

Abstract Submitted
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Crystal Field Excitations in Multiferroic HoMnO₃ OWEN VAJK,
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BAEK KIM, SANG-WOOK CHEONG — Antiferromagnetic and ferroelectric order
coexist in hexagonal HoMnO₃, and strong coupling between these two order
parameters has been previously observed. Neutron scattering measurements of the
low-energy excitations in HoMnO₃ reveal a complex spectra of Ho³⁺ crystal-field
excitations which depend upon both temperature and applied magnetic field. These
crystal-field changes are correlated with changes in the magnetic symmetry of the
Mn³⁺ magnetic sublattice. Measurements of the magnon excitations near these
crystal field levels indicates strong coupling between the Mn³⁺ moments and the
Ho³⁺ crystal field levels. This coupling may play a critical role in explaining the
interaction of ferroelectricity and antiferromagnetism in HoMnO₃.

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