$C_{qd}^{(1)}$ i1_i2_i3_i4_ →

$$-\frac{1}{6}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}+\hbar\left(-\frac{1}{1296}\frac{1}{m_\Phi^2}\left(81 s_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}\left(12c_\gamma^2 y_d^{ri4}y_d^{i1p}+y_d^{rp}y_d^{i1i4}\left(1+s_\gamma^2\right)\right)+\right.\right.$$
$$s_\gamma^2\left(81\overline{y_d}^{pr}\overline{y_d}^{i2i3}\left(y_d^{pi4}y_d^{i1r}\left(1+s_\gamma^2\right)-8c_\gamma^2y_d^{pr}y_d^{i1i4}\right)+\right.$$
$$3\overline{y_d}^{i2i3}\left(y_d^{i1i4}\left(5g_1^2+27g_2^2+96g_3^2\right)-9y_d^{pi4}\overline{y_u}^{pr}y_u^{i1r}\left(-1+c_\gamma^2\right)\right)+$$
$$\overline{y_d}^{pi3}\left(27\overline{y_u}^{i2r}\left(-y_d^{i1i4}y_u^{pr}\left(-1+c_\gamma^2\right)+12c_\gamma^2y_d^{pi4}y_u^{i1r}\right)+2g_1^2y_d^{pi4}\delta_{i1i2}\right)\Big)+$$
$$2g_1^2\left(5s_\gamma^2\overline{y_d}^{i2p}y_d^{i1p}-13c_\gamma^2\overline{y_u}^{i2p}y_u^{i1p}\right)\delta_{i3i4}\Big)-$$
$$\frac{1}{12}\sum_p s_\gamma g_1^2\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(2s_{2\gamma}c_\gamma+s_\gamma c_{2\gamma}\right)LF_{1,0}\left[m_{\tilde{d}}^{p}\right]-$$
$$\frac{2}{243}\sum_p g_1^4 LF_{3,0}\left[m_{\tilde{d}}^{p}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{5}{324}\sum_p g_1^4 LF_{4,-1}\left[m_{\tilde{d}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{8}{1215}\sum_p g_1^4 LF_{5,-2}\left[m_{\tilde{d}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{2}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{pr}\overline{y_d}^{i2i3}y_d^{pr}y_d^{i1i4}\left(-s_{2\gamma}c_\gamma+s_\gamma^3\right)LF_{1,0}\left[m_{\tilde{d}}^{r}\right]-$$
$$\frac{1}{12}\sum_p s_\gamma g_1^2\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(2s_{2\gamma}c_\gamma+s_\gamma c_{2\gamma}\right)LF_{1,0}\left[m_{\tilde{e}}^{p}\right]-$$
$$\frac{2}{81}\sum_p g_1^4 LF_{3,0}\left[m_{\tilde{e}}^{p}\right]\delta_{i1i2}\delta_{i3i4}+\frac{5}{108}\sum_p g_1^4 LF_{4,-1}\left[m_{\tilde{e}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{8}{405}\sum_p g_1^4 LF_{5,-2}\left[m_{\tilde{e}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{6}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\overline{y_e}^{pr}y_e^{pr}\left(-s_{2\gamma}c_\gamma+s_\gamma^3\right)LF_{1,0}\left[m_{\tilde{e}}^{r}\right]+$$
$$\frac{1}{12}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(2\overline{y_e}^{pr}y_e^{pr}\left(s_{2\gamma}c_\gamma-s_\gamma^3\right)+\sum_p g_1^2\left(2s_{2\gamma}c_\gamma+s_\gamma c_{2\gamma}\right)\right)LF_{1,0}\left[m_{\tilde{l}}^{p}\right]-$$
$$\frac{1}{81}\sum_p g_1^4 LF_{3,0}\left[m_{\tilde{l}}^{p}\right]\delta_{i1i2}\delta_{i3i4}+\frac{5}{216}\sum_p g_1^4 LF_{4,-1}\left[m_{\tilde{l}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{4}{405}\sum_p g_1^4 LF_{5,-2}\left[m_{\tilde{l}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{12}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}$$
$$\left(6\overline{y_d}^{pr}y_d^{pr}\left(-s_{2\gamma}c_\gamma+s_\gamma^3\right)+6c_\gamma\overline{y_u}^{pr}y_u^{pr}\left(s_{2\gamma}+s_\gamma c_\gamma\right)+\sum_p g_1^2\left(2s_{2\gamma}c_\gamma+s_\gamma c_{2\gamma}\right)\right)$$
$$LF_{1,0}\left[m_{\tilde{q}}^{p}\right]-\frac{1}{243}\sum_p g_1^4 LF_{3,0}\left[m_{\tilde{q}}^{p}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{5}{648}\sum_p g_1^4 LF_{4,-1}\left[m_{\tilde{q}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-\frac{4}{1215}\sum_p g_1^4 LF_{5,-2}\left[m_{\tilde{q}}^{p}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{6}\sum_p s_\gamma g_1^2\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(2s_{2\gamma}c_\gamma+s_\gamma c_{2\gamma}\right)LF_{1,0}\left[m_{\tilde{u}}^{p}\right]-\frac{8}{243}\sum_p g_1^4 LF_{3,0}\left[m_{\tilde{u}}^{p}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{5}{81}\sum_p g_1^4 LF_{4,-1}\left[m_{\tilde{u}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-\frac{32}{1215}\sum_p g_1^4 LF_{5,-2}\left[m_{\tilde{u}}^{p}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{2}s_\gamma c_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\overline{y_u}^{pr}y_u^{pr}\left(s_{2\gamma}+s_\gamma c_\gamma\right)LF_{1,0}\left[m_{\tilde{u}}^{r}\right]-\frac{1}{24}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}$$
$$\left(3s_{4\gamma}c_\gamma\left(g_1^2+g_2^2\right)+s_\gamma\left(g_1^2\left(-1+3c_{2\gamma}^2\right)+3g_2^2\left(-1+c_{2\gamma}^2\right)\right)\right)LF_{1,0}\left[m_\Phi\right]+$$
$$\frac{1}{24}\frac{1}{m_\Phi^2}s_\gamma^2\left(3s_\gamma^2\overline{y_d}^{pr}\overline{y_d}^{i2i3}y_d^{pi4}y_d^{i1r}+3y_d^{i1i4}\left(s_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{rp}-c_\gamma^2\overline{y_d}^{pi3}\overline{y_u}^{i2r}y_u^{pr}\right)-\right.$$
