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【139】 Quantum transport theory in disordered interacting systems: A dynamical mean-field approach

Wednesday 6 September 2023 19:00 (15 minutes)

We introduce a non-equilibrium dynamical mean-field theory (DMFT) for studying an inhomogeneous Anderson-Hubbard lattice that contains both electron-electron interactions and chemical disorders, which are treated on an equal footing. The theory reduces to conventional DMFT in the presence of only electron interactions and to coherent potential approximation (CPA) with only disorders.

An 8-site cube is employed to benchmark our method, showing high agreement in the spectral function in both weak and strong coupling cases. A serial double quantum dot sandwiched by two leads under a step-shaped voltage bias is also studied. Our method provides a generic framework for studying quantum transport problems with both interaction and disorder degrees of freedom.

Theoretical Work

Theory

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