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

$$|0_L\rangle = |C_\alpha^+\rangle$$
$$|1_L\rangle = |C_\alpha^-\rangle$$

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

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

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

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

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

$$\sigma_x \otimes \sigma_x$$