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Imaging Local Magnetic Domain Rearrangement in Strained $LaCoO_3$ Thin Films Using Magnetic Force Microscopy[1] MORGANN BERG, NELIZA LEON, AGHAM POSADAS, ALFRED LEE, University of Texas at Austin, JEEHOON KIM, Los Alamos National Laboratory, ALEX DE LOZANNE, ALEX DEMKOV, University of Texas at Austin — Previous studies we have conducted on thin films of lanthanum cobaltate (LCO) under tensile strain have revealed a tendency toward local magnetic domain rearrangement into streak-like configurations near the ferromagnetic to paramagnetic phase transition. Moreover, the persistence of these streak-like characteristics to lower temperatures after field-cooling appears to be linked to the strength of the applied magnetic field in which these films are field-cooled. This tendency has not yet been verified for thin films of LCO under compressive strain which could indicate whether this magnetic domain rearrangement is intrinsic to thin film samples of LCO or is merely an effect of tensile strain. Using magnetic force microscopy, we investigate the microscale magnetic properties of a thin film of LCO under compressive strain, prepared by molecular beam epitaxy and deposited on a lanthanum aluminate substrate. We observe these properties across a wide temperature range and compare our results to global magnetic characteristics of this film as measured by a SQUID magnetometer.

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