

New excitations in Spintronics



Contribution ID: 4

Type: **Short oral presentation**

Effects of spin-orbit couplings on emergent electric fields due to magnetic Skyrmion motion

We present an analytical study on the spinmotive force (SMF) generated by translational motion of magnetic Skyrmion. A SMF refers to an electrical voltage emerged due to dynamical magnetic textures, which reflects the spatiotemporal variation of the magnetization. The dynamics of a Skyrmion thus can be detected by a SMF measurement, which may play an important role in future Skyrmion-based technologies. We obtain the expression for the SMF, taking into account the Rashba and Dresselhaus spin-orbit couplings (SOCs) as well as the so-called β term arising from the nonadiabaticity in the electron spin dynamics. To this end, we derive a general formula for the SMF including the effect of the Dresselhaus SOC. Our results reveal the dependence of the SMF on the Skyrmion profile and the SOC parameters, which offers an estimation of the SMF for a given experiment.

Primary author: IEDA, Jun'ichi (ASRC, JAEA)

Co-author: Dr YAMANE, Yuta (CEMS, RIKEN)

Presenter: IEDA, Jun'ichi (ASRC, JAEA)