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STM investigation of FeSe/$SrTiO_3$ band structure[1] TATIANA A. WEBB, University of British Columbia, DENNIS HUANG, CAN-LI SONG, Harvard University, CUI-ZU CHANG, JAGADEESH MOODERA, Massachusetts Institute of Technology, JENNIFER E. HOFFMAN, Harvard University — Growing a single unit cell of FeSe on a $SrTiO_3$ substrate (1 u.c. FeSe/STO) enhances the superconducting transition temperature (T_c) by an order of magnitude. While the dramatic effect of the interface is evident, a mechanism is not. ARPES studies have revealed that the band structure differs significantly from bulk FeSe and the majority of other Fe-based superconductors, most notably in lacking a hole pocket at the Fermi level. ARPES, however, is limited to probing the filled electron states. STM/STS has access to the band structure, both above and below the Fermi level, with spatial resolution, and the data encodes electronic properties including orbital character and interactions. We present an STM/STS study of 1 u.c. FeSe/STO grown by molecular beam epitaxy (MBE), focusing on the empty-state band structure of this new high T_c superconductor.

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