Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Is hexagonal $InMnO_3$ ferroelectric? FEI-TING HUANG, YOICHI HORIBE, XUEYUN WANG, SANG-WOOK CHEONG, Department of Physics and Astronomy, Rutgers University, SHIGEO MORI, Department of Materials Science, Osaka Predecture University — Hexagonal manganite (h-$REMnO_3$; RE=rare earths) shows a unique improper ferroelectricity, accompanying a structural trimerization. RE can be replaced by In, which is much smaller than any RE ions. Recently, Oak *et al.* [1] suggested $InMnO_3$ is ferroelectric from the results of first-principles calculations, while Kumagai *et al.* [2] proposed a non-ferroelectric ground state. In this talk, we will report the results of our investigation on the structural domains and local structural distortions of $InMnO_3$ using dark-field transmission electron microscopy. We demonstrate that $InMnO_3$ shows a distinct $\sqrt{3} \times \sqrt{3}$-type superstructure from the high-temperature paraelectric phase ($P6_3/mmc$), and the domain structure can be delicately controlled by varying the synthesis and annealing conditions. The correlation between physical properties and local structural distortions in the $InMnO_3$ will be discussed in detail. [1] M.-A. Oak, J.-H. Lee, H. M. Jang, J. S. Goh, H. J. Choi and J. F. Scott, PRL **106**, 047601 (2011). [2] Y. Kumagai, A. A. Belik, M. Lilienblum, N. Leo, M. Fiebig, and N. A. Spaldin, PRB **85**, 174422 (2012).

Fei-Ting Huang
Department of Physics and Astronomy, Rutgers University

Date submitted: 17 Dec 2012

Electronic form version 1.4