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Experimental evidence for thermal spin transfer torque SIMON GRANVILLE, HAIMING YU¹, Ecole Polytechnique Federale de Lausanne, IPMC, CH-1015 Lausanne, Switzerland, DAPENG YU, State Key Laboratory for Mesoscopic Physics, School of Physics, Peking University, Beijing 100871, Peoples Republic of China, JEAN-PHILIPPE ANSERMET, Ecole Polytechnique Federale de Lausanne, IPMC, CH-1015 Lausanne, Switzerland — It has been predicted that a heat current can exert a spin torque on the magnetization in a nanostructure, analogous to the well-known spin-transfer torque induced by an electrical current. A number of recent theoretical studies have aroused interest in this subject, but no experimental evidence of such a thermal spin transfer torque has yet emerged. We present measurements of the second harmonic voltage response of Co-Cu- Co pseudo-spin-valves deposited within Cu nanowires. We exploit the quasi-1D nature of the nanostructures to generate a heat current by way of a large temperature gradient between the Co layers. Both the magnitude of the second harmonic response and the switching field of the Co layers are found to be dependent on the heat current generated. These effects show that the magnetization dynamics of the pseudo-spin-valves are influenced by the heat current, providing evidence for a thermal spin torque exerted on the magnetization of the Co layers.

¹also at School of Physics, Peking University

Simon Granville
Ecole Polytechnique Federale de Lausanne, IPMC,
CH-1015 Lausanne, Switzerland

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