

## Corrections for “A Supersymmetry Primer”, version 2

**Please note that version 2 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 v2, dated March 31, 1998. 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](mailto:spmartin@niu.edu).

This list was last updated: April 26, 2012.

- Section 1, eq. (1.2): The numerical coefficient of the logarithmic term should not be 6. In fact, it should be 12 for the real component of the complex field  $H$  and 4 for the imaginary part of  $H$ . This difference is due to the fact that the fermion mass necessarily breaks the electroweak symmetry, so one can't really talk about the logarithmic correction to  $m_H^2$  as if it were universal. The  $\Lambda_{UV}^2$  correction is the same for the real and imaginary parts of  $H$ , however, and is correct as given. (Thanks to Shufang Su.)
- Section 3.2, eq. (3.46): The indices  $ij$  should be lowered on  $W^{*ij}$ .
- Section 5.1, third sentence of the second full paragraph after eq. (5.3): There are five, not nine, more scalar quartic interactions proportional to  $y_t^2$  besides the three shown in Figure 8. (Thanks to Bob McElrath and Keith Thomas.)
- Section 5.1, fourth sentence from the end in the third full paragraph after eq. (5.3): The sentence “The winos and bino only couple to the left-handed squarks and sleptons, and . . .” should have the words “and bino” removed. So it should read: “The winos only couple to the left-handed squarks and sleptons, and . . .”.
- Section 5.2, third sentence of the first full paragraph after eq. (5.8): Instead of minutes or hours, the proton lifetime would actually be a tiny fraction of a second if all components of  $\lambda'$  and  $\lambda''$  were of order unity. (Thanks to John Terning.)
- Section 5.2, fourth sentence of the first full paragraph after eq. (5.8): The list of proton decay final states is misleading. Using the  $s$ -channel squark-exchange Feynman diagram in Figure 11, only the final states  $e^+\pi^0$  and  $\mu^+\pi^0$  and  $\bar{\nu}\pi^+$  and  $\bar{\nu}K^+$  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.)
- Section 6.1, eqs. (6.4) and (6.5): There are three minus sign errors. These equations should read:

$$V = -\frac{1}{2}D^2 - \kappa D - gD \sum_i q_i \phi^{*i} \phi_i$$
$$D = -\kappa - g \sum_i q_i \phi^{*i} \phi_i$$

- Section 6.3, second full sentence after eq (6.23):  $\langle F_S \rangle$  should actually be:  $\sqrt{\langle F_S \rangle}$ . (Thanks to Verónica Sanz.)
- Section 7.1, eq. (7.23): The coefficient of  $g_1^2 |M_1|^2$  should be  $-\frac{6}{5}$ , not  $-\frac{3}{5}$ . (Thanks to Scott Thomas and Gudrun Hiller.)
- Section 7.2, eq. (7.29): The 174 GeV should be squared. So, the equation should read:

$$v_u^2 + v_d^2 = v^2 = 2m_Z^2 / (g^2 + g'^2) \approx (174 \text{ GeV})^2.$$

- Section 7.2, eq. (7.41): The factor of  $\sin^4\beta$  should actually be  $\sin^2\beta \cos^2\alpha$ . However, in the usual decoupling limit of  $m_{A^0} \gg m_Z$ , then  $\cos\alpha \approx \sin\beta$  and eq. (7.41) becomes correct as written. (Thanks to John Terning and Gudrun Hiller.)
- Section 7.3, eq. (7.57): “ $\mathbf{U}^T$ ” should be “ $\mathbf{U}^*$ ”. So this equation should read:

$$\mathbf{U}^* \mathbf{X} \mathbf{V}^{-1} = \begin{pmatrix} m_{\tilde{C}_1} & 0 \\ 0 & m_{\tilde{C}_2} \end{pmatrix}.$$

- Section 7.3, eq. (7.58),(7.59) [archive version only]: This should be just one equation, not two equations as the numbering seemed to indicate.