

Complex Hadamard matrix

- A biunitary with two opposite shaded regions

$$U_{ab} = \text{diagram of a circle labeled } U \text{ with two shaded regions } a \text{ and } b$$

- Corresponds to a complex Hadamard matrix

$$U^\dagger U = U U^\dagger = q \mathbb{1} \quad \text{and} \quad |U_{ab}| = 1, \forall a, b$$

- Represents either **one-site unitary** or **two-site controlled phase**

