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Ferromagnetic resonance studies of nanopillars with Co/Ni multilayer free layers WENYU CHEN, J-M. L. BEAUJOUR, G. DE LOUBENS, ANDREW D. KENT, New York University, M. J. ROOKS, N. RUIZ, JONATHAN Z. SUN, IBM T. J. Watson Research Center — Recently it has become possible to study ferromagnetic resonance (FMR) of magnetic layers in nanopillar junctions using the spin-transfer interaction [1,2]. This enables powerful new quantitative studies of the layer magnetic anisotropy and damping in confined structures. Here we report studies of Co/Ni multilayer free layers with variable easy plane anisotropy. Experiments were conducted on ||[t nm Co 2t nm Ni] x 1.2/t| 10 nm Cu| 12 nm Co|| layer structures patterned to ∼50 nm lateral dimensions using a nanostencil process, with t=0.1, 0.2, 0.3 and 0.4. Varying the Co thickness (t) enables systematic variation of the Co/Ni easy-plane anisotropy, while the total magnetic moment and thickness of the free layer is kept constant. Field swept FMR measurements were conducted using a microwave signal generator (1 to 20 GHz) with a magnetic field applied perpendicular to the surface of the layers. The resonance field and linewidth were measured as a function of frequency and DC current bias. Magnetic anisotropy constants and damping parameters are determined and compared to those found in FMR studies of extended films of the same layer structure. [1] A. A. Tulapurkar et al., Nature, 438, 339 (2005) [2] J. C. Sankey et al., Phys. Rev. Lett., 96, 227601 (2006)

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