

Abstract Submitted
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Direct observation of collective magnetism at ferroelectric domain walls in multiferroic ErMnO_3 YANAN GENG, NARA LEE, YOUNGJAI CHOI, SANG-WOOK CHEONG, WEIDA WU, Rutgers Center for Emergent Materials & Department of Physics and Astronomy, Rutgers University, Piscataway, NJ, 08854 — Multiferroic hexagonal manganites $RE\text{MnO}_3$ ($RE = \text{Ho, Er, Lu, etc.}$) have been of great interest because of the coexistence of ferroelectric and magnetic orders. Herein we report cryogenic magnetic force microscopy (MFM) studies of flux-grown ErMnO_3 single crystals with vortex ferroelectric domain pattern. By uniquely correlating ambient piezo-response force microscopy and low temperature MFM images at the same location, we identified alternating uncompensated magnetic moments at ferroelectric domain walls that correlate over entire vortex network, suggesting collective magnetism at ferroelectric vortex domain walls.

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