Abstract Submitted
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Structural anomalies at the magnetic and ferroelectric transitions in RMn_2O_5[1] B. LORENZ, C.R. DELA CRUZ, F. YEN, Y.Y. SUN, C.W. CHU[2], Dept. of Physics, University of Houston, S. PARK, S-W. CHEONG, Dept. of Physics and Astronomy and RCEM, Rutgers University — Multiferroic RMn_2O_5 (R=rare earth, Y), have attracted significant attention because of their magneto-electric properties giving rise to complex phase diagrams and novel phenomena such as magnetic control of ferroelectric polarization and giant magneto-dielectric effects. In understanding their ferroelectricity and magneto-electric properties the magneto-elastic lattice distortions at the phase transitions are assumed to play a key role. Such distortions are difficult to detect by x-ray or neutron scattering experiments due to the limited resolution. Employing high-precision capacitance dilatometry, we show the existence of distinct, anisotropic lattice anomalies in RMn_2O_5 (R=Ho, Tb, Dy) at all magnetic and ferroelectric phase transitions as function of temperature and magnetic fields. These data provide unambiguous evidence for strong magneto-elastic coupling in multiferroic RMn_2O_5.

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