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Polarization switching dynamics in BZT-0.5BCT lead free ferroelectric thin films ANAGH BHAUMIK, Department of Physics, Astronomy and Materials Science, Missouri State University, Y. KOLEKAR, P. SHAIKH, University of Pune, Pune, India, C. RAMANA, University of Texas at El Paso, TX, K. GHOSH, Department of Physics, Astronomy and Materials Science, Missouri State University — We report polarization switching dynamics in lead (Pb) free $\text{BaTi}_{0.8}\text{Zr}_{0.2}\text{O}_3\text{-}0.5\text{Ba}_{0.7}\text{Ca}_{0.3}\text{TiO}_3$, (BZT- 0.5 BCT) ferroelectric thin films. High quality thin films of Pb free BZT- 0.5 BCT were grown on Pt/Ti/SiO₂/Si and SRO/LAO single crystal substrates using pulsed laser deposition (PLD). Polarization versus electric field data shows a hysteresis loop with a large remnant (35 micro C/cm²) and saturation polarization (40 micro C/cm²) and a small coercive field (1.5 kV/cm) which is essential for practical device applications. The polarization switching dynamics are well correlated with the structural distortion and phonon vibration observed in XRD and Raman spectroscopy. These results may stimulate to develop new Pb free ferroelectric thin films for future non-volatile random access memory and many other high-tech applications.

Kartik Ghosh
Missouri State University

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