$$C_{Hl}^{(1)\,i1\_i2\_} \to \hbar \left(\frac{1}{144} \frac{1}{m_{\Phi}^2} s_\gamma^2 \overline{y_e}^{i2p} \left(7 g_1^2 y_e^{i1p} - 12 c_\gamma^2 \overline{y_e}^{rs} y_e^{rp} y_e^{i1s}\right) - \right.$$

$$\frac{1}{27} \sum_p g_1^4 LF_{3,0}[m_{\tilde{d}}^p] \delta_{i1i2} + \frac{5}{72} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{d}}^p] \delta_{i1i2} - \frac{4}{135} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{d}}^p] \delta_{i1i2} -$$

$$\frac{1}{9} \sum_p g_1^4 LF_{3,0}[m_{\tilde{e}}^p] \delta_{i1i2} + \frac{5}{24} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{e}}^p] \delta_{i1i2} - \frac{4}{45} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{e}}^p] \delta_{i1i2} -$$

$$\frac{1}{18} \sum_p g_1^4 LF_{3,0}[m_{\tilde{l}}^p] \delta_{i1i2} + \frac{5}{48} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{l}}^p] \delta_{i1i2} - \frac{2}{45} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{l}}^p] \delta_{i1i2} -$$

$$\frac{1}{54} \sum_p g_1^4 LF_{3,0}[m_{\tilde{q}}^p] \delta_{i1i2} + \frac{5}{144} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{q}}^p] \delta_{i1i2} - \frac{2}{135} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{q}}^p] \delta_{i1i2} -$$

$$\frac{4}{27} \sum_p g_1^4 LF_{3,0}[m_{\tilde{u}}^p] \delta_{i1i2} + \frac{5}{18} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{u}}^p] \delta_{i1i2} - \frac{16}{135} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{u}}^p] \delta_{i1i2} +$$

$$\frac{1}{6} s_\gamma^2 \overline{y_e}^{i2p} \left(g_1^2 y_e^{i1p} - 3 c_\gamma^2 \overline{y_e}^{rs} y_e^{rp} y_e^{i1s}\right) LF_{1,2}[m_{\Phi}] - \frac{1}{24} g_1^2 s_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1}[m_{\Phi}] +$$

$$\frac{1}{72} \left(3 g_1^2 s_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} - 4 g_1^4 \delta_{i1i2}\right) LF_{3,0}[m_{\Phi}] + \frac{5}{48} g_1^4 LF_{4,-1}[m_{\Phi}] \delta_{i1i2} -$$

$$\frac{2}{45} g_1^4 LF_{5,-2}[m_{\Phi}] \delta_{i1i2} - \frac{1}{18} g_1^4 LF_{3,0}[\tilde{\mu}] \delta_{i1i2} - \frac{1}{12} g_1^4 LF_{4,-1}[\tilde{\mu}] \delta_{i1i2} + \frac{4}{45} g_1^4 LF_{5,-2}[\tilde{\mu}] \delta_{i1i2} +$$

$$\frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,0}[m_1, m_{\tilde{e}}^p] - g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,-1}[m_1, m_{\tilde{e}}^p] +$$

$$\frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{4,1,-2}[m_1, m_{\tilde{e}}^p] - \frac{1}{48} g_1^4 LF_{2,1,0}[m_1, m_{\tilde{l}}^{i2}] \delta_{i1i2} -$$

$$\frac{1}{48} g_1^4 LF_{2,2,-1}[m_1, m_{\tilde{l}}^{i2}] \delta_{i1i2} + \frac{1}{24} g_1^4 LF_{3,1,-1}[m_1, m_{\tilde{l}}^{i2}] \delta_{i1i2} - \frac{1}{48} g_1^4 LF_{4,1,-2}[m_1, m_{\tilde{l}}^{i2}] \delta_{i1i2} -$$

$$\frac{1}{16} g_1^2 g_2^2 LF_{2,1,0}[m_2, m_{\tilde{l}}^{i2}] \delta_{i1i2} - \frac{1}{16} g_1^2 g_2^2 LF_{2,2,-1}[m_2, m_{\tilde{l}}^{i2}] \delta_{i1i2} +$$

