

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Detection of Majorana Kramers pairs using a quantum point contact¹ JIAN LI, Princeton University, WEI PAN, Sandia National Laboratories, B. ANDREI BERNEVIG, Princeton University, ROMAN LUTCHYN, Microsoft Research Station Q — We propose a setup that integrates a quantum point contact (QPC) and a Josephson junction on a quantum spin Hall sample, experimentally realizable in InAs/GaSb quantum wells. The confinement due to both the QPC and the superconductor results in a Kramers pair of Majorana zero-energy bound states when the superconducting phases in the two arms differ by an odd multiple of π across the Josephson junction. We investigate the detection of these Majorana pairs with the integrated QPC, and find a robust switching from normal to Andreev scattering across the edges due to the presence of Majorana Kramers pairs. This transport signature is expected to be exhibited in measurements of differential conductance and/or current cross-correlation at low bias.

¹This work was supported by ONR-N00014-14-1-0330.

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Date submitted: 06 Nov 2015

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