)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3075\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8 m_c^{14} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{775\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{13725M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3825M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{425\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2025M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{45\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1575M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{10} s ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{165\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75\langle g^2G^2\rangle M^6 m_c^8 s^{3/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^8 s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{615\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^8 ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4725M^8 m_c^{16} ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{105\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8 m_c^{14} ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8 m_c^{12} ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{735\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{105\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{285\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^8 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}-\frac{75\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$-\frac{45\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}-\frac{45\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{580\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{45\langle g^2G^2\rangle M^6 m_c^8 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{1100\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5220M^8 m_c^{22} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{200\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9900M^8 m_c^{20} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{200\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1800M^8 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6790\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{1800M^8 m_c^{16} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{8820\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{61110M^8 m_c^{18} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3990\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{79380M^8 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{560\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{35910M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1050\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{5040M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{6650\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9450M^8 m_c^{20} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9030\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{59850M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{3990\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{81270M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{560\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{35910M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{1350\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5040M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{20\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{12150M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{60\langle g^2G^2\rangle M^6 m_c^{16} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{180M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{10\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{540M^8 m_c^{18} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{90M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{45\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{18\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{30\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{225\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^8 s^{7/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{3\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{69\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{411\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{255\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{45\langle g^2G^2\rangle M^6 m_c^8 s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{75\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{195\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{400\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1170M^8 m_c^{22} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2400M^8 m_c^{20} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2250M^8 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{450M^8 m_c^{16} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5895\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{150M^8 m_c^{14} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4380\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{17685M^8 m_c^{18} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4295\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{26280M^8 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12885M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{675\langle g^2G^2\rangle M^6 m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1890M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{6075\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2025M^8 m_c^{20} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9015\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{18225M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4245\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{27045M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12735M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1075\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1890M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3225M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{30M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{90M^8 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1020\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{15M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{690\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9180M^8 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{60\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6210M^8 m_c^{20} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{540M^8 m_c^{16} s ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{120\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1080M^8 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{23625M^8 m_c^{14} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4725M^8 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1230\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{30\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{11070M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3975\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{270M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{2715\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35775M^8 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{24435M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{3675\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4725M^8 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{1050\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{33075M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{210\langle g^2G^2\rangle M^6 m_c^{12} s ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9450M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{45\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1890M^8 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{10} sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{165\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{75\langle g^2G^2\rangle M^6 m_c^8 s^{3/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^6 m_c^8 s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{615\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{189M^{10} m_c^{14} ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6 s^8}$$
$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^6}-\frac{189M^{10} m_c^{14} ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{32\pi^6 s^8}$$
$$-\frac{3\langle g^2G^2\rangle M^6 m_c^8 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^5}-\frac{105M^8 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6}$$
$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{45M^8 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{405M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{15\langle g^2G^2\rangle M^6m_c^8ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^8\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{195\langle g^2G^2\rangle M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1170M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{400\langle g^2G^2\rangle M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2400M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{2250M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{450M^8m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5895\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{150M^8m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4380\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{17685M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4295\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{26280M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{315\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12885M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{675\langle g^2G^2\rangle M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1890M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{6075\langle g^2G^2\rangle M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2025M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9015\langle g^2G^2\rangle M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{18225M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4245\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{27045M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{12735M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1075\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1890M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3225M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{30M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{90M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{450\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}$$

$$+\frac{2700M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}-\frac{465\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}$$

$$+\frac{1395M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}-\frac{345\langle g^2G^2\rangle M^6 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}$$

$$+\frac{165\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}+\frac{1035M^8 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{9}}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{495M^8 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^8 m_c^{12} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1035\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3105M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{975\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2925M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5055\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15165M^8 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{19575M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2025M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{580\langle g^2G^2\rangle M^6 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{405M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5220M^8 m_c^{22} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1100\langle g^2G^2\rangle M^6 m_c^{18} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9900M^8 m_c^{20} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{200\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{200\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1800M^8 m_c^{18} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6790\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1800M^8 m_c^{16} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{8820\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{61110M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3990\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{79380M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{560\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{35910M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1050\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5040M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6650\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9450M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9030\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{59850M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3990\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{81270M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{560\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{35910M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1350\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5040M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{12150M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{60\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{180M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{10\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{540M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{225\langle g^2G^2\rangle M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^8 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1350M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{4725M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5775\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17325M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{525\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1575M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1020\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{9180M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{690\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{60\langle g^2G^2\rangle M^6 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{6210M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{120\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{540M^8 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1080M^8 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{23625M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{4725M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1230\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{30\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{11070M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{3975\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{270M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{2715\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{35775M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{24435M^8 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3675\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1050\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{33075M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{210\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{9450M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1890M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{425\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3375M^8 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{8925M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{2475M^8 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1525\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{675M^8 m_c^{12} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{50775M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{75M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{17325M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16425M^8 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{15075M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{975\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{675M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3575\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{16425M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{60225M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{30\langle g^2G^2\rangle M^6 m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{18\langle g^2G^2\rangle M^6 m_c^{12}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^8s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{69\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{411\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{255\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{45\langle g^2G^2\rangle M^6m_c^8s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{325\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1575M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3075\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{13725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{775\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{3825M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{425\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2025M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1575M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{165\langle g^2G^2\rangle M^6 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{45\langle g^2G^2\rangle M^6 m_c^{10}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^8 s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75\langle g^2G^2\rangle M^6 m_c^8 s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{615\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{15\langle g^2G^2\rangle M^6 m_c^8 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{4725M^8 m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{105\langle g^2G^2\rangle M^6 m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8 m_c^{14}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{735\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{105\langle g^2G^2\rangle M^6m_c^8\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{285\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{6075M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{225\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}+\frac{75\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}+\frac{45\langle g^2G^2\rangle M^6m_c^8\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6}-\frac{45\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^8ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5}+\frac{105M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6}$$

$$+\frac{45M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{405M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45\langle g^2G^2\rangle M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{135M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{8} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6 s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{8}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6 s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{450\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2700M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{465\langle g^2G^2\rangle M^6 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1395M^8 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{345\langle g^2G^2\rangle M^6 m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1035M^8 m_c^{16} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{495M^8 m_c^{14} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^8 m_c^{12} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1035\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15525M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2925M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{6675\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{20025M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1065\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^8 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3195M^8 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{675\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2025M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{135\langle g^2G^2\rangle M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{405M^8 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^8 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8 m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12} s ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1350M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8 m_c^{14} s ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{4725M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5775\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17325M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{525\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1575M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{12} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{425\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3375M^8 m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{8925M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{525\langle g^2G^2\rangle M^6 m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{2475M^8 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1525\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{675M^8 m_c^{12} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{50775M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{17325M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{975\langle g^2G^2\rangle M^6 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{16425M^8 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{15075M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{675M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{3575\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{16425M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{325\langle g^2G^2\rangle M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{60225M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1575M^8 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{3075\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{13725M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{775\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{3825M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{425\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2025M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1575M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{15\langle g^2G^2\rangle M^6 m_c^8 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{4725M^8 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{105\langle g^2G^2\rangle M^6 m_c^{12} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8 m_c^{14}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8 m_c^{12}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{735\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{105\langle g^2G^2\rangle M^6 m_c^8\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{285\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{12} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}-\frac{75\langle g^2G^2\rangle M^6 m_c^8\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{15\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}-\frac{15\langle g^2G^2\rangle M^6 m_c^{10} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}+\frac{45\langle g^2G^2\rangle M^6 m_c^8\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$-\frac{580\langle g^2G^2\rangle M^6 m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{45\langle g^2G^2\rangle M^6 m_c^8\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^4}$$

$$+\frac{5220M^8 m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1100\langle g^2G^2\rangle M^6 m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9900M^8 m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{200\langle g^2G^2\rangle M^6 m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{200\langle g^2G^2\rangle M^6 m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{1800M^8 m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{6790\langle g^2G^2\rangle M^6 m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1800M^8 m_c^{16}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{8820\langle g^2G^2\rangle M^6 m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{61110M^8 m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{3990\langle g^2G^2\rangle M^6 m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{79380M^8 m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{560\langle g^2G^2\rangle M^6 m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{35910M^8 m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{1050\langle g^2G^2\rangle M^6 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5040M^8 m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6650\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{9450M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{9030\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{59850M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3990\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{81270M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{560\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{35910M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1350\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{5040M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{20\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{12150M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{180M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{60\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{10\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{540M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{90M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{30\langle g^2G^2\rangle M^6 m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{18\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{45\langle g^2G^2\rangle M^6 m_c^8 s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{411\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{69\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^8 s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{255\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{15\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{195\langle g^2G^2\rangle M^6 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1170M^8 m_c^{22} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{400\langle g^2G^2\rangle M^6 m_c^{18} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2400M^8 m_c^{20} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{375\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2250M^8 m_c^{18} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{450M^8 m_c^{16} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5895\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{150M^8 m_c^{14} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4380\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{17685M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4295\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{26280M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12885M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{675\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1890M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6075\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2025M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{9015\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18225M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4245\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{27045M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{315\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12735M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1075\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1890M^8 m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3225M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15\langle g^2G^2\rangle M^6 m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{90M^8 m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1020\langle g^2G^2\rangle M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^8 m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9180M^8 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{690\langle g^2G^2\rangle M^6 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{60\langle g^2G^2\rangle M^6 m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{6210M^8 m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{120\langle g^2G^2\rangle M^6 m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{540M^8 m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1080M^8 m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{23625M^8 m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1230\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4725M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{30\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{11070M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{270M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3975\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2715\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{35775M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{525\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24435M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3675\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4725M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1050\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{33075M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9450M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{210\langle g^2G^2\rangle M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{45\langle g^2G^2\rangle M^6 m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1890M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{165\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45\langle g^2G^2\rangle M^6 m_c^{10}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^6m_c^8s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^8s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{525\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{15\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{615\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{15\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)} \tag{156}$$

$$\tilde{\rho}_{2,1^{++}}(s,M^2)=+\frac{567M^{10}m_c^{10}\sqrt{s-4m_c^2}}{256\pi^6s^{13/2}}-\frac{483M^{10}m_c^8\sqrt{s-4m_c^2}}{1280\pi^6s^{11/2}}$$
$$+\frac{25\langle g^2G^2\rangle M^6m_c^6\sqrt{s-4m_c^2}}{6144\pi^6s^{9/2}}+\frac{63M^8m_c^{10}\sqrt{s-4m_c^2}}{128\pi^6s^{11/2}}$$
$$+\frac{249M^{10}m_c^6\sqrt{s-4m_c^2}}{1280\pi^6s^{9/2}}-\frac{7M^8m_c^8\sqrt{s-4m_c^2}}{40\pi^6s^{9/2}}$$
$$+\frac{15\langle g^2G^2\rangle M^6m_c^4\sqrt{s-4m_c^2}}{2048\pi^6s^{7/2}}+\frac{9M^{10}m_c^4\sqrt{s-4m_c^2}}{160\pi^6s^{7/2}}$$
$$+\frac{5\langle g^2G^2\rangle M^4m_c^6\sqrt{s-4m_c^2}}{3072\pi^6s^{7/2}}+\frac{289M^8m_c^6\sqrt{s-4m_c^2}}{2560\pi^6s^{7/2}}$$
$$-\frac{13\langle g^2G^2\rangle M^6m_c^2\sqrt{s-4m_c^2}}{6144\pi^6s^{5/2}}-\frac{35M^6m_c^8\sqrt{s-4m_c^2}}{2048\pi^6s^{7/2}}$$
$$+\frac{\langle g^2G^2\rangle M^4m_c^4\sqrt{s-4m_c^2}}{512\pi^6s^{5/2}}+\frac{27M^8m_c^4\sqrt{s-4m_c^2}}{2560\pi^6s^{5/2}}$$
$$+\frac{53M^6m_c^6\sqrt{s-4m_c^2}}{2048\pi^6s^{5/2}}-\frac{17\langle g^2G^2\rangle M^4m_c^2\sqrt{s-4m_c^2}}{12288\pi^6s^{3/2}}$$
$$+\frac{1701M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^8}-\frac{15M^6m_c^4\sqrt{s-4m_c^2}}{4096\pi^6s^{3/2}}$$
$$+\frac{189M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^7}-\frac{315M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^7}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^6}+\frac{405M^{10}m_c^8\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^6}$$

$$+\frac{5\langle g^2G^2\rangle M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^5}-\frac{105M^8m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^6}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^8\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^5}+\frac{27M^{10}m_c^6\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^5}$$

$$+\frac{225M^8m_c^8\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^5}-\frac{105M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^5}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^4}-\frac{21\langle g^2G^2\rangle M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^4}$$

$$+\frac{45M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^4}-\frac{9M^8m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^2\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}-\frac{21\langle g^2G^2\rangle M^4m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}$$

$$+\frac{3M^8m_c^4\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^3}-\frac{27M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^3}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^2\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^2}+\frac{3M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^2}$$

