

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Exchange bias study of epitaxial LSMO/Cr2O3 thin film heterostructures integrated on Si(100)¹ SANDHYARANI PUNUGUPATI, FRANK HUNTE, JAGDISH NARAYAN, North Carolina State University — FM/AFM exchange bias continues to be an interesting phenomenon from both a fundamental physics and an applications point of view. Recent studies of multiferroic materials have also seen a revival of interest in the magnetoelectric (ME) and antiferromagnetic (AFM) material Cr2O3. The study of exchange bias in heterostructures consisting of ferromagnet (FM) and ME thin films provides an additional mechanism of switching the magnetization of the FM by the application of an electric field. La0.7Sr0.3MnO3 (LSMO) is a FM material with TC above room temperature and shows colossal magnetoresistance. We have studied exchange bias in epitaxial thin film heterostructures of LSMO/Cr2O3 grown on C-YSZ/Si(100) by the PLD technique. We present a detailed structural characterization of the films by XRD (2θ and Φ) and TEM which confirm that the films were grown epitaxially. The heterostructures exhibited exchange bias as measured by SQUID magnetometry. The effects of LSMO deposition conditions, crystal orientation, temperature, and cooling field on the exchange bias will be discussed.

¹Part of this research is supported by the National Science Foundation and the Army Research Office

Sandhyarani Punugupati
North Carolina State University

Date submitted: 14 Nov 2014

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