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Magnetic field effects on dielectrophoresis in manganites[1] DANIEL GRANT, GALIN DRAGIEV, AMLAN BISWAS, Department of Physics, University of Florida, Gainesville, FL 32611 — Perovskite-type manganese oxides (manganites) are of interest for many of the different properties they possess, including colossal magnetoresistance (CMR) and ferroelectric behavior. With the application of an electric field, large resistance decreases have been noted near the insulator-to-metal transition temperature in samples of $(La_{1-y}Pr_y)_{1-x}Ca_xMnO_3$ (LPCMO). Two proposed models have emerged to explain the behavior, dielectric breakdown and dielectrophoresis, with experimental evidence showing some aspects of the dielectrophoresis model to be correct. However, neither model accounts for magnetic interactions among the ferromagnetic metallic regions and the effects of a magnetic field applied in conjunction with an electric field. We have performed measurements on LPCMO samples by varying the strength and orientation of the magnetic field and the applied voltage. Cross-shaped microstructures have been made on LPCMO samples to allow us to investigate the effects of sample size on dielectrophoresis. We will present resistance and magnetization data obtained on LPCMO samples at various magnetic field strengths, magnetic field orientations, and sample sizes to elucidate the effect of magnetic interactions on dielectrophoresis induced transport and magnetic properties.

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