

Abstract Submitted
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The spatial profile of unpinned and pinned uncompensated spins in the antiferromagnetic layer of an exchange bias heterostructure determined with polarized neutron reflectometry M.R. FITZSIMMONS, S. PARK, A. MISRA, X. ZHANG, Los Alamos National Laboratory, S. ROY, M. DORN, O. PETRACIC, I.V. ROSHCHIN, Z.P. LI, X. BATLLE, R. MORALES, S.K. SINHA, IVAN K. SCHULLER, University of California, San Diego — The spin structure of an antiferromagnet plays a critically important role as a means to establish a reference state in magnetic devices; however, the spin structure at the surface and interior of an antiferromagnetic thin film remains unknown. We have used the unique spatial sensitivity of polarized neutron reflectometry to measure the depth dependence of magnetization across the interface between a ferromagnet and an antiferromagnet. The net uncompensated magnetization near the interface responds to applied field, while uncompensated spins in the antiferromagnet bulk are pinned. A new model is proposed for exchange bias. This work was supported in part by the Office of Basic Energy Science, U.S. Department of Energy, BES-DMS, the University of California Campus Laboratory Collaborative program, and Laboratory Directed Research and Development program funds.

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