

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Floquet Majorana Fermions for Topological Qubits D.E. LIU, Duke University, A. LEVCHENKO, Michigan State University, H.U. BARANGER, Duke University — We develop an approach to realizing a topological phase transition and non-Abelian statistics with dynamically induced Floquet Majorana Fermions (FMFs). When the periodic driving potential does not break fermion parity conservation, FMFs can encode quantum information. Quasi-energy analysis shows that a stable FMF zero mode and two other satellite modes exist in a wide parameter space with large quasi-energy gaps, which prevents transitions to other Floquet states under adiabatic driving. We also show that in the asymptotic limit FMFs preserve non-Abelian statistics and, thus, behave like their equilibrium counterparts.

Harold Baranger
Duke University

Date submitted: 14 Nov 2012

Electronic form version 1.4