$$\left.\overline{y_d}^{i2i3}\left(2y_d^{i1i4}\left(g_1^2+3g_2^2\right)+3c_\gamma^2y_d^{pi4}\overline{y_u}^{pr}y_u^{i1r}\right)\right)LF_{1,1}\left[m_\Phi\right]+\frac{1}{216}$$
$$\left(s_\gamma^2\left(-108c_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{ri4}y_d^{i1p}+9\overline{y_d}^{i2i3}\left(y_d^{i1i4}\left(g_1^2+3g_2^2\right)+2c_\gamma^2y_d^{pi4}\overline{y_u}^{pr}y_u^{i1r}\right)+\right.\right.$$
$$\left.2\overline{y_d}^{pi3}\left(9c_\gamma^2\overline{y_u}^{i2r}\left(y_d^{i1i4}y_u^{pr}-6y_d^{pi4}y_u^{i1r}\right)-2g_1^2y_d^{pi4}\delta_{i1i2}\right)\right)-$$
$$\left.8g_1^2\left(s_\gamma^2\overline{y_d}^{i2p}y_d^{i1p}-2c_\gamma^2\overline{y_u}^{i2p}y_u^{i1p}\right)\delta_{i3i4}\right)LF_{1,2}\left[m_\Phi\right]+$$
$$\frac{1}{36}\left(-9s_\gamma^4\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{ri4}y_d^{i1p}+s_\gamma^2\overline{y_d}^{pi3}y_d^{pi4}\left(9c_\gamma^2\overline{y_u}^{i2r}y_u^{i1r}+g_1^2\delta_{i1i2}\right)+\right.$$
$$\left.g_1^2\left(s_\gamma^2\overline{y_d}^{i2p}y_d^{i1p}-c_\gamma^2\overline{y_u}^{i2p}y_u^{i1p}\right)\delta_{i3i4}\right)LF_{2,1}\left[m_\Phi\right]-$$
$$\frac{1}{324}g_1^2\left(9s_\gamma^2\overline{y_d}^{pi3}y_d^{pi4}\delta_{i1i2}+\left(9s_\gamma^2\overline{y_d}^{i2p}y_d^{i1p}-9c_\gamma^2\overline{y_u}^{i2p}y_u^{i1p}+4g_1^2\delta_{i1i2}\right)\delta_{i3i4}\right)$$
$$LF_{3,0}\left[m_\Phi\right]+\frac{5}{216}g_1^4LF_{4,-1}\left[m_\Phi\right]\delta_{i1i2}\delta_{i3i4}-\frac{4}{405}g_1^4LF_{5,-2}\left[m_\Phi\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{81}g_1^4LF_{3,0}\left[\tilde{\mu}\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{54}g_1^4LF_{4,-1}\left[\tilde{\mu}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{8}{405}g_1^4LF_{5,-2}\left[\tilde{\mu}\right]\delta_{i1i2}\delta_{i3i4}+\frac{1}{54}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_1,m_{\tilde{d}}^{i3}\right]-$$
$$\frac{1}{108}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_1,m_{\tilde{d}}^{i3}\right]+\frac{1}{54}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_1,m_{\tilde{d}}^{i4}\right]-$$
$$\frac{1}{108}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_1,m_{\tilde{d}}^{i4}\right]-\frac{1}{486}g_1^4LF_{2,1,0}\left[m_1,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{486}g_1^4LF_{2,2,-1}\left[m_1,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}+\frac{1}{243}g_1^4LF_{3,1,-1}\left[m_1,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{486}g_1^4LF_{4,1,-2}\left[m_1,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}+\frac{1}{216}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_1,m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{432}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_1,m_{\tilde{q}}^{i1}\right]+\frac{1}{216}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_1,m_{\tilde{q}}^{i2}\right]-$$
$$\frac{1}{432}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_1,m_{\tilde{q}}^{i2}\right]-\frac{1}{1944}g_1^4LF_{2,1,0}\left[m_1,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{1944}g_1^4LF_{2,2,-1}\left[m_1,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+\frac{1}{972}g_1^4LF_{3,1,-1}\left[m_1,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{1944}g_1^4LF_{4,1,-2}\left[m_1,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+\frac{1}{6}g_1^2\frac{1}{m_\Phi^4}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2+s_\gamma^2\right)LF_{1,1,-1}\left[m_1,\tilde{\mu}\right]+$$
$$\frac{1}{3}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2-2s_\gamma^2\right)LF_{1,1,0}\left[m_1,\tilde{\mu}\right]+$$
$$\frac{1}{8}g_2^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_2,m_{\tilde{q}}^{i1}\right]-\frac{1}{16}g_2^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_2,m_{\tilde{q}}^{i1}\right]+$$
$$\frac{1}{8}g_2^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_2,m_{\tilde{q}}^{i2}\right]-\frac{1}{16}g_2^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_2,m_{\tilde{q}}^{i2}\right]-$$
$$\frac{1}{72}g_1^2g_2^2LF_{2,1,0}\left[m_2,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{72}g_1^2g_2^2LF_{2,2,-1}\left[m_2,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{36}g_1^2g_2^2LF_{3,1,-1}\left[m_2,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{72}g_1^2g_2^2LF_{4,1,-2}\left[m_2,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{2}g_2^2\frac{1}{m_\Phi^4}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2+s_\gamma^2\right)LF_{1,1,-1}\left[m_2,\tilde{\mu}\right]+$$
