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Probing the Influence of Thermal Spin Torque on Magnetic Tunnel Junction Switching TIMOTHY PHUNG, AAKASH PUSHP, CHARLES RETTNER, BRIAN HUGHES, SEE-HUN YANG, 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 so called Spin Seebeck effect, initially reported in ferromagnetic metals, has also been observed in magnetic semiconductors, magnetic insulators as well as in strongly spin orbit coupled systems. An open question has been whether heat induced spin currents can be used in switching a magnetic tunnel junction (MTJ) via thermal spin torque (TST). In order to answer this question, we investigate the MTJ switching with TST induced by sharp temperature gradients on the order of 1-10 K/nm. We will describe our experimental setup and present data that show the various roles that temperature plays on the saturation magnetization of the material and on the induced spin currents that influence MTJ switching.

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