

Abstract Submitted
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Time Reversal Invariant Topological Superconductors and Majorana Pairs FAN ZHANG, EUGENE MELE, CHARLES KANE, Department of Physics and Astronomy, University of Pennsylvania, Philadelphia, PA 19104 — We propose a feasible route to engineer two dimensional (2D) and one dimensional (1D) time reversal invariant topological superconductors via proximity effects. At a boundary of the 2D (1D) topological superconductor, a time reversal pair of Majorana edge (bound) states emerge as the localized midgap states. We analyze how the Majorana pair evolves in the presence of a Zeeman field, as the superconductor undergoes the symmetry class change as well as the topological phase transitions. A fractional Josephson effect with time reversal symmetry occurs in the presence of a mirror symmetry, realizing a topological crystalline superconducting state. We also briefly discuss the possible realization in materials and the unique signature in experiments.

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