Topological Transition Of Dirac Points In A Microwave

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Topological Transition Of Dirac Points

Dirac point movement can lead to a topological transition from semimetal to semiconductor when two inequivalent

Dirac points merge, an idea that has attracted significant research interest. However, such movement normally requires unrealistically high lattice anisotropy.

Dirac point movement and topological phase transition in ...

a topological transition b etween a

phase with a point-like band gap characteristic of massless Dirac fermions and a gapped phase. By applying a controlled anisotropy on the structure, we in...

(PDF) Topological Transition of Dirac Points in a ...

a topological transition between a phase

with a point-like band gap characteristic of massless Dirac fermions and a gapped phase. By applying a controlled anisotropy on the structure, we investigate the transition directly via density of states measurements.

Topological transition of Dirac points in a microwave ...

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Topological Transition of Dirac

Points in a Microwave ...

hoppings. With increasing asymmetry between the hoppings the Dirac points approach each other. At a critical asymmetry the Dirac points merge to open an energy gap, thus changing the topology of the eigenspectrum. We analyze the trajectory of the Dirac points and study the density of states in the

different phases.

Dirac-point engineering and topological phase transitions ...
the Dirac points can be controlled by the amplitude and the polarization of the field for high-frequency drivings, providing a new platform to achieve their merging, a topological transition

which has not been observed yet in

Merging of Dirac points and Floquet topological ...

Plexcitons are polaritonic modes that result from the strong coupling between excitons and plasmons. We consider plexcitons emerging from the interaction of excitons in an organic molecular layer

with surface plasmons in a metallic film. We predict the emergence of Dirac cones in the two-dimensional bandstructure of plexcitons due to the inherent alignment of the excitonic transitions in the ...

Plexcitons: Dirac points and topological modes

Plexciton Dirac points. The setup of interest is depicted in Fig. 1.It consists of three layers: a plasmonic metal modelled with a Drude permittivity , with constants , ω P =8.8 eV, which are representative parameters for Ag), an a=80 nm thick dielectric spacer and an organic layer ().The spacer is placed to avoid quenching of organic excitons by

single-particle excitations in the metal upon ...

Plexciton Dirac points and topological modes

Our observation of the spin-polarized Dirac surface states in the inverted Pb 1− x Sn x Te and their absence in the non-inverted compounds related via a

topological phase transition provide the...

Observation of a topological crystalline insulator phase ...

Here we show that NiTe2 hosts both bulk Type-II Dirac points and topological surface states. The underlying mechanism is shared with other TMDs

and based on the generic topological character of ...

Fermi-crossing Type-II Dirac fermions and topological ...

By means of a microwave tight-binding analogue experiment of a graphenelike lattice, we observe a topological transition between a phase with a

pointlike band gap characteristic of massless Dirac fermions and a gapped phase.

Topological Transition of Dirac Points in a Microwave ...

Dirac cones, named after Paul Dirac, are features that occur in some electronic band structures that describe unusual

electron transport properties of materials like graphene and topological insulators. In these materials, at energies near the Fermi level, the valence band and conduction band take the shape of the upper and lower halves of a conical surface, meeting at what are called Dirac points.

Dirac cone - Wikipedia

At the Lifshitz transition the vacuum is gapless with the Dirac point in the fermionic spectrum which has topological charge N 3 = 0. The typical Lifshitz transition, which involves the Weyl nodes in the fermionic spectrum, describes the formation of the Weyl points with opposite charges N 3 = ±1

from the fully gapped state.

Exotic Lifshitz transitions in topological materials ...

Dirac point, the cornerstone of topological insulators, has been attracting ever-increasing attention due to its extraordinary properties. In this pap...

Customizing acoustic Dirac cones and topological ...

Dirac point movement can lead to a topological transition from semimetal to semiconductor when two inequivalent Dirac points merge, an idea that has attracted significant research interest. However, such movement normally

requires unrealistically high lattice anisotropy.

Dirac point movement and topological phase transition in ...

Topological phase transitions happen when the band gap closes. It is not true that all band crossings are topological. There are Dirac (linear) band crossings,

quadratic band crossings, Dirac-like triply degenerate band crossings, double Dirac cone crossings, semi-Dirac transitions (linear in one direction and quadratic in another) etc.

Do topological transitions only occur at Dirac points?

types of Dirac surface states arising

from different terminations on the cleavage surfaces, one of which has insulating behavior with an energy gap of ~ 28 meV at the Dirac point. These outstanding features suggest that MnBi6Te10 is a promising system to realize various topological quantum effects at zero field and high temperature.

Magnetic topological insulator MnBi6Te10 with zero-field ...

Therefore, a 3D Dirac semimetal exists at the transition between a topological and a normal insulator phase , . It is robust only when protected by an additional space-group symmetry , , , , , , . Fig. 10(c) shows the Dirac point for a

massless Dirac equation. In most cases, however, the Dirac semimetal only acts as a parent state of a 3D topological insulator — it turns into either a 3D strong topological insulator or a 3D topological crystalline insulator where the Dirac point acquires a ...

Topological carbon materials: A new

perspective ...

Dirac's monopole solution in fact describes an infinitesimal line solenoid ending at a point, and the location of the solenoid is the singular part of the solution, the Dirac string. Dirac strings link monopoles and antimonopoles of opposite magnetic charge, although in Dirac's version, the string just goes off to

infinity.

Magnetic monopole - Wikipedia

The search for artificial structure with tunable topological properties is an interesting research direction of today’s topological physics. Here, we introduce a scheme to realize topological nodal states with a three-dimensional periodic

inductor-capacitor (LC) circuit lattice, where the topological nodal line state and Weyl state can be achieved by tuning the parameters of inductors and ...

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