Abstract Submitted
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Time Resolved X-ray Imaging of Magnetic Dynamics in Perpendicularly Magnetized Nanopillars DAVID BERNSTEIN, Stanford University, KENG CHOU, Advanced Light Source, ROOPALI KUKREJA, Stanford University, BJÖRN BRÄUER, SLAC, TOLEK TYLISZCZAK, Advanced Light Source, JORDAN KATINE, Hitachi GST, JOACHIM STÖHR, SLAC, YVES ACREMANN, ETH Zurich — Spin Transfer Torque (STT) provides a novel means to manipulate magnetic bits. Previous time-resolved scanning transmission x-ray microscopy (STXM) experiments have shown that in-plane magnetized nanomagnets switch via vortex motion through or virtual vortex motion around a metallic pillar[1]. Here we present results for perpendicularly magnetized samples. It has been suggested that such samples have a smaller critical switching current than those magnetized in-plane[2]. We find that the samples switch via domain wall propagation across the sample. Pillars of 300nm width switch from anti-parallel to parallel over 700 ps when subjected to 2 ns pulses, yielding a domain wall speed of approximately 400 m/s once the domain wall has formed. The reset pulse revealed a slower propagation, taking 1.3 ns, perhaps due to the difference in spin-polarization reflected by and transmitted through the polarizing layer.

[1] J.P. Strachan, *et. al.* Phys. Rev. Lett. 100, 247201 (2008)
[2] S. Mangin, *et. al*, Appl. Phys. Lett. 94, 012502 (2009)

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