

$$\begin{aligned}
& \frac{1}{12} \frac{1}{144} \frac{1}{m_s^2} s_\gamma^2 y_e^{-i2p} (7 g_1^2 y_e^{i1p} - 12 c_\gamma^2 \overline{y_e^{rs}} y_e^{rp} y_e^{i1s}) - \\
& \frac{1}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_d^P] \delta_{i1i2} + \frac{5}{72} \sum_p g_1^4 \text{LF}_{4,-1} [m_d^P] \delta_{i1i2} - \frac{4}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_d^P] \delta_{i1i2} - \\
& \frac{1}{9} \sum_p g_1^4 \text{LF}_{3,0} [m_e^P] \delta_{i1i2} + \frac{5}{24} \sum_p g_1^4 \text{LF}_{4,-1} [m_e^P] \delta_{i1i2} - \frac{4}{45} \sum_p g_1^4 \text{LF}_{5,-2} [m_e^P] \delta_{i1i2} - \\
& \frac{1}{18} \sum_p g_1^4 \text{LF}_{3,0} [m_l^P] \delta_{i1i2} + \frac{5}{48} \sum_p g_1^4 \text{LF}_{4,-1} [m_l^P] \delta_{i1i2} - \frac{2}{45} \sum_p g_1^4 \text{LF}_{5,-2} [m_l^P] \delta_{i1i2} - \\
& \frac{1}{54} \sum_p g_1^4 \text{LF}_{3,0} [m_q^P] \delta_{i1i2} + \frac{5}{144} \sum_p g_1^4 \text{LF}_{4,-1} [m_q^P] \delta_{i1i2} - \frac{2}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_q^P] \delta_{i1i2} - \\
& \frac{4}{27} \sum_p g_1^4 \text{LF}_{3,0} [m_u^P] \delta_{i1i2} + \frac{5}{18} \sum_p g_1^4 \text{LF}_{4,-1} [m_u^P] \delta_{i1i2} - \frac{16}{135} \sum_p g_1^4 \text{LF}_{5,-2} [m_u^P] \delta_{i1i2} + \\
& \frac{1}{6} s_\gamma^2 \overline{y_e^{i2p}} (g_1^2 y_e^{i1p} - 3 c_\gamma^2 \overline{y_e^{rs}} y_e^{rp} y_e^{i1s}) \text{LF}_{1,2} [m_\Phi] - \frac{1}{24} g_1^2 s_\gamma^2 \overline{y_e^{i2p}} y_e^{i1p} \text{LF}_{2,1} [m_\Phi] + \\
& \frac{1}{72} (3 g_1^2 s_\gamma^2 \overline{y_e^{i2p}} y_e^{i1p} - 4 g_1^4 \delta_{i1i2}) \text{LF}_{3,0} [m_\Phi] + \frac{5}{48} g_1^4 \text{LF}_{4,-1} [m_\Phi] \delta_{i1i2} - \\
& \frac{2}{45} g_1^4 \text{LF}_{5,-2} [m_\Phi] \delta_{i1i2} - \frac{1}{18} g_1^4 \text{LF}_{3,0} [\tilde{\mu}] \delta_{i1i2} - \frac{1}{12} g_1^4 \text{LF}_{4,-1} [\tilde{\mu}] \delta_{i1i2} + \frac{4}{45} g_1^4 \text{LF}_{5,-2} [\tilde{\mu}] \delta_{i1i2} + \\
& \frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e^{i2p}} y_e^{i1p} \text{LF}_{2,1,0} [m_1, m_e^P] - g_1^2 c_\gamma^2 \overline{y_e^{i2p}} y_e^{i1p} \text{LF}_{3,1,-1} [m_1, m_e^P] + \\
& \frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e^{i2p}} y_e^{i1p} \text{LF}_{4,1,-2} [m_1, m_e^P] - \frac{1}{48} g_1^4 \text{LF}_{2,1,0} [m_1, m_l^{i2}] \delta_{i1i2} - \\
& \frac{1}{48} g_1^4 \text{LF}_{2,2,-1} [m_1, m_l^{i2}] \delta_{i1i2} + \frac{1}{24} g_1^4 \text{LF}_{3,1,-1} [m_1, m_l^{i2}] \delta_{i1i2} - \frac{1}{48} g_1^4 \text{LF}_{4,1,-2} [m_1, m_l^{i2}] \delta_{i1i2} - \\
