Abstract Submitted
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Topological crystalline insulators and superconductors with order-two nonsymmorphic symmetry KEN SHIOZAKI, Department of Physics, University of Illinois at Urbana Champaign, MASATOSHI SATO, Yukawa Institute for Theoretical Physics, Kyoto University, KIYONORI GOMI, Department of Mathematical Sciences, Shinshu University — Topological crystalline insulators (TCIs) and topological crystalline superconductors (TCSCs) are symmetry protected topological phases of free fermions with space group symmetry. Like conventional topological insulators and superconductors, TCIs and TCSCs support stable gapless boundary states associated with bulk topological nontriviality, when the additional symmetry is compatible with the boundary. Using the twisted equivariant K-theory, we complete the classification of TCIs and TCSCs in the presence of additional order-two nonsymmorphic space group (NSG) symmetry, which includes half lattice translation with Z_2 spin flip, glide, two-fold screw rotation, and their magnetic symmetries. From isomorphisms connecting different space dimensions, the K-groups are evaluated by those in one-dimension. The resultant topological table shows several interesting features: (1) The NSGs allow various Z_2 topological phases, even in the absence of time-reversal and/or particle-hole symmetries. Their boundary states are detached from the bulk spectrum in the direction of the non-primitive lattice translation. (2) Z_4 phases are found to be realized. Especially, the TCI with the glide and the time-reversal symmetry in three-dimensions shows the Z_4 phase.

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