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Domain structure and magnetization reversal in multiferroic $LuFe_2O_4$ WEIDA WU, SOONYONG PARK, CHENGLIN ZHANG, S.-W. CHEONG, Department of Physics and Astronomy, Rutgers University — We report real space magnetic imaging of single crystal multiferroic $LuFe_2O_4$ via variable temperature magnetic force microscopy (VT-MFM). The magnetization reversal of $LuFe_2O_4$ is investigated in detail with MFM in magnetic fields up to 8 tesla at several temperatures below T_N=230 K. Our results suggest that the domain structure and the magnetization reversal of $LuFe_2O_4$ are different from those of conventional FM magnets with a uniaxial anisotropy. These unconventional behaviors may originate from the low dimentionality and the unusual spin-charge frustration of $LuFe_2O_4$.

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