

Abstract Submitted
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Electronic structure and multipolar fluctuations in URu₂Si₂ HIROAKI IKEDA, Department of Physics, Kyoto University, RYOTARO ARITA, Department of Applied Physics, University of Tokyo, TETSUYA TAKIMOTO, Asia Pacific Center for Theoretical Physics, POSTECH — The intriguing phase transition at 17.5K in URu₂Si₂ was discovered by Palstra in 1985. In spite of intensive research studies over a quarter century, the order parameter remains still unknown; so-called “hidden order” phase. Many recent experimental data indicate that the magnetic and electronic properties can be easy to understand from the viewpoint of the itinerant picture rather than the localized picture. Thus, to elucidate the complicated electronic structure will be our important first step to comprehend the nature. Recently, by using a state-of-the-art *ab initio* downfolding, we have succeeded to construct the Wannier orbitals and to obtain the tight-binding Hamiltonian in terms of these basis set. Adding on-site Coulomb interactions between f orbitals, we obtain a multi-band Anderson lattice model, including full f orbitals. We here analyze the model Hamiltonian within the random phase approximation, and investigate magnetic fluctuations and multipolar fluctuations in URu₂Si₂. From these results, we discuss possible order parameters in the “hidden order” phase.

Hiroaki Ikeda
Department of Physics, Kyoto University

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