$$m_2s_\gamma\tilde{\mu}c_\gamma g_2^2\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2-2s_\gamma^2\right)LF_{1,1,0}\left[m_2,\tilde{\mu}\right]+$$
$$\frac{2}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_3,m_{\tilde{d}}^{i3}\right]-\frac{1}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_3,m_{\tilde{d}}^{i3}\right]+$$
$$\frac{2}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_3,m_{\tilde{d}}^{i4}\right]-\frac{1}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_3,m_{\tilde{d}}^{i4}\right]-$$
$$\frac{2}{81}g_1^2g_3^2LF_{2,1,0}\left[m_3,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}-\frac{2}{81}g_1^2g_3^2LF_{2,2,-1}\left[m_3,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{4}{81}g_1^2g_3^2LF_{3,1,-1}\left[m_3,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}-\frac{2}{81}g_1^2g_3^2LF_{4,1,-2}\left[m_3,m_{\tilde{d}}^{i4}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{2}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_3,m_{\tilde{q}}^{i1}\right]-\frac{1}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_3,m_{\tilde{q}}^{i1}\right]+$$
$$\frac{2}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,0}\left[m_3,m_{\tilde{q}}^{i2}\right]-\frac{1}{9}g_3^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,1,-1}\left[m_3,m_{\tilde{q}}^{i2}\right]-$$
$$\frac{2}{81}g_1^2g_3^2LF_{2,1,0}\left[m_3,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-\frac{2}{81}g_1^2g_3^2LF_{2,2,-1}\left[m_3,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{4}{81}g_1^2g_3^2LF_{3,1,-1}\left[m_3,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-\frac{2}{81}g_1^2g_3^2LF_{4,1,-2}\left[m_3,m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{12}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{rp}y_d^{i1i4}LF_{1,1,0}\left[m_{\tilde{d}}^{p},\tilde{\mu}\right]-\frac{1}{27}g_1^2\overline{y_d}^{i2p}y_d^{i1p}LF_{2,1,0}\left[m_{\tilde{d}}^{p},\tilde{\mu}\right]\delta_{i3i4}+$$
$$\frac{1}{54}g_1^2\overline{y_d}^{i2p}y_d^{i1p}LF_{2,2,-1}\left[m_{\tilde{d}}^{p},\tilde{\mu}\right]\delta_{i3i4}+\frac{1}{54}g_1^2\overline{y_d}^{i2p}y_d^{i1p}LF_{3,1,-1}\left[m_{\tilde{d}}^{p},\tilde{\mu}\right]\delta_{i3i4}+$$
$$\frac{1}{2}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(\tilde{\mu}c_\gamma\overline{y_d}^{pr}\left(a_d^{pr}\left(c_\gamma^2-2s_\gamma^2\right)-3s_\gamma\tilde{\mu}c_\gamma y_d^{pr}\right)+\right.$$
$$\left.\overline{a_d}^{pr}\left(a_d^{pr}\left(2s_\gamma c_\gamma^2-s_\gamma^3\right)+\tilde{\mu}c_\gamma y_d^{pr}\left(c_\gamma^2-2s_\gamma^2\right)\right)\right)LF_{1,1,0}\left[m_{\tilde{d}}^{r},m_{\tilde{q}}^{p}\right]+$$
$$\frac{1}{12}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{pr}\overline{y_d}^{i2i3}y_d^{pi4}y_d^{i1r}LF_{1,1,0}\left[m_{\tilde{d}}^{r},\tilde{\mu}\right]+\frac{1}{243}g_1^4LF_{2,1,0}\left[m_{\tilde{d}}^{i4},m_1\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{486}g_1^4LF_{3,1,-1}\left[m_{\tilde{d}}^{i4},m_1\right]\delta_{i1i2}\delta_{i3i4}+\frac{4}{81}g_1^2g_3^2LF_{2,1,0}\left[m_{\tilde{d}}^{i4},m_3\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{2}{81}g_1^2g_3^2LF_{3,1,-1}\left[m_{\tilde{d}}^{i4},m_3\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{6}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(\tilde{\mu}c_\gamma\overline{y_e}^{pr}\left(a_e^{pr}\left(c_\gamma^2-2s_\gamma^2\right)-3s_\gamma\tilde{\mu}c_\gamma y_e^{pr}\right)+\right.$$
$$\left.\overline{a_e}^{pr}\left(a_e^{pr}\left(2s_\gamma c_\gamma^2-s_\gamma^3\right)+\tilde{\mu}c_\gamma y_e^{pr}\left(c_\gamma^2-2s_\gamma^2\right)\right)\right)LF_{1,1,0}\left[m_{\tilde{e}}^{r},m_{\tilde{l}}^{p}\right]+\frac{1}{6}s_\gamma c_\gamma\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}$$
$$y_d^{i1i4}\left(\tilde{\mu}\overline{y_e}^{pr}\left(a_e^{pr}\left(-c_\gamma^2+s_\gamma^2\right)+2s_\gamma\tilde{\mu}c_\gamma y_e^{pr}\right)+\overline{a_e}^{pr}\left(-2s_\gamma c_\gamma a_e^{pr}+\tilde{\mu}y_e^{pr}\left(-c_\gamma^2+s_\gamma^2\right)\right)\right)$$
$$LF_{2,1,0}\left[m_{\tilde{l}}^{p},m_{\tilde{e}}^{r}\right]+\frac{1}{6}s_\gamma c_\gamma\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(\tilde{\mu}\overline{y_e}^{pr}\left(a_e^{pr}\left(c_\gamma^2-s_\gamma^2\right)-2s_\gamma\tilde{\mu}c_\gamma y_e^{pr}\right)+\right.$$
$$\left.\overline{a_e}^{pr}\left(2s_\gamma c_\gamma a_e^{pr}+\tilde{\mu}y_e^{pr}\left(c_\gamma^2-s_\gamma^2\right)\right)\right)LF_{3,1,-1}\left[m_{\tilde{l}}^{p},m_{\tilde{e}}^{r}\right]-$$
