Local measurements of Preisach density in polycrystalline ferroelectric capacitors using piezoresponse force spectroscopy

Author(s): Ovchinnikov O (Ovchinnikov, O.)\textsuperscript{1,2}, Jesse S (Jesse, S.)\textsuperscript{1,2}, Guo S (Guo, S.)\textsuperscript{1,2}, Seal K (Seal, K.)\textsuperscript{1,2}, Bintachitt P (Bintachitt, P.)\textsuperscript{4,5}, Fujii I (Fujii, I.)\textsuperscript{4,5}, Trolier-McKinstry S (Trolier-McKinstry, S.)\textsuperscript{4,5}, Kalinin SV (Kalinin, S. V.)\textsuperscript{1,2}

Addresses:
1. Oak Ridge Natl Lab, Ctr Nanophase Mat Sci, Oak Ridge, TN 37831 USA
2. Oak Ridge Natl Lab, Mat Sci & Technol Div, Oak Ridge, TN 37831 USA
3. Univ Tennessee, Dept Phys & Astron, Knoxville, TN 37996 USA
4. Penn State Univ, Dept Mat Sci & Engn, University Pk, PA 16802 USA
5. Penn State Univ, Mat Res Inst, University Pk, PA 16802 USA

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Abstract: Polarization switching in polycrystalline ferroelectric capacitors is explored using piezoresponse force microscopy (PFM) based first-order reversal curve (FORC) measurements. The band excitation method facilitates decoupling the electromechanical responses from variations in surface elastic properties. A simulated annealing method is developed to estimate the Preisach densities from PFM FORC data. Microscopic and macroscopic Preisach densities are compared, illustrating good agreement between the two.