

Corrections for “A Supersymmetry Primer”, version 1

Please note that v1 is now hopelessly obsolete; you should be reading v4 (June 2006) instead!

The following is a list of known corrections to `hep-ph/9709356 v1`, dated September 15, 1997. If you have one of the more recent versions, you can find the corresponding list of corrections at:

<http://zippy.physics.niu.edu/primer.shtml>

Please send any further corrections or suggestions to `spmartin@niu.edu`.

This list was last updated: June 1, 2006

- 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 Λ_{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 2, eq. (2.12): $\overline{\Psi}_M$ should have its entries reversed. It should be $(\xi^\alpha \xi_\alpha^\dagger)$.
- Section 3.2, eq. (3.46): The indices ij should be lowered on W^{*ij} .
- Section 3.2, sentence after eq. (3.47): “ W_i ” should be “ W^i ”.
- 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 λ' and λ'' were of order unity. (Thanks to John Terning.)
- Section 5.3, eq. (5.11): “ Q ” in the last term of the second line in the equation should be “ L ”. That term should be $-\tilde{e} \mathbf{a}_e \tilde{L} H_d$. (Thanks to Graham Kribs.)
- 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 6.2, eq. (6.18) should have a δ in front: $\delta \tilde{\Psi}_\mu^\alpha = -\partial_\mu \epsilon^\alpha$.
- Section 6.3, second full sentence after eq. (6.21): $\langle F_S \rangle$ 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, last sentence of paragraph that includes eq. (7.53): “ μ ” should be “ $|\mu|$ ”.

- 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): This should be just one equation, not two equations as the numbering seemed to indicate.
- Section 7.5, 1st line after eq. (7.84)]: The range for the stop mixing angle should be $0 \leq \theta_{\tilde{t}} < \pi$. (Thanks to Graham Kribs.)
- Appendix, end of paragraph before equation (A.1): “infrared degrees of freedom” should be “ultra-violet degrees of freedom”