

Abstract Submitted  
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**Lattice-mismatch Strain Effects in Electron-Doped Calcium Manganese Oxide Thin Films**<sup>1</sup> CACIE HART, GRACE YONG, ZOEY WARECKI, ADEEL CHAUDHRY, PRAKASH SHARMA, ANTHONY JOHNSON, DAVID SCHAEFER, RAJESWARI KOLAGANI, Towson University — Electron-doped Calcium Manganese Oxide ( $\text{CaMnO}_{3-\delta}$ ) thin films are of interest for use as photocatalysts and fuel cell electrodes in renewable energy applications. Oxygen stoichiometry of the films is a key parameter for the functionality in these applications. Currently, we are investigating the properties of ( $\text{CaMnO}_{3-\delta}$ ) films grown by pulsed laser deposition. The thin films are epitaxially grown on  $\text{LaAlO}_3$  and  $\text{SrTiO}_3$  substrates. Both of these substrates have larger in-plane lattice parameters than  $\text{CaMnO}_{3-\delta}$ , which leads to bi-axial tensile strain in the thin films. We have characterized the thickness dependence of structural, electrical, and morphological properties of these films using high resolution x-ray diffraction, temperature dependent electrical resistivity measurements, and atomic force microscopy. The thickness dependence is characteristically different from what has been previously observed in thin films of hole-doped manganites. Our results suggest that coupling between tensile strain and oxygen deficiency affect the electrical and structural properties of the material.

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