
Absence of embedded boundstates in semi-Dirac semi-metals

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Abstract

Semi-Dirac semi-metals are recently constructed nanostructures, which behave like both conventional zero-gap semiconductors and materials of graphene type in a sense. These nanostructures have been extensively studied in physics literature, however, the rigorous theory is missing.

In the pioneering work [1], Krejčířík and Antunes analyse the spectral stability properties under small perturbations, notably sufficient conditions of absence/existence of discrete eigenvalues.

The main objective of this talk is to formulate sufficient conditions of absence of eigenvalues embedded in the essential spectrum. The first approach is in the spirit of the virial theorem. The other approach is the method of multipliers, which is more robust and also allows generalisation to the non-self-adjoint model.

References

- [1] D. Krejčířík and P. R. S. Antunes (2020) Bound states in semi-Dirac semi-metals, *Phys. Lett. A* **386**, 126991.