

$$\begin{aligned} & \frac{1}{16\pi^2} \left( -\frac{1}{144} \frac{1}{m_e^2} s_Y^2 (36 \overline{y_e}^{i2i3} y_e^{i1i4} (8 g_1^2 + 3 g_2^2) + 9 \overline{y_e}^{pr} \overline{y_e}^{i2i3} (3 y_e^{pi4} y_e^{i1r} (1 + s_Y^2) - \right. \\ & \quad 8 c_Y^2 y_e^{pr} y_e^{i1i4}) + 27 \overline{y_e}^{ri3} \overline{y_e}^{i2p} (4 c_Y^2 y_e^{ri4} y_e^{i1p} + y_e^{rp} y_e^{i1i4} (1 + s_Y^2)) + \\ & \quad \left. 2 g_1^2 (5 \overline{y_e}^{pi3} y_e^{pi4} \delta_{i1i2} + 7 \overline{y_e}^{i2p} y_e^{i1p} \delta_{i3i4}) \right) - \frac{1}{4} \sum_p s_Y g_1^2 \frac{1}{m_e^4} \overline{y_e}^{i2i3} \\ & \quad y_e^{i1i4} (2 s_{2Y} c_Y + s_Y c_{2Y}) \text{LF}_{1,0} [m_d^P] + \frac{2}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_d^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{5}{36} \sum_p g_1^4 \text{LF}_{4,-1} [m_d^P] \delta_{i1i2} \delta_{i3i4} + \frac{8}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_d^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{3}{2} s_Y \frac{1}{m_e^4} \overline{y_d}^{pr} y_d^{pr} \overline{y_e}^{i2i3} y_e^{i1i4} (-s_{2Y} c_Y + s_Y^3) \text{LF}_{1,0} [m_d^r] - \\ & \quad \frac{1}{4} \sum_p s_Y g_1^2 \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} (2 s_{2Y} c_Y + s_Y c_{2Y}) \text{LF}_{1,0} [m_e^P] + \frac{2}{9} \sum_p g_1^4 \text{LF}_{3,0} [m_e^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{5}{12} \sum_p g_1^4 \text{LF}_{4,-1} [m_e^P] \delta_{i1i2} \delta_{i3i4} + \frac{8}{45} \sum_p g_1^4 \text{LF}_{5,-2} [m_e^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{1}{2} s_Y \frac{1}{m_e^4} \overline{y_e}^{pr} \overline{y_e}^{i2i3} y_e^{pr} y_e^{i1i4} (-s_{2Y} c_Y + s_Y^3) \text{LF}_{1,0} [m_e^r] + \\ & \quad \frac{1}{4} s_Y \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} (2 \overline{y_e}^{pr} y_e^{pr} (s_{2Y} c_Y - s_Y^3) + \sum_p g_1^2 (2 s_{2Y} c_Y + s_Y c_{2Y})) \text{LF}_{1,0} [m_l^P] + \\ & \quad \frac{1}{9} \sum_p g_1^4 \text{LF}_{3,0} [m_l^P] \delta_{i1i2} \delta_{i3i4} - \frac{5}{24} \sum_p g_1^4 \text{LF}_{4,-1} [m_l^P] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{4}{45} \sum_p g_1^4 \text{LF}_{5,-2} [m_l^P] \delta_{i1i2} \delta_{i3i4} - \frac{1}{4} s_Y \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} \\ & \quad (6 \overline{y_d}^{pr} y_d^{pr} (-s_{2Y} c_Y + s_Y^3) + 6 c_Y \overline{y_d}^{pr} y_d^{pr} (s_{2Y} + s_Y c_Y) + \sum_p g_1^2 (2 s_{2Y} c_Y + s_Y c_{2Y})) \\ & \quad \text{LF}_{1,0} [m_q^P] + \frac{1}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_q^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{5}{72} \sum_p g_1^4 \text{LF}_{4,-1} [m_q^P] \delta_{i1i2} \delta_{i3i4} + \frac{4}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_q^P] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{1}{2} \sum_p s_Y g_1^2 \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} (2 s_{2Y} c_Y + s_Y c_{2Y}) \text{LF}_{1,0} [m_u^P] + \frac{8}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_u^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{5}{9} \sum_p g_1^4 \text{LF}_{4,-1} [m_u^P] \delta_{i1i2} \delta_{i3i4} + \frac{32}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_u^P] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{3}{2} s_Y c_Y \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} \overline{y_u}^{pr} y_u^{pr} (s_{2Y} + s_Y c_Y) \text{LF}_{1,0} [m_u^r] - \frac{1}{8} s_Y s_Y \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} \\ & \quad (3 s_{4Y} c_Y (g_1^2 + g_2^2) + s_Y (g_1^2 (-1 + 3 c_{2Y}^2) + 3 g_2^2 (-1 + c_{2Y}^2))) \text{LF}_{1,0} [m_\Phi] + \\ & \quad \frac{1}{8} \frac{1}{m_e^2} (3 s_{4Y} \overline{y_e}^{pr} \overline{y_e}^{i2i3} y_e^{pi4} y_e^{i1r} + s_Y^2 y_e^{i1i4} (-2 \overline{y_e}^{i2i3} (g_1^2 + 3 g_2^2) + 3 s_Y^2 \overline{y_e}^{ri3} \overline{y_e}^{i2p} y_e^{rp})) \\ & \quad \text{LF}_{1,1} [m_\Phi] + \frac{1}{24} s_Y^2 (3 \overline{y_e}^{i2i3} y_e^{i1i4} (g_1^2 + 3 g_2^2) - 4 g_1^2 \overline{y_e}^{pi3} y_e^{pi4} \delta_{i1i2} - \\ & \quad 4 \overline{y_e}^{i2p} y_e^{i1p} (3 c_Y^2 \overline{y_e}^{ri3} y_e^{ri4} + 2 g_1^2 \delta_{i3i4})) \text{LF}_{1,2} [m_\Phi] + \\ & \quad \frac{1}{12} s_Y^2 (-g_1^2 \overline{y_e}^{pi3} y_e^{pi4} \delta_{i1i2} + \overline{y_e}^{i2p} y_e^{i1p} (-3 s_Y^2 \overline{y_e}^{ri3} y_e^{ri4} + g_1^2 \delta_{i3i4})) \text{LF}_{2,1} [m_\Phi] + \\ & \quad \frac{1}{36} g_1^2 (3 s_Y^2 \overline{y_e}^{pi3} y_e^{pi4} \delta_{i1i2} + (-3 s_Y^2 \overline{y_e}^{i2p} y_e^{i1p} + 4 g_1^2 \delta_{i1i2}) \delta_{i3i4}) \text{LF}_{3,0} [m_\Phi] - \\ & \quad \frac{5}{24} g_1^4 \text{LF}_{4,-1} [m_\Phi] \delta_{i1i2} \delta_{i3i4} + \frac{4}{45} g_1^4 \text{LF}_{5,-2} [m_\Phi] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{1}{9} g_1^4 \text{LF}_{3,0} [\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{6} g_1^4 \text{LF}_{4,-1} [\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} - \\ & \quad \frac{8}{45} g_1^4 \text{LF}_{5,-2} [\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{2} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{1,1,0} [m_1, m_e^{i3}] - \\ & \quad \frac{1}{4} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{2,1,-1} [m_1, m_e^{i3}] + \frac{1}{2} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{1,1,0} [m_1, m_e^{i4}] - \\ & \quad \frac{1}{4} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{2,1,-1} [m_1, m_e^{i4}] + \frac{1}{6} g_1^4 \text{LF}_{2,1,0} [m_1, m_e^{i4}] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{1}{6} g_1^4 \text{LF}_{2,2,-1} [m_1, m_e^{i4}] \delta_{i1i2} \delta_{i3i4} - \frac{1}{3} g_1^4 \text{LF}_{3,1,-1} [m_1, m_e^{i4}] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{1}{6} g_1^4 \text{LF}_{4,1,-2} [m_1, m_e^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{8} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{1,1,0} [m_1, m_l^{i1}] - \\ & \quad \frac{1}{16} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{2,1,-1} [m_1, m_l^{i1}] + \frac{1}{8} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{1,1,0} [m_1, m_l^{i2}] - \\ & \quad \frac{1}{16} g_1^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{2,1,-1} [m_1, m_l^{i2}] + \frac{1}{24} g_1^4 \text{LF}_{2,1,0} [m_1, m_l^{i2}] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{1}{24} g_1^4 \text{LF}_{2,2,-1} [m_1, m_l^{i2}] \delta_{i1i2} \delta_{i3i4} - \frac{1}{12} g_1^4 \text{LF}_{3,1,-1} [m_1, m_l^{i2}] \delta_{i1i2} \delta_{i3i4} + \\ & \quad \frac{1}{24} g_1^4 \text{LF}_{4,1,-2} [m_1, m_l^{i2}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{2} g_1^2 \frac{1}{m_e^4} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{1,1,-1} [m_1, \tilde{\mu}] + \\ & \quad m_1 s_Y \tilde{\mu} c_Y g_1^2 \frac{1}{m_e^4} \overline{y_e}^{i2i3} y_e^{i1i4} (c_Y^2 - 2 s_Y^2) \text{LF}_{1,1,0} [m_1, \tilde{\mu}] + \\ & \quad \frac{3}{8} g_2^2 \frac{1}{m_e^2} s_Y^2 \overline{y_e}^{i2i3} y_e^{i1i4} \text{LF}_{1,1,0} [m_2, m_l^{i1}] - \\ & \quad \frac{3}{16} g_2^2 \frac{1$$