

Random Transitions In Stochastic Turbulent Flows

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Many turbulent systems exhibit random switches between qualitatively different attractors. The transition between two different attractors is often an extremely rare event that cannot be computed through direct numerical simulations due to complexity limitations. In this talk, we develop a path integral approach to studying bistability in the quasi-geostrophic equations, which enable us to compute the most probable transition trajectories or instantons between two coexisting attractors. By representing the transition probability between two given attractors as a path integral, we can determine the most probable transition by the minimization of an appropriate action functional.