Non-interacting two-impurity Anderson model on a lattice at particle-hole symmetry

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Abstract:

We study the non-interacting two-impurity Anderson model on a lattice using the Green function equation-of-motion method. A case of particular interest is the RKKY limit that is characterized by a small hybridization between impurities and host electrons and the absence of a direct coupling between the impurities. In contrast to the low-density case, at half band-filling and particle-hole symmetry, the RKKY interaction decays as the inverse square of the impurity distance along the axis of a simple cubic lattice. In the RKKY limit, for the spectral function we generically observe a small splitting of the single-impurity resonance into two peaks. For a vanishing density-density correlation function of the host electrons, we find only a broadened single peak in the local density of states.

Keywords:

Impurity Scattering, RKKY Interaction

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