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Preface

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Practically every geophysical and environmental related problem within the atmosphere and the ocean, and most of all affecting the interface between both fluids (air and water), is governed by environmental flow dynamics. Because human and most animal life dwells and develops around this very narrow zone, knowledge of these kinds of motions is fundamental. Turbulence affects also the evolution and diffusion of non-desired polluting substances, as much in the ocean or in fresh water as in the atmosphere, producing other kinds of contamination, such as deposition in solid earth or ocean bottoms. It is evident that two major body forces are felt by the fluids in environmental flows, gravity- and rotation-induced forces.

The importance of further understanding turbulent flows nowadays comprises a large variety of key scientific investigations: from the microphysics of bio-fluid circulation to synoptic or planetary scales and even astrophysical and cosmological fluid problems such as the evolution of galaxies or the universe anisotropy. One of the characteristics of turbulence is the importance of scale-to-scale transfer processes in a non-linear fashion.

This publication stems from the “Environmental Turbulence” Workshop and summer school held at the International University of Andalusia (UNIA) in the beautiful town of Baeza (Spain) during 23rd-25th June 2008. The 19 papers presented at *Nuovo Cimento C* cover most topics of the Workshop and focus on field data and laboratory and numerical experiments related to turbulence and environmental research. In an eclectic manner the different research lines including computational modelling of turbulence, the experimentation of Laboratory Geophysical Fluid Dynamics (LGFD) and atmospheric and ocean observations are all represented. Covering as much as possible the different lines of work in geosciences and the environment at different scales, in basic mathematical or in more applied investigations.

We hope that this issue will be attractive to a wide range of scientists and technicians of practical and theoretical knowledge belonging to different organisms and universities from the world, working in turbulence and related application within environmental science. We wish to stimulate, with this publication and with future workshops, a fruitful interchange of ideas and academic, scientific and applied methodologies, which will be useful also in the development of the next generation of scientists.