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Intermittency in non-homogeneous Wake and Jet Turbulence

O.B. Mahjoub, E. Sekula, and J.M. Redondo

The scale to scale transfer and the structure functions are calculated and from these the intermittency parametres [1[3]. The estimates of turbulent diffusivity could also be measured. Some two point correlations and time lag calculations are used to investigate the local mixedness [4,5] and the temporal and spatial integral length scales obtained from both Lagrangian and Eulerian correlations and functions. We compare these results with both theoretical and experimental ones in the Laboratory with a wind tunnel at the wake of a grid or cillinder with and withoutand a near Wall. The a theoretical description of how to simulate intermittency following the model of Babiano et al. (1996) and the role of locality in higher order exponents is applied to the different flows.
The information about turbulent jets is needed in several configurations providing basic information about the turbulent free jet, the circular jet and the turbulent wall jet. The experimental measurements of turbulent velocity is based on Acoustic Doppler Velocimeter measurements of the jet centerline and off centered radial positions in the tank at several distances from the wall. Spectral and structure function analysis are useful to determine the flow mixing ability using also flow visualization [6,7]. Results of experiments include the velocity distribution, entrainment angle of the jets, jet and wake average and fluctuating velocity, PDF's, Skewness and Kurthosis, velocity and vorticity standard deviation, boundary layers function and turbulence intensity . Different range of Wake and Jet flows show a maximum of turbulent intensity at a certain distance from the wall as it breaks the flow simmetry and adds large scale vorticity in the different experiments, these efects are also believed to occur in Geo-Astrophysical flows.

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