

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**La<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> Epitaxial Films on SrTiO<sub>3</sub>(001): Interface Effects & Magnetic Configuration** D.A. ARENA, J.-S. LEE, C.S. NELSON, National Synchrotron Light Source, Brookhaven National Lab, C.-C. KAO, Stanford Synchrotron Radiation Light Source, SLAC, P. YU, Dept. of Physics, UC-Berkeley, R. RAMESH, Dept. of Physics, UC-Berkeley and Mater. Sci. Div., LBNL, R. FAN, C.J. KINANE, S. LANGRIDGE, ISIS, Harwell Campus, STFC, UK — Mixed valence manganites, in which a delicate interaction between electronic, orbital, magnetic and structural degrees of freedom produces rich phase diagrams reflecting the competing, nearly-degenerate ground states, have been under intense investigation for decades. We present evidence for an unusual magnetic configuration in La<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> (LSMO) epitaxial films grown on SrTiO<sub>3</sub>(001) substrates. At low temperatures, the remanent state of the near-surface region in thick LSMO films is aligned anti-parallel to the the applied magnetic field. This unusual magnetic configuration is also correlated with an in-plane structural fluctuation, as measured by x-ray diffraction. We suggest that the unexpected magnetic ordering in these films may also be associated with an orbital reconstruction of the Mn  $e_g$  orbitals.

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Date submitted: 30 Dec 2010

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