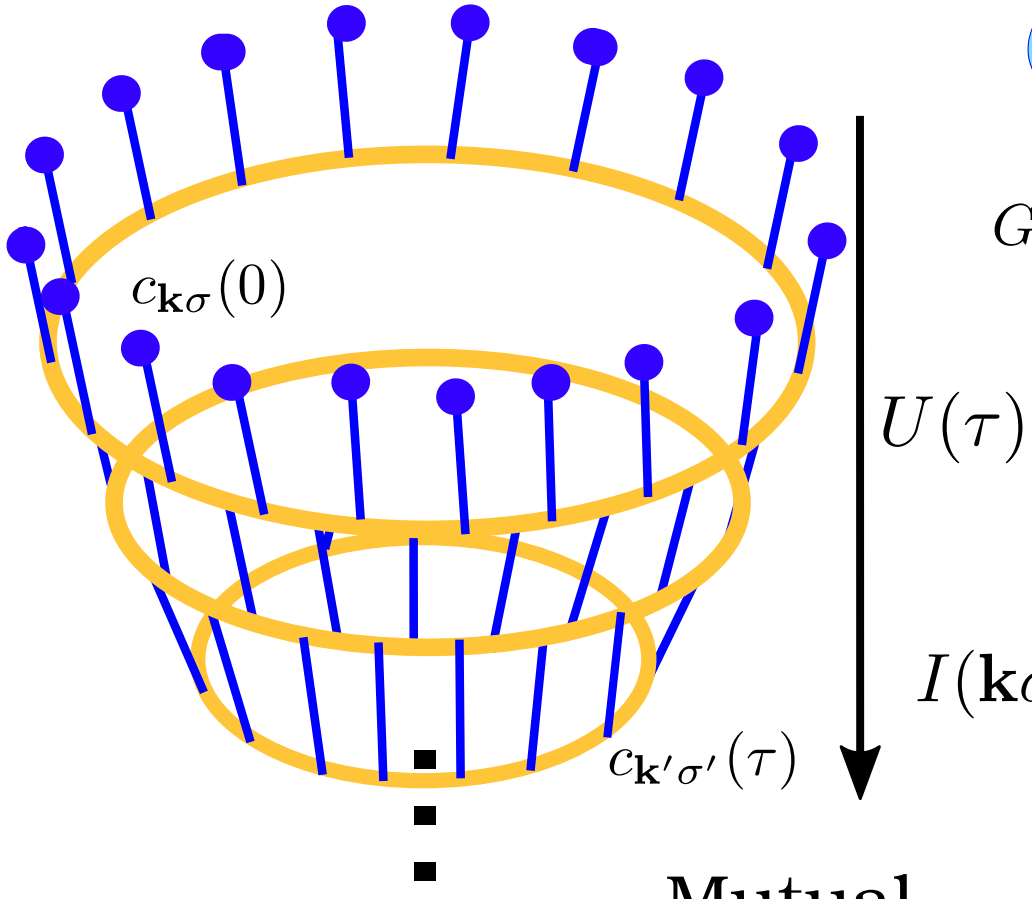
Studying EQL using TN

Properties of TN



Green Function based

$$G(\mathbf{k}\sigma,\tau;\mathbf{k}'\sigma',\tau') = \langle c_{\mathbf{k}\sigma}(\tau)c^{\dagger}_{\mathbf{k}'\sigma'}(\tau')\rangle$$

off diagonal green function

Entanglement based

$$I(\mathbf{k}\sigma:\mathbf{k}'\sigma',\tau) = S(\rho_{\mathbf{k}\sigma}) + S(\rho_{\mathbf{k}'\sigma'}) - S(\rho_{\mathbf{k}\sigma,\mathbf{k}'\sigma'})$$

Mutual Information = entangledness between pair of electron states

$$I(\mathbf{k}\sigma:\mathbf{k}'\sigma') \geq \frac{C(\hat{O}_{\mathbf{k}\sigma},\hat{O}_{\mathbf{k}'\sigma'})}{|\hat{O}_{\mathbf{k}\sigma}||\hat{O}_{\mathbf{k}'\sigma'}|}$$ Hastings 2008