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Valence Instability and Mass Enhancement in an Extended Periodic Anderson Model TAKASHI SUGIBAYASHI, YASUHIRO SAIGA, DAI HIRASHIMA, Nagoya University — In $CeCu_2Si_2$, $CeCu_2Ge_2$ and $CeRh_{1-x}Ir_xIn_5$, the shape of the superconducting region is asymmetric and the superconducting transtition temperature T_c reaches its maximum far away from the antiferromagnetic quantum critical point. Onishi and Miyake ascribed the asymmetric behavior of T_c to the enhanced valence fluctuations. They introduced the repulsive interaction U_{cf} between a conduction electron and an f electron, in addition to the Coulomb interaction U between f electrons and studied the periodic Anderson model (PAM) with both U and U_{cf} (which is the so-called extended PAM). We investigated the valence instability in the extended PAM and two-fold degenerate extended PAM with the dynamical mean field theory. In these models, we found that the valence instability is observed when U_{cf} is larger than the conduction band width $2W$ and the f-electron level ϵ_f is deeper than the lower bound of the conduction band, $-W$. It is also found that the orbital degeneracy suppresses the valence instability. In the parameter region of inducing the valence instability, we investigate the mass enhancement factor Z_f^{-1} which is related to the specific heat.

Takashi Sugibayashi
Nagoya University

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