800th ASRC Seminar

Date: 6月　11日　(金), 14:00~15:00

Location: Zoomによるオンラインセミナー

Speaker: 竹内　祐太朗　氏

(東北大学材料科学高等研究所)

Title: Electrical control of ferromagnets and non-collinear antiferromagnets by spin-orbit torque

Abstract:

Spin-orbit toque (SOT) can offer the electrical manipulation of ferromagnet by an in-plane current flowing into magnetic heterostructures and is recognized as a promising ingredient for functional spintronics devices [1-3]. In addition to ferromagnet, the Néel vector of collinear antiferromagnet can be switched by SOT [4]. Meanwhile, non-collinear antiferromagnets have recently attracted much interest owing to the large anomalous Hall effect [5].Here we present our recent study of electrical control of ferromagnets and non-collinear antiferromagnets by SOT. We find that the SOT efficiently induces an unconventional spin dynamics, the rotation of chiral-spin structure, at zero magnetic field in a non-collinear antiferromagnet Mn3Sn [6], which is different from the previously observed reversal of magnetic moment [7].
This study provides a new possibility in the field of spintronics.

[1] I. M. Miron et al., Nature 476, 189 (2011).
[2] L. Liu et al., Science 336, 555 (2012).
[3] S. Fukami et al., Nat. Nanotech. 11, 621 (2015).
[4] P. Wadley et al., Science 351, 587 (2016).
[5] S. Nakatsuji et al., Nature 527, 212 (2015).
[6] Y. Takeuchi et al., Nat. Mater. (2021). https://doi.org/10.1038/s41563-021-01005-3.
[7] H. Tsai et al., Nature 580, 608 (2020).

＜Contact＞

家田　淳一　(81-3449)

ZoomのURLにつきましては、
家田(ieda.junichi@jaea.go.jp) まで
ご連絡ください。

Advanced Science Research Center