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Topological invariants for nonsymmorphic symmetries ZHIJUN WANG, Princeton University, A.. ALEXANDRADINATA, Yale University, BARRY BRADLEY, JENNIFER CANO, Princeton University, BENJAMIN J. WIEDER, University of Pennsylvania, B. ANDREI BERNEVIG, Princeton University — Topological insulators with time reversal symmetry are known to fall into a Z_2 classification. With additional nonsymmorphic symmetry, topological phases can be extended into a more detailed classification, which can be characterized by a Z_4 invariant first defined in K theory in Shiozaki's paper [PRB93,195413]. In our work, we reformulate the $Z_4 \times Z_2$ invariant with the non-Abelian Wilson loop for the insulating systems preserving time reversal and a glide symmetry. Furthermore, we also extend the classification to the time-reversal-invariant systems with two glide symmetries. A lot of materials have been proposed to realize the distinct topological phases as well.

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