$$\frac{1}{6}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_e}^{pr}-s_\gamma\tilde{\mu}\overline{y_e}^{pr}\right)\left(c_\gamma a_e^{pr}-s_\gamma\tilde{\mu}y_e^{pr}\right)LF_{3,1,0}\left[m_{\tilde{l}}^{p},m_{\tilde{e}}^{r}\right]+$$
$$\frac{1}{2}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_e}^{pr}-s_\gamma\tilde{\mu}\overline{y_e}^{pr}\right)\left(c_\gamma a_e^{pr}-s_\gamma\tilde{\mu}y_e^{pr}\right)LF_{4,1,-1}\left[m_{\tilde{l}}^{p},m_{\tilde{e}}^{r}\right]-$$
$$\frac{1}{3}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_e}^{pr}-s_\gamma\tilde{\mu}\overline{y_e}^{pr}\right)\left(c_\gamma a_e^{pr}-s_\gamma\tilde{\mu}y_e^{pr}\right)LF_{5,1,-2}\left[m_{\tilde{l}}^{p},m_{\tilde{e}}^{r}\right]+$$
$$\frac{1}{2}s_\gamma c_\gamma\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}$$
$$\left(\tilde{\mu}\overline{y_d}^{pr}\left(a_d^{pr}\left(-c_\gamma^2+s_\gamma^2\right)+2s_\gamma\tilde{\mu}c_\gamma y_d^{pr}\right)+\overline{a_d}^{pr}\left(-2s_\gamma c_\gamma a_d^{pr}+\tilde{\mu}y_d^{pr}\left(-c_\gamma^2+s_\gamma^2\right)\right)\right)$$
$$LF_{2,1,0}\left[m_{\tilde{q}}^{p},m_{\tilde{d}}^{r}\right]+\frac{1}{2}s_\gamma c_\gamma\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(\tilde{\mu}\overline{y_d}^{pr}\left(a_d^{pr}\left(c_\gamma^2-s_\gamma^2\right)-2s_\gamma\tilde{\mu}c_\gamma y_d^{pr}\right)+\right.$$
$$\left.\overline{a_d}^{pr}\left(2s_\gamma c_\gamma a_d^{pr}+\tilde{\mu}y_d^{pr}\left(c_\gamma^2-s_\gamma^2\right)\right)\right)LF_{3,1,-1}\left[m_{\tilde{q}}^{p},m_{\tilde{d}}^{r}\right]-$$
$$\frac{1}{2}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_d}^{pr}-s_\gamma\tilde{\mu}\overline{y_d}^{pr}\right)\left(c_\gamma a_d^{pr}-s_\gamma\tilde{\mu}y_d^{pr}\right)LF_{3,1,0}\left[m_{\tilde{q}}^{p},m_{\tilde{d}}^{r}\right]+$$
$$\frac{3}{2}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_d}^{pr}-s_\gamma\tilde{\mu}\overline{y_d}^{pr}\right)\left(c_\gamma a_d^{pr}-s_\gamma\tilde{\mu}y_d^{pr}\right)LF_{4,1,-1}\left[m_{\tilde{q}}^{p},m_{\tilde{d}}^{r}\right]-$$
$$c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_d}^{pr}-s_\gamma\tilde{\mu}\overline{y_d}^{pr}\right)\left(c_\gamma a_d^{pr}-s_\gamma\tilde{\mu}y_d^{pr}\right)LF_{5,1,-2}\left[m_{\tilde{q}}^{p},m_{\tilde{d}}^{r}\right]+$$
$$\frac{1}{2}s_\gamma\frac{1}{m_\Phi^4}\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma\overline{a_u}^{pr}\left(-3s_\gamma c_\gamma a_u^{pr}+\tilde{\mu}y_u^{pr}\left(c_\gamma^2-2s_\gamma^2\right)\right)+\right.$$
$$\left.\tilde{\mu}\overline{y_u}^{pr}\left(a_u^{pr}\left(c_\gamma^3-2c_\gamma s_\gamma^2\right)-s_\gamma\tilde{\mu}y_u^{pr}\left(-2c_\gamma^2+s_\gamma^2\right)\right)\right)LF_{1,1,0}\left[m_{\tilde{q}}^{p},m_{\tilde{u}}^{r}\right]+$$
$$\frac{1}{6}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{pr}\overline{y_d}^{i2i3}y_d^{pi4}y_d^{i1r}LF_{1,1,0}\left[m_{\tilde{q}}^{p},\tilde{\mu}\right]-\frac{1}{54}g_1^2\overline{y_d}^{pi3}y_d^{pi4}LF_{2,1,0}\left[m_{\tilde{q}}^{p},\tilde{\mu}\right]\delta_{i1i2}+$$
$$\frac{1}{108}g_1^2\overline{y_d}^{pi3}y_d^{pi4}LF_{2,2,-1}\left[m_{\tilde{q}}^{p},\tilde{\mu}\right]\delta_{i1i2}+\frac{1}{108}g_1^2\overline{y_d}^{pi3}y_d^{pi4}LF_{3,1,-1}\left[m_{\tilde{q}}^{p},\tilde{\mu}\right]\delta_{i1i2}+$$
$$\frac{1}{6}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{rp}y_d^{i1i4}LF_{1,1,0}\left[m_{\tilde{q}}^{r},\tilde{\mu}\right]+$$
$$\frac{1}{972}g_1^4LF_{2,1,0}\left[m_{\tilde{q}}^{i2},m_1\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{1944}g_1^4LF_{3,1,-1}\left[m_{\tilde{q}}^{i2},m_1\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{36}g_1^2g_2^2LF_{2,1,0}\left[m_{\tilde{q}}^{i2},m_2\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{72}g_1^2g_2^2LF_{3,1,-1}\left[m_{\tilde{q}}^{i2},m_2\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{4}{81}g_1^2g_3^2LF_{2,1,0}\left[m_{\tilde{q}}^{i2},m_3\right]\delta_{i1i2}\delta_{i3i4}-\frac{2}{81}g_1^2g_3^2LF_{3,1,-1}\left[m_{\tilde{q}}^{i2},m_3\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{2}{27}g_1^2\overline{y_u}^{i2p}y_u^{i1p}LF_{2,1,0}\left[m_{\tilde{u}}^{p},\tilde{\mu}\right]\delta_{i3i4}-\frac{1}{27}g_1^2\overline{y_u}^{i2p}y_u^{i1p}LF_{2,2,-1}\left[m_{\tilde{u}}^{p},\tilde{\mu}\right]\delta_{i3i4}-$$
$$\frac{1}{27}g_1^2\overline{y_u}^{i2p}y_u^{i1p}LF_{3,1,-1}\left[m_{\tilde{u}}^{p},\tilde{\mu}\right]\delta_{i3i4}+\frac{1}{2}s_\gamma c_\gamma\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}$$
$$\left(\tilde{\mu}\overline{y_u}^{pr}\left(a_u^{pr}\left(-c_\gamma^2+s_\gamma^2\right)-2s_\gamma\tilde{\mu}c_\gamma y_u^{pr}\right)+\overline{a_u}^{pr}\left(2s_\gamma c_\gamma a_u^{pr}+\tilde{\mu}y_u^{pr}\left(-c_\gamma^2+s_\gamma^2\right)\right)\right)$$
