

$$\begin{array}{ccc}
{}^n\mathbb{H}_n^{\mathcal{U}} \times {}^n\mathbb{H}_n^{\mathcal{U}} & \xrightarrow[\text{on}]{\times} & \mathcal{U} \mid_O {}^n\mathbb{H}_n^{\mathcal{W}} \\
\uparrow \text{exp} & & \uparrow \text{exp} \\
{}^n\mathbb{H}_n^{\mathcal{W}} \times {}^n\mathbb{H}_n^{\mathcal{W}} & \xrightarrow[\text{on}]{q} & \mathcal{U} \mid_O {}^n\mathbb{H}_n^{\mathcal{W}}
\end{array}$$

$$\sqrt{\cdot} \times_A \frac{\begin{array}{c|c} \mathbb{1} & 0 \\ \hline 0 & \mathbb{1} \end{array}}{0} = \sqrt{\cdot} \times_A \begin{array}{c} \mathbb{1} \\ \hline 0 \end{array} \frac{\begin{array}{c|c} \mathbb{1} & 0 \\ \hline 0 & \mathbb{1} \end{array}}{0} A$$

$$A = \frac{1}{\sqrt{2}} \frac{\begin{array}{c|c} 1 & -1 \\ \hline 1 & 1 \end{array}}{1} \curvearrowright A \mathcal{U} \begin{array}{c} \mathbb{1} \\ \hline 0 \end{array} = -\mathcal{U} \text{ *-inv} / {}^n\mathbb{H}_n^{\mathcal{U}} \times {}^n\mathbb{H}_n^{\mathcal{U}}$$