Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Real Space Imaging of Phase Separation in Mangnites KAI DU, LIFENG YIN, JIAN SHEN, State key laboratory of surface physics and Department of Physics, Fudan University, Shanghai 200433, China — Electronic phase separation (EPS) in manganites is generally considered to be responsible for their unusual colossal magneto resistance (CMR) [1-2]. However, the dynamic behavior of EPS and the formation mechanism are still not very clear. Magnetic force microscopy (MFM) is one of the most powerful techniques which enables us to study the magnetic domains and direct image the EPS in real space without damaging the samples. In this work, we use a PPMS (Quantum Design) compatible MFM to study the magnetic domains of La0.7Sr0.3MnO3 (LSMO) thin films on NdGaO3(110) and La0.325Pr0.3Ca0.375MnO3 (LPCMO) thin films on SrTiO3 (100) grown by pulsed laser deposition technique (PLD). The LSMO system shows clear stripe domain pattern [3], while the LPCMO system exhibits large scale domains corresponding to charge-ordered insulating phase and ferromagnetic metallic phase [1]. Their transport properties were studied under a variety of temperatures and magnetic fields. The phase separation in submicron scale and their percolative transport have been confirmed by MFM images and the transport measurement during the imaging.

[1] M. Uehara, Nature (London) 399, 560 (1999)
[2] E. Dagotto, Phys. Rep. 344, 1(2001); and references therein
[3] Y. Jiang, Solid State Communications 150, 2028(2010)

Kai Du
State key laboratory of surface physics and Department of Physics,
Fudan University, Shanghai 200433, China

Date submitted: 07 Nov 2012 Electronic form version 1.4