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Magnetoresistance sign reversal in La1-xSrxMnO3 Nanoparticle samples TAO LIN, ZHIYONG WANG, JING SHI, Department of Physics and Astronomy, University of California at Riverside — La1-xSrxMnO3 (LSMO) exhibits interesting properties such as half-metallic ferromagnetism which is desirable for spintronics. Here we report a study of electrical transport properties of LSMO nanoparticles. The LSMO nanoparticle samples are prepared by the liquid phase codeposition method. The temperature dependence of the resistance shows a peak at about 120 K which is the characteristic of the ferromagnetic transition. The magnetoresistance is measured over a wide range of temperatures, and its magnitude is ∼30% at 1T at 20K. The bias dependence of the magnetoresistance is studied at low temperatures. We observe a sign change in the magnetoresistance at large currents, i.e. the magnetoresistance switches from negative to positive as the current exceeds a threshold. In the meantime, the resistance of LSMO undergoes an abrupt change from high to low. The sign reversal of the magnetoresistance is found to be correlated with the current-induced resistance state switching, which has not be found in LSMO films. We will discuss possible mechanisms of these effects.

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