

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Electron-Phonon Couplings of the Interfacial Mode in FeSe Thin Films on SrTiO₃ and BaTiO₃ YAN WANG, Department of Physics and Astronomy, University of Tennessee, Knoxville, TOM BERLIJN, Oak Ridge National Laboratory, LOUK RADEMAKER, Kavli Institute for Theoretical Physics, University of California Santa Barbara, STEVE JOHNSTON, Department of Physics and Astronomy, University of Tennessee, Knoxville — Monolayers FeSe on SrTiO₃ or BaTiO₃ substrates possess highest superconducting transition temperatures in Fe-based superconductors with $T_c \sim 70$ K measured by angle-resolved photoemission spectroscopy (ARPES) and other experiments. Furthermore, the high T_c 's concur with exact replica bands in ARPES spectra. A forward scattering mechanism with small momentum transfer through the electron-phonon interaction has been proposed to explain the high T_c 's and the replica bands.[1] We apply *ab initio* techniques to study such coupling in monolayer and bilayer FeSe thin films on SrTiO₃, BaTiO₃, and oxygen-vacant SrTiO₃ substrates. Our results confirm the forward scattering nature of electron-phonon coupling of the oxygen polar mode whose energy coincides with the off-set energy of the replica bands. [1]L. Rademaker, et al., arXiv:1507.03967.

Yan Wang
Department of Physics and Astronomy, University of Tennessee, Knoxville

Date submitted: 04 Nov 2015

Electronic form version 1.4