Abstract Submitted
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Pattern Formation and Dynamics in Electroconvection of Nematic Liquid Crystals: a Theoretical and Experimental Study of the Weak Electrolyte Model[1] IULIANA OPREA, Colorado State University, J.T. GLEESON, Kent State University, GERHARD DANGELMAYR, Colorado State University — Ginzburg Landau formalism is used in the study of electrohydrodynamic convection in a planar layer of nematic liquid crystal based on the weak electrolyte model. Stable wave patterns predicted by weak electrolyte model near a Hopf bifurcation of the basic state are analyzed and bounds for the Eckhaus stability are obtained. The weak electrolyte model, that treats the conductivity as a dynamical variable, is tested by quantitative comparison of experimentally measured and theoretically calculations of specific parameters, such as the recombination rate and charge transport, for the nematic I52. The experimentally observed spatiotemporal chaos evolving at the onset is qualitatively compared with the spatiotemporal chaos obtained in the numerical simulations of the four globally coupled Ginzburg Landau equations describing the dynamics of the amplitudes of the bifurcated patterns.

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