Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Energy-loss magnetic circular dichroism measurements of ferromagnetic ordering in $LaSrCoO_3$[1] AHMET GULEC, ROBERT F. KLIE, University of Illinois at Chicago, JOHN F. MITCHELL, The Materials Science Division at Argonne National Laboratory — Experimental results show that tuning the ferromagnetism of $LaSrCoO_3$ can be achieved at various temperatures by doping bulk sample with smaller atoms or straining thin film sample. In this work, we will use atomic-resolution Z-contrast imaging, annular bright field (ABF) imaging and electron energy-loss spectroscopy in the aberration-corrected JEOL JEM-ARM200CF in combination with in-situ heating and cooling experiments to examine the magnetic and spin-state transitions in $La_{1-x}Sr_xCoO_3$ (x=0-0.3) between 80 K and 600 K. Using energy-loss magnetic circular dichroism method, we confirm the magnetic ordering transition at room temperature with increasing doping concentrations. Differences in the O K- and Co-L-edges will be utilized to determine the Co valence of the samples. A magnetic transition is observed in 5% doped sample during in-situ cooling experiment to 95 K. Additionally, with increasing the doping concentration, a change in crystal structure is measured using ABF imaging, more specifically a distortion of the CoO_6 octahedra.

[1]NSF CAREER Award DMR-0846748

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Date submitted: 09 Nov 2012 Electronic form version 1.4