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## 1 Exponential Parameterization

$$|\Phi_{\text{HF}}\rangle = e^{-\hat{\kappa}}|0\rangle \quad (1)$$

in which  $\hat{\kappa}$  is an anti-Hermitian operator, i.e.:

$$\hat{\kappa} = \sum_{p>q} \kappa_{pq} (E_{pq} - E_{qp}) = \sum_{p>q} \kappa_{pq} E_{pq}^- \quad (2)$$

$$\kappa^\dagger = -\kappa \quad (3)$$