

Abstract Submitted  
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**Measurements of nanoscale domain wall flexing in a ferromagnetic thin film** A.L. BALK, Physics Dept., Penn State University, University Park PA 16802, M.E. NOWAKOWSKI, Physics Dept., University of California, Santa Barbara CA 93106, M.J. WILSON, D.S. RENCH, P. SCHIFFER, Physics Dept., Penn State University, University Park PA 16802, D.D. AWSCHALOM, Physics Dept., University of California, Santa Barbara CA 93106, N. SAMARTH, Physics Dept., Penn State University, University Park PA 16802 — We use the anomalous Hall effect to probe the nanoscale behavior of a single magnetic domain wall (DW) in (Ga,Mn)As thin film devices with out-of-plane magnetic anisotropy. Video-rate magneto-optical Kerr microscopy is also used to confirm the variation of the AHE with DW position. Our all-electrical technique allows us to observe a low field flexing regime of DW motion, distinct from the stochastic creep regime that occurs at higher fields. This flexing regime is characterized by a larger DW mobility, linear response to applied field, and non-hysteretic motion which is repeatable within our  $\sim 5$  nm experimental resolution. We then analyze the flexing and depinning behavior of the DW to estimate the density and strength of pinning sites. Supported by the ONR MURI program.

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