

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Conductance spectra of the Fe111 compounds in the normal and superconducting states HAMOOD ARHAM, W.K. PARK, L.H. GREENE, University of Illinois at Urbana, D.Y. CHUNG, D. BUGARIS, M.G. KANATZIDIS, Argonne National Laboratory — We use quasiparticle scattering spectroscopy (QPS), also known as point contact spectroscopy, to study Co doped NaFeAs. A conductance enhancement is observed in the normal state of NaFeAs with an onset temperature ~ 95 K. Our previous work on the electron and hole doped Fe122 compounds revealed that a conductance enhancement in the normal state is only observed for those compounds that have an in-plane resistive anisotropy. This enhancement is caused by the non-Fermi liquid behavior of these compounds due to orbital fluctuations. (Arham et al. PRB 85, 214515 (2012); Lee et al. arXiv:1110.5917). Our initial results indicate that the same conditions hold true for the Fe111 compounds as well. QPS is effective in detecting strong electron correlations (hybridization gap, Fano resonance, orbital fluctuations) in the normal state of a variety of strongly correlated electron systems that exhibit the ubiquitous ‘domed’ phase diagram. The need for some kind of a microscopic theory that explains how QPS detects strong electron correlations will be discussed. This work is supported by the Center for Emergent Superconductivity, an Energy Frontier Research Center funded by the US DOE, Office of Science, Award No. DE-AC0298CH1088.

Hamood Arham
University of Illinois at Urbana

Date submitted: 27 Nov 2012

Electronic form version 1.4