

$$\begin{aligned}
& \frac{1}{16\pi^2} \left(-\frac{1}{1296} \frac{1}{m_s^2} (81 s_\gamma^2 y_d^{r13} \overline{y_d}^{i2p} (12 c_\gamma^2 y_d^{r14} y_d^{i1p} + y_d^{rp} y_d^{i14} (1 + s_\gamma^2)) + \right. \\
& \quad s_\gamma^2 (81 \overline{y_d}^{pr} \overline{y_d}^{i2i3} (y_d^{pi4} y_d^{i1r} (1 + s_\gamma^2) - 8 c_\gamma^2 y_d^{pr} y_d^{i14}) + \\
& \quad 3 \overline{y_d}^{i2i3} (4 y_d^{i1i4} (2 g_1^2 + 27 g_2^2 + 168 g_3^2) - 9 y_d^{pi4} \overline{y_u}^{pr} y_u^{i1r} (-1 + c_\gamma^2)) + \\
& \quad \overline{y_d}^{pi3} (27 \overline{y_u}^{i2r} (-y_d^{i1i4} y_u^{pr} (-1 + c_\gamma^2) + 12 c_\gamma^2 y_d^{pi4} y_u^{i1r}) + 2 g_1^2 y_d^{pi4} \delta_{i1i2})) + \\
& \quad 2 g_1^2 (5 s_\gamma^2 \overline{y_d}^{i2p} y_d^{i1p} - 13 c_\gamma^2 \overline{y_u}^{i2p} y_u^{i1p}) \delta_{i3i4}) - \\
& \quad \frac{1}{12} \sum_p s_\gamma g_1^2 \frac{1}{m_s^2} \overline{y_d}^{i2i3} y_d^{i1i4} (2 s_{2\gamma} c_\gamma + s_\gamma c_{2\gamma}) \text{LF}_{1,0}[m_d^p] - \\
& \quad \frac{2}{243} \sum_p g_1^4 \text{LF}_{3,0}[m_d^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{5}{324} \sum_p g_1^4 \text{LF}_{4,-1}[m_d^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{1215} \sum_p g_1^4 \text{LF}_{5,-2}[m_d^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{1}{2} s_\gamma \frac{1}{m_s^4} \overline{y_d}^{pr} \overline{y_d}^{i2i3} y_d^{pr} y_d^{i1i4} (-s_{2\gamma} c_\gamma + s_\gamma^3) \text{LF}_{1,0}[m_d^r] - \\
& \quad \frac{1}{12} \sum_p s_\gamma g_1^2 \frac{1}{m_s^2} \overline{y_d}^{i2i3} y_d^{i1i4} (2 s_{2\gamma} c_\gamma + s_\gamma c_{2\gamma}) \text{LF}_{1,0}[m_e^p] - \\
& \quad \frac{2}{81} \sum_p g_1^4 \text{LF}_{3,0}[m_e^p] \delta_{i1i2} \delta_{i3i4} + \frac{5}{108} \sum_p g_1^4 \text{LF}_{4,-1}[m_e^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{405} \sum_p g_1^4 \text{LF}_{5,-2}[m_e^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{1}{6} s_\gamma \frac{1}{m_s^4} \overline{y_d}^{i2i3} y_d^{i1i4} \overline{y_e}^{pr} y_e^{pr} (-s_{2\gamma} c_\gamma + s_\gamma^3) \text{LF}_{1,0}[m_e^r] + \\
& \quad \frac{1}{12} s_\gamma \frac{1}{m_s^4} \overline{y_d}^{i2i3} y_d^{i1i4} (2 \overline{y_e}^{pr} y_e^{pr} (s_{2\gamma} c_\gamma - s_\gamma^3) + \sum_p g_1^2 (2 s_{2\gamma} c_\gamma + s_\gamma c_{2\gamma})) \text{LF}_{1,0}[m_l^p] - \\
