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X-ray Magnetic Circular Dichroism Study of $La_{(1-x)}Sr_xMnO_3$ Thin Films[1] XILEI KUANG, ZHUYUN XIAO, Bryn Mawr College, EUN JU MOON, STEVEN MAY, Drexel University, DAVID KEAVNEY, YAOHUA LIU, Argonne National Laboratory, X.M. CHENG, Bryn Mawr College — The perovskite manganite $La_{(1-x)}Sr_xMnO_3$ (LSMO) has attracted great attention recently due to its fundamental physics and potential applications in spintronics and data storage. In this work, we report a temperature-dependent x-ray magnetic circular dichroism (XMCD) study of epitaxial LSMO thin films deposited on orthorhombic $NdGaO_3$ (NGO) substrates grown by the molecular beam epitaxy (MBE) method. Small angle x-ray reflectivity and atomic force microscopy (AFM) results confirmed good epitaxial quality. XMCD measurements were performed at beamline 4-ID-C of the Advanced Photon Source at Argonne National Laboratory. XMCD spectra were taken in a 0.5 tesla field at temperatures ranging from 5 K to 180 K after the 0.5 tesla field cool. The total electron yield absorption spectra showed the oxide state characteristics of Mn, and the shapes of the Mn and O dichroism spectra change with temperature.

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