$$C_{He}{}^{i1\_i2\_} \to \hbar \Big(\frac{1}{72} \frac{1}{m_{\Phi}^{2}} s_\gamma^2 \overline{y_e}^{pi1} \left(5 g_1^2 y_e^{pi2} + 6 c_\gamma^2 \overline{y_e}^{rs} y_e^{ps} y_e^{ri2}\right) -$$

$$\frac{2}{27} \sum_p g_1^4 LF_{3,0}[m_{\tilde{d}}^{p}] \delta_{i1i2} + \frac{5}{36} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{d}}^{p}] \delta_{i1i2} - \frac{8}{135} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{d}}^{p}] \delta_{i1i2} -$$

$$\frac{2}{9} \sum_p g_1^4 LF_{3,0}[m_{\tilde{e}}^{p}] \delta_{i1i2} + \frac{5}{12} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{e}}^{p}] \delta_{i1i2} - \frac{8}{45} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{e}}^{p}] \delta_{i1i2} -$$

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

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

$$\frac{8}{27} \sum_p g_1^4 LF_{3,0}[m_{\tilde{u}}^{p}] \delta_{i1i2} + \frac{5}{9} \sum_p g_1^4 LF_{4,-1}[m_{\tilde{u}}^{p}] \delta_{i1i2} - \frac{32}{135} \sum_p g_1^4 LF_{5,-2}[m_{\tilde{u}}^{p}] \delta_{i1i2} +$$

$$\frac{1}{6} s_\gamma^2 \overline{y_e}^{pi1} \left(g_1^2 y_e^{pi2} + 3 c_\gamma^2 \overline{y_e}^{rs} y_e^{ps} y_e^{ri2}\right) LF_{1,2}[m_\Phi] + \frac{1}{12} g_1^2 s_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1}[m_\Phi] -$$

$$\frac{1}{36} g_1^2 \left(3 s_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} + 4 g_1^2 \delta_{i1i2}\right) LF_{3,0}[m_\Phi] + \frac{5}{24} g_1^4 LF_{4,-1}[m_\Phi] \delta_{i1i2} -$$

$$\frac{4}{45} g_1^4 LF_{5,-2}[m_\Phi] \delta_{i1i2} - \frac{1}{9} g_1^4 LF_{3,0}[\tilde{\mu}] \delta_{i1i2} - \frac{1}{6} g_1^4 LF_{4,-1}[\tilde{\mu}] \delta_{i1i2} +$$

$$\frac{8}{45} g_1^4 LF_{5,-2}[\tilde{\mu}] \delta_{i1i2} - \frac{1}{6} g_1^4 LF_{2,1,0}[m_1, m_{\tilde{e}}^{i2}] \delta_{i1i2} - \frac{1}{6} g_1^4 LF_{2,2,-1}[m_1, m_{\tilde{e}}^{i2}] \delta_{i1i2} +$$

$$\frac{1}{3} g_1^4 LF_{3,1,-1}[m_1, m_{\tilde{e}}^{i2}] \delta_{i1i2} - \frac{1}{6} g_1^4 LF_{4,1,-2}[m_1, m_{\tilde{e}}^{i2}] \delta_{i1i2} -$$

$$\frac{1}{4} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,0}[m_1, m_{\tilde{l}}^{p}] + \frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,-1}[m_1, m_{\tilde{l}}^{p}] -$$

$$\frac{1}{4} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{4,1,-2}[m_1, m_{\tilde{l}}^{p}] - \frac{3}{4} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,0}[m_2, m_{\tilde{l}}^{p}] +$$

$$\frac{3}{2} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,-1}[m_2, m_{\tilde{l}}^{p}] - \frac{3}{4} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{4,1,-2}[m_2, m_{\tilde{l}}^{p}] -$$

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

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

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

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

$$\frac{1}{3} g_1^4 LF_{2,1,0}[m_{\tilde{e}}^{i2}, m_1] \delta_{i1i2} - \frac{1}{6} g_1^4 LF_{3,1,-1}[m_{\tilde{e}}^{i2}, m_1] \delta_{i1i2} +$$

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

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

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

$$\frac{1}{3} g_1^2 \left(c_\gamma \overline{a_e}^{pr} - s_\gamma \tilde{\mu} \overline{y_e}^{pr}\right) \left(c_\gamma a_e^{pr} - s_\gamma \tilde{\mu} y_e^{pr}\right) LF_{5,1,-2}[m_{\tilde{l}}^{p}, m_{\tilde{e}}^{r}] \delta_{i1i2} +$$

$$\frac{1}{6} g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,0}[m_{\tilde{l}}^{p}, \tilde{\mu}] - \frac{1}{12} g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,2,-1}[m_{\tilde{l}}^{p}, \tilde{\mu}] - \frac{1}{12} g_1^2 \overline{y_e}^{pi1} y_e^{pi2}$$

