

Erratum: Low-energy effective field theory below the electroweak scale: operators and matching

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In ref. [1], the operator basis of the low-energy effective field theory below the weak scale (LEFT) was worked out to dimension six and the tree-level matching conditions to the Standard Model effective field theory (SMEFT) above the weak scale were given. Here, we correct two mistakes in the original publication.

In table 3 of ref. [1], the number of operators in the case of $n_g = 1$ generation of fermions was incorrect, although the number of operators for a generic number of generations was correctly given in table 22. The corrected table reads as follows.

d	quantum numbers	$n_g = 1$	$n_g = 3$
3	$(\Delta L = 2) + \text{h.c.}$	$1 + 1$	$6 + 6$
5	$\Delta B = \Delta L = 0$	$5 + 5$	$35 + 35$
5	$(\Delta L = 2) + \text{h.c.}$	$0 + 0$	$3 + 3$
6	$\Delta B = \Delta L = 0$	$80 = 57_+ + 23_-$	$3631 = 1933_+ + 1698_-$
6	$(\Delta L = 2) + \text{h.c.}$	$11 + 11$	$600 + 600$
6	$(\Delta L = 4) + \text{h.c.}$	$0 + 0$	$6 + 6$
6	$(\Delta B = \Delta L = 1) + \text{h.c.}$	$6 + 6$	$288 + 288$
6	$(\Delta B = -\Delta L = 1) + \text{h.c.}$	$2 + 2$	$228 + 228$

Furthermore, the matching condition for the first two $\Delta B = \Delta L = 1$ operators in table 20 in ref. [1] was incorrect. The correct entries should read as follows.

$\Delta B = \Delta L = 1 + \text{h.c.}$			
	Number	SM	Matching
$\mathcal{O}_{udd}^{S,LL}$	$n_\nu n_u n_d^2$	54	$C_{qqql}^{srpt} - C_{qqql}^{rspt} + C_{qqql}^{rpst}$
$\mathcal{O}_{duu}^{S,LL}$	$n_e n_d n_u^2$	36	$C_{qqql}^{srpt} - C_{qqql}^{rspt} + C_{qqql}^{rpst}$

The complete tree-level SMEFT-LEFT matching was reproduced and generalized to one loop in ref. [2].

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References

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