

$$\begin{aligned}
& -\frac{2}{9}m_1^2(g_1^2+g_2^2)+\frac{1}{16}\left(\frac{1}{m_2^2}(g_1^2+g_2^2)-\frac{1}{m_2^2}m_4^2(g_1^2+g_2^2)+2m_2^2c_2^2(g_1^2+3g_2^2)(c_\gamma^2+s_\gamma^2)\right)- \\
& -\frac{c_2^2}{9}m_1^2g_2^4LF_{3,0}[m_2]-\frac{2}{3}m_1^2g_2^4LF_{4,-1}[m_2]+\frac{32}{45}m_1^2g_2^4LF_{5,-2}[m_2]- \\
& -\frac{1}{4}\sum_{\mathbf{p}}s_2s_4s_\gamma g_1^2\frac{1}{m_4^2}(g_1^2+g_2^2)(m_1^2+m_5^2)LF_{1,0}[m_d^{\mathbf{p}}]-\frac{1}{12}\sum_{\mathbf{p}}g_1^4c_2\gamma^2LF_{2,0}[m_d^{\mathbf{p}}]+ \\
& -\frac{3}{4}s_2s_4s_\gamma\frac{1}{m_4^4}\overline{y}d^{\text{PR}}y_d^{\text{PR}}(g_1^2+g_2^2)(m_1^2+m_5^2)LF_{1,0}[m_d^{\mathbf{p}}]+c_2\gamma g_1^2c_2^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}LF_{2,0}[m_d^{\mathbf{p}}]- \\
& -\frac{1}{4}\sum_{\mathbf{p}}s_2s_4s_\gamma g_1^2\frac{1}{m_4^2}(g_1^2+g_2^2)(m_1^2+m_5^2)LF_{1,0}[m_e^{\mathbf{p}}]-\frac{1}{4}\sum_{\mathbf{p}}g_1^4c_2\gamma^2LF_{2,0}[m_e^{\mathbf{p}}]+ \\
& -\frac{1}{4}s_2s_4s_\gamma\frac{1}{m_4^4}\overline{y}e^{\text{PR}}y_e^{\text{PR}}(g_1^2+g_2^2)(m_1^2+m_5^2)LF_{1,0}[m_e^{\mathbf{p}}]+c_2\gamma g_1^2c_2^2\overline{y}e^{\text{PR}}y_e^{\text{PR}}LF_{2,0}[m_e^{\mathbf{p}}]+ \\
& -\frac{1}{4}s_2s_4s_\gamma\frac{1}{m_4^4}(g_1^2+g_2^2)(m_1^2+m_5^2)(\overline{y}e^{\text{PR}}y_e^{\text{PR}}+\sum_{\mathbf{p}}g_1^2)LF_{1,0}[m_l^{\mathbf{p}}]- \\
& -\frac{1}{8}c_2\gamma(4c_2^2\overline{y}e^{\text{PR}}y_e^{\text{PR}}(g_1^2+g_2^2)+\sum_{\mathbf{p}}c_2\gamma(g_1^2+g_2^2))LF_{2,0}[m_l^{\mathbf{p}}]+ \\
& -\frac{1}{18}m_1^2g_2^2(-36c_2\gamma c_\gamma^2\overline{y}e^{\text{PR}}y_e^{\text{PR}}+\sum_{\mathbf{p}}g_2^2(-4+9c_2\gamma^2))LF_{3,0}[m_l^{\mathbf{p}}]+ \\
& -\frac{1}{12}m_1^2g_2^2(24c_2\gamma c_\gamma^2\overline{y}e^{\text{PR}}y_e^{\text{PR}}+\sum_{\mathbf{p}}g_2^2(5-6c_2\gamma^2))LF_{4,-1}[m_l^{\mathbf{p}}]-\frac{8}{45}\sum_{\mathbf{p}}m_1^2g_2^4LF_{5,-2}[m_l^{\mathbf{p}}]- \\
& -\frac{1}{4}s_2s_4s_\gamma\frac{1}{m_4^2}(g_1^2+g_2^2)(m_1^2+m_5^2)(-3\overline{y}d^{\text{PR}}y_d^{\text{PR}}+3\overline{y}_0^{\text{PR}}y_0^{\text{PR}}+\sum_{\mathbf{p}}g_1^2)LF_{1,0}[m_l^{\mathbf{p}}]+ \\
& -\frac{1}{24}c_2\gamma(12c_\gamma^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}(g_1^2+3g_2^2)+12s_\gamma^2\overline{y}_0^{\text{PR}}y_0^{\text{PR}}(g_1^2+3g_2^2)-\sum_{\mathbf{p}}c_2\gamma(g_1^4+9g_2^4)) \\
& LF_{2,0}[m_l^{\mathbf{p}}]+\frac{6}{5}m_1^2g_2^2(36c_2\gamma(-c_\gamma^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}-s_\gamma^2\overline{y}_0^{\text{PR}}y_0^{\text{PR}})+\sum_{\mathbf{p}}g_2^2(-4+9c_2\gamma^2)) \\
