

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**The Manipulation of Electronic Phase Separation in Manganites.** LIFENG YIN, State Key Laboratory of Surface Physics and Department of Physics, Fudan University, Shanghai 200433, China — The Electronic Phase Separation (EPS) is a common phenomenon in strongly correlated systems where two or more electronic phases coexist owing to a delicate balance of competition between these phases. A model system is  $(\text{La}_{5/8-y}\text{Pr}_y)\text{Ca}_{3/8}\text{MnO}_3$  (LPCMO), a colossal magnetoresistance (CMR) manganite that is known for its large-scale EPS. Since the transport and magnetic properties depend sensitively on EPS, it is crucial to manipulate the EPS domains, especially for the applications of CMR manganites in multifunctional electronic and spintronic devices. Through the broken symmetry induced edge states, we can control the nucleation and growth of ferromagnetic metallic domains, thus the spatial distribution of EPS domains in turn. When the Pr doping is chemical ordered, we found the size of EPS domains will be one order of magnitude smaller. Furthermore, the EPS phenomena can be fully eliminated by the spatial confinement when the sample size is smaller than 500nm. These findings could help to understand the origin of large-scale EPS in LPCMO.

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Date submitted: 06 Nov 2015

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