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Heat Transport between Antiferromagnetic Insulators and Normal Metals EIRIK LOHAUGEN FJAERBU, HANS SKARSVAAG, ERLEND G. TVETEN, ARNE BRATAAS, Norwegian University of Science and Technology (NTNU) — Antiferromagnetic insulators can become active spintronics components by controlling and detecting their dynamics via spin currents in adjacent metals. This cross-talk occurs via spin-transfer and spin-pumping, phenomena that have been predicted to be as strong in antiferromagnets as in ferromagnets. In a recent article,[1] we demonstrate that a temperature gradient drives a significant heat flow from magnons in antiferromagnetic insulators to electrons in adjacent normal metals. The same coefficients as in the spin-transfer and spin-pumping processes also determine the thermal conductance. However, in contrast to ferromagnets, the heat is not transferred via a spin Seebeck effect which is absent in antiferromagnetic insulator-normal metal systems. Instead, the heat is proportional to a large staggered spin Seebeck effect.

[1] A. Brataas, H. Skarsvåg, E. G. Tveten and E. L. Fjærbu, arXiv:1506.06705 (2015)

Eirik Lohaugen Fjaerbu
Norwegian University of Science and Technology (NTNU)

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