

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Study of Magneto-Transmission Spectra of $\text{La}_{0.7}\text{Pb}_{0.3}\text{MnO}_{3-\delta}$ Epitaxial Thin Film¹ SIDNEY MALAK, Binghamton University, RYAN CLAYTON-COX, JIRI STEHLIK, JIAN-QING WANG, Binghamton University — Magneto-transmission (MT) of epitaxially grown $\text{La}_{0.7}\text{Pb}_{0.3}\text{MnO}_3$ g was measured. Thermo-Electron Nexus 670 FT-IR spectrometer equipped with an electromagnet was used to obtain IR spectra in the range of 350 to 15000 cm^{-1} in various applied magnetic fields up to 1.0 Tesla. For optimal magneto-spectroscopic measurements in transmission, the studied film had a thickness of 190 nm, with a maximum value up to 80% at 320 K in the colossal magnetoresistance (CMR) effect in 5.5 Tesla. It was observed that the MT scale proportionally with the applied magnetic field and was largest at longer wavelengths below 4000 cm^{-1} . In this far infrared range, the maximum observed MT value was 4.0 % at 1.0 Tesla. Beyond FIR range the MT curves monotonically decrease with frequency, until the effect vanishes at 12,000 cm^{-1} . Such crossover of magneto-spectroscopic responses from IR to optical frequencies is the first evidence of gradual disappearance of the magneto-dynamics at higher frequencies. Compared with the CMR effect, the measured MT property resembled that of the CMR closely in the field range and frequency ranges studied.

¹Work is supported by Research Corporation award CC5766 and by DOE award DEFC52004NA25658

Jian-Qing Wang
Binghamton University

Date submitted: 27 Nov 2007

Electronic form version 1.4