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Temperature Dependent Raman Scattering in Layered Manganites RAJEEV GUPTA, Department of Physics and Materials Science Programme, Indian Institute of Technology, Kanpur 208016, India, D. N. PATEL, S. L. GUPTA, Department of Physics, Indian Institute of Technology, Kanpur 208016, India — $La_{2-2x}Sr_{1+2x}Mn_2O_7$ (LSMO) is a manganite system built up of perovskite bilayers of corner linked MnO_6 octahedra forming infinite sheets and separated by a (La,Sr)O layer along the c-axis. For $0.3 < x < 0.5$, there is a transition from a low temperature ferromagnetic metallic state at $T_c \sim$ 110-130 K to a high temperature paramagnetic insulating state. Due to its layered structure, this system provides a unique opportunity to explore the interplay between spin, charge and lattice degrees of freedom in reduced dimensions. In this talk we present our results on temperature dependent Raman scattering measurements on single crystals of LSMO for x in the range 0.3-0.45. We observe four modes in the frequency range 300-800 cm^{-1} and track the changes in the Raman bands line shape parameters as a function of temperature. We correlate our results with other known transport and magnetic measurements on these systems.

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