

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Measuring fermion parity correlations in 1D topological superconducting wires**<sup>1</sup> F.J. BURNELL, University of Minnesota, ALEXANDER SHNIRMAN, Karlsruhe Institute of Technology (KIT), YUVAL OREG, Weizmann Institute — Zero energy Majorana fermion states (Majoranas) can arise at the ends of a semiconducting wire in proximity with a superconductor. A first generation of experiments has detected a zero bias conductance peak in these systems that strongly suggests these Majoranas do exist; however, a definitive demonstration of the long-ranged entanglement that is crucial for potential applications in quantum computing has yet to be carried out. We will discuss a possible measurement scheme to detect this long-ranged entanglement in a wire system with two coupled pairs of Majoranas, by varying the coupling between one pair and measuring the effect this has on the state of the second pair.

<sup>1</sup>This work was supported by DFG, TAMU, ISF, EU FP7 Project SOLID, and ERC (FP7/2007-2013) 340210 grants, and the BMBF Project RUS 10/053 “Topologische Materialien für Nanoelektronik.”

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Date submitted: 15 Nov 2013

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