

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

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This integral has been given in Eq. (6.73) of ref [1].

$$\beta = \sqrt{1 - \frac{4m_1^2}{s}}, \quad x = \frac{1 - \beta}{1 + \beta}$$

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

For Li_2 etc, see the file on [notation](#).

[Return to general page on boxes](#)

References

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