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Cryomagnetic Point-Contact Andreev Reflection Spectroscopy on Single Crvstal Iron-Chalcogenide Superconductors¹ Y.T. YEN, University of Toronto, RONGWEI HU, C. PETROVIC, Brookhaven National Laboratory, K.W. YEH, M.K. WU, Institute of Physics, Academia Sinica, Taiwan, J.Y.T. WEI, University of Toronto and Canadian Institute for Advanced Research — We report on cryomagnetic point-contact Andreev reflection spectroscopy performed on single crystals of superconducting $\text{FeTe}_{1-x}S_x$ and $\text{FeTe}_{1-x}Se_x$. The samples are cleaved in-situ and the measurements are carried out at temperatures down to $4.2 \mathrm{K}$ and in a field up to 9T. At base temperature and zero field, we observe a cone-shaped hump at lower voltages in the conductance spectra with no dips at zero bias and a linear background at higher voltages. The spectral evolution of gap size, zero-bias conductance, and excess spectral area are analyzed as a function of temperature and field. Further spectral analysis is carried out using theoretical models of conductance spectra in multiband superconductors [1,2] and of gap symmetry in Febased superconductors [3]. The role of interstitial iron is also considered, by comparison with atomically-resolved scanning tunneling spectroscopy data.

V. Lukic and E.J. Nicol, PRB 76, 144508 (2007) [2] A. Golubov et al., PRL 103, 077003 (2009) [3] P.J. Hirschfeld et al., RPP 74, 124508 (2011)

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