

$$\begin{aligned} & \text{LF}_{1,0}[m_1] \rightarrow m_1^2 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) \\ & \text{LF}_{1,1}[m_1] \rightarrow 1 + \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \\ & \text{LF}_{1,2}[m_1] \rightarrow \frac{1}{m_1^2} \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) \\ & \text{LF}_{2,0}[m_1] \rightarrow \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \\ & \text{LF}_{2,1}[m_1] \rightarrow -\frac{1}{m_1^2} \\ & \text{LF}_{3,-1}[m_1] \rightarrow -\frac{1}{2} + \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \\ & \text{LF}_{3,0}[m_1] \rightarrow -\frac{1}{2} \frac{1}{m_1^2} \\ & \text{LF}_{4,-1}[m_1] \rightarrow -\frac{1}{3} \frac{1}{m_1^2} \\ & \text{LF}_{5,-2}[m_1] \rightarrow -\frac{1}{4} \frac{1}{m_1^2} \\ & \text{LF}_{1,1,-1}[m_1, m_2] \rightarrow \left(m_1^4 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) - m_2^4 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_2^2} \right] \right) \right) \frac{1}{m_1^2 - m_2^2} \\ & \text{LF}_{1,1,0}[m_1, m_2] \rightarrow \left(m_1^2 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) - m_2^2 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_2^2} \right] \right) \right) \frac{1}{m_1^2 - m_2^2} \\ & \text{LF}_{2,1,-1}[m_1, m_2] \rightarrow \left(m_1^4 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] - m_1^2 m_2^2 \left(1 + 2 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) + m_2^4 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^2} \\ & \text{LF}_{2,1,0}[m_1, m_2] \rightarrow \left(-m_1^2 + m_2^2 \left(1 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^2} \\ & \text{LF}_{2,2,-2}[m_1, m_2] \rightarrow \left(m_1^6 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] - m_1^4 m_2^2 \left(2 + 3 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) - m_2^6 \text{Log} \left[\frac{\overline{x^2}}{m_2^2} \right] + m_1^2 m_2^4 \left(2 + 3 \text{Log} \left[\frac{\overline{x^2}}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^3} \\ & \text{LF}_{2,2,-1}[m_1, m_2] \rightarrow \left(-m_1^4 + m_2^4 + 2 m_1^2 m_2^2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \frac{1}{(m_1^2 - m_2^2)^3} \\ & \text{LF}_{2,2,0}[m_1, m_2] \rightarrow \left(m_1^2 \left(-2 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) + m_2^2 \left(2 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^3} \\ & \text{LF}_{3,1,-2}[m_1, m_2] \rightarrow \frac{1}{2} \left(2 m_1^4 m_2^2 \left(1 - 3 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) + m_1^6 \left(-1 + 2 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) + m_1^2 m_2^4 \left(1 + 6 \text{Log} \left[\frac{\overline{x^2}}{m_1^2} \right] \right) - 2 m_2^6 \left(1 + \text{Log} \left[\frac{\overline{x^2}}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^3} \\ & \text{LF}_{3,1,-1}[m_1, m_2] \rightarrow -\frac{1}{2} \left(m_1^4 - 4 m_1^2 m_2^2 + m_2^4 \left(3 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^3} \\ & \text{LF}_{3,1,0}[m_1, m_2] \rightarrow \frac{1}{2} \frac{1}{m_1^2} \left(m_1^4 - m_2^4 - 2 m_1^2 m_2^2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \frac{1}{(m_1^2 - m_2^2)^3} \\ & \text{LF}_{3,2,-2}[m_1, m_2] \rightarrow -\frac{1}{2} \left(m_1^6 - 6 m_1^4 m_2^2 + 2 m_2^6 + 3 m_1^2 m_2^4 \left(1 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^4} \\ & \text{LF}_{3,2,-1}[m_1, m_2] \rightarrow \frac{1}{2} \left(m_1^4 - 4 m_1^2 m_2^2 \left(-1 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) - m_2^4 \left(5 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^4} \\ & \text{LF}_{3,2,0}[m_1, m_2] \rightarrow -\frac{1}{2} \frac{m_1^2}{m_1^2} \left(m_2^4 + 4 m_1^2 m_2^2 \left(1 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) + m_1^4 \left(-5 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^4} \\ & \text{LF}_{3,3,-3}[m_1, m_2] \rightarrow \frac{1}{2} \left(-m_1^8 + 8 m_1^6 m_2^2 - 8 m_1^2 m_2^6 + m_2^8 - 12 m_1^4 m_2^4 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{3,3,-2}[m_1, m_2] \rightarrow \frac{1}{2} \left(m_1^6 - m_2^6 + 3 m_1^4 m_2^2 \left(3 - 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) - 3 m_1^2 m_2^4 \left(3 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{3,3,-1}[m_1, m_2] \rightarrow - \left(m_1^4 \left(-3 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) + 4 m_1^2 m_2^2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] + m_2^4 \left(3 + \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{3,3,0}[m_1, m_2] \rightarrow \frac{1}{2} \frac{1}{m_1^2} \frac{1}{m_2^2} \left(m_1^6 - m_2^6 + 3 m_1^4 m_2^2 \left(3 - 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) - 3 m_1^2 m_2^4 \left(3 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{4,1,-2}[m_1, m_2] \rightarrow \frac{1}{6} \left(-2 m_1^6 + 9 m_1^4 m_2^2 - 18 m_1^2 m_2^4 + m_2^6 \left(11 + 6 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^4} \\ & \text{LF}_{4,1,-1}[m_1, m_2] \rightarrow \frac{1}{6} \frac{1}{m_1^2} \left(m_1^6 - 6 m_1^4 m_2^2 + 2 m_2^6 + 3 m_1^2 m_2^4 \left(1 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^4} \\ & \text{LF}_{4,2,-3}[m_1, m_2] \rightarrow \frac{1}{3} \left(-m_1^8 + 6 m_1^6 m_2^2 - 18 m_1^4 m_2^4 + 3 m_2^8 + 2 m_1^2 m_2^6 \left(5 + 6 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{4,2,-2}[m_1, m_2] \rightarrow \frac{1}{6} \left(m_1^6 - 9 m_1^4 m_2^2 + 9 m_1^2 m_2^4 \left(-1 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) + m_2^6 \left(17 + 6 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{4,2,-1}[m_1, m_2] \rightarrow \frac{1}{3} \frac{1}{m_1^2} \left(-m_1^6 + m_2^6 + 3 m_1^4 m_2^2 \left(-3 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) + 3 m_1^2 m_2^4 \left(3 + 2 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{5,1,-3}[m_1, m_2] \rightarrow -\frac{1}{12} \left(3 m_1^8 - 16 m_1^6 m_2^2 + 36 m_1^4 m_2^4 - 48 m_1^2 m_2^6 + m_2^8 \left(25 + 12 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \right) \frac{1}{(m_1^2 - m_2^2)^5} \\ & \text{LF}_{5,1,-2}[m_1, m_2] \rightarrow \frac{1}{12} \frac{1}{m_1^2} \left(m_1^8 - 6 m_1^6 m_2^2 + 18 m_1^4 m_2^4 - 3 m_2^8 - 2 m_1^2 m_2^6 \left(5 + 6 \text{Log} \left[\frac{m_1^2}{m_2^2} \right] \right) \$$