Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

First-principles study of anomalous Nernst effect in skyrmion crystals FUMIYUKI ISHII, YO PIERRE MIZUTA, HIKARU SAWAHATA, Kanazawa Univ — The magnetic skyrmion, a topological object made up of spins in condensed matter, exhibits many peculiar properties, among which we target the anomalous Nernst effect (ANE), heat-to-electricity conversion in transverse direction, driven by an emergent magnetic field B originating from its spin texture. We have so far found from computations on some models that, in the so-called 2D SkX phase, where skyrmions are crystallized in two dimensions, the crystal-momentum component of B gives rise to the band structure that could generate large ANE when chemical potential is properly tuned [1]. Although this behavior was most clearly confirmed in the simplest model of square SkX with single s-orbital per site, our subsequent computations on more realistic models of transition-metal oxides also showed possible large ANE. In this presentation, such intriguing results, the details of our first-principles computational procedures, as well as the origin of large ANE will be discussed. [1] Y. P. Mizuta and F. Ishii, Scientific Reports 6, 28076 (2016)

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Date submitted: 12 Nov 2016 Electronic form version 1.4