& LF_{3,0}[m_l^{\mathbf{p}}]+\frac{4}{5}m_1^2g_2^2(24c_2\gamma(c_\gamma^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}-s_\gamma^2\overline{y}_0^{\text{PR}}y_0^{\text{PR}})+\sum_{\mathbf{p}}g_2^2(5-6c_2\gamma^2))LF_{4,-1}[m_l^{\mathbf{p}}]- \\
& -\frac{8}{15}\sum_{\mathbf{p}}m_1^2g_2^4LF_{5,-2}[m_l^{\mathbf{p}}]+\frac{1}{2}\sum_{\mathbf{p}}s_2s_4s_\gamma g_1^2\frac{1}{m_4^2}(g_1^2+g_2^2)(m_1^2+m_5^2)LF_{1,0}[m_0^{\mathbf{p}}]- \\
& -\frac{1}{3}\sum_{\mathbf{p}}g_1^4c_2\gamma^2LF_{2,0}[m_0^{\mathbf{p}}]-\frac{3}{4}s_2s_4s_\gamma\frac{1}{m_4^4}\overline{y}d^{\text{PR}}y_d^{\text{PR}}(g_1^2+g_2^2)(m_1^2+m_5^2)LF_{1,0}[m_0^{\mathbf{r}}]- \\
& 2c_2\gamma g_1^2s_\gamma^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}LF_{2,0}[m_0^{\mathbf{r}}]-\frac{3}{16}\frac{1}{m_2^2}s_4\gamma^2(m_1^2+m_5^2)LF_{1,0}[m_0](g_1^2+g_2^2)^2- \\
& -\frac{3}{16}s_4\gamma^2LF_{1,1}[m_0](g_1^2+g_2^2)^2-\frac{1}{16}m_4^2s_4\gamma^2LF_{1,2}[m_0](g_1^2+g_2^2)^2+ \\
& -\frac{1}{64}(2g_1^2g_2^2(3+c_4\gamma(2-5c_4\gamma)-4s_2\gamma^4)-g_2^2(9+c_4\gamma(-6+5c_4\gamma)+4s_2\gamma^4)- \\
& -g_1^4(1+c_4\gamma(2+5c_4\gamma)+4s_2\gamma^4))LF_{2,0}[m_0]+\frac{1}{288}m_1^2(9g_1^4((-1+c_4\gamma)^2+4s_2\gamma^4)+ \\
& +18g_1^2g_2^2(-3+c_4\gamma(2+c_4\gamma)+4s_2\gamma^4)+g_2^4(17+9c_4\gamma(6+c_4\gamma)+36s_2\gamma^4))LF_{3,0}[m_0]+ \\
& +\frac{1}{96}m_1^2(-3g_1^4((-1+c_4\gamma)^2+4s_2\gamma^4)-6g_1^2g_2^2(-3+c_4\gamma(2+c_4\gamma)+4s_2\gamma^4)- \\
& -g_2^4(-13+3c_4\gamma(6+c_4\gamma)+12s_2\gamma^4))LF_{4,-1}[m_0]-\frac{8}{45}m_1^2g_2^4LF_{5,-2}[m_0]- \\
& -\frac{2}{9}m_1^2g_2^4LF_{3,0}[\tilde{\mu}]-\frac{1}{3}m_1^2g_2^4LF_{4,-1}[\tilde{\mu}]+\frac{145}{45}m_1^2g_2^4LF_{5,-2}[\tilde{\mu}]+\frac{1}{2}m_1s_4\gamma\tilde{\mu}g_1^2\frac{1}{m_5^2} \\
& (g_1^2+g_2^2)(m_1^2+m_5^2)(c_\gamma^2-s_\gamma^2)LF_{1,1,1,0}[m_1,\tilde{\mu}]+\frac{1}{2}g_1^4LF_{2,2,-2}[m_1,\tilde{\mu}](c_\gamma^2+s_\gamma^2)^2+ \\
& +\frac{1}{2}g_1^4(m_1^2(c_\gamma^2+s_\gamma^2)^2+8m_1s_\gamma\tilde{\mu}c_\gamma(c_\gamma^2+s_\gamma^2)+4s_\gamma^2\tilde{\mu}^2c_\gamma^2)LF_{2,2,-1}[m_1,\tilde{\mu}]+ \\
& +2g_1^4m_1^2s_\gamma^2\tilde{\mu}^2\frac{1}{m_4^2}LF_{2,2,0}[m_1,\tilde{\mu}]+ \\
& +\frac{1}{2}m_2s_4\gamma\tilde{\mu}g_2^2\frac{1}{m_4^4}(g_1^2+g_2^2)(m_1^2+m_5^2)(c_\gamma^2-s_\gamma^2)LF_{1,1,0}[m_2,\tilde{\mu}]+ \\
& +\frac{8}{3}m_1^2g_2^4(c_\gamma^2+s_\gamma^2)LF_{2,1,0}[m_2,\tilde{\mu}]+\frac{1}{2}g_2^4(5c_\gamma^4+2s_\gamma^2c_\gamma^2+5s_\gamma^4)LF_{2,2,-2}[m_2,\tilde{\mu}]+ \\
& +\frac{1}{6}g_2^4(3c_\gamma^4(m_2^2+6m_1^2)+16m_1^2g_2^2+3s_\gamma^4(4m_2^2+6m_1^2)+72m_2s_\gamma\tilde{\mu}c_\gamma^3+ \\