$$+\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{8192\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{3M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{\langle g^2G^2\rangle M^4m_c^{10}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{3M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{135M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{225\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{245\langle g^2G^2\rangle M^6m_c^{10}}{6144\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{27M^{10}m_c^{10}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{45\langle g^2G^2\rangle M^4m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{25M^8m_c^{12}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{49\langle g^2G^2\rangle M^4m_c^{10}}{3072\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{135M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$-\frac{3M^8m_c^{10}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{25M^6m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{675\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{1215M^{10}m_c^{12}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$-\frac{315\langle g^2G^2\rangle M^6m_c^{10}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{585M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{135\langle g^2G^2\rangle M^4m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{4617M^{10}m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$-\frac{531M^8m_c^{12}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{585M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{513M^8m_c^{10}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{63\langle g^2G^2\rangle M^4m_c^{10}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{549M^6m_c^{12}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{675\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{1215M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{585M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{135M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{135\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{255\langle g^2G^2\rangle M^6m_c^{10}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}+\frac{585M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$-\frac{1701M^{10}m_c^{10}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{27M^8m_c^{12}}{32\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{51\langle g^2G^2\rangle M^4m_c^{10}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{189M^8m_c^{10}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{175\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{27M^6m_c^{12}}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$-\frac{1215M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{35\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{135M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$-\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{8192\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{3M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{\langle g^2G^2\rangle M^4m_c^{10}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{225\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{3M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$-\frac{245\langle g^2G^2\rangle M^6m_c^{10}}{6144\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{45\langle g^2G^2\rangle M^4m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{27M^{10}m_c^{10}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{25M^8m_c^{12}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{3M^8m_c^{10}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{49\langle g^2G^2\rangle M^4m_c^{10}}{3072\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{25M^6m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{675\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{1215M^{10}m_c^{12}}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{585M^8m_c^{14}}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{315\langle g^2G^2\rangle M^6m_c^{10}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{4617M^{10}m_c^{10}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{531M^8m_c^{12}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{135\langle g^2G^2\rangle M^4m_c^{12}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{63\langle g^2G^2\rangle M^4m_c^{10}}{1024\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{585M^6m_c^{14}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$-\frac{513M^8m_c^{10}}{512\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{549M^6m_c^{12}}{2048\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{1215M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{675\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{585M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{135\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{135M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{585M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{1701M^{10}m_c^{10}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{255\langle g^2G^2\rangle M^6m_c^{10}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{27M^8m_c^{12}}{32\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{51\langle g^2G^2\rangle M^4m_c^{10}}{1024\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{189M^8m_c^{10}}{256\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}+\frac{27M^6m_c^{12}}{128\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{175\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{1215M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{35\langle g^2G^2\rangle M^4 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{75M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$-\frac{135M^8 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{75M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$-\frac{500\langle g^2G^2\rangle M^6 m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1475\langle g^2G^2\rangle M^4 m_c^{18}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2400M^8 m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{4425M^6 m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4425M^8 m_c^{20}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7375\langle g^2G^2\rangle M^6 m_c^{18}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{12875\langle g^2G^2\rangle M^6 m_c^{14}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{200\langle g^2G^2\rangle M^4 m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{600M^6 m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7725M^8 m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2575\langle g^2G^2\rangle M^4 m_c^{14}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{875\langle g^2G^2\rangle M^6 m_c^{12}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525M^8 m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7725M^6 m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{175\langle g^2G^2\rangle M^4 m_c^{12}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^8 m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{525M^6 m_c^{14}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^6m_c^{12}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^4m_c^{10}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3125\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{625\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1875M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{9125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^4m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5475M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{625\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1825\langle g^2G^2\rangle M^4m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{44125\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5475M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{12625\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{8825\langle g^2G^2\rangle M^4m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{26475M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{2525\langle g^2G^2\rangle M^4 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{375M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7575M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{29375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2625\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7875M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{17625M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7875M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{13125\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5875\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2625\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1575M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{17625M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1575M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{525\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{16875\langle g^2G^2\rangle M^6 m_c^{14}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1275\langle g^2G^2\rangle M^4 m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{10125M^8 m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3825M^6 m_c^{18}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5875\langle g^2G^2\rangle M^6 m_c^{18}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3525M^8 m_c^{20}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{6375\langle g^2G^2\rangle M^6 m_c^{16}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1175\langle g^2G^2\rangle M^4 m_c^{18}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{3825M^8 m_c^{18}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3525M^6 m_c^{20}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3375\langle g^2G^2\rangle M^4 m_c^{14} s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3625\langle g^2G^2\rangle M^6 m_c^{12} s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2175M^8 m_c^{14} s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10125M^6 m_c^{16} s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{725\langle g^2G^2\rangle M^4 m_c^{12} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8 m_c^{12} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{2175M^6 m_c^{14} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6 m_c^{12} s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1175\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5550M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3525M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3525M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{33875\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{925\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2775 M^6 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{20325 M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{6775\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225 M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{20325 M^6 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225 M^6 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{18625\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{11175 M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725 M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10725 M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3575\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10725 M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725 M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{11175 M^6 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3725\langle g^2G^2\rangle M^4 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{23125\langle g^2G^2\rangle M^6 m_c^{12}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{34425 M^{10} m_c^{12}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5975\langle g^2G^2\rangle M^4m_c^{14}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{45875M^8m_c^{14}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{39125\langle g^2G^2\rangle M^6m_c^{16}}{96\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2300M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{87075M^{10}m_c^{16}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{14275M^8m_c^{18}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{29875\langle g^2G^2\rangle M^6m_c^{14}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{87075M^{10}m_c^{14}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{7825\langle g^2G^2\rangle M^4m_c^{16}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{8725M^8m_c^{16}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{14275M^6m_c^{18}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{16375\langle g^2G^2\rangle M^6m_c^{10}s}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4625\langle g^2G^2\rangle M^4m_c^{12}s}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{22275M^{10}m_c^{10}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2725M^8m_c^{12}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{7175M^6m_c^{14}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2475M^8m_c^{10}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3275\langle g^2G^2\rangle M^4m_c^{10}s^2}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{122125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4925M^6m_c^{12}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{9875\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{131625M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{44125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{42675M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{176175M^{10}m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{49375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{42675M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{16375\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{24425\langle g^2G^2\rangle M^4 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{22275M^{10}m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{34175M^8 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{34175M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3275\langle g^2G^2\rangle M^4 m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2475M^8 m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{16375\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{20575\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{22275M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{19825M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{28825M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{22275M^{10}m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{26875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{2475M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{275\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{66825M^{10} m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2475M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{16125M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{111375M^{10} m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{102875\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5375\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{875M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3275\langle g^2G^2\rangle M^4 m_c^{10} s\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{21075M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2475M^8 m_c^{10} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{675M^{10} m_c^{10}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{8375\langle g^2G^2\rangle M^6 m_c^{10}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{38475M^8 m_c^{12}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3875\langle g^2G^2\rangle M^4 m_c^{12}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{66125\langle g^2G^2\rangle M^6 m_c^{16}}{384\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{17625M^6 m_c^{14}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{6750M^{10} m_c^{16}}{\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{21225M^8 m_c^{18}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{114625\langle g^2G^2\rangle M^6 m_c^{14}}{256\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{30375M^{10} m_c^{14}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{13225\langle g^2G^2\rangle M^4 m_c^{16}}{192\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{152775M^8 m_c^{16}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{19375\langle g^2G^2\rangle M^6 m_c^{12}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{21225M^6m_c^{18}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{22925\langle g^2G^2\rangle M^4 m_c^{14}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{10125M^{10}m_c^{12}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{36375M^8 m_c^{14}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{104775M^6m_c^{16}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75M^8 m_c^{10}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1675\langle g^2G^2\rangle M^4 m_c^{10}s}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{8375\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2475M^6m_c^{12}s}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{37075\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{55275M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{54675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{8100M^{10} m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{68625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{185375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{60375M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{13725\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{7425M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2925M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{60375M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1675\langle g^2G^2\rangle M^4 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75M^8 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{24125\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{10125M^{10} m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{20475M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3375M^{10} m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{52375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{768\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4825\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{21525M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{10475\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{20475M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{14475M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^8 m_c^{10}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{14}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^6 m_c^{12}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{2025M^{10} m_c^{14}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{225M^8 m_c^{16}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{22275M^{10} m_c^{12}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{1375\langle g^2G^2\rangle M^6 m_c^{12}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8 m_c^{14}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{25\langle g^2G^2\rangle M^4 m_c^{14}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{225M^6m_c^{16}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{275\langle g^2G^2\rangle M^4m_c^{12}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{2025M^{10}m_c^{10}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{1125M^8m_c^{12}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{2475M^6m_c^{14}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s-4m_c^2}}{64\pi^6s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{2025M^{10}m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s-4m_c^2}}{128\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^8m_c^{14}\sqrt{s-4m_c^2}}{16\pi^6s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{2025M^{10}m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{225M^8m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{225M^6m_c^{14}\sqrt{s-4m_c^2}}{64\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{225M^8m_c^{10}\sqrt{s-4m_c^2}}{32\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{225M^6m_c^{12}\sqrt{s-4m_c^2}}{128\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{225M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{225M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{4125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{66825M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{7425M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{825\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{2025M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{225M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{7425M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{2125\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{34425M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{2125\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{3825M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{425\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{34425M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{3825M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{3825M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{3825M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{425\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{3825M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{3615\langle g^2G^2\rangle M^6 m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4338M^8 m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2875\langle g^2G^2\rangle M^6 m_c^{18}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6900M^8 m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{723\langle g^2G^2\rangle M^4 m_c^{20}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6395\langle g^2G^2\rangle M^6 m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{2169M^6 m_c^{22}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{575\langle g^2G^2\rangle M^4 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7674M^8 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1535\langle g^2G^2\rangle M^6 m_c^{14} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1725M^6 m_c^{20} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1279\langle g^2G^2\rangle M^4 m_c^{16} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1842M^8 m_c^{16} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{2195\langle g^2G^2\rangle M^6 m_c^{12} s^4}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3837M^6 m_c^{18} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{307\langle g^2G^2\rangle M^4 m_c^{14} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{878M^8 m_c^{14} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{921M^6 m_c^{16} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{12M^8 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{439\langle g^2G^2\rangle M^4 m_c^{12} s^5}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{439M^6 m_c^{14} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{49415\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3M^6 m_c^{12} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{8255\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{29649M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{9883\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{19812M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{16645\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{29649M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{1651\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3329M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4953M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3329\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{6M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3329M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{14775\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{40975\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{8865M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2955\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{24585M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{99785\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{8865M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{8195\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{19957M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{24585M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{21155\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{19957\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{4231M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{19957M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4231\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{38825\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{7765M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{655\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{131M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{655\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{262M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{7765\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{786M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{655\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{131M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{131\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{393M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{500\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2400M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1475\langle g^2G^2\rangle M^4m_c^{18}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4425M^6m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7375\langle g^2G^2\rangle M^6m_c^{18}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{12875\langle g^2G^2\rangle M^6 m_c^{14} s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{4425M^8m_c^{20}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{200\langle g^2G^2\rangle M^4 m_c^{16} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7725M^8m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{600M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{875\langle g^2G^2\rangle M^6 m_c^{12} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2575\langle g^2G^2\rangle M^4 m_c^{14} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{525M^8m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7725M^6m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{175\langle g^2G^2\rangle M^4 m_c^{12} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{525M^6m_c^{14}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3125\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{375M^6m_c^{12}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9125\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5475M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{44125\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1825\langle g^2G^2\rangle M^4 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26475M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5475M^6 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{12625\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{8825\langle g^2G^2\rangle M^4 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7575M^8 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26475M^6 m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2525\langle g^2G^2\rangle M^4 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7575M^6 m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{125\langle g^2G^2\rangle M^4 m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^6 m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{29375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{17625M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{13125\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7875M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7875M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5875\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1575M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{17625M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{13015\langle g^2G^2\rangle M^6 m_c^{20}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1575M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{70281M^{10} m_c^{20}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15618M^8 m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7425M^{10} m_c^{18} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1375\langle g^2G^2\rangle M^6 m_c^{18} s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{17268M^8 m_c^{20} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2603\langle g^2G^2\rangle M^4 m_c^{20} s}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{22595\langle g^2G^2\rangle M^6 m_c^{16} s^2}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7809M^6 m_c^{22} s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{275\langle g^2G^2\rangle M^4 m_c^{18} s^2}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{122013M^{10} m_c^{16} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{825M^6 m_c^{20} s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{25464M^8 m_c^{18} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{24246M^{10} m_c^{14} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2245\langle g^2G^2\rangle M^6 m_c^{14} s^3}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4519\langle g^2G^2\rangle M^4 m_c^{16} s^3}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{21726M^8 m_c^{16} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{155\langle g^2G^2\rangle M^6 m_c^{12} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{13557M^6 m_c^{18} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{2511M^{10} m_c^{12} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{898\langle g^2G^2\rangle M^4 m_c^{14} s^4}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{5946M^8 m_c^{14} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1347M^6 m_c^{16} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{81M^{10} m_c^{10} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{540M^8 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{31\langle g^2G^2\rangle M^4 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{279M^6 m_c^{14} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{18M^8 m_c^{10} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9M^6 m_c^{12} s^6}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{49355\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{799551M^{10} m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{32865\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{88839M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{9871\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{532413M^{10} m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{29682M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{88839M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{5455\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{88371M^{10} m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{49338M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6573\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{59157M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1091\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{81M^{10} m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{9828M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9819M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9M^8 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20425\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{330885M^{10} m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{36765M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{719415M^{10} m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{133225\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4085\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{43170M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{44585\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{36765M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{26645\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{240759M^{10} m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{26433M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{79935M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{93069M^{10}m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5745\langle g^2G^2\rangle M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{8917\langle g^2G^2\rangle M^4m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{43161M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26751M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1149\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{81M^{10}m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10332M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{10341M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9M^8m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{14675\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{247\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{237735M^{10}m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{24933M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{741M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1235\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6669M^{10}m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1235\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1482M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2935\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20007M^{10}m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{21969M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{26415M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6669M^{10}m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1235\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{247\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3705M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{247\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2223M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{741M^8m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{741M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{16875\langle g^2G^2\rangle M^6m_c^{14}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1275\langle g^2G^2\rangle M^4m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10125M^8m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3825M^6m_c^{18}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3525M^8m_c^{20}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6m_c^{18}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{6375\langle g^2G^2\rangle M^6m_c^{16}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1175\langle g^2G^2\rangle M^4m_c^{18}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3825M^8m_c^{18}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3525M^6m_c^{20}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3625\langle g^2G^2\rangle M^6m_c^{12}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3375\langle g^2G^2\rangle M^4m_c^{14}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10125M^6m_c^{16}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2175M^8m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{725\langle g^2G^2\rangle M^4 m_c^{12} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{225M^8 m_c^{12} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2175M^6 m_c^{14} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6 m_c^{12} s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{1175\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{5550M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3525M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{5875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3525M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{33875\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{925\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2775M^6 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{20325M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{6775\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{225M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{20325M^6 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{18625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{11175M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10725M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3575\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10725M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{11175M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3725\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1625\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{52650M^{10}m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3465M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1685\langle g^2G^2\rangle M^4m_c^{18}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{15165M^6m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{8425\langle g^2G^2\rangle M^6m_c^{18}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{136485M^{10}m_c^{18}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{15165M^8m_c^{20}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{9725\langle g^2G^2\rangle M^6m_c^{14}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{157545M^{10}m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{650\langle g^2G^2\rangle M^4 m_c^{16} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{29205M^8 m_c^{16} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{2825\langle g^2G^2\rangle M^6 m_c^{12} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2925M^6 m_c^{18} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{1945\langle g^2G^2\rangle M^4 m_c^{14} s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{45765M^{10} m_c^{12} s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{12420M^8 m_c^{14} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17505M^6 m_c^{16} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{1215M^{10} m_c^{10} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{5220M^8 m_c^{12} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{565\langle g^2G^2\rangle M^4 m_c^{12} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{5085M^6 m_c^{14} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{15\langle g^2G^2\rangle M^4 m_c^{10} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{135M^8 m_c^{10} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{135M^6 m_c^{12} s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6075M^{10} m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1215M^{10} m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{270M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{135M^8 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{15\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{135M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{235\langle g^2G^2\rangle M^4m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{168075M^{10}m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{16560M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2115M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1175\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{19035M^{10}m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{43375\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2115M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2075\langle g^2G^2\rangle M^4m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{702675M^{10}m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{18675M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{40725M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{218295M^{10}m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13475\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{8675\langle g^2G^2\rangle M^4m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{26910M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{78075M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1215M^{10}m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2695\langle g^2G^2\rangle M^4m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{12195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{24255M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{135M^8m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{135M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{36125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{585225M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{32175M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{289575M^{10}m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{32175M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{7225\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{57915M^{10}m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{52155M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{65025M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{715\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6435M^8m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{23125\langle g^2G^2\rangle M^6m_c^{12}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6435M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5975\langle g^2G^2\rangle M^4m_c^{14}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{34425M^{10}m_c^{12}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{45875M^8m_c^{14}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2300M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{87075M^{10}m_c^{16}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{39125\langle g^2G^2\rangle M^6m_c^{16}}{96\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{29875\langle g^2G^2\rangle M^6m_c^{14}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{14275M^8m_c^{18}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{7825\langle g^2G^2\rangle M^4m_c^{16}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{87075M^{10}m_c^{14}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{14275M^6m_c^{18}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{8725M^8m_c^{16}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{22275M^{10}m_c^{10}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16375\langle g^2G^2\rangle M^6m_c^{10}s}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4625\langle g^2G^2\rangle M^4m_c^{12}s}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2725M^8m_c^{12}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{3275\langle g^2G^2\rangle M^4m_c^{10}s^2}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{7175M^6m_c^{14}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2475M^8m_c^{10}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4925M^6m_c^{12}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{131625M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{122125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{9875\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{44125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{5375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{42675M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{49375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1075M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1075\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{176175M^{10} m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{42675M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{22275M^{10} m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16375\langle g^2G^2\rangle M^6 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{34175M^8 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{24425\langle g^2G^2\rangle M^4 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{34175M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3275\langle g^2G^2\rangle M^4 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2475M^8 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4925M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{22275M^{10} m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16375\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{20575\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{19825M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{28825M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{22275M^{10} m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2475M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{66825M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{26875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{275\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{16125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{102875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2475M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{5375\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{111375M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{875M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{21075M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2475M^8m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3275\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{8375\langle g^2G^2\rangle M^6m_c^{10}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{4925M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3875\langle g^2G^2\rangle M^4m_c^{12}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^{10}m_c^{10}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{38475M^8m_c^{12}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{17625M^6m_c^{14}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{6750M^{10}m_c^{16}}{\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{66125\langle g^2G^2\rangle M^6m_c^{16}}{384\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{21225M^8m_c^{18}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{114625\langle g^2G^2\rangle M^6m_c^{14}}{256\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{30375M^{10}m_c^{14}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{13225\langle g^2G^2\rangle M^4m_c^{16}}{192\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{152775M^8m_c^{16}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{21225M^6m_c^{18}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{19375\langle g^2G^2\rangle M^6 m_c^{12}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{10125M^{10}m_c^{12}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{36375M^8 m_c^{14}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{22925\langle g^2G^2\rangle M^4 m_c^{14}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1675\langle g^2G^2\rangle M^4 m_c^{10}s}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{104775M^6 m_c^{16}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75M^8 m_c^{10}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^6 m_c^{12}s}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{8375\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{37075\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{55275M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{68625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{54675M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{8100M^{10}m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{60375M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{185375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{7425M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2925M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{13725\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1675\langle g^2G^2\rangle M^4 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{60375M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75M^8m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{24125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{10125M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{52375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{768\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{20475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4825\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{3375M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{21525M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{20475M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{10475\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{10}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{14475M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225M^8m_c^{10}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{225M^6m_c^{12}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{2025M^{10}m_c^{14}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{125\langle g^2G^2\rangle M^6m_c^{14}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{225M^8m_c^{16}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{1375\langle g^2G^2\rangle M^6m_c^{12}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{22275M^{10}m_c^{12}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{25\langle g^2G^2\rangle M^4m_c^{14}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8m_c^{14}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{225M^6m_c^{16}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{2025M^{10}m_c^{10}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{1125M^8m_c^{12}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{275\langle g^2G^2\rangle M^4m_c^{12}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{2475M^6m_c^{14}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s-4m_c^2}}{64\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{2025M^{10}m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{225M^8m_c^{14}\sqrt{s-4m_c^2}}{16\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s-4m_c^2}}{128\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{2025M^{10}m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{225M^8m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{25\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s-4m_c^2}}{32\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{225M^6m_c^{14}\sqrt{s-4m_c^2}}{64\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{225M^8m_c^{10}\sqrt{s-4m_c^2}}{32\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{225M^6m_c^{12}\sqrt{s-4m_c^2}}{128\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{225M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{4125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{225M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{66825M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{7425M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{2025M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{825\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{7425M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{2125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{34425M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{3825M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{2125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{34425M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{3825M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{425\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{425\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{3825M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{3825M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{3825M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{70281M^{10}m_c^{20}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{13015\langle g^2G^2\rangle M^6m_c^{20}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{15618M^8m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1375\langle g^2G^2\rangle M^6m_c^{18}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{7425M^{10}m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2603\langle g^2G^2\rangle M^4m_c^{20}s}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{17268M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{7809M^6m_c^{22}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{22595\langle g^2G^2\rangle M^6m_c^{16}s^2}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{122013M^{10}m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{275\langle g^2G^2\rangle M^4m_c^{18}s^2}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{25464M^8m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{825M^6m_c^{20}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2245\langle g^2G^2\rangle M^6m_c^{14}s^3}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{4519\langle g^2G^2\rangle M^4m_c^{16}s^3}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{24246M^{10}m_c^{14}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{21726M^8m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{13557M^6m_c^{18}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{2511M^{10}m_c^{12}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{155\langle g^2G^2\rangle M^6m_c^{12}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{5946M^8m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{898\langle g^2G^2\rangle M^4m_c^{14}s^4}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{5\langle g^2G^2\rangle M^6m_c^{10}s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{1347M^6m_c^{16}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{31\langle g^2G^2\rangle M^4m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{81M^{10}m_c^{10}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{540M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{279M^6m_c^{14}s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{18M^8m_c^{10}s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{49355\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9M^6m_c^{12}s^6}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{799551M^{10}m_c^{16}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{88839M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{32865\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{532413M^{10}m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{29682M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9871\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{88839M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5455\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6573\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{88371M^{10}m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{49338M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{59157M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{81M^{10}m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9828M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1091\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9819M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9M^8m_c^{10}s^{11/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{9M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{330885M^{10}m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{20425\langle g^2G^2\rangle M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{133225\langle g^2G^2\rangle M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{36765M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{4085\langle g^2G^2\rangle M^4m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{719415M^{10}m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{36765M^6m_c^{20}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{43170M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{240759M^{10}m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{44585\langle g^2G^2\rangle M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{26645\langle g^2G^2\rangle M^4m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{26433M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{5745\langle g^2G^2\rangle M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{79935M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{8917\langle g^2G^2\rangle M^4m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{93069M^{10}m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{43161M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{26751M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{81M^{10}m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{5\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1149\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{10332M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{10341M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9M^8m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{9M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{14675\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{237735M^{10}m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{247\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{24933M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{741M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1235\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6669M^{10}m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{1482M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{20007M^{10}m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1235\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{2935\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{21969M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1235\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{26415M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{247\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{6669M^{10}m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3705M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{2223M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{247\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{741M^8m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{3615\langle g^2G^2\rangle M^6m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{741M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{4338M^8m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2875\langle g^2G^2\rangle M^6m_c^{18}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6900M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{723\langle g^2G^2\rangle M^4m_c^{20}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6395\langle g^2G^2\rangle M^6m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2169M^6m_c^{22}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{575\langle g^2G^2\rangle M^4 m_c^{18} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7674M^8 m_c^{18} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{1535\langle g^2G^2\rangle M^6 m_c^{14} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1725M^6 m_c^{20} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{1279\langle g^2G^2\rangle M^4 m_c^{16} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1842M^8 m_c^{16} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{2195\langle g^2G^2\rangle M^6 m_c^{12} s^4}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3837M^6 m_c^{18} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{307\langle g^2G^2\rangle M^4 m_c^{14} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{878M^8 m_c^{14} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{921M^6 m_c^{16} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{12M^8 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{439\langle g^2G^2\rangle M^4 m_c^{12} s^5}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{439M^6 m_c^{14} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3M^6 m_c^{12} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{49415\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{8255\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{29649M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{9883\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19812M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{29649M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{16645\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{1651\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3329M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4953M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3329\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3329M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{14775\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{40975\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{8865M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2955\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24585M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{8865M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{99785\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{8195\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{19957M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{21155\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24585M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{19957\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4231M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{19957M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4231\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4231M^6 m_c^{14} s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{38825\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3M^6 m_c^{12} s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{131\langle g^2G^2\rangle M^4 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7765M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131M^6 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{655\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{262M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{655\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{7765\langle g^2G^2\rangle M^4 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{786M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{655\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7765M^6 m_c^{20} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{131\langle g^2G^2\rangle M^4 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^4 m_c^{14} s^3\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{393M^6 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1625\langle g^2G^2\rangle M^6 m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131M^6 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1685\langle g^2G^2\rangle M^4 m_c^{18}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{52650M^{10} m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3465M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{15165M^6m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{136485M^{10}m_c^{18}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8425\langle g^2G^2\rangle M^6m_c^{18}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9725\langle g^2G^2\rangle M^6m_c^{14}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{15165M^8m_c^{20}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{650\langle g^2G^2\rangle M^4m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{157545M^{10}m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{29205M^8m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2925M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{45765M^{10}m_c^{12}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2825\langle g^2G^2\rangle M^6m_c^{12}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1945\langle g^2G^2\rangle M^4m_c^{14}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12420M^8m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{17505M^6m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1215M^{10}m_c^{10}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{565\langle g^2G^2\rangle M^4m_c^{12}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5220M^8m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{5085M^6m_c^{14}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{135M^8m_c^{10}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{135M^6m_c^{12}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6075M^{10}m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{675M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1215M^{10}m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{270M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{675M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{135M^8 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{135M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{10375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{168075M^{10}m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{235\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{16560M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2115M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1175\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19035M^{10}m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2115M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{702675M^{10}m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{43375\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2075\langle g^2G^2\rangle M^4 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{40725M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{13475\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18675M^6 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{8675\langle g^2G^2\rangle M^4 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{218295M^{10}m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{26910M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{78075M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1215M^{10}m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2695\langle g^2G^2\rangle M^4 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24255M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{135M^8m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{135M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{36125\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{585225M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3575\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{32175M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{17875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{289575M^{10}m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{32175M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{57915M^{10}m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3575\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{7225\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{52155M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{715\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{65025M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6435M^8m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{6435M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^6}-\frac{315M^{10}m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^7}$$

$$+\frac{405M^{10}m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^6}-\frac{105M^8m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^6}$$

$$+\frac{5\langle g^2G^2\rangle M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^5}+\frac{27M^{10}m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^5}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^5}+\frac{225M^8m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^5}$$

$$-\frac{21\langle g^2G^2\rangle M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^4}-\frac{105M^6m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^5}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^4}-\frac{9M^8m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}+\frac{45M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^4}$$

$$+\frac{3M^8m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^3}-\frac{21\langle g^2G^2\rangle M^4m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^2}-\frac{27M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^3}$$

$$+\frac{3M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^2}-\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{1024\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^8m_c^{16}ln(2)}{128\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}ln(2)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{16}ln(2)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^6m_c^{12}ln(2)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{225\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{3645M^{10}m_c^{12}ln(2)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{405M^8m_c^{14}ln(2)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{1215M^{10}m_c^{10}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{135M^8m_c^{12}ln(2)}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{405M^6m_c^{14}ln(2)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{135M^8m_c^{10}ln(2)}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^6m_c^{12}ln(2)}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{1215M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{135M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{1215M^{10}m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{135M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{135M^8m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{1024\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{16}ln(2)}{128\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{14}ln(2)}{64\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{16}ln(2)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{14}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{12}ln(2)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{225\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{3645M^{10}m_c^{12}ln(2)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} ln(2)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{405M^8 m_c^{14} ln(2)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{45\langle g^2G^2\rangle M^4 m_c^{12} ln(2)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{1215M^{10} m_c^{10} ln(2)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{135M^8 m_c^{12} ln(2)}{64\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{405M^6 m_c^{14} ln(2)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^8 m_c^{10} ln(2)}{128\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{15\langle g^2G^2\rangle M^4 m_c^{10} ln(2)}{256\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^6 m_c^{12} ln(2)}{512\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{1215M^{10} m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{135M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{1215M^{10} m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^6 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{15\langle g^2G^2\rangle M^4 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8 m_c^{10} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{1125\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{135M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{5400M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{465\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1395M^6m_c^{20}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2325\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2790M^8m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1725\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2070M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{450\langle g^2G^2\rangle M^4m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{825\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1350M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{990M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1035M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{90M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{495M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{25875\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^6m_c^{12}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1035\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15525M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4875\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5850M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^6 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{75\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{90M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{33375\langle g^2G^2\rangle M^6 m_c^{14} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^4 m_c^{16} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{20025M^8 m_c^{16} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{25275\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2925M^6 m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6675\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{20025M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5325\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3195M^8 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1065\langle g^2G^2\rangle M^4 m_c^{10} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{32625\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3195M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{675\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2025M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3375\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4050M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{675\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{810M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{135\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{405M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^8m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{675M^6m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8m_c^{20}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{2700M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{20}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{14}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{450M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^6m_c^{16}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6 m_c^{14} s^2 ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{7875\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{4725M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{27375\langle g^2G^2\rangle M^6 m_c^{12} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^4 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^8 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4725M^6 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6 m_c^{10} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^4 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{7875M^8 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^6 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^6 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{28875\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{17325M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1575M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3150M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5775\langle g^2G^2\rangle M^4 m_c^{12} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1875\langle g^2G^2\rangle M^6 m_c^{12} ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{17325M^6 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4 m_c^{14} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{30375M^{10} m_c^{12} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{7425M^8 m_c^{14} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{2475M^6 m_c^{16} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{103275M^{10} m_c^{16} ln(2)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2125\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{8925M^8 m_c^{18} ln(2)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2625\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{24300M^{10} m_c^{14} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{425\langle g^2G^2\rangle M^4 m_c^{16} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{21375M^8 m_c^{16} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{8925M^6 m_c^{18} ln(2)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{6075M^{10} m_c^{10} sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{12}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2025M^8m_c^{12}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3375M^6m_c^{14}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{675M^8m_c^{10}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{675M^6m_c^{12}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{7625\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{382725M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{22425M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{17325M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{127575M^{10}m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{17325M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{127575M^{10}m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4875\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1525\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{6525M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{975\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{50775M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{14175M^8m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{16425M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{115425M^{10}m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{9225M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3575\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{60225M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6075M^{10}m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{675M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{127575M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{7875M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{675M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{17875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{467775M^{10}m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{31875M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{16425M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{12825M^8m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{15075M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{675M^8m_c^{12}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{14}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1625\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2025M^{10}m_c^{16}ln(2)}{\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1575M^8m_c^{18}ln(2)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{325\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{4725M^8m_c^{16}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1575M^6m_c^{18}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{6075M^{10}m_c^{12}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{675M^8m_c^{14}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^6m_c^{16}ln(2)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1125M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{775\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3825M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{15375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{30375M^{10}m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{13725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{10125M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{17325M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3075\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{13725M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{6075M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2025M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2025M^{10}m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2125\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{425\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2025M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1575M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{42525M^{10}m_c^{14}ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{4725M^8m_c^{16}ln(2)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{4725M^8m_c^{14}ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{4725M^6m_c^{16}ln(2)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{6075M^{10}m_c^{12}ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s-4m_c^2}}{16\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^8m_c^{14}ln(2)\sqrt{s-4m_c^2}}{2\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s-4m_c^2}}{4\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^{10}m_c^{10}ln(2)\sqrt{s-4m_c^2}}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8m_c^{12}ln(2)\sqrt{s-4m_c^2}}{4\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^6m_c^{14}ln(2)\sqrt{s-4m_c^2}}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8m_c^{10}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^6m_c^{12}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{3375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{54675M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{6075M^{10}m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{3375M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{6075M^{10}m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{675M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{975\langle g^2G^2\rangle M^6m_c^{20}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2340M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1000\langle g^2G^2\rangle M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4800M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{195\langle g^2G^2\rangle M^4m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{585M^6m_c^{22}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1875\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4500M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{400\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1200M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{900M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1125M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{300M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{225M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{29475\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75M^6m_c^{14}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{10950\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{35370M^8 m_c^{18} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{5895\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{52560M^8 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{21475\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{17685M^6 m_c^{18} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{4380\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25770M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{13140M^6 m_c^{16} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1575\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4295\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3780M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12885M^6 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{3375\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{945M^6 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{30375\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4050M^8 m_c^{20} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{675\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{36450M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{45075\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2025M^6 m_c^{20} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{6075\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{54090M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{18225M^6m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{21225\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9015\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{25470M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1575\langle g^2G^2\rangle M^6m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{27045M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4245\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3780M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{12735M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5375\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{6450M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{60M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1075\langle g^2G^2\rangle M^4m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{180M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3225M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{30M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5\langle g^2G^2\rangle M^4m_c^{14}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{45M^6m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^6m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5400M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{465\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1395M^6m_c^{20}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2325\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2790M^8m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1725\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2070M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{450\langle g^2G^2\rangle M^4m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{825\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1350M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{990M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1035M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{90M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{495M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{25875\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6m_c^{12}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{3105M^8 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1035\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3105M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4875\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5850M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{33375\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{90M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{975\langle g^2G^2\rangle M^4 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^8 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2925M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{25275\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15165M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5325\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5055\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^8 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15165M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{32625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3375\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2025M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4050M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{810M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1450\langle g^2G^2\rangle M^6m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{405M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{46980M^{10}m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{10440M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{89100M^{10}m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2750\langle g^2G^2\rangle M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{30240M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{580\langle g^2G^2\rangle M^4m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2610M^6m_c^{22}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{500\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{16200M^{10}m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1100\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{23400M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{4950M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{500\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{16200M^{10}m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{900M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{200\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{200\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3600M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{16975\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{900M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{549990M^{10}m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{122220M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{714420M^{10}m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{22050\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6790\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{36540M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9975\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{30555M^6m_c^{18}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{8820\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{323190M^{10}m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{86940M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{39690M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45360M^{10}m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1400\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3990\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{61740M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{560\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{17955M^6 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10080M^8 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2520M^6 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{85050M^{10} m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{16625\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{18900M^8 m_c^{20} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1050\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{538650M^{10} m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{100800M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4725M^6 m_c^{20} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{22575\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{731430M^{10} m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6650\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{42840M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{29925M^6 m_c^{18} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9975\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9030\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{323190M^{10} m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{90720M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{40635M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1400\langle g^2G^2\rangle M^6m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45360M^{10}m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{61740M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3990\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{560\langle g^2G^2\rangle M^4m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{17955M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{10080M^8m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2520M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{109350M^{10}m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3375\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20\langle g^2G^2\rangle M^4m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{23940M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{50\langle g^2G^2\rangle M^6m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{90M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1620M^{10}m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{360M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{150\langle g^2G^2\rangle M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4860M^{10}m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{23220M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1350\langle g^2G^2\rangle M^4m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6075M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{60\langle g^2G^2\rangle M^4m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{810M^{10}m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{900M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{270M^6m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{180M^8m_c^{14}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10\langle g^2G^2\rangle M^4m_c^{14}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^6m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1125\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{675M^8m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8m_c^{20}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2700M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{20}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{450M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225\langle g^2G^2\rangle M^4m_c^{14}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^6m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{7875\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{4725M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{27375\langle g^2G^2\rangle M^6 m_c^{12} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^4 m_c^{14} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^8 m_c^{14} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4725M^6 m_c^{16} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6 m_c^{10} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^4 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{7875M^8 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^6 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^6 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{28875\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{17325M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1575M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3150M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5775\langle g^2G^2\rangle M^4 m_c^{12} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17325M^6 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2550\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{82620M^{10} m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{690\langle g^2G^2\rangle M^4 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{30780M^8 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3105M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{55890M^{10} m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1725\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{150\langle g^2G^2\rangle M^6 m_c^{14} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{12420M^8 m_c^{20} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1020\langle g^2G^2\rangle M^4 m_c^{16} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4860M^{10} m_c^{14} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17280M^8 m_c^{16} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{4590M^6 m_c^{18} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{300\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{9720M^{10} m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{60\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3240M^8 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{120\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{270M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2160M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{540M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{212625M^{10}m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{47250M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{42525M^{10}m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{37800M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{23625M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{9450M^8m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{4725M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3075\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{30\langle g^2G^2\rangle M^4m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{99630M^{10}m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{21600M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{135M^6m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2430M^{10}m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{19875\langle g^2G^2\rangle M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{540M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{1230\langle g^2G^2\rangle M^4m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{321975M^{10}m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5535M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{49410M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{219915M^{10}m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13575\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3975\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{22680M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{35775M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2715\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{42525M^{10}m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{39420M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{24435M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{9450M^8m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{18375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1050\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{297675M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{47250M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{85050M^{10}m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{18900M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{3675\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17010M^{10}m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{62370M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{33075M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{210\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3780M^8m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{945M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{30375M^{10}m_c^{12}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{7425M^8m_c^{14}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{2475M^6m_c^{16}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{103275M^{10}m_c^{16}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{8925M^8m_c^{18}ln(2)}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{24300M^{10}m_c^{14}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{425\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{21375M^8m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{8925M^6m_c^{18}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{375\langle g^2G^2\rangle M^6m_c^{10}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6075M^{10}m_c^{10}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{375\langle g^2G^2\rangle M^4m_c^{12}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2025M^8m_c^{12}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3375M^6m_c^{14}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{675M^8m_c^{10}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{675M^6m_c^{12}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{382725M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{7625\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{22425M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{17325M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{127575M^{10}m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{17325M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4875\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{127575M^{10}m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6525M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1525\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{50775M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{14175M^8m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16425M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{115425M^{10}m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3575\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{9225M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{60225M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{6075M^{10}m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{675M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{127575M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{7875M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{17875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{675M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{975\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{467775M^{10}m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{16425M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{31875M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{12825M^8m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{225\langle g^2G^2\rangle M^4m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{15075M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{12}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6m_c^{14}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2025M^{10}m_c^{16}ln(2)}{\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1625\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1575M^8m_c^{18}ln(2)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4725M^8m_c^{16}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{325\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1575M^6m_c^{18}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{6075M^{10}m_c^{12}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1125M^6m_c^{16}ln(2)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{775\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3825M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{15375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{30375M^{10}m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{13725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{10125M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{17325M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3075\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{13725M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{6075M^{10} m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2025M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2025M^{10} m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2125\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{425\langle g^2G^2\rangle M^4 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2025M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225M^8 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1575M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{42525M^{10} m_c^{14} ln(2)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{14} ln(2)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{4725M^8 m_c^{16} ln(2)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{4725M^8 m_c^{14} ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{4725M^6 m_c^{16} ln(2)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^{10} m_c^{12} ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{10} ln(2)\sqrt{s-4m_c^2}}{16\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8 m_c^{14} ln(2)\sqrt{s-4m_c^2}}{2\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{12} ln(2)\sqrt{s-4m_c^2}}{4\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{6075M^{10} m_c^{10} ln(2)\sqrt{s-4m_c^2}}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{675M^8m_c^{12}ln(2)\sqrt{s-4m_c^2}}{4\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^6m_c^{14}ln(2)\sqrt{s-4m_c^2}}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8m_c^{10}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^6m_c^{12}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{675M^8m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{54675M^{10}m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{3375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{6075M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{675\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^{10}m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{3375M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{6075M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{6075M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^{10}m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{1450\langle g^2G^2\rangle M^6m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{675M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{46980M^{10}m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{10440M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{89100M^{10}m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2750\langle g^2G^2\rangle M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{30240M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{580\langle g^2G^2\rangle M^4m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{2610M^6m_c^{22}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{500\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{16200M^{10}m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1100\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{23400M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{4950M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{500\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{16200M^{10}m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{900M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{200\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{200\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{3600M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{16975\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{900M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{549990M^{10}m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{122220M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{22050\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{714420M^{10}m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{6790\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{36540M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{30555M^6 m_c^{18} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9975\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{8820\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{323190M^{10}m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{86940M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{39690M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1400\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{45360M^{10}m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{61740M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{3990\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{560\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{17955M^6m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{10080M^8 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2520M^6m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{85050M^{10} m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2625\langle g^2G^2\rangle M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{16625\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{18900M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{1050\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{538650M^{10}m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{4725M^6m_c^{20}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{100800M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{731430M^{10}m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{22575\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6650\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{42840M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9975\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{29925M^6m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{9030\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{323190M^{10}m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{90720M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{40635M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{45360M^{10}m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1400\langle g^2G^2\rangle M^6m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3990\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{61740M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{560\langle g^2G^2\rangle M^4m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{17955M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{10080M^8m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{2520M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3375\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{109350M^{10}m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{20\langle g^2G^2\rangle M^4 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{23940M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{90M^6 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{50\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1620M^{10} m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{360M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{4860M^{10} m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{150\langle g^2G^2\rangle M^6 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1350\langle g^2G^2\rangle M^4 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{23220M^8 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{6075M^6 m_c^{20} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{60\langle g^2G^2\rangle M^4 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{810M^{10} m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{900M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{270M^6 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{10\langle g^2G^2\rangle M^4 m_c^{14} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{180M^8 m_c^{14} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{975\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45M^6 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{2340M^8 m_c^{22} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1000\langle g^2G^2\rangle M^6 m_c^{18} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4800M^8 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{195\langle g^2G^2\rangle M^4 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{585M^6m_c^{22}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1875\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4500M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{400\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1200M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{900M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1125M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{300M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{225M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{29475\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75M^6m_c^{14}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{10950\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{35370M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5895\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{52560M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{17685M^6m_c^{18}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{21475\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4380\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{25770M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1575\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{13140M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4295\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3780M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12885M^6 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3375\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^6 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30375\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4050M^8 m_c^{20} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{675\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{36450M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2025M^6 m_c^{20} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45075\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6075\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{54090M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{21225\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18225M^6 m_c^{18} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{9015\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25470M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{27045M^6 m_c^{16} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1575\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4245\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3780M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12735M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5375\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{945M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5\langle g^2G^2\rangle M^4m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6450M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^6m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{60M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1075\langle g^2G^2\rangle M^4m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{180M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3225M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{30M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{14}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{45M^6m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2550\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^6m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{82620M^{10}m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{690\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30780M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3105M^6m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{55890M^{10}m_c^{18}ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1725\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{150\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12420M^8m_c^{20}ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1020\langle g^2G^2\rangle M^4m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4860M^{10}m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{17280M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4590M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{300\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9720M^{10}m_c^{12}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{60\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3240M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{120\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{270M^6m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2160M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{540M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{212625M^{10}m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{13125\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{47250M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2625\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{42525M^{10}m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{37800M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{23625M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9450M^8m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3075\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4725M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{30\langle g^2G^2\rangle M^4 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{99630M^{10} m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{135M^6 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{21600M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2430M^{10} m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{540M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19875\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1230\langle g^2G^2\rangle M^4 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{321975M^{10} m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{49410M^8 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5535M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{13575\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{219915M^{10} m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{22680M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3975\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{35775M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2625\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2715\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{42525M^{10} m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{39420M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24435M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9450M^8m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{18375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4725M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1050\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{297675M^{10}m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4725M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{47250M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{85050M^{10}m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2625\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{18900M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{525\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3675\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{17010M^{10}m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{62370M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{33075M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3780M^8m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{210\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{945M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1701M^{10}m_c^{14}ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^8}$$

