

Magnetic and Transport Properties of Mn_3X ($\text{X} = \text{Ge}, \text{Sn}$) Weyl Semimetal

Topological quantum materials have attracted enormous attention since their discovery due to the observed anomalous transport properties, which originate from the non-zero Berry curvature. Mn_3X compounds show interesting physical properties like Anomalous Hall Effect (AHE), Planar Hall effect (PHE), chiral magnetic effect, and non-local transport properties due to non-vanishing Berry flux emerging from the Weyl points¹. It is widely believed that the magnetic structure and Weyl properties are intimately connected.

However, the observation of negative longitudinal magnetoresistance (LMR), AHE and PHE in Mn_3X compounds and its connection with the chiral magnetic effect is much debated in the literature. In this talk, I will give a brief overview of the current understanding of the negative LMR, AHE and PHE as observed in Mn_3Sn and Mn_3Ge compounds.

References:

- [1] S. Nakatsuji, N. Kiyohara and T. Higo, Nature (London) **527**, 212 (2015) .
- [2] Y. Song, Y. Hao, and S. Wang, Phys. Rev. B **101**, 144422 (2020)
- [3] A. K. Nayak, J. E. Fischer, Y. Sun, B. Yan, J. Karel, A. C. Komarek, C. Shekhar, N. Kumar, W. Schnelle, J. Kübler, C. Felser, and S. S. P. Parkin, Sci. Adv. **2**, e1501870 (2016)
- [4] N. Kumar, S. N. Guin, C. Felser, and C. Shekhar, Phys. Rev. B **98**, 041103(R) (2018)