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Growth, structural, dielectric and magnetic properties of epitaxial multiferroic $NaMnF_3$ thin films[1] AMIT KC, PAVEL BORISOV, West Virginia Univ, DAVID LEDERMAN, West Virginia Univ, University of California Santa Cruz — Epitaxial $NaMnF_3$ thin films were grown on $SrTiO_3$ (100) single crystal substrates via molecular beam epitaxy (MBE). The orthorhombically distorted perovskite fluoride $NaMnF_3$ (*Pnma* space group) has been predicted to have a polar instability at low temperatures due to MnF_6 octahedral tilts. Structural, magnetic and dielectric properties were studied. Thin film structural quality as a function of the substrate temperature and film thickness was investigated using X-ray diffraction (XRD), in-situ reflection high-energy electron diffraction (RHEED), and atomic force microscopy (AFM). The best films were smooth and single phase grown with four different twin domains. Magnetic characterization was performed using superconducting quantum interference device (SQUID) magnetometry. In-plane magnetization measurements revealed antiferromagnetic ordering with a Neel temperature $T_N = 66$ K. For the dielectric studies, $NaMnF_3$ films were grown on top of $SrRuO_3$ (100) buffer layers grown via pulsed laser deposition that were used as bottom electrodes. Dielectric spectroscopy was performed at different temperatures between 11K and room temperature in a frequency range 100 Hz to 100 kHz. Significant temperature dependent dielectric properties were observed.

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