Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Magnetically tunable 1D Coulomb drag: Experiment[1] YUHE TANG, ANTHONY TYLAN-TYLER, MICHELLE TOMCZYK, University of Pittsburgh, Pittsburgh Quantum Institute, MENGCHEN HUANG, University of California, Santa Barbara, JIANAN LI, University of Pittsburgh, Pittsburgh Quantum Institute, JUNG-WOO LEE, SANGWOO RYU, CHANG-BEOM EOM, University of Wisconsin-Madison, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh, Pittsburgh Quantum Institute — In an electronic system with two closely spaced but isolated conductors, current that is sourced in one conductor can induce a current or voltage in the second conductor. This phenomenon, known as Coulomb drag, represents a powerful approach to probe Coulomb interactions and electron correlations. Here we examine Coulomb drag in a pair of nanowires created with conductive-AFM lithography at the $LaAlO_3/SrTiO_3$ interface. Coulomb drag measurements are performed by sourcing current in one wire and measuring the induced voltage or current in the other wire. Experimental features depend strongly on magnetic field. At low magnetic fields, the wires can be superconducting, leading to large drag resistance when the wire is driven past the critical current. At high magnetic field, distinct oscillations are observed that are associated with the electron subband structure in the wires.

[1]We gratefully acknowledge financial support for this work from DOE DE-SC0014417 (JL)

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Date submitted: 11 Nov 2016 Electronic form version 1.4