

$$\begin{aligned}
& \hbar \left(\frac{1}{108} \frac{1}{m_e^2} \left(7 g_1^2 c_Y^2 \overline{y}_u^{p13} y_u^{pi4} \delta_{i1i2} + 2 s_Y^2 \overline{y}_e^{pi1} y_e^{pi2} \left(27 c_Y^2 \overline{y}_u^{ri3} y_u^{ri4} + 5 g_1^2 \delta_{i3i4} \right) \right) - \right. \\
& \quad \frac{8}{81} \sum_p g_1^4 \text{LF}_{3,0} [m_d^p] \delta_{i1i2} \delta_{i3i4} + \frac{5}{27} \sum_p g_1^4 \text{LF}_{4,-1} [m_d^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{32}{405} \sum_p g_1^4 \text{LF}_{5,-2} [m_d^p] \delta_{i1i2} \delta_{i3i4} - \frac{8}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_e^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{5}{9} \sum_p g_1^4 \text{LF}_{4,-1} [m_e^p] \delta_{i1i2} \delta_{i3i4} - \frac{32}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_e^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{4}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_l^p] \delta_{i1i2} \delta_{i3i4} + \frac{5}{18} \sum_p g_1^4 \text{LF}_{4,-1} [m_l^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{16}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_l^p] \delta_{i1i2} \delta_{i3i4} - \frac{4}{81} \sum_p g_1^4 \text{LF}_{3,0} [m_q^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{5}{54} \sum_p g_1^4 \text{LF}_{4,-1} [m_q^p] \delta_{i1i2} \delta_{i3i4} - \frac{16}{405} \sum_p g_1^4 \text{LF}_{5,-2} [m_q^p] \delta_{i1i2} \delta_{i3i4} - \frac{32}{81} \sum_p g_1^4 \text{LF}_{3,0} [m_u^p] \\
& \quad \delta_{i1i2} \delta_{i3i4} + \frac{20}{27} \sum_p g_1^4 \text{LF}_{4,-1} [m_u^p] \delta_{i1i2} \delta_{i3i4} - \frac{128}{405} \sum_p g_1^4 \text{LF}_{5,-2} [m_u^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{1}{9} \left(g_1^2 c_Y^2 \overline{y}_u^{p13} y_u^{pi4} \delta_{i1i2} + s_Y^2 \overline{y}_e^{pi1} y_e^{pi2} \left(9 c_Y^2 \overline{y}_u^{ri3} y_u^{ri4} + 2 g_1^2 \delta_{i3i4} \right) \right) \text{LF}_{1,2} [m_\Phi] + \\
& \quad \frac{1}{18} \left(3 g_1^2 c_Y^2 \overline{y}_u^{p13} y_u^{pi4} \delta_{i1i2} + s_Y^2 \overline{y}_e^{pi1} y_e^{pi2} \left(-9 c_Y^2 \overline{y}_u^{ri3} y_u^{ri4} + 2 g_1^2 \delta_{i3i4} \right) \right) \text{LF}_{2,1} [m_\Phi] - \\
& \quad \frac{1}{54} g_1^2 \left(6 s_Y^2 \overline{y}_e^{pi1} y_e^{pi2} \delta_{i3i4} + \left(9 c_Y^2 \overline{y}_u^{p13} y_u^{pi4} + 8 g_1^2 \delta_{i3i4} \right) \delta_{i1i2} \right) \text{LF}_{3,0} [m_\Phi] + \\
& \quad \frac{5}{18} g_1^4 \text{LF}_{4,-1} [m_\Phi] \delta_{i1i2} \delta_{i3i4} - \frac{16}{135} g_1^4 \text{LF}_{5,-2} [m_\Phi] \delta_{i1i2} \delta_{i3i4} - \frac{4}{27} g_1^4 \text{LF}_{3,0} [\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{2}{9} g_1^4 \text{LF}_{4,-1} [\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} + \frac{32}{135} g_1^4 \text{LF}_{5,-2} [\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} - \frac{2}{9} g_1^4 \text{LF}_{2,1,0} [m_1, m_e^{i2}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{2}{9} g_1^4 \text{LF}_{2,2,-1} [m_1, m_e^{i2}] \delta_{i1i2} \delta_{i3i4} + \frac{4}{9} g_1^4 \text{LF}_{3,1,-1} [m_1, m_e^{i2}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{2}{9} g_1^4 \text{LF}_{4,1,-2} [m_1, m_e^{i2}] \delta_{i1i2} \delta_{i3i4} - \frac{8}{81} g_1^4 \text{LF}_{2,1,0} [m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{81} g_1^4 \text{LF}_{2,2,-1} [m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{16}{81} g_1^4 \text{LF}_{3,1,-1} [m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{81} g_1^4 \text{LF}_{4,1,-2} [m_1, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} - \frac{8}{27} g_1^2 g_3^2 \text{LF}_{2,1,0} [m_3, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{27} g_1^2 g_3^2 \text{LF}_{2,2,-1} [m_3, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{16}{27} g_1^2 g_3^2 \text{LF}_{3,1,-1} [m_3, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{27} g_1^2 g_3^2 \text{LF}_{4,1,-2} [m_3, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{4}{9} g_1^4 \text{LF}_{2,1,0} [m_e^{i2}, m_1] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{2}{9} g_1^4 \text{LF}_{3,1,-1} [m_e^{i2}, m_1] \delta_{i1i2} \delta_{i3i4} + \frac{2}{9} g_1^2 \overline{y}_e^{pi1} y_e^{pi2} \text{LF}_{2,1,0} [m_l^p, \tilde{\mu}] \delta_{i3i4} - \\
& \quad \frac{1}{9} g_1^2 \overline{y}_e^{pi1} y_e^{pi2} \text{LF}_{2,2,-1} [m_l^p, \tilde{\mu}] \delta_{i3i4} - \frac{1}{9} g_1^2 \overline{y}_e^{pi1} y_e^{pi2} \text{LF}_{3,1,-1} [m_l^p, \tilde{\mu}] \delta_{i3i4} + \\
& \quad \frac{1}{9} g_1^2 \overline{y}_u^{p13} y_u^{pi4} \text{LF}_{2,1,0} [m_q^p, \tilde{\mu}] \delta_{i1i2} - \frac{1}{18} g_1^2 \overline{y}_u^{p13} y_u^{pi4} \text{LF}_{2,2,-1} [m_q^p, \tilde{\mu}] \delta_{i1i2} - \\
& \quad \frac{1}{18} g_1^2 \overline{y}_u^{p13} y_u^{pi4} \text{LF}_{3,1,-1} [m_q^p, \tilde{\mu}] \delta_{i1i2} + \frac{16}{81} g_1^4 \text{LF}_{2,1,0} [m_u^{i4}, m_1] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{81} g_1^4 \text{LF}_{3,1,-1} [m_u^{i4}, m_1] \delta_{i1i2} \delta_{i3i4} + \frac{16}{27} g_1^2 g_3^2 \text{LF}_{2,1,0} [m_u^{i4}, m_3] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{27} g_1^2 g_3^2 \text{LF}_{3,1,-1} [m_u^{i4}, m_3] \delta_{i1i2} \delta_{i3i4} - \frac{1}{9} g_1^2 \overline{y}_e^{pi1} y_e^{pi2} \text{LF}_{2,1,0} [\tilde{\mu}, m_l^p] \delta_{i3i4} + \\
& \quad \frac{5}{9} g_1^2 \overline{y}_e^{pi1} y_e^{pi2} \text{LF}_{3,1,-1} [\tilde{\mu}, m_l^p] \delta_{i3i4} - \frac{2}{9} g_1^2 \overline{y}_e^{pi1} y_e^{pi2} \text{LF}_{4,1,-2} [\tilde{\mu}, m_l^p] \delta_{i3i4} - \\
& \quad \frac{1}{18} g_1^2 \overline{y}_u^{p13} y_u^{pi4} \text{LF}_{2,1,0} [\tilde{\mu}, m_q^p] \delta_{i1i2} + \frac{11}{18} g_1^2 \overline{y}_u^{p13} y_u^{pi4} \text{LF}_{3,1,-1} [\tilde{\mu}, m_q^p] \delta_{i1i2} - \\
& \quad \frac{2}{9} g_1^2 \overline{y}_u^{p13} y_u^{pi4} \text{LF}_{4,1,-2} [\tilde{\mu}, m_q^p] \delta_{i1i2} + \frac{4}{9} g_1^4 \text{LF}_{2,1,1,-1} [m_1, m_e^{i2}, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \left. \frac{8}{9} g_1^4 m_1^2 \text{LF}_{2,1,1,0} [m_1, m_e^{i2}, m_u^{i4}] \delta_{i1i2} \delta_{i3i4} + \tilde{\mu}^2 \overline{y}_e^{pi1} y_e^{pi2} \overline{y}_u^{ri3} y_u^{ri4} \text{LF}_{2,1,1,0} [\tilde{\mu}, m_l^p, m_q^r] \right)
\end{aligned}$$