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Controlling Orthorhombic Domain Orientations in Epitaxial LaPrCaMnO Thin Films[1] JOHN BUDAI, Oak Ridge National Laboratory, T. ZAC WARD, Univ. of Tennessee, JON TISCHLER, JIAN SHEN, Oak Ridge National Laboratory — Microstructural effects such as strain and domain formation are known to influence the physical properties of transition metal oxide materials. For epitaxial films, lattice mismatch with the substrate can be used to investigate the effects due to in-plane biaxial tensile or compressive strain. Using synchrotron x-ray diffraction at the Advanced Photon Source, we have investigated the temperature-dependent lattice parameters and orthorhombic domain orientations for distorted perovskite LaPrCaMnO thin films grown on several different substrates (SrTiO3, LaAlO3, SrLaGaO4, NdGaO3). We find that structural phase transition in the substrate can have a large effect on the film. More generally, we find that tensile and compressive stresses generate different orthorhombic domain orientations and can be used to control the microstructure of the LPCMO films .

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