& \frac{1}{16} g_1^2 g_2^2 \text{LF}_{2,1,0} [m_2, m_l^{i2}] \delta_{i1i2} - \frac{1}{16} g_1^2 g_2^2 \text{LF}_{2,2,-1} [m_2, m_l^{i2}] \delta_{i1i2} + \\
& \frac{1}{8} g_1^2 g_2^2 \text{LF}_{3,1,-1} [m_2, m_l^{i2}] \delta_{i1i2} - \frac{1}{16} g_1^2 g_2^2 \text{LF}_{4,1,-2} [m_2, m_l^{i2}] \delta_{i1i2} - \\
& \frac{1}{6} g_1^2 (c_\gamma \overline{a_d^{pr}} - s_\gamma \tilde{\mu} \overline{y_d^{pr}}) (c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}) \text{LF}_{2,2,0} [m_d^r, m_q^P] \delta_{i1i2} + \\
& \frac{1}{12} g_1^2 (c_\gamma \overline{a_d^{pr}} - s_\gamma \tilde{\mu} \overline{y_d^{pr}}) (c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}) \text{LF}_{3,2,-1} [m_d^r, m_q^P] \delta_{i1i2} + \\
& \frac{1}{6} g_1^2 \overline{y_e^{i2p}} y_e^{i1p} \text{LF}_{2,1,0} [m_e^P, \tilde{\mu}] - \frac{1}{12} g_1^2 \overline{y_e^{i2p}} y_e^{i1p} \text{LF}_{2,2,-1} [m_e^P, \tilde{\mu}] - \frac{1}{12} g_1^2 \overline{y_e^{i2p}} y_e^{i1p} \\
& \text{LF}_{3,1,-1} [m_e^P, \tilde{\mu}] - \frac{1}{6} g_1^2 (c_\gamma \overline{a_e^{pr}} - s_\gamma \tilde{\mu} \overline{y_e^{pr}}) (c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}) \text{LF}_{2,2,0} [m_e^r, m_l^P] \delta_{i1i2} + \\
& \frac{1}{12} g_1^2 (c_\gamma \overline{a_e^{pr}} - s_\gamma \tilde{\mu} \overline{y_e^{pr}}) (c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}) \text{LF}_{3,2,-1} [m_e^r, m_l^P] \delta_{i1i2} + \\
& \frac{1}{6} g_1^2 (c_\gamma \overline{a_e^{pr}} - s_\gamma \tilde{\mu} \overline{y_e^{pr}}) (c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}) \text{LF}_{3,1,0} [m_l^P, m_e^r] \delta_{i1i2} + \\
& \frac{1}{6} g_1^2 (c_\gamma \overline{a_e^{pr}} - s_\gamma \tilde{\mu} \overline{y_e^{pr}}) (c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}) \text{LF}_{3,2,-1} [m_l^P, m_e^r] \delta_{i1i2} - \\
& \frac{3}{8} g_1^2 (c_\gamma \overline{a_e^{pr}} - s_\gamma \tilde{\mu} \overline{y_e^{pr}}) (c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}) \text{LF}_{4,1,-1} [m_l^P, m_e^r] \delta_{i1i2} + \\
& \frac{1}{6} g_1^2 (c_\gamma \overline{a_e^{pr}} - s_\gamma \tilde{\mu} \overline{y_e^{pr}}) (c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}) \text{LF}_{5,1,-2} [m_l^P, m_e^r] \delta_{i1i2} + \\
& \frac{1}{24} g_1^4 \text{LF}_{2,1,0} [m_l^{i2}, m_1] \delta_{i1i2} - \frac{1}{48} g_1^4 \text{LF}_{3,1,-1} [m_l^{i2}, m_1] \delta_{i1i2} + \\
