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“Proximity fingerprint” as a measure of order parameter symmetry with planar tunnel junctions grown on Fe chalcogenides HAN ZHAO, CAN ZHANG, JUAN ATKINSON, HAMOOD ARHAM, WAN KYU PARK, Univ of Illinois - Urbana, GENDA GU, Brookhaven National Laboratory, DALE VAN HARLINGEN, JAMES ECKSTEIN, LAURA GREENE, Univ of Illinois - Urbana — A fundamental question regarding the iron-based superconductors is: what is their order parameter symmetry? To answer this question, we are performing the experiment proposed by Koshelev and Stanev [1] called the “proximity fingerprint.” In this experiment, a thin film of a conventional s-wave superconductor is directly deposited onto the surface of an iron-based superconductor. Planar tunneling spectra on this layered structure are then analyzed to differentiate between the s++ and s+- symmetries. Our experiments have been performed using both Nb and Al as the s-wave proximity layer on MBE grown Fe chalcogenide thin films, and Nb on bulk single crystals. Preliminary tunneling spectra will be presented. 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.
[1]. A. E. Koshelev and V. Stanev, EPL 96, 27014 (2011).

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