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Investigation of Spin-Torque Effects on the Exchange Bias of Ferromagnet/Antiferromagnet Bilayers KIRAN V. THADANI, R.A. BUHRMAN, D.C. RALPH, Cornell University — Spin-polarized current, generated by one ferromagnetic layer in a magnetic multilayer structure, can deposit spin angular momentum into a second ferromagnetic layer, causing it to either reversibly switch its orientation or oscillate in steady state at microwave frequencies. Recent calculations and experiments have investigated the possibility that spin torque might also alter the structure of an antiferromagnet [1], thereby affecting the exchange-bias field produced by the antiferromagnet on an adjacent ferromagnetic layer [2, 3]. Here we report studies made using nanopillar samples in which the free magnetic layer is exchange-biased to an antiferromagnet, which allow a direct measurement of the magnitude of the exchange bias and its current dependence. We will also investigate the degree to which the exchange bias alters the damping of the free-layer magnet and the extent to which the effective damping can be controlled with current. [1] A. S. Nunez et al., Phys. Rev. B 73, 214426 (2006). [2] Z. Wei et al., Phys. Rev. Lett. 98, 116603 (2007). [3] S. Urazhdin et al., Phys. Rev. Lett. 99, 046602 (2007).

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