Abstract Submitted
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**Alignment-Sensitive Reversal Mechanisms of Epitaxial-$FeF_2$/Polycrystalline-Ni Exchange Biased Thin Films*** JUSTIN OLAMIT, KAI LIU, UC Davis Physics Department, ZHI-PAN LI, IVAN K. SCHULLER, UC San Diego Physics Department — Magnetization reversal mechanisms of epitaxial-$FeF_2$/polycrystalline-Ni exchange biased thin films were investigated with vector magnetometry and a First Order Reversal Curve (FORC) technique [1]. The FORCs were measured ***without*** remounting the sample after the vector magnetometry measurements, ensuring consistency between the two methods. Samples were exchange biased by field cooling along the $FeF_2$ spin axis. When the applied field is aligned with the spin axis, the transverse hysteresis loop is flat and FORC analysis shows that the magnetization switching is highly irreversible ($\sim$80%), indicating that domain nucleation and motion is the reversal mechanism. With a misalignment of $5^\circ$, the transverse hysteresis loop shows that the reversal is predominantly by rotation [2] and FORC analysis shows that the majority of the magnetic switching is by a reversible mechanism (only $\sim$40% irreversible). These results demonstrate that the magnetization reversal mechanisms are ***extremely sensitive*** to the alignment of the applied field with the antiferromagnet spin axis and the exchange bias direction [3]. .1. J. E. Davies, et al., Phys. Rev. B **70**, 224434 (2004); Phys. Rev. B **72**, 134419 (2005). 2. J. Olamit, et al., Phys. Rev. B **72**, 012408 (2005). 3. A. Tillmans et al, cond-mat/0509419. *Work supported by ACS-PRF, Alfred P. Sloan Foundation, and DOE.

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