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Avalanches and hysteresis at the structural transition in stripe-ordered $\mathbf{La_{1.48}Nd_{0.4}Sr_{0.12}CuO_4}$[1] P. G. BAITY, GARIMA SARASWAT, DRAGANA POPOVIĆ, Dept. of Phys. & Natl. High Magnetic Field Lab., Florida State Univ., T. SASAGAWA, Tokyo Inst. of Tech. — The coupling or intertwining of lattice, spin and charge orders and their effects on superconductivity are of great current interest in the physics of cuprates. The rare-earth-doped cuprate $La_{1.48}Nd_{0.4}Sr_{0.12}CuO_4$ (LNSCO), for example, exhibits a first-order structural phase transition (SPT) from the low-temperature orthorhombic (LTO) to the low-temperature tetragonal (LTT) phase, with the onset of the static charge stripe order roughly coinciding with the SPT. We present out-of-plane magnetoresistance measurements around the LTO-LTT transition in LNSCO single crystals with $H \parallel c$ up to 12 T and $H \parallel ab$ up to 9 T. Hysteresis is observed for both field orientations, but for $H \parallel c$ we also find evidence for the existence of metastable states and collective dynamics in the form of avalanches and return point memory. Such behavior indicates that, in LNSCO, the LTO-LTT structural transition can be driven with H. A detailed analysis of the avalanche statistics is used to determine their size and field dependence, and to extract information about the domain structure and dynamics of domain walls. Our results shed light on the interplay of lattice, spin and charge degrees of freedom in stripe-ordered La-based cuprates.

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Paul Baity
FSU/NHMFL

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