

Mechanisms and universality in the subcritical route to turbulence

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Abstract

Recent years have witnessed a profound change in our understanding of the route to turbulence in wall-bounded shear flows. In stark contrast to the classical Hopf-Landau picture where turbulence arises through an increase in the temporal complexity of fluid motion, the route to turbulence in subcritical shear flows occurs via spatio-temporal intermittency and falls in the class of non-equilibrium statistical phase transitions known as directed percolation. In this talk I will focus on two aspects of the transition problem. The first is physical mechanisms underlying spatio-temporal intermittency in shear flows. The second is the universality in the subcritical route to turbulence.

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