& \frac{1}{8} g_1^2 g_2^2 \text{LF}_{2,1,0} [m_l^{i2}, m_2] \delta_{i1i2} - \frac{1}{16} g_1^2 g_2^2 \text{LF}_{3,1,-1} [m_l^{i2}, m_2] \delta_{i1i2} + \\
& \frac{1}{6} g_1^2 (c_\gamma \overline{a_d^{pr}} - s_\gamma \tilde{\mu} \overline{y_d^{pr}}) (c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}) \text{LF}_{3,1,0} [m_q^P, m_d^r] \delta_{i1i2} + \\
& \frac{1}{6} g_1^2 (c_\gamma \overline{a_d^{pr}} - s_\gamma \tilde{\mu} \overline{y_d^{pr}}) (c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}) \text{LF}_{3,2,-1} [m_q^P, m_d^r] \delta_{i1i2} - \\
& \frac{5}{8} g_1^2 (c_\gamma \overline{a_d^{pr}} - s_\gamma \tilde{\mu} \overline{y_d^{pr}}) (c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}) \text{LF}_{4,1,-1} [m_q^P, m_d^r] \delta_{i1i2} + \\
& \frac{1}{2} g_1^2 (c_\gamma \overline{a_d^{pr}} - s_\gamma \tilde{\mu} \overline{y_d^{pr}}) (c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}) \text{LF}_{5,1,-2} [m_q^P, m_d^r] \delta_{i1i2} + \\
& \frac{1}{12} g_1^2 (s_\gamma \overline{a_u^{pr}} - \tilde{\mu} c_\gamma \overline{y_u^{pr}}) (s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}) \text{LF}_{2,2,0} [m_q^P, m_u^r] \delta_{i1i2} - \\
& \frac{1}{24} g_1^2 (s_\gamma \overline{a_u^{pr}} - \tilde{\mu} c_\gamma \overline{y_u^{pr}}) (s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}) \text{LF}_{3,2,-1} [m_q^P, m_u^r] \delta_{i1i2} - \\
& \frac{1}{12} g_1^2 (s_\gamma \overline{a_u^{pr}} - \tilde{\mu} c_\gamma \overline{y_u^{pr}}) (s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}) \text{LF}_{3,1,0} [m_u^r, m_q^P] \delta_{i1i2} - \\
& \frac{1}{12} g_1^2 (s_\gamma \overline{a_u^{pr}} - \tilde{\mu} c_\gamma \overline{y_u^{pr}}) (s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}) \text{LF}_{3,2,-1} [m_u^r, m_q^P] \delta_{i1i2} - \\
& \frac{1}{4} g_1^2 (s_\gamma \overline{a_u^{pr}} - \tilde{\mu} c_\gamma \overline{y_u^{pr}}) (s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}) \text{LF}_{4,1,-1} [m_u^r, m_q^P] \delta_{i1i2} + \\
& \frac{1}{2} g_1^2 (s_\gamma \overline{a_u^{pr}} - \tilde{\mu} c_\gamma \overline{y_u^{pr}}) (s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}) \text{LF}_{5,1,-2} [m_u^r, m_q^P] \delta_{i1i2} + \\
& \frac{5}{24} g_1^4 \text{LF}_{4,1,-2} [\tilde{\mu}, m_1] \delta_{i1i2} + \frac{1}{4} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 \text{LF}_{4,1,-1} [\tilde{\mu}, m_1] \delta_{i1i2} - \\
& \frac{1}{6} g_1^4 \text{LF}_{5,1,-3} [\tilde{\mu}, m_1] \delta_{i1i2} - \frac{1}{3} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 \text{LF}_{5,$$