

Abstract Submitted
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Topological Bloch oscillations JUDITH HOELLER, ARIS ALEXANDRADINATA, Yale University, Physics Department — We propose a new way to characterize topological crystalline insulators without robust surface signatures. A topological insulator in an electric field is characterized by a recurrence time which is an integer multiple of the usual Bloch period. This same integer is a topological invariant protected by crystal symmetries, and divides n for n -fold rotationally-symmetric crystals. We explain the origin of topological Bloch oscillations from two dual perspectives: from symmetric parallel transport of Bloch states in the Brillouin zone, and from Wannier functions which are fixed to Wyckoff positions. By considering deformations of energy bands, we estimate how long topological Bloch oscillations survive.

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