Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Effects of interfacial frustration in ferromagnet/antiferromagnet bilayers[1] SERGEI URAZHDIN, TIANYU MA, Emory University — While the ferromagnet (F)/antiferromagnet (AF) bilayers have been extensively studied in the context of exchange bias, and more recently in the context of antiferromagnetic spintronics, the fundamental understanding of the nature of the magnetic state in this system is still a subject a debate. We will present measurements of magnetization aging in several F/AF systems based on AF=FeMn, CoO, and NiO, universally observed in all of these systems when AF layers are sufficiently thin. Quite generally, the aging curves are well-described by the power law with a small exponent. We show that the aging characteristics such as the dependence on temperature and the magnetic history are inconsistent with the Arrhenius activation, disproving the granular models of exchange bias. Furthermore, we show that the aging characteristics qualitatively change across the exchange bias blocking temperature, demonstrating that the latter is similar to the glass transition temperature, and is not simply of a characteristic activation temperature of the AF domains. We discuss the our findings in the context of frustration due to the random effective exchange field at the F/AF interface.

[1]supported by NSF DMR

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Date submitted: 11 Nov 2016 Electronic form version 1.4