$$LF_{2,1,0}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p}\right]+\frac{1}{2}s_\gamma c_\gamma\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(\tilde{\mu}\overline{y_u}^{pr}\left(a_u^{pr}\left(c_\gamma^2-s_\gamma^2\right)+2s_\gamma\tilde{\mu}c_\gamma y_u^{pr}\right)+\right.$$
$$\left.\overline{a_u}^{pr}\left(-2s_\gamma c_\gamma a_u^{pr}+\tilde{\mu}y_u^{pr}\left(c_\gamma^2-s_\gamma^2\right)\right)\right)LF_{3,1,-1}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p}\right]-$$
$$\frac{1}{2}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)LF_{3,1,0}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p}\right]+$$
$$\frac{3}{2}c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)LF_{4,1,-1}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p}\right]-$$
$$c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)LF_{5,1,-2}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p}\right]+$$
$$\frac{1}{12}\frac{1}{m_\Phi^2}s_\gamma^2\left(\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}y_u^{pr}+\overline{y_d}^{i2i3}y_d^{pi4}\overline{y_u}^{pr}y_u^{i1r}\right)LF_{1,1,0}\left[m_{\tilde{u}}^{r},\tilde{\mu}\right]+$$
$$\frac{1}{3}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(-c_\gamma^2+s_\gamma^2\right)LF_{2,1,0}\left[\tilde{\mu},m_1\right]+$$
$$\frac{1}{3}c_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma m_\Phi^2\left(c_\gamma^2+s_\gamma^2\right)+m_1s_\gamma\tilde{\mu}\left(c_\gamma^2-s_\gamma^2\right)\right)LF_{3,1,-1}\left[\tilde{\mu},m_1\right]+$$
$$\frac{1}{3}m_1s_\gamma\tilde{\mu}g_1^2c_\gamma^3\overline{y_d}^{i2i3}y_d^{i1i4}LF_{3,1,0}\left[\tilde{\mu},m_1\right]-$$
$$\frac{2}{3}g_1^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2+s_\gamma^2\right)LF_{4,1,-2}\left[\tilde{\mu},m_1\right]-$$
$$m_1s_\gamma\tilde{\mu}g_1^2c_\gamma^3\overline{y_d}^{i2i3}y_d^{i1i4}LF_{4,1,-1}\left[\tilde{\mu},m_1\right]+\frac{1}{3}g_1^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2+s_\gamma^2\right)LF_{5,1,-3}\left[\tilde{\mu},m_1\right]+$$
$$\frac{2}{3}m_1s_\gamma\tilde{\mu}g_1^2c_\gamma^3\overline{y_d}^{i2i3}y_d^{i1i4}LF_{5,1,-2}\left[\tilde{\mu},m_1\right]+$$
$$m_2s_\gamma\tilde{\mu}c_\gamma g_2^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(-c_\gamma^2+s_\gamma^2\right)LF_{2,1,0}\left[\tilde{\mu},m_2\right]+$$
$$c_\gamma g_2^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma m_\Phi^2\left(c_\gamma^2+s_\gamma^2\right)+m_2s_\gamma\tilde{\mu}\left(c_\gamma^2-s_\gamma^2\right)\right)LF_{3,1,-1}\left[\tilde{\mu},m_2\right]+$$
$$m_2s_\gamma\tilde{\mu}g_2^2c_\gamma^3\overline{y_d}^{i2i3}y_d^{i1i4}LF_{3,1,0}\left[\tilde{\mu},m_2\right]-2g_2^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2+s_\gamma^2\right)LF_{4,1,-2}\left[\tilde{\mu},m_2\right]-$$
$$3m_2s_\gamma\tilde{\mu}g_2^2c_\gamma^3\overline{y_d}^{i2i3}y_d^{i1i4}LF_{4,1,-1}\left[\tilde{\mu},m_2\right]+$$
$$g_2^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}\left(c_\gamma^2+s_\gamma^2\right)LF_{5,1,-3}\left[\tilde{\mu},m_2\right]+2m_2s_\gamma\tilde{\mu}g_2^2c_\gamma^3\overline{y_d}^{i2i3}y_d^{i1i4}LF_{5,1,-2}\left[\tilde{\mu},m_2\right]-$$
$$\frac{1}{24}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{rp}y_d^{i1i4}LF_{2,1,-1}\left[\tilde{\mu},m_{\tilde{d}}^{p}\right]+\frac{1}{54}g_1^2\overline{y_d}^{i2p}y_d^{i1p}LF_{2,1,0}\left[\tilde{\mu},m_{\tilde{d}}^{p}\right]\delta_{i3i4}+$$
$$\frac{5}{108}g_1^2\overline{y_d}^{i2p}y_d^{i1p}LF_{3,1,-1}\left[\tilde{\mu},m_{\tilde{d}}^{p}\right]\delta_{i3i4}-\frac{1}{108}g_1^2\overline{y_d}^{i2p}y_d^{i1p}LF_{4,1,-2}\left[\tilde{\mu},m_{\tilde{d}}^{p}\right]\delta_{i3i4}-$$
$$\frac{1}{24}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{pr}\overline{y_d}^{i2i3}y_d^{pi4}y_d^{i1r}LF_{2,1,-1}\left[\tilde{\mu},m_{\tilde{d}}^{r}\right]-$$
$$\frac{1}{12}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{pr}\overline{y_d}^{i2i3}y_d^{pi4}y_d^{i1r}LF_{2,1,-1}\left[\tilde{\mu},m_{\tilde{q}}^{p}\right]+\frac{1}{108}g_1^2\overline{y_d}^{pi3}y_d^{pi4}LF_{2,1,0}\left[\tilde{\mu},m_{\tilde{q}}^{p}\right]\delta_{i1i2}+$$
$$\frac{7}{108}g_1^2\overline{y_d}^{pi3}y_d^{pi4}LF_{3,1,-1}\left[\tilde{\mu},m_{\tilde{q}}^{p}\right]\delta_{i1i2}-\frac{1}{54}g_1^2\overline{y_d}^{pi3}y_d^{pi4}LF_{4,1,-2}\left[\tilde{\mu},m_{\tilde{q}}^{p}\right]\delta_{i1i2}-$$
$$\frac{1}{12}\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{rp}y_d^{i1i4}LF_{2,1,-1}\left[\tilde{\mu},m_{\tilde{q}}^{r}\right]-\frac{1}{27}g_1^2\overline{y_u}^{i2p}y_u^{i1p}LF_{2,1,0}\left[\tilde{\mu},m_{\tilde{u}}^{p}\right]\delta_{i3i4}-$$
