

Abstract Submitted
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Surface investigation of $\text{Ca}_{1-x}\text{Pr}_x\text{Fe}_2\text{As}_2$ by scanning tunneling microscopy DENNIS HUANG, ILIJA ZELJKOVIC, CAN-LI SONG, Harvard University, BING LV, CHING-WU CHU, University of Houston, JENNIFER E. HOFFMAN, Harvard University — Rare-earth-doped CaFe_2As_2 exhibits small volume-fraction superconductivity up to 49 K of unknown origin [1,2]. We use scanning tunneling microscopy to locally probe possible sources of this phase in $\text{Ca}_{1-x}\text{Pr}_x\text{Fe}_2\text{As}_2$. We encounter three kinds of surface morphologies and infer their chemical identities with local work function measurements. We also image Pr^{3+} dopants as positive-energy resonances in tunneling conductance and examine their relationship with an observed inhomogeneous spectral gap. [1] B. Lv, L. Denga, M. Goocha, F. Weia, Y. Suna, J. K. Meena, Y.-Y. Xuea, B. Lorenza, and C.-W. Chu, Proc. Nat. Acad. Sci. 108, 15705 (2011). [2] S. R. Saha, N. P. Butch, T. Drye, J. Magill, S. Ziemak, K. Kirshenbaum, P. Y. Zavalij, J. W. Lynn, and J. Paglione, Phys. Rev. B 85, 024525 (2012)

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