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Uncompensated Magnetization in FeF_2 KARIE BADGLEY, IGOR V. ROSHCHIN, Department of Physics and Astronomy, Texas A&M University, MIKHAIL ZHERNENKOV, MICHAEL R. FITZSIMMONS, LANSCE, Los Alamos National Laboratory, M. EREKHINSKY, IVAN K. SCHULLER, Department of Physics, UCSD, HUGO PONCE, ALDO H. ROMERO, CINVESTAV, Queretaro, Mexico, CASEY W. MILLER, Physics Department, University of South Florida — Exchange bias (EB) between a ferromagnet (FM) and an antiferromanget (AF) manifests itself as a horizontal shift of the hysteresis loop below the critical temperature of the AF. While uncompensated magnetization has been shown to play an important role in EB, its origin is still unknown. To investigate the properties and origin of this uncompensated magnetization, AF-only samples were prepared: 36nm thick FeF_2 on MgF_2, coated with 3nm of Al to prevent oxidation. Using polarized neutron reflectometry and SQUID magnetometry, we measured the uncompensated magnetization in the samples and its depth profile. The magnitude of this magnetization is larger than what is expected from piezomagnetism or from ab-initio calculations of effects of FeF_2 surface relaxation on the uncompensated magnetization. Field and temperature dependence of this magnetization will also be presented. Funded by Texas A&M University, Texas A&M University–CONACyT Collaborative Research Grant Program, DOE, and NSF-9976899.

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