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Growth and Structural Study of Epitaxial NaMnF₃ Thin Films on SrTiO₃ AMIT KC, TRENT JOHNSON, PAVEL BORISOV, DAVID LEDERMAN, WVU — Perovskite fluorides (ABF₃) exhibit many interesting phenomena, e.g. dipolar and magnetic long-range order superconductivity, as well as magnetoelectric coupling. Recently, G. C. Garcia-Castro et al. predicted that orthorhombically distorted *Pnma* NaMnF₃ perovskite should have a particularly soft ferroelectric mode, and is expected to demonstrate ferroelectric order regardless of elastic strain, despite the competing antiferrodistortive instability. Thus, in combination with weak ferromagnetic order, this material is expected to be multiferroic¹. Here, we report the growth of epitaxial NaMnF₃ thin films on SrTiO₃(100) single crystal substrates via Molecular Beam Epitaxy (MBE). Structural qualities of the films were studied as a function of the substrate temperature and film thickness by the techniques of X-ray diffraction (XRD), in-situ reflection high-energy electron diffraction (RHEED), and atomic force microscopy (AFM). The best films were smooth single phase NaMnF₃, grown with four in-plane and two out-of-plane twin domains.

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