$$+\frac{1701M^{10}m_c^{14}ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{64\pi^6s^8}-\frac{189M^8m_c^{14}ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^7}$$

$$+\frac{189M^8m_c^{14}ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{32\pi^6s^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6s^6}$$
$$+\frac{405M^{10}m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6}+\frac{105M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6}$$
$$+\frac{45M^8m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^5}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5}$$
$$+\frac{105M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5}-\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$-\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{45M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{45M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{3645M^{10} m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{405M^8 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{1215M^{10} m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^8 m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45\langle g^2G^2\rangle M^4 m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{405M^6 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{135M^8 m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^6 m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{1215M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{1215M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{135M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{135M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{975\langle g^2G^2\rangle M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2340M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1000\langle g^2G^2\rangle M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{195\langle g^2G^2\rangle M^4m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4800M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{585M^6m_c^{22}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{400\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4500M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1200M^6m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{900M^8m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1125M^6m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{300M^8m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{225M^6m_c^{16}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{75M^6m_c^{14}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{35370M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{29475\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{10950\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5895\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{17685M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{52560M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4380\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{21475\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25770M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{13140M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1575\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{4295\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12885M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3780M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4050M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3375\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{30375\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{675\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2025M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{36450M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6075\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{45075\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{54090M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18225M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{21225\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{9015\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{27045M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25470M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4245\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1575\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3780M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12735M^6 m_c^{14} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^6 m_c^{12} s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5375\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5\langle g^2G^2\rangle M^4 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^6 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6450M^8 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{60M^8 m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^6 m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{180M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3225M^6 m_c^{20} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{45M^6 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{30M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^4 m_c^{14} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^6 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1125\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{465\langle g^2G^2\rangle M^4 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5400M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1395M^6 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2325\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2790M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1725\langle g^2G^2\rangle M^6 m_c^{14} s ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{450\langle g^2G^2\rangle M^4 m_c^{16} s ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2070M^8 m_c^{16} s ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1350M^6 m_c^{18} s ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{825\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{990M^8 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035M^6 m_c^{16} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{75\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{165\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^8 m_c^{12} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{495M^6 m_c^{14} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^6 m_c^{12} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15\langle g^2G^2\rangle M^4 m_c^{10} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15525M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{25875\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1035\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15\langle g^2G^2\rangle M^4m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5850M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{75\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^4m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{33375\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20025M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2925M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{25275\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6675\langle g^2G^2\rangle M^4m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20025M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^4m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5325\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1065\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{32625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{675\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2025M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4050M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{675\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{810M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{405M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{135\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1450\langle g^2G^2\rangle M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{46980M^{10}m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2750\langle g^2G^2\rangle M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10440M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{580\langle g^2G^2\rangle M^4m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{89100M^{10}m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{30240M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2610M^6m_c^{22}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{500\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{16200M^{10}m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1100\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{23400M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{500\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4950M^6m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{200\langle g^2G^2\rangle M^4m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{16200M^{10}m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{200\langle g^2G^2\rangle M^4m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{900M^6m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3600M^8m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{900M^6m_c^{16}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{549990M^{10}m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{16975\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{22050\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{122220M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6790\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{714420M^{10}m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{30555M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{36540M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{323190M^{10}m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{9975\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{8820\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{86940M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1400\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{39690M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3990\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45360M^{10} m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{61740M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{17955M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{560\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10080M^8 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2520M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{85050M^{10} m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{18900M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{16625\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{538650M^{10} m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1050\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{100800M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4725M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{22575\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6650\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{731430M^{10} m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{42840M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{29925M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9975\langle g^2G^2\rangle M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{323190M^{10}m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90720M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9030\langle g^2G^2\rangle M^4m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{40635M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1400\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3990\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{45360M^{10}m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{61740M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{17955M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10080M^8m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{560\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3375\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2520M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{20\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{109350M^{10}m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{23940M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1620M^{10}m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{50\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{360M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{150\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1350\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{4860M^{10}m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{23220M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6075M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{810M^{10}m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{900M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{60\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{270M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{180M^8m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1125\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2700M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{12} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225\langle g^2G^2\rangle M^4 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{450M^8 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{12} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^6 m_c^{12} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{27375\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{16425M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5475\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{28875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3150M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2550\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{82620M^{10}m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{690\langle g^2G^2\rangle M^4m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{30780M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1725\langle g^2G^2\rangle M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3105M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{55890M^{10}m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{12420M^8m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4860M^{10}m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{150\langle g^2G^2\rangle M^6m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1020\langle g^2G^2\rangle M^4m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17280M^8m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{300\langle g^2G^2\rangle M^6m_c^{12}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4590M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{9720M^{10}m_c^{12}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{60\langle g^2G^2\rangle M^4m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{3240M^8m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{270M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2160M^8m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{120\langle g^2G^2\rangle M^4m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{540M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{212625M^{10}m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{47250M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{42525M^{10}m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{37800M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{23625M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{9450M^8m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3075\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{99630M^{10}m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{30\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{21600M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{135M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2430M^{10}m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{540M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{321975M^{10}m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{19875\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1230\langle g^2G^2\rangle M^4 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{49410M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{13575\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5535M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3975\langle g^2G^2\rangle M^4 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{219915M^{10}m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{22680M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{35775M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{42525M^{10}m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2715\langle g^2G^2\rangle M^4 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{39420M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{24435M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{9450M^8 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{4725M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{18375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{297675M^{10} m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1050\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{47250M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4725M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{85050M^{10} m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{18900M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17010M^{10} m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{525\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3675\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{62370M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{210\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{33075M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3780M^8m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{945M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{30375M^{10}m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1875\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{7425M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2125\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2475M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{103275M^{10}m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{8925M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{24300M^{10}m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{425\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{21375M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{10}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{8925M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6075M^{10}m_c^{10}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375\langle g^2G^2\rangle M^4m_c^{12}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2025M^8m_c^{12}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{3375M^6m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{675M^8m_c^{10}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{7625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{675M^6m_c^{12}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{382725M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{17325M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{22425M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{127575M^{10}m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{17325M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{4875\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1525\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{127575M^{10}m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{6525M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{50775M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{14175M^8m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{975\langle g^2G^2\rangle M^4m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{16425M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$-\frac{3575\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{115425M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{9225M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{60225M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{6075M^{10}m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{4875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{675M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{127575M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{675M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{7875M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$+\frac{467775M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$
$$-\frac{17875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{31875M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{16425M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{12825M^8m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{15075M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1625\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{2025M^{10}m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1575M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{325\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{4725M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1575M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{6075M^{10}m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{775\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{1125M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3825M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{15375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{30375M^{10}m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{13725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3075\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{10125M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{17325M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{13725M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{6075M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2025M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2025M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2025M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{425\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{1575M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{42525M^{10} m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{4725M^8 m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{4725M^8 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{525\langle g^2G^2\rangle M^4 m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{4725M^6 m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{6075M^{10} m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^8 m_c^{14}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^{10} m_c^{10}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8 m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{75\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{10}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^6 m_c^{14}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{675M^8 m_c^{10}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^6 m_c^{12}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{3375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{54675M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{6075M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{375\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{3375M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{6075M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{6075M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{6075M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}-\frac{675M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{675M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}+\frac{675M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^5}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^6}-\frac{405M^{10}m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5}-\frac{105M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6}$$

$$-\frac{45M^8m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^5}-\frac{105M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{225\langle g^2G^2\rangle M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{3645M^{10}m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{405M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{45\langle g^2G^2\rangle M^4m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{1215M^{10}m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{135M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{405M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{135M^8m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{135M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{1215M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{1215M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{135M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{135M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{465\langle g^2G^2\rangle M^4m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5400M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2325\langle g^2G^2\rangle M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1395M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1725\langle g^2G^2\rangle M^6m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2790M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{450\langle g^2G^2\rangle M^4m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2070M^8m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{825\langle g^2G^2\rangle M^6m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1350M^6m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^4m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{990M^8m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{90M^8m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{165\langle g^2G^2\rangle M^4m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{495M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{25875\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{45M^6m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3105M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1035\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{5850M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{33375\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{90M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{975\langle g^2G^2\rangle M^4m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2925M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{25275\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^4m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15165M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5325\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5055\langle g^2G^2\rangle M^4m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{32625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{19575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2025M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4050M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^4 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{810M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^4 m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{19575M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1125\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{405M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^4 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{675M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1125\langle g^2G^2\rangle M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{225M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2700M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{450M^8m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225\langle g^2G^2\rangle M^4m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{7875M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{27375\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{16425M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^6 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{5475\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{16425M^6 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{28875\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1575M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{3150M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^4 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1875\langle g^2G^2\rangle M^6 m_c^{12} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{17325M^6 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{30375M^{10} m_c^{12} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{7425M^8 m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2475M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2125\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{103275M^{10} m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{8925M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{425\langle g^2G^2\rangle M^4 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{24300M^{10} m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{21375M^8 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{8925M^6 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6075M^{10} m_c^{10} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^6 m_c^{10} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2025M^8 m_c^{12} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^4 m_c^{12} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3375M^6 m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{675M^8m_c^{10}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{675M^6m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{382725M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{7625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{22425M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{17325M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{75M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{127575M^{10}m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{17325M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4875\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{127575M^{10}m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6525M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1525\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{975\langle g^2G^2\rangle M^4m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{50775M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{14175M^8m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{16425M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{115425M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3575\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{9225M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{60225M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{6075M^{10}m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{675M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{127575M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{7875M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{17875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{675M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{975\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{467775M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{16425M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{31875M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{12825M^8m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{225\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{15075M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2025M^{10}m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1625\langle g^2G^2\rangle M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1575M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4725M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{325\langle g^2G^2\rangle M^4m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1575M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{6075M^{10}m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1125M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{775\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{15375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3825M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{30375M^{10}m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{13725M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3875\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{10125M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3075\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{17325M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{2625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{13725M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{6075M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2025M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2125\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2025M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1125M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{525\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{425\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2025M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1575M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{42525M^{10}m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{4725M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{4725M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{4725M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^{10}m_c^{12}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8m_c^{14}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s^{5/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{6075M^{10}m_c^{10}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{675M^8m_c^{12}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^6m_c^{14}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^{3/2}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8m_c^{10}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^6m_c^{12}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\sqrt{s}\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{675M^8m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{54675M^{10}m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{3375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{6075M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{675\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^{10}m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{3375M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{6075M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{6075M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^4\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{6075M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}+\frac{675M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}-\frac{675M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$+\frac{1450\langle g^2G^2\rangle M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{675M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^5}$$

$$-\frac{46980M^{10}m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{10440M^8m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{2750\langle g^2G^2\rangle M^6m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{89100M^{10}m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{580\langle g^2G^2\rangle M^4m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{30240M^8m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{500\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2610M^6m_c^{22}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{1100\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{16200M^{10}m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{23400M^8m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{4950M^6m_c^{20}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{16200M^{10}m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{500\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{200\langle g^2G^2\rangle M^4m_c^{16}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{900M^6m_c^{18}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{3600M^8m_c^{14}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{200\langle g^2G^2\rangle M^4m_c^{14}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{16975\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{900M^6m_c^{16}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{549990M^{10}m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{122220M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{714420M^{10}m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{22050\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6790\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{36540M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{9975\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{30555M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{8820\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{323190M^{10}m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{86940M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{39690M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{45360M^{10}m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1400\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{3990\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{61740M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{560\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{17955M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{10080M^8 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{2520M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{85050M^{10} m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{16625\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{18900M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{1050\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{538650M^{10} m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{100800M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{4725M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{22575\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{731430M^{10} m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{6650\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{42840M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{29925M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{9975\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{9030\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{323190M^{10} m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{90720M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{40635M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{1400\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{45360M^{10}m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{61740M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{3990\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{560\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{17955M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{10080M^8m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{2520M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{109350M^{10}m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{3375\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{20\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{23940M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{50\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{90M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$-\frac{1620M^{10}m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{360M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$
$$+\frac{150\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{4860M^{10}m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{23220M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{1350\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{6075M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{60\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}+\frac{810M^{10}m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$-\frac{900M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{270M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{180M^8m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}-\frac{10\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{975\langle g^2G^2\rangle M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{45M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^2}$$

$$+\frac{1000\langle g^2G^2\rangle M^6m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2340M^8m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{195\langle g^2G^2\rangle M^4m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4800M^8m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{585M^6m_c^{22}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{400\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4500M^8m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1200M^6 m_c^{20} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{375\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{900M^8 m_c^{16} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1125M^6 m_c^{18} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{300M^8 m_c^{14} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{225M^6 m_c^{16} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{29475\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{75M^6 m_c^{14} s^5 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{10950\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35370M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{5895\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{52560M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{21475\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{17685M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4380\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25770M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{13140M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1575\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4295\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3780M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12885M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3375\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{945M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{30375\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4050M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{675\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{36450M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{45075\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2025M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{6075\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{54090M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{18225M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{21225\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9015\langle g^2G^2\rangle M^4m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{25470M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1575\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{27045M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4245\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3780M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12735M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5375\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{6450M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{60M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1075\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{180M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3225M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{30M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5\langle g^2G^2\rangle M^4 m_c^{14} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45M^6 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2550\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{15M^6 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{690\langle g^2G^2\rangle M^4 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{82620M^{10} m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{30780M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3105M^6 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1725\langle g^2G^2\rangle M^6 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{55890M^{10} m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{150\langle g^2G^2\rangle M^6 m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12420M^8 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1020\langle g^2G^2\rangle M^4 m_c^{16} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4860M^{10} m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{17280M^8 m_c^{16} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4590M^6 m_c^{18} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9720M^{10} m_c^{12} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{300\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{8}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3240M^8m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{60\langle g^2G^2\rangle M^4m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{270M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{120\langle g^2G^2\rangle M^4m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2160M^8m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{540M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{212625M^{10}m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2625\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{47250M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{42525M^{10}m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{37800M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{23625M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9450M^8m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4725M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3075\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{99630M^{10}m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{21600M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{135M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2430M^{10}m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19875\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{540M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1230\langle g^2G^2\rangle M^4 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{321975M^{10}m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5535M^6 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{49410M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{219915M^{10}m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{13575\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3975\langle g^2G^2\rangle M^4 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{22680M^8 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2625\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35775M^6 m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2715\langle g^2G^2\rangle M^4 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{42525M^{10}m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{39420M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{24435M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9450M^8m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{18375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4725M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1050\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{297675M^{10}m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{47250M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4725M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{85050M^{10}m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18900M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3675\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{17010M^{10}m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{62370M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{33075M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{210\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3780M^8m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{945M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)} \tag{157}$$

$$\tilde{\rho}_{0,2^{++}}(s,M^2)=+\frac{1449M^{10}m_c^8\sqrt{s-4m_c^2}}{2560\pi^6s^{11/2}}-\frac{651M^{10}m_c^{10}\sqrt{s-4m_c^2}}{512\pi^6s^{13/2}}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^6\sqrt{s-4m_c^2}}{6144\pi^6s^{9/2}}-\frac{63M^8m_c^{10}\sqrt{s-4m_c^2}}{128\pi^6s^{11/2}}$$

$$+\frac{35579M^8m_c^8\sqrt{s-4m_c^2}}{122880\pi^6s^{9/2}}-\frac{339M^{10}m_c^6\sqrt{s-4m_c^2}}{5120\pi^6s^{9/2}}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^4\sqrt{s-4m_c^2}}{18432\pi^6s^{7/2}}-\frac{63M^6m_c^{10}\sqrt{s-4m_c^2}}{1024\pi^6s^{9/2}}$$

$$+\frac{3M^{10}m_c^4\sqrt{s-4m_c^2}}{5120\pi^6s^{7/2}}-\frac{5\langle g^2G^2\rangle M^4m_c^6\sqrt{s-4m_c^2}}{2048\pi^6s^{7/2}}$$

$$+\frac{1921M^6m_c^8\sqrt{s-4m_c^2}}{40960\pi^6s^{7/2}}-\frac{6557M^8m_c^6\sqrt{s-4m_c^2}}{122880\pi^6s^{7/2}}$$

$$+\frac{23\langle g^2G^2\rangle M^6m_c^2\sqrt{s-4m_c^2}}{36864\pi^6s^{5/2}}-\frac{\langle g^2G^2\rangle M^4m_c^4\sqrt{s-4m_c^2}}{12288\pi^6s^{5/2}}$$

$$+\frac{151M^8m_c^4\sqrt{s-4m_c^2}}{81920\pi^6s^{5/2}}-\frac{5\langle g^2G^2\rangle M^2m_c^6\sqrt{s-4m_c^2}}{8192\pi^6s^{5/2}}$$

$$+\frac{19\langle g^2G^2\rangle M^4m_c^2\sqrt{s-4m_c^2}}{49152\pi^6s^{3/2}}-\frac{523M^6m_c^6\sqrt{s-4m_c^2}}{40960\pi^6s^{5/2}}$$

$$+\frac{7\langle g^2G^2\rangle M^2m_c^4\sqrt{s-4m_c^2}}{24576\pi^6s^{3/2}}+\frac{87M^6m_c^4\sqrt{s-4m_c^2}}{81920\pi^6s^{3/2}}$$

$$+\frac{\langle g^2G^2\rangle M^2m_c^2\sqrt{s-4m_c^2}}{49152\pi^6\sqrt{s}}-\frac{1953M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^8}$$

$$+\frac{315M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^7}-\frac{189M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^7}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^6}-\frac{135M^{10}m_c^8\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^6}$$

