

$$|C_{\alpha}^{\pm}\rangle = \mathcal{N}_{\alpha}^{\pm}(|\alpha\rangle \pm |-\alpha\rangle), \quad \mathcal{N}_{\alpha}^{\pm} = \frac{1}{\sqrt{2\left(1 \pm e^{-2|\alpha|^2}\right)}}$$

$$\begin{aligned} |0_L\rangle &= |C_{\alpha}^{+}\rangle \\ |1_L\rangle &= |C_{\alpha}^{-}\rangle \end{aligned}$$

$$\hat{a}\,|C_{\alpha}^{\pm}\rangle=\alpha\,|C_{\alpha}^{\mp}\rangle$$

$$\hat{H}_s/\hbar=-K\hat{a}^{\dagger 2}\hat{a}^2+\epsilon_2\hat{a}^{\dagger 2}+\epsilon_2^*\hat{a}^2$$

$$|\pm\alpha\rangle=|\pm\sqrt{\epsilon_2/K}\rangle$$

$$\epsilon_x\hat{a}^\dagger+\epsilon_x^*\hat{a}$$

$$\hat{H}_c/\hbar=g(t)(\hat{a}_1^\dagger\otimes\hat{a}_2+\hat{a}_1\otimes\hat{a}_2^\dagger)$$

$$\sigma_x\otimes\sigma_x$$