

Abstract Submitted
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Zeno Hall effect ZONGPING GONG, SHO HIGASHIKAWA, Univ of Tokyo, MASAHITO UEDA, Univ of Tokyo, RIKEN — The quantum Zeno effect and the Hall effect are two seemingly unrelated fundamental physical phenomena, yet we find that the former can give rise to the latter by tailoring the Hilbert space of a two-dimensional lattice system into a single Bloch band with a nonzero Berry curvature. Consequently, a wave packet undergoes transverse motion in response to a potential gradient. We call such a phenomenon the Zeno Hall effect to be distinguished from other Hall effects in the quantum Zeno origin. Our findings provide a general protocol to engineer flat bands. We also propose an experimental implementation with cold atoms in an optical lattice.

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