Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Scalable Designs for Topological Quantum Computation with Majorana Zero Modes: Part 2 Measurement[1] CHRISTINA KNAPP, Univ of California - Santa Barbara, TORSTEN KARZIG, ROMAN LUTCHYN, PARSA BONDERSON, MATTHEW HASTINGS, Station Q, Microsoft Research, CHETAN NAYAK, Univ of California - Santa Barbara; Station Q, Microsoft Research, JASON ALICEA, CalTech, KARSTEN FLENSBERG, Niels Bohr Institute; Station Q Copenhagen, STEPHAN PLUGGE, Niels Bohr Institute; Station Q Copenhagen; Dusseldorf, YUVAL OREG, Weizmann Institute of Science, CHARLES MARCUS, Niels Bohr Institute; Station Q Copenhagen, MICHAEL FREEDMAN, Station Q, Microsoft Research; Univ of California- Santa Barbara — Majorana zero modes (MZMs) provide an attractive platform for fault tolerant quantum computing by storing and manipulating quantum information non-locally. Qubits encoded in aggregates of four or more MZMs assembled into superconducting islands with significant charging energy are a promising avenue for scalable quantum computers. In such a design, quantum information can be manipulated according to a measurement-only protocol, which is facilitated by tunable couplings between MZMs and nearby semiconductor dots. In this talk, we discuss how to perform these projective MZM parity measurements and explain how these measurements allow for protected implementation of all Clifford gates.

[1]NSF GRFP DGE 1144085

Christina Knapp
Univ of California - Santa Barbara

Date submitted: 09 Nov 2016 Electronic form version 1.4