

Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Equivalence of topological insulators and superconductors GERARDO ORTIZ, Indiana Univ - Bloomington, EMILIO COBANERA, Dartmouth College — Systems of free fermions are classified by symmetry, space dimensionality, and topological properties described by K-homology. We show that by taking a many-body/Fock space viewpoint it becomes possible to establish equivalences of topological insulators and superconductors in terms of duality transformations [1]. These mappings connect topologically inequivalent systems of fermions, jumping across entries in existent classification tables, because of the phenomenon of symmetry transmutation by which a symmetry and its dual partner have identical algebraic properties but very different physical interpretations and electromagnetic response. Since our analysis extends to interacting fermion systems we also briefly discuss some such applications. To illustrate main concepts we will present dual superconducting partners of paradigmatic models, such as the Haldane Chern insulator as well as a quantum spin Hall effect graphene model. [1] Phys. Rev. B 92, 155125 (2015).

Gerardo Ortiz
Indiana Univ - Bloomington

Date submitted: 04 Nov 2015

Electronic form version 1.4