Unitary circuits

- Consider time evolution generated by two-site **unitary circuits**

$$U = \quad \text{} \qquad\qquad U^\dagger = \quad \text{}$$

E.g. $U_{n,n+1} = \exp[-ih_{n,n+1}\Delta t]$

- Unitarity can be graphically represented as

$$\sum_{ef} U_{ab,ef} U^\dagger_{ef,cd} = \sum_{ef} U^\dagger_{ab,ef} U_{ef,cd} = \delta_{ac}\delta_{bd}$$