

Abstract Submitted
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Spatio-temporal dynamics in transitional shear flows BRUNO ECKHARDT, Philipps-Universitaet Marburg, KORINNA ALLHOFF — The spatio-temporal dynamics of transition pipe flow is dominated by the interplay between a local decay of turbulent puffs and the spreading of turbulence to neighboring regions. Much of the dynamics can be captured by a cellular model with two parameters that describe the local persistence and the spreading. The model shows a transition from a transient turbulence to a persistent one for sufficiently strong spreading. The bulk properties of the model fall into the universality class of 1+1-d directed percolation. The model can also be used to analyze the dynamics of local excitations. These localized excitations show an initial phase of spreading, which is followed by a slower spreading in the parameter range of persistent turbulence, or a contraction and a decay for transient turbulence. The observations are also compared to observations on turbulent spots in plane Couette flow.

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