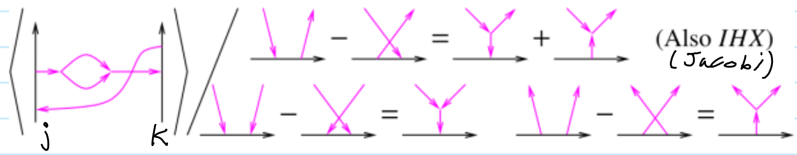
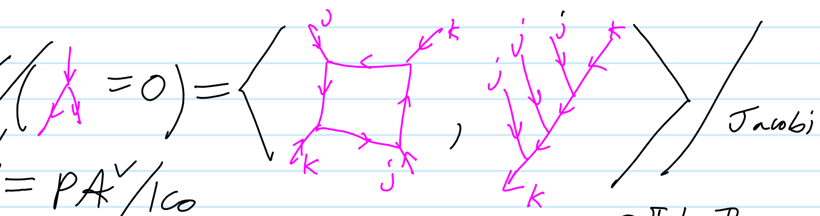
PolyPoly Extras - 160131

Dror Bar-Natan, Iowa, March 2016, http://drorbn.net/Iowa-1603

$\mathcal{A}^v = $



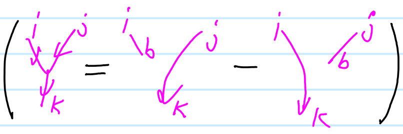
$P\mathcal{A}^v/(\ \ =0) = \langle\ \ ,\ \ \rangle/\text{Jacobi}$



$P\mathcal{A}^w = P\mathcal{A}^v/1co$

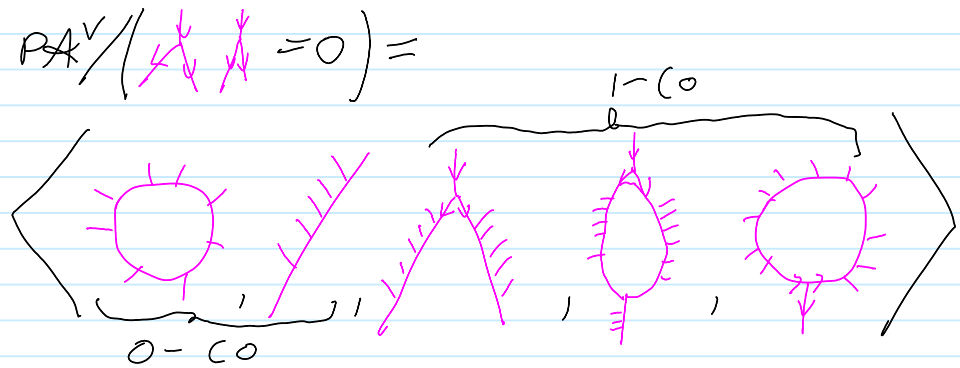
So

$P\mathcal{A}^w(\uparrow_s)/(\ \ = \ \ - \ \ ) = \widehat{R_s}\oplus M_{s\times s}(\widehat{R_s})$, $\quad \widehat{R_s} = \mathbb{Q}[\![b_i]\!]$

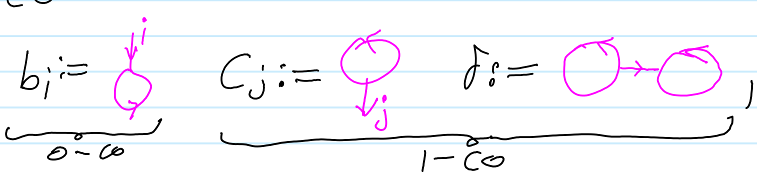


and the rest is (hard!) calculations, which lead to a simple rational-function result.

$P\mathcal{A}^v/(\ \ \ \ =0) =$



So with $b_i :=$, $c_j :=$, $\delta :=$,



$(P\mathcal{A}^v/2co)/2D \subset$

$\widehat{R_s}\oplus M_{s\times s}(\widehat{R_s})\oplus \widehat{R_s}\ \oplus \delta\widehat{R_s}\ \oplus \widehat{R_s}\ \oplus \delta\widehat{R_s}$

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

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

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

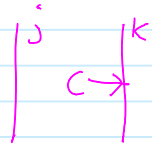
Proposition The element R_{ij} given below solves the YB equation

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

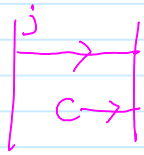
in $\mathcal{A}^v/2co/2D$:

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

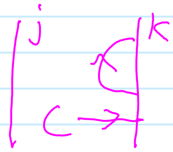
$\rho = -\phi_2(b_j)$



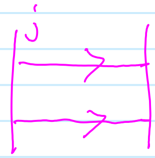
$+\dfrac{\phi_2(b_j)}{b_j}$



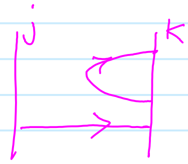
$+\dfrac{\phi_1(b_j)\phi_2(b_k)}{b_k\phi_1(b_k)}$



$-\dfrac{\phi_2(b_j)}{b_j^2}\delta$



$-\dfrac{\phi_1(b_j)\phi_2(b_k)}{b_jb_k\phi_1(b_k)}\delta$



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

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