

平成 27 年 6 月 3 日
応用物理学会北海道支部
会員各位

応用物理学会北海道支部講演会のお知らせ

下記講演会を開催いたしますので、多数ご参加下さいますようご案内申し上げます。

演題：Realization of Spin Gapless Semiconductors: The Heusler Compound Mn_2CoAl

講師：Siham Ouardi 氏

(Max Planck Institute for Chemical Physics of Solids, Dresden, Germany, Dr.)

日時：平成 27 年 6 月 10 日（水） 15:00～16:00

場所：北海道大学情報科学研究科 5 階会議室 (5-08)

主催：応用物理学会北海道支部

講演の要旨

Spin gapless semiconductors (SGS) are new class of magnetic materials bridging the gap between halfmetals and magnetic semiconductors. These new materials have unique electronic band structures, where, one spin channel is gapless (zero band gap) and the other spin channel is semiconducting. Therefore, no energy is required to excite electrons from the valence band to the conduction band. Furthermore, the excited charge carriers, both electrons and holes, can be 100% spin polarized simultaneously. Here, we report the first experimental verification of the spin gapless magnetic semiconductor Mn_2CoAl , an inverse Heusler compound with a Curie temperature of 720 K and a magnetic moment of $2 \mu_B/\text{f.u.}$ [1]. The Seebeck coefficient nearly vanishes in the temperature range from 5K to 300K. Typical for gapless systems, the compensation of electron and holes will lead to such a zero Seebeck effect over a wide range of temperatures. Measurement of the Hall coefficient reveals a low carrier concentration of the order of 10^{17} cm^{-3} and a high mobility.

[1] S. Ouardi, G.H. Fecher, J. Kübler, and C. Felser, Phys. Rev. Lett. **110**, 100401, (2013).

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