Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Effects of Spin transfer torques on domain wall nucleation and propagation in perpendicular spinvalve nanopillars STEPHANE MANGIN, JULIEN CUCCHIARA, THOMAS HAUET, Nancy Unversite, DAVID P. BERNSTEIN, SLAC - Stanford, ERIC E. FULLERTON, UCSD, ANDREW D. KENT, New York Univ, JORDAN KATINE, Hitachi-GST, JONATHAN Z. SUN, IBM — Controlled manipulation of magnetic domain wall (DW) propagation has spurred intensive research in recent years because of its fundamental interest and the potential impact in spintronic device technology such as racetrack memories. Both magnetic fields and electric currents may be used to control domain walls. Most of the studies have been performed on magnetic nanowires with in plane anisotropy. Here we study domain wall creation and propagation in spinvalve nanopillar composed of magnetic materials with perpendicular anisotropy such Co/Ni multilayers [1]. It is shown that DWs can nucleate and propagate in perpendicularly magnetized nanopillar spin valves as small as 50×100 nm^2 [2]. The study of the dynamics of DW nucleation and propagation driven by applied fields and injected currents is presented [3]. High domain wall velocities of about 100m/s are found.

[1] S. Mangin, et al , *Nat. Mater.* **5**, 210 (2006), S. Mangin, et al, *Appl. Phys. Lett.* **94**, 012502 (2009)
[2] D. Ravelosona, et al (2006)
[3] J. Cucchiara, et al *Appl. Phys. Lett. 94 102503 (2009)*

Stephane Mangin
Nancy Unversite

Date submitted: 30 Dec 2010 Electronic form version 1.4