The Role Of Local Structures In STC Of The 1D CGLE (general)

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The 1D CGLE displays a wide range of spatiotemporal chaotic states as a function of its linear and nonlinear dispersion coefficients. We show how most of its phase diagram, as well as the nature of the transitions between various chaotic states, can be understood from the behavior of 3 families of local structures. In particular we focus on the transition from phase to defect chaos. Nozaki-Bekki holes, Homoclons and MAWs are the building blocks of spatiotemporal chaos in this model.

Breakdown of Universality in Coupled Map Lattices (research)

We show that the transition from laminar to active behavior in extended chaotic systems can vary from a continuous transition in the universality class of directed percolation with infinitely many absorbing states to what appears as a first-order transition. The latter occurs when finite lifetime nonchaotic structures, called "solitons," dominate the dynamics. We illustrate this scenario in an extension of the deterministic Chate-Manneville coupled map lattice model and in a soliton including variant of the stochastic Domany-Kinzel cellular automaton.