

Abstract Submitted
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Nanoscale polarization switching at a single 180° ferroelectric domain wall¹ VENKATRAMAN GOPALAN, VASUDEVA RAO ARAVIND, SAMRAT CHOUDHURY, YULAN LI, KATYAYANI SEAL, ANNA MOROZOVSKA, EUGENE ELISEEV, LONG-QING CHEN, ANDREW RAPPE, SIMON PHILLPOT, SERGEI KALININ, PENNSYLVANIA STATE UNIVERSITY COLLABORATION — Domain wall motion in ferroelectric materials is strongly affected by lattice, surface and defect pinning effects. A variant of Piezoresponse Force Microscopy (PFM) called Switching Spectroscopy PFM (SSPFM) is ideally suited to probe the local domain switching near ferroelectric domain walls and study domain dynamics and polarization switching on the nanoscale. In the vicinity of the biased probe tip, the domain wall bends, attracts or repels from the probe apex, depending on the sign and value of the applied bias. The wall profoundly affects switching on length scales of the order of micrometers. Systematic SSPFM experiments with varying bias voltages are used to plot an **experimental phase diagram** summarizing the effect of bias voltage on nucleation in the vicinity of a 180° domain wall.

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