Abstract Submitted
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Magnetic coercive field changes due to electric field generated anisotropy in $(La_{1-y}Pr_y)_{1-x}Ca_xMnO_3$ thin films[1] DANIEL GRANT, BRIAN SCHAEFER, AMLAN BISWAS, Department of Physics, University of Florida, Gainesville FL 32611 — The hole-doped manganite $(La_{1-y}Pr_y)_{1-x}Ca_xMnO_3$ (LPCMO) shows phase competition between ferromagnetic metallic and antiferromagnetic charge order insulator regions due to the interplay between magnetic, electronic, and structural interactions. Of particular interest is the possibility of utilizing the phase competition to modify the magnetic properties of LPCMO using an electric field. We will present electric field dependent magnetization data on LPCMO thin films grown on (110) $NdGaO_3$ substrates which show shifts in the coercive magnetic fields when an in-plane electric field is applied to the sample. The electric field effect is also influenced by the in-plane magnetic anisotropy of the thin films. The proposed dielectrophoresis model offers a qualitative scenario through which we can explain these observations. This model states that application of an electric field can cause an alignment of the ferromagnetic metallic regions to create an anisotropic low resistance path, which could affect the in-plane shape anisotropy of phase separated LPCMO thin films. We will also discuss our results on LPCMO microstructures.

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