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Quasiparticles in a Bose-Fermi mixture in optical lattice KAZUTO NODA, ROBERT PETERS, NORIO KAWAKAMI, Kyoto University, THOMAS PRUSCHKE, University of Goettingen — We investigate a mixture of interacting bosons and fermions using a generalized dynamical mean-field theory combined with the numerical renormalization group. We focus on many-body effects in the presence of the superfluidity. It is elucidated that fermionic particles are strongly renormalized by low-energy bosonic excitations via the boson-fermion interaction, giving rise to an anomalous peak structure in the density of states for fermions. We also address how the renormalization effects appear in the phases with long-range order such as a supersolid phase.

Kazuto Noda
Kyoto University

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