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

Page contributed by R.K. Ellis

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

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

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)