

Abstract Submitted  
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**STM investigation of nanoscale inhomogeneity in single-layer FeSe/SrTiO<sub>3</sub>**<sup>1</sup> DENNIS HUANG, Harvard University, TATIANA A. WEBB, University of British Columbia, CAN-LI SONG, Harvard University, CUI-ZU CHANG, JAGADEESH MOODERA, Massachusetts Institute of Technology, JENNIFER E. HOFFMAN, Harvard University — FeSe possesses the simplest stoichiometry within the family of iron-based high- $T_c$  superconductors. The ability to grow high quality films layer-by-layer using molecular beam epitaxy (MBE) yields opportunities to engineer high- $T_c$  superconducting heterostructures with novel behaviors. In particular, single-layer FeSe deposited on SrTiO<sub>3</sub> exhibits an order of magnitude increase in  $T_c$  from its bulk value, possibly due to strain, charge doping or enhanced electron-phonon coupling from the substrate. We use a combined scanning tunneling microscope (STM) and MBE system to examine single-layer FeSe/SrTiO<sub>3</sub> at the atomic scale. Using real-space spectroscopic imaging, we investigate the superconducting states in this material, and their perturbation by various nanoscale disorders within the FeSe film and its substrate.

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Dennis Huang  
Harvard University

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