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The finite size effects on transport and magnetic properties of colossal magnetoresistant manganites KEFENG WANG, Physics Department, Boston College, 02467 MA, and Nanjing National Laboratory of Microstructure, Nanjing University, Nanjing 210093, China , J.-M. LIU, Nanjing National Laboratory of Microstructure, Nanjing University, Nanjing 210093, China , Z.F. REN, Physics Department, Boston College, 02467 MA — The presence of electronic phase separation in strongly correlated materials has been linked to many types of exotic behavior, such as colossal magnetoresistant effects. If the spatial dimension of these materials is artificially reduced to the scale of the phase separation, significant changes in the transport and magnetic properties of manganites could be expected. Hot press technology provides the possibility to prepare bulk materials with nanosized grain which can be used to carefully study the transport properties of nanostructure of manganites. In this presentation, we carefully prepared a series of manganite ceramics with different grain size by hot pressure and the significant effects of finite size on physical properties of manganites were clarified. An enhanced magnetoresistant effects and collapse of charge-ordered state were identified in nanostructure manganites. The possible origin is attributed to the mesoscopic phase-separated domains inherent in the materials and the development of ferromagnetic correlations at the surface of these small systems.

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