

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Dynamics of Spontaneous Magnetization Reversal in Exchange Biased Bilayers¹ ZHI-PAN LI, CASEY W. MILLER, IGOR V. ROSHCHIN, IVAN K. SCHULLER, Physics Department, UC San Diego, La Jolla, CA 92093 — We observe a temperature-driven magnetization reversal of a ferromagnet (FM= Ni, Co) magnetization under a constant magnetic field, when it is exchange biased by an antiferromagnet (AF=FeF₂). We attribute this phenomenon to the competition of the AF interfacial coupling and the FM Zeeman energy. This striking behavior allows us to investigate the AF dynamics through the FM reversal behavior. We found that the magnitude of FM reversal for a given cooling field strongly depends on the cooling speed, and the wait time around the Néel temperature. This shows the magnetic viscosity of the AF around its phase transition temperature. Moreover, by thermal cycling, the FM exhibits successive spontaneous reversal. This thermal training effect further points to high energy barriers resulting in slow dynamic processes of the system.

¹Work supported by US-DOE and Cal(IT)2.

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Date submitted: 30 Nov 2005

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