

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Electric field-tuning of the magneto-transport of superconducting LaAlO₃/SrTiO₃ interfaces STEFANO GARIGLIO, NICOLAS REYREN, ANDREA D. CAVIGLIA, CLAUDIA CANCELLIERI, DPMC, University of Geneva, TONI SCHNEIDER, Physikinstitut, University of Zurich, JEAN-MARC TRISCONI, DPMC, University of Geneva, DPMC, UNIVERSITY OF GENEVA TEAM, PHYSIKINSTITUT, UNIVERSITY OF ZURICH TEAM — LaAlO₃/SrTiO₃ interfaces display a complex phase diagram that can be explored by an electric field [1,2]. Using transport measurements in magnetic fields for different doping levels, we have characterized the superconducting phase diagram in three dimensions (temperature, electric and magnetic fields). Analyses of the anisotropy for parallel and perpendicular magnetic fields [3] reveal a two-dimensional superconducting state for all doping levels. Magneto-resistances in perpendicular fields present hallmarks of superconductor-insulator and superconductor-metal transitions depending on the doping level. We will discuss scaling analyses of the magnetic field-tuned transitions and the role of fluctuations and disorder in this two-dimensional superconductor.

[1] N. Reyren et al. Science 317, 1196 (2007).

[2] A. Caviglia et al. Nature 456, 624 (2008).

[3] N. Reyren et al. Appl. Phys. Lett. 94, 112506 (2009).

Stefano Gariglio
DPMC, University of Geneva

Date submitted: 23 Dec 2010

Electronic form version 1.4