Errata: Helicity-coupling amplitudes in tensor formalism

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PACS number(s): 13.88.+e, 11.80.Et, 13.40.Hq, 99.10.+g

On page 1226, the phrase ‘‘...the second deals with \( \pi_2(1670) \rightarrow f_2(1270) + \pi \) in which...’’ should be replaced by ‘‘...the second deals with the decays \( \pi_2(1670) \rightarrow f_2(1270) + \pi, \bar{p}p(3P_1) \rightarrow f_2(1270) + \pi, \pi_2(1670) \rightarrow f_2(1270) + \pi, \) and \( \eta_c(2980) \rightarrow a_2(1230) + \pi \) in which...’’ near the end of Sec. I.

On page 1227, the equation \( r = |\mathbf{q}| - |\mathbf{k}| \) which follows Eq. (14) should be replaced by \( r = q - k \).

On page 1229, add minus signs to \( (\omega \cdot \tilde{e}) \) in Eq. (31) and \( (\mathbf{r} \cdot \mathbf{r}) \) in Eq. (34).

On page 1231, replace \( \omega \) and \( \phi \) by their three-vector counterparts \( \mathbf{\omega} \) and \( \mathbf{\phi} \), evaluated in the \( J \) rest frame. Equation (57) should thus read

\[
A_0(\lambda) = [\mathbf{\omega}(\lambda) \cdot \mathbf{\phi}^*(\lambda)],
\]

\[
A_2(\lambda) = [\mathbf{r} \cdot \mathbf{\omega}(\lambda)][\mathbf{r} \cdot \mathbf{\phi}^*(\lambda)] - \frac{1}{2}r^2[\mathbf{\omega}(\lambda) \cdot \mathbf{\phi}^*(\lambda)]
\]

in the \( J \) rest frame.

On page 1237, the phrase ‘‘One encounters ... a polynomial...’’ should be removed.

If the isobar has spin 2, then its wave function \( \omega_{a\beta} \) is ‘‘traceless’’ in the sense that \( (\mathbf{g} : \omega) = 0 \). But the situation is different for \( (\mathbf{g} : \omega) \), where \( \mathbf{g}_{a\beta} \) is the modified metric as defined in Eq. (20):

\[
(\mathbf{g} : \omega) = [\mathbf{g}(W) : \omega(m_0)] = \sum_{m_1m_2} (1m_1m_2)2m_0 \frac{\omega(m_1) \cdot \omega(m_2)}{\mathbf{r} \cdot \mathbf{r}}.
\]

Here the three-vector \( \omega \) is evaluated in the parent rest frame. It is seen that this quantity is nonzero if \( m_0 = 0 \), being equal to

\[
\sqrt{2/3}[(q_0/m)^2 - 1]
\]

where \( m \) is the isobar mass and \( q_0 \) is its energy in the parent rest frame. In several examples worked out in the paper, the factors proportional to \( (\mathbf{g} : \omega) \) have been set to zero inadvertently. The correct formulas are listed below.

(1) The second equation of (115) on page 1236 should be replaced by

\[
A_2(m) = \sum_{m_1m_2} (1m_1m_2)2m_0 \left[ [\mathbf{r} \cdot \omega(m_1)][\mathbf{r} \cdot \omega(m_2)][\mathbf{r} \cdot \mathbf{\phi}^*(m)] - \frac{1}{2}r^2[\mathbf{\omega}(m_1) \cdot \omega(m_2)][\mathbf{r} \cdot \mathbf{\phi}^*(m)]
\]

\[
- \frac{1}{r^2}[\mathbf{\omega}(m_1)][\omega(m_2) \cdot \mathbf{\phi}^*(m)]
\]

which leads to a modified form for the second equation of (116):

\[
F_0^{(1)} = \sqrt{2/3} \left( \frac{q_0}{m} \right)^2 \left( g_1 + \frac{2}{5}g_2r^2 + \frac{1}{5}g_2r^2 \right) r.
\]

(2) On page 1237, replace the third equations of both (124) and (125) by
$$A_3 = (\vec r \cdot \omega \cdot \vec r)(r \cdot \phi^\ast \cdot r) - \frac{1}{11}(r \cdot \vec r)(\vec r \cdot \omega \cdot \vec r) - \frac{1}{11}(r \cdot \vec r)(\vec g \cdot \omega)(r \cdot \phi^\ast \cdot r) + \frac{1}{11}(r \cdot \vec r)^2(\omega \cdot \phi^\ast)$$

and

$$F_{0}^{(2)} = \frac{2}{3} \left( \frac{q_0}{m} \right)^2 \left( g_1 + \frac{2}{3} g_2 r^2 + \frac{12}{35} g_3 r^4 \right) + \frac{1}{3} \left( g_1 - \frac{1}{3} g_2 r^2 + \frac{12}{35} g_3 r^4 \right),$$

respectively.

