Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Large anomalous Hall effect in a non-collinear antiferromagnet Mn_3Sn at room temperature[1] TOMOYA HIGO, NAOKI KIYOHARA, ISSP, University of Tokyo, SATORU NAKATSUJI, ISSP, University of Tokyo and PRESTO, JST — Recent development in theoretical and experimental studies have provided a framework for understanding the anomalous Hall effect using Berry-phase concepts, and this perspective has led to predictions that, under certain conditions, a large anomalous Hall effect may appear in spin liquids and antiferromagnets [1, 2]. In this talk, we will present experimental results showing that the antiferromagnet Mn_3Sn, which has a non-collinear 120-degree spin order, exhibits a large anomalous Hall effect [3]. The magnitude of the Hall conductivity is $\sim 20\ \Omega^{-1}\ \mathrm{cm}^{-1}$ at room temperature and $> 100\ \Omega^{-1}\ \mathrm{cm}^{-1}$ at low temperatures. We found that a main component of the Hall signal, which is nearly independent of a magnetic field and magnetization, can change the sign with the reversal of a small applied field, corresponding to the rotation of the staggered moments of the non-collinear antiferromagnetic spin order which carries a very small net moment of a few of $\mathrm{m}\mu_\mathrm{B}$. [1] N. Nagaosa *et al.*, Rev. Mod. Phys. **82**, 1539 (2010). [2] Y. Machida *et al.*, Nature **463**, 210 (2010). [3] S. Nakatsuji, N. Kiyohara and T. Higo, Nature, doi:10.1038/nature15723, (2015).

[1]Supported by PRESTO, JST, and Grants-in-Aid for Program for Advancing Strategic International Networks to Accelerate the Circulation of Talented Researchers (No. R2604) and Scientific Research on Innovative Areas (15H05882 and 15H05883) from JSPS.

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Date submitted: 06 Nov 2015 Electronic form version 1.4