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## Recent Work

### Title

Vectormagnetometry studies of exchange biased systems using soft x-ray magnetic dichroism

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### Publication Date

2004-07-23

**Vectormagnetometry studies of exchange biased systems using soft x-ray magnetic dichroism**

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The most basic property of a magnetic system is the response of the magnetic moment, both in magnitude and direction, to an applied excitation like an external magnetic field. For most multilayered magnetic device applications (magnetic recording media, magnetic random access memory, etc.), it is the change of the relative magnetization directions that defines the operation of the device and is therefore necessarily the critical process which must be thoroughly characterized and understood.

The full characterization of the magnetic moment vector in a single component film can be straightforwardly accomplished by standard magnetometry techniques like SQUID or vibrating sample magnetometry (VSM). We employed the demonstrated capabilities of soft x-ray magnetic dichroism to study the magnetization vector reversal in multi-layered, multi-element and heteromagnetic structures. We will present evidence of the creation of an exchange spring in an antiferromagnet due to exchange coupling to a ferromagnet [1] and first results of our efforts investigating the parallel ferromagnetic domain wall in exchange biased systems. The correlation between exchange bias and pinned interfacial spins in exchange biased bilayer systems will also be discussed [2].

The Advanced Light Source is supported by the Director, Office of Science, Office of Basic Energy Sciences, Materials Sciences Division, of the U.S. Department of Energy

[1] A. Scholl et al., submitted for publication (2004).

[2] H. Ohldag et al., Phys. Rev. Lett. **91**, 017203 (2003).