Unstable recurrent patterns in Kuramoto-Sivashinsky dynamics
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— We test the "recurrent patterns" description of turbulence on a Kuramoto-Sivashinsky model, deploying a new variational method that yields a large number of numerical unstable spatiotemporally periodic solutions. For a small but turbulent system, the attracting set appears surprisingly thin. Its backbone are several Smale horseshoe repellers, well approximated by local return maps, each with good symbolic dynamics. Global dynamics appears decomposable into chaotic dynamics within such local repellers, interspersed by infrequent transitions between them.

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