$Z_2 \times Z_3$ **vortex density in hexagonal manganites and the Kibble-Zurek mechanism** XUEYUN WANG, SANG-WOOK CHEONG, Rutgers Univ — 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. Six types of ferroelectric-trimerization domains form the so-called $Z_2 \times Z_3$ vortices. We have carefully examined how the $Z_2 \times Z_3$ vortex density changes with the cooling rate across the transition temperature, and compared the result with the so-called Kibble-Zurek mechanism, which is relevant to the formation of cosmological defects such as cosmological strings.

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Date submitted: 15 Nov 2013

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