

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Counterpropagation and amplitude modulation of rolls in a broken-symmetry electroconvection experiment DAN SPIEGEL, ELLIOT JOHNSON, SKYLER SAUCEDO, Department of Physics and Astronomy, Trinity University, San Antonio, Texas, USA — We report a liquid-crystal electroconvection pattern-formation experiment along a narrow strip in which the translational symmetry is broken with a laser-induced thermal gradient. In contrast with other broken-symmetry patterns that display a uniform drift, we observe rolls that counter-propagate into a sink point and a strong temporally periodic amplitude modulation near this point. The time dependence of the amplitude at a fixed position is periodic but not sinusoidal. On the basis of experimental spacetime contours and wavenumber profiles, along with a measurement of the change in the roll-drift frequency with applied voltage at a fixed control parameter, we propose a simple qualitative model based on (1) the enhancement of thermal transport due to advection, and (2) a hyperbolic-tangent solution to the Ginzburg-Landau equation that is relevant near the Eckhaus boundary.

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Date submitted: 03 Aug 2005

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