

Abstract Submitted
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Dependence of the Properties of MBE-grown Multiferroic YMnO₃/GaN Heterostructures on the Growth Temperature and Post-growth Annealing Processes¹ TAO LIU, YEWHEE CHYE, CAMERON KEENAN, THOMAS MYERS, DAVID LEDERMAN, Multifunctional Materials Laboratory, Dept of Physics, West Virginia University — We report on the molecular beam epitaxy (MBE) of multiferroic YMnO₃ on c-plane GaN. Study and understanding of these YMnO₃/GaN heterostructures are important for potential applications in multifunctional materials and structures. Atomic force microscopy revealed that the YMnO₃ films grown at different temperatures have significantly different morphologies. X-ray diffraction showed that there is a 30° rotation between the unit cells of YMnO₃ and GaN. Samples grown at the optimal growth temperature are ferroelectric at room temperature, with a large remnant polarization, and magnetic at low temperatures. The difference between magnetic field-cooled and zero-field-cooled behavior at low temperatures indicates the presence of antiferromagnetic frustration or ferromagnetic behavior. The effects of different growth temperatures and post-growth annealing will be discussed.

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