

SEMINARIO

"Topological semimetals in external fields"

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Topological materials have become a primary target of research in the last few years due to their exceptional properties with high potential for applications. In three dimensions we have the last additions to the family of topological materials, which include Dirac and Weyl semimetals with isolated Dirac or Weyl nodes in the band structure, and the nodal-line semimetals with a continuous line of nodes in the Brillouin zone. The surface states corresponding to these topological semimetals lie on constant energy contours which do not form closed curves. We study the properties of topological semimetals in external electric and magnetic fields. First, we investigate the topological protection of surface states in Weyl, Dirac, and nodal-line semimetals by characterizing them as evanescent states when the band structure is extended to complex momenta. These results can be used in the description of the response to external electric and magnetic fields, including the effect of polarized light and the Hall effect.

- [1] J. González, R.A. Molina, Phys. Rev. Lett. 116, 156803 (2016).
- [2] J. González, R.A. Molina, Phys. Rev. B 96, 045437 (2017).
- [3] R.A. Molina, J. González, Phys. Rev. Lett. 120, 146601 (2018).
- [4] E. Benito-Matías, R.A. Molina, Phys. Rev. B 99, 075304 (2019).
- [5] Y. Baba, A. Díaz-Fernández, E. Díaz, F. Domínguez-Adame, R.A. Molina, Phys. Rev. B 100, 165105 (2019).
- [6] E. Benito-Matías, R.A. Molina, J. González, Phys. Rev. B 101, 085420 (2020).

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