



Diagram theory for the periodic anderson model: Stationarity of the thermodynamic potential

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Abstract

We develop a diagram theory for the periodic Anderson model assuming that the Coulomb repulsion of localized f electrons is the main parameter of the theory. The f electrons are strongly correlated and the c conduction electrons are uncorrelated. We determine the f -electron correlation function and the c -electron mass operator. We formulate the Dyson equation for c electrons and a Dyson-type equation for f electrons and their propagators. We define the skeleton diagrams for the correlation function and the thermodynamic functional. We establish the stationarity of the renormalized thermodynamic potential under variation of the mass operator. The obtained results are applicable to both the normal and the superconducting system states.