Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Dynamical Generation of Floquet Majorana Flat Bands in s-Wave Superconductors AMRIT POUDEL, Dartmouth College, GERARDO ORTIZ, Indiana University, Bloomington, LORENZA VIOLA, Dartmouth College — We present techniques to dynamically engineer flat bands of symmetry-protected Majorana edge modes in s-wave superconductors. Specifically, we show how time-dependent periodic control may be employed for designing time-independent effective Hamiltonians, which support Floquet Majorana flat bands, starting from topologically trivial equilibrium conditions. In the first approach, a suitably chosen modulation of the chemical potential simultaneously induces Majorana flat bands and dynamically "activates" a pre-existing chiral symmetry which is responsible for their protection. In the second approach, a desired chiral symmetry is dynamically generated by suppressing a chirality-breaking term in the static Hamiltonian. In the process, we also show how a non-equilibrium topological state of matter may be reached, that has no known equilibrium counterpart.

Amrit Poudel
Dartmouth College

Date submitted: 13 Nov 2014 Electronic form version 1.4