Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Impact of iron-site defects on superconductivity in LiFeAs R. ALURU, P. WAHL, University of St Andrews, S. CHI, R. LIANG, W. N. HARDY, D. A. BONN, University of British Columbia, A. KREISEL, B. M. ANDERSEN, University of Copenhagen, U. R. SINGH, Max-Planck-Institut fuer Festkoerperforschung, R. NELSON, Louisiana State University, T. BERLIJN, Oak Ridge National Laboratory, W. KU, Brookhaven National Laboratory, Shanghai Jiao Tong University, P. J. HIRSCHFELD, University of Florida — In iron-based high temperature superconductors the symmetry of the order parameter still remains a controversial topic where for the same compound sign changing and non sign-changing order parameters have been proposed theoretically. Among the iron-based superconductors, LiFeAs takes a special role (together with FeSe) by being a stoichiometric superconductor, minimizing intrinsic scattering. Here, we study engineered iron-site defects in LiFeAs by low temperature scanning tunneling microscopy and spectroscopy (STM/STS). The tunneling spectra obtained on individual defects show signatures of impurity bound states[1]. A detailed comparison of the tunneling spectra measured on impurities with theoretical simulations [2] enables us to draw conclusions about the superconducting order parameter in LiFeAs. Studying Ni, Co, Mn impurities and native defects, we find a continuous evolution from negligible impurity bound states at the smaller gap edge to detectable states as the scattering potential increases. [1] R. Aluru, et al., PRB 94, 134515 (2016) [2] A. Kreisel, et al., arXiv:1610.00619

Ramakrishna Aluru
University of St Andrews

Date submitted: 29 Nov 2016 Electronic form version 1.4