Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Novel Resistive Switching Behavior in Phase Separated Manganites[1] HANGWEN GUO, The University of Tennessee, Knoxville & Oak Ridge National Laboratory, T. ZAC WARD, DALI SUN, PAUL C. SNIJDERS, Oak Ridge National Laboratory, ZHENG GAI, Oak Ridge National Laboratory & Center for Nanophase Materials Science, JIAN SHEN, The University of Tennessee, Knoxville & Fudan University — Electronic phase separation plays a key role in many novel phenomena in complex materials. Manganites are a prime example of this class of materials and have recently come under increase scrutiny for possible application in resistive random-access memory (RRAM) technology. Here, we will discuss our recent work on spatially confined La5/8-xPrxCa3/8MnO3. We have discovered that it is possible to drive single electronic domain formation/annihilation through electric field pulsing. By measuring the I-V curve, we find such resistive switching is different from normal RRAM mechanisms in manganites and is closely related to the nature of electronic phase separation. These findings open these systems to a new understanding of the nature of electronic phase separation and begin the development of manganites for future applications in RRAM devices.

[1]Research sponsored by the Division of Materials Sciences and Engineering, Office of Basic Energy Sciences, U.S. Department of Energy.

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Date submitted: 21 Nov 2010 Electronic form version 1.4