

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Neutron Reflectivity Study in Py/CoO Exchange Bias System**

SAN-WEN CHEN, XIANGSHUN LU, SUNIL SINHA, Dept. of Physics, University of California, San Diego, AMI BERKOWITZ, ERIC FULLERTON, KEITH CHAN, Center of Magnetic Recording Research, University of California, San Diego, VALARIA LAUTER, HAILEMARIAM AMBAYE, Neutron Science Divn., Oak Ridge National Laboratory, ELIZABETH BLACKBURN, University of Birmingham, UK — We have studied the permalloy-cobalt monoxide exchange bias system using polarized neutron reflectivity. Both polycrystalline and epitaxial single crystalline (with the (111) and (100) CoO planes at the interface) CoO films were studied. By fitting the reflectivity for both directions of the applied field relative to the cooling field, we are able to obtain both the nuclear and spin depth profiles, as well as locating the pinned spins which are responsible for the exchange bias effect. The pinned spins at the interface can be resolved in the polycrystalline sample, which is consistent with our previous study with resonant soft x-ray reflectivity. One could reasonably have expected a stronger exchange bias effect in the (111) single crystal CoO film, because it has more uncompensated spins at the interface. The neutron reflectivity, however, shows lesser pinned spins. In the presentation, we will show the difference between the magnetic density profiles of the samples involving polycrystalline, (111) and (100) single crystalline CoO films respectively.

San-Wen Chen  
Dept. of Physics, University of California, San Diego

Date submitted: 19 Nov 2010

Electronic form version 1.4