

Abstract Submitted
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Large magneto-dielectric coupling in orthorhombic YMnO_3 and HoMnO_3 ¹ BERND LORENZ, Y. Q. WANG, Y. Y. SUN, C. W. CHU², TCSUH, University of Houston — We have found a remarkable increase (up to 60 %) of the dielectric constant with the onset of magnetic order at 42 K in the metastable orthorhombic structures of YMnO_3 and HoMnO_3 that proves the existence of a strong magneto-dielectric coupling in the compounds. Magnetic, dielectric, and thermodynamic properties show distinct anomalies at the onset of the incommensurate magnetic order and thermal hysteresis effects are observed around the lock-in transition temperature at which the incommensurate magnetic order locks into a temperature independent wave vector. The orders of Mn^{3+} spins and Ho^{3+} moments both contribute to the magneto-dielectric coupling. A large magneto-dielectric effect was observed in HoMnO_3 at low temperature where the dielectric constant can be tuned by an external magnetic field resulting in a decrease of up to 8 % at 7 Tesla. By comparing data for YMnO_3 and HoMnO_3 the contributions to the coupling between the dielectric response and Mn and Ho magnetic orders is separated.

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