& \quad \frac{1}{81} \sum_p g_1^4 \text{LF}_{3,0}[m_l^p] \delta_{i1i2} \delta_{i3i4} + \frac{5}{216} \sum_p g_1^4 \text{LF}_{4,-1}[m_l^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{8}{405} \sum_p g_1^4 \text{LF}_{5,-2}[m_l^p] \delta_{i1i2} \delta_{i3i4} - \frac{1}{12} s_\gamma \frac{1}{m_s^4} \overline{y_d}^{i2i3} y_d^{i1i4} \\
& \quad (6 \overline{y_d}^{pr} y_d^{pr} (-s_{2\gamma} c_\gamma + s_\gamma^3) + 6 c_\gamma \overline{y_u}^{pr} y_u^{pr} (s_{2\gamma} + s_\gamma c_\gamma) + \sum_p g_1^2 (2 s_{2\gamma} c_\gamma + s_\gamma c_{2\gamma})) \\
& \quad \text{LF}_{1,0}[m_q^p] - \frac{1}{243} \sum_p g_1^4 \text{LF}_{3,0}[m_q^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{5}{648} \sum_p g_1^4 \text{LF}_{4,-1}[m_q^p] \delta_{i1i2} \delta_{i3i4} - \frac{1}{1215} \sum_p g_1^4 \text{LF}_{5,-2}[m_q^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{1}{6} \sum_p s_\gamma g_1^2 \frac{1}{m_s^4} \overline{y_d}^{i2i3} y_d^{i1i4} (2 s_{2\gamma} c_\gamma + s_\gamma c_{2\gamma}) \text{LF}_{1,0}[m_u^p] - \frac{8}{243} \sum_p g_1^4 \text{LF}_{3,0}[m_u^p] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{5}{81} \sum_p g_1^4 \text{LF}_{4,-1}[m_u^p] \delta_{i1i2} \delta_{i3i4} - \frac{32}{1215} \sum_p g_1^4 \text{LF}_{5,-2}[m_u^p] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{1}{2} s_\gamma c_\gamma \frac{1}{m_s^4} \overline{y_d}^{i2i3} y_d^{i1i4} \overline{y_u}^{pr} y_u^{pr} (s_{2\gamma} + s_\gamma c_\gamma) \text{LF}_{1,0}[m_u^r] - \frac{1}{24} s_\gamma \frac{1}{m_s^4} \overline{y_d}^{i2i3} y_d^{i1i4} \\
& \quad (3 s_{4\gamma} c_\gamma (g_1^2 + g_2^2) + s_\gamma (g_1^2 (-1 + 3 c_{2\gamma}^2) + 3 g_2^2 (-1 + c_{2\gamma}^2))) \text{LF}_{1,0}[m_\phi] + \\
& \quad \frac{1}{24} \frac{1}{m_s^2} s_\gamma^2 (3 s_\gamma^2 \overline{y_d}^{pr} \overline{y_d}^{i2i3} y_d^{pi4} y_d^{i1r} + 3 y_d^{i1i4} (s_\gamma^2 \overline{y_d}^{r13} \overline{y_d}^{i2p} y_d^{rp} - c_\gamma^2 \overline{y_d}^{pi3} \overline{y_u}^{i2r} y_u^{pr}) - \\
& \quad \overline{y_d}^{i2i3} (2 y_d^{i1i4} (g_1^2 + 3 g_2^2) + 3 c_\gamma^2 y_d^{pi4} \overline{y_u}^{pr} y_u^{i1r})) \text{LF}_{1,1}[m_\phi] + \frac{1}{216} \\
& \quad (s_\gamma^2 (-108 c_\gamma^2 \overline{y_d}^{r13} \overline{y_d}^{i2p} y_d^{r14} y_d^{i1p} + 9 \overline{y_d}^{i2i3} (y_d^{i1i4} (g_1^2 + 3 g_2^2) + 2 c_\gamma^2 y_d^{pi4} \overline{y_u}^{pr} y_u^{i1r}) + \\
& \quad 2 \overline{y_d}^{pi3} (9 c_\gamma^2 \overline{y_u}^{i2r} (y_d^{i1i4} y_u^{pr} - 6 y_d^{pi4} y_u^{i1r}) - 2 g_1^2 y_d^{pi4} \delta_{i1i2})) - \\
