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Entropy transport in Bi_2Se_3 BENOîT FAUQUÉ, AURELIE COLLAUDIN, KAMRAN BEHNIA, LPEM (UPMC-CNRS), ESPCI, 75005 Paris, France, NICK BUTCH, JOHNPIERRE PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, College Park, Maryland 20742, USA, STEFFEN WIEDMANN, High Field Magnet Laboratory, Institute for Molecules and Materials, Radboud University Nijmegen, 6525 ED Nijmegen, The Netherlands — Bi_2Se_3 and Bi_2Te_3 are well known compounds in the thermoelectricity community as they present a high figure of merit [1]. Although the thermoelectric power of Bi_2Se_3 has been extensively studied at high temperature, little is known about its behaviour at the low temperature limit. In this presentation, we will report the results of our entropy measurement of Bi_2Se_3 at low temperature and high magnetic field for a bulk carrier concentration from $10^{17}cm^3$ to $10^{19}cm^3$. In all compounds we show significant quantum oscillations in the Seebeck and Nernst responses. Based on the bulk Fermi surface, we propose a simple description of the entropy transport measurement in Bi_2Se_3 (in the range of concentrations studied). Indeed, Bi_2Se_3 (non compensated system) appears as a complementary system of bismuth [2] and graphite [3] (compensated systems) to understand the entropy transport in the low carrier concentration limit.

[1] G.S. Nolas et al, Thermoelectrics Basic Principles and New Materials Developments, Springer.
[2] K.Behnia et al, PRL, 98, 166602 (2007)
[3] Z.Zhu et al, Nature Physics, 6, 26 (2009)

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