& -72m_1^2\tilde{\mu}c_\gamma s_\gamma^2+c_\gamma^2(m_1^2(16-48s_\gamma^2)+6s_\gamma^2(5m_2^2+72m_2^2))LF_{2,2,-1}[m_2,\tilde{\mu}]+ \\
& +\frac{2}{3}m_2s_\gamma c_\gamma g_2^4(8m_1^2\tilde{\mu}+3m_2s_\gamma c_\gamma(2m_1^2+3\tilde{\mu}^2))LF_{2,2,0}[m_2,\tilde{\mu}]-\frac{4}{3}m_1^2g_2^4(c_\gamma^2+s_\gamma^2) \\
& LF_{3,1,-1}[m_2,\tilde{\mu}]-\frac{4}{3}m_1^2g_2^4(6c_\gamma^4+s_\gamma^2+6s_\gamma^4+c_\gamma^2(1-12s_\gamma^2))LF_{3,2,-2}[m_2,\tilde{\mu}]+ \\
& +\frac{2}{3}m_1^2m_2g_2^4(9m_2(c_\gamma^2-s_\gamma^2)^2-4s_\gamma\tilde{\mu}c_\gamma)LF_{3,2,-1}[m_2,\tilde{\mu}]+ \\
& +4m_1^2g_2^4LF_{3,3,-3}[m_2,\tilde{\mu}](c_\gamma^2-s_\gamma^2)^2-4m_1^2g_2^4m_2^2LF_{3,3,-2}[m_2,\tilde{\mu}](c_\gamma^2-s_\gamma^2)^2+ \\
& +4m_1^2g_2^4LF_{4,2,-3}[m_2,\tilde{\mu}](c_\gamma^2-s_\gamma^2)^2-4m_1^2g_2^4m_2^2LF_{4,2,-2}[m_2,\tilde{\mu}](c_\gamma^2-s_\gamma^2)^2- \\
& -3c_\gamma^4\overline{y}d^{\text{PR}}\overline{y}d^{\text{st}}y_d^{\text{PR}}y_d^{\text{st}}y_0^{\text{PR}}LF_{1,1,0}[m_0^{\mathbf{r}},m_d^{\mathbf{r}}]+\frac{3}{4}s_4\gamma\frac{1}{m_4^2}(g_1^2+g_2^2)(m_1^2+m_5^2) \\
& (\tilde{\mu}\overline{y}d^{\text{PR}}(a_d^{\text{PR}}(c_\gamma^2-s_\gamma^2)-2s_\gamma\tilde{\mu}c_\gamma y_0^{\text{PR}})+\overline{a}_d^{\text{PR}}(2s_\gamma c_\gamma a_d^{\text{PR}}+\tilde{\mu}y_d^{\text{PR}}(c_\gamma^2-s_\gamma^2))) \\
& -m_1^2LF_{1,1,0}[m_d^{\mathbf{r}},m_q^{\mathbf{p}}]+c_2\gamma g_1^2(c_\gamma\overline{a}_d^{\text{PR}}(c_\gamma 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}})LF_{2,1,0}[m_d^{\mathbf{r}},m_q^{\mathbf{p}}]- \\
& -c_\gamma^4\overline{y}e^{\text{PR}}\overline{y}e^{\text{st}}y_e^{\text{PR}}y_e^{\text{st}}y_0^{\text{PR}}LF_{1,1,0}[m_e^{\mathbf{r}},m_e^{\mathbf{t}}]+\frac{3}{4}s_4\gamma\frac{1}{m_4^2}(g_1^2+g_2^2)(m_1^2+m_5^2) \\
& (\tilde{\mu}\overline{y}e^{\text{PR}}(a_e^{\text{PR}}(c_\gamma^2-s_\gamma^2)-2s_\gamma\tilde{\mu}c_\gamma y_e^{\text{PR}})+\overline{a}_e^{\text{PR}}(2s_\gamma c_\gamma a_e^{\text{PR}}+\tilde{\mu}y_e^{\text{PR}}(c_\gamma^2-s_\gamma^2))) \\
& -LF_{1,1,0}[m_e^{\mathbf{r}},m_l^{\mathbf{p}}]+c_2\gamma g_1^2(c_\gamma\overline{a}_e^{\text{PR}}(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}\overline{y}e^{\text{PR}})(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}y_e^{\text{PR}})LF_{2,1,0}[m_e^{\mathbf{r}},m_l^{\mathbf{p}}]- \\
& -m_1^2c_2\gamma g_1^2(c_\gamma\overline{a}_e^{\text{PR}}(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}\overline{y}e^{\text{PR}})(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}y_e^{\text{PR}})LF_{2,2,0}[m_e^{\mathbf{r}},m_l^{\mathbf{p}}]+ \\
