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Charge and heat transport in topological semimetals

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場所　：　本館 1 階 156 物理学系輪講室

概　要

Topological Weyl semimetals provide ideal platforms to examine exotic transport phenomena such as the chiral anomaly and the anomalous Hall effect. In the ordinary (longitudinal) transport, the Wiedemann-Franz law links the ratio of electronic charge and heat conductivity to a fundamental constant. It has been tested in numerous solids, but the extent of its relevance to the anomalous (transverse) transport remains an open question. I will introduce recently-discovered magnetic Weyl materials Mn_3Sn and Mn_3Ge. Their noncollinear chiral spin structure induces huge anomalous Hall effect and thermal Hall effect in a Kagome-type lattice. In collaboration with experiment, we reveal a finite temperature violation of the Wiedemann-Franz correlation. This violation is caused by the Berry curvature distribution, rather than the inelastic scattering as observed in ordinary metals. See more in arXiv:1812.04339 (2018).

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