## Abstract Submitted for the MAR15 Meeting of The American Physical Society

Quantized conductance through reconfigurable 1D channels<sup>1</sup> SHICHENG LU, ANIL ANNADI, GUANGLEI CHENG, MICHELLE TOMCZYK, MENGCHEN HUANG, University of Pittsburgh, HYUNGWOO LEE, SANGWOO RYU, CHANG-BEOM EOM, University of Wisconsin-Madison, PATRICK IRVIN, JEREMY LEVY, University of Pittsburgh — In recent years, a high mobility twodimensional electron gas LaAlO<sub>3</sub>/SrTiO<sub>3</sub> (LAO/STO) system has become a model system to investigate various exotic ground states of condensed matter physics. This system can co-host superconductivity, magnetism, and strong spin-orbit coupling at 2D interfaces which led to predictions of exotic phenomena such as unconventional superconductivity, helical/chiral modes, and Majorana phases in these interfaces. In order to explore these exotic phases high quality 1D devices are desirable. We demonstrate the realization of a gate tunable quantum point contact (QPC) structure embedded in a LAO/STO nanowire created using conductive AFM lithography. We observe integer quantized conductance in the units of  $e^2/h$  at high magnetic fields (B = 9 Tesla, T = 50 mK), a signature of the existence of 1D quantum channels. Significantly, we observe quantized conduction for nanowires as long as 1  $\mu$ m, implying that transport is ballistic along the magnetic-field induced chiral edge states in these devices.

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Shicheng Lu University of Pittsburgh

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