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Partial symmetry transformation to compute topological invariants of interacting fermionic SPTs HASSAN SHAPOURIAN, KEN SHIOZAKI, SHINSEI RYU, University of Illinois at Urbana-Champaign — We present an approach to define and compute topological invariants of interacting fermionic symmetry-protected topological (SPT) phases, protected by an orientation-reversing symmetry, such as time-reversal or reflection symmetry. The topological invariants are given by partition functions on unoriented spacetime manifolds which as we show, can be computed for a given ground state wave function by considering a non-local operation, “partial” time-reversal or reflection. As an application of our scheme, we study the Z_8 and Z_{16} classification of topological superconductors in one and three dimensions. Finally, we make a bridge between partial time-reversal transformation and the entanglement negativity in fermionic systems.

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