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Aberration-corrected STEM-EELS studies of epitaxial La0.5Sr0.5CoO3 thin films
MARIA VARELA, Oak Ridge National Laboratory, JAUME GAZQUEZ, NEVEN BISKUP, Universidad Complutense, Spain, STEPHEN PENNYCOOK, Oak Ridge National Laboratory, MARIA TORIJA, MANISH SHARMA, SHAMEEK BOSE, CHRIS LEIGHTON, University of Minnesota — Cobaltite thin films provide a unique opportunity to study magneto-electronic phase separation, which can be strong in this reduced dimensionality environment. Here we present an investigation of epitaxial La0.5Sr0.5CoO3 thin films on SrTiO3 and LaAlO3 substrates by scanning transmission electron microscopy and electron energy loss spectroscopy. The different degrees of strain and also different orientations of the substrates (such as (001) vs. (110)) induce major changes of the crystal structure and the depth profile of the chemical composition, observed both in the La/Sr and O sub-lattices. These effects can lead to lower effective doping level at the interface, favoring interfacial magneto-electronic phase separation. Research Council Starting Investigator Award (JS, NB) and the U.S. Dept. of Energy, Office of Basic Energy Sciences, Materials Sciences and Engineering Div. (MV, SJP). Work at UMN supported by NSF and DOE (scattering).

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