Corrections for “A Supersymmetry Primer”, version 5

Please note that version 5 is now hopelessly obsolete; you should be reading version 7 (January 2016) instead!

The following is a list of known corrections to hep-ph/9709356 v5, dated December 2008. If you have a different arXiv version, you can find the corresponding list of corrections at:
http://www.niu.edu/spmartin/primer
I do not maintain errata for the World Scientific “Perspectives on Supersymmetry” chapter (non-arXiv) versions.
Please send any further corrections or suggestions to spmartin@niu.edu.
This list was last updated: June 4, 2014.

- The list of proton decay final states in the last full sentence before eq. (5.9) is somewhat misleading. Using the s-channel squark-exchange Feynman diagram in Figure 5.5, only the final states $e^+\pi^0$ and $\mu^+\pi^0$ and $\bar{\nu}\pi^+$ and $\nu K^+$ can be obtained at tree-level. However, the other final states $e^+K^0$ and $\mu^+K^0$ and $\nu\pi^+$ and $\nu K^+$ can be obtained by tree-level $t$-channel squark-exchange diagrams involving the $\lambda'$ and $\lambda''$ couplings. (Note that I also sloppily did not distinguish between neutrinos and antineutrinos in the original text. The cases with neutrinos in the final state rely on left-right squark mixing.)
  (Thanks to Herbi Dreiner.)

- Equation (5.33): the second term should have $a^{mnp}$ replaced by $a^{mnk}$.
  (Thanks to Matt Reece.)

- In equation (6.5), the coefficients of $D^a$ were incorrect. The equation should read:
  \[
  m_5^2 = \begin{pmatrix}
  W^*_{jk}W^{ik} + g_a^2(T^a\phi)_{ij}(\phi^*T^a)^i - g_aT^a_{ij}D^a & W^*_{jk}W^{ik} + g_a^2(T^a\phi)_{ij}(T^a\phi)_{j} \\
  W_{ijk}W_k^* + g_a^2(\phi^*T^a)^i(\phi^*T^a)^j & W_{ijk}W_k^* + g_a^2(T^a\phi)_{ij}(\phi^*T^a)^j - g_aT^a_{ij}D^a
  \end{pmatrix},
  \]
  (6.5)
  (Thanks to Robert Ziegler.)

- Equation (6.6) is missing a factor of 1/2 on the right side.
  (Thanks to Robert Ziegler.)

- In equations (6.7) and (6.13), $2g_a^2\text{Tr}(T^a)D^a$ should be changed to $-2g_a\text{Tr}(T^a)D^a$. [This follows from the correction to equation (6.5) noted above.] So they should read:
  \[
  \text{Tr}(m_5^2) = 2W_{ik}^*W^{ik} + 2g_a^2C_a(i)\phi^*\phi_i - 2g_a\text{Tr}(T^a)D^a,
  \]
  (6.7)
  \[
  S\text{Tr}(m^2) = \text{Tr}(m_5^2) - 2\text{Tr}(m_F^\dagger m_F) + 3\text{Tr}(m_\nu^2) = -2g_a\text{Tr}(T^a)D^a = 0.
  \]
  (6.13)
  (Thanks to Robert Ziegler.)

- In equation (6.8), the lower right entry of the matrix on the right side has an index $a$ which is implicitly summed over. It should be replaced (three times) by $c$. This is to avoid confusion with the index $a$ being used as an external matrix index (not summed over) in the first column of the matrix.

- In equation (6.12), the factor of $(-1)^j$ should be $(-1)^{2j}$.
  (Thanks to Daniel Arnold.)
In equation (7.60), the middle expression is missing a factor of 1/2. So it should read:

$$\Delta_\phi = \frac{1}{2} (T_{3\phi} g^2 - Y_\phi g'^2)(v_d^2 - v_u^2) = (T_{3\phi} - Q_\phi \sin^2 \theta_W) \cos(2\beta) m_Z^2$$

(7.60)

(Thanks to Jorge de Blas.)

In the third full paragraph after equation (9.25), the chargino limits were incorrectly given as upper mass bounds when they should be lower mass bounds. So they should read $m_{\tilde{C}_1} > 103$ GeV and $m_{\tilde{C}_1} > 92$ GeV and $m_{\tilde{C}_1} > 103$ GeV. Similarly, in the next paragraph the Higgs limit in the non-decoupling case should be a lower mass bound, $m_{h^0} > 92$ GeV.

(Thanks to Meike de With.)