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

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

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

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

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

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

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

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

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

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

$$\frac{5}{12} g_1^4 \left(c_\gamma^2 + s_\gamma^2\right) LF_{4,1,-2}[\tilde{\mu}, m_1] \delta_{i1i2} + \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^4 LF_{4,1,-1}[\tilde{\mu}, m_1] \delta_{i1i2} -$$

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

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

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

$$\frac{1}{2} c_\gamma^2 \overline{y_e}^{pi1} \overline{y_e}^{rs} y_e^{ps} y_e^{ri2} LF_{2,1,0}[\tilde{\mu}, m_{\tilde{e}}^{s}] + c_\gamma^2 \overline{y_e}^{pi1} \overline{y_e}^{rs} y_e^{ps} y_e^{ri2} LF_{3,1,-1}[\tilde{\mu}, m_{\tilde{e}}^{s}] -$$

$$\frac{1}{2} c_\gamma^2 \overline{y_e}^{pi1} \overline{y_e}^{rs} y_e^{ps} y_e^{ri2} LF_{4,1,-2}[\tilde{\mu}, m_{\tilde{e}}^{s}] - \frac{1}{12} g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,0}[\tilde{\mu}, m_{\tilde{l}}^{p}] +$$

$$\frac{5}{12} g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,-1}[\tilde{\mu}, m_{\tilde{l}}^{p}] - \frac{1}{6} g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{4,1,-2}[\tilde{\mu}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{4} m_1 c_\gamma g_1^2 y_e^{pi2} \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,1,1,0}[m_1, m_{\tilde{e}}^{i1}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 y_e^{pi2} \left(-c_\gamma \overline{a_e}^{pi1} + s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{e}}^{i1}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{4} m_1 c_\gamma g_1^2 y_e^{pi2} \left(-c_\gamma \overline{a_e}^{pi1} + s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{3,1,1,-1}[m_1, m_{\tilde{e}}^{i1}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{4} m_1 c_\gamma g_1^2 \overline{y_e}^{pi1} \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,1,1,0}[m_1, m_{\tilde{e}}^{i2}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 \overline{y_e}^{pi1} \left(-c_\gamma a_e^{pi2} + s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{e}}^{i2}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{4} m_1 c_\gamma g_1^2 \overline{y_e}^{pi1} \left(-c_\gamma a_e^{pi2} + s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{3,1,1,-1}[m_1, m_{\tilde{e}}^{i2}, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{4} g_1^4 \left(-c_\gamma^2 + s_\gamma^2\right) LF_{2,1,1,-1}[m_1, m_{\tilde{e}}^{i2}, \tilde{\mu}] \delta_{i1i2} + \frac{1}{2} g_1^4 m_1^2 \left(-c_\gamma^2 + s_\gamma^2\right) LF_{2,1,1,0}[m_1, m_{\tilde{e}}^{i2}, \tilde{\mu}]$$

$$\delta_{i1i2} + \frac{1}{8} m_1 c_\gamma g_1^2 y_e^{pi2} \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{l}}^{p}, m_{\tilde{e}}^{i1}] +$$

$$\frac{1}{8} m_1 c_\gamma g_1^2 \overline{y_e}^{pi1} \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,2,1,-1}[m_1, m_{\tilde{l}}^{p}, m_{\tilde{e}}^{i2}] -$$

$$\frac{3}{4} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,-1}[m_1, m_{\tilde{l}}^{p}, \tilde{\mu}] - \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,0}[m_1, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-2}[m_1, m_{\tilde{l}}^{p}, \tilde{\mu}] + \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-1}[m_1, m_{\tilde{l}}^{p}, \tilde{\mu}] -$$

$$\frac{1}{4} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,2,1,-2}[m_1, \tilde{\mu}, m_{\tilde{e}}^{i1}] - \frac{1}{4} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,2,1,-1}[m_1, \tilde{\mu}, m_{\tilde{e}}^{i1}] +$$

$$\frac{1}{4} \left(-g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} + g_1^4 \left(-c_\gamma^2 + s_\gamma^2\right) \delta_{i1i2}\right) LF_{2,2,1,-2}[m_1, \tilde{\mu}, m_{\tilde{e}}^{i2}] +$$

$$\frac{1}{4} m_1 g_1^2 \left(-s_\gamma \tilde{\mu} c_\gamma \overline{y_e}^{pi1} y_e^{pi2} + m_1 g_1^2 \left(c_\gamma^2 - s_\gamma^2\right) \delta_{i1i2}\right) LF_{2,2,1,-1}[m_1, \tilde{\mu}, m_{\tilde{e}}^{i2}] +$$

$$\frac{1}{8} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,2,1,-2}[m_1, \tilde{\mu}, m_{\tilde{l}}^{p}] -$$

$$\frac{1}{8} g_1^2 s_\gamma^2 \tilde{\mu}^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,2,1,-1}[m_1, \tilde{\mu}, m_{\tilde{l}}^{p}] + \frac{9}{4} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,-1}[m_2, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{3}{2} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,0}[m_2, m_{\tilde{l}}^{p}, \tilde{\mu}] - \frac{3}{2} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-2}[m_2, m_{\tilde{l}}^{p}, \tilde{\mu}] -$$

