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Phonon Anomaly across Charge/Orbital Ordering Transition in $\mathbf{Pr_{0.65}Ca_{0.35}MnO_3}$.[1] JIANDI ZHANG, HAO SHA, Florida International University, Miami, FL 33199, F. YE, M.D. LUMSDEN, Oak Ridge National Laboratory, Oak Ridge, TN 37831, P.C. DAI, J. A. FERNANDEZ-BACA, University of Tennessee, Knoxville, TN 37996;Oak Ridge National Laboratory, Oak Ridge, TN 37831, Y. TOMIOKA, Correlated Electron Research Center, Tsukuba 305-0046, Japan, Y. TOKURA, Correlated Electron Research Center, Tsukuba 305-0046, Japan;University of Tokyo, Tokyo 113-8656, Japan — The lattice dynamics, especially the Jahn-Teller active optical phonon modes across the charge/orbital ordering (CO/OO) transition in the single crystal $Pr_{0.65}Ca_{0.35}MnO_3$ has been investigated using inelastic neutron scattering (INS) technique. Three phonon peaks (around 36, 58 and 74 meV near the Brillouin zone center) appear in the scattering spectra, which are associated with the bond-stretching and bond-breathing modes of MnO_6. Both intensity and phonon energies show changes when the system undergoes the CO/OO transition indicating a strong coupling between the lattice and orbital degrees of freedom.

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Jiandi Zhang
Florida International University, Miami, FL 33199

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