

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Many body topological invariants in topological phases with point group symmetry KEN SHIOZAKI, HASSAN SHAPOURIAN, SHINSEI RYU, Department of Physics, University of Illinois at Urbana-Champaign — A way to detect topological phases from a given short-range entangled state is discussed. Many body topological invariants are defined as partition functions of topological quantum field theory (TQFT) on space-time manifolds, for example, real projective spaces. It is expected that by translating TQFT partition functions to the operator formalism one can get a definition of many body topological invariants made from ground state wave functions and symmetry operations. We propose that a kind of non-local operator, the "partial point group transformation", on a short-range entangled state is a unified measure to detect topologically nontrivial phases with point group symmetry. In this talk, I introduce (i) the partial rotations on (2+1)d chiral superconductors, and (ii) the Z_{16} invariant from the partial inversion on (3+1)d superconductors. These partial point group transformations can be analytically calculated from the boundary theory. We confirmed that analytical results from the boundary theory match with direct numerical calculations on bulk.

Ken Shiozaki
Department of Physics, University of Illinois at Urbana-Champaign

Date submitted: 10 Nov 2016

Electronic form version 1.4