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Phase Transitions of a $(La_{0.5}Pr_{0.5})_{0.67}Ca_{0.33}MnO_3$ Thin Film Repeated with Increasing Voltage as Probed by Low Temperature Magnetic Force Microscopy[1] FRANK RUZICKA, ALFRED LEE, ALEX DE LOZANNE, Department of Physics, The University of Texas at Austin, Austin, Texas 78712, AMLAN BISWAS, TARA DHAKAL, JACOB TOSADO, Department of Physics, University of Florida, Gainesville, Florida 32611 — Low-temperature magnetic force microscopy was used to study the phase diagram of a $(La_{0.5}Pr_{0.5})_{0.67}Ca_{0.33}MnO_3$ thin film grown on a (110) $NdGaO_3$ (NGO) substrate by pulsed laser deposition. Traditionally, one can observe the phase change at the nanoscale level as the sample is cooled through the transition temperature, but in this case a fixed voltage was applied before each cooling cycle. From in-situ transport measurements, it is observed that the temperature of the peak of the transition increases with applied field; however, the MFM images show that the magnetic transition begins at a lower temperature with the same increase in field. The MFM data will be presented to show the complete phase change as it is cooled through each transition at a fixed voltage.

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