$$\mathcal{H} = \mathcal{H}_0 + \hat{\mathrm{V}}$$

$$\mathcal{H}_0 = U \cdot \sum_{l} \hat{\mathrm{n}}_{l,\uparrow} \hat{\mathrm{n}}_{l,\downarrow} + \sum_{l,\sigma} \underbrace{\left(\vec{E} \cdot \vec{r}_l \right)}_{\varepsilon_l} \hat{\mathrm{n}}_{l,\sigma}$$

$$\hat{\mathrm{V}} = -J \cdot \sum_{\langle l,m \rangle, \sigma} \left(\hat{\mathrm{h}}^{\dagger}_{l,\sigma} \hat{\mathrm{h}}_{m,\sigma} + \hat{\mathrm{h}}^{\dagger}_{m,\sigma} \hat{\mathrm{h}}_{l,\sigma} \right)$$