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**Single-Shot Time Domain Studies of Spin-Torque-Driven Switching and Precession in Magnetic Tunnel Junctions** YONG-TAO CUI, ROBERT A. BUHRMAN, DANIEL C. RALPH, Cornell University, Ithaca, NY 14853, DANIELE MAURI, JORDAN A. KATINE, Hitachi Global Storage Technologies, San Jose Research Center, San Jose, CA 95135 — We present single-shot time domain resistance measurements of spin-transfer-driven dynamics in CoFeB/MgO/CoFeB tunnel junctions. In the regime of thermally-activated current-driven switching, we have sufficient sensitivity to resolve the pattern of resistance oscillations caused by the magnetic dynamics leading up to switching. When an in-plane hard-axis magnetic field is applied, within a short interval before the switching instant the resistance oscillations show a steadily-increasing amplitude, qualitatively consistent with expectations for large-angle precession in a simple macrospin model, although the oscillation amplitude can vary between individual switching events. Coherent large-angle oscillations are generally absent in the case of an applied field along the easy axis, which can be attributed to the differences in the precession axis and switching barriers as well as effects of thermal fluctuations. We will also report results of single-shot transport measurements in the regime of spin-torque-driven steady-state precession.

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