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Structural and magnetic properties of single layered manganite Pr0.5Ca1.5MnO4[1] SONGXUE CHI, University of Tennessee, Knoxville, PENGCHENG DAI, University of Tennessee, Knoxville, FENG YE, Oak Ridge National Laboratory, JAIME FERNANDEZ-BACA, Oak Ridge National Laboratory, ROLAND MATHIEU, University of Tokyo, YOSHI TOKURA, University of Tokyo, QINGZHEN HUANG, NIST Center for Neutron Scattering, JEFFREY LYNN, NIST Center for Neutron Scattering — High resolution neutron powder diffraction and elastic neutron scattering have been used to determine the lattice and magnetic structure of the single layer manganite Pr0.5Ca1.5MnO4. The system becomes charge/orbital ordered (CO-OO) near 300K and antiferromagnetically ordered with a Neel temperature (T_N) near 125K, which has CE-type (checkerboard like) structure in the Mn-O plane. At temperatures above T_N but below T_{CO-OO}, we discovered an anomalous lattice response around 160K. We discuss the microscopic origin of this lattice distortion and its association with competing CO-OO and antiferromagnetic states.

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