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Pinned magnetization in the exchange bias system Permalloy/CoO SUJOY ROY, Advanced Light Source, Lawrence Berkeley National Laboratory, ELIZABETH BLACKBURN, University of California, San Diego, CECILIA SANCHEZ-HANKE, Brookhaven National Laboratory, SUNIL SINHA, AMI BERKOWITZ, University of California, San Diego — Interfacial effects are understood to be crucial in the development of exchange bias. In particular, the role of uncompensated spins is important, although because the interface is buried these uncompensated spins can be difficult to measure. Penetrating radiation such as neutrons or x-rays are one of the few tools available to do this. The problem of exchange bias is further complicated by the myriad differences observed from system to system, indicating that the local environment of the magnetic ions has a strong effect on the type of coupling that dominates across the interface. In turn, understanding this coupling is vital in understanding the microscopic origin of exchange bias in a given system. In this paper, we present soft x-ray reflectivity data that show that in the exchange biased state (i.e. below the Neel temperature 289 K for CoO) there is an interfacial layer between the Py and CoO that possesses a net magnetization at room temperature. In the exchange biased state, this contains the uncompensated spins from the CoO layer, and a significant fraction of the spins in this layer are pinned.

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