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Oscillations in Power and Structure During the Transition to Defect Turbulence MARCUS DAUM, ZRINKA GREGURIC FERENCEK, JOHN CRESSMAN, George Mason University — Electroconvecting liquid crystals support a wide range of dynamics from ordered rolls to highly chaotic states characterized by the creation, interactions, and dissipation of defects. In addition to visual observations these systems also allow the direct measurement of the electrical power injected into them. Here we report on a remarkable phenomenon that occurs when a sample is abruptly driven from an ordered steady state to a complex driven state. During such transitions the system transiently maintains its ordered structure beyond the transition to defect dynamics. The order enables the system to absorb more and then less power than in the steady state. By simultaneously imaging the system and measuring the power injected into the system, we are able to investigate the relationship between defect dynamics, conductivity, and power injection in this system.

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