Hamiltonian RG flow equation

Definition of electron-hole transition operator

$$\eta_{j,l} = Tr(c^{\dagger}_{j,l} H_{j,l}) c_{j,l} \frac{1}{\hat{\omega}_{j,l} - Tr_{j,l}(H^{D}_{j,l} \hat{n}_{j,l}) \hat{n}_{j,l}}$$

off-diagonal scattering operation between e-h configuration

Quantum fluctuation operator

diag. part of H

$$\hat{\omega}_{j,l} = H^{D}_{j,l} + H^{X}_{j,l} - H^{X}_{j,l-1}$$

renormalized off diag. part of H

$$H^{D}_{j,l} = \sum_{\Lambda \hat{s}, \sigma} \epsilon^{j,l}_{\mathbf{k}_{\Lambda \hat{s}}} \hat{n}_{\mathbf{k}_{\Lambda \hat{s}}, \sigma} + \sum_{\alpha} \Gamma^{4,(j,l)}_{\alpha} \hat{n}_{\mathbf{k}\sigma} \hat{n}_{\mathbf{k}'\sigma'} + \bullet \bullet$$

Number diagonal Hamiltonian composed of
1-p self energy and higher order diagonal terms