$$\frac{1}{108}g_1^2\overline{y_u}^{i2p}y_u^{i1p}LF_{3,1,-1}\left[\tilde{\mu},m_{\tilde{u}}^{p}\right]\delta_{i3i4}-\frac{1}{108}g_1^2\overline{y_u}^{i2p}y_u^{i1p}LF_{4,1,-2}\left[\tilde{\mu},m_{\tilde{u}}^{p}\right]\delta_{i3i4}-$$
$$\frac{1}{24}\frac{1}{m_\Phi^2}s_\gamma^2\left(\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}y_u^{pr}+\overline{y_d}^{i2i3}y_d^{pi4}\overline{y_u}^{pr}y_u^{i1r}\right)LF_{2,1,-1}\left[\tilde{\mu},m_{\tilde{u}}^{r}\right]+$$
$$\frac{1}{54}m_1s_\gamma g_1^2\frac{1}{m_\Phi^2}y_d^{i1i4}\left(s_\gamma\overline{a_d}^{i2i3}+\tilde{\mu}c_\gamma\overline{y_d}^{i2i3}\right)LF_{1,1,1,0}\left[m_1,m_{\tilde{d}}^{i3},m_{\tilde{q}}^{i2}\right]+$$
$$\frac{1}{216}m_1c_\gamma g_1^2y_d^{i1i4}\left(-c_\gamma\overline{a_d}^{i2i3}+s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,2,1,-1}\left[m_1,m_{\tilde{d}}^{i3},m_{\tilde{q}}^{i2}\right]-$$
$$\frac{1}{18}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,-1}\left[m_1,m_{\tilde{d}}^{i3},\tilde{\mu}\right]+$$
$$\frac{1}{18}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,0}\left[m_1,m_{\tilde{d}}^{i3},\tilde{\mu}\right]+$$
$$\frac{1}{54}m_1s_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}\left(s_\gamma a_d^{i1i4}+\tilde{\mu}c_\gamma y_d^{i1i4}\right)LF_{1,1,1,0}\left[m_1,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i1}\right]+$$
$$\frac{1}{216}m_1c_\gamma g_1^2\overline{y_d}^{i2i3}\left(-c_\gamma a_d^{i1i4}+s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,2,1,-1}\left[m_1,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{324}g_1^4LF_{2,1,1,-1}\left[m_1,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-\frac{1}{162}g_1^4m_1^2LF_{2,1,1,0}\left[m_1,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-$$
$$\frac{1}{18}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,-1}\left[m_1,m_{\tilde{d}}^{i4},\tilde{\mu}\right]+$$
$$\frac{1}{18}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,0}\left[m_1,m_{\tilde{d}}^{i4},\tilde{\mu}\right]+$$
$$\frac{1}{216}m_1c_\gamma g_1^2\overline{y_d}^{i2i3}\left(-c_\gamma a_d^{i1i4}+s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,2,1,-1}\left[m_1,m_{\tilde{q}}^{i1},m_{\tilde{d}}^{i4}\right]-$$
$$\frac{1}{36}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,-1}\left[m_1,m_{\tilde{q}}^{i1},\tilde{\mu}\right]+$$
$$\frac{1}{36}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,0}\left[m_1,m_{\tilde{q}}^{i1},\tilde{\mu}\right]+$$
$$\frac{1}{216}m_1c_\gamma g_1^2y_d^{i1i4}\left(-c_\gamma\overline{a_d}^{i2i3}+s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,2,1,-1}\left[m_1,m_{\tilde{q}}^{i2},m_{\tilde{d}}^{i3}\right]-$$
$$\frac{1}{36}g_1^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,-1}\left[m_1,m_{\tilde{q}}^{i2},\tilde{\mu}\right]+$$
$$\frac{1}{36}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,0}\left[m_1,m_{\tilde{q}}^{i2},\tilde{\mu}\right]-$$
$$\frac{1}{36}g_1^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-2}\left[m_1,\tilde{\mu},m_{\tilde{d}}^{i3}\right]-$$
$$\frac{1}{36}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-1}\left[m_1,\tilde{\mu},m_{\tilde{d}}^{i3}\right]-$$
$$\frac{1}{36}g_1^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-2}\left[m_1,\tilde{\mu},m_{\tilde{d}}^{i4}\right]-$$
$$\frac{1}{36}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-1}\left[m_1,\tilde{\mu},m_{\tilde{d}}^{i4}\right]-$$
$$\frac{1}{72}g_1^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-2}\left[m_1,\tilde{\mu},m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{72}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-1}\left[m_1,\tilde{\mu},m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{72}g_1^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-2}\left[m_1,\tilde{\mu},m_{\tilde{q}}^{i2}\right]-$$
$$\frac{1}{72}m_1s_\gamma\tilde{\mu}c_\gamma g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-1}\left[m_1,\tilde{\mu},m_{\tilde{q}}^{i2}\right]-$$
$$\frac{1}{4}g_2^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,-1}\left[m_2,m_{\tilde{q}}^{i1},\tilde{\mu}\right]+$$
$$\frac{1}{4}m_2s_\gamma\tilde{\mu}c_\gamma g_2^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,0}\left[m_2,m_{\tilde{q}}^{i1},\tilde{\mu}\right]-$$
$$\frac{1}{4}g_2^2\frac{1}{m_\Phi^2}s_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,-1}\left[m_2,m_{\tilde{q}}^{i2},\tilde{\mu}\right]+$$
$$\frac{1}{4}m_2s_\gamma\tilde{\mu}c_\gamma g_2^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,0}\left[m_2,m_{\tilde{q}}^{i2},\tilde{\mu}\right]-$$
