Magneto-Optical measurements in Weyl Semimetals

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Abstract

We present in this work is an experimental study of topological semimetals. This work was focused on studying the behavior of the type I $Co_3Sn_2S_2$ Weyl semimetals. Primarily, we are interested in magneto-optical measurements of these materials. Due to the effect of chiral anomaly, it is expected that the angle between electric and magnetic fields due to the term E*B [1] leads to the specific impacts in Weyl semimetals. In particular, it has been claimed that the chiral anomaly results in a charge imbalance between the Weyl nodes. In Weyl semimetals, the dielectric tensor receives a specific form [2] that allows observing chiral anomaly via the magneto-optical Kerr effect. Such studies have been performed for Cd_3As_2 crystals under an external magnetic field, and the outcome of the chiral anomaly was measured by magneto-optical methods. We are demonstrating our first results for $Co_3Sn_2S_2$ crystals. To the best of our knowledge, such a study was not performed in these materials.

References

[1] D. Cheskis, Symmetry, 12(9) (2020), 1412

[2] P. Hosur and X. L. Qi, Phys. Rev. B, 91(8) (2015), 081106

Figures

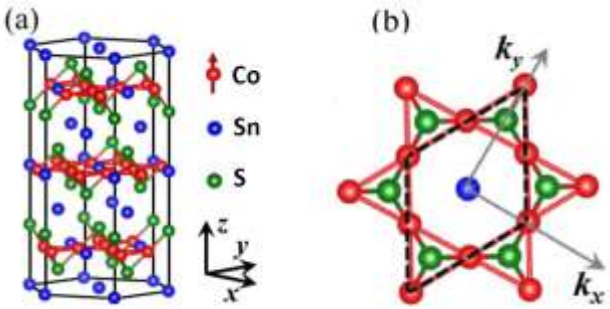

Figure 1: Lattice structure of $Co_3Sn_2S_2$ (a) 3-D view and (b) from the top.

Figure 2: Insert caption to place caption below figure (Century Gothic 10)