

Quantum Hall and Light Responses in a 2D Topological Semimetal

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We investigate the topological characteristics of a recently discovered class of semimetals in two dimensions on the honeycomb lattice. These semimetals reside at the transition between two distinct topological insulators, each existing in a nontrivial topological phase. As a result, these semimetals exhibit specific topological properties, including the presence of edge modes. In a preceding work [1], we demonstrated the topological robustness of this semimetal phase against disorder and interactions. In this work [2], we delve deeper into the semimetal's.

References

- [1] Karyn Le Hur and Sariah Al Saati. Topological nodal ring semimetal in graphene. *Physical Review B*, 107(16) (2023).
- [2] Sariah Al Saati and Karyn Le Hur. Quantum hall and light responses in a 2d topological semimetal, arXiv:2311.13922 (2023).

Figures

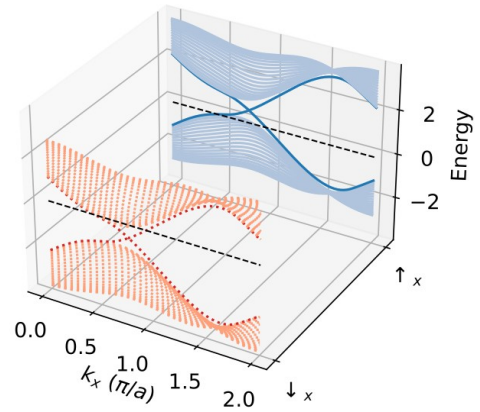


Figure 1: One-dimensional energy bands of the topological semimetal showing the two underlying band structures of opposite spin polarization, with the spin polarization shown in the third direction.

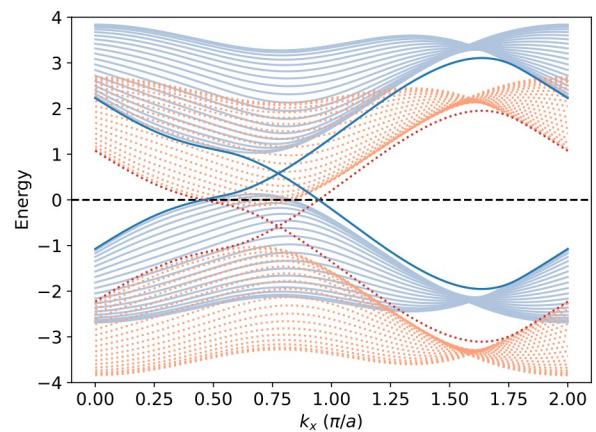


Figure 2: Resulting energy bands in the momentum-Energy axis.