Abstract Submitted
for the MAS16 Meeting of
The American Physical Society

Structure, Transport and Magnetoresistance Properties of Tensile Strained CaMnO3 Thin Films.[1] BRIDGET LAWSON[2], DUSTIN ULLERY[3], ADEEL CHAUDHRY[4], SAMUEL NEUBAUER[5], CACIE HART[6], RAJESWARI KOLAGANI[7], Department of Physics, Astronomy and Geosciences, Towson University — We will present our studies of the structure, transport and magnetoresistance properties of tensile strained CaMnO3 thin films. We observe that the resistivity decreases significantly as the film thickness decreases. The decrease in resistivity is more pronounced in the films on (100) SrTiO3 with the larger lattice mismatch, the resistivity of the thinnest films being about 3 orders of magnitude lower than the of bulk CaMnO3. Structural changes accompanying resistivity changes cannot be fully explained as due to tensile strain, and suggest the presence of oxygen vacancies. These results suggest a coupling between tensile strain and oxygen deficiency, consistent with predictions from models based on density functional theory calculations. We observe a significant change in resistance under the application of magnetic field.

[1]We acknowledge support from the Towson Office of University Undergraduate Research, Fisher Endowment Grant and Undergraduate Research Grant from the Fisher College of Science and Mathematics, and Seed Funding grant from the School of Emerging technologies
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Date submitted: 03 Oct 2016 Electronic form version 1.4