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Epitaxial growth of (111)-oriented $LaAlO_3/LaNiO_3$ ultra-thin superlattices S. MIDDEY, D. MEYERS, M. KAREEV, E.J. MOON, B.A. GRAY, Department of Physics, University of Arkansas, Fayetteville, Arkansas 72701, USA, J.W. FREELAND, Advanced Photon Source, Argonne National Laboratory, Argonne, Illinois 60439, USA, J. CHAKHALIAN, Department of Physics, University of Arkansas, Fayetteville, Arkansas 72701, USA — The epitaxial stabilization of a single layer or superlattice structures composed of complex oxide materials on polar (111) surfaces is severely burdened by reconstructions at the interface, that commonly arise to neutralize the polarity. We report on the synthesis of high quality $LaNiO_3/mLaAlO_3$ pseudo cubic (111) superlattices on polar (111)-oriented $LaAlO_3$, the proposed complex oxide candidate for a topological insulating behavior. Comprehensive X-Ray diffraction measurements, RHEED, and element specific resonant X-ray absorption spectroscopy affirm their high structural and chemical quality. The study offers an opportunity to fabricate interesting interface and topology controlled (111) oriented superlattices based on ortho-nickelates.

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