& \quad 8 g_1^2 (s_\gamma^2 \overline{y_d}^{i2p} y_d^{i1p} - 2 c_\gamma^2 \overline{y_u}^{i2p} y_u^{i1p}) \delta_{i3i4}) \text{LF}_{1,2}[m_\phi] + \\
& \quad \frac{1}{36} (-9 s_\gamma^4 \overline{y_d}^{r13} \overline{y_d}^{i2p} y_d^{r14} y_d^{i1p} + s_\gamma^2 \overline{y_d}^{pi3} y_d^{pi4} (9 c_\gamma^2 \overline{y_u}^{i2r} y_u^{i1r} + g_1^2 \delta_{i1i2}) + \\
& \quad g_1^2 (s_\gamma^2 \overline{y_d}^{i2p} y_d^{i1p} - c_\gamma^2 \overline{y_u}^{i2p} y_u^{i1p}) \delta_{i3i4}) \text{LF}_{2,1}[m_\phi] - \\
& \quad \frac{1}{324} g_1^2 (9 s_\gamma^2 \overline{y_d}^{pi3} y_d^{pi4} \delta_{i1i2} + (9 s_\gamma^2 \overline{y_d}^{i2p} y_d^{i1p} - 9 c_\gamma^2 \overline{y_u}^{i2p} y_u^{i1p} + 4 g_1^2 \delta_{i1i2}) \delta_{i3i4}) \\
& \quad \text{LF}_{3,0}[m_\phi] + \frac{5}{216} g_1^4 \text{LF}_{4,-1}[m_\phi] \delta_{i1i2} \delta_{i3i4} - \frac{4}{405} g_1^4 \text{LF}_{5,-2}[m_\phi] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{1}{81} g_1^4 \text{LF}_{3,0}[\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} - \frac{1}{54} g_1^4 \text{LF}_{4,-1}[\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} + \\
& \quad \frac{8}{405} g_1^4 \text{LF}_{5,-2}[\tilde{\mu}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{54} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i3} y_d^{i1i4} \text{LF}_{1,1,0}[m_1, m_d^{i3}] - \\
& \quad \frac{1}{108} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i3} y_d^{i1i4} \text{LF}_{2,1,-1}[m_1, m_d^{i3}] + \frac{1}{54} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i3} y_d^{i1i4} \text{LF}_{1,1,0}[m_1, m_d^{i4}] - \\
& \quad \frac{1}{108} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i3} y_d^{i1i4} \text{LF}_{2,1,-1}[m_1, m_d^{i4}] - \frac{1}{486} g_1^4 \text{LF}_{2,1,0}[m_1, m_d^{i4}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{1}{486} g_1^4 \text{LF}_{2,2,-1}[m_1, m_d^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{243} g_1^4 \text{LF}_{3,1,-1}[m_1, m_d^{i4}] \delta_{i1i2} \delta_{i3i4} - \\
& \quad \frac{1}{486} g_1^4 \text{LF}_{4,1,-2}[m_1, m_d^{i4}] \delta_{i1i2} \delta_{i3i4} + \frac{1}{216} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i3} y_d^{i1i4} \text{LF}_{1,1,0}[m_1, m_q^{i1}] - \\
& \quad \frac{1}{432} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i3} y_d^{i1i4} \text{LF}_{2,1,-1}[m_1, m_q^{i1}] + \frac{1}{216} g_1^2 \frac{1}{m_s^2} s_\gamma^2 \overline{y_d}^{i2i$$