

Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Transverse susceptibility as a probe of spin and charge dynamics in LSMO single crystals H. SRIKANTH, P. PODDAR, G. T. WOODS, Department of Physics, University of South Florida, Y. MUKOVSKII, Moscow Institute of Steel and Alloys — AC and RF susceptibility measurements are excellent probes to investigate the charge and spin dynamics in novel materials such as half-metals, exchange bias materials, intermetallic Kondo systems and manganites. We will present temperature and field-dependent transverse susceptibility (TS) measurements on $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$; ($x=0.1, 0.15, 0.25$) single crystals at radio frequency (10 MHz) using a precise resonant tunnel-diode oscillator technique. These dynamic experiments probe the coupled electronic, magnetic and structural transitions in LSMO. The effective magnetic anisotropy fields are directly probed over a wide range in temperature, from the ferromagnetic Curie temperature to low temperatures well into the charge-ordered state in the insulating samples. Our experiments reveal distinct features at characteristic temperatures within the charge-ordered state that indicate a change in magnetic anisotropy associated with the dynamics of charge ordering itself. Overall, we demonstrate the unique advantages offered by RF susceptibility measurements in probing magnetic phase transitions in CMR oxides and other novel materials.

Srikanth Hariharan
University of South Florida

Date submitted: 29 Nov 2004

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