Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Oxygen Vacancy Induced Metal Insulator Transition in Epitaxial $Pr_{0.7}Ca_{0.3}MnO_3$ Thin Films[1] JINGDI ZHANG, KEBIN FAN, Boston University, RYUHEI KINJO, WEIMING XU, IWAO KAWAYAMA, MASAYOSHI TONOUCHI, Osaka University, XIN ZHANG, RICHARD AVERITT, Boston University — We report the metal-insulator transition in epitaxial $Pr_{0.7}Ca_{0.3}MnO_3$ thin film by introducing oxygen vacancies, which assist the nucleation of ferromagnetic metallic domains in a antiferromagnetic insulating matrix. The hysteresis of the resistivity indicates the transition is first-order, and covers a broad temperature range from 80K to 220K. Such novel transport properties of the x=0.3 doped manganite may result from strong spin-lattice coupling which stabilizes the system to a metallic metastable state at low temperature.

[1]We acknowledge DOE BES support.

Jingdi Zhang
Boston University

Date submitted: 23 Nov 2011 Electronic form version 1.4