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Spin temperature and thermalization in spin valves[1] TERO HEIKKILÄ, Low Temperature Laboratory, Aalto University, MOOSA HATAMI, GERRIT E.W. BAUER, Kavli Institute of Nanoscience, Delft University of Technology — We study the concept of spin temperature in excited spin valves, more precisely the effective electron temperature that may become spin dependent, both in linear response and far from equilibrium. A temperature or voltage gradient create non-equilibrium energy distributions of the two spin ensembles in the normal metal spacer, which approach Fermi-Dirac functions through energy relaxation mediated by electron-electron and electron-phonon coupling. Both mechanisms also exchange energy between the spin subsystems. This spin thermalization may strongly affect thermoelectric properties spin valves, leading, e.g., to violations of the Wiedemann-Franz law.[2]

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[2]Tero T. Heikkilä, Moosa Hatami and Gerrit E.W. Bauer, [arXiv:0910.4867].

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