$$\frac{1}{8} g_1^2 g_2^2 LF_{3,1,-1}[m_2, m_{\tilde{l}}^{i2}] \delta_{i1i2} - \frac{1}{16} g_1^2 g_2^2 LF_{4,1,-2}[m_2, m_{\tilde{l}}^{i2}] \delta_{i1i2} -$$

$$\frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{2,2,0}[m_{\tilde{d}}^r, m_{\tilde{q}}^p] \delta_{i1i2} +$$

$$\frac{1}{12} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,2,-1}[m_{\tilde{d}}^r, m_{\tilde{q}}^p] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,0}[m_{\tilde{e}}^p, \tilde{\mu}] - \frac{1}{12} g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,2,-1}[m_{\tilde{e}}^p, \tilde{\mu}] - \frac{1}{12} g_1^2 \overline{y_e}^{i2p} y_e^{i1p}$$

$$LF_{3,1,-1}[m_{\tilde{e}}^p, \tilde{\mu}] - \frac{1}{6} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{2,2,0}[m_{\tilde{e}}^r, m_{\tilde{l}}^p] \delta_{i1i2} +$$

$$\frac{1}{12} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{3,2,-1}[m_{\tilde{e}}^r, m_{\tilde{l}}^p] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{3,1,0}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{3,2,-1}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] \delta_{i1i2} -$$

$$\frac{3}{8} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{4,1,-1}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{5,1,-2}[m_{\tilde{l}}^p, m_{\tilde{e}}^r] \delta_{i1i2} +$$

$$\frac{1}{24} g_1^4 LF_{2,1,0}[m_{\tilde{l}}^{i2}, m_1] \delta_{i1i2} - \frac{1}{48} g_1^4 LF_{3,1,-1}[m_{\tilde{l}}^{i2}, m_1] \delta_{i1i2} +$$

$$\frac{1}{8} g_1^2 g_2^2 LF_{2,1,0}[m_{\tilde{l}}^{i2}, m_2] \delta_{i1i2} - \frac{1}{16} g_1^2 g_2^2 LF_{3,1,-1}[m_{\tilde{l}}^{i2}, m_2] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,1,0}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{3,2,-1}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] \delta_{i1i2} -$$

$$\frac{5}{8} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{4,1,-1}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] \delta_{i1i2} +$$

$$\frac{1}{2} g_1^2 \left(c_\gamma \overline{a_d}^{pr} - s_\gamma \tilde{\mu} \overline{y_d}^{pr}\right) \left(c_\gamma a_d^{pr} - s_\gamma \tilde{\mu} y_d^{pr}\right) LF_{5,1,-2}[m_{\tilde{q}}^p, m_{\tilde{d}}^r] \delta_{i1i2} +$$

$$\frac{1}{12} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{2,2,0}[m_{\tilde{q}}^p, m_{\tilde{u}}^r] \delta_{i1i2} -$$

$$\frac{1}{24} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,2,-1}[m_{\tilde{q}}^p, m_{\tilde{u}}^r] \delta_{i1i2} -$$

$$\frac{1}{12} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,1,0}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] \delta_{i1i2} -$$

$$\frac{1}{12} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{3,2,-1}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] \delta_{i1i2} -$$

$$\frac{1}{4} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{4,1,-1}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] \delta_{i1i2} +$$

$$\frac{1}{2} g_1^2 \left(s_\gamma \overline{a_u}^{pr} - \tilde{\mu} c_\gamma \overline{y_u}^{pr}\right) \left(s_\gamma a_u^{pr} - \tilde{\mu} c_\gamma y_u^{pr}\right) LF_{5,1,-2}[m_{\tilde{u}}^r, m_{\tilde{q}}^p] \delta_{i1i2} +$$

$$\frac{5}{24} g_1^4 \left(c_\gamma^2 + s_\gamma^2\right) LF_{4,1,-2}[\tilde{\mu}, m_1] \delta_{i1i2} + \frac{1}{4} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 LF_{4,1,-1}[\tilde{\mu}, m_1] \delta_{i1i2} -$$

$$\frac{1}{6} g_1^4 \left(c_\gamma^2 + s_\gamma^2\right) LF_{5,1,-3}[\tilde{\mu}, m_1] \delta_{i1i2} - \frac{1}{3} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 LF_{5,1,-2}[\tilde{\mu}, m_1] \delta_{i1i2} +$$

