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Reciprocal Space Mapping of Thin $\text{La}_x \text{MnO}_3$ Films of Varying Thickness M.A. DELEON, T. TYSON, New Jersey Institute of Technology, Applied Physics, C. DUBOURDIEU, Laboratoire des Matériaux et du Génie Physique UMR CNRS 5628, INPG, 38402 St.Martin d'Hères, France, J. BAI, ORNL — In order to understand the growth of ultrathin manganite films on substrates, we made reciprocal space maps in the 004, 404, and 044 pseudocubic directions of La_xMnO_3 films deposited on LaAlO_3 (LAO) via metal-organic chemical vapor deposition. The x-ray maps exhibit the strain effects of the lattice-substrate mismatch and the effects of a twinned interface on the growth of films. Reciprocal space mapping provides more accurate lattice parameters and strain effects from lattice-substrate interface mismatch. A characteristic feature of the LAO substrates is twinning, which results in multiple structural components of the films, similar lattice parameters but differing orientation. These characteristics reveal crucial aspects of deposition processes to be inspected in assuring high-quality films. This research is supported by NSF DMR-0209243 and DMR-0512196.

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