

$$I_4^{\{D=4-2\epsilon\}}(0, m_1^2, 0, m_2^2; t, u; 0, 0, m_2^2, m_1^2)$$

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$$\begin{aligned}
& I_4^{\{D=4-2\epsilon\}}(0, m_1^2, 0, m_2^2; t, u; 0, 0, m_2^2, m_1^2) = \\
& \frac{1}{(t - m_2^2)(u - m_1^2) + (m_1^2 - m_2^2)^2} \left[-\frac{1}{\epsilon} \left[\ln \left(\frac{m_2^2 - t}{m_2^2 - m_1^2} \right) + \ln \left(\frac{m_1^2 - u}{m_1^2 - m_2^2} \right) \right] + 2 \ln \left(\frac{m_2^2 - t}{m_2 \mu} \right) \ln \left(\frac{m_1^2 - u}{m_1 \mu} \right) \right. \\
& - \ln^2 \left(\frac{m_2^2 - m_1^2}{m_2 \mu} \right) - \ln^2 \left(\frac{m_1^2 - m_2^2}{m_1 \mu} \right) - \ln^2 \left(\frac{m_1}{m_2} \right) - 2 \operatorname{Li}_2 \left(\frac{(m_1^2 - t)}{(m_2^2 - t)} \right) - 2 \operatorname{Li}_2 \left(\frac{(m_2^2 - u)}{(m_1^2 - u)} \right) \\
& - \operatorname{Li}_2 \left(1 - \frac{(m_1^2 - m_2^2)}{(m_2^2 - t)} \right) - \operatorname{Li}_2 \left(1 - \frac{(m_2^2 - m_1^2)}{(m_1^2 - u)} \right) - \operatorname{Li}_2 \left(1 - \frac{m_2^2 (m_1^2 - m_2^2)}{m_1^2 (m_2^2 - t)} \right) \\
& \left. - \operatorname{Li}_2 \left(1 - \frac{m_1^2 (m_2^2 - m_1^2)}{m_2^2 (m_1^2 - u)} \right) + 2 \operatorname{Li}_2 \left(1 - \frac{m_2^2 - m_1^2 (m_1^2 - m_2^2)}{m_1^2 - u (m_2^2 - t)} \right) \right]
\end{aligned}$$

For Li_2 etc, see the file on **notation**.

This integral has been given in Eq. (6.79) of ref [1].

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References

- [1] R. Höpker, Hadroproduction and decay of squarks and gluinos, (in german), DESY Internal report DESY-T-96-02, (**[Relevant excerpt](#)**)