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Length Scales of Chaotic patterns near the onset of of Electroconvection in the Nematic Liquid Crystal I52[1] XIAOCHAO XU, GUENTER AHLERS, Dept. of Physics and iQUEST, University of California, Santa Barbara — We report experimental results for Electroconvection of the nematic Liquid Crystal I52 with planar alignment and a conductivity of $1.0 \times 10^{-8}\,(\Omega\,\mathrm{m})^{-1}$. The cell spacing was $19.4\,\mu$m and the driving frequency was 25.0 Hz. Spatio-temporal chaos consisting of a superposition of zig and zag oblique rolls evolved by means of a supercritical Hopf bifurcation from the uniform conduction state.[2] For small $\epsilon \equiv V^2/V_c^2 - 1$, we measured the correlation lengths of the envelopes of both zig and zag patterns. These lengths could be fit to a power law in ϵ with an exponent smaller than that predicted from amplitude equations. The disagreement with theory is similar to that found previously for domain chaos in rotating Rayleigh-Benard convection.[3]

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[3]Y. Hu, R. E. Ecke and G. Ahlers, Phys. Rev. Lett. **74**, 5040 (1995).

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