

$$\begin{array}{c} \cdots \\ \cdots \end{array} \begin{array}{c} \text{---} \hat{\rho}_0^\dagger \\ \text{---} \hat{\rho}_1^\dagger \end{array} = \begin{array}{c} \cdots \\ \cdots \end{array} \begin{array}{c} \text{---} \text{D} \hat{\rho}_0 \\ \text{---} \text{D} \hat{\rho}_1 \end{array} \iff \text{tr}_{0,1}[(\hat{\rho}_0 \otimes \hat{\rho}_1)(\cdots)]$$