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Fractal Geometry of Undriven Dissipative Systems XIAOWEN CHEN, TAKASHI NISHIKAWA, ADILSON E. MOTTER, Department of Physics and Astronomy, Northwestern University — Traditional studies of chaos in conservative or driven dissipative systems have established a correspondence between sensitive dependence on initial conditions and fractal basin boundaries. Here, I will present on a new type of chaos due to transient interactions with transient chaotic saddles in undriven dissipative systems. I will show that such systems can develop complicated trajectories, but only exhibit fractality and the Wada property at all scales for specific parameter choices at which the dynamics have a degenerate fixed point. For other parameter choices, the boundaries become simple at sufficiently small but widely different scales across the phase space, despite the observed sensitive dependence on initial conditions. However, such scales are often far below the current computational resolution even for low-dimensional dynamical systems.

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