



Large-Eddy Simulation of an offshore Mediterranean area

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Large-Eddy Simulations (LES) are important for gaining a deeper understanding of the structure of the marine atmospheric boundary layer and its interaction with the synoptic scale forcing. A possible application is to simulate mean and turbulent spatial/temporal structure of the marine boundary layer to optimise the structural design of offshore large wind turbines. In the present work, large eddy simulations have been performed and compared with offshore experimental data collected during the LASIE campaign performed in the Mediterranean in Summer 2007.

A series of simulations are performed and compared against experimental soundings, using a force-restore nudging technique LES in order to force the model to the evolving large-scale situation. Results show that the LES with a force restore nudging technique outperforms the simulations without force-restore nudging for all the fields. This demonstrates that incorporating changes in the large-scale features into the model is necessary in order to provide a realistic evolution of the meteorological fields at local scale.

Thus, LES appears as a promising technique to be applied to the simulation of offshore cases and particularly appropriate for wind energy applications.