Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

LSCO: Consistent agreement for electronic structure and experimental X-ray spectra Y. LEE, B.N. HARMON, Ames Laboratory and Dept. Physics and Astronomy, Iowa State University, S. MEDLING, F. BRIDGES, Dept. of Physics, University of California, Santa Cruz, H. ZHENG, J.F. MITCHELL, Materials Science Division, Argonne National Laboratory, J.W. FREELAND, Advanced Photon Source, Argonne National Laboratory, AMES LABORATORY AND DEPT. PHYSICS AND ASTRONOMY, IOWA STATE UNIVERSITY COLLABORATION, DEPT. OF PHYSICS, UNIVERSITY OF CALIFORNIA SANTA CRUZ COLLABORATION, MATERIALS SCIENCE DIVISION, ARGONNE NATIONAL LABORATORY COLLABORATION, ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LABORATORY COLLABORATION — We have investigated magnetic properties of $La_{1-x}Sr_xCoO_3$ (LSCO) as a function of Sr doping with X-ray absorption spectroscopy (XAS), x-ray magnetic circular dichroism(XMCD) at the O K edge and a first principles method. Experiment shows the peak of the oxygen XAS at beginning of the edge is increased with increasing Sr doping. The calculations, using supercells, are in good agreement with detailed XAS of the O K-edge as a function of doping. XMCD calculations reproduce the full experimental spectrum well, and show an increase of the magnetic moment on the oxygen with the number of Sr nearest neighbors. The calculations show that the hybridization involving Co d- and O-p electrons is the key factor for obtaining agreement with the changing XAS spectra as a function of doping. In this talk, we will discuss the XAS, XMCD results and the large external magnetic field effects on the ground state of LSCO(x=0).

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Date submitted: 27 Dec 2012 Electronic form version 1.4