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Susceptibility imaging of a weakly disordered manganite in high magnetic field WEIDA WU, Dept. of Physics and Astronomy, Rutgers University, CASEY ISRAEL, Department of Materials Science and Metallurgy, University of Cambridge, ALEX DE LOZANNE, Physics Department, University of Texas at Austin, NAMJUNG HUR, Department of Physics, Inha University, SOONYONG PARK, SANG-WOOK CHEONG, Dept. of Physics and Astronomy, Rutgers University — We report variable temperature magnetic force microscopy (VT-MFM) studies of $(\text{La,Pr})_{0.625}\text{Ca}_{0.375}\text{MnO}_3$ in a 1 T magnetic field with temperature ranging from 10 K to 250 K. *In-situ* resistance measurements confirmed the bulk phase transitions between paramagnetic, anti-ferromagnetic charge ordering and ferromagnetic (FM) phases. Above the FM transition ($\sim 80\text{K}$), MFM images show μm -scale magnetic contrast which originates from the local susceptibility variations of the different phases.¹ By comparing the MFM images with polarized optical microscopy images taken at room temperature, it becomes apparent that the magnetic phase inhomogeneity observed at elevated temperature is linked to local strain variations at the surface of the sample. The high field susceptibility imaging technique could be extended to the study of other magnetic phase separated systems.

¹C. Israel, W. Wu and A. de Lozanne, APL, **89**, 032502 (2006).

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