

Abstract Submitted  
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**Scanning Tunneling Spectroscopy and Vortex Imaging in the Iron-Pnictide Superconductor  $\text{BaFe}_{1.8}\text{Co}_{0.2}\text{As}_2$** <sup>1</sup> YI YIN, M. ZECH, T.L. WILLIAMS, Harvard University, X.F. WANG, G. WU, X.H. CHEN, University of Science and Technology of China, J.E. HOFFMAN, Harvard University — We present an atomic resolution scanning tunneling spectroscopy study of superconducting  $\text{BaFe}_{1.8}\text{Co}_{0.2}\text{As}_2$  single crystals in magnetic fields up to 9 Tesla. At zero field, a single gap with coherence peaks at  $\bar{\Delta} = 6.25$  meV is observed in the density of states. At 9 T and 6 T, we image a disordered vortex lattice, consistent with isotropic, single flux quantum vortices. Vortex locations are uncorrelated with strong scattering surface impurities, demonstrating bulk pinning. The vortex-induced sub-gap density of states fits an exponential decay from the vortex center, from which we extract a coherence length  $\xi = 27.6 \pm 2.9$  Å, corresponding to an upper critical field  $H_{c2} = 43$  T.

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