Math Equations Used

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Anderson-Hubbard Hamiltonian with On-site Interactions:

$$H = \sum_{i,\sigma}(\epsilon_i - \mu)\hat{n}_{i\sigma} + t\sum_{\langle i,j\rangle,\sigma}\hat{c}^{\dagger}_{i\sigma}\hat{c}_{j\sigma} + U\sum_{i}\hat{n}_{i\uparrow}\hat{n}_{i\downarrow} \tag{1}$$

Green's Function:

$$\rho_i = \sum_{\sigma,q} \left| \left\langle \Psi_q | c^{\dagger}_{i\sigma} | \Psi_0 \right\rangle \right|^2 \delta\big(\omega - (\Omega_q - \Omega_0)\big) + \left| \langle \Psi_q | c_{i\sigma} | \Psi_0 \rangle \right|^2 \delta\big(\omega + (\Omega_q - \Omega_0)\big) \tag{2}$$

Density of states (DOS) from local density of states (LDOS):

$$\rho = \frac{1}{N}\sum_{i=1}^{N}\rho_i \tag{3}$$

Generalized inverse participation ratio (GIPR) from local density of states (LDOS):

$$I(\omega) = \frac{\sum_{i=1}^{N}\rho_i^2(\omega)}{\left[\sum_{i=1}^{N}\rho_i(\omega)\right]^2} \tag{4}$$