Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Interfacial magnetic properties of $La_{0.7}Sr_{0.3}MnO_3$ / $BaTiO_3$ bilayers[1] SUZANNE G.E. TE VELTHUIS, YAOHUA LIU, Materials Science Division, Argonne National Laboratory, USA, C. KINANE, T. CHARLTON, ISIS, STFC Rutherford Appleton Laboratory, Didcot, United Kingdom, J.W. FREELAND, Advanced Photon Source, Argonne National Laboratory, USA, J. TORNOS, C. LEON, J. SANTAMARIA, GFMC, Dpto. Fisica Aplicada III, Univ. Complutense Madrid, Spain — Interfaces between the ferromagnetic and ferroelectric oxides may host artificial multiferroic phases with a strong magnetoelectric coupling, which can potentially be utilized for energy-efficient spintronics. Key for potential applications is that the magnetization of the ferromagnet is preserved at the interface, which is not always the case in complex oxide systems. In this work, we have explored the interfacial magnetic properties of ferromagnetic La0.7Sr0.3MnO3 and ferroelectric $BaTiO_3$ bilayers. The samples studied consist 10 nm $La_{0.7}Sr_{0.3}MnO_3$/ t $BaTiO_3$ (LSMO/BTO) and t $BaTiO_3$ (LSMO/BTO)/10 nm $La_{0.7}Sr_{0.3}MnO_3$ bilayers grown on $SrTiO_3$ substrates, with t = 1.2, 2.4 and 4.8 nm. Results from X-ray resonant magnetic scattering, X-ray magnetic circular dichroism, and x-ray and polarized neutron reflectometry are combined to provide insights into how the interfacial magnetization of $La_{0.7}Sr_{0.3}MnO_3$ is influenced by the presence of the adjacent $BaTiO_3$. We find a modified interfacial magnetization in the ferromagnetic manganite layer that is dependent on the thickness and relative position of the ferroelectric layer.

[1]Work at ANL supported by US-DOE, Office of Science, Basic Energy Sciences

Suzanne G.E. te Velthuis
Materials Science Division, Argonne National Laboratory, USA

Date submitted: 15 Nov 2013 Electronic form version 1.4