$$\frac{3}{2} m_2 s_\gamma \tilde{\mu} c_\gamma g_2^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-1}[m_2, m_{\tilde{l}}^{p}, \tilde{\mu}] - \frac{9}{8} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,2,1,-2}[m_2, \tilde{\mu}, m_{\tilde{l}}^{p}] -$$

$$\frac{3}{8} s_\gamma \tilde{\mu} g_2^2 \overline{y_e}^{pi1} y_e^{pi2} (4 m_2 c_\gamma + s_\gamma \tilde{\mu}) LF_{2,2,1,-1}[m_2, \tilde{\mu}, m_{\tilde{l}}^{p}] +$$

$$\frac{3}{4} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i1}] + \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,0}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i1}] -$$

$$\frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-2}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i1}] - \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i1}] +$$

$$\frac{3}{4} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i2}] + \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,0}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i2}] -$$

$$\frac{1}{2} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-2}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i2}] - \frac{1}{2} m_1 s_\gamma \tilde{\mu} c_\gamma g_1^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{3,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i2}] -$$

$$\frac{1}{8} g_1^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{l}}^{p}] + \frac{1}{4} g_1^2 s_\gamma^2 \tilde{\mu}^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,0}[\tilde{\mu}, m_1, m_{\tilde{l}}^{p}] -$$

$$\frac{3}{8} g_2^2 c_\gamma^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,-1}[\tilde{\mu}, m_2, m_{\tilde{l}}^{p}] + \frac{3}{4} g_2^2 s_\gamma^2 \tilde{\mu}^2 \overline{y_e}^{pi1} y_e^{pi2} LF_{2,1,1,0}[\tilde{\mu}, m_2, m_{\tilde{l}}^{p}] +$$

$$\frac{1}{4} g_1^2 y_e^{pi2} (m_1 c_\gamma - s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{1,1,1,1,0}[m_1, m_{\tilde{e}}^{i1}, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{1}{8} g_1^2 y_e^{pi2} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,1,1,1,-1}[m_1, m_{\tilde{e}}^{i1}, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{1}{4} g_1^2 \overline{y_e}^{pi1} (m_1 c_\gamma - s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{1,1,1,1,0}[m_1, m_{\tilde{e}}^{i2}, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{1}{8} g_1^2 \overline{y_e}^{pi1} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,1,1,1,-1}[m_1, m_{\tilde{e}}^{i2}, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{1}{4} c_\gamma \overline{y_e}^{si1} y_e^{pi2} \overline{a_e}^{pr} \left(-c_\gamma a_e^{sr} + s_\gamma \tilde{\mu} y_e^{sr}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^{r}, m_{\tilde{l}}^{p}, m_{\tilde{l}}^{s}, \tilde{\mu}] +$$

$$\frac{1}{4} s_\gamma \tilde{\mu} \overline{y_e}^{pi1} \overline{y_e}^{rs} y_e^{ri2} \left(c_\gamma a_e^{ps} - s_\gamma \tilde{\mu} y_e^{ps}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^{s}, m_{\tilde{l}}^{p}, m_{\tilde{l}}^{r}, \tilde{\mu}] +$$

$$\frac{1}{8} g_1^2 y_e^{pi2} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^{i1}, m_1, m_{\tilde{l}}^{p}, \tilde{\mu}] +$$

$$\frac{1}{8} g_1^2 \overline{y_e}^{pi1} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,1,1,1,-1}[m_{\tilde{e}}^{i2}, m_1, m_{\tilde{l}}^{p}, \tilde{\mu}] -$$

$$\frac{1}{8} g_1^2 y_e^{pi2} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{p}, m_1, m_{\tilde{e}}^{i1}, \tilde{\mu}] +$$

$$\frac{1}{2} g_1^2 \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{p}, m_1, m_{\tilde{e}}^{i2}, m_{\tilde{e}}^{i1}] -$$

$$\frac{1}{8} g_1^2 \overline{y_e}^{pi1} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,1,1,1,-1}[m_{\tilde{l}}^{p}, m_1, m_{\tilde{e}}^{i2}, \tilde{\mu}] -$$

$$\frac{1}{8} g_1^2 y_e^{pi2} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma \overline{a_e}^{pi1} - s_\gamma \tilde{\mu} \overline{y_e}^{pi1}\right) LF_{2,1,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i1}, m_{\tilde{l}}^{p}] -$$

$$\frac{1}{8} g_1^2 \overline{y_e}^{pi1} (m_1 c_\gamma + s_\gamma \tilde{\mu}) \left(c_\gamma a_e^{pi2} - s_\gamma \tilde{\mu} y_e^{pi2}\right) LF_{2,1,1,1,-1}[\tilde{\mu}, m_1, m_{\tilde{e}}^{i2}, m_{\tilde{l}}^{p}] \Big)$$