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Using Disorder to Detect Locally Ordered Electron Nematics via Hysteresis ERICA CARLSON, Purdue University, KARIN DAHMEN, University of Illinois at Urbana Champaign — The interplay between charge, orbital, and lattice degrees of freedom in correlated electron systems has resulted in many proposals for new electronic phases of matter. An electron nematic breaks the point group symmetry of the host crystal, often from C_6 or C_4 rotational symmetry to C_2. Electron nematics have been reported in several condensed matter systems including cuprate and iron arsenic based high temperature superconductors, and they have been proposed to exist in many other materials. However, the combination of reduced dimensionality and material disorder typically limits the spatial range over which electron nematic order persists, rendering its experimental detection extremely difficult. Despite the tantalizing possible connection between the phase and high temperature superconductivity, there is surprisingly little guidance in the literature about how to detect the remaining disordered electron nematic. We propose a general method for detecting disordered electron nematics in bulk condensed matter systems using nonequilibrium methods.

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