Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Uncompensated moments in antiferromagnets: Origin and role in exchange bias. IGOR V. ROSHCHIN, Physics Department, University of California, San Diego and Texas A&M University, ZHI-PAN LI, Physics Department, University of California, San Diego and Cornell University, CASEY W. MILLER, Physics Department, University of California, San Diego and University of South Florida, MARIA VARELA, STEPHEN J. PENNYCOOK, Oak Ridge National Laboratory, IVAN K. SCHULLER, Physics Department, University of California, San Diego — Exchange bias (EB) is a ferromagnet (FM) – antiferromagnet (AF) proximity effect. The depth profile of the magnetization across the interface between a FM (Co) and an AF (FeF_2) in an EB system has been measured. [1] It was found that both uncompensated and compensated magnetic moments are present in FeF_2. The origin of these moments remains an open question. Our high-resolution STEM study confirms that FeF2 grows epitaxially on MgF_2, and its structural quality is very high. It also reveals that the substrate surface imperfections do not necessarily affect the quality of the FeF_2 layer. In magnetization measurements of just a thin film of FeF_2, without a FM, we find an uncompensated magnetization. This magnetization demonstrates temperature dependence and horizontal hysteresis loop shift, typical for EB. Dependence of this magnetization on the substrate, film parameters and cooling conditions will be discussed. Work supported by US DOE.
[1] M. R. Fitzsimmons *et al.*, Phys. Rev. B **75**, 214412 (2007).

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Date submitted: 17 Nov 2007 Electronic form version 1.4