& +\frac{1}{4}\frac{1}{m_5^2}(\tilde{\mu}\overline{y}e^{\text{PR}}(a_e^{\text{PR}}(-m_1^2s_4\gamma c_\gamma^2(g_1^2+g_2^2)- \\
& -2s_\gamma c_2\gamma c_\gamma m_5^2(g_1^2(-1+c_2\gamma)+g_2^2(1+c_2\gamma))+m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2))+ \\
& +2s_\gamma\tilde{\mu}y_e^{\text{PR}}(m_1^2s_4\gamma c_\gamma(g_1^2+g_2^2)+s_\gamma c_2\gamma m_5^2(g_1^2(-1+c_2\gamma)+g_2^2(1+c_2\gamma)))+ \\
& +\overline{a}_e^{\text{PR}}(2c_\gamma a_e^{\text{PR}}(c_2\gamma c_\gamma m_5^2(g_1^2+g_2^2)+s_\gamma c_2\gamma(g_1^2+g_2^2)+g_2^2(1+c_2\gamma))-m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2)) \\
& -\tilde{\mu}y_e^{\text{PR}}(m_1^2s_4\gamma c_\gamma^2(g_1^2+g_2^2)+2s_\gamma c_2\gamma c_\gamma m_5^2(g_1^2(-1+c_2\gamma)+g_2^2(1+c_2\gamma))+ \\
& -m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2)))LF_{2,1,0}[m_l^{\mathbf{p}},m_e^{\mathbf{r}}]+\frac{1}{4}\frac{1}{m_5^2}(g_1^2+g_2^2) \\
& (2c_\gamma\overline{a}_e^{\text{PR}}a_e^{\text{PR}}(-c_\gamma m_5^2c_2\gamma^2+m_1^2s_4\gamma s_\gamma)+\tilde{\mu}(m_1^2s_4\gamma c_\gamma^2+2s_\gamma c_\gamma m_5^2c_2\gamma^2-m_1^2s_4\gamma s_\gamma^2) \\
& (\overline{y}e^{\text{PR}}a_e^{\text{PR}}+y_e^{\text{PR}}\overline{a}_e^{\text{PR}})-2s_\gamma\tilde{\mu}^2\overline{y}e^{\text{PR}}y_e^{\text{PR}}(m_1^2s_4\gamma c_\gamma+s_\gamma m_5^2c_2\gamma^2))LF_{3,1,-1}[m_l^{\mathbf{p}},m_e^{\mathbf{r}}]- \\
& -m_1^2c_2\gamma(g_1^2(-1+c_2\gamma)+g_2^2(1+c_2\gamma))(c_\gamma\overline{a}_e^{\text{PR}}-s_\gamma\tilde{\mu}\overline{y}e^{\text{PR}})(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}y_e^{\text{PR}}) \\
& LF_{3,1,0}[m_l^{\mathbf{p}},m_e^{\mathbf{r}}]+m_1^2c_2\gamma g_1^2(c_\gamma\overline{a}_e^{\text{PR}}-s_\gamma\tilde{\mu}\overline{y}e^{\text{PR}})(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}y_e^{\text{PR}})LF_{3,2,-1}[m_l^{\mathbf{p}},m_e^{\mathbf{r}}]+ \\
& +\frac{1}{2}m_1^2(-1+2c_2\gamma)(2g_2^2+3c_2\gamma(g_1^2+g_2^2))(c_\gamma\overline{a}_e^{\text{PR}}-s_\gamma\tilde{\mu}\overline{y}e^{\text{PR}}) \\
& (c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}y_e^{\text{PR}})LF_{4,1,-1}[m_l^{\mathbf{p}},m_e^{\mathbf{r}}]- \\
& -\frac{2}{3}m_1^2(-2g_2^2+3c_2\gamma^2(g_1^2+g_2^2))(c_\gamma\overline{a}_e^{\text{PR}}-s_\gamma\tilde{\mu}\overline{y}e^{\text{PR}})(c_\gamma a_e^{\text{PR}}-s_\gamma\tilde{\mu}y_e^{\text{PR}})LF_{5,1,-2}[m_l^{\mathbf{p}},m_e^{\mathbf{r}}]- \\
