Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Spin-orbit engineering of $LaAlO_3/SrTiO_3$ nanowires[1] PATRICK IRVIN, MEGAN KIRKENDALL, JEREMY LEVY, University of Pittsburgh, SANGWOO RYO, CHANG-BEOM EOM, University of Wisconsin-Madison — $LaAlO_3/SrTiO_3$ heterostructures possess a tunable spin-orbit coupling that strongly influences other properties such as magnetism and superconductivity. Low-temperature transport experiments with nanowires created by conductive AFM show a sizeable non-zero resistance in the superconducting state. Here we present low-temperature magnetotransport of nanowires with 1D corrugations (e.g., triangular and rectangular lattices). We find that these "zig-zag" nanostructures possess a robust, fully superconducting state as compared to conventional "straight" nanowires. The most likely explanation relates to an effective spin-orbit interaction in which the effective magnetic fields of segments within the zig-zag "unit cell" cancel. We discuss implications for engineering spin-orbit couplings in superconducting nanostructures capable of supporting Majorana zero modes.

[1]We gratefully acknowledge support for this work from AFOSR (FA9550-10-1-0524, FA9550-12-1-0057, FA9550-12-1-0268, and FA9550-12-1-0342) and ONR (N00014-13-1-0806).

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Date submitted: 15 Nov 2013 Electronic form version 1.4