

The Variables:

$$\begin{pmatrix} b_1 \backslash a_1 & x_{12} & x_{13} \\ y_{12} & b_2 \backslash a_2 & x_{23} \\ y_{13} & y_{23} & b_3 \backslash a_3 \end{pmatrix}, \quad \xi_-, \alpha_-, \beta_-, \eta_-.$$

We short “ x_1 ” for either of x_{12}, x_{23} and “ x_2 ” for x_{13} . Weights are intuitive on yb and 3-complementary on ax : wt: $b \rightarrow 0, y_1 \rightarrow 1, y_2 \rightarrow 2, a \rightarrow 3, x_1 \rightarrow 2, x_2 \rightarrow 1$. Weights are 3-complementary on the dual (greek) variables.

In $m[ij \rightarrow k]$:

At $\epsilon = 0$: $\dots, \xi_1 \eta_1 b, \xi_2 \eta_2 b, \xi_1' \xi_1'' x_2, \eta_2 \xi_1 y_1, \alpha \xi_i x_i \dots$

At ϵ / ϵ^2 : $\dots, \xi_1 \eta_1 a, \xi_2 \eta_2 a, \dots$

In $\Delta[i \rightarrow jk]$:

At $\epsilon = 0$: $\dots, \eta_i b y_i, \dots$

The General Heisenberg Integrand.

$L = Q + V = Q + V_0 + V_{\geq 1}$, where

$$Q \sim - \sum_{c:(s,i,j),\alpha} x_i^\alpha \left(p_i^\alpha - T^{s\alpha} p_{i+}^\alpha + (T^{s\alpha} - 1) p_{j+}^\alpha \right) + x_j^\alpha \left(p_j^\alpha - p_{j+}^\alpha \right)$$

$$V_0 \sim p_i^{x_3} x_{(i/j)}^{x_1} + x_{(i/j)}^{x_2}$$



In trees,