& -c_\gamma^4\overline{y}e^{\text{PR}}\overline{y}e^{\text{st}}y_e^{\text{PR}}y_e^{\text{st}}y_0^{\text{PR}}LF_{1,1,0}[m_l^{\mathbf{p}},m_l^{\mathbf{s}}]+2m_1^2m_2^2c_\gamma^2\overline{y}e^{\text{PR}}\overline{y}e^{\text{st}}y_e^{\text{PR}}y_e^{\text{st}}y_0^{\text{PR}}[m_l^{\mathbf{p}},m_l^{\mathbf{s}}]- \\
& -2m_1^2c_\gamma^4\overline{y}e^{\text{PR}}\overline{y}e^{\text{st}}y_e^{\text{PR}}y_e^{\text{st}}y_0^{\text{PR}}LF_{3,1,-1}[m_l^{\mathbf{p}},m_l^{\mathbf{s}}]+\frac{1}{4}\frac{1}{m_4^2}(\tilde{\mu}\overline{y}d^{\text{PR}}(a_d^{\text{PR}}(-3m_1^2s_4\gamma c_\gamma^2(g_1^2+g_2^2)+ \\
& -2s_\gamma c_2\gamma c_\gamma m_5^2(g_1^2(1+c_2\gamma)+3g_2^2(1+c_2\gamma))+3m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2))+ \\
& +2s_\gamma\tilde{\mu}y_d^{\text{PR}}(3m_1^2s_4\gamma c_\gamma(g_1^2+g_2^2)+s_\gamma c_2\gamma m_5^2(g_1^2(1+c_2\gamma)+3g_2^2(1+c_2\gamma)))- \\
& +\overline{a}_d^{\text{PR}}(2c_\gamma a_d^{\text{PR}}(c_2\gamma c_\gamma m_5^2(g_1^2(1+c_2\gamma)+3g_2^2(1+c_2\gamma))-3m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2))- \\
& -\tilde{\mu}y_d^{\text{PR}}(3m_1^2s_4\gamma c_\gamma^2(g_1^2+g_2^2)+2s_\gamma c_2\gamma c_\gamma m_5^2(g_1^2(1+c_2\gamma)+3g_2^2(1+c_2\gamma))- \\
& -3m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2)))LF_{2,1,0}[m_q^{\mathbf{p}},m_d^{\mathbf{r}}]+\frac{3}{4}\frac{1}{m_5^2}(g_1^2+g_2^2) \\
& (2c_\gamma\overline{a}_d^{\text{PR}}a_d^{\text{PR}}(-c_\gamma m_5^2c_2\gamma^2+m_1^2s_4\gamma s_\gamma)+\tilde{\mu}(m_1^2s_4\gamma c_\gamma^2+2s_\gamma c_\gamma m_5^2c_2\gamma^2-m_1^2s_4\gamma s_\gamma^2) \\
& (\overline{y}d^{\text{PR}}a_d^{\text{PR}}+y_d^{\text{PR}}\overline{a}_d^{\text{PR}})-2s_\gamma\tilde{\mu}^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}(m_1^2s_4\gamma c_\gamma+s_\gamma m_5^2c_2\gamma^2))LF_{3,1,-1}[m_q^{\mathbf{p}},m_d^{\mathbf{r}}]- \\
& -m_1^2c_2\gamma(g_1^2(1+c_2\gamma)+3g_2^2(1+c_2\gamma))(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}}) \\
& LF_{3,1,0}[m_q^{\mathbf{p}},m_d^{\mathbf{r}}]+m_1^2c_2\gamma g_1^2(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}})LF_{3,2,-1}[m_q^{\mathbf{p}},m_d^{\mathbf{r}}]+ \\
& +\frac{3}{2}m_1^2(-2g_2^2+c_2\gamma(1+6c_2\gamma)(g_1^2+g_2^2))(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}})LF_{4,1,-1}[m_q^{\mathbf{p}},m_d^{\mathbf{r}}]- \\
& -2m_1^2(-2g_2^2+3c_2\gamma^2(g_1^2+g_2^2))(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}})LF_{5,1,-2}[m_q^{\mathbf{p}},m_d^{\mathbf{r}}]- \\
& -3(c_\gamma^4\overline{y}d^{\text{PR}}\overline{y}d^{\text{st}}y_d^{\text{PR}}y_d^{\text{st}}y_0^{\text{PR}}+s_\gamma^4\overline{y}d^{\text{PR}}\overline{y}d^{\text{st}}y_d^{\text{PR}}y_d^{\text{st}}y_0^{\text{PR}})LF_{1,1,0}[m_0^{\mathbf{r}},m_0^{\mathbf{s}}]+ \\
