Erratum: Testable two-loop radiative neutrino mass model based on an $LLQd^cQd^c$ effective operator

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We found a few typos as well as some errors in some of the chirality structures due to wrongly reading off the result from FormCalc. The final results are not affected, since these chirality structures do not contribute to the strongest constraints which set the limit for this model.

The upper index of the momentum q in eq. (4.2) should be a lower index, q_ν , and the indices of the masses m_{l_i} (m_{l_j}) in the expression of σ_L (σ_R) in eq. (4.3) should read m_{l_j} (m_{l_i}). The exponent of $(t_{am} - 1)$ in the denominator of the expressions for $A_1^{L,R}$ in eqs. (4.9a) and (A.2a) should read 4 instead of 2

$$A_1^{L,R} = \sum_{a=1}^3 \sum_{m=1}^2 \frac{\lambda_{2am}^{LQ,eu} \lambda_{1am}^{LQ,eu\dagger}}{384\pi^2 m_{\phi_m}^2} \times \frac{(t_{am} - 1)(10 + (-17 + t_{am})t_{am}) - 2(4 - 6t_{am} - t_{am}^3) \ln t_{am}}{(t_{am} - 1)^4}. \quad (1)$$

Furthermore, the right-handed contributions A_1^R , F_R , B_1^R in eqs. (4.9a), (4.11a), and (4.13) vanish for $\lambda^{eu} = 0$, as it is correctly written in eqs. (A.2a), (A.2c), and (A.2d). After correcting the exponent of $(t_{am} - 1)$ in eq. (4.2), figure 5 has to be updated. The corrected figure is shown in figure 1. The main change is in the third quadrant of figure 5(a) and contrary to our previous discussion, the constraint from $\mu \rightarrow e\gamma$ is always more stringent in the third quadrant compared to the one from $\mu \rightarrow eee$. A_L and A_R in eq. (4.22) should read A_2^L and A_2^R , respectively.

Figure 1. Contour plots of the branching ratio in $\mu^- \rightarrow e^-e^+e^-$ at $m_f = 1 \text{ TeV}$ (left) and $m_f = 10 \text{ TeV}$ (right).

The first and the fourth of the operators given in eq. (4.23) have the wrong chirality structure and should read

$$C_{ijtt}^{\ell u, LL} 2\sqrt{2}G_F(\bar{\ell}_i \gamma^\mu P_L \ell_j)(\bar{t} \gamma_\mu P_L t), \quad C_{ijkl}^{\nu d, RL} 2\sqrt{2}G_F(\bar{\nu}_i^C \gamma^\mu P_R \nu_j^C)(\bar{d}_k \gamma_\mu P_L d_l). \quad (2)$$

We changed the name of the Wilson coefficient for consistency, which have to be changed in eq. (4.24) and the following discussion as well. The chirality structure of the contribution to meson mixing is the same as in the SM contrary to our discussion. Thus it is an additional contribution to the Wilson coefficient C_1^{ij} and the Wilson coefficient in eq. (4.29) should read C_1^{ij} , similarly in eqs. (4.32)–(4.34). In eqs. (4.44) and (4.45), the sign of C_{10} is wrong and the first equality should read $C_9 = -C_{10}$. The chirality structure of the operator in eq. (4.46) should read

$$D_{ijkl} 2\sqrt{2}G_F(\bar{d}_i \gamma^\mu P_L d_j)(\bar{\ell}_k \gamma_\mu P_L \ell_l), \quad (3)$$

where we renamed the Wilson coefficient for consistency. It should be changed accordingly in eq. (4.47) and (4.48). Finally the chirality structures of the operators given in eqs. (5.7a)–(5.7d) have to be corrected as follows

$$C_{ijkl}^{\ell u, LR} 2\sqrt{2}G_F(\bar{\ell}_i P_L \ell_j)(\bar{u}_k P_R u_l), \quad C_{ijkl}^{\ell u, RL} 2\sqrt{2}G_F(\bar{\ell}_i P_R \ell_j)(\bar{u}_k P_L u_l), \quad (4a)$$

$$C_{ijkl}^{\ell u, VLL} 2\sqrt{2}G_F(\bar{\ell}_i \gamma^\mu P_L \ell_j)(\bar{u}_k \gamma_\mu P_L u_l), \quad C_{ijkl}^{\ell u, VRR} 2\sqrt{2}G_F(\bar{\ell}_i \gamma^\mu P_R \ell_j)(\bar{u}_k \gamma_\mu P_R u_l), \quad (4b)$$

$$C_{ijkl}^{\ell u, TLR} 2\sqrt{2}G_F(\bar{\ell}_i \sigma^{\mu\nu} P_L \ell_j)(\bar{u}_k \sigma_{\mu\nu} P_R u_l), \quad C_{ijkl}^{\ell u, TRL} 2\sqrt{2}G_F(\bar{\ell}_i \sigma^{\mu\nu} P_R \ell_j)(\bar{u}_k \sigma_{\mu\nu} P_L u_l), \quad (4c)$$

$$C_{ijkl}^{\nu d, VLL} 2\sqrt{2}G_F(\bar{\nu}_i \gamma^\mu P_L \nu_j)(\bar{d}_k \gamma_\mu P_L d_l), \quad C_{ijkl}^{\nu d, VRL} 2\sqrt{2}G_F(\bar{\nu}_i^C \gamma^\mu P_R \nu_j^C)(\bar{d}_k \gamma_\mu P_L d_l). \quad (4d)$$

We again changed the name of the Wilson coefficients to match the chirality structure. It has to be changed accordingly in eqs. (5.8a)–(5.8d) as well as in the last line of the following paragraph.

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