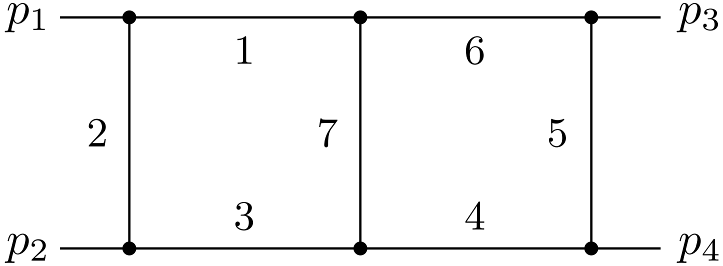
Double box with irreducible numerator $(k+p_1+p_2+p_4)^2$



$$B_2(s,t;a_1,\ldots,a_8,\epsilon) \;=\; \int\int \frac{\mathrm{d}^d k\,\mathrm{d}^d l}{(k^2)^{a_1}[(k+p_1)^2]^{a_2}[(k+p_1+p_2)^2]^{a_3}}$$
$$\times \frac{[(k+p_1+p_2+p_4)^2]^{-a_8}}{[(l+p_1+p_2)^2]^{a_4}[(l+p_1+p_2+p_4)^2]^{a_5}(l^2)^{a_6}[(k-l)^2]^{a_7}}$$

$$B_2(s,t;a_1,\ldots,a_8,\epsilon) = \int \frac{\mathrm{d}^d k\, [(k+p_1+p_2+p_4)^2]^{-a_8}}{(k^2)^{a_1}[(k+p_1)^2]^{a_2}[(k+p_1+p_2)^2]^{a_3}}$$

$$\times B_{1100}(s,(k+p_1+p_2+p_4)^2,k^2,(k+p_1+p_2)^2;a_6,a_7,a_4,a_5,d)$$

After using the threefold MB representation for B_{1100} and changing the order of integration we obtain an on-shell box integral with indices shifted by z-variables. Apply then the onefold representation for the this box.

Derivation of MB representation loop-by-loop.

AMBRE

[J. Gluza, K. Kajda & T. Riemann'07]