Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Identification and separation of two distinct contributions to the training effect in polycrystalline exchange biased Co/FeMn bilayers M.K. CHAN, J.S. PARKER, P.A. CROWELL, C. LEIGHTON, University of Minnesota — We show that polycrystalline Co/FeMn bilayers display two distinct forms of training and qualitatively explain their FeMn thickness (t_{FeMn}) dependence. The two types of training can be identified and separated via their distinctive field cycle and t_{FeMn} dependences, and the degree of asymmetry between the ascending and descending branches of the hysteresis loops. Samples were prepared via UHV dc magnetron sputter deposition onto Si/SiO_2 substrates at room temperature. The Co thickness was 6 nm while t_{FeMn} was varied between 0 and 20 nm. Upon field cooling, hysteresis loops display two distinct forms of training. The first is single cycle training accompanied by strong reversal asymmetry. The amount of training and degree of asymmetry are correlated and strongly dependent on t_{FeMn}. This effect is due to the biaxial anisotropy of the antiferromagnet[1]. Subsequent loops are symmetric and exhibit multi-loop training that follows a $n^{-1/2}$ dependence, where n is the loop number[2]. This effect is attributed to thermally activated depinning of weakly coupled uncompensated interfacial antiferromagnet spins. 1. A. Hoffmann, Phys. Rev. Lett. **93** 97203, 2004. 2. D. Paccard, C. Schlenker, O. Massenet, R. Montmory, A. Yelon, Phys. Stat. Sol.16, 301, 1966. This work was supported by the NSF MRSEC program and NSF DMR 04-06029.

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Date submitted: 22 Nov 2006 Electronic form version 1.4