Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Competing magnetic interactions and interfacial frozen spin in Ni-NiO core-shell nano-rods[1] YUAN-CHIEH TSENG, HAO-CHUN HSU, CHIH-CHIEH LO, National Chiao Tung University, NATIONAL CHIAO TUNG UNIVERSITY TEAM — This work investigates the complex interfacial magnetism of free- standing Ni-NiO core-shell rods fabricated by electroless plating and an anodic aluminum oxide template. Vertical magnetization shift, arising from opposite field cooling conditions, suggests frozen spin (FS) at the Ni-NiO interface. The FS was related to the pinning effects of the NiO on the Ni, which mediated the interfacial antiferromagnetic (AFM)-ferromagnetic (FM) coupling, leading to the temperature-dependent properties of the rods. The FS was evident below 100 K, at which point the NiO-AFM dominated the properties with a suppressed coercive field and non-saturated magnetization. Above 100 K, however, the Ni-FM dominated and the FM phase was restored, due to the disappearance of the FS.

[1]The work is supported by the National Science Council of Taiwan under Grant No. NSC 98-2112-M-009 022-MY3.

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Date submitted: 21 Sep 2011 Electronic form version 1.4