

Abstract Submitted
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Can heat flow induced spin currents move a magnetic domain wall? AAKASH PUSHP, TIMOTHY PHUNG, LUC THOMAS, KONSTANTINOS ALEXANDROU, XIN JIANG, SEEHUN YANG, BRIAN HUGHES, CHARLES RETTNER, STUART PARKIN, IBM Almaden Research Center — It has been established in the past few years that heat flow within a ferromagnet can induce a spin current and an associated voltage. This Spin Seebeck effect, initially reported in ferromagnetic metals, has also been observed in magnetic semiconductors as well as magnetic insulators. An open question has been whether heat flow induced spin currents can also move magnetic domain walls in 'racetrack' magnetic nanowires. In order to answer this question, we investigate the interaction of a magnetic domain wall with spin currents induced by sharp temperature gradients in magnetic nanowire spin valves. We use optical as well as electrical techniques to create sharp temperature gradients on the order of 1-10 K/nm on nanosecond timescales. We will describe our experimental setup and present data that show the various roles that temperature plays on the saturation magnetization of the material as well as on the induced spin currents that influence magnetic domain wall motion.

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