(3) Equation (127) on page 1237 should be changed to

$$A = (\vec r^{(2)} \cdot \omega) = (\vec r \cdot \omega \cdot \vec r) - \frac{1}{11}(r \cdot \vec r)(\vec g \cdot \omega).$$

The phrase following this equation “for a pure D wave,” should be changed to “for a pure D-wave $\vec r^{(2)}$ [see Eq. (35)].” The following sentence “Note that…traceless.” should be removed. Finally, replace Eq. (128) by

$$F_{0}^{(0)} = \left[ \frac{2}{3} \left( \frac{q_0}{m} \right)^2 + \frac{1}{3} \right] g r^2.$$

We would like to correct the inaccuracy that we committed in the paper published in Phys. Rev. D 53, 1204 (1996).

(1) In Eq. (6) what appears as $\delta Z_{H^z}^2$ should be replaced by $\delta Z_{H^z}$.

(2) Equations (10) and (16) should be replaced by

$$\delta M^{\text{vert}} = -ie^2 e^\mu(p_1) e^\nu(p_2) \left[ \frac{(p_2-2p_4)_{\mu}}{i-m_{H^z}^2} (f_1+f_3)_{\nu} + \frac{(p_2+p_3-p_4)_{\mu}}{i-m_{H^z}^2} (f_5+f_7)_{\nu} + \frac{(p_1+p_3-p_4)_{\nu}}{u-m_{H^z}^2} (f_2+f_6)_{\mu} + \frac{(p_1-2p_4)_{\mu}}{u-m_{H^z}^2} (f_4+f_8)_{\nu} + (M'_0+M''_0) \left( \delta Z_c + 1 \frac{\delta Z_{AA}}{2} + \frac{s_w^2-c_w^2}{s_w c_w} 2 \delta Z_{ZA} + 2 \delta Z_{H^z} \right) \right].$$

$$\delta M^{\text{box}} = 2ie^2 e^\mu(p_1) e^\nu(p_2) \left[ \left( f_9 + 2 \delta Z_c + \frac{s_w^2-c_w^2}{4s_w c_w} 2 \delta Z_{ZA} + 2 \delta Z_{H^z} \right) g_{\mu\nu} + f_{10} p_{3\mu} p_{4\nu} + f_{11} p_{3\mu} p_{4\nu} + f_{12} p_{3\mu} p_{3\nu} + f_{13} p_{4\mu} p_{4\nu} \right].$$
The form factors \( f_i \) (\( i = 9 - 13 \)) are given by the box diagrams 1–6 in Fig. 4:

\[
f_i = \sum_{j=1}^{6} f_{ij}^{(6)} \quad (i = 9 - 13),
\]

where

\[
f_9^{(1)} = \frac{D}{96 \pi^2} (g_{\pm}^2 + g_{\mp}^2) (4B_0[p_{\pm}^2, m_{b}^2, m_{b}^2] - 2 \{2(m_0^2 + \hat{s} - m_{H^\pm}^2 - p_1 \cdot p_3)C_0 - (3\hat{s} - 6p_1 \cdot p_3 - 4p_1 \cdot p_4)\}C_{11})
\]

\[
- 2(2p_1 \cdot p_3 + p_1 \cdot p_4)C_{12} - 4C_{24}[p_2 \cdot p_1, m_{b}^2, m_{b}^2, m_{b}^2] - 2\{2m_0^2(\hat{s} - m_{H^\pm}^2 - m_i^2 + p_1 \cdot p_3 - p_1 \cdot p_4)\}D_{12}
\]

\[
+ 2[m_0^2(p_1 \cdot p_4 - 2p_1 \cdot p_3) + (m_0^2 - 2p_1 \cdot p_3)p_1 \cdot p_4]D_{13} + 2m_0^2(\hat{s} - 2m_{H^\pm}^2)D_{21} + 4p_1 \cdot p_3p_1 \cdot p_4(D_{22} + D_{23})
\]

\[
+ [4m_0^2(p_1 \cdot p_3 - p_1 \cdot p_4) - 2\hat{s}p_1 \cdot p_3]D_{24} + 2[2m_0^2(p_1 \cdot p_4 - p_1 \cdot p_3) - \hat{s}p_1 \cdot p_4]D_{25} + (\hat{s}^2 - 8p_1 \cdot p_3p_1 \cdot p_4)D_{26}
\]

\[
+ (2m_{H^\pm}^2 - m_i^2 - \hat{s})D_{27})[p_4 \cdot p_2, \hat{p}_3, m_{b}^2, m_{b}^2, m_{b}^2, m_{b}^2, m_{b}^2].
\]
The corresponding numerical results are shown in revised Figs. 5, 6, 7, and 8. The major conclusions remain unchanged.

