

$$\begin{aligned} & \rightarrow c_Y y_e^{i1i2} + \hbar \left(\frac{1}{16} c_Y \frac{1}{m_\Phi^2} \left(m_\Phi^2 y_e^{i1i2} \left(3 g_2^2 \left(1 + 2 c_Y^2 + 2 s_Y^2 \right) + g_1^2 \left(5 + 2 c_Y^2 + 2 s_Y^2 \right) \right) + \right. \\ & \quad \left. \overline{y_e}^{pr} \left(6 m_\Phi^2 y_e^{pi2} y_e^{i1r} \left(1 + s_Y^2 \right) + 8 m_H^2 s_Y^2 y_e^{pr} y_e^{i1i2} \right) - \right. \\ & \quad \frac{1}{2} \sum_p s_{2Y} s_Y g_1^2 \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_d^{pr} \right] + \frac{3}{2} s_{2Y} s_Y \frac{1}{m_\Phi^4} \overline{y_d}^{pr} y_d^{pr} y_e^{i1i2} \\ & \quad \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_d^{pr} \right] - \frac{1}{2} \sum_p s_{2Y} s_Y g_1^2 \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_e^{pr} \right] + \\ & \quad \frac{1}{2} s_{2Y} s_Y \frac{1}{m_\Phi^4} \overline{y_e}^{pr} y_e^{pr} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_e^{pr} \right] + \\ & \quad \frac{1}{2} s_{2Y} s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(\overline{y_e}^{pr} y_e^{pr} + \sum_p g_1^2 \right) LF_{1,0} \left[m_l^{pr} \right] - \\ & \quad \frac{1}{2} s_{2Y} s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(-3 \overline{y_d}^{pr} y_d^{pr} + 3 \overline{y_u}^{pr} y_u^{pr} + \sum_p g_1^2 \right) LF_{1,0} \left[m_q^{pr} \right] + \\ & \quad \sum_p s_{2Y} s_Y g_1^2 \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_u^{pr} \right] - \\ & \quad \frac{3}{2} s_{2Y} s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \overline{y_u}^{pr} y_u^{pr} \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_u^{pr} \right] - \\ & \quad \frac{3}{8} s_{4Y} s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \left(g_1^2 + g_2^2 \right) \left(m_H^2 + m_\Phi^2 \right) LF_{1,0} \left[m_\Phi \right] - \frac{3}{4} c_Y s_Y^2 \overline{y_e}^{pr} y_e^{pi2} y_e^{i1r} LF_{1,1} \left[m_\Phi \right] - \\ & \quad c_Y g_1^2 y_e^{i1i2} LF_{1,1,0} \left[m_1, m_e^{i2} \right] + \frac{1}{2} c_Y g_1^2 y_e^{i1i2} LF_{2,1,-1} \left[m_1, m_e^{i2} \right] - \\ & \quad \frac{1}{4} c_Y g_1^2 y_e^{i1i2} LF_{1,1,0} \left[m_1, m_l^{i1} \right] + \frac{1}{8} c_Y g_1^2 y_e^{i1i2} LF_{2,1,-1} \left[m_1, m_l^{i1} \right] + \\ & \quad m_1 s_Y \tilde{\mu} g_1^2 \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(c_Y^2 - s_Y^2 \right) LF_{1,1,0} \left[m_1, \tilde{\mu} \right] - \frac{3}{4} c_Y g_2^2 y_e^{i1i2} LF_{1,1,0} \left[m_2, m_l^{i1} \right] + \\ & \quad \frac{3}{8} c_Y g_2^2 