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**Torque, spin and energy Hall currents in magnets with Dzyaloshinskii-Moriya interactions** VLADIMIR ZYUZIN, ALEXEY KOVALEV, University of Nebraska — Within a linear response theory, we study nonequilibrium magnonic torques as well as spin and energy Hall currents generated by thermal gradients in ferromagnetic and anti-ferromagnetic systems. We predict a contribution related to Berry curvature which arises in multiband systems with topologically non-trivial magnon bands. We identify symmetries that need to be broken in order to have non-vanishing nonequilibrium magnonic torques. As an example, we study kagome lattice of spins with various symmetries of Dzyaloshinskii-Moriya interactions.

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