Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Enhanced superconductivity due to forward scattering in FeSe thin films on SrTiO3 substrates STEVEN JOHNSTON, Univ of Tennessee, Knoxville, LOUK RADEMAKER, Kavli Institute for Theoretical Physics, University of California Santa Barbara, YAN WANG, Univ of Tennessee, Knoxville, TOM BERLIJN, Center for Nanophase Materials Sciences, Oak Ridge National Laboratory — We examine the consequences of an electron-phonon (*e-ph*) interaction that is strongly peaked in the forward scattering ($\mathbf{q} = 0$) direction in a two-dimensional superconductor. We find that strong forward scattering results in an enhanced Tc that is linearly proportional to the strength of the dimensionless *e-ph* coupling constant λ_m in the weak coupling limit. This is in stack contrast to the exponential dependence commonly derived in conventional BCS theory. This interaction also produces distinct replica bands in the single-particle spectral function, similar to those observed in recent angle-resolved photoemission experiments on FeSe monolayers on $SrTiO_3$ and $BaTiO_3$ substrates. By comparing our model to photoemission experiments, we infer an *e-ph* coupling strength that can provide a significant portion of the observed high T_c in these systems. [Reference: arXiv:1507.03967]

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Date submitted: 31 Oct 2015 Electronic form version 1.4