$$+\frac{9535M^8m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{4096\pi^6s^6}-\frac{189M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^6}$$
$$+\frac{39M^{10}m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^5}-\frac{5\langle g^2G^2\rangle M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{1536\pi^6s^5}$$
$$-\frac{15\langle g^2G^2\rangle M^4m_c^8\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^5}-\frac{675M^8m_c^8\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^5}$$
$$+\frac{9\langle g^2G^2\rangle M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^4}+\frac{1455M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{4096\pi^6s^5}$$
$$+\frac{5\langle g^2G^2\rangle M^4m_c^6\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^4}+\frac{153M^8m_c^6\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^4}$$
$$-\frac{15\langle g^2G^2\rangle M^2m_c^8\sqrt{s\left(s-4m_c^2\right)}}{4096\pi^6s^4}-\frac{135M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^4}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^4\sqrt{s\left(s-4m_c^2\right)}}{8192\pi^6s^3}-\frac{\langle g^2G^2\rangle M^6m_c^2\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}$$
$$+\frac{5\langle g^2G^2\rangle M^2m_c^6\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}-\frac{5M^8m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}$$
$$+\frac{45M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}-\frac{3\langle g^2G^2\rangle M^4m_c^2\sqrt{s\left(s-4m_c^2\right)}}{8192\pi^6s^2}$$
$$-\frac{3\langle g^2G^2\rangle M^2m_c^4\sqrt{s\left(s-4m_c^2\right)}}{8192\pi^6s^2}-\frac{3M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^2}$$
$$+\frac{11M^8m_c^{12}}{16384\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{24576\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{3M^6m_c^{12}}{16384\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{\langle g^2G^2\rangle M^4m_c^{10}}{8192\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{\langle g^2G^2\rangle M^2m_c^{10}}{32768\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$-\frac{235\langle g^2G^2\rangle M^6m_c^{10}}{18432\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{495M^8m_c^{14}}{4096\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{45\langle g^2G^2\rangle M^4m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{517M^8m_c^{12}}{12288\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{47\langle g^2G^2\rangle M^4m_c^{10}}{6144\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^6m_c^{14}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{45\langle g^2G^2\rangle M^2m_c^{12}}{8192\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{47M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{47\langle g^2G^2\rangle M^2m_c^{10}}{24576\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{165M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{165M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{165M^8m_c^{14}}{4096\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{33M^8m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^{10}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{45M^6m_c^{14}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$-\frac{15\langle g^2G^2\rangle M^2m_c^{12}}{8192\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{9M^6m_c^{12}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{3\langle g^2G^2\rangle M^2m_c^{10}}{4096\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{165M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{16384\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{99M^8m_c^{12}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{15\langle g^2G^2\rangle M^6m_c^{10}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{27M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{9\langle g^2G^2\rangle M^4m_c^{10}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{6144\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{9\langle g^2G^2\rangle M^2m_c^{10}}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{55M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{5\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{15M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{5\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{24576\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{11M^8m_c^{12}}{16384\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10}}{8192\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{3M^6 m_c^{12}}{16384\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{\langle g^2G^2\rangle M^2 m_c^{10}}{32768\pi^6 s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6 m_c^{12}}{2048\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{235\langle g^2G^2\rangle M^6 m_c^{10}}{18432\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{495M^8 m_c^{14}}{4096\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{45\langle g^2G^2\rangle M^4 m_c^{12}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{517M^8 m_c^{12}}{12288\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{47\langle g^2G^2\rangle M^4 m_c^{10}}{6144\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{135M^6 m_c^{14}}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{45\langle g^2G^2\rangle M^2 m_c^{12}}{8192\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{47M^6 m_c^{12}}{4096\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{47\langle g^2G^2\rangle M^2 m_c^{10}}{24576\pi^6 s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{25\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{165M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{165M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{45M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{12}}{2048\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{165M^8m_c^{14}}{4096\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{33M^8m_c^{12}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$-\frac{3\langle g^2G^2\rangle M^4m_c^{10}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{45M^6m_c^{14}}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}}{8192\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{9M^6m_c^{12}}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{3\langle g^2G^2\rangle M^2m_c^{10}}{4096\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{165M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{16384\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{99M^8m_c^{12}}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$
$$+\frac{9\langle g^2G^2\rangle M^4m_c^{10}}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{27M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$
$$+\frac{9\langle g^2G^2\rangle M^2m_c^{10}}{8192\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{6144\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{55M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{5\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{15M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{5\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{500\langle g^2G^2\rangle M^6m_c^{16}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1475\langle g^2G^2\rangle M^4m_c^{18}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{550M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4425M^6m_c^{20}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7375\langle g^2G^2\rangle M^6m_c^{18}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{16225M^8m_c^{20}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{100\langle g^2G^2\rangle M^4m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{12875\langle g^2G^2\rangle M^6m_c^{14}s}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1475\langle g^2G^2\rangle M^2m_c^{18}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{28325M^8m_c^{16}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{12}s^2}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{150M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2575\langle g^2G^2\rangle M^4m_c^{14}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1925M^8m_c^{14}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{7725M^6m_c^{16}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}s^3}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{175\langle g^2G^2\rangle M^4m_c^{12}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2575\langle g^2G^2\rangle M^2m_c^{14}s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1375M^8m_c^{12}s^3}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^4}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{525M^6 m_c^{14} s^3}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{175\langle g^2G^2\rangle M^2 m_c^{12} s^4}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6 m_c^{12} s^4}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3125\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{6875M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1375M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1875M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^2 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{375M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{9125\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{20075M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{44125\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1375M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1825\langle g^2G^2\rangle M^4 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{97075M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^2 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{5475M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{8825\langle g^2G^2\rangle M^4 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{12625\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{27775M^8 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1825\langle g^2G^2\rangle M^2 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{26475M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1375M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2525\langle g^2G^2\rangle M^4 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{8825\langle g^2G^2\rangle M^2 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{7575M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2525\langle g^2G^2\rangle M^2 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{29375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{64625M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7875M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{28875M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{875\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5875\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^2 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5775 M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{17625 M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5875\langle g^2G^2\rangle M^2 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1575 M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525\langle g^2G^2\rangle M^2 m_c^{12} s^3\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5625\langle g^2G^2\rangle M^6 m_c^{14}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{37125 M^8 m_c^{16}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1275\langle g^2G^2\rangle M^4 m_c^{16}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3825 M^6 m_c^{18}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1175\langle g^2G^2\rangle M^2 m_c^{18}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{12925 M^8 m_c^{20}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6 m_c^{18}}{96\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2125\langle g^2G^2\rangle M^6 m_c^{16}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1175\langle g^2G^2\rangle M^4 m_c^{18}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{14025 M^8 m_c^{18}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{3525 M^6 m_c^{20}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3625\langle g^2G^2\rangle M^6 m_c^{12} s}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3375\langle g^2G^2\rangle M^4 m_c^{14} s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1275\langle g^2G^2\rangle M^2 m_c^{16} s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7975 M^8 m_c^{14} s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10} s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{10125 M^6 m_c^{16} s}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{725\langle g^2G^2\rangle M^4m_c^{12}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{825M^8m_c^{12}s^2}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$-\frac{3375\langle g^2G^2\rangle M^2m_c^{14}s^2}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2175M^6m_c^{14}s^2}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^3}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{725\langle g^2G^2\rangle M^2m_c^{12}s^3}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^4}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{12}s^3}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{825M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{225M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{4625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}\sqrt{s-4m_c^2}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$-\frac{1175\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10175M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{3525M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{12925M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{33875\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{925\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{74525M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$-\frac{1175\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2775M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{6775\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{925\langle g^2G^2\rangle M^2 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{825M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{20325M^6 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{6775\langle g^2G^2\rangle M^2 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{18625\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{3575\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{40975M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^2 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{10725M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{39325M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{39325M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^4 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3575\langle g^2G^2\rangle M^2 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^2 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{11175M^6 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2375\langle g^2G^2\rangle M^6m_c^{12}}{288\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{475\langle g^2G^2\rangle M^4m_c^{14}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{5075\langle g^2G^2\rangle M^2m_c^{16}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5225M^8m_c^{14}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{25375\langle g^2G^2\rangle M^6m_c^{16}}{288\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{475M^6m_c^{16}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2375\langle g^2G^2\rangle M^6m_c^{14}}{72\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{55825M^8m_c^{18}}{192\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{5075\langle g^2G^2\rangle M^4m_c^{16}}{96\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5225M^8m_c^{16}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5075M^6m_c^{18}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s}{288\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^4m_c^{12}s}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{275M^8m_c^{12}s}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{14}s}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{475M^6m_c^{14}s}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{12}s^2}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s^2}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^6m_c^{12}s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^3}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1175\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{24625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{576\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{54175M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{5375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{288\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3525M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{11825M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1075\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{12925M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{576\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1075M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{4925\langle g^2G^2\rangle M^4 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{275M^8 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1175\langle g^2G^2\rangle M^2 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4925M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925\langle g^2G^2\rangle M^2 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^2 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{576\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4075\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2075\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{275M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{10375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4075M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{20375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{576\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{22825M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2075\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{44825M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{6225M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4075\langle g^2G^2\rangle M^2 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{25\langle g^2G^2\rangle M^2 m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^4 m_c^{12}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{275M^8 m_c^{12}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1075\langle g^2G^2\rangle M^2 m_c^{14}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{375M^6 m_c^{14}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4625\langle g^2G^2\rangle M^6 m_c^{16}}{384\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{10175M^8 m_c^{18}}{256\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{5375\langle g^2G^2\rangle M^6 m_c^{14}}{768\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{925\langle g^2G^2\rangle M^4 m_c^{16}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{11825M^8 m_c^{16}}{512\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2775M^6 m_c^{18}}{256\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{14}}{256\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{625\langle g^2G^2\rangle M^6 m_c^{12}}{384\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^2 m_c^{16}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1375M^8 m_c^{14}}{256\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3225M^6 m_c^{16}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{125\langle g^2G^2\rangle M^2m_c^{12}s}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75M^6m_c^{12}s}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{275M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{625\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^2m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1875M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{10175M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{6875M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2775M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{625\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^2m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{9075M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{825\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{9075M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2475M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{825\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1205\langle g^2G^2\rangle M^6 m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7953M^8 m_c^{22}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2875\langle g^2G^2\rangle M^6 m_c^{18}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{723\langle g^2G^2\rangle M^4 m_c^{20}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{6325M^8 m_c^{20}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2169M^6 m_c^{22}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{575\langle g^2G^2\rangle M^4 m_c^{18}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6395\langle g^2G^2\rangle M^6 m_c^{16}s^2}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{723\langle g^2G^2\rangle M^2 m_c^{20}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{14069M^8 m_c^{18}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1535\langle g^2G^2\rangle M^6 m_c^{14}s^3}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1725M^6 m_c^{20}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3377M^8 m_c^{16}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1279\langle g^2G^2\rangle M^4 m_c^{16}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{575\langle g^2G^2\rangle M^2 m_c^{18}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3837M^6 m_c^{18}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2195\langle g^2G^2\rangle M^6 m_c^{12}s^4}{36\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{307\langle g^2G^2\rangle M^4 m_c^{14}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1279\langle g^2G^2\rangle M^2 m_c^{16}s^4}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4829M^8 m_c^{14}s^4}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{921M^6 m_c^{16} s^4}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{439\langle g^2G^2\rangle M^4 m_c^{12} s^5}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{11M^8 m_c^{12} s^5}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{307\langle g^2G^2\rangle M^2 m_c^{14} s^5}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{439M^6 m_c^{14} s^5}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^6}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{439\langle g^2G^2\rangle M^2 m_c^{12} s^6}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{\langle g^2G^2\rangle M^2 m_c^{10} s^7}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^6 m_c^{12} s^6}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{108713M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{49415\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{8255\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{9883\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{29649M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18161M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1651\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{16645\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{36619M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{9883\langle g^2G^2\rangle M^2 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4953M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{3329\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{11M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1651\langle g^2G^2\rangle M^2 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3329M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3329\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{32505M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4925\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{40975\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2955\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8865M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{90145M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8195\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{99785\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{219527M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2955\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{21155\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{24585M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{19957\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{46541M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8195\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{19957M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{4231\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{19957\langle g^2G^2\rangle M^2m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{11M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4231\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{38825\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{131\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{85415M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{655\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{36\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1441M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{655\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{7765\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1441M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{131\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{655\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{131\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{7765\langle g^2G^2\rangle M^2m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1441M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{393M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{131\langle g^2G^2\rangle M^2m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{500\langle g^2G^2\rangle M^6m_c^{16}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{131\langle g^2G^2\rangle M^2m_c^{14}s^4\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1475\langle g^2G^2\rangle M^4m_c^{18}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{550M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{7375\langle g^2G^2\rangle M^6m_c^{18}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4425M^6m_c^{20}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{12875\langle g^2G^2\rangle M^6m_c^{14}s}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{16225M^8m_c^{20}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{100\langle g^2G^2\rangle M^4m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{28325M^8m_c^{16}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{1475\langle g^2G^2\rangle M^2m_c^{18}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{150M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{875\langle g^2G^2\rangle M^6m_c^{12}s^2}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2575\langle g^2G^2\rangle M^4m_c^{14}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{25\langle g^2G^2\rangle M^2m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1925M^8m_c^{14}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}s^3}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7725M^6m_c^{16}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{175\langle g^2G^2\rangle M^4m_c^{12}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1375M^8m_c^{12}s^3}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{2575\langle g^2G^2\rangle M^2m_c^{14}s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525M^6m_c^{14}s^3}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{125\langle g^2G^2\rangle M^4m_c^{10}s^4}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{175\langle g^2G^2\rangle M^2m_c^{12}s^4}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^2m_c^{10}s^5}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6m_c^{12}s^4}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3125\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{625\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1875M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{625\langle g^2G^2\rangle M^2m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^2m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{125\langle g^2G^2\rangle M^4m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20075M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{625\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1825\langle g^2G^2\rangle M^4m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{44125\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{97075M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{125\langle g^2G^2\rangle M^2m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{12625\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5475M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{8825\langle g^2G^2\rangle M^4 m_c^{14} s^2 \sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{27775M^8 m_c^{14} s^2 \sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1825\langle g^2G^2\rangle M^2 m_c^{16} s^2 \sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{26475M^6 m_c^{16} s^2 \sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^3 \sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2525\langle g^2G^2\rangle M^4 m_c^{12} s^3 \sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{8825\langle g^2G^2\rangle M^2 m_c^{14} s^3 \sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1375M^8 m_c^{12} s^3 \sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^4 m_c^{10} s^4 \sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7575M^6 m_c^{14} s^3 \sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2525\langle g^2G^2\rangle M^2 m_c^{12} s^4 \sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6 m_c^{12} s^4 \sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{29375\langle g^2G^2\rangle M^6 m_c^{14} \sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5 \sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2625\langle g^2G^2\rangle M^4 m_c^{16} \sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{64625M^8 m_c^{16} \sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7875M^6 m_c^{18} \sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4375\langle g^2G^2\rangle M^6 m_c^{16} \sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{28875M^8 m_c^{18} \sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{875\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5875\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5775M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2625\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{17625M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5875\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1575M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5625\langle g^2G^2\rangle M^6m_c^{14}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1275\langle g^2G^2\rangle M^4m_c^{16}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1175\langle g^2G^2\rangle M^2m_c^{18}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{37125M^8m_c^{16}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5875\langle g^2G^2\rangle M^6m_c^{18}}{96\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3825M^6m_c^{18}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2125\langle g^2G^2\rangle M^6m_c^{16}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{12925M^8m_c^{20}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1175\langle g^2G^2\rangle M^4m_c^{18}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{14025M^8m_c^{18}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3625\langle g^2G^2\rangle M^6m_c^{12}s}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3525M^6m_c^{20}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3375\langle g^2G^2\rangle M^4m_c^{14}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{7975M^8m_c^{14}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1275\langle g^2G^2\rangle M^2m_c^{16}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10125M^6m_c^{16}s}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{725\langle g^2G^2\rangle M^4m_c^{12}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3375\langle g^2G^2\rangle M^2m_c^{14}s^2}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{825M^8m_c^{12}s^2}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2175M^6m_c^{14}s^2}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^3}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{225M^6m_c^{12}s^3}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{725\langle g^2G^2\rangle M^2m_c^{12}s^3}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^4}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{825M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{225M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}\sqrt{s-4m_c^2}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{4625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1175\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{3525M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10175M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{12925M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{925\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{33875\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{74525M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1175\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2775M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{825M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6775\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{925\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{20325M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6775\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{18625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3575\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^2m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{40975M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{10725M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{17875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{39325M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{39325M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3575\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{11175M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2375\langle g^2G^2\rangle M^6m_c^{12}}{288\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{3725\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{475\langle g^2G^2\rangle M^4m_c^{14}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5225M^8m_c^{14}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{5075\langle g^2G^2\rangle M^2m_c^{16}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{475M^6m_c^{16}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{55825M^8m_c^{18}}{192\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25375\langle g^2G^2\rangle M^6m_c^{16}}{288\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2375\langle g^2G^2\rangle M^6m_c^{14}}{72\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5075\langle g^2G^2\rangle M^4m_c^{16}}{96\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5075M^6m_c^{18}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5225M^8m_c^{16}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^4m_c^{12}s}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s}{288\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{14}s}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{275M^8m_c^{12}s}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s^2}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{475M^6m_c^{14}s}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{12}s^2}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{25M^6m_c^{12}s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{24625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{576\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^3}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1175\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{54175M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{3525M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{288\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{11825M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{12925M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1075M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4925\langle g^2G^2\rangle M^4 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{125\langle g^2G^2\rangle M^6 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{576\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{275M^8 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1175\langle g^2G^2\rangle M^2 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4925M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4925\langle g^2G^2\rangle M^2 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{25M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{576\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^2 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{275M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4075\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2075\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4075M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{10375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{22825M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2075\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{20375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{576\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{44825M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{384\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6225M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}}{192\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4075\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^4m_c^{12}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{275M^8m_c^{12}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1075\langle g^2G^2\rangle M^2m_c^{14}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{4625\langle g^2G^2\rangle M^6m_c^{16}}{384\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375M^6m_c^{14}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{10175M^8m_c^{18}}{256\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{5375\langle g^2G^2\rangle M^6m_c^{14}}{768\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{11825M^8m_c^{16}}{512\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{925\langle g^2G^2\rangle M^4m_c^{16}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{12}}{384\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2775M^6m_c^{18}}{256\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{1075\langle g^2G^2\rangle M^4m_c^{14}}{256\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1375M^8m_c^{14}}{256\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3225M^6m_c^{16}}{512\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{925\langle g^2G^2\rangle M^2m_c^{16}}{512\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{125\langle g^2G^2\rangle M^2m_c^{12}s}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75M^6m_c^{12}s}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{625\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{275M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1875M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{3125\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{768\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{10175M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{6875M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{25\langle g^2G^2\rangle M^4 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2775M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{625\langle g^2G^2\rangle M^2 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^2 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^2 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{9075M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{825\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2475M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{9075M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{825\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1205\langle g^2G^2\rangle M^6 m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2475M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2875\langle g^2G^2\rangle M^6 m_c^{18}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7953M^8 m_c^{22}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{723\langle g^2G^2\rangle M^4 m_c^{20}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6325M^8 m_c^{20}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{6395\langle g^2G^2\rangle M^6 m_c^{16}s^2}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2169M^6 m_c^{22}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{575\langle g^2G^2\rangle M^4 m_c^{18}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{14069M^8 m_c^{18}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{723\langle g^2G^2\rangle M^2 m_c^{20}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1725M^6 m_c^{20}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1535\langle g^2G^2\rangle M^6 m_c^{14}s^3}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1279\langle g^2G^2\rangle M^4 m_c^{16}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{575\langle g^2G^2\rangle M^2 m_c^{18}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3377M^8 m_c^{16}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2195\langle g^2G^2\rangle M^6 m_c^{12}s^4}{36\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3837M^6 m_c^{18}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{307\langle g^2G^2\rangle M^4 m_c^{14}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4829M^8 m_c^{14}s^4}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{921M^6 m_c^{16}s^4}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1279\langle g^2G^2\rangle M^2 m_c^{16}s^4}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^6 m_c^{10}s^5}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{439\langle g^2G^2\rangle M^4 m_c^{12}s^5}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{307\langle g^2G^2\rangle M^2m_c^{14}s^5}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{11M^8m_c^{12}s^5}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{439M^6m_c^{14}s^5}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{439\langle g^2G^2\rangle M^2m_c^{12}s^6}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3M^6m_c^{12}s^6}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{49415\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{\langle g^2G^2\rangle M^2m_c^{10}s^7}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{8255\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{108713M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{9883\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{18161M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{16645\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{29649M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{1651\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{36619M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{9883\langle g^2G^2\rangle M^2m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4953M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3329\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{11M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1651\langle g^2G^2\rangle M^2m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3329M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3329\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4925\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{40975\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{32505M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2955\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{90145M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{99785\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8865M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{8195\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{219527M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2955\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{24585M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19957\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{21155\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{46541M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8195\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19957M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{11M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4231\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19957\langle g^2G^2\rangle M^2m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4231\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{38825\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{85415M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{655\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{36\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1441M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{655\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7765\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1441M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{655\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{72\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1441M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{7765\langle g^2G^2\rangle M^2m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{393M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^2m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131\langle g^2G^2\rangle M^2m_c^{14}s^4\sqrt{s\left(s-4m_c^2\right)}}{96\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315M^{10}m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^7}-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^6}$$

$$+\frac{9535M^8m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{1024\pi^6s^6}-\frac{135M^{10}m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^6}$$

$$+\frac{39M^{10}m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^5}-\frac{5\langle g^2G^2\rangle M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{384\pi^6s^5}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^5}-\frac{675M^8m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^5}$$

$$+\frac{9\langle g^2G^2\rangle M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^4}+\frac{1455M^6m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{1024\pi^6s^5}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^4}+\frac{153M^8m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{1024\pi^6s^4}-\frac{135M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{2048\pi^6s^3}-\frac{\langle g^2G^2\rangle M^6m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}$$

$$+\frac{5\langle g^2G^2\rangle M^2m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}-\frac{5M^8m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}$$

$$+\frac{45M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}-\frac{3\langle g^2G^2\rangle M^4m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{2048\pi^6s^2}$$

$$-\frac{3\langle g^2G^2\rangle M^2m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{2048\pi^6s^2}-\frac{3M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^2}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{1024\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{165M^8m_c^{16}ln(2)}{2048\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{25\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{165M^8m_c^{14}ln(2)}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{16}ln(2)}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{165M^8m_c^{12}ln(2)}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^6m_c^{14}ln(2)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}ln(2)}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{25\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{165M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{165M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{1024\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{165M^8m_c^{16}ln(2)}{2048\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{165M^8m_c^{14}ln(2)}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{16}ln(2)}{2048\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{165M^8m_c^{12}ln(2)}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{14}ln(2)}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln(2)}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)}{8192\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{165M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{25\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{165M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8192\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{465\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2475M^8m_c^{18}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1395M^6m_c^{20}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{775\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5115M^8m_c^{20}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{575\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{225\langle g^2G^2\rangle M^4m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{465\langle g^2G^2\rangle M^2m_c^{18}sln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3795M^8m_c^{16}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{275\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{675M^6m_c^{18}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1815M^8m_c^{14}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{16}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035M^6m_c^{16}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{165\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^2m_c^{14}s^3ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{165M^8m_c^{12}s^3ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{495M^6m_c^{14}s^3ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^6m_c^{12}s^4ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{8625\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1725\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{56925M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{11385M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1035\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^2m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3105M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1625\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035\langle g^2G^2\rangle M^2m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{10725M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^6m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{11125\langle g^2G^2\rangle M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{165M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{975\langle g^2G^2\rangle M^4 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{73425M^8 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{2925M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{8425\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{55605M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{975\langle g^2G^2\rangle M^2 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1775\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5055\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{11715M^8 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^2 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15165M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^4 m_c^{10} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5055\langle g^2G^2\rangle M^2 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^2 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{10875\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{71775M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2025M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1125\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7425M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^6 m_c^{12} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{6525\langle g^2G^2\rangle M^4 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^2 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1485M^8 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^4 m_c^{12} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{19575M^6 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^2 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{405M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^2 m_c^{12} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^4 m_c^{16} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{2475M^8 m_c^{16} ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^2 m_c^{18} ln(2)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^6 m_c^{18} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{825M^8 m_c^{20} ln(2)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{125\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4 m_c^{18} ln(2)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6 m_c^{20} ln(2)}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2475M^8 m_c^{18} ln(2)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{12} sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225\langle g^2G^2\rangle M^4 m_c^{14} sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^2 m_c^{16} sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{825M^8 m_c^{14} sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{14}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{28875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{825M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{9125\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{60225M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^6m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{5475\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{28875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{16425M^6m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{9625\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{63525M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1575M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5775M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{5775M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^2m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^6m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^2m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{225M^6m_c^{16}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{425\langle g^2G^2\rangle M^2m_c^{16}ln(2)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4675M^8m_c^{18}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{425\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{825M^8m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1275M^6m_c^{18}ln(2)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}sln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{15125M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{275M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5775M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1375\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4125M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{625\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4125M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4125M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{15125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^4m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{625\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{825M^8m_c^{18}ln(2)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{4125M^8m_c^{16}ln(2)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^6m_c^{18}ln(2)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln(2)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1125M^6m_c^{16}ln(2)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{825M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2475M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2475M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{325\langle g^2G^2\rangle M^6m_c^{20}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2145M^8m_c^{22}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1000\langle g^2G^2\rangle M^6m_c^{18}sln(2)}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{195\langle g^2G^2\rangle M^4m_c^{20}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1100M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{585M^6m_c^{22}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{200\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{195\langle g^2G^2\rangle M^2m_c^{20}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4125M^8m_c^{18}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{300M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{825M^8m_c^{16}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{50\langle g^2G^2\rangle M^2m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1125M^6m_c^{18}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{16}s^4ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{275M^8m_c^{14}s^4ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{225M^6m_c^{16}s^4ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{75M^6m_c^{14}s^5ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}s^5ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{9825\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^2 m_c^{12} s^6 ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3650\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{64845 M^8 m_c^{18} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5895\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12045 M^8 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{17685 M^6 m_c^{18} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{21475\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2190\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{47245 M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5895\langle g^2G^2\rangle M^2 m_c^{16} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3285 M^6 m_c^{16} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4295\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1095\langle g^2G^2\rangle M^2 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3465 M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{12885 M^6 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4295\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945 M^6 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1125\langle g^2G^2\rangle M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{10125\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{7425 M^8 m_c^{20} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{675\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{66825M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2025M^6 m_c^{20} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15025\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6075\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{99165M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{675\langle g^2G^2\rangle M^2 m_c^{18} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18225M^6 m_c^{18} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{7075\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{9015\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6075\langle g^2G^2\rangle M^2 m_c^{16} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{46695M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{27045M^6 m_c^{16} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4245\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3465M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{9015\langle g^2G^2\rangle M^2 m_c^{14} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12735M^6 m_c^{14} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4245\langle g^2G^2\rangle M^2 m_c^{12} s^6 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^6 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^6 m_c^{12} s^6 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{315\langle g^2G^2\rangle M^2 m_c^{10} s^7 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5375\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5\langle g^2G^2\rangle M^4 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^6 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{11825M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{55M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^6 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{165M^8 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5\langle g^2G^2\rangle M^2 m_c^{20} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3225M^6 m_c^{20} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{55M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1075\langle g^2G^2\rangle M^2 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{45M^6 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^4 m_c^{14} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15\langle g^2G^2\rangle M^2 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^2 m_c^{14} s^4 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^6 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{465\langle g^2G^2\rangle M^4 m_c^{18} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2475M^8 m_c^{18} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1395M^6 m_c^{20} ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{775\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5115M^8m_c^{20}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{575\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{225\langle g^2G^2\rangle M^4m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{465\langle g^2G^2\rangle M^2m_c^{18}sln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3795M^8m_c^{16}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{275\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{675M^6m_c^{18}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1815M^8m_c^{14}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{16}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035M^6m_c^{16}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{25\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{165\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^2m_c^{14}s^3ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{165M^8m_c^{12}s^3ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{495M^6m_c^{14}s^3ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^6m_c^{12}s^4ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{8625\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1725\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{56925M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{11385M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1035\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15525M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^2 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1625\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1035\langle g^2G^2\rangle M^2 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10725M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^6 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{25\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{165M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{11125\langle g^2G^2\rangle M^6 m_c^{14} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^4 m_c^{16} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{73425M^8 m_c^{16} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^2 m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2925M^6 m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{8425\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{6675\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^2 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{55605M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20025M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1775\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{11715M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1065\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{675\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2025M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{71775M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7425M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{225\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1485M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{675\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{135\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{405M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{135\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2475M^8m_c^{16}ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^2m_c^{18}ln(2)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{675M^6m_c^{18}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{125\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{825M^8m_c^{20}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2475M^8m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{20}ln(2)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225\langle g^2G^2\rangle M^4m_c^{14}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{225\langle g^2G^2\rangle M^2m_c^{16}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{825M^8m_c^{14}sln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6m_c^{16}sln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{14}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{28875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{7875M^6m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{2625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{825M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{9125\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{60225M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{5475\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{28875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{16425M^6m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{9625\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{63525M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1575M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5775M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{5775M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^2m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^6m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^2m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225M^6m_c^{16}ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{425\langle g^2G^2\rangle M^2m_c^{16}ln(2)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4675M^8m_c^{18}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{425\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{825M^8m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1275M^6m_c^{18}ln(2)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}sln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{15125M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1575M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{275M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{875\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5775M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{625\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{525\langle g^2G^2\rangle M^2m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1125M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4125M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{15125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1375\langle g^2G^2\rangle M^2m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{825M^8m_c^{18}ln(2)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{4125M^8m_c^{16}ln(2)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{225M^6m_c^{18}ln(2)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln(2)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^6m_c^{16}ln(2)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{825M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2475M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2 m_c^{12} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2475M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{325\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2145M^8 m_c^{22} ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1000\langle g^2G^2\rangle M^6 m_c^{18} sln(2)}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{195\langle g^2G^2\rangle M^4 m_c^{20} sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1100M^8 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{585M^6 m_c^{22} sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{200\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{195\langle g^2G^2\rangle M^2m_c^{20}s^2ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4125M^8m_c^{18}s^2ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{300M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{825M^8m_c^{16}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{50\langle g^2G^2\rangle M^2m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1125M^6m_c^{18}s^3ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{16}s^4ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{275M^8m_c^{14}s^4ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{225M^6m_c^{16}s^4ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75M^6m_c^{14}s^5ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}s^5ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9825\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^2m_c^{12}s^6ln(2)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3650\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{64845M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5895\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12045M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{21475\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{17685M^6m_c^{18}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2190\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{47245M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5895\langle g^2G^2\rangle M^2m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3285M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4295\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{525\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3465M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1095\langle g^2G^2\rangle M^2m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12885M^6m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4295\langle g^2G^2\rangle M^2m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{945M^6m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{315\langle g^2G^2\rangle M^2m_c^{10}s^{13/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{10125\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7425M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{675\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{66825M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{15025\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2025M^6m_c^{20}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{6075\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{99165M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{675\langle g^2G^2\rangle M^2m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{18225M^6m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{9015\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7075\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{46695M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6075\langle g^2G^2\rangle M^2m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{525\langle g^2G^2\rangle M^6m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{27045M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4245\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3465M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9015\langle g^2G^2\rangle M^2m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12735M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4245\langle g^2G^2\rangle M^2m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^2m_c^{10}s^7ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5375\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{11825M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{55M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1075\langle g^2G^2\rangle M^4m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^2m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{165M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3225M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{55M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1075\langle g^2G^2\rangle M^2 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45M^6 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^4 m_c^{14} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15M^6 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^2 m_c^{14} s^4 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1953M^{10} m_c^{14} ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6 s^8}+\frac{189M^8 m_c^{14} ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6 s^7}$$

