SPIN AND CHARGE FLUCTUATIONS IN THE DYNAMICAL MEAN FIELD THEORY OF STRONGLY CORRELATED ELECTRON SYSTEMS

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9.7 cm

The contribution of the local spin and charge fluctuations in the self-energy and density-of-states are considered for strongly correlated electron systems within the strong coupling analytical approach [1,2] in the Dynamical Mean Field Theory (DMFT). The Luttinger-Ward functional Φ, which includes as Hartree-Fock contributions as the self-consistent renormalization (SCR) of bosonic excitations, is constructed that allows to perform all calculations in the thermodynamically consistent way. It is shown for the Hubbard model that spin fluctuations give the main contribution close to half filling in the non-Fermi liquid regime while for small electron ($n \ll 1$) and hole ($2 - n \ll 1$) concentrations in the Fermi liquid regime the contributions from the charge fluctuations are essential.

[1] A.M. Shvaika, Phys. Rev. B **62**, 2358 (2000)
[2] A.M. Shvaika, Acta Physica Polonica B **32**, 3415 (2001)

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