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Spin Nernst and torque effects in Dzyaloshinskii-Moriya ferromagnets.[1] ALEXEY A. KOVALEV, VLADIMIR ZYUZIN, University of Nebraska-Lincoln — We predict that a temperature gradient can induce a magnon-mediated intrinsic torque and a transverse spin current in ferromagnets with nontrivial magnon Berry curvature. With the help of a microscopic linear response theory of nonequilibrium magnon-mediated torques and spin currents we identify the interband and intraband components that manifest in ferromagnets with Dzyaloshinskii–Moriya interactions and magnetic textures. In addition to the torque and spin current, we also identify the mechanical torque effect in accordance with the conservation of angular momentum. To illustrate and assess the importance of such effects, we apply our theory to the magnon-mediated spin Nernst and torque responses in a kagome lattice ferromagnet.

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