Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Fabrication and properties of LuFeO3 thin film[1] WENBIN WANG, University of Tennessee & Oak Ridge National Lab, XIAOSHAN XU, ZHENG GAI, NINA BALKE, MIAOFANG CHI, THOMAS Z. WARD, PAUL C. SNIJDERS, Oak Ridge National Lab, JIAN SHEN, University of Tennessee & Fudan University, UNIVERSITY OF TENNESSEE TEAM, OAK RIDGE NATIONAL LAB TEAM, FUDAN UNIVERSITY COLLABORATION — We have succeeded in growing the hexagonal LuFeO3 single crystalline thin films on Al2O3(0001) substrates using Pulsed Laser Deposition (PLD). The structures, epitaxial relation between film and substrate, ferroelectric and magnetic properties of the samples were characterized by RHEED, LEED, XRD, AFM, TEM, PFM and SQUID magnetometry. The structure of our hexagonal LuFeO3 films is consistent with that of YMnO3, and the samples exhibit a piezoelectric effect at room temperature. RHEED data are consistent with a structural change from a polar P63cm (185) to non-polar P63/mmc (194) at 1050 K. SQUID measurements reveal strong magnetic order in the thin film. All the data suggests a coexistence of ferroelectricity and magnetic order in hexagonal LuFeO3 films.

[1]Research sponsored by the Division of Materials Sciences and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy.

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Date submitted: 16 Nov 2011 Electronic form version 1.4