

Weyl Geometry in Weyl Semimetals

Friday, January 24, 2025 3:10 PM (25 minutes)

A novel oscillatory behaviour of the DC conductivity in Weyl semimetals with vacancies has recently been identified [1], occurring in the absence of external magnetic fields. Here, we argue that this effect has a geometric interpretation in terms of a magnetic-like field induced by an emergent Weyl connection. This geometric gauge field is related to the non-metricity of the underlying effective geometry, which is physically induced by vacancies in the lattice system. As a consequence of our geometric model, we postulate that the chiral magnetic effect in Weyl semimetals can be affected by the presence of dynamical vacancies.

[1] J. P. Santos Pires, S. M. Joao, A. Ferreira, B. Amorim, and J. M. Viana Parente Lopes, Anomalous transport signatures in weyl semimetals with point defects, *Phys. Rev. Lett.* 129, 196601 (2022).

Primary author: PALUMBO, Giandomenico

Presenter: PALUMBO, Giandomenico