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Role of Cu in Intrinsic Exchange Bias in FeMn IGOR V. ROSHCHIN, PAVEL N. LAPA, DOGAN KAYA, Texas A&M University, E. SKOROPATA, J. VAN LIEROP, University of Manitoba, H. BELLIVEAU, P. JAYATHILAKA, CASEY W. MILLER, University of South Florida — We report studies of the role of Cu in the exchange bias (EB) in FeMn. The multilayers of Ta(50 Å)/[FeMn(50−450 Å)/Cu(50 Å)]$_{10}$/Ta(50 Å) exhibit EB while Ta(50 Å)/[FeMn(50−450 Å)/Ta(50 Å)]$_{10}$ show no EB. This "*intrinsic*" EB occurs between pinned and unpinned uncompensated magnetization (UM) in FeMn. The unpinned UM is distributed uniformly throughout FeMn [1]. Since the magnitude of H_e scales with the inverse thickness of FeMn, from Malozemoff's model for the bilayer EB systems, the pinned magnetization should be located near the interface of FeMn. This is consistent with the required for the EB presence of Cu. To test if Cu diffuses into FeMn, Mössbauer spectroscopy is performed using the naturally occurring ^{57}Fe in FeMn. The spectra of the samples consisting of one FeMn layer (50 and 150 Å) with and without Cu show two components: One corresponds to the "bulk" FeMn, while the other is attributed to Fe-rich areas of FeMn. These areas are likely to be the source of the unpinned UM. No measurable difference in these spectra for the samples with and without Cu indicates that Cu is unlikely to diffuse into FeMn, contrary to the previously proposed hypothesis [1].

[1] D. Kaya *et al.*, J. Appl. Phys., **113**, 17D717 (2013).
[2] A. P. Malozemoff, Phys. Rev. B **35**, 3679 (1987), *ibid.*, **37**, 7673 (1988).

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