

Abstract Submitted
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Electrical and Structural Properties of Lattice-Mismatched Calcium Manganese Oxide Thin Films¹ CACIE HART, ZOHEY WARECKI², ADEEL CHAUDHRY, NATALIE FERRONE, GRACE YONG, Towson University — Electron-doped $\text{CaMnO}_{3-\delta}$ thin films are of interest for use in renewable energy applications because of their oxygen stoichiometry. We have investigated the properties of $\text{CaMnO}_{3-\delta}$ films epitaxially grown by pulsed laser deposition on LaAlO_3 and SrTiO_3 substrates, both of which have larger in-plane lattice parameters than $\text{CaMnO}_{3-\delta}$. This lattice-mismatch leads to bi-axial tensile strain in the thin films. We have characterized the thickness dependence of structural and electrical properties of these films using high resolution x-ray diffraction and temperature-dependent electrical resistivity measurements. We found that the thickness dependence is characteristically different from what has been previously observed for hole-doped manganite thin films. Our results suggest that the electrical and structural properties of $\text{CaMnO}_{3-\delta}$ are related to a coupling between the tensile strain and the oxygen deficiency in the thin films.

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