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Linewidths for spin-transfer-driven precession in magnetic nanopillars as a function of the direction of applied magnetic field KIRAN V. THADANI, J.C. SANKEY, I.N. KRIVOROTOV, O. OZATAY, P.M. BRAGANCA, R.A. BUHRMAN, D.C. RALPH, Cornell University — In a magnetic multilayer spin valve, the spin-transfer torque from a spin-polarized DC current can drive the free-layer magnetic moment into steady-state precessional modes [1, 2]. We report measurements of how the linewidths of these modes depend on the angle and magnitude of an applied magnetic field, for devices in the nanopillar configuration with elliptical cross sections. We find that the field direction studied most commonly, in-plane along the magnetic easy axis of the ellipse, generally gives the largest linewidths, corresponding to the least coherent precession. As the field is rotated either in plane or out of plane, the linewidths can change dramatically, decreasing by a factor of 50 or more in some devices. We will discuss the temperature dependence of the linewidths for the field directions that give the minimum linewidths, and we will compare both the field-angle dependence and the temperature dependence to theoretical models. [1] S. I. Kiselev et al., Nature 425, 380 (2003). [2] J. C. Sankey et al., cond-mat/0505733.

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