Geophysical Research Abstracts
Vol. 12, EGU2010-14600, 2010
EGU General Assembly 2010
© Author(s) 2010

Asymetrical structure in coastal river flows and jets

Jose M. Redondo (1), Emil Sekula (1), and Allen Bateman (2)

(1) Universidad Politecnica de Catalunya, Dept. Fisica Aplicada, Applied Physics, Barcelona, Spain (redondo@fa.upc.es, +34 93 4016090), (2) Universidad Politecnica de Catalunya, Dept. Eng. Hidraulica, Barcelona, Spain

We apply visual scaling methods to both laboratory experiments and to satellite images of coastal flows as a tool to understand
jet/boundary interactions in the environment. We compare the structure of SAR(Synthetic Aperture Radar) images of coastal jets and vortices and to experiments of jets of different Reynolds numbers and their images searching for common scaling and structural relationship between these two kinds of jets taking advantage of the self-similarity of the mixing processes.

In order to investigate the structure of ocean surface detected jets (SAR)and vortices near the coast, we compare wall and boundary effects on the structure of turbulent jets (3D and 2D) which are non-homogeneous. We also use the multifractal analysis of SAR and experimental jets (plumes) images looking for relationship between these two kinds of jets. The SAR images exhibit a large variation of natural features produced by winds, internal waves, the bathymetric distribution, by thermal or solutal convection by rain, etc. These produce variations in the sea surface roughness. The satellite-borne SAR is able to detect oceanic features with a range of scales. The
spatial cross-correlation may give an indication of the length over which such features are correlated. We compare the inner and outer jet boundaries detecting a clear asymetry, A similar effect is detected in laboratory experiments at large Reynolds number when a wall is near one of the sides of the jet. The geometrical constrains are seen to affect also the scale to scale energy transfer.