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Unfolding Vortices to Topological stripes in a multiferroic XUEYUN WANG, Department of Physics and Astronomy, Rutgers University, MYUNG-GEUN HAN, Condensed Matter Physics and Materials Science, Brookhaven National Laboratory, YOICHI HORIBE, Department of Physics and Astronomy, Rutgers University, TOSHIHIRO AOKI, YIMEI ZHU, Condensed Matter Physics and Materials Science, Brookhaven National Laboratory, SANG-WOOK CHEONG, Department of Physics and Astronomy, Rutgers University — Hexagonal $REMnO_3$ (RE=Ho, Er, Tm, Yb, Lu) is an improper ferroelectric where the size mismatch between RE layers and Mn-O layers induces a simultaneous ferroelectric-trimerization structural phase transition [1]. Two distinct domain configurations have been observed in $REMnO_3$ (RE=rare earths): vortex domains vs. stripe domains [2]. However, the rapport between those topologically distinct domain patterns has never been studied. We have investigated the transformation process between vortex domains and stripe domains with the variation of temperature and the application of various strains on thin-plate-like crystals. [1] T. Choi *et al.*, Nature Mater. 9, 253 (2010). [2] S. C. Chae *et al.*, PRL 108, 167603 (2012).

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