

Erratum: Singlet night in Feynman-ville: one-loop matching of a real scalar

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Due to an oversight, in the original paper we did not give the one-loop matching correction to the (non-hermitian) operator $Q_{Hud} = (i\tilde{H}^\dagger D_\mu H)(\bar{u}\gamma^\mu d)$, which reads

$$C_{Hud}^{(1)} = -\frac{5A^2}{4M^4} y_u^\dagger y_d + \gamma_{Hud,H\Box} C_{H\Box}^{(0)} \ln \frac{\mu M}{M}, \quad \gamma_{Hud,H\Box} = 2y_u^\dagger y_d,$$

as computed from the amplitude for the $HH \rightarrow u\bar{d}$ process. Thus, up to the one-loop level, matching the real singlet scalar extensions of the Standard Model to the Standard Model effective field theory generates non-zero Wilson coefficients for 18 effective operators. We thank Benjamin Summ for bringing this omission to our attention.

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