

Abstract Submitted  
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**Substrate induced strain effects on the multiferroism of BiMnO<sub>3</sub> thin films**<sup>1</sup> HYOUNG JEEN JEEN, PATRICK MICKEL, A.F. HEBARD, AM-LAN BISWAS, Department of Physics, University of Florida, Gainesville, FL 32611, VALENTIN CRACIUN, Major Analytical Instrumentation Center University of Florida Gainesville, FL 32611 — BiMnO<sub>3</sub> is a single phase multiferroic material, which shows ferroelectricity and ferromagnetism at low temperature. However, it is difficult to grow BiMnO<sub>3</sub> either in bulk or thin film form, since it is metastable with substantial desorption of Bi ions at high growth temperature. Here we have used SrTiO<sub>3</sub> and SrLaGaO<sub>4</sub> substrates, which provide different degrees of compressive strain, to stabilize the BiMnO<sub>3</sub> phase and have introduced fast quenching after deposition in oxygen atmosphere to suppress re-evaporation of Bi-ions but retain film crystallinity. Surface morphology indicates island growth mode. X-ray diffraction (XRD) shows that the BiMnO<sub>3</sub> [111] is parallel with [001] SrTiO<sub>3</sub> and [001] SrLaGaO<sub>4</sub>. XRD results confirm that the BiMnO<sub>3</sub> films on SrTiO<sub>3</sub> substrates are epitaxial, with in-plane alignment. The films have a magnetization of 1  $\mu_B$ /Mn at 5 T and 10 K. We also observed ferroelectricity in our BiMnO<sub>3</sub> films. Based on these results, we will discuss the substrate induced strain effects on the multiferroic properties of BiMnO<sub>3</sub> thin films.

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