

Abstract Submitted
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Nonlinear stochastic advection and structure generation in two-dimensional ideal fluids¹ MADALINA VLAD, FLORIN SPINEANU, National Institute of Laser, Plasma and Radiation Physics — We show that trajectory trapping or eddying in the structure of the turbulence is the main physical reasons for the strong nonlinear effects that are observed in two-dimensional ideal fluids. This conclusion is drawn from a study of the statistics of test particles in turbulent Euler fluids, which is based on a new analytical method. Trajectory trapping determines non-Gaussian distribution of the displacements, quasi-coherent motion and local flows. This nonstandard statistical properties of trajectories determine the evolution of turbulence toward large correlation lengths (inverse cascade) and long correlation times. Thus, trajectory trapping explains the tendency of structure generation in two-dimensional Euler fluids.

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