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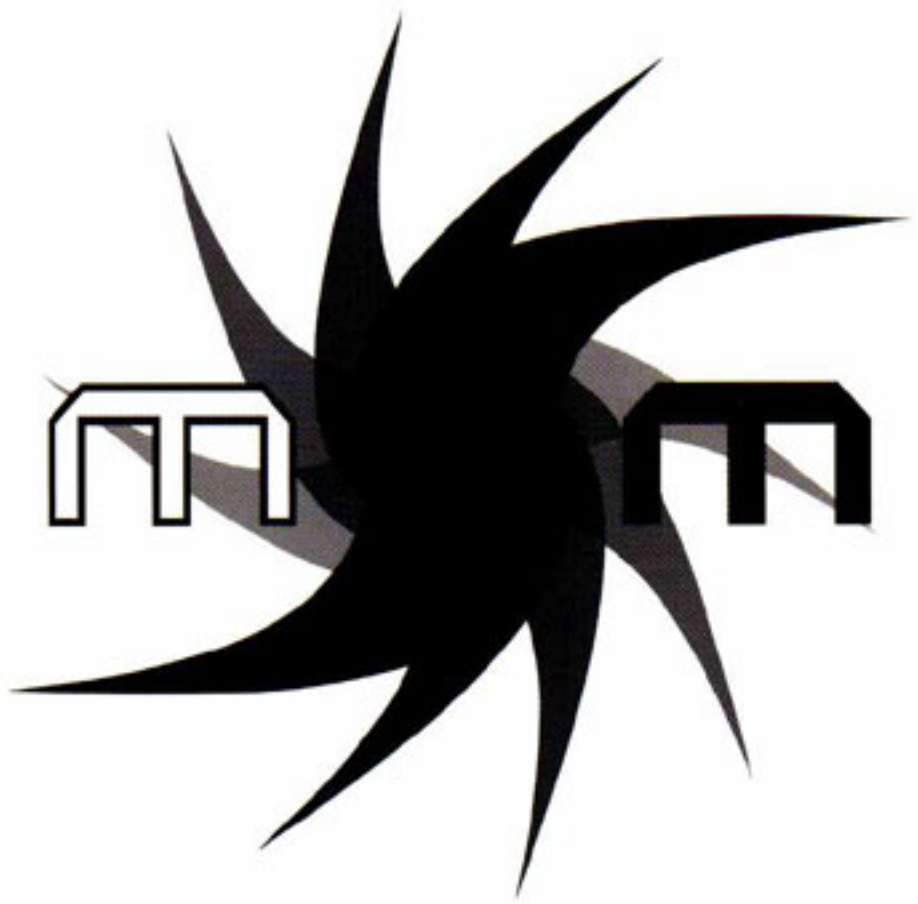

ABSTRACTS

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Magnetoresistance on LSMO/SiO2/Si Granular Thin Films

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The effects of grain boundary on low-field tunnel-type magnetoresistance (MR) were assessed by preparing a set of polycrystalline La2/3Sr1/3MnO3(LSMO) granular thin films with varying grain sizes and measuring their MR. Controlling the different grain sizes was done by varying catalysts and their amount into the LSMO stock solution prepared for spin coating. As the grain sizes increased, MR ratios decreased under the applied field of 120 Oe at room temperature. The difference in the measured MR values was explained by interpreting grain boundary effects characterized using complex impedance analysis (CIA). Results showed that the resistivity of grains(233 ~ 207 §Ù) was nearly independent of the grain size(610 ~ 345 Ǻ). On the other hand, resistivity of the grain boundary(530 ~ 1396 §Ù) increased with decreasing grain size(610 ~ 345 Ǻ). From these results, it can be concluded that the enhanced MR of polycrystalline LSMO/SiO2/Si thin films with decreasing grain size is mainly due to an increase in grain boundary regions that can act as potential barrier. Thus, complex impedance analysis provides useful information on the separated contribution of grains and grain boundaries to MR.