Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Effect of Excess Fe on the Conductance Spectra of Iron Chalcogenides[1] HAMOOD Z. ARHAM, C.R. HUNT, J. ZUO, W.K. PARK, L.H. GREENE, University of Illinois at Urbana-Chamapaign, Z.J. XU, J.S. WEN, Z.W. LIN, Q. LI, G. GU, Brookhaven National Laboratory — We present point contact spectroscopy measurements on single crystal $Fe_{1+y}Te_{1-x}Se_x$ using a nanometer scale gold tip, as a function of applied magnetic field, temperature, doping and contact resistance. The superconducting samples exhibit a zero bias peak that persists up to 5K above T_c while the $x = 0$ compound shows a dip at zero bias, unaffected by applied field of up to 9T. For superconducting compounds, features observed above T_c are also unaffected while superconducting features are diminished by the applied field. The sample surface is characterized by atomic force microscopy while the sample bulk is examined by x-ray diffraction, energy dispersive x-ray spectroscopy and transmission electron microscopy. Point-to-point reproducibility is limited by inhomogeneities in the crystal structure and composition.

[1]The work at UIUC is supported by NSF-DMR-0706013 and by the U.S. DOE under Award No. DE-AC02-98CH10886 (CRH) and DE-FG02-07ER46453 (WKP) and through FSMRL and CMM. The work at BNL is carried out under U.S. DOE Award No. DE-AC0298CH10886.

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Date submitted: 07 Dec 2009 Electronic form version 1.4