Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

The effect of interfacial octahedral behavior on magnetic properties in ultrathin manganite films[1] EUN JU MOON, Dep. of Materials Science and Engineering, Drexel Univ., X.M. CHENG, Dep. of Physics, Bryn Mawr College, D.J. KEAVNEY, Advanced Photon Source, Argonne National Lab., S.J. MAY, Dep. of Materials Science and Engineering, Drexel Univ. — In ABO_3 perovskites, the rotation and distortions of BO_6 octahedra lead to crystal symmetric variants of the basic perovskite structure. The rotation angles play a role in magnetic exchange with previous work demonstrating a clear relationship between bond angles and ordering temperatures. Recent work has shown that heteroepitaxial oxide films can be stabilized with non-equilibrium crystal structures due to structural coupling of octahedral behavior across the substrate/film interface. However, it is not yet apparent how the crystal symmetry across a heteroepitaxial oxide interface contributes to magnetic properties. Here, we report on the effect of crystal symmetry in $La_{0.67}Sr_{0.33}MnO_3$ (LSMO), a canonical magnetic oxide, grown using molecular beam epitaxy on different symmetric substrates with similar lattice parameters. For this study, we have used x-ray magnetic circular dichroism, transport, and magnetoresistance measurements to explore the magnetic properties of ultrathin LSMO films for a direct comparison of magnetic behavior in isocompositional perovskites with different octahedral behavior.

[1]Work at Drexel Univ. supported by the U.S. ARO (W911NF-12-1-0132). Work at the Advanced Photon Source supported by the U.S. DOE, Office of Basic Energy Sciences (DE-AC02-06CH11357). Work at Bryn Mawr College supported by NSF DMR-1053854.

E. J. Moon
Dep. of Materials Science and Engineering, Drexel Univ.

Date submitted: 21 Dec 2012 Electronic form version 1.4