Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Strain-mediated control of orbital ordering planes in heteroepitaxial lanthanum manganite thin films YONG-JIN KIM, JIN HONG LEE, KAIST, TAE YEONG KOO, Pohang Accelerator Laboratory, Pohang University of Science and Technology, Pohang 790-784, Korea, CHAN-HO YANG, KAIST — Strain engineering which controls the misfit strain of heteroepitaxial thin films leads to distinctive physical properties in contrast to the intrinsic properties of unstrained bulk materials Perovskite $LaMnO_3$ (LMO) has attracted considerable attention due to strong coupling among the lattice, charge, spin and orbital degrees of freedom. Bulk LMO is known to be an A-type antiferromagnetic (T_N˜140 K) Mott insulator, and its orbital ordering plane is established due to cooperative Jahn-Teller distortion below ˜750 K. Previous studies have focused on the orbital ordering planes of the bulk LMO but not researched on correlation between orbital planes and misfit stain. To figure out the strain dependence of orbital ordering planes, we have grown LMO thin films on four different substrates, *i.e.*, $DyScO_3$(110), $GaScO_3$(110), $SrTiO_3$(001), and LSAT(001), using the pulsed laser deposition technique. The films have been characterized by atomic force microscopy and x-ray diffraction. We have performed resonant x-ray scattering to identify orbital ordering plane on each film. We have found that orbital ordering planes can be modulated depending on the misfit strain.

Yong-Jin Kim
KAIST

Date submitted: 03 Nov 2015 Electronic form version 1.4