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Impact of Strong Forward Scattering Electron-Phonon Coupling at the SrTiO₃ Interface BENJAMIN NOSARZEWSKI, EDWIN HUANG, Stanford University, BRIAN MORITZ, SLAC National Accelerator Laboratory and Stanford University, YAO WANG, Stanford University, THOMAS DEVEREAUX, SLAC National Accelerator Laboratory and Stanford University — Recent experiments have demonstrated the importance of electron-phonon coupling strongly peaked at small momentum transfer in enhancing superconductivity and providing strong band renormalizations in both monolayer FeSe films on SrTiO₃ (STO) as well as bulk STO. This coupling to the LO₄ phonon in STO also was found to be sensitive to the screening of doped carriers in the surface state, whose shallow band bottom precludes perturbative treatment of the coupling. Using microscopic models and many-body algorithms, we characterize spectra and trends of superconductivity via a doping dependence of the effective electron-phonon coupling. We discuss our results in terms of the ratio of the lattice to kinetic energy and highlight the role of screening.

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