

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

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This integral has been given in Eq. (6.71) of ref [1].

$$\begin{aligned} I_4^{\{D=4-2\epsilon\}}(0, 0, m_1^2, m_1^2; s, t; 0, 0, 0, m_2^2) &= \frac{1}{s(t - m_2^2)} \left(\frac{\mu^2}{m_1^2} \right)^\epsilon \\ &\left[\frac{1}{\epsilon^2} - \frac{1}{\epsilon} \left[\ln \left(\frac{s}{m_1^2} \right) + 2 \ln \left(\frac{m_2^2 - t}{m_2^2 - m_1^2} \right) \right] - 4 \operatorname{Li}_2 \left(1 + \frac{m_2^2 - m_1^2}{t - m_2^2} \right) - \frac{\pi^2}{6} - \operatorname{Li}_2 \left(1 + \frac{(m_2^2 - m_1^2)^2}{sm_2^2} \right) \right. \\ &\left. + \frac{1}{2} \ln^2 \left(\frac{s}{m_1^2} \right) - \frac{1}{2} \ln^2 \left(\frac{s}{m_2^2} \right) + 2 \ln \left(\frac{s}{m_1^2} \right) \ln \left(\frac{m_2^2 - t}{m_2^2} \right) - 2 \ln \left(\frac{m_2^2 - m_1^2}{m_1^2} \right) \ln \left(\frac{m_2^2 - m_1^2}{m_2^2} \right) \right] + \mathcal{O}(\epsilon) \end{aligned}$$

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

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References

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