$I_4^{\{D=4-2\epsilon\}}(0,m^2,0,p_4^2;s_{12},s_{23};0,0,m^2,m^2)$

Page contributed by R.K. Ellis

Integral obtained from second formula, Eq.(A4), in ref. [1]

$$
\begin{aligned}
I_4^{\{D=4-2\epsilon\}}(0,m^2,0,p_4^2;s_{12},s_{23};0,0,m^2,m^2) &= \left(\frac{\mu^2}{m^2}\right)^{\epsilon}\frac{1}{(s_{12}-m^2)(s_{23}-m^2)} \\
\times \Bigg[\frac{1}{2}\frac{1}{\epsilon^2} - \frac{1}{\epsilon}\Bigg\{ \ln\left(1-\frac{s_{12}}{m^2}\right) &+ \ln\left(1-\frac{s_{23}}{m^2}\right) - \ln\left(1-\frac{p_4^2}{m^2}\right)\Bigg\} \\
- 2\mathrm{Li}_2\left(\frac{s_{23}-p_4^2}{s_{23}-m^2}\right) &- 2\mathrm{Li}_2\left(\frac{s_{12}-p_4^2}{s_{12}-m^2}\right) + 2\ln\left(1-\frac{s_{12}}{m^2}\right)\ln\left(1-\frac{s_{23}}{m^2}\right) \\
- \ln^2\left(1-\frac{p_4^2}{m^2}\right) &- \frac{\pi^2}{12}\Bigg] + \mathcal{O}(\epsilon)
\end{aligned}
$$

See the file on notation. Analytic continuation by the replacements $s_{ij} \to s_{ij} + i\varepsilon, p_j^2 \to p_j^2 + i\varepsilon$.

A more complicated expression for this integral is given in ref. [2] where it is called D_0^c. Return to general page on boxes

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[2] L. G. Jin, C. S. Li and J. J. Liu, Eur. Phys. J. C **30**, 77 (2003) [arXiv:hep-ph/0210362]. [arXiv:hep-ph/0211352]