& +6m_1^2(c_\gamma^2y_d^{\text{PR}}y_d^{\text{st}}(c_\gamma^2y_d^{\text{st}}y_d^{\text{PR}}-s_\gamma^2y_0^{\text{PR}}y_0^{\text{PR}})+s_\gamma^4\overline{y}d^{\text{PR}}\overline{y}d^{\text{st}}y_d^{\text{PR}}y_d^{\text{st}}y_0^{\text{PR}})LF_{2,1,0}[m_0^{\mathbf{r}},m_0^{\mathbf{s}}]- \\
& +6m_1^2(c_\gamma^2y_d^{\text{PR}}y_d^{\text{st}}(c_\gamma^2y_d^{\text{st}}y_d^{\text{PR}}-s_\gamma^2y_0^{\text{PR}}y_0^{\text{PR}})+s_\gamma^4\overline{y}d^{\text{PR}}\overline{y}d^{\text{st}}y_d^{\text{PR}}y_d^{\text{st}}y_0^{\text{PR}})LF_{3,1,-1}[m_0^{\mathbf{r}},m_0^{\mathbf{s}}]+ \\
& +\frac{3}{4}s_4\gamma\frac{1}{m_5^2}(g_1^2+g_2^2)(m_1^2+m_5^2)(\tilde{\mu}\overline{y}d^{\text{PR}}(a_d^{\text{PR}}(c_\gamma^2-s_\gamma^2)+2s_\gamma\tilde{\mu}c_\gamma y_d^{\text{PR}})+ \\
& -c_2\gamma(-2s_\gamma c_\gamma a_d^{\text{PR}}+\tilde{\mu}y_d^{\text{PR}}(c_\gamma^2-s_\gamma^2)))LF_{1,1,0}[m_0^{\mathbf{r}},m_0^{\mathbf{r}}]+ \\
& +\frac{1}{2}c_2\gamma(g_1^2-3g_2^2)(s_\gamma\overline{a}_0^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_0^{\text{PR}})(s_\gamma a_0^{\text{PR}}-\tilde{\mu}c_\gamma y_0^{\text{PR}})LF_{2,1,0}[m_0^{\mathbf{p}},m_0^{\mathbf{r}}]- \\
& +\frac{1}{2}m_1^2(c_2\gamma g_1^2+g_2^2(4-3c_2\gamma))(s_\gamma\overline{a}_0^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_0^{\text{PR}})(s_\gamma a_0^{\text{PR}}-\tilde{\mu}c_\gamma y_0^{\text{PR}})LF_{2,2,0}[m_0^{\mathbf{p}},m_0^{\mathbf{r}}]+ \\
& +6m_1^2c_2\gamma g_2^2(s_\gamma\overline{a}_0^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_0^{\text{PR}})(s_\gamma a_0^{\text{PR}}-\tilde{\mu}c_\gamma y_0^{\text{PR}})LF_{3,1,0}[m_0^{\mathbf{p}},m_0^{\mathbf{r}}]- \\
& -m_1^2g_2^2(-1+3c_2\gamma)(s_\gamma\overline{a}_0^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_0^{\text{PR}})(s_\gamma a_0^{\text{PR}}-\tilde{\mu}c_\gamma y_0^{\text{PR}})LF_{3,2,-1}[m_0^{\mathbf{p}},m_0^{\mathbf{r}}]- \\
& -6m_1^2c_2\gamma g_2^2(s_\gamma\overline{a}_0^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_0^{\text{PR}})(s_\gamma a_0^{\text{PR}}-\tilde{\mu}c_\gamma y_0^{\text{PR}})LF_{4,1,-1}[m_0^{\mathbf{p}},m_0^{\mathbf{r}}]- \\
& +6m_1^2s_\gamma^2c_\gamma^2\overline{y}_d^{\text{PR}}y_d^{\text{st}}\overline{y}_0^{\text{PR}}y_0^{\text{PR}}LF_{2,1,0}[m_q^{\mathbf{s}},m_q^{\mathbf{p}}]+ \\
& +6m_1^2s_\gamma^2c_\gamma^2\overline{y}_d^{\text{PR}}y_d^{\text{st}}\overline{y}_0^{\text{PR}}y_0^{\text{PR}}LF_{3,1,-1}[m_q^{\mathbf{s}},m_q^{\mathbf{p}}]+ \\