$$\frac{5}{8} g_1^2 g_2^2 \left(c_\gamma^2 + s_\gamma^2\right) LF_{4,1,-2}[\tilde{\mu}, m_2] \delta_{i1i2} + \frac{3}{4} m_2 s_\gamma \tilde{\mu} c_\gamma g_1^2 g_2^2 LF_{4,1,-1}[\tilde{\mu}, m_2] \delta_{i1i2} -$$

$$\frac{1}{2} g_1^2 g_2^2 \left(c_\gamma^2 + s_\gamma^2\right) LF_{5,1,-3}[\tilde{\mu}, m_2] \delta_{i1i2} - m_2 s_\gamma \tilde{\mu} c_\gamma g_1^2 g_2^2 LF_{5,1,-2}[\tilde{\mu}, m_2] \delta_{i1i2} -$$

$$\frac{1}{12} g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,0}[\tilde{\mu}, m_{\tilde{e}}^p] + \frac{1}{24} g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,-1}[\tilde{\mu}, m_{\tilde{e}}^p] -$$

$$\frac{1}{24} g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{4,1,-2}[\tilde{\mu}, m_{\tilde{e}}^p] + \frac{1}{2} c_\gamma^2 \overline{y_e}^{rs} \overline{y_e}^{i2p} y_e^{rp} y_e^{i1s} LF_{2,1,0}[\tilde{\mu}, m_{\tilde{l}}^r] -$$

$$c_\gamma^2 \overline{y_e}^{rs} \overline{y_e}^{i2p} y_e^{rp} y_e^{i1s} LF_{3,1,-1}[\tilde{\mu}, m_{\tilde{l}}^r] + \frac{1}{2} c_\gamma^2 \overline{y_e}^{rs} \overline{y_e}^{i2p} y_e^{rp} y_e^{i1s} LF_{4,1,-2}[\tilde{\mu}, m_{\tilde{l}}^r] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 \overline{y_e}^{i2p} \left(-c_\gamma a_e^{i1p} + s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,0}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}] +$$

$$\frac{1}{16} m_1 c_\gamma g_1^2 \overline{y_e}^{i2p} \left(-c_\gamma a_e^{i1p} + s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 \overline{y_e}^{i2p} \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{3,1,1,-1}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 y_e^{i1p} \left(-c_\gamma \overline{a_e}^{i2p} + s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,0}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}] +$$

$$\frac{1}{16} m_1 c_\gamma g_1^2 y_e^{i1p} \left(-c_\gamma \overline{a_e}^{i2p} + s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 y_e^{i1p} \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{3,1,1,-1}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}] -$$

$$\frac{3}{4} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[m_1, m_{\tilde{e}}^p, \tilde{\mu}] - \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[m_1, m_{\tilde{e}}^p, \tilde{\mu}] +$$

$$\frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-2}[m_1, m_{\tilde{e}}^p, \tilde{\mu}] + \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-1}[m_1, m_{\tilde{e}}^p, \tilde{\mu}] +$$

$$\frac{1}{16} m_1 c_\gamma g_1^2 \overline{y_e}^{i2p} \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{l}}^{i1}, m_{\tilde{e}}^p] +$$

$$\frac{1}{16} m_1 c_\gamma g_1^2 y_e^{i1p} \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{l}}^{i2}, m_{\tilde{e}}^p] +$$

$$\frac{1}{16} g_1^4 \left(c_\gamma^2 - s_\gamma^2\right) LF_{2,1,1,-1}[m_1, m_{\tilde{l}}^{i2}, \tilde{\mu}] \delta_{i1i2} +$$

$$\frac{1}{8} g_1^4 m_1^2 \left(c_\gamma^2 - s_\gamma^2\right) LF_{2,1,1,0}[m_1, m_{\tilde{l}}^{i2}, \tilde{\mu}] \delta_{i1i2} + \frac{5}{16} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,2,1,-2}[m_1, \tilde{\mu}, m_{\tilde{e}}^p] +$$

$$\frac{1}{16} s_\gamma \tilde{\mu} g_1^2 \overline{y_e}^{i2p} y_e^{i1p} (6 m_1 c_\gamma + s_\gamma \tilde{\mu}) LF_{2,2,1,-1}[m_1, \tilde{\mu}, m_{\tilde{e}}^p] - \frac{1}{16} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p}$$

