

Abstract Submitted  
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**Nanoscale 180 Degree Stripe Domains in PbTiO<sub>3</sub> Films<sup>1</sup>** CAROL THOMPSON, Physics Dept., Northern Illinois University, D. D. FONG, G. B. STEPHENSON, J. A. EASTMAN, P. H. FUOSS, F. JIANG, Materials Science Division, Argonne National Laboratory, S. K. STREIFFER, R. -W. WANG, Center for Nanoscale Materials, Argonne National Laboratory, K. LATIFI, Physics Dept., Northern Illinois University — Nanoscale 180 degree stripe domains have been found to be the equilibrium structure of ultrathin ferroelectric films on insulating substrates [Fong, D. D. *et al.*, *Science* **304**, 1650 (2004)]. Here we report a study of the morphology of these stripe domains in PbTiO<sub>3</sub> films using room-temperature AFM imaging and high-temperature synchrotron x-ray scattering. The stripes can be aligned with surface steps, or with the underlying crystal lattice, depending upon film thickness and temperature. These equilibrium domains provide a new class of electrically active, controllable “soft” patterns in a hard material that are promising for self-assembly of oppositely charged adsorbates on sub-lithographic length scales.

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