MAR13-2012-000400

Abstract for an Invited Paper for the MAR13 Meeting of the American Physical Society

Majorana Bound States and Disclinations in Topological Crystalline Superconductors¹ JEFFREY TEO, University of Illinois at Urbana-Champaign

We prove a topological criterion for the existence of zero-energy Majorana bound-state on a disclination, a rotation symmetry breaking point defect, in topological crystalline superconductors (TCS). We first establish a complete topological classification of TCS using the Chern invariant and a few integral rotation invariants. By analytically and numerically studying disclinations, we algebraically deduce a Z_2 -index that identifies the parity of the number of Majorana zero-modes at a disclination. Surprisingly, we also find weakly-protected Majorana fermions bound at the corners of superconductors with trivial Chern and weak invariants.

¹Simons Fellowship