Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Spatial anisotropy of topological domain structure in hexagonal manganites. JUNMING LIU, KUNLUN YANG, LIN LIN, Nanjing Univ, SANG-WOOK CHEONG, Rutgers University — The domain structure of hexagonal manganites is simulated based on the phenomenological Ginzburg-Landau theory, and special attention is paid to the evolution of topological vortex-antivortex pattern with the varying out-of-plane anisotropies of two stiffness parameters for the in-plane (xy-plane) trimerization amplitude Q and out-of-plane (z-axis) polarization P. It is revealed that the topological domain structure can be remarkably modulated by the stiffness anisotropies. A larger stiffness for Q along the z-axis makes the trajectory lines of the vortex nodes and antivortex nodes to be seriously stretched along the z-axis, eventually leading to the topological stripe-like domain pattern. The larger stiffness for either Q or P along the z-axis makes the domain walls perpendicular to the z-axis wider, while the domain walls parallel to the z-axis remain less affected. The present work suggests that the topological domain structure may be controlled by some approaches (e.g. lattice strain) which can change the trimerization stiffness and polarization stiffness in hexagonal manganites.

Junming Liu
Nanjing Univ

Date submitted: 10 Nov 2016 Electronic form version 1.4