

American Physical Society Meeting
March 21–25, 2005
Los Angeles, California

Atomistic View of Manganite Thin Films by Scanning Tunneling Microscopy

J. X. Ma, E. W. Plummer, and J. Shen

Condensed Matter Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN 37831
Department of Physics and Astronomy, University of Tennessee, Knoxville, TN 37996

Perovskite manganites $\text{Ln}_{1-x}\text{M}_x\text{MnO}_3$ ($\text{Ln}=\text{La, Pr, Nd}$, $\text{M}=\text{Ca, Sr, Ba, Pb}$) have been extensively studied due to the famous CMR effect. However, the underlying mechanism is not yet well understood. It is generally accepted that polaron plays a very important role. Scanning tunneling microscopy and spectroscopy (STM/S) capable of obtaining atomic structure and electronic information near the Fermi level at atomic resolution has been extremely successful in studying layered transition metal oxide superconductors. To study the manganites with STM/S, we have developed an in-situ Laser MBE system. Atomic resolution has been successfully achieved in manganite thin films. Results pertaining to phase separation and polaron effects will be discussed in this talk. **Research sponsored by the U. S. Department of Energy under contract DE-AC05-00OR22725 with the Oak Ridge National Laboratory, managed by UT-Battelle, LLC**