

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Thermally Driven Ratchet Motion of Skyrmion Microcrystal and Topological Magnon Hall Effect MASAHITO MOCHIZUKI, Aoyama Gakuin University, XIUZHEN YU, SHINICHIRO SEKI, RIKEN CEMS, NAOYA KANAZAWA, University of Tokyo, WATARU KOSHIBAE, RIKEN CEMS, JIADONG ZANG, Johns Hopkins University, MAXIM MOSTOVOY, University of Groningen, YOSHINORI TOKURA, NAOTO NAGAOSA, RIKEN CEMS — By means of the Lorentz TEM, we have found that micron-sized crystals of topologically nontrivial spin textures so called skyrmions in thin specimens of MnSi and Cu₂OSeO₃ show unidirectional rotations. Our numerical simulation based on a stochastic Landau-Lifshitz-Gilbert equation demonstrates that these rotations are driven sheerly by thermal fluctuations in the presence of temperature gradient. We show that hidden behind the skyrmion rotation is the rotational flow of magnons deflected by the effective magnetic field of skyrmions.

Masahito Mochizuki
Aoyama Gakuin University

Date submitted: 15 Nov 2013

Electronic form version 1.4