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Giant thermal Hall effect in polar magnets $(Zn,Fe)_2Mo_3O_8$ TOSHIYA IDEUE, TAKASHI KURUMAJI, HOSHO KATSURA, SHINTARO ISHIWATA, Univ. of Tokyo, NAOTO NAGAOSA, YOSHINORI TOKURA, Univ. of Tokyo,RIKEN Center for Emergent Matter Science (CEMS), DEPARTMENT OF APPLIED PHYSICS, UNIVERSITY OF TOKYO TEAM, DEPARTMENT OF PHYSICS, UNIVERSITY OF TOKYO COLLABORATION, RIKEN CENTER FOR EMERGENT MATTER SCIENCE (CEMS) COLLABORATION — Spin transport in magnetic insulators has been attracting much attention because of the fundamental and technological interest for future spintronics. Recently we have observed Hall effect of magnons in ferromagnetic insulators with pyrochlore and perovskite structures in terms of the thermal Hall effect. Observed thermal Hall conductivity can be well explained by the Berry curvature of magnons induced by the Dzyaloshinsky-Moriya spin-orbit interaction which reflects the lattice geometry, while the magnitude of the signal is small and Hall effects in other magnetic phases have been unknown. In this work, we have studied thermal Hall effect in magnetic insulators $(Zn,Fe)_2Mo_3O_8$. $(Zn,Fe)_2Mo_3O_8$ has the polar crystal structure and shows various magnetic phases by changing the composition ratio of Fe and Zn or by applying the magnetic field. We have observed giant thermal Hall effect in ferrimagnetic phase in which the thermal Hall conductivities are twenty times larger than those of the magnon Hall effect observed in the previous study. We discuss possible mechanism of the large thermal Hall effect in this systems.

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