MICHELE COTI-ZELATI, University of Maryland

Stochastic perturbations of passive scalars and small noise inviscid limits

We consider a class of invariant measures for a passive scalar driven by an incompressible velocity field on a periodic domain. The measures are obtained as limits of stochastic viscous perturbations. We prove that the span of the $H^1$ eigenfunctions of the transport operator contains the support of these measures, and apply the result to a number of examples in which explicit computations are possible (relaxation enhancing, shear, cellular flows). In the case of shear flows, anomalous scalings can be handled in view of a precise quantification of the enhanced dissipation effects due to the flow.