$$LF_{2,2,1,-2}[m_1, \tilde{\mu}, m_{\tilde{l}}^{i1}] - \frac{1}{16} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,2,1,-1}[m_1, \tilde{\mu}, m_{\tilde{l}}^{i1}] +$$

$$\frac{1}{16} \left(-g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} + g_1^4 \left(c_\gamma^2 - s_\gamma^2\right) \delta_{i1i2}\right) LF_{2,2,1,-2}[m_1, \tilde{\mu}, m_{\tilde{l}}^{i2}] -$$

$$\frac{1}{16} m_1 g_1^2 \left(s_\gamma \tilde{\mu} c_\gamma \overline{y_e}^{i2p} y_e^{i1p} + m_1 g_1^2 \left(c_\gamma^2 - s_\gamma^2\right) \delta_{i1i2}\right) LF_{2,2,1,-1}[m_1, \tilde{\mu}, m_{\tilde{l}}^{i2}] +$$

$$\frac{3}{16} g_2^4 \left(c_\gamma^2 - s_\gamma^2\right) LF_{2,1,1,-1}[m_2, m_{\tilde{l}}^{i2}, \tilde{\mu}] \delta_{i1i2} +$$

$$\frac{3}{8} g_2^4 m_2^2 \left(c_\gamma^2 - s_\gamma^2\right) LF_{2,1,1,0}[m_2, m_{\tilde{l}}^{i2}, \tilde{\mu}] \delta_{i1i2} + \frac{3}{16} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,2,1,-2}[m_2, \tilde{\mu}, m_{\tilde{e}}^p] +$$

$$\frac{3}{16} s_\gamma \tilde{\mu} g_2^2 \overline{y_e}^{i2p} y_e^{i1p} (2 m_2 c_\gamma + s_\gamma \tilde{\mu}) LF_{2,2,1,-1}[m_2, \tilde{\mu}, m_{\tilde{e}}^p] + \frac{3}{16} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p}$$

$$LF_{2,2,1,-2}[m_2, \tilde{\mu}, m_{\tilde{l}}^{i1}] + \frac{3}{16} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,2,1,-1}[m_2, \tilde{\mu}, m_{\tilde{l}}^{i1}] +$$

$$\frac{3}{16} \left(g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} + g_2^4 \left(c_\gamma^2 - s_\gamma^2\right) \delta_{i1i2}\right) LF_{2,2,1,-2}[m_2, \tilde{\mu}, m_{\tilde{l}}^{i2}] +$$

$$\frac{3}{16} m_2 g_2^2 \left(s_\gamma \tilde{\mu} c_\gamma \overline{y_e}^{i2p} y_e^{i1p} + m_2 g_2^2 \left(-c_\gamma^2 + s_\gamma^2\right) \delta_{i1i2}\right) LF_{2,2,1,-1}[m_2, \tilde{\mu}, m_{\tilde{l}}^{i2}] +$$

$$\frac{1}{16} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^p] - \frac{1}{8} g_1^2 s_\gamma^2 \tilde{\mu}^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[\tilde{\mu}, m_1, m_{\tilde{e}}^p] +$$

$$\frac{3}{16} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i1}] + \frac{1}{8} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i1}] -$$

$$\frac{1}{8} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-2}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i1}] - \frac{1}{8} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i1}] +$$

$$\frac{3}{16} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i2}] + \frac{1}{8} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i2}] -$$

$$\frac{1}{8} g_1^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-2}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i2}] - \frac{1}{8} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{l}}^{i2}] +$$

$$\frac{3}{16} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{e}}^p] - \frac{3}{8} g_2^2 s_\gamma^2 \tilde{\mu}^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[\tilde{\mu}, m_2, m_{\tilde{e}}^p] -$$

$$\frac{9}{16} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i1}] - \frac{3}{8} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i1}] +$$

$$\frac{3}{8} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-2}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i1}] + \frac{3}{8} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i1}] -$$

$$\frac{9}{16} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i2}] - \frac{3}{8} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{2,1,1,0}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i2}] +$$

$$\frac{3}{8} g_2^2 c_\gamma^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-2}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i2}] + \frac{3}{8} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{i2p} y_e^{i1p} LF_{3,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{l}}^{i2}] +$$

