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Tensile Strain Effects on the Magneto-transport in Calcium Manganese Oxide Thin Films: Comparison with its Hole-doped Counterpart[1]
BRIDGET LAWSON, SAMUEL NEUBAUER, ADEEL CHAUDHRY, CACIE HART, NATALIE FERRONE, DAVID HOUSTON, GRACE YONG, RAJESWARI KOLAGANI, Towson University — Magnetoresistance properties of the epitaxial thin films of doped rare earth manganites are known to be influenced by the effect of bi-axial strain induced by lattice mismatch with the substrate. In hole-doped manganites, the effect of both compressive and tensile strain is qualitatively consistent with the expected changes in unit cell symmetry from cubic to tetragonal, leading to Jahn-Teller strain fields that affect the energy levels of Mn3+ energy levels. Recent work in our laboratory on $CaMnO_3$ thin films has pointed out that tetragonal distortions introduced by tensile lattice mismatch strain may also have the effect of modulating the oxygen content of the films in agreement with theoretical models that propose such coupling between strain and oxygen content. Our research focuses on comparing the magneto-transport properties of hole-doped manganite $LaCaMnO_3$ thin films with that of its electron doped counter parts, in an effort to delineate the effects of oxygen stoichiometry changes on magneto-transport from the effects of Jahn-Teller type strain.

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