$$+\frac{189M^6 m_c^{14} ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6 s^6}-\frac{1953M^{10} m_c^{14} ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{128\pi^6 s^8}$$

$$-\frac{189M^8 m_c^{14} ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{32\pi^6 s^7}-\frac{189M^6 m_c^{14} ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{256\pi^6 s^6}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{6144\pi^6 s^6}-\frac{55M^8 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6 s^6}$$

$$+\frac{5\langle g^2G^2\rangle M^4 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^5}-\frac{15M^6 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6 s^5}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{5\langle g^2G^2\rangle M^2 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8192\pi^6 s^4}$$

$$-\frac{25\langle g^2G^2\rangle M^6 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{165M^8 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{165M^8 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{165M^8 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8192\pi^6 s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{165M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{25\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{165M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8192\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{2145M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{325\langle g^2G^2\rangle M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1000\langle g^2G^2\rangle M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{195\langle g^2G^2\rangle M^4m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1100M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{585M^6m_c^{22}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{625\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{200\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4125M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{195\langle g^2G^2\rangle M^2m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{300M^6m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{825M^8m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1125M^6m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{50\langle g^2G^2\rangle M^2m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{375\langle g^2G^2\rangle M^2m_c^{16}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{275M^8m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{225M^6m_c^{16}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75M^6m_c^{14}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9825\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{25\langle g^2G^2\rangle M^2m_c^{12}s^6ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{3650\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{64845M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5895\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{12045M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{21475\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{17685M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{2190\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{47245M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5895\langle g^2G^2\rangle M^2m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3285M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4295\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{525\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3465M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1095\langle g^2G^2\rangle M^2m_c^{14}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12885M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4295\langle g^2G^2\rangle M^2m_c^{12}s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{315\langle g^2G^2\rangle M^2m_c^{10}s^{13/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{10125\langle g^2G^2\rangle M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7425M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{675\langle g^2G^2\rangle M^4m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{66825M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15025\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2025M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{6075\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{99165M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{675\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{18225M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9015\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7075\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{46695M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6075\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{525\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{27045M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4245\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3465M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9015\langle g^2G^2\rangle M^2 m_c^{14} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{12735M^6 m_c^{14} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^4 m_c^{10} s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4245\langle g^2G^2\rangle M^2 m_c^{12} s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{315\langle g^2G^2\rangle M^2 m_c^{10} s^7\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^6 m_c^{12} s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5375\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{11825M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{6\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{55M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1075\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{165M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3225M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{55M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1075\langle g^2G^2\rangle M^2m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{45M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{5\langle g^2G^2\rangle M^4 m_c^{14} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{15M^6 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5\langle g^2G^2\rangle M^2 m_c^{14} s^4\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{465\langle g^2G^2\rangle M^4 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{2475M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1395M^6 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{5115M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{775\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{575\langle g^2G^2\rangle M^6 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{225\langle g^2G^2\rangle M^4 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{3795M^8 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{465\langle g^2G^2\rangle M^2 m_c^{18} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$+\frac{275\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{675M^6 m_c^{18} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$
$$-\frac{345\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1815M^8 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1035M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{225\langle g^2G^2\rangle M^2m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{165\langle g^2G^2\rangle M^4m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^2m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{165M^8m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{495M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{8625\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1725\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{56925M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{11385M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1035\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^2m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1625\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035\langle g^2G^2\rangle M^2 m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{10725M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{11125\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{165M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{975\langle g^2G^2\rangle M^4 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{73425M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2925M^6 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^4 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{8425\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{55605M^8 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{975\langle g^2G^2\rangle M^2 m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1775\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^6 m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5055\langle g^2G^2\rangle M^4 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{11715M^8 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{10875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{71775M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2025M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7425M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{225\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1485M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{19575M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{405M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{2475M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^2m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{825M^8m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{125\langle g^2G^2\rangle M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2475M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{12}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225\langle g^2G^2\rangle M^4m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{825M^8m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{28875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17325M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{825M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{9125\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{60225M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{28875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{9625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{63525M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{525\langle g^2G^2\rangle M^2m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{5775M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5775M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5775\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{17325M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5775\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{425\langle g^2G^2\rangle M^2m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{225M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2125\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4675M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{425\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{825M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1275M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{15125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1575M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{275M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1375\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4125M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{625\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4125M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^2m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{15125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{625\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{825M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{4125M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1125M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{825M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{225M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2475M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{55M^8 m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6 s^6}-\frac{25\langle g^2G^2\rangle M^6 m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{6144\pi^6 s^6}$$

$$+\frac{15M^6 m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6 s^5}-\frac{5\langle g^2G^2\rangle M^4 m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6 s^5}$$

$$-\frac{25\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6 s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{5\langle g^2G^2\rangle M^2 m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8192\pi^6 s^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{165M^8 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6 s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{165M^8 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{25\langle g^2G^2\rangle M^6 m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{165M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{165M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{165M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8192\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{465\langle g^2G^2\rangle M^4 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2475M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1395M^6 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5115M^8 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{775\langle g^2G^2\rangle M^6 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{575\langle g^2G^2\rangle M^6 m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{225\langle g^2G^2\rangle M^4 m_c^{16} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3795M^8 m_c^{16} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{465\langle g^2G^2\rangle M^2 m_c^{18} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{275\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{675M^6 m_c^{18} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1815M^8 m_c^{14} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1035M^6 m_c^{16} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{225\langle g^2G^2\rangle M^2 m_c^{16} s^2 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{165\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^2 m_c^{14} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{165M^8 m_c^{12} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{495M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^6m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{8625\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1725\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{56925M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{11385M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1035\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^2m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1625\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1035\langle g^2G^2\rangle M^2m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{10725M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{25\langle g^2G^2\rangle M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{165M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{11125\langle g^2G^2\rangle M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^4m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{73425M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2925M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{8425\langle g^2G^2\rangle M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{6675\langle g^2G^2\rangle M^4m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^2m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{55605M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{20025M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1775\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^4m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{11715M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1065\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{675\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2025M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{71775M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7425M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1125\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^4 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{225\langle g^2G^2\rangle M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1485M^8 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{675\langle g^2G^2\rangle M^2 m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{135\langle g^2G^2\rangle M^4 m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^6 m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^2 m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{405M^6 m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{135\langle g^2G^2\rangle M^2 m_c^{12}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2475M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{675M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{825M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2475M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{225\langle g^2G^2\rangle M^4m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{825M^8m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^6m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{28875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17325M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{825M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{9125\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{60225M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4375\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{28875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{9625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{63525M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{525\langle g^2G^2\rangle M^2m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{5775M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5775M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5775\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{17325M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5775\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{425\langle g^2G^2\rangle M^2m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{225M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2125\langle g^2G^2\rangle M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4675M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{425\langle g^2G^2\rangle M^4m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{825M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1275M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{75\langle g^2G^2\rangle M^2m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{525\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{15125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1575M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{24\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{275M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{1375\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{625\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{4125M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$-\frac{375\langle g^2G^2\rangle M^4m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1125M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{625\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$-\frac{1375\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{375\langle g^2G^2\rangle M^2m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4125M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$
$$-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{48\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{15125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{125\langle g^2G^2\rangle M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{825M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{4125M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{225M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{825M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{225M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2475M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2145M^8m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{325\langle g^2G^2\rangle M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1000\langle g^2G^2\rangle M^6m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{195\langle g^2G^2\rangle M^4m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1100M^8m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{585M^6m_c^{22}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{625\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{200\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4125M^8m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{195\langle g^2G^2\rangle M^2m_c^{20}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{300M^6m_c^{20}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{16}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{825M^8m_c^{16}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1125M^6m_c^{18}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{50\langle g^2G^2\rangle M^2m_c^{18}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{125\langle g^2G^2\rangle M^6m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{75\langle g^2G^2\rangle M^4m_c^{14}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{375\langle g^2G^2\rangle M^2m_c^{16}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{275M^8m_c^{14}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^{12}s^5ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{225M^6m_c^{16}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}s^5ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75M^6m_c^{14}s^5ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{25\langle g^2G^2\rangle M^2m_c^{12}s^6ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9825\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3650\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{64845M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{5895\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12045M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{17685M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{21475\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{2190\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{47245M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{5895\langle g^2G^2\rangle M^2m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3285M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{525\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{4295\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1095\langle g^2G^2\rangle M^2m_c^{14}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3465M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{12885M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4295\langle g^2G^2\rangle M^2m_c^{12}s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{945M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{315\langle g^2G^2\rangle M^2m_c^{10}s^{13/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1125\langle g^2G^2\rangle M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{10125\langle g^2G^2\rangle M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{7425M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{675\langle g^2G^2\rangle M^4m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{66825M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2025M^6m_c^{20}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15025\langle g^2G^2\rangle M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6075\langle g^2G^2\rangle M^4m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{99165M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{675\langle g^2G^2\rangle M^2m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18225M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{7075\langle g^2G^2\rangle M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{9015\langle g^2G^2\rangle M^4m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6075\langle g^2G^2\rangle M^2m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{46695M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{27045M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{525\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4245\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3465M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{9015\langle g^2G^2\rangle M^2m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12735M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4245\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{315\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{945M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{315\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5375\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{11825M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{55M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{6\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{25\langle g^2G^2\rangle M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{165M^8 m_c^{18} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^2 m_c^{20} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25\langle g^2G^2\rangle M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3225M^6 m_c^{20} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{55M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1075\langle g^2G^2\rangle M^2 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{45M^6 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^4 m_c^{14} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{15\langle g^2G^2\rangle M^2 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^2 m_c^{14} s^4\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^6 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)} \tag{158}$$

$$+0 \tag{159}$$

$$\tilde{\rho}_{1,1^{++}}(s,M^2) = +\frac{9M^{10}m_c^6\sqrt{s-4m_c^2}}{512\pi^6 s^{9/2}} - \frac{105M^{10}m_c^8\sqrt{s-4m_c^2}}{512\pi^6 s^{11/2}}$$
$$+\frac{65M^8m_c^8\sqrt{s-4m_c^2}}{2048\pi^6 s^{9/2}} - \frac{5\langle g^2G^2\rangle M^6m_c^4\sqrt{s-4m_c^2}}{1024\pi^6 s^{7/2}}$$
$$+\frac{3M^{10}m_c^4\sqrt{s-4m_c^2}}{1024\pi^6 s^{7/2}} + \frac{13M^8m_c^6\sqrt{s-4m_c^2}}{2048\pi^6 s^{7/2}}$$
$$-\frac{3\langle g^2G^2\rangle M^6m_c^2\sqrt{s-4m_c^2}}{4096\pi^6 s^{5/2}} - \frac{33M^8m_c^4\sqrt{s-4m_c^2}}{4096\pi^6 s^{5/2}}$$
$$+\frac{45M^{10}m_c^8\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s^6} - \frac{315M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s^7}$$
$$+\frac{195M^8m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6 s^6} - \frac{15\langle g^2G^2\rangle M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s^5}$$
$$+\frac{3\langle g^2G^2\rangle M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6 s^4} - \frac{27M^8m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6 s^4}$$
$$+\frac{3\langle g^2G^2\rangle M^6m_c^2\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6 s^3} + \frac{3M^8m_c^4\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6 s^3}$$
$$+\frac{3M^8m_c^{12}}{4096\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4} - \frac{135M^8m_c^{14}}{1024\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{47M^8m_c^{12}}{1024\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3} - \frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{45M^8m_c^{14}}{1024\pi^6 s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2} + \frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2} - \frac{9M^8m_c^{12}}{512\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{15M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)} + \frac{27M^8m_c^{12}}{1024\pi^6 s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{135M^8m_c^{14}}{1024\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{3M^8m_c^{12}}{4096\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{47M^8m_c^{12}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^8m_c^{14}}{1024\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{9M^8m_c^{12}}{512\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{15M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{27M^8m_c^{12}}{1024\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$-\frac{4425M^8m_c^{20}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{600M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7725M^8m_c^{16}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{525M^8m_c^{14}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^8m_c^{12}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5475M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{375M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{17625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10125M^8m_c^{16}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3525M^8m_c^{20}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{3825M^8m_c^{18}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2175M^8m_c^{14}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8m_c^{12}s^2}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3525M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{20325M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{11175M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10725M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5075M^8m_c^{18}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{475M^8m_c^{14}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^8m_c^{12}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{475M^8m_c^{16}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1075M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4925M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{3525M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6225M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{4075M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^8m_c^{12}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{2775M^8m_c^{18}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3225M^8m_c^{16}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375M^8m_c^{14}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1875M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{2169M^8m_c^{22}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1725M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3837M^8m_c^{18}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{921M^8m_c^{16}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{439M^8m_c^{14}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{29649M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4953M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3329M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8865M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{24585M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{19957M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4231M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{7765M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{393M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{600M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{131M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{7725M^8m_c^{16}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4425M^8m_c^{20}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{525M^8m_c^{14}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8m_c^{12}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5475M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{17625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1575M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3525M^8m_c^{20}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10125M^8m_c^{16}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2175M^8m_c^{14}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3825M^8m_c^{18}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8m_c^{12}s^2}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3525M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{20325M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{10725M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{11175M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10725M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{475M^8m_c^{14}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5075M^8m_c^{18}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{475M^8m_c^{16}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25M^8m_c^{12}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4925M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3525M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1075M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{25M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4075M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6225M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2775M^8m_c^{18}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{75M^8m_c^{12}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3225M^8m_c^{16}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375M^8m_c^{14}}{64\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1875M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{2169M^8m_c^{22}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2475M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3837M^8m_c^{18}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1725M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{921M^8m_c^{16}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{439M^8m_c^{14}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{29649M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4953M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3329M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8865M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{24585M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19957M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4231M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{7765M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{393M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{45M^{10}m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^6}-\frac{315M^{10}m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^7}$$

$$+\frac{195M^8m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^6}-\frac{15\langle g^2G^2\rangle M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^5}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^4}-\frac{27M^8m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}+\frac{3M^8m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^3}$$

$$+\frac{45M^8m_c^{14}ln(2)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{16}ln(2)}{512\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{12}ln(2)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{16}ln(2)}{512\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{12}ln(2)}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}ln(2)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{1395M^8m_c^{20}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1350M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{495M^8m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035M^8m_c^{16}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^8m_c^{12}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2925M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3105M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{45M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15165M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2025M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675M^8m_c^{16}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{405M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{225M^8m_c^{20}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{14}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{7875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{16425M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1575M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1275M^8m_c^{18}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4125M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{16}ln(2)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^8m_c^{18}ln(2)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{585M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1200M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{225M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1125M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{17685M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{75M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12885M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{13140M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2025M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{27045M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18225M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12735M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3225M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{45M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1395M^8m_c^{20}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1350M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{495M^8m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035M^8m_c^{16}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{45M^8m_c^{12}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2925M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{20025M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2025M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{405M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{675M^8m_c^{16}ln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8m_c^{20}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8m_c^{14}sln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{16425M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1575M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1275M^8m_c^{18}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{16}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1575M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225M^8m_c^{18}ln(2)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^8m_c^{16}ln(2)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{585M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1200M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{225M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1125M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{75M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{17685M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{13140M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12885M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{945M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2025M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{18225M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{27045M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{12735M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3225M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{45M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6 s^6}$$

$$+\frac{45M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{585M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1200M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1125M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{225M^8m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{17685M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75M^8m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{13140M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12885M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2025M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{18225M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{27045M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12735M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3225M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{45M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1395M^8m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1350M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1035M^8m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{495M^8m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{15525M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^8m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2925M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{3105M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{45M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15165M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{19575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2025M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{405M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{225M^8m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{17325M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1275M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{225M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1575M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{45M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{15M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6}$$

$$+\frac{45M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{1395M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1350M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1035M^8m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{495M^8m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15525M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^8m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2925M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{20025M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2025M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{405M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{675M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{675M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225M^8m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{17325M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1275M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1575M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{225M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{585M^8m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1200M^8m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1125M^8m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{225M^8m_c^{16}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{17685M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75M^8m_c^{14}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{12885M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{13140M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2025M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{27045M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18225M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{945M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12735M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{15M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3225M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{45M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)} \tag{160}$$

$$+0 \tag{161}$$

$$\tilde{\rho}_{1,1^{-+}}(s,M^2)=+\frac{525M^{10}m_c^8\sqrt{s-4m_c^2}}{512\pi^6s^{11/2}}-\frac{165M^{10}m_c^6\sqrt{s-4m_c^2}}{512\pi^6s^{9/2}}$$
$$+\frac{15\langle g^2G^2\rangle M^6m_c^4\sqrt{s-4m_c^2}}{1024\pi^6s^{7/2}}+\frac{5M^8m_c^8\sqrt{s-4m_c^2}}{64\pi^6s^{9/2}}$$
$$+\frac{9M^{10}m_c^4\sqrt{s-4m_c^2}}{1024\pi^6s^{7/2}}-\frac{7M^8m_c^6\sqrt{s-4m_c^2}}{512\pi^6s^{7/2}}$$
$$-\frac{7\langle g^2G^2\rangle M^6m_c^2\sqrt{s-4m_c^2}}{4096\pi^6s^{5/2}}-\frac{65M^6m_c^8\sqrt{s-4m_c^2}}{2048\pi^6s^{7/2}}$$
$$+\frac{5\langle g^2G^2\rangle M^4m_c^4\sqrt{s-4m_c^2}}{1024\pi^6s^{5/2}}+\frac{47M^6m_c^6\sqrt{s-4m_c^2}}{2048\pi^6s^{5/2}}$$
$$-\frac{5\langle g^2G^2\rangle M^4m_c^2\sqrt{s-4m_c^2}}{4096\pi^6s^{3/2}}-\frac{15M^6m_c^4\sqrt{s-4m_c^2}}{4096\pi^6s^{3/2}}$$
$$+\frac{1575M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^7}-\frac{405M^{10}m_c^8\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^6}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^5}+\frac{15M^8m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^6}$$

$$+\frac{27M^{10}m_c^6\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^5}-\frac{45M^8m_c^8\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^5}$$

$$-\frac{57\langle g^2G^2\rangle M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^4}-\frac{195M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{1024\pi^6s^5}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^4}+\frac{45M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^2\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}-\frac{27\langle g^2G^2\rangle M^4m_c^4\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^3}$$

$$+\frac{3M^8m_c^4\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^3}-\frac{27M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^3}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^2\sqrt{s\left(s-4m_c^2\right)}}{2048\pi^6s^2}+\frac{3M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^2}$$

$$-\frac{3M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{3M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{135M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{47M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{135M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{47M^6m_c^{12}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{9M^8m_c^{12}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{45M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{9M^6m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{45M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$-\frac{27M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{27M^6m_c^{12}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$-\frac{15M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{15M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$

$$+\frac{3M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{3M^6m_c^{12}}{4096\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{47M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{47M^6m_c^{12}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{135M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{45M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{9M^8m_c^{12}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{45M^6m_c^{14}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{9M^6m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{2048\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$

$$+\frac{27M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}+\frac{27M^6m_c^{12}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$-\frac{15M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{15M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{2400M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{4425M^6m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4425M^8m_c^{20}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7725M^8m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525M^8m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{600M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7725M^6m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525M^6m_c^{14}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{375M^6m_c^{12}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1875M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5475M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5475M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{26475M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{7575M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7875M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{17625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1575M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1575M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{17625M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{10125M^8m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3825M^6m_c^{18}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{3525M^8m_c^{20}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3825M^8m_c^{18}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2175M^8m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3525M^6m_c^{20}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{12}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10125M^6m_c^{16}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2175M^6m_c^{14}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{225M^6m_c^{12}s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5550M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3525M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{3525M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{20325M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2775M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{20325M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{11175M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10725M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10725M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{11175M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{475M^8m_c^{14}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{475M^6m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475M^8m_c^{16}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5075M^8m_c^{18}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{25M^8m_c^{12}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5075M^6m_c^{18}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475M^6m_c^{14}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^6m_c^{12}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3525M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3525M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4075M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4075M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{6225M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{6225M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^8m_c^{12}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375M^6m_c^{14}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2775M^8m_c^{18}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{3225M^8m_c^{16}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2775M^6m_c^{18}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375M^8m_c^{14}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{3225M^6m_c^{16}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{75M^6m_c^{12}s}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1875M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1875M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2775M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2475M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2475M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4338M^8m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{6900M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2169M^6m_c^{22}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7674M^8m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1725M^6m_c^{20}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1842M^8m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{878M^8m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3837M^6m_c^{18}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{921M^6m_c^{16}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{439M^6m_c^{14}s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3M^6m_c^{12}s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{19812M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{29649M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{3329M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{29649M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{4953M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3329M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{24585M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{8865M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{19957M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{8865M^6m_c^{20}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4231M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{24585M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{19957M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{7765M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{131M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{262M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{786M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{393M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{2400M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{4425M^6m_c^{20}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4425M^8m_c^{20}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7725M^8m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{525M^8m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{600M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7725M^6m_c^{16}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{525M^6m_c^{14}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{375M^6m_c^{12}s^4}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5475M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{375M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26475M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7575M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5475M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26475M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7575M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{375M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{17625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7875M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1575M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{17625M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1575M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10125M^8m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3825M^6m_c^{18}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3525M^8m_c^{20}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3825M^8m_c^{18}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3525M^6m_c^{20}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2175M^8m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10125M^6m_c^{16}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8m_c^{12}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2175M^6m_c^{14}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{12}s^3}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{225M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5550M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3525M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3525M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{20325M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2775M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{20325M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{11175M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10725M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10725M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{11175M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{475M^8m_c^{14}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{475M^6m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475M^8m_c^{16}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5075M^8m_c^{18}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25M^8m_c^{12}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5075M^6m_c^{18}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475M^6m_c^{14}s}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25M^6m_c^{12}s^2}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4925M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3525M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3525M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4925M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4075M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6225M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4075M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6225M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375M^6m_c^{14}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75M^8m_c^{12}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{2775M^8m_c^{18}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3225M^8m_c^{16}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375M^8m_c^{14}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2775M^6m_c^{18}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{3225M^6m_c^{16}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75M^6m_c^{12}s}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1875M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2775M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1875M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2775M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2475M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2475M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2475M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4338M^8m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{6900M^8m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2169M^6m_c^{22}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7674M^8m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1725M^6m_c^{20}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1842M^8m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{878M^8m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3837M^6m_c^{18}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{12M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{921M^6m_c^{16}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{439M^6m_c^{14}s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3M^6m_c^{12}s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{29649M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19812M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3329M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{29649M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{6M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4953M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3329M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{8865M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24585M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19957M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{8865M^6m_c^{20}s^2\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4231M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{24585M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19957M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7765M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{262M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{786M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{131M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{393M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1575M^{10}m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^7}-\frac{405M^{10}m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^6}$$

