

# simplejunction

May 20, 2018

## 1 Simple Junction: {Matsubara Formalism}

First we consider tunneling current in the textbok. First, we repeat his derivation following Mahan's Book, in **page 85, page 207 and page 789**. The Hamiltonian of the junction writes as,

$$H = H_R + H_L + H_T = H_0 + H_T$$

with the Hamiltonians for the left side,

$$H_R = \sum_{\sigma, \mathbf{k}} \xi_{\mathbf{k}} c_{\sigma, \mathbf{k}}^{\dagger} c_{\sigma, \mathbf{k}} + \sum_{\mathbf{k}} \Delta_R (c_{\mathbf{k}, \uparrow}^{\dagger} c_{-\mathbf{k}, \downarrow}^{\dagger} + c_{\mathbf{k}, \downarrow} c_{-\mathbf{k}, \uparrow})$$

In [ ]: