

Abstract Submitted
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Correlation between bias fields and magnetoresistance in CoPt biased FeNi/Ta/FeNi GMR heterosystems YI WANG, University of Nebraska-Lincoln, S. SAHOO, Seagate Technology, W. ECHTENKAMP, CH. BINEK, University of Nebraska-Lincoln — Exchange coupled magnetic hard layer (HL)/ soft layer (SL) thin films show SL biasing in close analogy to conventional exchange bias systems with antiferromagnetic pinning.¹ Here we study CoPt(35nm)/FeNi450nm/Ta(d)/FeNi450nm heterostructures with d between 0.7 and 5nm. The CoPt films have in-plane magnetic anisotropy and pin the adjacent FeNi SL films. The latter are exchange coupled from top via Ta spacer layers with FeNi in a GMR-type architecture. We use AGFM and SQUID magnetometry to study the FeNi magnetization reversal with (CoPt) and without (vacuum) pinning layer proximity. The two minor FeNi hysteresis loops of the GMR trilayer reveal different biasing effects due to the distinct exchange interaction at the respective interfaces. The FeNi/CoPt coupling is systematically tuned via a series of set fields which allow partial demagnetization of the pinning layer. Moreover we study the correlation between the overall and minor magnetization reversals and the corresponding magnetoresistance effects for various temperature between T=20 and 400K. ¹Ch. Binek, S. Polisetty, Xi He and A. Berger, Phys. Rev. Lett. **96**, 067201 (2006). Financial support by NSF through Career DMR-0547887, MRSEC DMR-0820521 and the NRI.

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