

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Exchange bias training effect in coupled all ferromagnetic bilayer structures¹ SRINIVAS POLISETTY, XI HE, CHRISTIAN BINEK, University of Nebraska-Lincoln, ANDREAS BERGER, Hitachi Global Storage Technologies — We study exchange coupled bilayers of soft and hard ferromagnetic (FM) thin films by means of Alternating Gradient Force Magnetometry. A CoCr thin film realizes the magnetically soft layer (SL) which is exchange coupled via a Ru-interlayer with a hard CoPtCrB pinning layer (HL). This new class of all FM bilayers shows remarkable analogies to conventional antiferromagnetic (AF)/FM exchange bias (EB) heterostructures. Not only do these all FM bilayers exhibit a tunable EB effect, they also show a distinct training behavior upon cycling the SL through consecutive hysteresis loops. Training resembles the cycle dependent evolution of the bias field and is to a large extent analogous to the gradual degradation of the EB field observed upon cycling the FM top layer of a AF/FM EB heterostructure through consecutive hysteresis loops. However, in contrast to these conventional EB systems, our all FM bilayer structures allow the observation of training induced changes in the bias-setting HL by means of simple magnetometry. Our experiments show unambiguously that the training effect is driven by deviations from equilibrium in the pinning layer. A comparison of the experimental data with predictions from a theory based upon triggered relaxation phenomena shows excellent agreement.

¹Work supported through NSF-MRSEC

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Date submitted: 01 Dec 2005

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