Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Nanoscale probing of material properties across antiparallel domain wall in ferroelectrics VASUDEVA RAO ARAVIND, LILI TIAN, NOZOMI ODAGAWA, SAMRAT CHOUDHURY, PAVEL CAPEK, VOLKMAR DIEROLF, ANNA N. MOROZOVSKA, EUGENE A. ELISEEV, LONG-QING CHEN, YASUO CHO, SERGEI KALININ, VENKATRAMAN GOPALAN, Department of Materials Science and Engineering, Pennsylvania State University, University Park, PA 16802, USA — Although the intrinsic width of an ideal antiparallel ferroelectric domain wall is expected to be step-like on a unit cell level ($\sim$0.5nm), we have recently shown that actual widths of these walls can extend to $\sim$20-100nm in lithium niobate and lithium tantalate (L.Tian *et al.*, Physical Review Letters (*in review*)). In this work we study the variation of material properties coercive field and switchable ferroelectric polarization as a function of the distance from the domain wall in lithium niobate. Until recently, the study of these material properties on the nanoscale were limited by the lack of theoretical modeling of the instrument resolution limits. Using experimental results and theoretical modeling we demonstrate the relation between intrinsic width of the domain wall and its effect on material properties.

Vasudeva Rao Aravind

Date submitted: 19 Nov 2007 Electronic form version 1.4