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An improved algorithm for the functional renormalization group and its application to two-dimensional Hubbard model HIROKAZU TAKASHIMA, University of Tokyo, RYOTARO ARITA, Riken, KAZUHIKO KUROKI, University of Electro-Communications, HIDEO AOKI, University of Tokyo — Among the methods that treat strongly correlated electron systems, the functional renormalization group (fRG) method has desirable a feature that it can take account of the shape of the Fermi surface with an unbiased inclusion of diagrams up to the one-loop level. Specifically, the temperature-flow functional renormalization group (T-flow fRG), proposed by Honerkamp and Salmhofer[1], can be a powerful method. We adopted the equal interval patch discretization in the Cartesian coordinates, for which we have constructed a fast and stable algorithm. This method becomes especially powerful at lower T. We also propose a way to include the Matsubara frequency in the four-point coupling and the self-energy. With the present algorithm we discuss spin, charge, and pairing susceptibilities and the spectral function at low T for the two-dimensional Hubbard model, including the effect of t' and t". [1] C. Honerkamp and M. Salmhofer, Phys. Rev. B **64**, 184516 (2001).

Hirokazu Takashima
University of Tokyo

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