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Environmental turbulence and climate-weather scaling

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Climate changes in Harbours, coastal areas and ROFI are key to Environmental flows. Ocean and Atmospheric turbulence is an energetic, eddying state of motion that disperses material at rates far higher than those of molecular processes alone; The role of intermittency and understanding of how turbulence is modified at Climatic and Weather scales in shallow seas, the deep ocean, and in the mixed layers is of great importance and practical applications. The larger-scale and time coherent structures associated with large Stommel diagram processes akin to turbulence that also have intermittency.

With the aid of remote sensing we also use surface signatures[1,2] that can be detected and used to infer ocean parameters. Such effects dominate mesoscale vorticity, the role of Rossby deformation radius, Spiral eddies, convective cells, or the spacing of Langmuir turbulence, related to the depth of the mixed layer, or to cloud tops. The dominant instability processes can generate different intermittency , detected often as bursts or in variations in the scale to scale transfer of turbulence. We include climatic scales where Extended Self Simmilarity is used also in these scales in a fractal way.

Global experiments, even with a wide range of new configurations are possible[3-6]. Such complex flows are known to generate nonequilbrium and non-local turbulence which produces different turbulence properties and varying intermittency. Applications to enhanced mixing and drag reduction are still being investigated [6, 7], and how do the turbulence and mixing properties change in Lagrangian and Eulerian descriptors with generalized Rayleigh, Rossby, Richardson and Reynolds numbers? in complex Poincare like, parameter spaces.

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