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Weak ferromagnetism and short range polar order in $NaMnF_3$ thin films[1] AMIT KC, University of California Santa Cruz, PAVEL BORISOV, West Virginia University, VLADIMIR SHVARTSMAN, University Duisburg-Essen, DAVID LEDERMAN, University of California Santa Cruz — The orthorhombically distorted perovskite NaMnF3 has been predicted to become ferroelectric if an a = c distortion of the bulk *Pnma* structure is imposed. In order to test this prediction, $NaMnF_3$ thin films were grown on $SrTiO_3$ (100) single crystal substrates via molecular beam epitaxy. The best films were smooth and single phase with four different twin domains. In-plane magnetization measurements revealed the presence of antiferromagnetic ordering with weak ferromagnetism below the Néel temperature T_N = 66 K. For the dielectric studies, $NaMnF_3$ films were grown on a 30 nm $SrRuO_3$ (100) layer used as a bottom electrode grown via pulsed laser deposition. The complex permittivity as a function of frequency indicated a strong Debye-like relaxation contribution characterized by a distribution of relaxation times. A power-law divergence of the characteristic relaxation time revealed an order-disorder phase transition at 8 K. The slow relaxation dynamics indicated the formation of super-dipoles (superparaelectric moments) that extend over several unit cells, similar to polar nanoregions of relaxor ferroelectrics.

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