

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Interplay between magnetic impurity and superconductivity in annealed Fe_{1.05}Te_{0.75}Se_{0.25} WENZHI LIN, PANCHAPAKESAN GANESH, Oak Ridge National Laboratory, ANTHONY GIANFRANCESCO, UT/ORNL Breddesen Center, University of Tennessee, TOM BERLIJN, THOMAS MAIER, SERGEI KALILIN, BRIAN SALES, MINGHU PAN, Oak Ridge National Laboratory — By annealing Fe_{1.05}Te_{0.75}Se_{0.25} in Te vapor, we are able to recover the moment of the magnetic impurity in the bulk chalcogenide superconductor, and enhance the superconductivity in the material. Scanning tunneling microscopy/spectroscopy studies across a local magnetic impurity reveal the modification of electronic structure around the impurity on the surface of Fe_{1.05}Te_{0.75}Se_{0.25} sample after being annealed in the Te-vapor. The superconducting gap feature, normally seen on a pristine area, is suppressed around the magnetic impurity. In addition, density-functional theory calculations are carried out to identify the atomic structure, chemical composition and magnetic moment of impurity. Research was supported (WL, BCS, SVK) by Materials Sciences and Engineering Division, Basic Energy Sciences, the U.S. Department of Energy. This research was conducted (WL, MP) at the Center for Nanophase Materials Sciences, which is sponsored at Oak Ridge National Laboratory by the Scientific User Facilities Division, Office of Basic Energy Sciences, U.S. Department of Energy. Fellowship support (AG) from the UT/ORNL Breddesen Center for Interdisciplinary Research and Graduate Education.

Wenzhi Lin
Oak Ridge National Laboratory

Date submitted: 14 Nov 2013

Electronic form version 1.4