Tunable interface states between Floquet-Weyl semimetals

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Abstract

Weyl semimetals and nodal line semimetals are characterized by linear electronic bands touching at zero-dimensional points and one-dimensional lines, respectively. Recently, it has been predicted that nodal line semimetals can be driven into tunable Floquet-Weyl semimetals by circularly polarized light. Here, we study the occurrence of interface states between two regions of a nodal line semimetal shined by two beams of light with opposite circular polarizations. Within a minimal model, we find remarkable modifications of the energy structure by tuning the polarized light, such as the possible generation of van Hove singularities. Moreover, by adding a δ -doping of magnetic impurities along the interfacial plane, we show the occurrence of a switchable and topologically non-trivial, vortex-like pseudo-spin pattern of the interface states.

References

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