$$+\frac{45\langle g^2G^2\rangle M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^5}+\frac{15M^8m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{8\pi^6s^6}$$

$$+\frac{27M^{10}m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^5}-\frac{45M^8m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^5}$$

$$-\frac{57\langle g^2G^2\rangle M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^4}-\frac{195M^6m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{256\pi^6s^5}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^4}+\frac{45M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^6m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}-\frac{27\langle g^2G^2\rangle M^4m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^3}$$

$$+\frac{3M^8m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^3}-\frac{27M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^3}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{512\pi^6s^2}+\frac{3M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^2}$$
$$+\frac{45M^8m_c^{16}ln(2)}{128\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}ln(2)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{45M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^6m_c^{16}ln(2)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{45M^6m_c^{12}ln(2)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{45M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{45M^8m_c^{14}ln(2)}{64\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{16}ln(2)}{128\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$-\frac{45M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{16}ln(2)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{45M^6m_c^{14}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{12}ln(2)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{45M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{5400M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1395M^6m_c^{20}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2790M^8m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{2070M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1350M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{990M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1035M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{90M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{495M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^6m_c^{12}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15525M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{45M^6m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5850M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{90M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{20025M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{15165M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2925M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3195M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{20025M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2025M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4050M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{810M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{405M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675M^6m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^8m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2700M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^8m_c^{20}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{450M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{20}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{675M^6m_c^{16}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{7875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{225M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{4725M^6m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^6m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17325M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3150M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{17325M^6m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1275M^8m_c^{18}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{225M^6m_c^{16}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{450M^8m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1275M^6m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1575M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1575M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4125M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1125M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{225M^8m_c^{18}ln(2)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8m_c^{16}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225M^6m_c^{18}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^6m_c^{16}ln(2)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{2340M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{4800M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4500M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{585M^6m_c^{22}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1200M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{900M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1125M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{300M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{225M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{75M^6m_c^{14}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{52560M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{35370M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{25770M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{17685M^6m_c^{18}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3780M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{13140M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^6m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12885M^6m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{36450M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4050M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{54090M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2025M^6m_c^{20}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25470M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{18225M^6m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{3780M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{27045M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12735M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6450M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{60M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{180M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{30M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3225M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^6m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{45M^6m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5400M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1395M^6m_c^{20}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2790M^8m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2070M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1350M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{990M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1035M^6m_c^{16}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{90M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{495M^6m_c^{14}s^3ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6m_c^{12}s^4ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3105M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3105M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5850M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{45M^6m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{90M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15165M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2925M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3195M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15165M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{19575M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2025M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{4050M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{810M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{405M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675M^8m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{20}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2700M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{450M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^6m_c^{20}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln(2)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{225M^6m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{7875M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{4725M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{225M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{4725M^6m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^6m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17325M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3150M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{17325M^6m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1275M^8m_c^{18}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{225M^6m_c^{16}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{450M^8m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1275M^6m_c^{18}ln(2)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1575M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1575M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1125M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{16}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^8m_c^{18}ln(2)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125M^6m_c^{16}ln(2)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^6m_c^{18}ln(2)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2340M^8m_c^{22}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4800M^8m_c^{20}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4500M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{585M^6m_c^{22}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1200M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{900M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1125M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{300M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{225M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{75M^6m_c^{14}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{35370M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{52560M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25770M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{17685M^6m_c^{18}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3780M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{13140M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{12885M^6m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^6m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4050M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{36450M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{54090M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2025M^6m_c^{20}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{25470M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18225M^6m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3780M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{27045M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{945M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12735M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6450M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{60M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{180M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{30M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3225M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{45M^6m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^6m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6}+\frac{15M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5}$$

$$+\frac{45M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{2340M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4800M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4500M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{585M^6m_c^{22}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{900M^8m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1200M^6m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{300M^8m_c^{14}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1125M^6m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{225M^6m_c^{16}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{75M^6m_c^{14}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{35370M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{52560M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{25770M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{17685M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{3780M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{13140M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12885M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{945M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4050M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{36450M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{54090M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{2025M^6m_c^{20}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{25470M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18225M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3780M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{27045M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{945M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12735M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6450M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{60M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{180M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{30M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3225M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{45M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{15M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5400M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1395M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2790M^8m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2070M^8m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{990M^8m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1350M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^8m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{495M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{45M^6m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15525M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{45M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5850M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{20025M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{15165M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2925M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{20025M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2025M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4050M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{810M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{405M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2700M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^8m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{450M^8m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{675M^6m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{7875M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{16425M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{7875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3150M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1575M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1275M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{225M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{450M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1275M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1575M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1575M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1125M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{225M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{675M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{15M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6}-\frac{15M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5}$$

$$+\frac{45M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{45M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{5400M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1395M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2790M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2070M^8m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{990M^8m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1350M^6m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{90M^8m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{495M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{45M^6m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3105M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5850M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{45M^6m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{90M^8m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^8m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15165M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{2925M^6m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{3195M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{19575M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2025M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{4050M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{810M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{19575M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{405M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2700M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{450M^8m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{225M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{225M^6m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{7875M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{16425M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{7875M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3150M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1575M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1275M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{225M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{450M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1275M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4125M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4125M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1125M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1125M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{675M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{2340M^8m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4800M^8m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4500M^8m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{585M^6m_c^{22}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{900M^8m_c^{16}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1200M^6m_c^{20}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{300M^8m_c^{14}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1125M^6m_c^{18}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{225M^6m_c^{16}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{75M^6m_c^{14}s^5ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{52560M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35370M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{25770M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{17685M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3780M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{13140M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{945M^6m_c^{12}s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12885M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{36450M^8m_c^{18}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4050M^8m_c^{20}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{54090M^8m_c^{16}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2025M^6m_c^{20}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{25470M^8m_c^{14}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{18225M^6m_c^{18}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{3780M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{27045M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{12735M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{945M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6450M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{15M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{60M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{180M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3225M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{15M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{45M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)} \tag{162}$$

$$+0 \tag{163}$$

$$\tilde{\rho}_{0,0^{++}}(s,M^2)=+\frac{1701M^{10}m_c^8\sqrt{s-4m_c^2}}{80\pi^6s^{11/2}}-\frac{1323M^{10}m_c^{10}\sqrt{s-4m_c^2}}{32\pi^6s^{13/2}}$$
$$-\frac{25\langle g^2G^2\rangle M^6m_c^6\sqrt{s-4m_c^2}}{128\pi^6s^{9/2}}-\frac{189M^8m_c^{10}\sqrt{s-4m_c^2}}{16\pi^6s^{11/2}}$$
$$+\frac{18677M^8m_c^8\sqrt{s-4m_c^2}}{2560\pi^6s^{9/2}}-\frac{1077M^{10}m_c^6\sqrt{s-4m_c^2}}{320\pi^6s^{9/2}}$$
$$+\frac{5\langle g^2G^2\rangle M^6m_c^4\sqrt{s-4m_c^2}}{384\pi^6s^{7/2}}-\frac{63M^6m_c^{10}\sqrt{s-4m_c^2}}{64\pi^6s^{9/2}}$$
$$+\frac{3M^{10}m_c^4\sqrt{s-4m_c^2}}{40\pi^6s^{7/2}}-\frac{5\langle g^2G^2\rangle M^4m_c^6\sqrt{s-4m_c^2}}{64\pi^6s^{7/2}}$$
$$+\frac{1921M^6m_c^8\sqrt{s-4m_c^2}}{2560\pi^6s^{7/2}}-\frac{3251M^8m_c^6\sqrt{s-4m_c^2}}{2560\pi^6s^{7/2}}$$
$$+\frac{\langle g^2G^2\rangle M^6m_c^2\sqrt{s-4m_c^2}}{96\pi^6s^{5/2}}+\frac{13\langle g^2G^2\rangle M^4m_c^4\sqrt{s-4m_c^2}}{768\pi^6s^{5/2}}$$
$$-\frac{5\langle g^2G^2\rangle M^2m_c^6\sqrt{s-4m_c^2}}{512\pi^6s^{5/2}}-\frac{21M^8m_c^4\sqrt{s-4m_c^2}}{5120\pi^6s^{5/2}}$$
$$+\frac{23\langle g^2G^2\rangle M^4m_c^2\sqrt{s-4m_c^2}}{3072\pi^6s^{3/2}}-\frac{523M^6m_c^6\sqrt{s-4m_c^2}}{2560\pi^6s^{5/2}}$$
$$+\frac{7\langle g^2G^2\rangle M^2m_c^4\sqrt{s-4m_c^2}}{1536\pi^6s^{3/2}}+\frac{87M^6m_c^4\sqrt{s-4m_c^2}}{5120\pi^6s^{3/2}}$$
$$+\frac{\langle g^2G^2\rangle M^2m_c^2\sqrt{s-4m_c^2}}{3072\pi^6\sqrt{s}}-\frac{3969M^{10}m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^8}$$
$$+\frac{2835M^{10}m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^7}-\frac{567M^8m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^7}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^6}-\frac{45M^{10}m_c^8\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^6}$$
$$+\frac{14835M^8m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^6}-\frac{189M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^6}$$
$$+\frac{5\langle g^2G^2\rangle M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^5}+\frac{135M^{10}m_c^6\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^5}$$
$$-\frac{15\langle g^2G^2\rangle M^4m_c^8\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6s^5}-\frac{1035M^8m_c^8\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^5}$$
$$+\frac{25\langle g^2G^2\rangle M^4m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^4}+\frac{1455M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^5}$$
$$+\frac{189M^8m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^4}-\frac{15\langle g^2G^2\rangle M^2m_c^8\sqrt{s\left(s-4m_c^2\right)}}{256\pi^6s^4}$$
$$+\frac{3\langle g^2G^2\rangle M^4m_c^4\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^3}-\frac{135M^6m_c^8\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6s^4}$$
$$+\frac{5\langle g^2G^2\rangle M^2m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^3}+\frac{3M^8m_c^4\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^3}$$
$$+\frac{45M^6m_c^6\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^3}-\frac{3\langle g^2G^2\rangle M^4m_c^2\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^2}$$
$$-\frac{3\langle g^2G^2\rangle M^2m_c^4\sqrt{s\left(s-4m_c^2\right)}}{512\pi^6s^2}-\frac{3M^6m_c^4\sqrt{s\left(s-4m_c^2\right)}}{128\pi^6s^2}$$
$$+\frac{15M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{3M^6m_c^{12}}{1024\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{\langle g^2G^2\rangle M^4m_c^{10}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$+\frac{225\langle g^2G^2\rangle M^6m_c^{12}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{\langle g^2G^2\rangle M^2m_c^{10}}{2048\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$
$$-\frac{235\langle g^2G^2\rangle M^6m_c^{10}}{384\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{675M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$
$$+\frac{45\langle g^2G^2\rangle M^4m_c^{12}}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{235M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{47\langle g^2G^2\rangle M^4m_c^{10}}{192\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{135M^6m_c^{14}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{45\langle g^2G^2\rangle M^2m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{47M^6m_c^{12}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{47\langle g^2G^2\rangle M^2m_c^{10}}{1536\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{225M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}-\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{12}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^3}$$

$$+\frac{15\langle g^2G^2\rangle M^6m_c^{10}}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{225M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{12}}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{45M^8m_c^{12}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^{10}}{32\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{45M^6m_c^{14}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$-\frac{15\langle g^2G^2\rangle M^2m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{9M^6m_c^{12}}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}+\frac{3\langle g^2G^2\rangle M^2m_c^{10}}{256\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^2}$$
$$+\frac{135M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{45\langle g^2G^2\rangle M^6m_c^{10}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{27M^6m_c^{12}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{9\langle g^2G^2\rangle M^4m_c^{10}}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{9\langle g^2G^2\rangle M^2m_c^{10}}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{5\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{15M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}-\frac{5\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)}$$
$$+\frac{5\langle g^2G^2\rangle M^6m_c^{10}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15M^8m_c^{12}}{1024\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{\langle g^2G^2\rangle M^4m_c^{10}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{3M^6m_c^{12}}{1024\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$
$$+\frac{\langle g^2G^2\rangle M^2m_c^{10}}{2048\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{225\langle g^2G^2\rangle M^6m_c^{12}}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{235\langle g^2G^2\rangle M^6m_c^{10}}{384\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{675M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{45\langle g^2G^2\rangle M^4m_c^{12}}{64\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{235M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{47\langle g^2G^2\rangle M^4m_c^{10}}{192\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{135M^6m_c^{14}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{45\langle g^2G^2\rangle M^2m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{47M^6m_c^{12}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{47\langle g^2G^2\rangle M^2m_c^{10}}{1536\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{225M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}-\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^3}$$
$$-\frac{15\langle g^2G^2\rangle M^6m_c^{10}}{64\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{225M^8m_c^{14}}{256\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}}{64\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{45M^8m_c^{12}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$-\frac{3\langle g^2G^2\rangle M^4m_c^{10}}{32\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{45M^6m_c^{14}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}+\frac{9M^6m_c^{12}}{128\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{3\langle g^2G^2\rangle M^2m_c^{10}}{256\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{1024\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}-\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^2}$$
$$+\frac{45\langle g^2G^2\rangle M^6m_c^{10}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{135M^8m_c^{12}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$
$$+\frac{9\langle g^2G^2\rangle M^4m_c^{10}}{64\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{27M^6m_c^{12}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$
$$+\frac{9\langle g^2G^2\rangle M^2m_c^{10}}{512\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{25\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{75M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{5\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{15M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}-\frac{5\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)}$$

$$+\frac{8000\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{5900\langle g^2G^2\rangle M^4m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{12000M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4425M^6m_c^{20}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{14750\langle g^2G^2\rangle M^6m_c^{18}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{22125M^8m_c^{20}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3200\langle g^2G^2\rangle M^4m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{25750\langle g^2G^2\rangle M^6m_c^{14}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1475\langle g^2G^2\rangle M^2m_c^{18}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{38625M^8m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1750\langle g^2G^2\rangle M^6m_c^{12}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2400M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{10300\langle g^2G^2\rangle M^4m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2625M^8m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{400\langle g^2G^2\rangle M^2m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{7725M^6m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1250\langle g^2G^2\rangle M^6m_c^{10}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{700\langle g^2G^2\rangle M^4m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2575\langle g^2G^2\rangle M^2m_c^{14}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1875M^8m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{500\langle g^2G^2\rangle M^4 m_c^{10} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{525M^6 m_c^{14} s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{175\langle g^2G^2\rangle M^2 m_c^{12} s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6 m_c^{12} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3125\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{9375M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1250\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1875M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{250\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1875M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^2 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{375M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{18250\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{500\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{27375M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1250\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{375M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{44125\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1875M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{7300\langle g^2G^2\rangle M^4 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{132375M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^2 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{5475M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{17650\langle g^2G^2\rangle M^4 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{12625\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{37875M^8 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1825\langle g^2G^2\rangle M^2 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{26475M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1875M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5050\langle g^2G^2\rangle M^4 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{8825\langle g^2G^2\rangle M^2 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{7575M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{250\langle g^2G^2\rangle M^4 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2525\langle g^2G^2\rangle M^2 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{375M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10500\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{29375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{88125M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7875M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{26250\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{39375M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5250\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{11750\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2625\langle g^2G^2\rangle M^2 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7875M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2100\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{17625M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5875\langle g^2G^2\rangle M^2 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1575M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{525\langle g^2G^2\rangle M^2 m_c^{12} s^3\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{16875\langle g^2G^2\rangle M^6 m_c^{14}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{50625M^8 m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5100\langle g^2G^2\rangle M^4 m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3825M^6 m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1175\langle g^2G^2\rangle M^2 m_c^{18}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17625M^8 m_c^{20}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6 m_c^{18}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{12750\langle g^2G^2\rangle M^6 m_c^{16}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1175\langle g^2G^2\rangle M^4 m_c^{18}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{19125M^8 m_c^{18}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{3525M^6 m_c^{20}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3625\langle g^2G^2\rangle M^6 m_c^{12} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3375\langle g^2G^2\rangle M^4 m_c^{14} s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1275\langle g^2G^2\rangle M^2 m_c^{16} s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10875M^8 m_c^{14} s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{10125M^6 m_c^{16} s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1450\langle g^2G^2\rangle M^4 m_c^{12} s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1125M^8 m_c^{12} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{3375\langle g^2G^2\rangle M^2 m_c^{14} s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2175M^6 m_c^{14} s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{725\langle g^2G^2\rangle M^2 m_c^{12} s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2 m_c^{10} s^4}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6 m_c^{12} s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1125M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{18500\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1175\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{27750M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3525M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17625M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{33875\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7400\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{101625M^8 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1175\langle g^2G^2\rangle M^2 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5550M^6 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{375\langle g^2G^2\rangle M^6 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{6775\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{925\langle g^2G^2\rangle M^2 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{1125M^8 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{20325M^6 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^4 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{6775\langle g^2G^2\rangle M^2 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{18625\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{7150\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{55875M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^2 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{10725M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{53625M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{53625M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{10725M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^4 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3575\langle g^2G^2\rangle M^2 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^2 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{11175M^6 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2375\langle g^2G^2\rangle M^6m_c^{12}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1900\langle g^2G^2\rangle M^4m_c^{14}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{5075\langle g^2G^2\rangle M^2m_c^{16}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2375M^8m_c^{14}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{25375\langle g^2G^2\rangle M^6m_c^{16}}{6\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{475M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4750\langle g^2G^2\rangle M^6m_c^{14}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{25375M^8m_c^{18}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{5075\langle g^2G^2\rangle M^4m_c^{16}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2375M^8m_c^{16}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5075M^6m_c^{18}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^4m_c^{12}s}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{125M^8m_c^{12}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{14}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{475M^6m_c^{14}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{12}s^2}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s^2}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25M^6m_c^{12}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^3}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1175\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{24625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{24625M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1075\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{5375\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3525M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{5375M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1075\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{17625M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1075M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{4925\langle g^2G^2\rangle M^4 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{125M^8 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1175\langle g^2G^2\rangle M^2 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4925M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4925\langle g^2G^2\rangle M^2 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^2 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4075\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2075\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{125M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{10375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4075M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{20375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{31125M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2075\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{20375M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{6225M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4075\langle g^2G^2\rangle M^2 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{25M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^6 m_c^{10}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{25\langle g^2G^2\rangle M^2 m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^4 m_c^{12}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375M^8 m_c^{12}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1075\langle g^2G^2\rangle M^2 m_c^{14}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{375M^6 m_c^{14}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4625\langle g^2G^2\rangle M^6 m_c^{16}}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{13875M^8 m_c^{18}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{5375\langle g^2G^2\rangle M^6 m_c^{14}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{925\langle g^2G^2\rangle M^4 m_c^{16}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{16125M^8 m_c^{16}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2775M^6 m_c^{18}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{14}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{625\langle g^2G^2\rangle M^6 m_c^{12}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^2 m_c^{16}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1875M^8 m_c^{14}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3225M^6 m_c^{16}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{125\langle g^2G^2\rangle M^2m_c^{12}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75M^6m_c^{12}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{625\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^2m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1875M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4625\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{13875M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{9375M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2775M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{625\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^2m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{4125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{4125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{12375M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{825\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{12375M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{2475M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{825\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{2475M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{14460\langle g^2G^2\rangle M^6 m_c^{20}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{21690M^8 m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{23000\langle g^2G^2\rangle M^6 m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{5784\langle g^2G^2\rangle M^4 m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{34500M^8 m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4338M^6 m_c^{22}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9200\langle g^2G^2\rangle M^4 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25580\langle g^2G^2\rangle M^6 m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{723\langle g^2G^2\rangle M^2 m_c^{20}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{38370M^8 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{6140\langle g^2G^2\rangle M^6 m_c^{14}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6900M^6 m_c^{20}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{9210M^8 m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{10232\langle g^2G^2\rangle M^4 m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1150\langle g^2G^2\rangle M^2 m_c^{18}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{7674M^6 m_c^{18}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8780\langle g^2G^2\rangle M^6 m_c^{12}s^4}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2456\langle g^2G^2\rangle M^4 m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1279\langle g^2G^2\rangle M^2 m_c^{16}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4390M^8 m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{40\langle g^2G^2\rangle M^6 m_c^{10} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1842M^6 m_c^{16} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{3512\langle g^2G^2\rangle M^4 m_c^{12} s^5}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{60M^8 m_c^{12} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{307\langle g^2G^2\rangle M^2 m_c^{14} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{878M^6 m_c^{14} s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{16\langle g^2G^2\rangle M^4 m_c^{10} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{439\langle g^2G^2\rangle M^2 m_c^{12} s^6}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{2\langle g^2G^2\rangle M^2 m_c^{10} s^7}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12M^6 m_c^{12} s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{148245M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{98830\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{66040\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{39532\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{29649M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{99060M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{26416\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{33290\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{16645M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{9883\langle g^2G^2\rangle M^2 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{20\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{19812M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{13316\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{30M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{3302\langle g^2G^2\rangle M^2 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3329M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3329\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{44325M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{29550\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{81950\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{11820\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8865M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{122925M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{32780\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{199570\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{99785M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2955\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{42310\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{24585M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{79828\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{21155M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8195\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{19957M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{20\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{16924\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{19957\langle g^2G^2\rangle M^2m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{30M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{8\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4231\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{77650\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{1048\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{38825M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{262M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2620\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1310M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2620\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{31060\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3930M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{131\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{1310\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1048\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{7765\langle g^2G^2\rangle M^2m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{655M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{524\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{786M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{131\langle g^2G^2\rangle M^2m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8000\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{131\langle g^2G^2\rangle M^2m_c^{14}s^4\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5900\langle g^2G^2\rangle M^4m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{12000M^8m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{14750\langle g^2G^2\rangle M^6m_c^{18}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4425M^6m_c^{20}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{25750\langle g^2G^2\rangle M^6m_c^{14}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{22125M^8m_c^{20}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3200\langle g^2G^2\rangle M^4m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{38625M^8m_c^{16}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1475\langle g^2G^2\rangle M^2m_c^{18}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2400M^6m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1750\langle g^2G^2\rangle M^6m_c^{12}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10300\langle g^2G^2\rangle M^4m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{400\langle g^2G^2\rangle M^2m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2625M^8m_c^{14}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1250\langle g^2G^2\rangle M^6m_c^{10}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7725M^6m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{700\langle g^2G^2\rangle M^4m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^8m_c^{12}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2575\langle g^2G^2\rangle M^2m_c^{14}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525M^6m_c^{14}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{500\langle g^2G^2\rangle M^4m_c^{10}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{175\langle g^2G^2\rangle M^2m_c^{12}s^4}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6 m_c^{12} s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9375M^8 m_c^{14} s^{3/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3125\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1250\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1875M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{250\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{625\langle g^2G^2\rangle M^2 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{18250\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{500\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{375M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{27375M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1875M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1250\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7300\langle g^2G^2\rangle M^4 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{44125\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{132375M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{125\langle g^2G^2\rangle M^2 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{12625\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5475M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{17650\langle g^2G^2\rangle M^4 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{37875M^8 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1825\langle g^2G^2\rangle M^2 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{26475M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{625\langle g^2G^2\rangle M^6 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5050\langle g^2G^2\rangle M^4 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{8825\langle g^2G^2\rangle M^2 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1875M^8 m_c^{12} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{250\langle g^2G^2\rangle M^4 m_c^{10} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7575M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2525\langle g^2G^2\rangle M^2 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{375M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{29375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{125\langle g^2G^2\rangle M^2 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{10500\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{88125M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7875M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26250\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{39375M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5250\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{11750\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7875M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2625\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{17625M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5875\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2100\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1575M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{525\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{16875\langle g^2G^2\rangle M^6m_c^{14}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{5100\langle g^2G^2\rangle M^4m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1175\langle g^2G^2\rangle M^2m_c^{18}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{50625M^8m_c^{16}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5875\langle g^2G^2\rangle M^6m_c^{18}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3825M^6m_c^{18}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{12750\langle g^2G^2\rangle M^6m_c^{16}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17625M^8m_c^{20}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1175\langle g^2G^2\rangle M^4m_c^{18}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{19125M^8m_c^{18}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3625\langle g^2G^2\rangle M^6m_c^{12}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3525M^6m_c^{20}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3375\langle g^2G^2\rangle M^4m_c^{14}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{10875M^8m_c^{14}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1275\langle g^2G^2\rangle M^2m_c^{16}s}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10125M^6m_c^{16}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{10}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1450\langle g^2G^2\rangle M^4m_c^{12}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3375\langle g^2G^2\rangle M^2m_c^{14}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{1125M^8m_c^{12}s^2}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2175M^6m_c^{14}s^2}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^3}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{225M^6m_c^{12}s^3}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{725\langle g^2G^2\rangle M^2m_c^{12}s^3}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{375\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^4}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{1125M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{225M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}\sqrt{s-4m_c^2}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{18500\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1175\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{3525M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{27750M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{17625M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{7400\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{33875\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{101625M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1175\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{375\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5550M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{1125M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6775\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{925\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{20325M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6775\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{18625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7150\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^2m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{55875M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{17875\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{10725M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{17875\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{53625M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3575\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{53625M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3725\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{10725M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{3575\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{11175M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2375\langle g^2G^2\rangle M^6m_c^{12}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{3725\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1900\langle g^2G^2\rangle M^4m_c^{14}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2375M^8m_c^{14}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{5075\langle g^2G^2\rangle M^2m_c^{16}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{475M^6m_c^{16}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25375M^8m_c^{18}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25375\langle g^2G^2\rangle M^6m_c^{16}}{6\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4750\langle g^2G^2\rangle M^6m_c^{14}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5075\langle g^2G^2\rangle M^4m_c^{16}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5075M^6m_c^{18}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2375M^8m_c^{16}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^4m_c^{12}s}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{14}s}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{125M^8m_c^{12}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s^2}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{475M^6m_c^{14}s}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{475\langle g^2G^2\rangle M^2m_c^{12}s^2}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{25M^6m_c^{12}s^2}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{24625\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^3}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1175\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{24625M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{24\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{3525M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5375\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5375M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1075\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5875\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{17625M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1075M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4925\langle g^2G^2\rangle M^4 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{125\langle g^2G^2\rangle M^6 m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125M^8 m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1175\langle g^2G^2\rangle M^2 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4 m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4925M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4925\langle g^2G^2\rangle M^2 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{25M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^2 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4075\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2075\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4075M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{10375\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{31125M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2075\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{20375\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{12\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{20375M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6225M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4075\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}}{48\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{125\langle g^2G^2\rangle M^4m_c^{12}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{125\langle g^2G^2\rangle M^6m_c^{10}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375M^8m_c^{12}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1075\langle g^2G^2\rangle M^2m_c^{14}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{4625\langle g^2G^2\rangle M^6m_c^{16}}{8\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375M^6m_c^{14}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{13875M^8m_c^{18}}{16\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{5375\langle g^2G^2\rangle M^6m_c^{14}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{16125M^8m_c^{16}}{32\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{925\langle g^2G^2\rangle M^4m_c^{16}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{625\langle g^2G^2\rangle M^6m_c^{12}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{2775M^6m_c^{18}}{16\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{1075\langle g^2G^2\rangle M^4m_c^{14}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1875M^8m_c^{14}}{16\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{3225M^6m_c^{16}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{925\langle g^2G^2\rangle M^2m_c^{16}}{32\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{125\langle g^2G^2\rangle M^2m_c^{12}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^4m_c^{10}s}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75M^6m_c^{12}s}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^2m_c^{10}s^2}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{125\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{625\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{375M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4625\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1875M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{3125\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{13875M^8 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{925\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{9375M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{25\langle g^2G^2\rangle M^4 m_c^{10} s\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{2775M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75M^6 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{625\langle g^2G^2\rangle M^2 m_c^{12} s\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^2 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{25\langle g^2G^2\rangle M^2 m_c^{10} s^2\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{12375M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{4125\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{4125\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{825\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{2475M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{12375M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{825\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{825\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{14460\langle g^2G^2\rangle M^6 m_c^{20}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2475M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}}{32\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{23000\langle g^2G^2\rangle M^6 m_c^{18}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{21690M^8 m_c^{22}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5784\langle g^2G^2\rangle M^4 m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{34500M^8 m_c^{20}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{25580\langle g^2G^2\rangle M^6 m_c^{16}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4338M^6 m_c^{22}s}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9200\langle g^2G^2\rangle M^4 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{38370M^8 m_c^{18}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{723\langle g^2G^2\rangle M^2 m_c^{20}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6900M^6 m_c^{20}s^2}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{6140\langle g^2G^2\rangle M^6 m_c^{14}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{10232\langle g^2G^2\rangle M^4 m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1150\langle g^2G^2\rangle M^2 m_c^{18}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{9210M^8 m_c^{16}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{8780\langle g^2G^2\rangle M^6 m_c^{12}s^4}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{7674M^6 m_c^{18}s^3}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{2456\langle g^2G^2\rangle M^4 m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4390M^8 m_c^{14}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1842M^6 m_c^{16}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1279\langle g^2G^2\rangle M^2 m_c^{16}s^4}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{40\langle g^2G^2\rangle M^6 m_c^{10}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3512\langle g^2G^2\rangle M^4 m_c^{12}s^5}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{307\langle g^2G^2\rangle M^2m_c^{14}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{60M^8m_c^{12}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{16\langle g^2G^2\rangle M^4m_c^{10}s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{878M^6m_c^{14}s^5}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{439\langle g^2G^2\rangle M^2m_c^{12}s^6}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12M^6m_c^{12}s^6}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{98830\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2\langle g^2G^2\rangle M^2m_c^{10}s^7}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{66040\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{148245M^8m_c^{18}s^{3/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{39532\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{99060M^8m_c^{16}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{33290\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{29649M^6m_c^{18}s^{5/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{26416\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{16645M^8m_c^{14}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{9883\langle g^2G^2\rangle M^2m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{19812M^6m_c^{16}s^{7/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{13316\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{20\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{30M^8m_c^{12}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3302\langle g^2G^2\rangle M^2m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{8\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3329M^6m_c^{14}s^{9/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3329\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{6M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{29550\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2}\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{81950\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{44325M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{11820\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{122925M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{199570\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8865M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{32780\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{99785M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2955\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{24585M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{79828\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{42310\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{21155M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8195\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{20\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{19957M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{16924\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{19957\langle g^2G^2\rangle M^2m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4231M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{8\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4231\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1048\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{77650\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{38825M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{262M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2620\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1310M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2620\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{31060\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3930M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{7765M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1310\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1048\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{655M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{7765\langle g^2G^2\rangle M^2m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{786M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131\langle g^2G^2\rangle M^2m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{524\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}}{3\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{131M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{131\langle g^2G^2\rangle M^2m_c^{14}s^4\sqrt{s\left(s-4m_c^2\right)}}{6\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{2835M^{10}m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{4\pi^6s^7}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^6}$$