y_e^{i1i2} LF_{2,1,-1} \left[m_2, m_l^{i1} \right] + 3 m_2 s_Y \tilde{\mu} g_2^2 \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(c_Y^2 - s_Y^2 \right) LF_{1,1,0} \left[m_2, \tilde{\mu} \right] + \\ & \quad 3 s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(s_Y \overline{a_d}^{pr} + \tilde{\mu} c_Y \overline{y_d}^{pr} \right) \left(c_Y a_d^{pr} - s_Y \tilde{\mu} y_d^{pr} \right) LF_{1,1,0} \left[m_d^{pr}, m_q^{pr} \right] + \\ & \quad s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(s_Y \overline{a_e}^{pr} + \tilde{\mu} c_Y \overline{y_e}^{pr} \right) \left(c_Y a_e^{pr} - s_Y \tilde{\mu} y_e^{pr} \right) LF_{1,1,0} \left[m_e^{pr}, m_l^{pr} \right] - \\ & \quad \frac{1}{2} c_Y \overline{y_e}^{pr} y_e^{pi2} y_e^{i1r} LF_{1,1,0} \left[m_e^{pr}, \tilde{\mu} \right] + \frac{1}{2} \frac{1}{m_\Phi^2} y_e^{i1i2} \\ & \quad \left(\overline{a_d}^{pr} \left(m_\Phi^2 c_Y^2 - 2 m_H^2 s_Y^2 \right) - s_Y \tilde{\mu} c_Y \overline{y_e}^{pr} \left(2 m_H^2 + m_\Phi^2 \right) \right) \left(c_Y a_e^{pr} - s_Y \tilde{\mu} y_e^{pr} \right) LF_{2,1,0} \left[m_l^{pr}, m_e^{pr} \right] - \\ & \quad \frac{1}{2} \frac{1}{m_\Phi^2} y_e^{i1i2} \left(\overline{a_e}^{pr} \left(m_\Phi^2 c_Y^2 - 2 m_H^2 s_Y^2 \right) - s_Y \tilde{\mu} c_Y \overline{y_e}^{pr} \left(2 m_H^2 + m_\Phi^2 \right) \right) \left(c_Y a_e^{pr} - s_Y \tilde{\mu} y_e^{pr} \right) \\ & \quad LF_{3,1,-1} \left[m_l^{pr}, m_e^{pr} \right] - m_H^2 c_Y y_e^{i1i2} \left(c_Y \overline{a_e}^{pr} - s_Y \tilde{\mu} \overline{y_e}^{pr} \right) \left(c_Y a_e^{pr} - s_Y \tilde{\mu} y_e^{pr} \right) LF_{3,1,0} \left[m_l^{pr}, m_e^{pr} \right] + \\ & \quad 3 m_H^2 c_Y y_e^{i1i2} \left(c_Y \overline{a_e}^{pr} - s_Y \tilde{\mu} \overline{y_e}^{pr} \right) \left(c_Y a_e^{pr} - s_Y \tilde{\mu} y_e^{pr} \right) LF_{4,1,-1} \left[m_l^{pr}, m_e^{pr} \right] - \\ & \quad 2 m_H^2 c_Y y_e^{i1i2} \left(c_Y \overline{a_e}^{pr} - s_Y \tilde{\mu} \overline{y_e}^{pr} \right) \left(c_Y a_e^{pr} - s_Y \tilde{\mu} y_e^{pr} \right) LF_{5,1,-2} \left[m_l^{pr}, m_e^{pr} \right] - \\ & \quad c_Y \overline{y_e}^{pr} y_e^{pi2} y_e^{i1r} LF_{1,1,0} \left[m_l^{pr}, \tilde{\mu} \right] + \frac{3}{2} \frac{1}{m_\Phi^2} y_e^{i1i2} \\ & \quad \left(\overline{a_d}^{pr} \left(m_\Phi^2 c_Y^2 - 2 m_H^2 s_Y^2 \right) - s_Y \tilde{\mu} c_Y \overline{y_d}^{pr} \left(2 m_H^2 + m_\Phi^2 \right) \right) \left(c_Y a_d^{pr} - s_Y \tilde{\mu} y_d^{pr} \right) LF_{2,1,0} \left[m_q^{pr}, m_d^{pr} \right] - \\ & \quad \frac{3}{2} \frac{1}{m_\Phi^2} y_e^{i1i2} \left(\overline{a_d}^{pr} \left(m_\Phi^2 c_Y^2 - 2 m_H^2 s_Y^2 \right) - s_Y \tilde{\mu} c_Y \overline{y_d}^{pr} \left(2 m_H^2 + m_\Phi^2 \right) \right) \left(c_Y a_d^{pr} - s_Y \tilde{\mu} y_d^{pr} \right) \\ & \quad LF_{3,1,-1} \left[m_q^{pr}, m_d^{pr} \right] - 3 m_H^2 c_Y y_e^{i1i2} \left(c_Y \overline{a_d}^{pr} - s_Y \tilde{\mu} \overline{y_d}^{pr} \right) \left(c_Y a_d^{pr} - s_Y \tilde{\mu} y_d^{pr} \right) LF_{3,1,0} \left[m_q^{pr}, m_d^{pr} \right] + \\ & \quad 9 m_H^2 c_Y y_e^{i1i2} \left(c_Y \overline{a_d}^{pr} - s_Y \tilde{\mu} \overline{y_d}^{pr} \right) \left(c_Y a_d^{pr} - s_Y \tilde{\mu} y_d^{pr} \right) LF_{4,1,-1} \left[m_q^{pr}, m_d^{pr} \right] - \\ & \quad 6 m_H^2 c_Y y_e^{i1i2} \left(c_Y \overline{a_d}^{pr} - s_Y \tilde{\mu} \overline{y_d}^{pr} \right) \left(c_Y a_d^{pr} - s_Y \tilde{\mu} y_d^{pr} \right) LF_{5,1,-2} \left[m_q^{pr}, m_d^{pr} \right] - \\ & \quad 3 s_Y \frac{1}{m_\Phi^4} y_e^{i1i2} \left(m_H^2 + m_\Phi^2 \right) \left(s_Y \overline{a_u}^{pr} - \tilde{\mu} c_Y \overline{y_u}^{pr} \right) \left(c_Y a_u^{pr} + s_Y \tilde{\mu} y_u^{pr} \right) LF_{1,1,0} \left[m_q^{pr}, m_u^{pr} \right] + \\ & \quad \frac{3}{2} \frac{1}{m_\Phi^2} y_e^{i1i2} \left(s_Y \overline{a_u}^{pr} - \tilde{\mu} c_Y \overline{y_u}^{pr} \right) \left(s_Y c_Y a_u^{pr} \left(2 m_H^2 + m_\Phi^2 \right) + \tilde{\mu} y_u^{pr} \left(-m_\Phi^2 c_Y^2 + 2 m_H^2 s_Y^2 \right) \right) \\ & \quad LF_{2,1,0} \left[m_u^{pr}, m_q^{pr} \right] - \frac{3}{2} \frac{1}{m_\Phi^2} y_e^{i1i2} \left(s_Y \overline{a_u}^{pr} - \tilde{\mu} c_Y \overline{y_u}^{pr} \right) \\ & \quad \left(s_Y c_Y a_u^{pr} \left(2 m_H^2 + m_\Phi^2 \right) + \tilde{\mu} y_u^{pr} \left(-m_\Phi^2 c_Y^2 + 2 m_H^2 s_Y^2 \right) \right) LF_{3,1,-1} \left[m_u^{pr}, m_q^{pr} \right] - \\ & \quad 3 m_H^2 c_Y y_e^{i1i2} \left(-s_Y \overline{a_u}^{pr} + \tilde{\mu} c_Y \overline{y_u}^{pr} \right) \left(-s_Y a_u^{pr} + \tilde{\mu} c_Y y_u^{pr} \right) LF_{3,1,0} \left[m_u^{pr}, m_q^{pr} \right] + \\ & \quad 9 m_H^2 c_Y y_e^{i1i2} \left(-s_Y \overline{a_u}^{pr} + \tilde{\mu} c_Y \overline{y_u}^{pr} \right) \left(-s_Y a_u^{pr} + \tilde{\mu} c_Y y_u^{pr} \right) LF_{4,1,-1} \left[m_u^{pr}, m_q^{pr} \right] - \\ & \quad 6 m_H^2 c_Y y_e^{i1i2} \left(-s_Y \overline{a_u}^{pr} + \tilde{\mu} c_Y \overline{y_u}^{pr} \right) \left(-s_Y a_u^{pr} + \tilde{\mu} c_Y y_u^{pr} \right) LF_{5,1,-2} \left[m_u^{pr}, m_q^{pr} \right] - \\ & \quad \frac{$$