

Abstract Submitted
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Topological semimetals with Riemann surface states¹ CHEN FANG, Institute of Physics, Chinese Academy of Sciences, LING LU, JUNWEI LIU, LIANG FU, Massachusetts Inst of Tech-MIT — Topological semimetals have robust bulk band crossings between the conduction and the valence bands. Among them, Weyl semimetals are so far the only class having topologically protected signatures on the surface known as the “Fermi arcs”. Here we theoretically find new classes of topological semimetals protected by nonsymmorphic glide reflection symmetries. On a symmetric surface, there are multiple Fermi arcs protected by nontrivial Z_2 spectral flows between two high-symmetry lines (or two segments of one line) in the surface Brillouin zone. We observe that so far topological semimetals with protected Fermi arcs have surface dispersions that can be mapped to noncompact Riemann surfaces representing simple holomorphic functions. We propose perovskite superlattice $[(\text{SrIrO}_3)_{2m}, (\text{CaIrO}_3)_{2n}]$ as a nonsymmorphic Dirac semimetal.

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