$$I_4^{\{D=4-2\epsilon\}}(0, p^2, 0, p^2; t, u; 0, 0, m^2, m^2)$$

Page contributed by R.K. Ellis

This integral has been given in Eq. (6.72) of ref [1]. In the region $t, u, p^2 < 0$ and $m^2 > 0$ we have,

$$I_4^{\{D=4-2\epsilon\}}(0, p^2, 0, p^2; t, u; 0, 0, m^2, m^2) = \frac{1}{[(m^2 - t)(m^2 - u) - (m^2 - p^2)^2]}$$
$$\left[\left[\frac{1}{\epsilon} - \ln\left(\frac{(m^2 - p^2)^2}{\mu^2 m^2}\right) \right] \ln\left(\frac{(m^2 - p^2)^2}{(m^2 - t)(m^2 - u)}\right) - \ln^2\left(\frac{m^2 - p^2}{m^2 - t}\right) - \ln^2\left(\frac{m^2 - p^2}{m^2 - u}\right) \right.$$
$$\left. - 4\,\mathrm{Li}_2\left(1 - \frac{m^2 - p^2}{m^2 - t}\right) - 4\,\mathrm{Li}_2\left(1 - \frac{m^2 - p^2}{m^2 - u}\right) - 2\,\mathrm{Li}_2\left(1 - \frac{(m^2 - t)(m^2 - u)}{(m^2 - p^2)^2}\right) \right] + \mathcal{O}(\epsilon)$$

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)