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Effect of Cu Layer on Exchange Bias in FeMn DOGAN KAYA, Texas A&M University, PRIYANGA JAYATHILAKA, CASEY W. MILLER, University of South Florida, IGOR V. ROSHCHIN, Texas A&M University — One of the most important puzzles related to the mechanism of exchange bias is the origin and role of uncompensated magnetization in the antiferromagnet. We study effects of a Cu layer on the uncompensated magnetization and exchange bias in FeMn, the material with a high potential for applications in magnetic recording. The multilayers of Ta(50 Å)/[FeMn(50 Å – 150 Å)/Cu(50 Å)]$_{10}$/Ta(50 Å) are deposited by UHV DC magnetron sputtering on top of Si/SiO$_x$ 3 mm x5 mm substrates. Samples with a single layer of FeMn of the same thickness, Ta(50 Å)/FeMn(50 Å – 150 Å)/Ta(50 Å) are used as control samples. The samples are cooled in a field of 7 T and their magnetization is measured using a SQUID magnetometer. All the samples have uncompensated magnetization that exhibits a hysteresis at 10 K. The hysteresis loops for FeMn/Cu multilayers are exchange bias shifted, while FeMn without Cu exhibits no exchange bias. Dependence of coercive field (H$_c$), exchange bias (H$_e$), and saturated magnetization (M$_s$) on the FeMn thickness and on temperature will be discussed. Work is supported by Texas A&M University, TAMU-CONACYT Collaborative Research Program, and by NSF (USF).

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