

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

The enhanced magnetoresistant effects and cluster-glass state induced by A-site cationic size disorder KEFENG WANG, LIFENG WANG, Nanjing National Laboratory of Microstructures, Nanjing University, JUNMING LIU¹, Nanjing National Laboratory of Microstructures, Nanjing University & International Center for Materials Physics, Chinese Academy of Sciences — In perovskite-structure oxides, not only the A-site cationic mean radii, but also the variance of the A-site cationic radii, controls the physical properties of the sample. The disorder effects induced by A-site cationic size mismatch in large band-width manganite $\text{La}_{0.55}\text{Sr}_{0.45}\text{MnO}_3$ have been carefully studied by preparing a series of samples which have the same $\langle r_A \rangle = 1.25\text{\AA}$ with different variance of the A-site ionic radii. The ground state of the system changed from a ferromagnetic metal to a cluster-glass insulator with increasing of the variance of the A-site ionic radii. Moreover, the magnetoresistant effects is enhanced significantly in the sample with intermediate disorder. We argued that the A-site disorder enhanced the fluctuation between the competing ordered states and then induced the cluster-glass state and the enhanced magnetoresistant effects.

¹corresponding author

JunMing Liu
Nanjing National Laboratory of Microstructures, Nanjing University &
International Center for Materials physics, Chinese Academy of Sciences

Date submitted: 28 Nov 2005

Electronic form version 1.4