$$
\begin{aligned}
M_H^2 \to\ & -C_{H^2} + \frac{1}{16\,\pi^2}\Big(-\frac{1}{4}\,C_{H^2}\,\left(g_1{}^2 + 3\,g_2{}^2\right) - C_{H^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_{2,1,0}\left[m_{\tilde{l}}{}^p,\ m_{\tilde{e}}{}^r\right] + \\
& C_{H^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,-1}\left[m_{\tilde{l}}{}^p,\ m_{\tilde{e}}{}^r\right] - \\
& C_{H^2}{}^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}\left[m_{\tilde{l}}{}^p,\ m_{\tilde{e}}{}^r\right] + \\
& 3\,C_{H^2}{}^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}\left[m_{\tilde{l}}{}^p,\ m_{\tilde{e}}{}^r\right] - \\
& 2\,C_{H^2}{}^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}\left[m_{\tilde{l}}{}^p,\ m_{\tilde{e}}{}^r\right] - \\
& 3\,C_{H^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_{2,1,0}\left[m_{\tilde{q}}{}^p,\ m_{\tilde{d}}{}^r\right] + \\
& 3\,C_{H^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,-1}\left[m_{\tilde{q}}{}^p,\ m_{\tilde{d}}{}^r\right] - \\
& 3\,C_{H^2}{}^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}\left[m_{\tilde{q}}{}^p,\ m_{\tilde{d}}{}^r\right] + \\
& 9\,C_{H^2}{}^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}\left[m_{\tilde{q}}{}^p,\ m_{\tilde{d}}{}^r\right] - \\
& 6\,C_{H^2}{}^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}\left[m_{\tilde{q}}{}^p,\ m_{\tilde{d}}{}^r\right] - \\
& 3\,C_{H^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_{2,1,0}\left[m_{\tilde{u}}{}^r,\ m_{\tilde{q}}{}^p\right] + \\
& 3\,C_{H^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,-1}\left[m_{\tilde{u}}{}^r,\ m_{\tilde{q}}{}^p\right] - \\
& 3\,C_{H^2}{}^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}\left[m_{\tilde{u}}{}^r,\ m_{\tilde{q}}{}^p\right] + \\
& 9\,C_{H^2}{}^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}\left[m_{\tilde{u}}{}^r,\ m_{\tilde{q}}{}^p\right] - \\
& 6\,C_{H^2}{}^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}\left[m_{\tilde{u}}{}^r,\ m_{\tilde{q}}{}^p\right] + \\
& \frac{3}{2}\,C_{H^2}\,g_1{}^2\,LF_{2,1,-1}[\tilde{\mu},\ m_1] + 2\,m_1\,s_\gamma\,C_{H^2}\,\tilde{\mu}\,c_\gamma\,g_1{}^2\,LF_{2,1,0}[\tilde{\mu},\ m_1] - C_{H^2}\,g_1{}^2\,LF_{3,1,-2}[\tilde{\mu},\ m_1] + \\
& 2\,C_{H^2}\,g_1{}^2\,\left(C_{H^2} - m_1\,s_\gamma\,\tilde{\mu}\,c_\gamma\right)\,LF_{3,1,-1}[\tilde{\mu},\ m_1] + 2\,m_1\,s_\gamma\,\tilde{\mu}\,c_\gamma\,g_1{}^2\,C_{H^2}{}^2\,LF_{3,1,0}[\tilde{\mu},\ m_1] - \\
& 4\,g_1{}^2\,C_{H^2}{}^2\,LF_{4,1,-2}[\tilde{\mu},\ m_1] - 6\,m_1\,s_\gamma\,\tilde{\mu}\,c_\gamma\,g_1{}^2\,C_{H^2}{}^2\,LF_{4,1,-1}[\tilde{\mu},\ m_1] + \\
& 2\,g_1{}^2\,C_{H^2}{}^2\,LF_{5,1,-3}[\tilde{\mu},\ m_1] + 4\,m_1\,s_\gamma\,\tilde{\mu}\,c_\gamma\,g_1{}^2\,C_{H^2}{}^2\,LF_{5,1,-2}[\tilde{\mu},\ m_1] + \\
& \frac{9}{2}\,C_{H^2}\,g_2{}^2\,LF_{2,1,-1}[\tilde{\mu},\ m_2] + 6\,m_2\,s_\gamma\,C_{H^2}\,\tilde{\mu}\,c_\gamma\,g_2{}^2\,LF_{2,1,0}[\tilde{\mu},\ m_2] - 3\,C_{H^2}\,g_2{}^2\,LF_{3,1,-2}[\tilde{\mu},\ m_2] + \\
& 6\,C_{H^2}\,g_2{}^2\,\left(C_{H^2} - m_2\,s_\gamma\,\tilde{\mu}\,c_\gamma\right)\,LF_{3,1,-1}[\tilde{\mu},\ m_2] + 6\,m_2\,s_\gamma\,\tilde{\mu}\,c_\gamma\,g_2{}^2\,C_{H^2}{}^2\,LF_{3,1,0}[\tilde{\mu},\ m_2] - \\
& 12\,g_2{}^2\,C_{H^2}{}^2\,LF_{4,1,-2}[\tilde{\mu},\ m_2] - 18\,m_2\,s_\gamma\,\tilde{\mu}\,c_\gamma\,g_2{}^2\,C_{H^2}{}^2\,LF_{4,1,-1}[\tilde{\mu},\ m_2] + \\
& 6\,g_2{}^2\,C_{H^2}{}^2\,LF_{5,1,-3}[\tilde{\mu},\ m_2] + 12\,m_2\,s_\gamma\,\tilde{\mu}\,c_\gamma\,g_2{}^2\,C_{H^2}{}^2\,LF_{5,1,-2}[\tilde{\mu},\ m_2]\Big)
\end{aligned}
$$