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Epitaxial growth and electrical properties of *perovskite* $HoMnO_3$ thin films DAISUKE KAN, M. MURAKAMI, Department of Materials Science and Engineering, University of Maryland, W. YU, R.L. GREENE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland, S.W. CHEONG, Department of Physics and Astronomy, Rutgers University, I. TAKEUCHI, Department of Materials Science and Engineering, University of Maryland — Recently, it was predicted that orthorhombic $HoMnO_3$ would exhibit relatively large polarization (of the order of $\mu C/cm^2$) due to the existence of a ferroelectric order in the *E*- type magnetic structure [1]. We have fabricated perovskite $HoMnO_3$ thin films on $SrTiO_3$ (001) substrates by pulsed laser deposition. X-ray 2θ-θ scan shows (00 l) peaks only indicating that there are no secondary phases. The reciprocal space mapping around the $SrTiO_3$ (103) Bragg reflection and the ϕ scan of the $HoMnO_3$ (103) peak reveals the tetragonal symmetry of the films and the epitaxial relationship, [100]$HoMnO_3$ // [100]$SrTiO_3$ and [001] $HoMnO_3$ // [001]$SrTiO_3$, confirming that the film has the perovskite structure and not the hexagonal one. The films show good insulating properties at low temperatures. We will present electrical properties of the films including results of PUND measurements in applied magnetic field below the Neel temperature. This work is supported by NSF MRSEC, ARO, and the W. M. Keck Foundation.
[1] Sergienko et al., PRL 97, 227204 (2006).

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