$$\frac{1}{16} g_1^2 \overline{y_e}^{i2p} (m_1 c_\gamma - s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{1,1,1,1,0}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}, \tilde{\mu}] +$$

$$\frac{1}{32} g_1^2 \overline{y_e}^{i2p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}, \tilde{\mu}] +$$

$$\frac{1}{16} g_1^2 y_e^{i1p} (m_1 c_\gamma - s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{1,1,1,1,0}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}, \tilde{\mu}] +$$

$$\frac{1}{32} g_1^2 y_e^{i1p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}, \tilde{\mu}] -$$

$$\frac{3}{16} g_2^2 \overline{y_e}^{i2p} (m_2 c_\gamma - s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{1,1,1,1,0}[m_2, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}, \tilde{\mu}] -$$

$$\frac{3}{32} g_2^2 \overline{y_e}^{i2p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_2, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}, \tilde{\mu}] -$$

$$\frac{3}{16} g_2^2 y_e^{i1p} (m_2 c_\gamma - s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{1,1,1,1,0}[m_2, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}, \tilde{\mu}] -$$

$$\frac{3}{32} g_2^2 y_e^{i1p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[m_2, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}, \tilde{\mu}] -$$

$$\frac{1}{32} g_1^2 \overline{y_e}^{i2p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^p, m_1, m_{\tilde{l}}^{i1}, \tilde{\mu}] -$$

$$\frac{1}{16} g_1^2 \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^p, m_1, m_{\tilde{l}}^{i2}, m_{\tilde{l}}^{i1}] -$$

$$\frac{1}{32} g_1^2 y_e^{i1p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^p, m_1, m_{\tilde{l}}^{i2}, \tilde{\mu}] +$$

$$\frac{3}{32} g_2^2 \overline{y_e}^{i2p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^p, m_2, m_{\tilde{l}}^{i1}, \tilde{\mu}] -$$

$$\frac{3}{16} g_2^2 \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^p, m_2, m_{\tilde{l}}^{i2}, m_{\tilde{l}}^{i1}] +$$

$$\frac{3}{32} g_2^2 y_e^{i1p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^p, m_2, m_{\tilde{l}}^{i2}, \tilde{\mu}] +$$

$$\frac{1}{4} c_\gamma \overline{y_e}^{i2s} y_e^{i1r} \overline{a_e}^{pr} \left(c_\gamma a_e^{ps} - s_\gamma \tilde{\mu} y_e^{ps}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^p, m_{\tilde{e}}^r, m_{\tilde{e}}^s, \tilde{\mu}] +$$

$$\frac{1}{4} s_\gamma \tilde{\mu} \overline{y_e}^{rs} \overline{y_e}^{i2p} y_e^{i1s} \left(-c_\gamma a_e^{rp} + s_\gamma \tilde{\mu} y_e^{rp}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^r, m_{\tilde{e}}^p, m_{\tilde{e}}^s, \tilde{\mu}] +$$

$$\frac{1}{32} g_1^2 \overline{y_e}^{i2p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{i1}, m_1, m_{\tilde{e}}^p, \tilde{\mu}] -$$

$$\frac{3}{32} g_2^2 \overline{y_e}^{i2p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{i1}, m_2, m_{\tilde{e}}^p, \tilde{\mu}] +$$

$$\frac{1}{32} g_1^2 y_e^{i1p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{i2}, m_1, m_{\tilde{e}}^p, \tilde{\mu}] -$$

$$\frac{3}{32} g_2^2 y_e^{i1p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{i2}, m_2, m_{\tilde{e}}^p, \tilde{\mu}] -$$

$$\frac{1}{32} g_1^2 \overline{y_e}^{i2p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}] -$$

$$\frac{1}{32} g_1^2 y_e^{i1p} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}] +$$

$$\frac{3}{32} g_2^2 \overline{y_e}^{i2p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{i1p} - s_\gamma \tilde{\mu} y_e^{i1p}\right) LF_{2,1,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{e}}^p, m_{\tilde{l}}^{i1}] +$$

$$\left. \frac{3}{32} g_2^2 y_e^{i1p} (m_2 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{i2p} - s_\gamma \tilde{\mu} \overline{y_e}^{i2p}\right) LF_{2,1,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{e}}^p, m_{\tilde{l}}^{i2}] \right)$$