

Abstract Submitted
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3-D Space-Time Topology of Spiral Defect Chaos in Rayleigh Benard Convection¹ HUSEYIN KURTULDU, MICHAEL SCHATZ, Georgia Institute of Technology, MARCIO GAMEIRO, KONSTANTIN MISCHAIKOW, Rutgers University — An algebraic topological method, computational homology, is used to characterize the evolution in space-time of spiral defect chaos in Rayleigh-Benard convection experiments. The convective flow is described by a time-sequential collection of 2-D shadowgraph images that forms a 3-D representation (2-D space, 1-D time) known as a space-time block. Topological analysis of a space-time block yields Betti numbers quantifying the components, holes and cavities within the block. We present results that show how the dynamics of spiral defect chaos are captured by analyzing a time series of space-time blocks

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