DYNAMICAL CPA THEORY OF MAGNETISM

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We have developed the dynamical coherent potential approximation (CPA) to the correlated electron system on the basis of the functional integral method and the harmonic approximation. The theory becomes exact in the high temperature limit, reproduces the results of the second order perturbation theory for small Coulomb interaction, and takes into account the terms to describe the strong correlation limit. The numerical calculations for the Hubbard model with the electron number $n = 1.44$ (bcc Fe) and $n = 1.80$ (fcc Ni) show up the Curie-Weiss susceptibility and the reduction of Curie temperature by a factor of two due to the dynamical effects in the case of the former, and a many-body satellite peak and a band narrowing in the density of states in the case of the latter, so that we have succeeded in describing both the finite-temperature magnetism and the many-body effects in the photoemission data on the same footing.

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