

CHARGE KONDO STATE IN THE (HARD CORE) BOSON-FERMION MODEL

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We study the phase diagrams and thermodynamic properties of a system of coexisting local pairs and itinerant electrons described by the (hard-core) boson-fermion model. The model considered takes into account both the intersubsystem charge exchange coupling I_0 as well as the density-density interaction V_0 . Up to now the studies of the model have been concentrated on the superconducting (SC), charge ordered (CDW) and nonordered (normal) phases. Here we will discuss the conditions of occurrence and the properties of the so called charge Kondo state (CKS). One finds that such a state can be realized in the present model if the charge exchange interaction is increased. The CKS being an analogue of the magnetic Kondo state in the systems of the periodic Kondo lattice is characterized by a compensation of a local charge moment (isospin singlet) and it can compete with the superconducting and charge orderings. Within an extended mean-field approximation a mutual stability of CDW, SC and CKS states are determined at $T = 0$ for various lattice structures in the case of half-filled fermionic and bosonic bands. The effects of increasing temperature on the properties of CKS are also discussed.

← 13.4 cm →

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9.7 cm