Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Influence of twin boundaries on superconducting gap nodes in FeSe single crystal studied by STM/STS T. WATASHIGE, Dept. Phys., Kyoto Univ., T. HANAGURI, Y. KOHSAKA, K. IWAYA, Y. FU, RIKEN CEMS, S. KASAHARA, D. WATANABE, Y. MIZUKAMI, T. MIKAMI, Y. KAWAMOTO, S. KURATA, T. SHIBAUCHI, Y. MATSUDA, Dept. Phys., Kyoto Univ., A.E. BÖHMER, T. WOLF, C. MEINGAST, H. V. LÖHNEYSEN, IFP, Karlsruhe Institut für Technologie — We performed scanning tunneling microscopy (STM) and spectroscopy (STS) measurements on high-quality FeSe single crystals grown by vapor transport technique [1] to examine the superconducting-gap structure. In MBE-grown FeSe thin films, based on the V-shaped tunneling spectra, nodal superconductivity is suggested [2]. It is interesting to investigate how the nodes are affected by various kinds of defects. We found that twin boundaries bring about drastic effects on the gap nodes. With approaching to the twin boundary, V-shaped spectra gradually change to U-shaped ones. Interestingly, in the area between the twin boundaries separated by about 30 nm, the gap node is completely lifted and there appears a finite gap over ± 0.4 meV. This unusual twin-boundary effect will give us a hint to elucidate the superconducting-gap structure.

[1] A. E. Böhmer *et al.,* Phys. Rev. B **87,** 180505(R) (2013).
[2] C. -L. Song *et al.,* Science **332,** 1410 (2011).

T. Watashige
Dept. Phys., Kyoto Univ.

Date submitted: 15 Nov 2013 Electronic form version 1.4