& +\frac{1}{4}\frac{1}{m_5^2}(\tilde{\mu}\overline{y}d^{\text{PR}}(a_d^{\text{PR}}(-3m_1^2s_4\gamma c_\gamma^2(g_1^2+g_2^2)- \\
& -2s_\gamma c_2\gamma c_\gamma m_5^2(g_1^2(-4+3c_2\gamma)+3c_2\gamma g_2^2)+3m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2))+ \\
& +2\tilde{\mu}c_\gamma y_d^{\text{PR}}(3m_1^2s_4\gamma c_\gamma(g_1^2+g_2^2)+3c_2\gamma g_2^2)-3m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2))+ \\
& +\overline{a}_d^{\text{PR}}(2c_\gamma a_d^{\text{PR}}(c_2\gamma c_\gamma m_5^2(g_1^2+g_2^2)+s_\gamma c_2\gamma(g_1^2+g_2^2)+g_2^2(1+c_2\gamma))- \\
& -\tilde{\mu}y_d^{\text{PR}}(3m_1^2s_4\gamma c_\gamma^2(g_1^2+g_2^2)+2s_\gamma c_2\gamma c_\gamma m_5^2(g_1^2(1+c_2\gamma)+3g_2^2(1+c_2\gamma))- \\
& -3m_1^2s_4\gamma s_\gamma^2(g_1^2+g_2^2)))LF_{2,1,0}[m_0^{\mathbf{r}},m_q^{\mathbf{p}}]+\frac{3}{4}\frac{1}{m_5^2}(g_1^2+g_2^2) \\
& (-2s_\gamma\overline{a}_d^{\text{PR}}a_d^{\text{PR}}(m_1^2s_4\gamma c_\gamma+s_\gamma m_5^2c_2\gamma^2)+\tilde{\mu}(m_1^2s_4\gamma c_\gamma^2+2s_\gamma c_\gamma m_5^2c_2\gamma^2-m_1^2s_4\gamma s_\gamma^2) \\
& (\overline{y}d^{\text{PR}}a_d^{\text{PR}}+y_d^{\text{PR}}\overline{a}_d^{\text{PR}})+2c_\gamma\tilde{\mu}^2\overline{y}d^{\text{PR}}y_d^{\text{PR}}(-c_\gamma m_5^2c_2\gamma^2+m_1^2s_4\gamma s_\gamma^2))LF_{3,1,-1}[m_0^{\mathbf{r}},m_q^{\mathbf{p}}]- \\
& -m_1^2(c_2\gamma g_1^2(-4+3c_2\gamma)+g_2^2(-2+3c_2\gamma^2))(s_\gamma\overline{a}_d^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_d^{\text{PR}}) \\
& (s_\gamma a_d^{\text{PR}}-\tilde{\mu}c_\gamma y_d^{\text{PR}})LF_{3,1,0}[m_0^{\mathbf{r}},m_q^{\mathbf{p}}]+ \\
& +\frac{1}{2}m_1^2(c_2\gamma g_1^2+g_2^2(4-3c_2\gamma))(s_\gamma\overline{a}_d^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_d^{\text{PR}})(s_\gamma a_d^{\text{PR}}-\tilde{\mu}c_\gamma y_d^{\text{PR}})LF_{3,2,-1}[m_0^{\mathbf{r}},m_q^{\mathbf{p}}]+ \\
& +3m_1^2(c_2\gamma g_1^2(-2+3c_2\gamma)+g_2^2(-2-3c_2\gamma^2)) \\
& (s_\gamma\overline{a}_d^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_d^{\text{PR}})(s_\gamma a_d^{\text{PR}}-\tilde{\mu}c_\gamma y_d^{\text{PR}})LF_{4,1,-1}[m_0^{\mathbf{r}},m_q^{\mathbf{p}}]- \\
& -2m_1^2(-2g_2^2+3c_2\gamma^2(g_1^2+g_2^2))(s_\gamma\overline{a}_d^{\text{PR}}-\tilde{\mu}c_\gamma\overline{y}_d^{\text{PR}})(s_\gamma a_d^{\text{PR}}-\tilde{\mu}c_\gamma y_d^{\text{PR}})LF_{5,1,-2}[m_0^{\mathbf{r}},m_q^{\mathbf{p}}]- \\
& -3c_\gamma^4\overline{y}_d^{\text{PR}}\overline{y}_d^{\text{st}}y_d^{\text{PR}}y_d^{\text{st}}y_0^{\text{PR}}LF_{1,1,0}[m_0^{\mathbf{r}},m_0^{\mathbf{t}}]- \\
& -\frac{3}{4}g_1^2c_2^2(g_1^2+g_2^2)(c_\gamma^2+s_\gamma^2)LF_{2,1,-1}[\tilde{\mu},m_1]- \\
