Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Topology of Symmetry Protected Gapless Modes in Insulators and Superconductors MASATOSHI SATO, Department of Applied Physics, Nagoya University — There has been much recent interest in topological insulators and superconductors. Whereas the recent developments are based on topological classifications using the general symmetries of time-reversal and charge conjugation, systems often have other symmetries specific to their structures such as point group symmetries . Interestingly, additional symmetries can give rise to a nontrivial topology of the bulk wave functions and gapless states on the boundaries. Although these specific symmetries are microscopically sensitive to a small disturbance, recent studies of topological crystalline insulators have shown that if the symmetries are preserved on average, then the existence of gapless boundary states is rather robust. Therefore, it is expected that the symmetry-protected topological phase can provide an alternative platform of topological materials. Here we argue symmetry protected gapless modes in topological insulators and superconductors. We consider topological objects described by non-interacting Bloch and Bogoliubov de Gennes Hamiltonians that support an additional spatial symmetry, besides any of ten classes of symmetries defined by time-reversal and charge conjugation. Varoius symmetry protected gapless modes will be discussed in a uniform manner.

Masatoshi Sato
Department of Applied Physics, Nagoya University

Date submitted: 15 Nov 2013 Electronic form version 1.4