



量子物理学・ナノサイエンス第 35 回特別セミナー

# Topological Magnon Matter and Transverse Magnon Transport

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- 日程** : 1 月 17 日 (火) 15:00-16:00 【時間変更】
- 場所** : 本館 1 階 H155B 理学院セミナー室

## 概要

Magnons are carriers of spin and heat, and can show transverse transport phenomena, one example being the thermal magnon Hall effect [1]. As in the case of electrons, this Hall-type transport is related to the topologically nontrivial magnon spectrum, that is, to  $k$ -space Berry curvature [2,3]. In this talk, I give an introduction to topological magnon matter. In particular, I present the magnonic pendants to electronic topological insulators [4], Weyl semimetals [5,6], and nodal-line semimetals [7]. Thereafter, I introduce a method based on atomistic spin dynamics simulations for the calculation of magnon transport tensors, describing the response of a classical spin cluster to a magnetic-field gradient and a temperature gradient. It is applied to both a ferromagnetic topological magnon insulator [8] and a skyrmion crystal phase induced by frustration [9]. Magnon Hall angles as large as 60 % are predicted.

### References

- [1] Y. Onose *et al.*, Science **329**, 297 (2010)
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- [5] F.-Y. Li *et al.*, Nature Commun. **7**, 12691 (2016)
- [6] A. Mook *et al.*, Phys. Rev. Lett. **177**, 157204 (2016)
- [7] A. Mook *et al.*, Phys. Rev. B, *accepted* (2016/17)
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