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Enhanced low field magnetoresistance in nanostructured manganite thin films

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Manganese perovskites are promising candidates for spintronic devices as they present large magnetoresistance in the vicinity of the insulator-metal/paramagnetic-ferromagnetic transition. In the last years, numerous efforts have been devoted to enhance the magnetoresistance in these materials at the low applied magnetic fields required for practical applications. It has been shown that there is an strong correlation between the observed low field magnetoresistance and the thin film microstructure.

Here we report on our last results on the magnetotransport properties of nanostructured $La_{2/3}Sr_{1/3}MnO_3$ epitaxial thin films. In the past we have shown that by fine tuning the growth conditions of the sputtered films, long-range ordered arrays of antidots can be obtained at the film surface [1]. We will shown that these nanostructured surface morphologies lead to an enhancement of low-field magnetoresistance (LFMR) in the as-grown films with values higher than 40% at H=1T. We will also study the influence of film thickness on the LFMR.

Biography

A. Pomar is Tenured Scientist at the Institute of Materials Science of Barcelona (CSIC). He obtained his Ph. D. in 1996 from University of Santiago de Compostela (Spain). He was postdoctoral fellow at the University of Paris-Sud (France) and scientist at CNRS (France) and CEA (Saclay, France). His research interests include superconducting and magnetic materials and the interplay between microstructure and physical properties in complex oxides. He has authored more than 80 publications, 5 patents and more than 20 invited or oral presentations in international meetings.

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