

Abstract Submitted
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Point Contact Andreev Reflection Studies on Iron Pnictide Superconductors¹ XIAOHANG ZHANG, S.R. SAHA, N.P. BUTCH, K. KIRSHENBAUM, J. PAGLIONE, R.L. GREENE, I. TAKEUCHI, Center for Nanophysics and Advanced Materials (CNAM), University of Maryland, Y.-S. OH, Y. LIU, L.Q. YAN, K.-H. KIM, Seoul National University — We have systematically investigated the temperature, doping and the directional dependence of the gap structure for various types of single crystal iron pnictide superconductors by point contact Andreev reflection spectroscopy. Our studies were performed on highly transparent junctions evidenced by sharp and dramatic conductance enhancements at low temperatures. For the 122 family, despite some small features occasionally observed on the spectroscopy curves which may originate from the multiband superconductivity, a more conclusive characteristic of our obtained spectra is the presence of one predominant superconducting gap. By applying the BTK model, we find that the determined gap size scales well with the transition temperature, resulting in the $2\Delta/k_B T_C$ value of ~ 3.1 for both potassium doped and cobalt doped single crystals. Directional studies suggest that this gap is highly isotropic. Results on chalcogenide and nickel doped 122 superconductors will also be discussed. [X. H. Zhang et al., Phys. Rev. B 81, 024518 (2010)].

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