XV Krajowa Szkoła Nadprzewodnictwa
"Stulecie Nadprzewodnictwa"
Kazimierz Dolny, 9-13 października 2011 r.

Superconductivity and charge orderings in the system of coexisting local pairs and itinerant electrons

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We study the phase diagrams and thermodynamical properties of a system of coexisting local pairs and itinerant electrons described by the (hard-core) boson-fermion model. The considered model takes into account both the density-density interaction V_0 as well as the intersubsystem charge exchange coupling I_0. In this report we focus on the problems of mutual relations and competition between superconducting (SS) and charge density wave (CDW) orderings. The evolutions of several basic characteristics of the system as a function of interaction parameters, particle concentration and chemical potential are analysed within an extended mean-field approach (MFA-HFA). Possible stabilities of mixed (SS-CDW) orderings and the charge Kondo state are also discussed.