

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Dimensionality effects on superconductivity in $\text{LaAlO}_3/\text{SrTiO}_3$ nano-structures¹ ANIL ANNADI, SHICHENG LU, GUANGLEI CHENG, MICHELLE TOMCZYK, MENGCHEN HUANG, PATRICK IRVIN, University of Pittsburgh, HYUNGWOO LEE, CHANG-BEOM EOM, University of WisconsinMadison, JEREMY LEVY, University of Pittsburgh — We investigate electron transport, especially superconductivity, in $\text{LaAlO}_3/\text{SrTiO}_3$ nanostructures with respect to the dimensionality by creating channels with widths varying from nanometers to micrometers using *c*-AFM lithography. Superconducting properties such as upper critical magnetic field and critical current are compared as a function of electron doping (gating) and temperature. The superconducting properties among these devices show a marked deviation from naive scaling expectations. We discuss the results in regard to ferroelastic domains and possible edge/boundary mode transport scenarios.

¹We gratefully acknowledge financial support from following agencies and grants: AFOSR FA9550-10-1-0524 (JL, CBE), AFOSR FA9550-12-1-0057 (JL, CBE), NSF DMR-1104191 (JL), ONR N00014-15-1-2847 (JL).

Anil Annadi
University of Pittsburgh

Date submitted: 06 Nov 2015

Electronic form version 1.4