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Effect of multiple bands on point contact spectra in iron chalcogenide superconductors[1] CASSANDRA R. HUNT, H.Z. ARHAM, W.K. PARK, L.H. GREENE, University of Illinois at Urbana-Champaign, Z.J. XU, J.S. WEN, Z.W. LIN, Q. LI, G. GU, Brookhaven National Laboratory — We present point-contact spectroscopy (PCS) measurements on single crystal $Fe_{1+y}Te_{1-x}Se_x$ using a nanoscale Au tip contact. Analysis of PCS measurements using BTK theory[1] is well-established, and recent work[2] that extends BTK to two-band superconductors with a relative band phase may shed new light on the nature of the SC order parameter (OP) of these iron-based materials. Recent experiments suggests that they have $s_{\pm}$ symmetry, but d-wave and anisotropic s-wave OPs cannot yet be ruled out[3]. The two-band model predicts that $s_{\pm}$-wave leads to interference effects between bands that result in conductance profiles distinct from a d-wave OP. Preliminary fitting is discussed for the chalcogenides as well as the conventional multi-band s_{++}-wave superconductor, MgB_2. [1] G E Blonder, M Tinkham, T M Klapwijk, PRB **25**, 4515 (1982); [2] A A Golubov, *et al.* PRL **103**, 077003 (2009); [3] M V Sadovskii, UFN **178** 1243 (2008)

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