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## Effects of spin-orbit coupling on quantum transport

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$$\mathcal{H} = \frac{p^2}{2m} + \frac{\alpha}{\hbar} (p_y \sigma_x - p_x \sigma_y)$$

$$I_i^\sigma = \frac{e^2}{\hbar} \sum_{j, \sigma'} T_{ij}^{\sigma\sigma'} (v_i - v_j)$$

$$\langle T_{ij}^{(\mu)} \rangle = \frac{2\delta_{\mu 0}}{N_T - 1/2} (N_i N_j - \frac{1}{2} N_i \delta_{ij})$$

## Effects of Spin-Orbit Coupling on Quantum Transport

$$S(\bar{B}) =$$

$$\sigma_y S^T(-\bar{B}) \sigma_y$$

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