

Abstract Submitted  
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**Structural, ferroelectric, and magnetic properties of epitaxial  $\text{YMnO}_3$  thin films grown on wurtzite-structure materials** AGHAM POSADAS, JENG-BANG YAU, JUNG HAN, CHARLES AHN, Yale University, KAREN JOHNSTON, KARIN RABE, Rutgers University, JEFFREY NEATON, Lawrence Berkeley National Laboratory, STEFANO GARIGLIO, University of Geneva — Thin films of the multiferroic oxide  $\text{YMnO}_3$  have been grown on single crystal substrates with the wurtzite crystal structure, including GaN and ZnO with different polarities. Films have also been grown on the wurtzite derivative 6H-SiC. X-ray diffraction reveals epitaxial, c-axis oriented growth on all of these crystals. The measured ferroelectric polarization is similar to that of single crystal  $\text{YMnO}_3$ , and magnetization measurements reveal frustrated antiferromagnetic ordering in the plane of the film. X-ray diffraction also reveals an epitaxial relationship that is associated with a very large ( $\sim 10\%$ ) in-plane strain for growth on GaN. This unusual observation is explained by first principles calculations of the strain and bonding energies.

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