

Abstract Submitted
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Bloch points are sticky¹ OLEG TCHERNYSHYOV, SE KWON KIM,
Johns Hopkins University — Bloch points are zero-dimensional topological defects in three-dimensional ferromagnets. A representative magnetic configuration is a hedgehog with magnetization pointing away from a center. The singular nature of a Bloch point's core leads to interesting and observable consequences [1]. A simple argument based on dimensional analysis shows that a magnetic lattice creates a periodic potential that can pin a Bloch point even if the lattice has no defects. The pinning force is of the order of the micromagnetic exchange constant, a few piconewtons in a typical ferromagnet. A domain wall in a cylindrical ferromagnetic wire with the diameter of a few tens of nanometers may contain a Bloch point. Such a domain wall will have a sizable depinning field, tens of oersteds. A Bloch point moving through an atomic lattice should emit electromagnetic waves at the frequency of a few hundred gigahertz.

[1] S. K. Kim and O. Tchernyshyov, Phys. Rev. B **88**, 174402 (2013).

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