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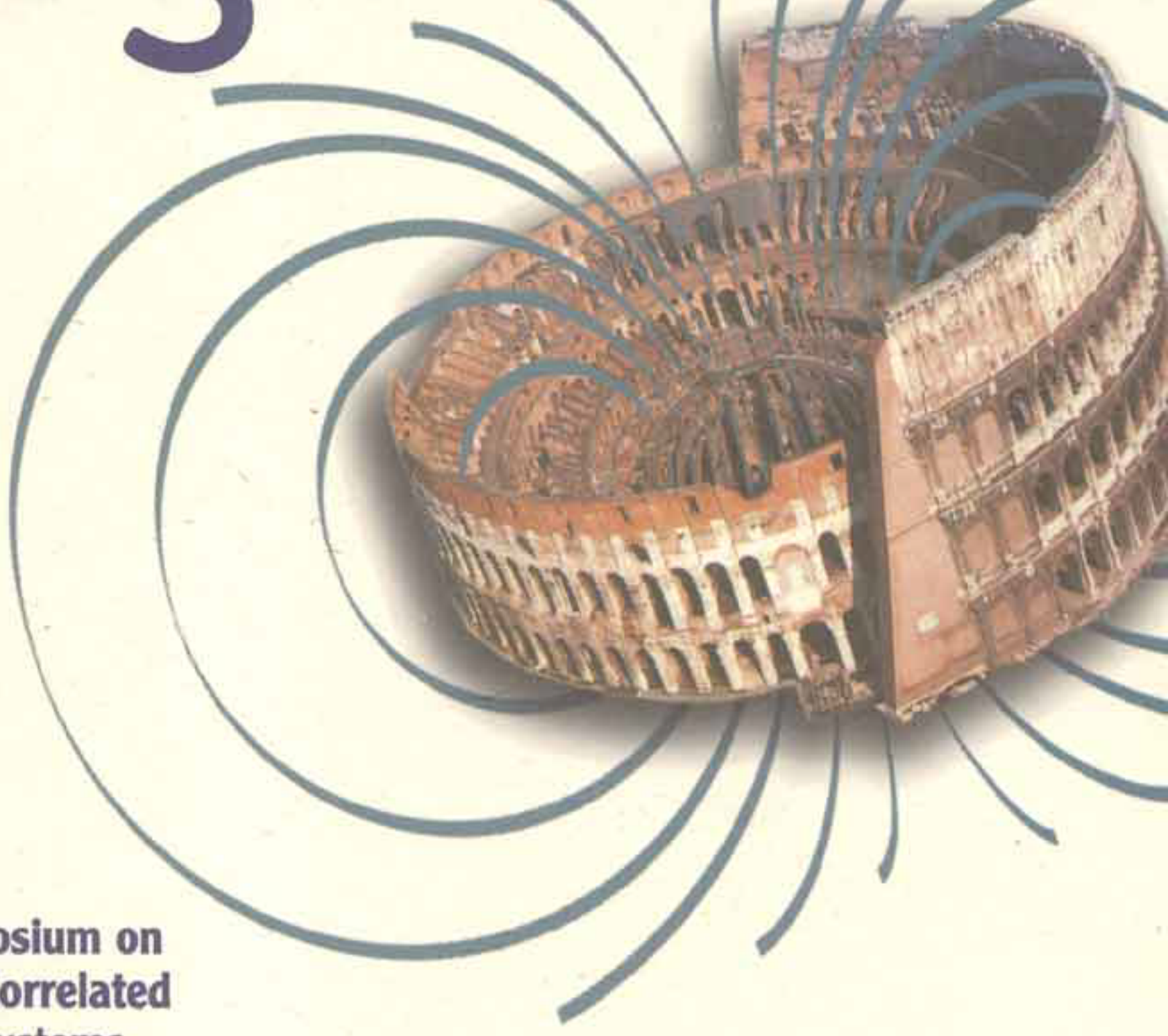

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**The Symposium on Strongly Correlated Electron Systems**

# abstracts

**4R-pm-02——— LOW-FIELD MAGNETORESISTANCE IN THE La-Sr Mn O GRANULAR THIN FILMS**

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Polycrystalline LSMO thin films were grown through RF magnetron sputtering on Si (100) substrates. The deposition conditions of the LSMO thin films were 0, 20, 40, 60 and 80 % partial oxygen pressures of the buffer gas; an RF magnetron sputtering power of 2.46 W/cm$^2$ and a substrate temperature of room temperature. After deposition, all films were annealed in air for 3 hours at 800 ℃. The crystal structure, the chemical composition, the microstructure, the thickness, the magnetic properties and the low-field magnetoresistance of the La-Sr-Mn-O films were studied using x-ray diffraction, Rutherford back-scattering spectroscopy, atomic force microscopy, scanning electron microscopy, and a vibrating sample magnetometer. The crystal structure of the LSMO thin films was found to be a pseudo-cubic perovskite with the lattice constant $a_0$ = 3.862 ± 0.001 Å. The crystal structure and lattice constants of LSMO films did not change with changes in partial oxygen pressure, whereas the root mean square roughness($R_{rms}$) and particle size decreased with increasing partial oxygen pressure. The chemical compositions of the LSMO thin film with $P_{O2}$=60% was determined to be $La_{0.60}Sr_{0.32}MnO_{3.2}$. In this case of the low-field tunnel-type MR had a maximum value of 0.68 % under the applied field of 500 Oe at room temperature. The enhancement of the low-field MR ratio is caused by the improvement of morphologies and the growth of uniform and smaller grains according to the increase of the partial oxygen pressure in polycrystalline LSMO thin films. The correlation between the grain size and the low-field magnetoresistance at room temperature can be explained by the viewpoint that the grain boundary regions can play the role of a potential barrier.