

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

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

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

See the file on [notation](#). Analytic continuation by the replacements $s_{ij} \rightarrow s_{ij} + i\epsilon, p_j^2 \rightarrow p_j^2 + i\epsilon$.

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](#)

References

- [1] W. Beenakker, S. Dittmaier, M. Kramer, B. Plumper, M. Spira and P. M. Zerwas, Nucl. Phys. B **653**, 151 (2003) [[arXiv:hep-ph/0211352](#)].
- [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](#)]