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Structure, Transport and Magnetoresistance Properties of Tensile Strained CaMnO3 Thin Films. BRIDGET LAWSON, DUSTIN ULLERY, ADEEL CHAUDHRY, SAMUEL NEUBAUER, CACIE HART, RAJESWARI KOLAGANI, 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.

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2Undergraduate Student
3Undergraduate Student
4Undergraduate Student
5Undergraduate Student
6Undergraduate Student
7Professor of Physics

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Rajeswari Kolagani
Towson University