$$\frac{1}{8}g_2^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-2}\left[m_2,\tilde{\mu},m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{8}m_2s_\gamma\tilde{\mu}c_\gamma g_2^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-1}\left[m_2,\tilde{\mu},m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{8}g_2^2c_\gamma^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-2}\left[m_2,\tilde{\mu},m_{\tilde{q}}^{i2}\right]-$$
$$\frac{1}{8}m_2s_\gamma\tilde{\mu}c_\gamma g_2^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{2,2,1,-1}\left[m_2,\tilde{\mu},m_{\tilde{q}}^{i2}\right]-$$
$$\frac{4}{9}m_3s_\gamma g_3^2\frac{1}{m_\Phi^2}y_d^{i1i4}\left(s_\gamma\overline{a_d}^{i2i3}+\tilde{\mu}c_\gamma\overline{y_d}^{i2i3}\right)LF_{1,1,1,0}\left[m_3,m_{\tilde{d}}^{i3},m_{\tilde{q}}^{i2}\right]+$$
$$\frac{1}{9}m_3c_\gamma g_3^2y_d^{i1i4}\left(c_\gamma\overline{a_d}^{i2i3}-s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,2,1,-1}\left[m_3,m_{\tilde{d}}^{i3},m_{\tilde{q}}^{i2}\right]-$$
$$\frac{4}{9}m_3s_\gamma g_3^2\frac{1}{m_\Phi^2}\overline{y_d}^{i2i3}\left(s_\gamma a_d^{i1i4}+\tilde{\mu}c_\gamma y_d^{i1i4}\right)LF_{1,1,1,0}\left[m_3,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i1}\right]+$$
$$\frac{1}{9}m_3c_\gamma g_3^2\overline{y_d}^{i2i3}\left(c_\gamma a_d^{i1i4}-s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,2,1,-1}\left[m_3,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i1}\right]-$$
$$\frac{2}{9}g_3^4LF_{2,1,1,-1}\left[m_3,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}-\frac{4}{9}g_3^4m_3^2LF_{2,1,1,0}\left[m_3,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i2}\right]\delta_{i1i2}\delta_{i3i4}+$$
$$\frac{1}{9}m_3c_\gamma g_3^2\overline{y_d}^{i2i3}\left(c_\gamma a_d^{i1i4}-s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,2,1,-1}\left[m_3,m_{\tilde{q}}^{i1},m_{\tilde{d}}^{i4}\right]+$$
$$\frac{1}{9}m_3c_\gamma g_3^2y_d^{i1i4}\left(c_\gamma\overline{a_d}^{i2i3}-s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,2,1,-1}\left[m_3,m_{\tilde{q}}^{i2},m_{\tilde{d}}^{i3}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2y_d^{i1i4}\left(c_\gamma\overline{a_d}^{i2i3}-s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,1,1,0}\left[m_{\tilde{d}}^{i3},m_1,m_{\tilde{q}}^{i2}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2y_d^{i1i4}\left(-c_\gamma\overline{a_d}^{i2i3}+s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{3,1,1,-1}\left[m_{\tilde{d}}^{i3},m_1,m_{\tilde{q}}^{i2}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2y_d^{i1i4}\left(-c_\gamma\overline{a_d}^{i2i3}+s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,1,1,0}\left[m_{\tilde{d}}^{i3},m_3,m_{\tilde{q}}^{i2}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2y_d^{i1i4}\left(c_\gamma\overline{a_d}^{i2i3}-s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{3,1,1,-1}\left[m_{\tilde{d}}^{i3},m_3,m_{\tilde{q}}^{i2}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2\overline{y_d}^{i2i3}\left(c_\gamma a_d^{i1i4}-s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,1,1,0}\left[m_{\tilde{d}}^{i4},m_1,m_{\tilde{q}}^{i1}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2\overline{y_d}^{i2i3}\left(-c_\gamma a_d^{i1i4}+s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{3,1,1,-1}\left[m_{\tilde{d}}^{i4},m_1,m_{\tilde{q}}^{i1}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2\overline{y_d}^{i2i3}\left(-c_\gamma a_d^{i1i4}+s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,1,1,0}\left[m_{\tilde{d}}^{i4},m_3,m_{\tilde{q}}^{i1}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2\overline{y_d}^{i2i3}\left(c_\gamma a_d^{i1i4}-s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{3,1,1,-1}\left[m_{\tilde{d}}^{i4},m_3,m_{\tilde{q}}^{i1}\right]-$$
$$\frac{1}{6}s_\gamma\tilde{\mu}\frac{1}{m_\Phi^2}\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(c_\gamma\overline{a_u}^{pr}+s_\gamma\tilde{\mu}\overline{y_u}^{pr}\right)+\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(c_\gamma a_u^{pr}+s_\gamma\tilde{\mu}y_u^{pr}\right)\right)$$
$$LF_{1,1,1,0}\left[m_{\tilde{q}}^{p},m_{\tilde{u}}^{r},\tilde{\mu}\right]+\frac{1}{12}\tilde{\mu}c_\gamma\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(s_\gamma\overline{a_u}^{pr}-\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)+\right.$$
$$\left.\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(s_\gamma a_u^{pr}-\tilde{\mu}c_\gamma y_u^{pr}\right)\right)LF_{2,1,1,0}\left[m_{\tilde{q}}^{p},m_{\tilde{u}}^{r},\tilde{\mu}\right]+$$
$$\frac{1}{12}\tilde{\mu}c_\gamma\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)+\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)\right)$$