There should be a minus sign on each right-hand side of the expressions for the form factors $f_1$, $f_2$, $f_3$, and $f_4$ in the Appendix.

Reference [10] should be replaced by [10] B. A. Kniehl, Phys. Rep. 240, 211 (1994), and references therein. The corresponding numerical results are shown in revised Figs. 5, 6, 7, and 8. The major conclusions remain unchanged.

\[ f^{(5)}_{10} = \frac{D}{48\pi^2} (g^2 + g^2)(-4(C_{11} - C_{0} - C_{12})[p_2^2, p_3^2, m_h^2, m_6^2, m_7^2] - 4(m_7^2 D_0 + m_6^2 D_{11} + (m_H^2 - 3m_7^2 - \hat{s}) D_{12}) + (3m_7^2 - 2m_H^2 - \hat{s}) D_{13} + 2p_1 \cdot p_3 D_{22} + 2(p_1 \cdot p_3 - m_H^2) D_{23} - 2(m_7^2 + p_1 \cdot p_4) (D_{24} - D_{25}) + 2(m_H^2 - 2p_1 \cdot p_3) D_{26} + 2D_{27})[p_4^2, p_2^2, p_3^2, m_7^2, m_6^2, m_7^2]). \]

\[ f^{(5)}_{11} = \frac{D}{48\pi^2} (g^2 + g^2)(4(C_{0} + C_{11} - C_{12})[p_2^2, p_3^2, m_h^2, m_6^2, m_7^2] - 4(m_7^2 D_0 + D_{11}) + (m_H^2 + m_7^2 - 2p_1 \cdot m_H^2) D_{12} + (2p_1 \cdot p_3 - m_H^2) D_{13} - 2m_H^2 D_{21} - (p_1 \cdot p_3 D_{22} + D_{23}) - 2(m_7^2 + p_1 \cdot m_H^2) D_{24} + 2(m_7^2 - p_1 \cdot p_4) D_{25} + (\hat{s} - 2m_7^2) D_{26} + 4D_{27})[p_4^2, p_2^2, p_3^2, m_7^2, m_6^2, m_7^2]). \]

\[ f^{(5)}_{12} = \frac{D}{48\pi^2} (g^2 + g^2)(4(C_{0} + C_{11})[p_2^2, p_3^2, m_h^2, m_6^2, m_7^2] - 4m_7^2 D_0 + m_6^2 D_{11} + (m_H^2 + m_7^2 - 2p_1 \cdot m_H^2) D_{12} - (2m_7^2 + m_7^2 - 2p_1 \cdot m_H^2) D_{13} - 2p_1 \cdot p_3 D_{22} + 2m_7^2 D_{23} + 2m_H^2 D_{24} - 2m_7^2 D_{25} - 2(m_7^2 - p_1 \cdot m_H^2) D_{26}) \times [p_4^2, p_2^2, p_3^2, m_7^2, m_6^2, m_7^2]). \]

\[ f^{(5)}_{13} = \frac{D}{48\pi^2} (g^2 + g^2)(-4C_{11}[p_2^2, p_3^2, m_h^2, m_6^2, m_7^2] - 4m_7^2 D_0 + 3D_{11} + 2D_{21} - 2D_{24}) + (m_H^2 - 3m_7^2) D_{12} - m_6^2 D_{13} + 2D_{25} + 2p_1 \cdot p_3 D_{22} + 2(m_H^2 - p_1 \cdot m_H^2) D_{26} + 2D_{27})[p_4^2, p_2^2, p_3^2, m_7^2, m_6^2, m_7^2]). \]

\[ f^{(5)}_{9,10,11,12,13} = f^{(5)}_{9,11,10,12,13}(p_1 \rightarrow p_2). \]
Erratum: Muon anomalous magnetic dipole moment in the minimal supersymmetric standard model

Takeo Moroi

PACS number(s): 12.60.Jv, 13.40.Em, 14.60.Ef, 99.10.+g

Equations (20), (23), and (29) contain misprints; the correct equations should read

\[
N_R^{\alpha} = -y_\mu(U_{\chi^0})_3 (U_{\mu})_R A + \frac{1}{\sqrt{2}} g_2 (U_{\chi^0})_2 (U_{\mu})_L + \frac{1}{\sqrt{2}} g_1 (U_{\chi^0})_1 (U_{\mu})_L ,
\]

(20)

\[
\mathcal{L}_{MDM} = -\frac{e}{4m_\mu} F_{\mu} \sigma_{\rho\lambda} \mu F^{\rho\lambda}.
\]

(23)

\[
\Delta a_\mu^{\gamma} = m_\mu \sum_X \left[ m_\mu (C_{X}^{L} C_{-X}^{L} + C_{X}^{R} C_{-X}^{R}) [J_4 (m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2})
\right.

\[
+ m_\mu J_5 (m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2}) - J_4 (m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2})]
\]

\[
- 2 m_\mu C_{X}^{L} C_{-X}^{R} J_4 (m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2} - m_{X}^{2})
\]

\[
= \ldots
\]

(29)

In the numerical calculation, the correct formulas were used, and all the figures are unchanged. The author would like to thank U. Sarid for pointing out the error.

