

Abstract Submitted  
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**Correlation between bias fields and magnetoresistance in CoPt biased NiFe/Ta/NiFe heterosystems** YI WANG, XI HE, TATHAGATA MUKHERJEE, Department of Physics and Astronomy, University of Nebraska-Lincoln, SARBESWAR SAHOO, Seagate Technology, MICHAEL FITZSIMMONS, Los Alamos National Laboratory, CHRISTIAN BINEK, Department of Physics and Astronomy, University of Nebraska-Lincoln — Exchange coupled magnetic hard layer/soft layer (SL) thin films show SL biasing in close analogy to exchange bias systems with antiferromagnetic pinning. Here we study CoPt(35nm)/NiFe(450nm)/Ta(d)/NiFe(450nm) heterostructures with  $0.7 < d < 5\text{nm}$ . We use alternating gradient force magnetometry to measure the overall magnetization reversal and minor loop behavior. Magnetoresistance (MR) is measured by four-point methodology and modeled using magnetization data thus confirming the assumptions of uniform rotation of the top layer and exchange spring behavior of the pinned NiFe layer. In addition, Polarized Neutron Reflectometry (PNR) provides an independent data set for magnetization depth profiles. We compare and contrast results from our magnetometry and MR technique with PNR results. The objective of this comparison is to show that single-component magnetometry in concert with MR and modeling reveals the full vector and depth profile information of the distinct magnetization reversal mechanisms. Financial support by NSF through Career, MRSEC, DOE-OBES

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