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Type: **Poster**

Epitaxial multiferroic composite heterostructures probed with x-rays and neutrons

Friday, 16 September 2011 12:29 (2 minutes)

In this work, we have used element-specific soft X-ray photoemission electron microscopy (X-PEEM) and polarized neutron reflectivity (PNR) to determine the influence of piezoelectric-ferroelectric BaTiO₃ (BTO) on the magnetic properties of magnetostrictive ferromagnetic spinel CoFe₂O₄ and NiFe₂O₄ thin films. By using a combination of circular and linear dichroism spectro-microscopy as well as neutron reflectivity, we have spatially mapped magneto-electric interactions in a model system of a ferroelectric substrate with an epitaxial ferromagnetic film as cap layer. By performing temperature, angular, and polarization dependent studies, we have found that this strain-induced effect strongly influences the magnetic anisotropy of individual 250 nm wide magnetic domains of the spinel films. The observation of magneto-electric interactions in individual domains has provided valuable insight into strain-driven domain nucleation and reorientation, important for implementation of artificial multiferroic materials in devices utilizing electric-field control of the magnetization.

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Multiple Order Parameter Systems

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