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**Magnetic properties of $La_{0.7}Sr_{0.3}MnO_3/BaTiO_3$ interfaces**[1] YAOHUA LIU, S.G.E. TE VELTHUIS, Materials Science Division, Argonne National Laboratory, Argonne, IL, USA, J.W. FREELAND, Advanced Photon Source, Argonne National Laboratory, Argonne, IL, USA, N.J. TORNOS, C. LEON, J. SANTAMARIA, GFMC. Depto. Fisica Aplicada III. U. Complutense, Madrid, Spain
— Interfaces between the ferromagnetic (FM) and ferroelectric (FE) oxides may host nanoscale multiferroic phases with strong magnetoelectric coupling, which can be potentially utilized for energy-efficient spintronics. In this work, we have investigated the magnetic properties of the interface between ferromagnetic $La_{0.7}Sr_{0.3}MnO_3$ (LSMO) and ferroelectric $BaTiO_3$ (BTO) via X-ray resonant magnetic scattering (XRMS) and X-ray magnetic circular dichroism (XMCD) on a series of 10 nm LSMO / t BTO bilayers, with t = 1.2, 2.4 and 4.8 nm, respectively. Additionally, we have studied a LSMO/BTO/LSMO trilayer. Interestingly, we have observed magnetic dichroism from Ti ions between 30 K and 210 K, which closely tracks the Mn's dichroism during the magnetization reversal. In contrast, no Ti magnetization has been observed in a single-layer BTO film on a $SrTiO_3$ substrate. These results suggest that there are $Ti^{3+}$ ions that reside at the LSMO/BTO interfaces and the interfacial Mn and Ti moments are exchange coupled.

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Yaohua Liu
Materials Science Division, Argonne National Laboratory, Argonne, IL, USA

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