Corrections for “A Supersymmetry Primer”, version 3

Please note that version 3 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 v3, dated April 7, 1999. 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: 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 $\Lambda_{\text{UV}}^2$ 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 5.2, 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 $\bar{\nu}\tau^+$ 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 5.1, eqs. (6.4) and (6.5): There are three minus sign errors. These equations should read:

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

$$D = -\kappa - g \sum_i q_i \phi^s_i \phi_i$$

- Section 6.3, second full sentence after eq (6.25): $\langle F_X \rangle$ should actually be: $\sqrt{\langle F_X \rangle}$. (Thanks to Verónica Sanz.)

- Section 6.4, third full sentence after eq. (6.47): “squared masses $y_t\langle S\rangle$” should read “squared masses $|y_t\langle S\rangle|^2$.” (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. (7.41): 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.)