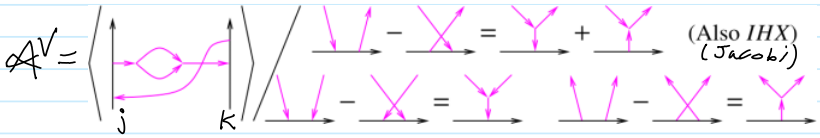
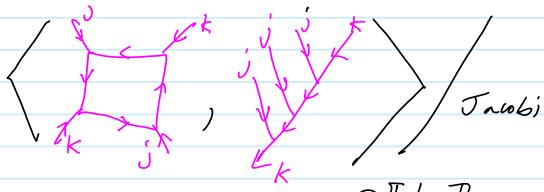
PolyPoly Extras

Monday, August 24, 2015 3:10 AM

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

$\mathcal{A}^V =$ 

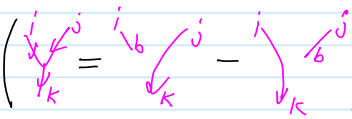
$P\mathcal{A}^V/(\ \ =0) =$ 

$\parallel$

$P\mathcal{A}^W = P\mathcal{A}^V/1co$

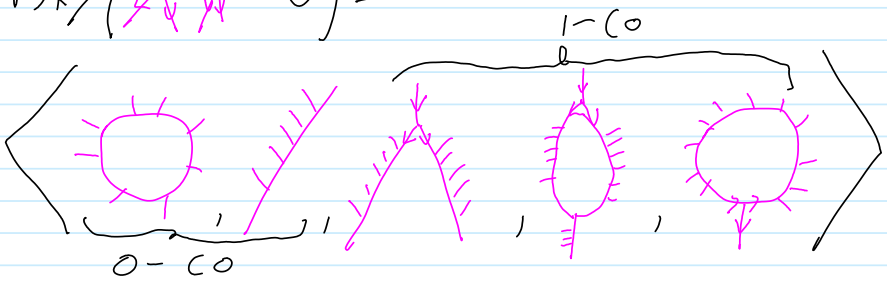
So

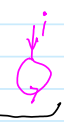
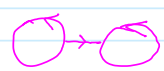
$P\mathcal{A}^W(\uparrow_s)/(\ \ =\ \ -\ \ ) = \hat{R}_s \oplus M_{s\times s}(\hat{R}_s)$, $\hat{R}_s = \otimes[\![b_i]\!]$



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

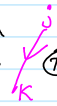
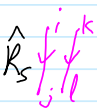
$P\mathcal{A}^V/(\ \ =0) =$



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

$\underbrace{\qquad}_{0-co}$ $\underbrace{\qquad}_{1-co}$

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

$\hat{R}_s \oplus M_{s\times s}(\hat{R}_s) \oplus \hat{R}_s$ $\oplus\, \delta\hat{R}_s$  $\oplus\, \hat{R}_s$ $\oplus\, \delta\hat{R}_s$ 

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

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

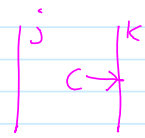
Stitching is clearly possible, but I still don't have explicit formulas.

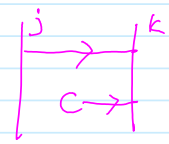
Proposition The element R_{ij} given below solves the YB equation

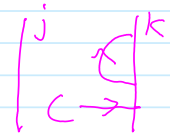
$R_{12}R_{13}R_{23} = R_{23}R_{13}R_{12}$

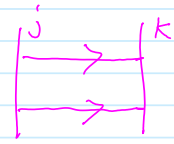
in $\mathcal{A}^V/2co/2D$:

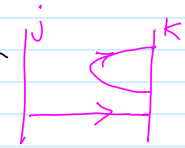
$R_{jk} = e^{j\text{---}k}e^{\rho}$, with

$\rho = -\phi_2(b_j)$ 

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

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

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

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

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/