$$+\frac{14835M^8m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^6}-\frac{180M^{10}m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{\pi^6s^6}$$

$$+\frac{5\langle g^2G^2\rangle M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{4\pi^6s^5}+\frac{135M^{10}m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{8\pi^6s^5}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{8\pi^6s^5}-\frac{1035M^8m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^5}$$

$$+\frac{25\langle g^2G^2\rangle M^4m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^4}+\frac{1455M^6m_c^{12}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^5}$$

$$+\frac{189M^8m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{64\pi^6s^4}$$

$$+\frac{3\langle g^2G^2\rangle M^4m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^3}-\frac{135M^6m_c^{10}\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^4}$$

$$+\frac{5\langle g^2G^2\rangle M^2m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^3}+\frac{3M^8m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^3}$$

$$+\frac{45M^6m_c^8\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^3}-\frac{3\langle g^2G^2\rangle M^4m_c^4\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^2}$$

$$-\frac{3\langle g^2G^2\rangle M^2m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{128\pi^6s^2}-\frac{3M^6m_c^6\tanh^{-1}\left(\sqrt{1-\frac{4m_c^2}{s}}\right)}{32\pi^6s^2}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{64\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{225M^8m_c^{16}ln(2)}{128\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{32\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{32\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{225M^8m_c^{14}ln(2)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{16}ln(2)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{16\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{225M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^6m_c^{14}ln(2)}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}ln(2)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{225M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{225M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{64\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)}{32\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{225M^8m_c^{16}ln(2)}{128\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{32\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{225M^8m_c^{14}ln(2)}{64\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{16}ln(2)}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)}{16\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{225M^8m_c^{12}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{14}ln(2)}{64\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)}{128\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)}{64\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln(2)}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)}{512\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{225M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{32\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{128\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{225M^8m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{64\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{512\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{18000\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3720\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{27000M^8m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2790M^6m_c^{20}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{9300\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{13950M^8m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6900\langle g^2G^2\rangle M^6m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{7200\langle g^2G^2\rangle M^4m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{465\langle g^2G^2\rangle M^2m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{10350M^8m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{3300\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5400M^6m_c^{18}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2760\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{4950M^8m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{900\langle g^2G^2\rangle M^2m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2070M^6m_c^{16}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{300\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1320\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^2m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{450M^8m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{990M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{120\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{90M^6m_c^{12}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{51750\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{10350\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{77625M^8m_c^{14}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{20700\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15525M^8m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{4140\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^2m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{3105M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{19500\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1035\langle g^2G^2\rangle M^2m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{120\langle g^2G^2\rangle M^4m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{29250M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{300\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{90M^6m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{66750\langle g^2G^2\rangle M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{450M^8m_c^{20}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{7800\langle g^2G^2\rangle M^4m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{100125M^8m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{5850M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{26700\langle g^2G^2\rangle M^4m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{50550\langle g^2G^2\rangle M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{75825M^8m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{975\langle g^2G^2\rangle M^2m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10650\langle g^2G^2\rangle M^6m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20025M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{20220\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15975M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15165M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4260\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3195M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5400\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{65250\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{97875M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4050M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{13500\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{20250M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2700\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{26100\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4050M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{1080\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{810M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{2250\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{3600\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{3375M^8m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^2m_c^{18}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2700M^6m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1125M^8m_c^{20}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{750\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{9000\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{300\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{13500M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1500\langle g^2G^2\rangle M^6m_c^{12}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{900\langle g^2G^2\rangle M^4m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{450\langle g^2G^2\rangle M^2m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{2250M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{675M^6m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{600\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{450M^6m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{39375M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{15750\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{300\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{23625M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1125M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{750\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{6300\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{27375\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{82125M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4725M^6m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{10950\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{39375M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^2 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{16425M^6 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{5475\langle g^2G^2\rangle M^2 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2 m_c^{10} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6 m_c^{12} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{28875\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{4200\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{86625M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5250\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{3150M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{10500\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2100\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{15750M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{11550\langle g^2G^2\rangle M^4 m_c^{12} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1575M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^2 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{17325M^6 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^2 m_c^{12} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{600\langle g^2G^2\rangle M^4 m_c^{14} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{450M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{425\langle g^2G^2\rangle M^2 m_c^{16} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6375M^8m_c^{18}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4250\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1500\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1700\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2250M^8m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1275M^6m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2100\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{20625M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1575M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{250\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5250\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{100\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{7875M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{2750\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5625M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{750\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4125M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1875\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2750\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{5625M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5625M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{3750\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1500\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{20625M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{750\langle g^2G^2\rangle M^4m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1125M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8m_c^{18}ln(2)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{5625M^8m_c^{16}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^6m_c^{18}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1125M^6m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{1125\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{3375M^8m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{225M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{3375M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3375M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{7800\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{11700M^8 m_c^{22} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{16000\langle g^2G^2\rangle M^6 m_c^{18} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3120\langle g^2G^2\rangle M^4 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{24000M^8 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{2340M^6 m_c^{22} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{15000\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{6400\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{390\langle g^2G^2\rangle M^2 m_c^{20} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{22500M^8 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{3000\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4800M^6 m_c^{20} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6000\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{4500M^8 m_c^{16} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{800\langle g^2G^2\rangle M^2 m_c^{18} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4500M^6 m_c^{18} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1000\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1200\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{750\langle g^2G^2\rangle M^2 m_c^{16} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1500M^8 m_c^{14} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{900M^6 m_c^{16} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{400\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{300M^6 m_c^{14} s^5 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{150\langle g^2G^2\rangle M^2 m_c^{14} s^5 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{117900\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{50\langle g^2G^2\rangle M^2 m_c^{12} s^6 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{175200\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{176850M^8 m_c^{18} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{47160\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{262800M^8 m_c^{16} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{35370M^6 m_c^{18} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{85900\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{70080\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{128850M^8 m_c^{14} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5895\langle g^2G^2\rangle M^2 m_c^{16} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{52560M^6 m_c^{16} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{12600\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{34360\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8760\langle g^2G^2\rangle M^2 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18900M^8 m_c^{12} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5040\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{25770M^6 m_c^{14} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{4295\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3780M^6 m_c^{12} s^{11/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{630\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{13500\langle g^2G^2\rangle M^6 m_c^{18} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{121500\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{20250M^8 m_c^{20} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{5400\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{182250M^8 m_c^{18} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4050M^6 m_c^{20} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{180300\langle g^2G^2\rangle M^6 m_c^{14} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{48600\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{270450M^8 m_c^{16} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{675\langle g^2G^2\rangle M^2 m_c^{18} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{36450M^6 m_c^{18} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{84900\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{72120\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{6075\langle g^2G^2\rangle M^2 m_c^{16} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{127350M^8 m_c^{14} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{54090M^6 m_c^{16} s^4 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{12600\langle g^2G^2\rangle M^6 m_c^{10} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{33960\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{18900M^8 m_c^{12} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{9015\langle g^2G^2\rangle M^2 m_c^{14} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25470M^6 m_c^{14} s^5 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4245\langle g^2G^2\rangle M^2 m_c^{12} s^6 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5040\langle g^2G^2\rangle M^4 m_c^{10} s^6 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{3780M^6 m_c^{12} s^6 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{630\langle g^2G^2\rangle M^2 m_c^{10} s^7 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{21500\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{80\langle g^2G^2\rangle M^4 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{60M^6 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{32250M^8 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{300M^8 m_c^{22} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{200\langle g^2G^2\rangle M^6 m_c^{20} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{8600\langle g^2G^2\rangle M^4 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{600\langle g^2G^2\rangle M^6 m_c^{16} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{900M^8 m_c^{18} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{10\langle g^2G^2\rangle M^2 m_c^{20} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{100\langle g^2G^2\rangle M^6 m_c^{14} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6450M^6 m_c^{20} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{240\langle g^2G^2\rangle M^4 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{150M^8 m_c^{16} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1075\langle g^2G^2\rangle M^2 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{180M^6 m_c^{18} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{40\langle g^2G^2\rangle M^4 m_c^{14} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{30\langle g^2G^2\rangle M^2 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5\langle g^2G^2\rangle M^2 m_c^{14} s^4 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{30M^6 m_c^{16} s^3 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{18000\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{3720\langle g^2G^2\rangle M^4 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{27000M^8 m_c^{18} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2790M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{9300\langle g^2G^2\rangle M^6 m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{13950M^8 m_c^{20} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6900\langle g^2G^2\rangle M^6 m_c^{14} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{7200\langle g^2G^2\rangle M^4 m_c^{16} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{465\langle g^2G^2\rangle M^2 m_c^{18} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10350M^8 m_c^{16} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3300\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5400M^6 m_c^{18} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2760\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{4950M^8 m_c^{14} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{900\langle g^2G^2\rangle M^2 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2070M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{300\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1320\langle g^2G^2\rangle M^4 m_c^{12} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{345\langle g^2G^2\rangle M^2 m_c^{14} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{450M^8 m_c^{12} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{990M^6 m_c^{14} s^3 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{120\langle g^2G^2\rangle M^4 m_c^{10} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^6 m_c^{12} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{165\langle g^2G^2\rangle M^2 m_c^{12} s^4 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{51750\langle g^2G^2\rangle M^6 m_c^{12} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15\langle g^2G^2\rangle M^2 m_c^{10} s^5 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10350\langle g^2G^2\rangle M^6 m_c^{10} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{77625M^8 m_c^{14} s^{3/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{20700\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^8 m_c^{12} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4140\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15525M^6 m_c^{14} s^{5/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^2 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3105M^6 m_c^{12} s^{7/2} ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{19500\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1035\langle g^2G^2\rangle M^2 m_c^{10} s^{9/2} ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{120\langle g^2G^2\rangle M^4 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{29250M^8 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{90M^6 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{300\langle g^2G^2\rangle M^6 m_c^{18} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{450M^8 m_c^{20} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{66750\langle g^2G^2\rangle M^6 m_c^{14} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{7800\langle g^2G^2\rangle M^4 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{100125M^8 m_c^{16} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^2 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5850M^6 m_c^{18} s ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{50550\langle g^2G^2\rangle M^6 m_c^{12} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{26700\langle g^2G^2\rangle M^4 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^2 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{75825M^8 m_c^{14} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20025M^6 m_c^{16} s^2 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{10650\langle g^2G^2\rangle M^6 m_c^{10} s^3 ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20220\langle g^2G^2\rangle M^4m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15975M^8m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15165M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4260\langle g^2G^2\rangle M^4m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{65250\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5400\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4050M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{97875M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20250M^8m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{13500\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{26100\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2700\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4050M^8m_c^{14}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{675\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{1080\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{19575M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6525\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{810M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2250\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{135\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{3600\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3375M^8m_c^{16}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{18}ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{2700M^6m_c^{18}ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{750\langle g^2G^2\rangle M^6m_c^{18}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1125M^8m_c^{20}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{300\langle g^2G^2\rangle M^4m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{9000\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{13500M^8m_c^{18}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{20}ln(2)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1500\langle g^2G^2\rangle M^6m_c^{12}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{900\langle g^2G^2\rangle M^4m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{450\langle g^2G^2\rangle M^2m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2250M^8m_c^{14}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{600\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{675M^6m_c^{16}sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{450M^6m_c^{14}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{39375M^8m_c^{12}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{15750\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{300\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{23625M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1125M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{750\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{6300\langle g^2G^2\rangle M^4m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{27375\langle g^2G^2\rangle M^6m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{82125M^8m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4725M^6m_c^{16}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{10950\langle g^2G^2\rangle M^4m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{39375M^8m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{16425M^6m_c^{14}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6m_c^{12}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{28875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{4200\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{86625M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5250\langle g^2G^2\rangle M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3150M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{10500\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^8 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2100\langle g^2G^2\rangle M^4 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{15750M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{11550\langle g^2G^2\rangle M^4 m_c^{12} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1575M^6 m_c^{18} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{525\langle g^2G^2\rangle M^2 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{17325M^6 m_c^{14} sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{5775\langle g^2G^2\rangle M^2 m_c^{12} s^2 ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{600\langle g^2G^2\rangle M^4 m_c^{14} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{450M^6 m_c^{16} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{425\langle g^2G^2\rangle M^2 m_c^{16} ln(2)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6375M^8 m_c^{18} ln(2)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4250\langle g^2G^2\rangle M^6 m_c^{16} ln(2)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1500\langle g^2G^2\rangle M^6 m_c^{14} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1700\langle g^2G^2\rangle M^4 m_c^{16} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2250M^8 m_c^{16} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1275M^6 m_c^{18} ln(2)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75\langle g^2G^2\rangle M^2 m_c^{14} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{2100\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{20625M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1575M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{250\langle g^2G^2\rangle M^6m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375M^8m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{100\langle g^2G^2\rangle M^4m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5250\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{7875M^8m_c^{16}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{75M^6m_c^{18}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2750\langle g^2G^2\rangle M^4m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1875\langle g^2G^2\rangle M^6m_c^{10}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5625M^8m_c^{12}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{525\langle g^2G^2\rangle M^2m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{750\langle g^2G^2\rangle M^4m_c^{10}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^6m_c^{14}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1125M^6m_c^{12}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{10}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{2750\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5625M^8m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4125M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{3750\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5625M^8m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1500\langle g^2G^2\rangle M^4m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{20625M^8m_c^{14}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{16}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{750\langle g^2G^2\rangle M^4m_c^{10}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1375\langle g^2G^2\rangle M^2m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6m_c^{12}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln(2)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln(2)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1125M^8m_c^{18}ln(2)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln(2)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{5625M^8m_c^{16}ln(2)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln(2)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{225M^6m_c^{18}ln(2)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^6m_c^{16}ln(2)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225\langle g^2G^2\rangle M^4m_c^{12}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6m_c^{14}ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{1125\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{4\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^8 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{3375M^8 m_c^{14} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2 m_c^{12} sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^6 m_c^{16} ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125\langle g^2G^2\rangle M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125\langle g^2G^2\rangle M^6 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{3375M^8 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3375M^8 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4 m_c^{12} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6 m_c^{16} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6 m_c^{14} ln(2)\sqrt{s\left(s-4m_c^2\right)}}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{7800\langle g^2G^2\rangle M^6 m_c^{20} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{11700M^8 m_c^{22} ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{16000\langle g^2G^2\rangle M^6 m_c^{18} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3120\langle g^2G^2\rangle M^4 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{24000M^8 m_c^{20} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{2340M^6 m_c^{22} sln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{15000\langle g^2G^2\rangle M^6 m_c^{16} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{6400\langle g^2G^2\rangle M^4 m_c^{18} s^2 ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{390\langle g^2G^2\rangle M^2m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{22500M^8m_c^{18}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{3000\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4800M^6m_c^{20}s^2ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{6000\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4500M^8m_c^{16}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{800\langle g^2G^2\rangle M^2m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4500M^6m_c^{18}s^3ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{1000\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1200\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{750\langle g^2G^2\rangle M^2m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1500M^8m_c^{14}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{900M^6m_c^{16}s^4ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{400\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{300M^6m_c^{14}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{150\langle g^2G^2\rangle M^2m_c^{14}s^5ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{117900\langle g^2G^2\rangle M^6m_c^{16}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{50\langle g^2G^2\rangle M^2m_c^{12}s^6ln(2)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{175200\langle g^2G^2\rangle M^6m_c^{14}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{176850M^8m_c^{18}s^{3/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{47160\langle g^2G^2\rangle M^4m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{262800M^8m_c^{16}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{85900\langle g^2G^2\rangle M^6m_c^{12}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{35370M^6m_c^{18}s^{5/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{70080\langle g^2G^2\rangle M^4m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{128850M^8m_c^{14}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5895\langle g^2G^2\rangle M^2m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{52560M^6m_c^{16}s^{7/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{34360\langle g^2G^2\rangle M^4m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12600\langle g^2G^2\rangle M^6m_c^{10}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{18900M^8m_c^{12}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8760\langle g^2G^2\rangle M^2m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{5040\langle g^2G^2\rangle M^4m_c^{10}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25770M^6m_c^{14}s^{9/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4295\langle g^2G^2\rangle M^2m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{3780M^6m_c^{12}s^{11/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{13500\langle g^2G^2\rangle M^6m_c^{18}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{630\langle g^2G^2\rangle M^2m_c^{10}s^{13/2}ln(2)\sqrt{s-4m_c^2}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{121500\langle g^2G^2\rangle M^6m_c^{16}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{20250M^8m_c^{20}sln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{5400\langle g^2G^2\rangle M^4m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{182250M^8m_c^{18}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{180300\langle g^2G^2\rangle M^6m_c^{14}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4050M^6m_c^{20}s^2ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{48600\langle g^2G^2\rangle M^4m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{270450M^8m_c^{16}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{675\langle g^2G^2\rangle M^2m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{36450M^6m_c^{18}s^3ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{72120\langle g^2G^2\rangle M^4m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{84900\langle g^2G^2\rangle M^6m_c^{12}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{127350M^8m_c^{14}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6075\langle g^2G^2\rangle M^2m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{12600\langle g^2G^2\rangle M^6m_c^{10}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{54090M^6m_c^{16}s^4ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{33960\langle g^2G^2\rangle M^4m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18900M^8m_c^{12}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{9015\langle g^2G^2\rangle M^2m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{25470M^6m_c^{14}s^5ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5040\langle g^2G^2\rangle M^4m_c^{10}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4245\langle g^2G^2\rangle M^2m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{630\langle g^2G^2\rangle M^2m_c^{10}s^7ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3780M^6m_c^{12}s^6ln(2)\sqrt{\frac{s-4m_c^2}{s}}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{80\langle g^2G^2\rangle M^4m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{21500\langle g^2G^2\rangle M^6m_c^{18}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{32250M^8m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{60M^6m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{200\langle g^2G^2\rangle M^6m_c^{20}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{300M^8m_c^{22}ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{600\langle g^2G^2\rangle M^6m_c^{16}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{8600\langle g^2G^2\rangle M^4m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{10\langle g^2G^2\rangle M^2m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{900M^8m_c^{18}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6450M^6m_c^{20}sln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{100\langle g^2G^2\rangle M^6m_c^{14}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{240\langle g^2G^2\rangle M^4m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{150M^8m_c^{16}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{1075\langle g^2G^2\rangle M^2m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{180M^6m_c^{18}s^2ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30\langle g^2G^2\rangle M^2m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{40\langle g^2G^2\rangle M^4m_c^{14}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{30M^6m_c^{16}s^3ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5\langle g^2G^2\rangle M^2m_c^{14}s^4ln(2)\sqrt{s\left(s-4m_c^2\right)}}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3969M^{10}m_c^{14}ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{8\pi^6s^8}+\frac{567M^8m_c^{14}ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{4\pi^6s^7}$$

$$+\frac{189M^6m_c^{14}ln\left(1-\sqrt{1-\frac{4m_c^2}{s}}\right)}{16\pi^6s^6}-\frac{3969M^{10}m_c^{14}ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{8\pi^6s^8}$$

