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Magnetic Properties of $Ba_{0.4}Sr_{0.6}TiO_3/La_{0.7}Sr_{0.3}MnO_3$ heterostructures LUIS MARTINEZ, SRINIVASA RAO SINGAMANENI, The Department of Physics, The University of Texas at El Paso, JOHN PRATER, JAGDISH NARAYAN, Department of Materials Science and Engineering, The North Carolina State University — $Ba_{1-x}Sr_xTiO_3$ is an excellent material for voltage-tunable dielectric applications. $Ba_{0.4}Sr_{0.6}TiO_3$ (BST)[1], which is cubic and paraelectric at 300K, and transforms to a ferroelectric tetragonal phase upon cooling through the T_C at 200K. The main focus here is to study what happens when BST (200nm) is placed in contact with ferromagnetic layer such as $La_{0.7}Sr_{0.3}MnO_3$ (LSMO) (63nm), when BST/LSMO were deposited onto MgO/TiN buffered Si (100)[2]. X-ray diffraction measurements showed that these films were of single phase and epitaxial in nature. The magnetic measurements showed that the Curie temperature (T_C) of LSMO remained unchanged at 350K when BST was in contact with LSMO layer. Interestingly, at 4K both the coercive field and the exchange bias of the BST/LSMO heterostructure as compared to the lone LSMO film increased significantly from 400 to 800 Oe and from 155 to 305 Oe, respectively. These differences were found to disappear above 200 K. This strongly suggests that the observed changes in the magnetic behavior of the heterostructure was the result of stress and/or charge redistributions that resulted when the BST layer transformed from the cubic (paraelectric) to tetragonal (ferroelectric) phase at 200K. [1]Singamaneni et al Appl. Phys. Lett., **108**, 142407 (2016); [2]Appl. Phys. Rev. **3**, 031301 (2016).

Srinivasa Rao Singamaneni
The Department of Physics, The University of Texas at El Paso

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