



Monday, August 24, 2015 3:10 AM

$$\mathcal{A}^V = \left\langle \begin{array}{c} \text{diagram with crossings} \\ \text{diagram with crossings} \end{array} \right\rangle \quad \text{(Also IHX) (Jacobi)}$$

$$\text{PA}^V / (\text{crossing} = 0) = \left\langle \begin{array}{c} \text{diagram 1} \\ \text{diagram 2} \end{array} \right\rangle \quad \text{Jacobi}$$

$$\text{PA}^V = \text{PA}^V / \text{co}$$

So

$$\text{PA}^V(\uparrow_s) / (\text{crossing} = 0) = \hat{R}_s \oplus M_{s \times s}(\hat{R}_s)$$

and the rest is (hard!) calculations, which lead to a simple **rational function** result.

$$\text{PA}^V / (\text{crossing} = 0) = \left\langle \begin{array}{c} \text{diagram 1} \\ \text{diagram 2} \\ \text{diagram 3} \\ \text{diagram 4} \end{array} \right\rangle$$

So with  $b_i := \text{diagram}$ ,  $c_j := \text{diagram}$ ,  $\delta_s := \text{diagram}$

$$(\text{PA}^V / 2\text{co}) / 2D \subset \hat{R}_s \oplus M_{s \times s}(\hat{R}_s) \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s$$

$$= V_s + V_s^{\otimes 2} + V_s + V_s^{\otimes 2} + V_s^{\otimes 3} + (S^2(V_s))^{\otimes 2}$$

[The product law is awful, but experience shows that things simplify....]

Stitching is clearly possible, but I still don't have explicit formulas.

Proposition The element  $R_{ij}$  given below solves the YB equation

$$R_{12} R_{13} R_{23} = R_{23} R_{13} R_{12}$$

in  $A^V / 2\text{co} / 2D$ :

$$R_{jk} = e^{j \text{---} k} e^{\rho}, \text{ with}$$

$$\rho = -\phi_2(b_j) \begin{array}{c} j \\ \text{---} \\ k \end{array}$$

$$+ \frac{\phi_2(b_j)}{b_j} \begin{array}{c} j \\ \text{---} \\ k \end{array}$$

$$+ \frac{\phi_1(b_j)\phi_2(b_k)}{b_k \phi_1(b_k)} \begin{array}{c} j \\ \text{---} \\ k \end{array}$$

$$- \frac{\phi_2(b_j)}{b_j^2} \rho \begin{array}{c} j \\ \text{---} \\ k \end{array}$$

$$- \frac{\phi_1(b_j)\phi_2(b_k)}{b_j b_k \phi_1(b_k)} \rho \begin{array}{c} j \\ \text{---} \\ k \end{array}$$

Where  $\phi_1(x) = e^{-x} - 1$

$$\text{and } \phi_2(x) = \frac{(x+2)e^{-x} - 2 + x}{2x}$$