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Anomalous Phonon Behavior in Orthorhombic LuMnO₃ at Low Temperature PENG GAO, HAIYAN CHEN, TREVOR A. TYSON, Department of Physics, New Jersey Institute of Technology, Newark, NJ 07102, ZHENXIAN LIU, Geophysical Laboratory, Carnegie Institution of Washington DC 20015, JIANMING BAI, Oak Ridge National Laboratory Oak Ridge, TN 37831, LIPING WANG, Mineral Physics Institute, Stony Brook University, Stony Brook, NY 11794, YOUNGJAI CHOI, SANG-WOOK CHEONG, Rutgers Center for Emergent Materials and Department of Physics and Astronomy, Rutgers University, Piscataway, NJ 08854 — We present the pressure dependent phonon spectra of orthorhombic-LuMnO₃ which are conducted in the low temperature region (below T_N and T_L). A temperature dependent anomalous phonon coincides with the ferroelectric behavior at low pressure condition. At ~ 10 GPa, this anomalous phonon exhibits an unusual softening trend which will be suppressed at higher pressure. This work is supported by DOE Grant DE-FG02-07ER46402 (NJIT), by DE-FG02-07ER46402 (Rutgers), by COMPRES (U2A beam line at NSLS), the Consortium for Materials Properties Research in Earth Sciences under NSF Cooperative Agreement EAR01-35554, U.S. Department of Energy (DOE-BES and NNSA/CDAC) and by the U.S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-98CH10886 (use of NSLS at Brookhaven National Laboratory).

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