$$LF_{3,1,1,-1}\left[m_{\tilde{q}}^{p},m_{\tilde{u}}^{r},\tilde{\mu}\right]+\frac{1}{24}\tilde{\mu}c_\gamma\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)+\right.$$
$$\left.\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)\right)LF_{2,2,1,-1}\left[m_{\tilde{q}}^{p},\tilde{\mu},m_{\tilde{u}}^{r}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2\overline{y_d}^{i2i3}\left(c_\gamma a_d^{i1i4}-s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,1,1,0}\left[m_{\tilde{q}}^{i1},m_1,m_{\tilde{d}}^{i4}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2\overline{y_d}^{i2i3}\left(-c_\gamma a_d^{i1i4}+s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{3,1,1,-1}\left[m_{\tilde{q}}^{i1},m_1,m_{\tilde{d}}^{i4}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2\overline{y_d}^{i2i3}\left(-c_\gamma a_d^{i1i4}+s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{2,1,1,0}\left[m_{\tilde{q}}^{i1},m_3,m_{\tilde{d}}^{i4}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2\overline{y_d}^{i2i3}\left(c_\gamma a_d^{i1i4}-s_\gamma\tilde{\mu}y_d^{i1i4}\right)LF_{3,1,1,-1}\left[m_{\tilde{q}}^{i1},m_3,m_{\tilde{d}}^{i4}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2y_d^{i1i4}\left(c_\gamma\overline{a_d}^{i2i3}-s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,1,1,0}\left[m_{\tilde{q}}^{i2},m_1,m_{\tilde{d}}^{i3}\right]+$$
$$\frac{1}{108}m_1c_\gamma g_1^2y_d^{i1i4}\left(-c_\gamma\overline{a_d}^{i2i3}+s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{3,1,1,-1}\left[m_{\tilde{q}}^{i2},m_1,m_{\tilde{d}}^{i3}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2y_d^{i1i4}\left(-c_\gamma\overline{a_d}^{i2i3}+s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{2,1,1,0}\left[m_{\tilde{q}}^{i2},m_3,m_{\tilde{d}}^{i3}\right]+$$
$$\frac{2}{9}m_3c_\gamma g_3^2y_d^{i1i4}\left(c_\gamma\overline{a_d}^{i2i3}-s_\gamma\tilde{\mu}\overline{y_d}^{i2i3}\right)LF_{3,1,1,-1}\left[m_{\tilde{q}}^{i2},m_3,m_{\tilde{d}}^{i3}\right]+$$
$$\frac{1}{12}\tilde{\mu}c_\gamma\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(s_\gamma\overline{a_u}^{pr}-\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)+\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(s_\gamma a_u^{pr}-\tilde{\mu}c_\gamma y_u^{pr}\right)\right)$$
$$LF_{2,1,1,0}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p},\tilde{\mu}\right]+\frac{1}{12}\tilde{\mu}c_\gamma\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)+\right.$$
$$\left.\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)\right)LF_{3,1,1,-1}\left[m_{\tilde{u}}^{r},m_{\tilde{q}}^{p},\tilde{\mu}\right]+$$
$$\frac{1}{24}\tilde{\mu}c_\gamma\left(\overline{y_d}^{i2i3}y_d^{pi4}y_u^{i1r}\left(-s_\gamma\overline{a_u}^{pr}+\tilde{\mu}c_\gamma\overline{y_u}^{pr}\right)+\overline{y_d}^{pi3}y_d^{i1i4}\overline{y_u}^{i2r}\left(-s_\gamma a_u^{pr}+\tilde{\mu}c_\gamma y_u^{pr}\right)\right)$$
$$LF_{2,2,1,-1}\left[m_{\tilde{u}}^{r},\tilde{\mu},m_{\tilde{q}}^{p}\right]-\frac{1}{4}\overline{y_d}^{ri3}\overline{y_d}^{i2p}y_d^{ri4}y_d^{i1p}LF_{2,1,1,-1}\left[\tilde{\mu},m_{\tilde{d}}^{p},m_{\tilde{q}}^{r}\right]-$$
$$\frac{1}{2}\tilde{\mu}^2\overline{y_d}^{pi3}y_d^{pi4}\overline{y_u}^{i2r}y_u^{i1r}LF_{2,1,1,0}\left[\tilde{\mu},m_{\tilde{q}}^{p},m_{\tilde{u}}^{r}\right]+$$
$$\frac{1}{108}g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_1,m_{\tilde{d}}^{i3},m_{\tilde{q}}^{i1},\tilde{\mu}\right]+$$
$$\frac{1}{54}g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_1,m_{\tilde{d}}^{i4},m_{\tilde{d}}^{i3},\tilde{\mu}\right]+$$
$$\frac{1}{108}g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_1,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i2},\tilde{\mu}\right]+$$
$$\frac{1}{216}g_1^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_1,m_{\tilde{q}}^{i2},m_{\tilde{q}}^{i1},\tilde{\mu}\right]+$$
$$\frac{1}{8}g_2^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_2,m_{\tilde{q}}^{i2},m_{\tilde{q}}^{i1},\tilde{\mu}\right]-$$
$$\frac{2}{9}g_3^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_3,m_{\tilde{d}}^{i3},m_{\tilde{q}}^{i1},\tilde{\mu}\right]+$$
$$\frac{2}{9}g_3^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_3,m_{\tilde{d}}^{i4},m_{\tilde{d}}^{i3},\tilde{\mu}\right]-$$
$$\frac{2}{9}g_3^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_3,m_{\tilde{d}}^{i4},m_{\tilde{q}}^{i2},\tilde{\mu}\right]+$$
$$\left.\frac{2}{9}g_3^2\overline{y_d}^{i2i3}y_d^{i1i4}LF_{1,1,1,1,-1}\left[m_3,m_{\tilde{q}}^{i2},m_{\tilde{q}}^{i1},\tilde{\mu}\right]\right)$$