Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Aging in Co/Cr Superlattices T. MUKHERJEE, University of Nebraska-Lincoln, M. PLEIMLING, Virginia Polytechnic Institute and State University, CH. BINEK, University of Nebraska-Lincoln — Aging phenomena are observed in various systems brought into non-equilibrium and subsequently showing slow relaxation dynamics. Magnetic specimens with well defined interactions and dimensions can serve as model systems for universal aspects of aging. Magnetic thin films provide access to a wide range of microscopic parameters. Superlattice structures allow tuning the intra and inter-plane exchange and enable geometrical confinement of the spin fluctuations. We use Co/Cr thin film superlattices to study magnetic aging. The static and dynamic properties are affected via the Co and Cr film thicknesses. T_C of the Co films is reduced from the bulk value by geometrical confinement. Non-ergodic behavior sets in at a tunable temperature T^* in a range of some 100K above zero. Cr provides antiferromagnetic coupling between the Co films. Non-equilibrium spin states are set via low field cooling in 5mT in-plane magnetic field to below T^*. Next various in-plane magnetic set fields of some 10-100 mT are applied and the sample is exposed to the latter for various waiting times t_w, respectively. After removing the field, relaxation of the magnetization is recorded via longitudinal Kerr-magnetometry. The relaxation data are analyzed by scaling plots revealing universal aspects of aging. Financial support by Teledyne-Isco, NRI, and NSF through EPSCoR, Career DMR-0547887, and MRSEC.

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Date submitted: 20 Nov 2008 Electronic form version 1.4