Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Investigation of Multiferroic properties of the Co doping $SrBi_2Nb_2O_9$ WILLIAM PEREZ, NORA ORTEGA, ASHOK KUMAR, RAM KATIYAR, University of Puerto Rico — Multiferroics (MF) are novel class of next generation multifunctional materials, however there are very few single-phase MF materials existing in nature. Thin films (TF) of $(Sr_xCo_{1-x})Bi_2Nb_2O_9$ (SCBN) with x = 0, 0.05, 0.1, 0.15, 0.2, 0.25, 0.3 with thickness ∼400 nm were fabricated from individual SCBN targets on $Pt/Ti/SiO_2/Si$ substrate by pulsed laser deposition technique. The x-ray diffraction studies revealed orthorhombic structure of SCBN for up to 20% Co doped TF without any phase segregation, the splitting in (200) peak was observed above 25% of Co doping. The room temperature (RT) Raman spectra of SCBN TF showed $SrBi_2Nb_2O_9$ peaks in all compositions, however additional modes appeared in the 600-800 cm^{-1}frequency region. The dielectric constant of all SCBN films showed linear frequency dispersion above 1 kHz, and their values are in the range of 400 to 650 at 1 kHz. An increase in tangent loss from ∼ 0.040 to 0.135 at 1 kHz was observed with increase in Co concentration. All SCBN TF show well defined hysteresis loop with remanent polarization of about 16 $\mu C/cm^2$. However, less saturation in the ferroelectric loop was observed with increase of Co content. Both magnetic and magneto-electric behavior of TF along with the ferroelectric properties will be discussed.

Nora Ortega
University of Puerto Rico

Date submitted: 18 Nov 2010 Electronic form version 1.4