

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Two-dimensional quantum oscillations of the conductance at the $\text{LaAlO}_3/\text{SrTiO}_3$ interface ANDREA CAVIGLIA, STEFANO GARIGLIO, NICOLAS REYREN, CLAUDIA CANCELLIERI, ALEXANDRE FETE, BENJAMIN SACEPE, DPMC University of Geneva, MARC GABAY, University of Paris, ALBERTO MORPURGO, JEAN-MARC TRISCONI, DPMC University of Geneva, DPMC UNIVERSITY OF GENEVA TEAM, LABORATOIRE DE PHYSIQUE DES SOLIDES, UNIVERSITÉ PARIS-SUD TEAM — Electronic states with unusual properties can be promoted at interfaces between complex oxides. A striking example is the interface between the band insulators LaAlO_3 and SrTiO_3 , which displays conductivity with high mobility and 2D superconductivity. We report on a study of magnetotransport in $\text{LaAlO}_3/\text{SrTiO}_3$ interfaces characterized by mobilities of the order of several thousands cm^2/Vs . We observe Shubnikov-de Haas oscillations whose period depends only on the perpendicular component of the magnetic field. This observation directly indicates that the electron gas is two-dimensional and originates from quantum confinement at the interface. From the temperature dependence of the oscillation amplitude we extract an effective carrier mass $m^* \simeq 1.45m_e$. We discuss the relevance of spin effects on the observed phenomenology.

Andrea Caviglia
DPMC University of Geneva

Date submitted: 24 Nov 2010

Electronic form version 1.4