& -\frac{1}{2}m_1\tilde{\mu}g_1^2\frac{1}{m_5^2}(g_1^2+g_2^2)(m_1^2s_4\gamma c_\gamma^2+2s_\gamma c_\gamma m_5^2c_2\gamma^2-m_1^2s_4\gamma s_\gamma^2)LF_{2,1,0}[\tilde{\mu},m_1]+ \\
& +\frac{1}{2}g_1^2c_2^2(g_1^2+g_2^2)(c_\gamma^2+s_\gamma^2)LF_{3,1,-2}[\tilde{\mu},m_1]+\frac{1}{2}g_1^2\frac{1}{m_5^2}(g_1^2+g_2^2) \\
& (m_1^2m_1s_4\gamma\tilde{\mu}(c_\gamma^2-s_\gamma^2)+2m_2^2c_2^2(2m_1^2(c_\gamma^2+s_\gamma^2)+m_1s_\gamma\tilde{\mu}c_\gamma))LF_{3,1,-1}[\tilde{\mu},m_1]+ \\
& +2m_1m_1^2s_\gamma\tilde{\mu}c_\gamma g_1^2c_2\gamma^2(g_1^2+g_2^2)LF_{3,1,0}[\tilde{\mu},m_1]-\frac{3}{2}m_1^2g_1^4LF_{3,2,-2}[\tilde{\mu},m_1](c_\gamma^2+s_\gamma^2)^2+ \\
& +\frac{1}{2}m_1^2g_1^4(-3m_1^2(c_\gamma^2+s_\gamma^2)^2-20m_1s_\gamma\tilde{\mu}c_\gamma(c_\gamma^2+s_\gamma^2)-8s_\gamma^2\tilde{\mu}^2c_\gamma^2)LF_{3,2,-1}[\tilde{\mu},m_1]- \\
& -4m_1^2g_1^4m_1^2s_\gamma^2\tilde{\mu}^2c_2^2LF_{3,2,0}[\tilde{\mu},m_1]+ \\
& +\frac{1}{3}m_1^2g_1^2(-5g_2^2+12c_2\gamma^2(g_1^2+g_2^2))(c_\gamma^2+s_\gamma^2)LF_{4,1,-2}[\tilde{\mu},m_1]+ \\
& +2m_1m_1^2s_\gamma\tilde{\mu}c_\gamma g_1^2(g_2^2-3c_2\gamma^2(g_1^2+g_2^2))LF_{4,1,-1}[\tilde{\mu},m_1]+ \\
& +m_1^2g_1^4LF_{4,2,-3}[\tilde{\mu},m_1](c_\gamma^2+s_\gamma^2)^2+ \\
& +m_1^2g_1^4(m_1^2(c_\gamma^2+s_\gamma^2)^2+8m_1s_\gamma\tilde{\mu}c_\gamma(c_\gamma^2+s_\gamma^2)+4s_\gamma^2\tilde{\mu}^2c_\gamma^2)LF_{4,2,-2}[\tilde{\mu},m_1]+ \\
& +4m_1^2g_1^4m_1^2s_\gamma^2\tilde{\mu}^2c_2^2LF_{4,2,-1}[\tilde{\mu},m_1]+ \\
& +\frac{1}{2}m_1^2g_1^2(-2g_2^2+3c_2\gamma^2(g_1^2+g_2^2))(c_\gamma^2+s_\gamma^2)LF_{5,1,-3}[\tilde{\mu},m_1]+ \\
& +\frac{4}{3}m_1^2m_1^2s_\gamma\tilde{\mu}c_\gamma g_1^2(-2g_2^2+3c_2\gamma^2(g_1^2+g_2^2))LF_{5,1,-2}[\tilde{\mu},m_1]- \\
& -\frac{9}{4}g_2^2c_2^2\gamma^2(g_1^2+g_2^2)(c_\gamma^2+s_\gamma^2)LF_{2,1,-2}[\tilde{\mu},m_2]- \\
& +\frac{3}{2}m_2\tilde{\mu}g_2^2\frac{1}{m_5^2}(g_1^2+g_2^2)(m_1^2s_4\gamma c_\gamma^2+2s_\gamma c_\gamma m_5^2c_2\gamma^2-m_1^2s_4\gamma s_\gamma^2)LF_{2,1,0}[\tilde{\mu},m_2]+ \\
& +\frac{3}{2}g_2^2c_2^2\gamma^2(g_1^2+g_2^2)(c_\gamma^2+s_\gamma^2)LF_{3,1,-2}[\tilde{\mu},m_2]+ \\
& +\frac{1}{6}g_2^2\frac{1}{m_5^2}(4m_1^2m_2^2(-8g_2^2+9c_2\gamma^2(g_1^2+g_2^2))(c_\gamma^2+s_\gamma^2)+ \\
& +9m_2^2\tilde{\mu}(g_1^2+g_2^2)(m_1^2s_4\gamma c_\gamma^2+2s_\gamma c_\gamma m_5^2c_2\gamma^2-m_1^2s_4\gamma s_\gamma^2))LF_{3,1,-1}[\tilde{\mu},m_2]+ \\
& -\frac{2}{3}m_1^2m_2s_\gamma\tilde{\mu}c_\gamma g_2^2(-8g_2^2+9c_2\gamma^2(g_1^2+g_2^2))LF_{3,1,0}[\tilde{\mu},m_2]- \\
& +\frac{1}{6}m_1^2g_2^4(69c_\gamma^4+16s_\$$