

Anomalous diffusion of tracer particles in fast cellular flows.

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Abstract

It is well known that a diffusive tracer particle in the presence of an array of strong opposing vortices (aka cellular flow) behaves like an effective Brownian motion on long time scales. On intermediate time scales, however, a robust anomalous diffusive behaviour has been numerically observed. This talk is a first step towards understanding this anomalous behaviour. We will show that the variance of the particle behaves like $O(\sqrt{t})$ on “intermediate” time scales; in contrast, the long time behaviour of the variance is like $O(t)$.