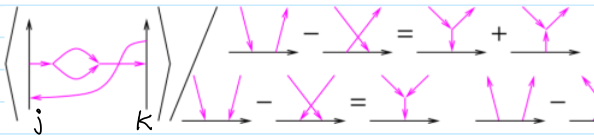
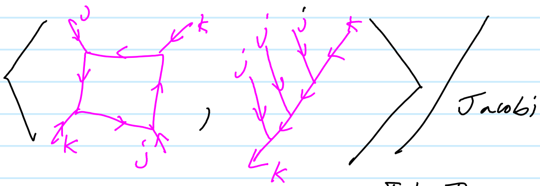
PolyPoly Extras

Dror Bar-Natan, Les Diablerets, August 2015
http://drorbn.net/LD

Monday, August 24, 2015 3:10 AM

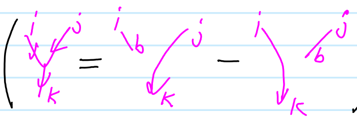
$\mathcal{A}^v =$  (Also *IHX*) (Jacobi)

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

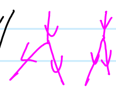
$\|$

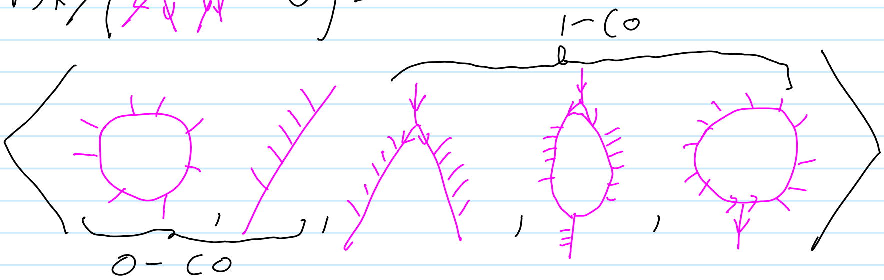
$P\mathcal{A}^w = P\mathcal{A}^v/lco$

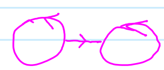
So

$P\mathcal{A}^w(\uparrow_S)/($  $) = \hat{R}_S \oplus M_{S\times S}(\hat{R}_S)$ $\quad \oplus[b_i]$

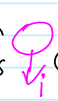
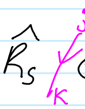
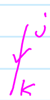
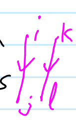
and the rest is (hard!) calculations, which lead to a simple rational-function result.

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



So with $\underbrace{b_i :=}_{0-co}$  $\underbrace{c_j :=}_{1-co}$  $\delta :=$ ,

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

$\hat{R}_S \oplus M_{S\times S}(\hat{R}_S) \oplus \hat{R}_S$  $\oplus\, \delta \hat{R}_S$  $\oplus\, \hat{R}_S$   $\oplus\, \delta \hat{R}_S$ 

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

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

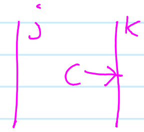
Stitching is clearly possible, but I still don't have explicit formulas.

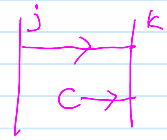
Proposition The element R_{ij} given below solves the YB equation

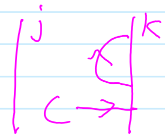
$$R_{12}R_{13}R_{23} = R_{23}R_{13}R_{12}$$

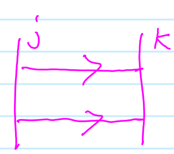
in $\mathcal{A}^v/2co/2D$:

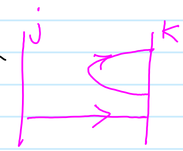
$R_{jk} = e^{j \longrightarrow k} e^{\rho}$, with

$\rho = -\phi_2(b_j)$ 

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

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

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

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

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

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

Video and more at http://www.math.toronto.edu/~drorbn/Talks/LesDiablerets-1508/