Lagrangian Structure Functions in Turbulence: Experimental and Numerical Results

LUCA BIFERALE[1], University of Tor Vergata, Rome, Italy

A detailed comparison between experimental and numerical data of Lagrangian velocity structure functions in turbulent flows is presented. Thanks to the integration of information coming from experimental and numerical data, a quantitative understanding of the velocity scaling properties over a wide range of time scales and Reynolds numbers can be achieved. Intermittency changes if measured close to the Kolmogorov time scales or at larger time lags. A quantitative comparison with prediction from multifractal theory for Lagrangian turbulence will also be presented. These results shed some new insight on the relevance of vortex filaments for the statistics of tracers and/or heavy/light particles in turbulence.

[1]International Collaboration for Turbulence Research