

$$\mathcal{S}_{\phi c} = -g \int d^2r d\tau \sum_{\alpha=1}^{N_f} \phi \left[ c_{\alpha}^{\dagger} \left\{ (\partial_x^2 - \partial_y^2) c_{\alpha} \right\} + \left\{ (\partial_x^2 - \partial_y^2) c_{\alpha}^{\dagger} \right\} c_{\alpha} \right]$$