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Optical Measurements of Transition from Insulator to Metallic Phases in LaxMnO3:Evidence for Mixed Phases Below Tp[1] MICHAEL DELEON, PENG GAO, TREVOR A. TYSON, Physics Department, New Jersey Institute of Technology, ZHENXIAN LIU, Geophysical Laboratory,Carnegie Institution of Washington, CATHERINE DUBOURDIEU, LMGP-Minatec, France — Infrared measurements were conducted over the range 100 to 8000 cm-1 on film of LaxMnO3 (x$\sim$0.8). From these measurements we determined the frequency dependent conductivity, the effective number of carriers and the frequency dependence of specific phonon modes. The Drude model conductivity matches well with the measured DC resistance measurements. The bulk magnetization noset and resistance peak coincide near $\sim$270 K. However, the onset of the increase in the free carrier number lags these curves and occurs $\sim$ 25 K lower in temperature and saturates at 200 K. This indicates that indicates that a significant volume of the insulating phase exists below Tp.

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