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A Temporal Period Doubling Route to Spatiotemporal Chaos in a System of Amplitude Equations for the Nematic Electroconvection[1] IULIANA OPREA, GERHARD DANGELMAYR, Colorado State University — We analyze the transition from periodic solutions to spatiotemporal chaos in a system of four globally coupled Ginzburg Landau equations describing the dynamics of instabilities in the electroconvection of nematic liquid crystals, in the weakly nonlinear regime. If spatial variations are ignored, these equations reduce to the normal form for a Hopf bifurcation with O(2) x O(2) symmetry. Coexistence of low dimensional and extensive spatiotemporal chaotic patterns, as well as a temporal period doubling route to spatiotemporal chaos, corresponding to a period doubling cascade towards a chaotic attractor in the normal form, are also identified and discussed, for values of the parameters including experimentally measured values of the nematic I52.

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