Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Real space visualization of Kondo holes in Zn-doped $CeCoIn_5$ thin films studied by STM. MASAHIRO HAZE, YOHEI TORII, YOSUKE HANAOKA, SHIGERU KASAHARA, YUICHI KASAHARA, TAKAHITO TERASHIMA, Department of Physics, Kyoto University, TETSUO HANAGURI, RIKEN, CEMS, YUJI MATSUDA, Department of Physics, Kyoto University — The effects of magnetic impurities in a metal, i.e. Kondo impurities, have been well established and extensively studied experimentally and theoretically. At low temperatures, magnetic moments of the impurities are screened by conduction electrons through the Kondo effect. On the other hand, the roles of nonmagnetic impurities in a periodic lattice consisted of f-electron atoms, i.e. Kondo holes, have been unclear, because of the lack of local measurements. However, the Kondo holes have significant attentions due to the complex many-body effects by the Coulomb interaction. Here, in order to investigate the Kondo holes, we performed measurements of scanning tunneling microscopy (STM), which can reveal the electronic structure with high energy and spatial resolution. Although it is difficult to obtain atomically flat surfaces in bulk crystals, we have successfully prepared atomically flat thin films of Zn-doped $CeCoIn_5$ by molecular beam epitaxy (MBE) and performed *in situ* STM measurements. We clearly resolved the spatial modulation of local density of states around the Kondo holes caused by the suppression of the hybridization. We also discuss quasi-particle interference patterns in Zn-doped $CeCoIn_5$.

Masahiro Haze
Department of Physics, Kyoto University

Date submitted: 11 Nov 2016 Electronic form version 1.4