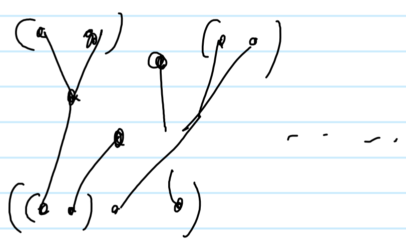
Meeting of Thursday Dec 5

December-05-13 7:18 AM

Duniv =



• = M

by pushing the vertices to the bottom, these are just braids + merging information.

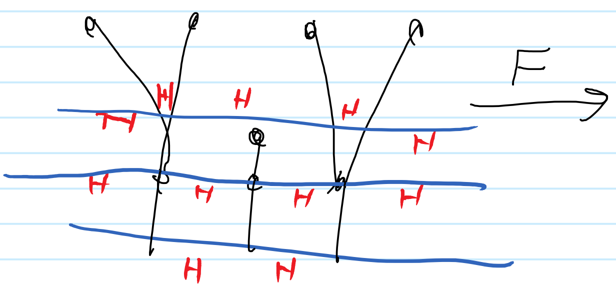
<u>Q</u> Given H a Hopf algebra in a BMC $\mathcal{C}$, does it come from our construction applied on Duniv?

$\exists ?$ $F : \mathcal{D}_{univ} \longrightarrow \mathcal{C}$ s.t. $H = F(\cdot\,\cdot)$?,

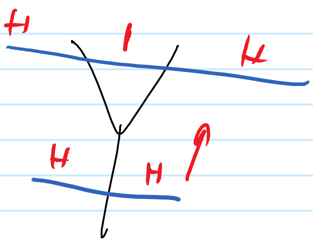
<u>Ans.</u> Take $F(\cdot^{n}) = H^{n-1}$

↑ regardless of parenthetizations.

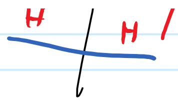
H^3

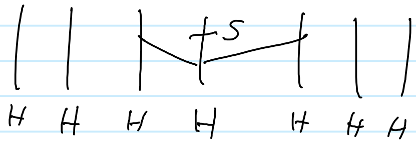


H^2

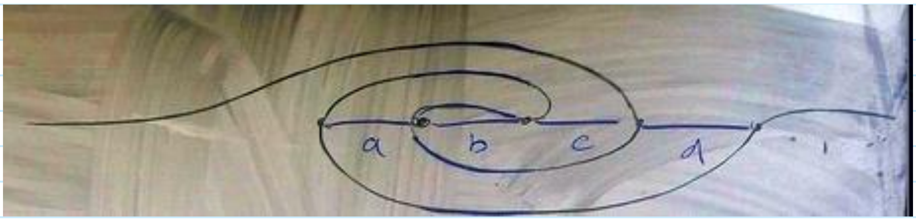


It remains to see how braids act:



$\sigma_i \longmapsto$ 

In general the Formula on the right plays.



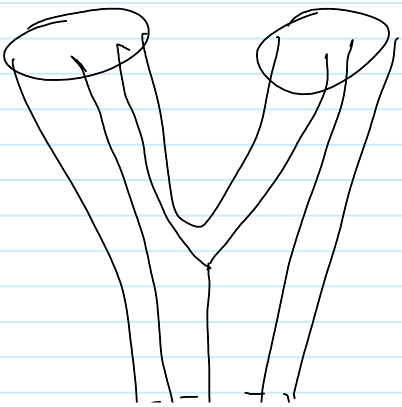
Probably makes sense also for braided H?!

$$\mathcal{C}_{univ} \quad \& \quad \begin{tikzcd} \mathcal{D}_{univ} \arrow[r, "F_{univ}"] \arrow[dr, "F"'] & \mathcal{C}_{univ} \arrow[d] \\ & \mathcal{C} \end{tikzcd}$$

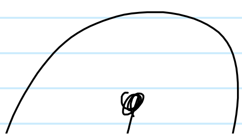
$$\mathrm{obj}(\mathcal{C}_u) = \{ [F((\cdot\cdot)\cdot)\, F(\cdot\cdot)]\, F(\cdot(\cdot\cdot)) \ldots \}$$

with "double braids" between them:

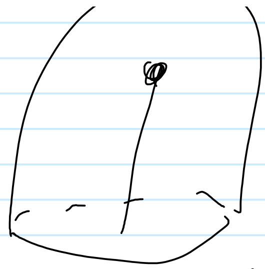
Localized to make certain things invertible:



must be made invertible

also 

also



The result is the braided/symmetric MC equivalent to the PROP of Hopf algebras

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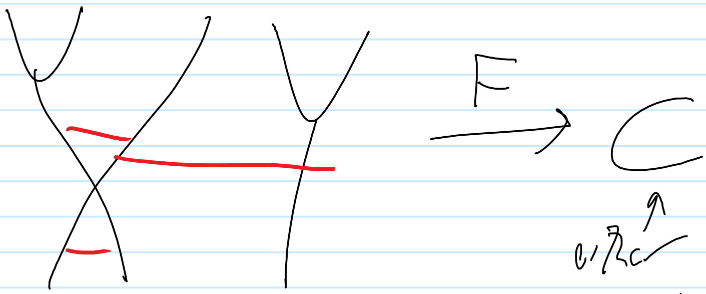
Adding infinitesimals:



either symmetric monoidal or infinitesimally braided.

Then $F(\circ\,\circ)$ is a "Hopf co-Poisson algebra"

[$H = U(g)$ is a Hopf co-Poisson algebra if g is a Lie-bi-alg by having $\delta : g \to g \otimes g$ extended to $U(g)$]