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**Electric field induced anisotropic transport properties of phase separated $(La_{1-y}Pr_y)_{0.67}Ca_{0.33}MnO_3$ thin films**[1] HYOUNG JEEN JEEN, ALESSANDRA GALLASTEGUI, AMLAN BISWAS, Department of Physics, University of Florida, Gainesville, Florida 32611 — The perovskite manganese oxide $(La_{1-y}Pr_y)_{0.67}Ca_{0.33}MnO_3$ (LPCMO) exhibits electronic phase separation i.e., a ferromagnetic metallic phase and a charge ordered insulating phase coexist in a certain temperature range. It was shown that in such a phase separated state thin films of manganites show a colossal electroresistance (CER) although the mechanism driving this phenomenon is still unknown. We present transport measurements which show that the CER is due to an electric field driven anisotropy in phase separated manganites. LPCMO thin films were grown on $NdGaO_3$ (110) substrates using Pulsed Laser Deposition. A cross shaped micro-structure, with 60 by 10 $\mu$m legs, was fabricated using UV photolithography and chemical etching. We observe CER close to the insulator to metal transition temperature ($T_{IM}$) in the longitudinal direction i.e. parallel to the applied electric field. We simultaneously measure the transverse resistance in the other (orthogonal) leg of the microstructure. We observe a clear anisotropy in the conduction of the cross shaped microstructure which could be the origin of CER in manganites.

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