

SPIN-CALORITRONIC EFFECTS IN MAGNETIC NANOSTRUCTURES

G. E. W. Bauer

Kavli Institute of NanoScience, TU Delft, The Netherlands

The spin, charge, and entropy flows in magnetoelectronic nanostructures are addressed from a theoretical point of view. Heat currents are important for the magnetization dynamics in the form of a thermal spin transfer torque in spin valves that can be large enough to switch the relative magnetization configuration. A giant violation of the Wiedemann-Franz Law is predicted.

These and related topics may be called “spin-caloritronics” [1] and will be discussed in more detail, with special attention on inelastic scattering, spin-orbit interaction, and magnetic domain walls.

The work reported is the result of collaborations with A. Brataas, M. Hatami, P.J. Kelly, S. Maekawa, H.J. Skadsem, Y. Tserkovnyak, and Q.F. Zhang.

[1] <http://www.lc.leidenuniv.nl/lc/web/2009/323/info.php3?wsid=323>