Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Dielectric and Resistive Response in Multiferroic Superlattices SANDRA DUSSAN, ASHOK KUMAR, RAM S. KATIYAR, University of Puerto Rico — Building superlattices (SLs) with alternate layers of ultra thin films of ferroelectric and ferromagnetic materials is one of the ways to engineer magnetoelectric multiferroic materials. Alternate thin layers of ferroelectric $PbZr_{0.52}Ti_{0.48}O_3$ (PZT) and ferromagnetic $La_{0.67}Sr_{0.33}MnO_3$ (LSMO) materials were grown on $LaAlO_3$ (001) substrates using Pulsed laser deposition technique. X-ray diffraction patterns displayed the typical satellite peaks confirming SLs formation. The surface topography indicates homogeneous films with average surface roughness of ~ 1.5 nm. Well saturated polarization and high dielectric tunability were observed at room temperature. Piezo-force microscopy (PFM) measurements revealed switching of polarization under the external DC bias field. The zero field cooled (ZFC) and field cooled (FC) magnetic measurements revealed the ferromagnetic behavior of SLs, and it undergoes phase transition at lower temperature compared to the bulk and thin films of pure LSMO. To gain further understanding of the electrical properties of the SLs, impedance spectroscopy, dielectric permittivity and ac conductivity were investigated. We observed dynamic magneto-resistive and magneto-dielectric effects around the LSMO metal-insulator and ferromagnetic phase transition temperature

Sandra Dussan
University of Puerto Rico

Date submitted: 08 Dec 2010 Electronic form version 1.4