STRONG COUPLING APPROACH IN DYNAMICAL MEAN FIELD THEORY OF STRONGLY CORRELATED ELECTRON SYSTEMS

I.V. Stasyuk and A.M. Shvaika
Institute for Condensed Matter Physics Nat. Acad. Sci. Ukr.
1 Svientsitskii Str., UA–290011 Lviv, Ukraine

An alternative approach based on an expansion over electron hopping around the atomic limit (within the diagrammatic technique for site operators) is considered for the strongly correlated electron systems in infinite dimensions. It is shown that in the $d \to \infty$ limit all contributions can be classified by their connectivity in hopping lines and for the fermionic and bosonic Green functions only the diagrams with single site vertices connected by one or two hopping lines, respectively, survive. The possibility of the approach is demonstrated for the known exactly solvable Falicov–Kimball model and for the simplified pseudospin–electron model. Results of investigations of the dynamical susceptibilities and thermodynamics of these models are presented. Different types of ionic and pseudospin orderings as well as the phase separation are considered.

9.7 cm

13.4 cm

Subject category :

1. Correlated Electrons and High Temperature Superconductors

Presentation mode :
poster

Corresponding author :
A.M. Shvaika

Address for correspondence :
Institute for Condensed Matter Physics
1 Svientsitskii Str., UA–290011 Lviv, Ukraine

Email address :
ashv@icmp.lviv.ua