Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Direct Visualization of Electric-Field-Driven Migration and Decay of Oxygen Vacancy-induced Stripes in $Pr_{0.7}Ca_{0.3}MnO_3$[1] DONGMIN CHEN, Institute Of Physics, Chinese Academy of Sciences, ZHAOLIANG LIAO, Institute Of Physics, Chinese Academy of Sciences & Department of Physics and Astronomy, Louisiana State University, XUEDONG BAI, PENG GAO, Institute Of Physics, Chinese Academy of Sciences, JIANDI ZHANG, Department of Physics and Astronomy, Louisiana State University — We report on the microscopic evidence of electric-field driven migration and decay of oxygen vacancy stripes in $Pr_{0.7}Ca_{0.3}MnO_3$ (PCMO30). A local lattice stripe phase associated with oxygen vacancy migrating along the applied electric field was imaged in real time by using *in-situ* imaging with high-resolution transmission electron microscopy (TEM). Such a field-driven dynamic oxygen migration process should be responsible to the transport for the resistance switching effects observed in many metal-oxide-metal structures, thus providing a direct microscopic evidence for the oxygen migration model. A decay of oxygen vacancy stripes with a characteristic decay time has been observed, consistent with measurement of resistance relaxation in the materials.

[1]Supported by the Chinese Academy of Sciences (NO. KJCX2-SW-W26) and the National Natural Science Foundation of China under Grant No. 90406017. ZL and JZ were partially supported by U.S. DOE under Grant No. DOE DE-SC0002136.

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Date submitted: 14 Nov 2011 Electronic form version 1.4