Divergent Box Integral 9: $I_4^{\{D=4-2\epsilon\}}(0,p_2^2,p_3^2,m^2;s_{12},s_{23};0,0,0,m^2)$

Page contributed by R.K. Ellis

The result for this integral (see figure) is[**?**, **?**]

$$I_4^{\{D=4-2\epsilon\}}(0,p_2^2,p_3^2,m^2;s_{12},s_{23};0,0,0,m^2) = \frac{1}{s_{12}(s_{23}-m^2)}\left[\frac{1}{2\epsilon^2} - \frac{1}{\epsilon}\ln\left(\frac{s_{12}}{p_2^2}\frac{(m^2-s_{23})}{\mu m}\right)\right.$$
$$+ \left.\mathrm{Li}_2\left(1+\frac{(m^2-p_3^2)(m^2-s_{23})}{m^2 p_2^2}\right) + 2\,\mathrm{Li}_2\left(1-\frac{s_{12}}{p_2^2}\right) + \frac{\pi^2}{12} + \ln^2\left(\frac{s_{12}}{p_2^2}\frac{(m^2-s_{23})}{\mu m}\right)\right] + \mathcal{O}(\epsilon)\,.$$

See the file on notation.

References

[1] R. K. Ellis and G. Zanderighi, “Scalar one-loop integrals for QCD,” arXiv:0712.1851 [hep-ph]

[2] F. Febres Cordero, L. Reina, and D. Wackeroth (unpublished).