Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Cation Ordering in Layered Nickelates BRITTANY NELSON-CHEESEMAN, School of Engineering, University of St. Thomas & Materials Science Division, Argonne National Laboratory, HUA ZHOU, Advanced Photon Source, Argonne National Lab, ANTONIO CAMMARATA, Dept of Materials Science and Engineering, Drexel University, JASON HOFFMAN, Materials Science Division, Argonne National Lab, PRASANNA BALACHANDRAN, JAMES RONDINELLI, Dept of Materials Science and Engineering, Drexel University, ANAND BHATTACHARYA, Materials Science Division & Center for Nanoscale Materials, Argonne National Lab — The single layer Ruddlesden-Popper nickelates present a model system to understand how the effects of digital dopant cation ordering may affect the properties of 2-dimensional conducting sheets. We investigate the effects of aliovalent A-site cation order on $LaSrNiO_4$ films. Using molecular beam epitaxy, we interleave full layers of SrO and LaO in a series of chemically equivalent films, varying the pattern of SrO and LaO layers relative to the NiO_2 layers. Through synchrotron surface x-ray diffraction and Coherent Bragg Rod Analysis (COBRA), we directly investigate the A-site cation order and the resulting atomic displacements for each ordering pattern. We correlate these results with theoretical calculations and transport measurements of the layered nickelate films.

Brittany Nelson-Cheeseman
School of Engineering, University of St. Thomas &
Materials Science Division, Argonne National Laboratory

Date submitted: 20 Nov 2012 Electronic form version 1.4