Corrections for "Two-component spinor techniques and Feynman rules for quantum field theory and supersymmetry", v1, by Herbi K. Dreiner, Howard E. Haber and Stephen P. Martin.

The following is a list of known corrections to `arXiv:0812.1594 [hep-ph] v1`, which appeared on December 9, 2008. Also, we note that many additions and clarifications now appear in v2, which appeared on September 10, 2009. This list was last updated September 11, 2009. Please send any further corrections or suggestions to: `dreiner@th.physik.uni-bonn.de` or `haber@scipp.ucsc.edu` or `spmartin@niu.edu`.

We note the following corrections to version 1:

- page 5: In version 1, footnote 1 read: "In the limit of zero mass, neutrinos can be described by either Majorana or Weyl fermions. Both are naturally described in the two-component spinor formalism." This statement is misleading, as there is no distinction between a massless Majorana fermion and a massless Weyl fermion in the two-component spinor formalism.

- page 24: In the first sentence of the last paragraph of section 3.1, the words "massive and massive" should read "massive and massless".

- page 27: The possibility of fermions transforming under a pseudo-real representation of the flavor group was omitted. This case is treated more fully in version 2.

- page 28: For consistency of notation, a conjugated quantum field should be denoted with a hermitian conjugation symbol. Thus, right above eq. (3.2.30), replace Φ^* with $\Phi^\dagger$.

- page 33: Following the convention established in the previous erratum, right above eq. (4.3.1), replace $(\hat{\Phi}_I)^*$ with $(\hat{\Phi}_I)^\dagger$. In eq. (4.3.1), replace $\hat{\Phi}^*$ with $\hat{\Phi}^\dagger$.

- page 34: In eq. (4.3.6) replace Φ^* with $\Phi^\dagger$ (twice).

- page 36: Below eq. (4.3.13) it was stated that G^a is a hermitian matrix. However, it is often convenient to switch from the original basis in which $\boldsymbol{T^a}$ is hermitian to a basis of complex vectors with well-defined charges under the unbroken gauge symmetry. Then the $\boldsymbol{T^a}$ are no longer necessarily hermitian for some choices of a [cf. footnote 23], in which case G^a need not be hermitian.

- page 37: Figure 4.3.3 has two obvious spurious factors of g.

- page 40: Note that the labeling of two-component fermions in Section 4.5 differs from the one subsequently adopted in Section 5 and later sections. In section 4.5, all two-component fermion lines are labeled by their corresponding left-handed $(\frac{1}{2}, 0)$ fields. In section 5 and later sections, the field labels for external lines correspond to the physical particle, as explained after Table 5.1.

- page 41: The labeling of momenta and spins in Fig. 4.5.2 is incorrect. The incoming η in the first diagram and the outgoing χ in the second diagram must be assigned the same momentum and spin, (p_1, s_1), as they represent the same Dirac fermion. Likewise, the incoming χ in the first diagram and the outgoing η in the second diagram should both be assigned (p_2, s_2).

- page 48: Equation (4.5.18) had the wrong sign on the term $m_D G_L G_R$.

- page 58: The last full sentence of the second paragraph should read: "For each particle, we list the two-component field with the same quantum numbers, i.e., the field that contains the annihilation operator for that one-particle state (which creates the one-particle state when acting to the *left* on the vacuum $\langle 0|$)." (Thanks to A. Garrett Lisi.)

- page 64: In figure 6.2.1(b), $Z^0(p, \varepsilon_\mu)$ should be $Z^0(p, \lambda_Z)$. (Thanks to an anonymous referee.)

- page 83: The last N_{j2} in equation (6.12.5) should be N_{j1}, and the last N_{i2} in equation (6.12.6) should be N_{i1}. (Thanks to Lorenzo Ubaldi.)

- page 131: In the acknowledgments, we inadvertently omitted Lance Dixon and Daniel Maitre from the list of colleagues who provided valuable conversations during the writing of this manuscript. We also have acknowledged more recent correspondence from Garrett Lisi, Nicholas Setzer, Lorenzo Ubaldi, José Valle, and an anonymous referee.

- page 165: Footnote 84 is not correct. The U(1) may be orthogonal to the gauge group G, as in the case of the interaction of a pair of Majorana fermion gluinos with a gluon. Or it may not be, as in the case of the interaction of a pair of Majorana fermion neutralinos with the Z-boson.

- page 166: Below eq. (G.2.1) it was stated that G^a_L and G^a_R are hermitian matrices. However, it is often convenient to switch from the original basis of fields in which the $\boldsymbol{T^a}$ are hermitian to a basis of complex fields with well-defined charges under the unbroken gauge symmetry. Then the $\boldsymbol{T^a}$ are no longer necessarily hermitian for some choices of a [cf. footnote 23], in which case G^a_L and G^a_R need not be hermitian.

- page 166: In eq. (G.2.2), replace $(G^a_R)_j{}^i$ with $(G^a_R)_i{}^j$ (that is swap the indices i and j). Do the same in the last Feynman rule of Figure G.2.1.

- page 167: In eq. (G.2.4), Φ^* should be $\Phi^\dagger$ and W^* should be $W^\dagger$. G_1 and G_2 are arbitrary complex matrices, and not hermitian matrices as claimed below the equation. Likewise, κ_1 and κ_2 are arbitrary complex matrices, and not complex symmetric matrices as claimed below the equation.

- page 168: In Figure G.2.2, the last two Feynman diagrams are the conjugates of the previous two, respectively. As a result, in the last two Feynman rules, replace ${G_{1j}}^i$ with G^i_{1j} and replace ${G_{2i}}^j$ with G^j_{2i}.

- page 171: In Eq. (G.3.5), the sign of G_R should be positive.

- page 173: All four charged scalar (dashed) lines in the two exhibited Feynamn diagrams should carry arrows pointing out of the diagram.

- page 174: In eq. (G.3.11), there is a sign error. Change all signs of G_R. A similar error in the corresponding two-component fermion result was also corrected as noted previously.

- page 210: In eq. (J.2.9), the first summation should be over i and j, not k. Also, note that the hermitian conjugation applies to both lines on the right-hand side, not just the second line.

- page 211: In figure (J.2.1), the Feynman rules for $h^0_{\rm SM}$ and G^0 should each be multiplied by 2. (This is because the neutrinos are identical). In other words, the four factors of $\sqrt{2}$ in the denominators in this figure should be in the numerators.