

Abstract Submitted  
for the DFD10 Meeting of  
The American Physical Society

**DNS of multiscale-generated turbulence** JOHN CHRISTOS VASSILICOS, SYLVAIN LAIZET, Imperial College London — Four spatially evolving turbulent flows, one generated by a regular grid and three generated by fractal square grids of different aspect ratio are studied by means of Direct Numerical Simulations (DNS). An innovative approach which combines high order compact schemes, Immersed Boundary Method and an efficient domain decomposition is used in this study to perform such large simulations. Statistics such as turbulent intensities are investigated with the objective of analysing the two different regions (production and decay regions) downstream from the fractal square grids, as already observed in the experimental results of Mazellier & Vassilicos (PoF, 2010). The main goal of this numerical study is to identify the physical mechanisms implicated in the generation of turbulent flows, especially when generated at different scales, but also to compare the different levels of turbulence intensity generated by each grid.

John Christos Vassilicos  
Imperial College London

Date submitted: 29 Jul 2010

Electronic form version 1.4