$$-\frac{567M^8m_c^{14}ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{4\pi^6s^7}-\frac{189M^6m_c^{14}ln\left(\sqrt{1-\frac{4m_c^2}{s}}+1\right)}{16\pi^6s^6}$$

$$+\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^6}-\frac{75M^8m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^6}$$

$$+\frac{5\langle g^2G^2\rangle M^4m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^5}-\frac{15M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^5}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{5\langle g^2G^2\rangle M^2m_c^{10}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^4}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{225M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6s^8\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{225M^8 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{225M^8 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}+\frac{45M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{10} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6 s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6 m_c^{12} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{225M^8 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^7\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{32\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{75\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{225M^8 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{45M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{128\pi^6 s^6\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{64\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{256\pi^6s^5\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{512\pi^6s^4\left(\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}+\frac{1}{2}\right)^4}$$

$$+\frac{11700M^8m_c^{22}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{7800\langle g^2G^2\rangle M^6m_c^{20}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{16000\langle g^2G^2\rangle M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3120\langle g^2G^2\rangle M^4m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{24000M^8m_c^{20}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{2340M^6m_c^{22}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{15000\langle g^2G^2\rangle M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6400\langle g^2G^2\rangle M^4m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{22500M^8m_c^{18}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{390\langle g^2G^2\rangle M^2m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{3000\langle g^2G^2\rangle M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{4800M^6m_c^{20}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{6000\langle g^2G^2\rangle M^4m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4500M^8m_c^{16}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{4500M^6m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{800\langle g^2G^2\rangle M^2m_c^{18}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{1000\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{1200\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{750\langle g^2G^2\rangle M^2 m_c^{16} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{1500M^8 m_c^{14} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{400\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{900M^6 m_c^{16} s^4 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{150\langle g^2G^2\rangle M^2 m_c^{14} s^5 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{300M^6 m_c^{14} s^5 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{117900\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{50\langle g^2G^2\rangle M^2 m_c^{12} s^6 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{175200\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{176850M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{47160\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{262800M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{85900\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{35370M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{70080\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{128850M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{5895\langle g^2G^2\rangle M^2 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{52560M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{34360\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{12600\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{18900M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{8760\langle g^2G^2\rangle M^2 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{5040\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{25770M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{4295\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{3780M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{13500\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{630\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{121500\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{20250M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{5400\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{182250M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{180300\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4050M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{48600\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{270450M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{675\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{36450M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{72120\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{84900\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{127350M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{6075\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{12600\langle g^2G^2\rangle M^6 m_c^{10} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{54090M^6 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$-\frac{33960\langle g^2G^2\rangle M^4 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{18900M^8 m_c^{12} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$
$$+\frac{9015\langle g^2G^2\rangle M^2 m_c^{14} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{25470M^6 m_c^{14} s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{5040\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{4245\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{630\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{3780M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{80\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{21500\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{32250M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{60M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{200\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{300M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{600\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{8600\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{10\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{900M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{6450M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{100\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{240\langle g^2G^2\rangle M^4 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}+\frac{150M^8 m_c^{16} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{1075\langle g^2G^2\rangle M^2 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{180M^6 m_c^{18} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{30\langle g^2G^2\rangle M^2 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{40\langle g^2G^2\rangle M^4 m_c^{14} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$+\frac{30M^6 m_c^{16} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}-\frac{5\langle g^2G^2\rangle M^2 m_c^{14} s^4\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^{10}}$$

$$-\frac{18000\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3720\langle g^2G^2\rangle M^4 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{27000M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{2790M^6 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{13950M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{9300\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6900\langle g^2G^2\rangle M^6 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{7200\langle g^2G^2\rangle M^4 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10350M^8m_c^{16}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{465\langle g^2G^2\rangle M^2m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{3300\langle g^2G^2\rangle M^6m_c^{12}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5400M^6m_c^{18}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{2760\langle g^2G^2\rangle M^4m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4950M^8m_c^{14}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2070M^6m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{900\langle g^2G^2\rangle M^2m_c^{16}s^2ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{300\langle g^2G^2\rangle M^6m_c^{10}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{1320\langle g^2G^2\rangle M^4m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^2m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{450M^8m_c^{12}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{120\langle g^2G^2\rangle M^4m_c^{10}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{990M^6m_c^{14}s^3ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{90M^6m_c^{12}s^4ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{51750\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{10350\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{77625M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{20700\langle g^2G^2\rangle M^4 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15525M^8 m_c^{12} s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{4140\langle g^2G^2\rangle M^4 m_c^{10} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15525M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5175\langle g^2G^2\rangle M^2 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{3105M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{19500\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{1035\langle g^2G^2\rangle M^2 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{120\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{29250M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{300\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{90M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{66750\langle g^2G^2\rangle M^6 m_c^{14} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{450M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{7800\langle g^2G^2\rangle M^4 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{100125M^8 m_c^{16} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^2 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{5850M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{26700\langle g^2G^2\rangle M^4 m_c^{14} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{50550\langle g^2G^2\rangle M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{75825M^8m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{975\langle g^2G^2\rangle M^2m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{10650\langle g^2G^2\rangle M^6m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20025M^6m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{20220\langle g^2G^2\rangle M^4m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{15975M^8m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}+\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{4260\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{5400\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{65250\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{97875M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4050M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{13500\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{20250M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{2700\langle g^2G^2\rangle M^6 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{26100\langle g^2G^2\rangle M^4 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{675\langle g^2G^2\rangle M^2 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{4050M^8 m_c^{14} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{1080\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{19575M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$-\frac{6525\langle g^2G^2\rangle M^2 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{810M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}$$

$$+\frac{135\langle g^2G^2\rangle M^2 m_c^{12} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^9}-\frac{2250\langle g^2G^2\rangle M^6 m_c^{14} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{3600\langle g^2G^2\rangle M^4 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{3375M^8 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{75\langle g^2G^2\rangle M^2 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2700M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1125M^8 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{750\langle g^2G^2\rangle M^6 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{9000\langle g^2G^2\rangle M^6 m_c^{16} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{300\langle g^2G^2\rangle M^4 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{225M^6 m_c^{20} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13500M^8 m_c^{18} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{1500\langle g^2G^2\rangle M^6 m_c^{12} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{900\langle g^2G^2\rangle M^4 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{450\langle g^2G^2\rangle M^2 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{2250M^8 m_c^{14} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{675M^6 m_c^{16} sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{600\langle g^2G^2\rangle M^4 m_c^{12} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{450M^6 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225\langle g^2G^2\rangle M^2 m_c^{14} s^2 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6 m_c^{10} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{75\langle g^2G^2\rangle M^2 m_c^{12} s^3 ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4 m_c^{10} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{39375M^8 m_c^{12} s^{3/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2 m_c^{10} s^{7/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{7875M^6 m_c^{12} s^{5/2}\sqrt{s-4m_c^2} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{300\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{15750\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{\frac{s-4m_c^2}{s}} ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{23625M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{750\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{1125M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{27375\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{6300\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{82125M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{10950\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{39375M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$+\frac{4200\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$
$$-\frac{28875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{86625M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{525\langle g^2G^2\rangle M^2m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{5250\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{3150M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{10500\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{7875M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$-\frac{2100\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{15750M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{1575M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}-\frac{11550\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}+\frac{17325M^6m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{600\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5775\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^8}$$

$$+\frac{425\langle g^2G^2\rangle M^2m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{450M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{4250\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6375M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1500\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{1700\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{2250M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1275M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{14}sln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{6875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2100\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{20625M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{25\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1575M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{250\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5250\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{100\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{7875M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{2750\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{5625M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{750\langle g^2G^2\rangle M^4m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{4125M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^2 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1125M^6 m_c^{12} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2 m_c^{10} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{1875\langle g^2G^2\rangle M^6 m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{2750\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}+\frac{5625M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{375\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{4125M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{5625M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{3750\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{1500\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{20625M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2 m_c^{12} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$-\frac{750\langle g^2G^2\rangle M^4 m_c^{10} s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{1125M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{375\langle g^2G^2\rangle M^2m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{1125M^8m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{5625M^8m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{225M^6m_c^{18}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1125M^6m_c^{16}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{1125M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{75\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3375M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{225M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^2m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{1125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{3375M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{3375M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}-\frac{675M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}+\frac{675M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(1-\sqrt{\frac{s-4m_c^2}{s}}\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)^6}$$

$$+\frac{75M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6}-\frac{25\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^6}$$

$$+\frac{15M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5}-\frac{5\langle g^2G^2\rangle M^4m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^5}$$

$$-\frac{75\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{5\langle g^2G^2\rangle M^2m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{225M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^8\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{225M^8m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}+\frac{225M^8m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{15\langle g^2G^2\rangle M^2m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{12}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{75\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{225M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^7\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{32\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{75\langle g^2G^2\rangle M^6m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{225M^8m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{45M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{128\pi^6s^6\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^4m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{64\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$+\frac{45M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{256\pi^6s^5\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}-\frac{15\langle g^2G^2\rangle M^2m_c^{10}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{512\pi^6s^4\left(\frac{1}{2}-\frac{1}{2}\sqrt{\frac{s-4m_c^2}{s}}\right)^4}$$

$$-\frac{18000\langle g^2G^2\rangle M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3720\langle g^2G^2\rangle M^4m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{27000M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{2790M^6m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{13950M^8m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{9300\langle g^2G^2\rangle M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6900\langle g^2G^2\rangle M^6m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{7200\langle g^2G^2\rangle M^4m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10350M^8m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{465\langle g^2G^2\rangle M^2m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3300\langle g^2G^2\rangle M^6m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{5400M^6m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2760\langle g^2G^2\rangle M^4m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4950M^8m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{2070M^6m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{900\langle g^2G^2\rangle M^2m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{300\langle g^2G^2\rangle M^6m_c^{10}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1320\langle g^2G^2\rangle M^4m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{345\langle g^2G^2\rangle M^2m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{450M^8m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{120\langle g^2G^2\rangle M^4m_c^{10}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{990M^6m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{165\langle g^2G^2\rangle M^2m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{90M^6m_c^{12}s^4ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{15\langle g^2G^2\rangle M^2m_c^{10}s^5ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{51750\langle g^2G^2\rangle M^6m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{10350\langle g^2G^2\rangle M^6m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{77625M^8m_c^{14}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{20700\langle g^2G^2\rangle M^4m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15525M^8m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4140\langle g^2G^2\rangle M^4m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15525M^6m_c^{14}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5175\langle g^2G^2\rangle M^2m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{3105M^6m_c^{12}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{19500\langle g^2G^2\rangle M^6 m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{1035\langle g^2G^2\rangle M^2 m_c^{10}s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{120\langle g^2G^2\rangle M^4 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{29250M^8 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{90M^6 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{300\langle g^2G^2\rangle M^6 m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{450M^8 m_c^{20}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{66750\langle g^2G^2\rangle M^6 m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{7800\langle g^2G^2\rangle M^4 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{100125M^8 m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{15\langle g^2G^2\rangle M^2 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{5850M^6 m_c^{18}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{50550\langle g^2G^2\rangle M^6 m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{26700\langle g^2G^2\rangle M^4 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{975\langle g^2G^2\rangle M^2 m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{75825M^8 m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{20025M^6 m_c^{16}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{10650\langle g^2G^2\rangle M^6 m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{20220\langle g^2G^2\rangle M^4 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{15975M^8 m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{6675\langle g^2G^2\rangle M^2m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{15165M^6m_c^{14}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{5055\langle g^2G^2\rangle M^2m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{4260\langle g^2G^2\rangle M^4m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{3195M^6m_c^{12}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{1065\langle g^2G^2\rangle M^2m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{65250\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{5400\langle g^2G^2\rangle M^4m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4050M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{97875M^8m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{20250M^8m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{13500\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{26100\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{2700\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$+\frac{4050M^8m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}-\frac{675\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$

$$-\frac{1080\langle g^2G^2\rangle M^4 m_c^{12} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$
$$-\frac{19575M^6 m_c^{16} s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$
$$+\frac{6525\langle g^2G^2\rangle M^2 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}+\frac{810M^6 m_c^{14} s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$
$$+\frac{2250\langle g^2G^2\rangle M^6 m_c^{14} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{135\langle g^2G^2\rangle M^2 m_c^{12} s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^9}$$
$$-\frac{3600\langle g^2G^2\rangle M^4 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3375M^8 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{75\langle g^2G^2\rangle M^2 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{2700M^6 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{750\langle g^2G^2\rangle M^6 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1125M^8 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{300\langle g^2G^2\rangle M^4 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{9000\langle g^2G^2\rangle M^6 m_c^{16} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{13500M^8 m_c^{18} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6 m_c^{20} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$
$$+\frac{1500\langle g^2G^2\rangle M^6 m_c^{12} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{900\langle g^2G^2\rangle M^4 m_c^{14} sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{450\langle g^2G^2\rangle M^2m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2250M^8m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{600\langle g^2G^2\rangle M^4m_c^{12}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{675M^6m_c^{16}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{225\langle g^2G^2\rangle M^2m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{450M^6m_c^{14}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{75\langle g^2G^2\rangle M^2m_c^{12}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{39375M^8m_c^{12}s^{3/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{7875M^6m_c^{12}s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{300\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{15750\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{23625M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{225M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{750\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{1125M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{27375\langle g^2G^2\rangle M^6m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{6300\langle g^2G^2\rangle M^4m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{75\langle g^2G^2\rangle M^2m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{82125M^8m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4725M^6m_c^{16}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{13125\langle g^2G^2\rangle M^6m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10950\langle g^2G^2\rangle M^4m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{39375M^8m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{1575\langle g^2G^2\rangle M^2m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{16425M^6m_c^{14}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{5475\langle g^2G^2\rangle M^2m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^4m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{7875M^6m_c^{12}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{2625\langle g^2G^2\rangle M^2m_c^{10}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{4200\langle g^2G^2\rangle M^4m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{28875\langle g^2G^2\rangle M^6m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{86625M^8m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{525\langle g^2G^2\rangle M^2m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{5250\langle g^2G^2\rangle M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{3150M^6m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{10500\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{7875M^8 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$-\frac{2100\langle g^2G^2\rangle M^4 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{15750M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{1575M^6 m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}-\frac{11550\langle g^2G^2\rangle M^4 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{525\langle g^2G^2\rangle M^2 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}+\frac{17325M^6 m_c^{14}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{600\langle g^2G^2\rangle M^4 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5775\langle g^2G^2\rangle M^2 m_c^{12}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^8}$$

$$+\frac{425\langle g^2G^2\rangle M^2 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{450M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{4250\langle g^2G^2\rangle M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{6375M^8 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1500\langle g^2G^2\rangle M^6 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1700\langle g^2G^2\rangle M^4 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2250M^8 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1275M^6 m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{6875\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{75\langle g^2G^2\rangle M^2 m_c^{14}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2100\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{20625M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{25\langle g^2G^2\rangle M^2m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1575M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{250\langle g^2G^2\rangle M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375M^8m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{100\langle g^2G^2\rangle M^4m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5250\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{7875M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{75M^6m_c^{18}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{2750\langle g^2G^2\rangle M^4m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1875\langle g^2G^2\rangle M^6m_c^{10}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{5625M^8m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{525\langle g^2G^2\rangle M^2m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{750\langle g^2G^2\rangle M^4m_c^{10}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{4125M^6m_c^{14}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1375\langle g^2G^2\rangle M^2m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{1125M^6m_c^{12}s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{10}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{375\langle g^2G^2\rangle M^2m_c^{10}s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{2750\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5625M^8 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}+\frac{4125M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{3750\langle g^2G^2\rangle M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{5625M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{1500\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{6875\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{20625M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{750\langle g^2G^2\rangle M^4 m_c^{10}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$-\frac{1375\langle g^2G^2\rangle M^2 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2 m_c^{10}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}-\frac{1125M^6 m_c^{12}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^7}$$

$$+\frac{375\langle g^2G^2\rangle M^2 m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{375\langle g^2G^2\rangle M^6 m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{1875\langle g^2G^2\rangle M^6m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1125M^8m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$-\frac{75\langle g^2G^2\rangle M^4m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{5625M^8m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$+\frac{375\langle g^2G^2\rangle M^4m_c^{14}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{225M^6m_c^{18}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$-\frac{75\langle g^2G^2\rangle M^2m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{1125M^6m_c^{16}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$+\frac{225\langle g^2G^2\rangle M^4m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{75\langle g^2G^2\rangle M^2m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$-\frac{375\langle g^2G^2\rangle M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{12}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{1125M^8m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$-\frac{75\langle g^2G^2\rangle M^4m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3375M^8m_c^{14}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$+\frac{225\langle g^2G^2\rangle M^2m_c^{12}s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{225M^6m_c^{16}\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$+\frac{1125\langle g^2G^2\rangle M^6m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$
$$-\frac{225\langle g^2G^2\rangle M^2m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{16\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{1125\langle g^2G^2\rangle M^6 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{3375M^8 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^3\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^4 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{3375M^8 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$-\frac{225\langle g^2G^2\rangle M^4 m_c^{12}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{2\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}-\frac{675M^6 m_c^{16}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{4\pi^6 s^2\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{225\langle g^2G^2\rangle M^2 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}+\frac{675M^6 m_c^{14}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{8\pi^6 s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^6}$$

$$+\frac{11700M^8 m_c^{22}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{7800\langle g^2G^2\rangle M^6 m_c^{20}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{16000\langle g^2G^2\rangle M^6 m_c^{18}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3120\langle g^2G^2\rangle M^4 m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{24000M^8 m_c^{20}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{2340M^6 m_c^{22}sln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{15000\langle g^2G^2\rangle M^6 m_c^{16}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6400\langle g^2G^2\rangle M^4 m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{22500M^8 m_c^{18}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{390\langle g^2G^2\rangle M^2 m_c^{20}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{3000\langle g^2G^2\rangle M^6 m_c^{14}s^3ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{4800M^6 m_c^{20}s^2ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{6000\langle g^2G^2\rangle M^4 m_c^{16} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{4500M^8 m_c^{16} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4500M^6 m_c^{18} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{800\langle g^2G^2\rangle M^2 m_c^{18} s^3 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{1000\langle g^2G^2\rangle M^6 m_c^{12} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{1200\langle g^2G^2\rangle M^4 m_c^{14} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{750\langle g^2G^2\rangle M^2 m_c^{16} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{1500M^8 m_c^{14} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{400\langle g^2G^2\rangle M^4 m_c^{12} s^5 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{900M^6 m_c^{16} s^4 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{150\langle g^2G^2\rangle M^2 m_c^{14} s^5 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{300M^6 m_c^{14} s^5 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{50\langle g^2G^2\rangle M^2 m_c^{12} s^6 ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{117900\langle g^2G^2\rangle M^6 m_c^{16} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{175200\langle g^2G^2\rangle M^6 m_c^{14} s^{5/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{176850M^8 m_c^{18} s^{3/2}\sqrt{s-4m_c^2} ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{47160\langle g^2G^2\rangle M^4 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{262800M^8 m_c^{16} s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{35370M^6 m_c^{18} s^{5/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{85900\langle g^2G^2\rangle M^6 m_c^{12} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{70080\langle g^2G^2\rangle M^4 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{128850M^8 m_c^{14} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{5895\langle g^2G^2\rangle M^2 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{52560M^6 m_c^{16} s^{7/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{12600\langle g^2G^2\rangle M^6 m_c^{10} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{34360\langle g^2G^2\rangle M^4 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{8760\langle g^2G^2\rangle M^2 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{18900M^8 m_c^{12} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{5040\langle g^2G^2\rangle M^4 m_c^{10} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{25770M^6 m_c^{14} s^{9/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{4295\langle g^2G^2\rangle M^2 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{3780M^6 m_c^{12} s^{11/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{630\langle g^2G^2\rangle M^2 m_c^{10} s^{13/2}\sqrt{s-4m_c^2}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{13500\langle g^2G^2\rangle M^6 m_c^{18} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{121500\langle g^2G^2\rangle M^6 m_c^{16} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{20250M^8 m_c^{20} s\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{5400\langle g^2G^2\rangle M^4 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{182250M^8 m_c^{18} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{4050M^6 m_c^{20} s^2\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{180300\langle g^2G^2\rangle M^6 m_c^{14} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{48600\langle g^2G^2\rangle M^4 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{270450M^8 m_c^{16} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{675\langle g^2G^2\rangle M^2 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{36450M^6 m_c^{18} s^3\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{84900\langle g^2G^2\rangle M^6 m_c^{12} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{72120\langle g^2G^2\rangle M^4 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{6075\langle g^2G^2\rangle M^2 m_c^{16} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{127350M^8 m_c^{14} s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{54090M^6m_c^{16}s^4\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{12600\langle g^2G^2\rangle M^6m_c^{10}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{33960\langle g^2G^2\rangle M^4m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}+\frac{18900M^8m_c^{12}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{9015\langle g^2G^2\rangle M^2m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{25470M^6m_c^{14}s^5\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{4245\langle g^2G^2\rangle M^2m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{5040\langle g^2G^2\rangle M^4m_c^{10}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{3780M^6m_c^{12}s^6\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{630\langle g^2G^2\rangle M^2m_c^{10}s^7\sqrt{\frac{s-4m_c^2}{s}}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{21500\langle g^2G^2\rangle M^6m_c^{18}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{80\langle g^2G^2\rangle M^4m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{60M^6m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{32250M^8m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{300M^8m_c^{22}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{200\langle g^2G^2\rangle M^6m_c^{20}\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6s\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$+\frac{8600\langle g^2G^2\rangle M^4m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$
$$-\frac{600\langle g^2G^2\rangle M^6m_c^{16}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{900M^8m_c^{18}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{10\langle g^2G^2\rangle M^2m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{100\langle g^2G^2\rangle M^6m_c^{14}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{6450M^6m_c^{20}s\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{240\langle g^2G^2\rangle M^4m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{150M^8m_c^{16}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{1075\langle g^2G^2\rangle M^2m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{180M^6m_c^{18}s^2\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{40\langle g^2G^2\rangle M^4m_c^{14}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$-\frac{30\langle g^2G^2\rangle M^2m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}$$

$$+\frac{5\langle g^2G^2\rangle M^2m_c^{14}s^4\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)}-\frac{30M^6m_c^{16}s^3\sqrt{s\left(s-4m_c^2\right)}ln\left(\sqrt{\frac{s-4m_c^2}{s}}+1\right)}{\pi^6\left(\sqrt{s\left(s-4m_c^2\right)}-s\right)^{10}\left(\sqrt{s\left(s-4m_c^2\right)}+s\right)} \tag{164}$$

$$+0 \tag{165}$$

Kaynakça

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TÜBİTAK
PROJE ÖZET BİLGİ FORMU

Proje Yürütücüsü:	Prof. Dr. ALTUĞ ÖZPİNECİ
Proje No:	114F234
Proje Başlığı:	X(3872) ve Diğer Hadronik Moleküllerin İncelenmesi
Proje Türü:	1001 - Araştırma
Proje Süresi:	30
Araştırmacılar:	HÜSEYİN DAĞ
Danışmanlar:	
Projenin Yürütüldüğü Kuruluş ve Adresi:	ORTA DOĞU TEKNİK Ü. FEN-EDEBİYAT F. FİZİK B.
Projenin Başlangıç ve Bitiş Tarihleri:	01/10/2014 - 01/04/2017
Onaylanan Bütçe:	236650.0
Harcanan Bütçe:	178695.48
Öz:	Standart mezonlar, bir kuark bir tane de anti kuarktan oluşan bağlı durumlardır. Ancak, son senelerde gözlemlenen bazı mezonların kimi özelliklerini bu basit resimle açıklamaya çalışıldığında, kimi sorunlarla karşılaşılmaktadır. Bundan dolayı, bu yeni gözlemlenen mezonların, kuark-anti-kuark çiftlerinden daha karışık durumlar olduğu düşünülmektedir. Bu egzotik durumlardan birisi de $X(3872)$ mezonudur. kütlesinin $D^0\bar D^{*0}$ eşiğine olan yakınlığından dolayı, D ve D^* mezonlarından oluşan bir molekül olduğu düşünülmektedir. Mezonları incelemek için, tedirgemeye dayanmayan yöntemlere ihtiyaç vardır. Bu yöntemlerden birisi, KRD toplam kurallarıdır. Bu projede, KRD toplam kuralları kullanılarak, iki vektör kuark-anti-kuark yapısından oluşabilecek, gizli tılsım içeren olası egzotik durumlar incelenmiştir (İP1 ve İP2). $X(3872)$ mezonu, çoğunlukla bir molekül olsa bile içinde ihmal edilemeyecek kadar büyük bir $c\bar c$ yapısı olma ihtimali yüksektir. Molekülleri incelemek için en ideal yöntem etki alan kuramlarıdır. c kuarkın ağır olduğu da göz önüne alınında, D mezonlarının olası bağlı durumları, ağır kuark etkin alan kuramları kullanılarak incelenebilir. $X(3872)$'nin olası $c \bar c$ bileşenini göz önüne almak için, D mezonlarının etkin Lagranjiyanına $c \bar c$ durumlarının etkileri de eklenmiştir (İP3). Bu elde edilen yeni etkin alan kuramının öngördüğü spektruma, $c\bar c$ katkısının etkisi incelenmiş (İP4) ve $X(3872)$ mezonunu ve ağır kuark eşinin ışınımsal bozunmalarının olası $c \bar c$ bileşenine duyarlılığı incelenmiştir. (İP5)
Anahtar Kelimeler:	Mezon Molekülleri, KRD Toplam Kuralları, Etkin Kuramlar
Fikri Ürün Bildirim Formu Sunuldu Mu?:	Hayır

TÜBİTAK