Burgers Turbulence on a Fractal Fourier set

MICHELE BUZZICOTTI, LUCA BIFERALE, Dept. Physics University of Rome “Tor Vergata”, URIEL FRISCH, CNRS, Observatory of Nice, SAMRIDDHI RAY, Tata Institute of Fundamental Research — We present a systematic investigation of the effects introduced by a fractal decimation in Fourier space on stochastically forced one-dimensional Burgers equations. The aim is to understand the statistical robustness of the shock singularity under different reductions of the number of the degrees of freedom. We perform a series of direct numerical simulations by using a pseudospectral code with resolution up to 16384 points and for various dimensions of the fractal set of Fourier modes $D_F < 1$. We present results concerning the scaling properties of statistical measures in real space and the probability distribution functions of local and non-local triads in Fourier space.

$^1$Partially supported by ERC Grant No 339032.