



Monday, August 24, 2015 3:10 AM

$$AV = \left\langle \begin{array}{c} \text{diagram} \\ j \quad k \end{array} \right\rangle / \left( \begin{array}{c} \text{diagram} \\ \text{diagram} \end{array} \right) = \text{diagram} + \text{diagram} \quad (\text{Also IHX}) \\ (\text{Jacobi})$$

$$PAV / (\text{diagram} = 0) = \left\langle \begin{array}{c} \text{diagram} \\ \text{diagram} \end{array} \right\rangle \quad \text{Jacobi} \\ PAV = PAV / \text{co}$$

So

$$PAV(\uparrow_s) / (\text{diagram} = \text{diagram} - \text{diagram}) = \hat{R}_s \oplus M_{S \times S}(\hat{R}_s)$$

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

$$PAV / (\text{diagram} = 0) = \left\langle \begin{array}{c} \text{diagram} \\ \text{diagram} \\ \text{diagram} \\ \text{diagram} \end{array} \right\rangle$$

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

$$(PAV / 2\text{co}) / 2D \subset \hat{R}_s \oplus M_{S \times S}(\hat{R}_s) \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s \oplus \hat{R}_s \otimes \hat{R}_s \\ = V_s + V_s^{\otimes 2} + V_s + V_s^{\otimes 2} + V_s^{\otimes 3} + (S^2(V_s))^{\otimes 2}$$

[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  $AV / 2\text{co} / 2D$ :

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

$$\rho = -\phi_2(b_j) \left| \begin{array}{c} j \\ c \rightarrow k \end{array} \right.$$

$$+ \frac{\phi_2(b_j)}{b_j} \left| \begin{array}{c} j \\ c \rightarrow k \end{array} \right.$$

$$+ \frac{\phi_1(b_j) \phi_2(b_k)}{b_k \phi_1(b_k)} \left| \begin{array}{c} j \\ c \rightarrow k \end{array} \right.$$

$$- \frac{\phi_2(b_j)}{b_j^2} \rho \left| \begin{array}{c} j \\ c \rightarrow k \end{array} \right.$$

$$- \frac{\phi_1(b_j) \phi_2(b_k)}{b_j b_k \phi_1(b_k)} \rho \left| \begin{array}{c} j \\ c \rightarrow k \end{array} \right.$$

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

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