Erratum: Supersymmetry studies at future linear e^+ e^- colliders
[Phys. Rev. D 54, 6735 (1996)]

Howard Baer, Ray Munroe, and Xerxes Tata

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Several formulas in the appendix of our paper contain typos. In particular, the cross section formula for left selectron pair production on p. 6751 needs a factor of 2 on the second term, and a factor of 4 on the fourth term. The correct expression reads

\[
\Phi_{\tilde{e}_L}(z) = \Phi_{\tilde{e}_L}(z) + \sum_{i=1}^{4} \frac{2 |A_{\tilde{e}_L}^{i}|^2 (1 - z^2)}{2 E (E - p z) - m_{\tilde{e}_L}^{2} + m_{Z_i}^{2}} - 8 e^2 (1 - z^2) \sum_{i=1}^{4} \frac{|A_{\tilde{e}_L}^{i}|^2}{2 E (E - p z) - m_{\tilde{e}_L}^{2} + m_{Z_i}^{2}}
\]

\[
\times \left[ 1 + \frac{(\alpha - \beta z)^2 (s - M_Z^2)}{(s - M_Z^2 + M_{Z_f}^2 x_0 Z)} + \sum_{i=1}^{4} \frac{4 |A_{\tilde{e}_L}^{i}|^2 |A_{\tilde{e}_L}^{i}|^2 (1 - z^2)}{[2 E (E - p z) - m_{\tilde{e}_L}^{2} + m_{Z_i}^{2}] [2 E (E - p z) - m_{\tilde{e}_L}^{2} + m_{Z_i}^{2}]}
\right].
\]

The expression on p. 6752 for sneutrino pair production was missing the subscript 1 on several chargino mass terms. The corrected expression reads
\[
\frac{d\sigma}{dz}(e_Le_R\rightarrow\nu_\tau\bar{\nu}_\tau) = \frac{p^3 E}{8\pi}(1-z^2) \left[ \frac{4e^4(\alpha_e-\beta_e)^2(\alpha_e-\beta_e)^2}{(s-M_Z^2)^2 + M_Z^2\Gamma_Z^2} \right] \left[ \frac{g^4 \sin^4 \gamma_R}{[2E(E-pz) + m_{\tilde{W}_1}^2 - m_\nu_e^2]^2} + \frac{g^4 \cos^4 \gamma_R}{[2E(E-pz) + m_{\tilde{W}_2}^2 - m_\nu_e^2]^2} \right] \\
- \frac{4e^2 g^2(\alpha_e-\beta_e)(\alpha_e-\beta_e)(s-M_Z^2)\sin^2 \gamma_R}{[(s-M_Z^2)^2 + M_Z^2\Gamma_Z^2][2E(E-pz) + m_{\tilde{W}_1}^2 - m_\nu_e^2]} - \frac{4e^2 g^2(\alpha_e-\beta_e)(\alpha_e-\beta_e)(s-M_Z^2)\cos^2 \gamma_R}{[(s-M_Z^2)^2 + M_Z^2\Gamma_Z^2][2E(E-pz) + m_{\tilde{W}_2}^2 - m_\nu_e^2]} \\
+ \frac{2g^4 \sin^2 \gamma_R \cos^2 \gamma_R}{[2E(E-pz) + m_{\tilde{W}_1}^2 - m_\nu_e^2][2E(E-pz) + m_{\tilde{W}_2}^2 - m_\nu_e^2]}.
\]

Finally, in the $M_{zzL}^R$ expression on p. 6752 for neutralino pair production, two mass terms should not be squared. The correct expression reads

\[
M_{zzL}^R = \frac{4e^2 |W_{ij}|^2 (\alpha_e \pm \beta_e)^2}{(s-M_Z^2)^2 + M_Z^2\Gamma_Z^2} \left[ s^2 - (m_{\tilde{Z}_1}^2 - m_{\tilde{Z}_j}^2)^2 - 4(-1)^{\theta_i} m_{\tilde{Z}_i} m_{\tilde{Z}_j} + 4s^2 z^2 \right].
\]

The correct formulas were used in the computer code for all the numerical results so that none of the figures or numerical results shown in the paper are affected by these changes.