Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Non-magnetic impurity effects in LiFeAs studied by STM/STS T. HANAGURI, RIKEN, SEUNG HYUN KHIM, BUM-SUNG LEE, KEE HOON KIM, Seoul National Univ., K. KITAGAWA, K. MATSUBAYASHI, Y. MAZAKI, Y. UWATOKO, M. TAKIGAWA, ISSP, Univ. Tokyo, H. TAKAGI, RIKEN/Univ. Tokyo — Detecting the possible sign reversal of the superconducting gap in iron-based superconductors is highly non-trivial. Here we use non-magnetic impurity as a sign indicator. If the sign of the superconducting gap is positive everywhere in momentum space, in-gap bound state should not be observed near the impurity site unless it is magnetic. On the other hand, if there is a sign-reversal in the gap, even non-magnetic impurity may create in-gap bound state [1]. We performed STM/STS experiments on self-flux and Sn-flux grown LiFeAs crystals and examined the effects of Sn impurity. In STM images of Sn-flux grown samples, we found a ring-like object which may represent Sn. Tunneling spectrum taken at this defect site exhibits in-gap bound state. Together with flat-bottom superconducting gap observed far from the defects, sign-reversing *s*-wave gap is the most plausible gap structure in LiFeAs. [1] T. Kariyado and M. Ogata, JPSJ **79**, 083704 (2010).

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Date submitted: 11 Nov 2011 Electronic form version 1.4