

$$\mathbb{1} \in \mathbb{N}\mathbb{K} \text{ alg}$$

$$\mathbf{\Gamma} \in \mathbb{K}\mathbb{V} \text{ Hopf alg}$$

$$\mathbf{\Gamma} \mathbf{x} \mathbb{1} \rightarrow \mathbb{1}$$

$$P \in \mathbf{\Gamma} \xrightarrow[\text{hom}]{} \mathcal{U}(\mathbb{1}) \ni \tilde{P}$$

$$\begin{array}{ccc} \bigwedge_{P \in \mathbf{\Gamma}} \mathbb{1} & \xleftarrow{\mu} & \mathbb{1} \mathbf{x} \mathbb{1} \\ \tilde{P} \downarrow & & \downarrow \tilde{\Delta} P \\ \mathbb{1} & \xleftarrow{\mu} & \mathbb{1} \mathbf{x} \mathbb{1} \end{array}$$

$$\Delta P = P_i \mathbf{x}^i P \Rightarrow \tilde{\Delta} P = \tilde{P}_i \mathbf{x}^i \tilde{P}$$

$$\tilde{P} \mathbb{1} \mathbb{1} = \underbrace{\tilde{P}_i \mathbb{1}}^i \mathbb{1} \tilde{P}$$

$$\text{LHS} = \tilde{P} \mu \mathbb{1} \mathbf{x} \mathbb{1} = \mu \underbrace{\tilde{P}_i \mathbf{x}^i \tilde{P}} \mathbb{1} \mathbf{x} \mathbb{1} = \mu \underbrace{\tilde{P}_i \mathbb{1}} \mathbf{x}^i \underbrace{\tilde{P} \mathbb{1}} = \text{RHS}$$