

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Magnetic coercive field changes in microstructured  $(\text{La}_{1-y}\text{Pr}_y)_{1-x}\text{Ca}_x\text{MnO}_3$  thin films**<sup>1</sup> DANIEL GRANT, MICHAEL RYAN, AM-LAN BISWAS, Department of Physics, University of Florida, Gainesville, FL 32611 — The hole-doped manganite  $(\text{La}_{1-y}\text{Pr}_y)_{1-x}\text{Ca}_x\text{MnO}_3$  (LPCMO) shows effects such as phase coexistence and colossal magnetoresistance. Since the phase coexistence occurs at length scales of up to 10 micrometers, it is relatively straightforward to reduce the sample size to the scale of phase separation. We will present magnetization data that show a change in the magnetic coercive fields of LPCMO thin films by a factor of about 2 when the sample size is reduced to 100 micrometers using a photolithography process. The amount of the increase of the coercive field increases with film thickness. We will discuss the increased coercive field in the context of the competition between shape and stress magnetic anisotropies. We will also describe the role of dimensionality in determining the coercive field behavior. This process can be used to control the phase separation and the magnetic hardness of manganites.

<sup>1</sup>NSF DMR-1410237

Daniel Grant  
Department of Physics, University of Florida, Gainesville, FL 32611

Date submitted: 13 Nov 2014

Electronic form version 1.4