

$$\begin{aligned} \text{CHG} &\rightarrow \tilde{h} \\ &\left( \frac{1}{24} \sum_{\mathbf{p}} c_{2\gamma} g_1^2 g_3^2 \text{LF}_{3,0} [m_d^{-\mathbf{p}}] - \frac{1}{24} \sum_{\mathbf{p}} c_{2\gamma} g_1^2 g_3^2 \text{LF}_{4,-1} [m_d^{-\mathbf{p}}] - \frac{1}{4} g_3^2 c_\gamma^2 \overline{y}_d^{\text{pr}} y_d^{\text{pr}} \text{LF}_{3,0} [m_d^{-\mathbf{r}}] + \frac{1}{4} g_3^2 c_\gamma^2 \overline{y}_d^{\text{pr}} y_d^{\text{pr}} \text{LF}_{4,-1} [m_d^{-\mathbf{r}}] + \right. \\ &\quad \frac{1}{24} g_3^2 (-6 c_\gamma^2 \overline{y}_d^{\text{pr}} y_d^{\text{pr}} - 6 s_\gamma^2 \overline{y}_u^{\text{pr}} y_u^{\text{pr}} + \sum_{\mathbf{p}} c_{2\gamma} g_1^2) \text{LF}_{3,0} [m_q^{-\mathbf{p}}] + \\ &\quad \frac{1}{24} g_3^2 (6 c_\gamma^2 \overline{y}_d^{\text{pr}} y_d^{\text{pr}} + 6 s_\gamma^2 \overline{y}_u^{\text{pr}} y_u^{\text{pr}} - \sum_{\mathbf{p}} c_{2\gamma} g_1^2) \text{LF}_{4,-1} [m_q^{-\mathbf{p}}] - \frac{1}{12} \sum_{\mathbf{p}} c_{2\gamma} g_1^2 g_3^2 \text{LF}_{3,0} [m_u^{-\mathbf{p}}] + \\ &\quad \frac{1}{12} \sum_{\mathbf{p}} c_{2\gamma} g_1^2 g_3^2 \text{LF}_{4,-1} [m_u^{-\mathbf{p}}] - \frac{1}{4} g_3^2 s_\gamma^2 \overline{y}_u^{\text{pr}} y_u^{\text{pr}} \text{LF}_{3,0} [m_u^{-\mathbf{r}}] + \frac{1}{4} g_3^2 s_\gamma^2 \overline{y}_u^{\text{pr}} y_u^{\text{pr}} \text{LF}_{4,-1} [m_u^{-\mathbf{r}}] - \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{2,2,0} [m_d^{-\mathbf{r}}, m_q^{-\mathbf{p}}] - \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{3,1,0} [m_d^{-\mathbf{r}}, m_q^{-\mathbf{p}}] + \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{3,2,-1} [m_d^{-\mathbf{r}}, m_q^{-\mathbf{p}}] + \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{4,1,-1} [m_d^{-\mathbf{r}}, m_q^{-\mathbf{p}}] - \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{3,1,0} [m_q^{-\mathbf{p}}, m_d^{-\mathbf{r}}] + \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{3,2,-1} [m_q^{-\mathbf{p}}, m_d^{-\mathbf{r}}] + \\ &\quad \frac{1}{4} g_3^2 (c_\gamma \overline{a}_d^{\text{pr}} - s_\gamma \tilde{\mu} \overline{y}_d^{\text{pr}}) (c_\gamma a_d^{\text{pr}} - s_\gamma \tilde{\mu} y_d^{\text{pr}}) \text{LF}_{4,1,-1} [m_q^{-\mathbf{p}}, m_d^{-\mathbf{r}}] - \\ &\quad \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{2,2,0} [m_q^{-\mathbf{p}}, m_u^{-\mathbf{r}}] - \\ &\quad \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{3,1,0} [m_q^{-\mathbf{p}}, m_u^{-\mathbf{r}}] + \\ &\quad \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{3,2,-1} [m_q^{-\mathbf{p}}, m_u^{-\mathbf{r}}] + \\ &\quad \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{4,1,-1} [m_q^{-\mathbf{p}}, m_u^{-\mathbf{r}}] - \\ &\quad \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{3,1,0} [m_u^{-\mathbf{r}}, m_q^{-\mathbf{p}}] + \\ &\quad \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{3,2,-1} [m_u^{-\mathbf{r}}, m_q^{-\mathbf{p}}] + \\ &\quad \left. \frac{1}{4} g_3^2 (s_\gamma \overline{a}_u^{\text{pr}} - \tilde{\mu} c_\gamma \overline{y}_u^{\text{pr}}) (s_\gamma a_u^{\text{pr}} - \tilde{\mu} c_\gamma y_u^{\text{pr}}) \text{LF}_{4,1,-1} [m_u^{-\mathbf{r}}, m_q^{-\mathbf{p}}] \right) \end{aligned}$$