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DMFT+FLEX approach to unconventional superconductivity

MOTOHARU KITATANI, NAOTO TSUJI, HIDEO AOKI, Department of Physics, University of Toko — We propose to combine the dynamical mean field theory (DMFT) with the fluctuation exchange approximation (FLEX) to investigate strongly correlated systems and especially to obtain a phase diagram for d-wave superconductors such as the cuprates. The DMFT+FLEX method, which can also be viewed as a proposal for a new Luttinger-Ward functional, describes the momentum-dependent effective pairing interaction, so that the method can describe anisotropic pairing along with the local correlation effect that is important in Mott physics. We have applied the formalism to the two-dimensional repulsive Hubbard model to obtain superconducting transition temperature. The result does indeed exhibit a T_c-dome structure. We have traced back the origin of the dome to the local vertex correction from DMFT that gives a filling-dependent effect on the FLEX self-energy.

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