Abstract Submitted
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Point contact Andreev reflection spectroscopic (PCARS) studies on 122-type iron-based superconductors[1] XIN LU, W.K. PARK, L.H. GREENE, Physics and FSMRL, UIUC, H.Q. YUAN, Zhejiang Univ., China, G.F. CHEN, G.L. LUO, N.L. WANG, Chinese Academy of Science, China, A.S. SEFAT, M.A. MCGUIRE, R. JIN, B.C. SALES, D. MANDRUS, Oak Ridge National Lab, J. GILLETT, S.E. SEBASTIAN, Cambridge Univ., UK — PCARS is applied to investigate the superconducting gap in iron pnictide single crystal superconductors of the AFe_2As_2 (A=Ba, Sr) family with two categories of G(V) curves observed [1]: one where Andreev reflection (AR) is present for $(Ba_{0.6}K_{0.4})Fe_2As_2$ and $Ba(Fe_{0.9}Co_{0.1})_2As_2$, and the other without AR but a $V^{2/3}$ shape for $Sr_{0.6}Na_{0.4}Fe_2As_2$ and $Sr(Fe_{0.9}Co_{0.1})_2As_2$. The latter is also observed in the nonsuperconducting parent compound $BaFe_2As_2$. Mesoscopic phase-separated coexistence of magnetic and superconducting orders is considered to explain distinct behaviors. A gap size ∼3.0-4.0 meV with $2\Delta_0/k_BT_c$ ∼2.0-2.6 is observed for PCARS on $Ba_{0.6}K_{0.4}Fe_2As_2$. For the $Ba(Fe_{0.9}Co_{0.1})_2As_2$, G(V) curves typically display a zero-bias conductance peak, sometimes with a V-shape background. [1] Xin Lu *et al.,* arXiv:0910.4230

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