Evaluation and Intercomparison of MM5 and WRF Predictions during the LASIE Experiment

Ricardo Tomé (1,6,7), Alvaro Semedo (2,7), João Teixeira (3), Anna Maria Sempreviva (4,7), Maria Schiano (5), and Pedro Miranda (6)

(1) CCMMG, Azores University, Angra do Heroísmo, Terceira, Portugal (rftome@fc.ul.pt), (2) Department of Earth Sciences, Uppsala University, Uppsala, Sweden, (3) Jet Propulsion Laboratory, California Institute of Technology, Pasadena, California, USA, (4) CNR-ISAC, Lamezia Terme, Italy, (5) CNR-ISMAR, Genova, Italy, (6) CGUL-IDL, Lisboa, Portugal, (7) Risø, National Laboratory for Sustainable Energy, Technical University of Denmark

Besides being used as operational regional forecasting tools, mesoscale meteorological models have also been used for research purposes to advance the understanding of regional-scale processes and help the development of parameterizations for use in larger-scale weather forecast and climate prediction models. Several previous studies have compared the performance of two or more mesoscale models using either long-term observations or data from short-term field campaigns. This kind of studies over the ocean, in particular in coastal environments, is nevertheless scarcer. The forecasting of winds, temperature, clouds and precipitation, visibly, and boundary layer structure, while challenging in any region, become particularly complex near coastlines, where processes associated with the coastal boundary adds additional complexity: interaction between terrain-induced flows and sea/land breezes, sharp sea-land temperature gradients, highly baroclinic environment, complex air-sea exchanging processes, etc. The present study evaluates the forecasting skills of the mesoscale models MM5 and WRF in a demanding coastal environment, with high mountainous coast lines, and sharp sea-land temperature gradients. The models are compared against intensive observations collected during the Ligurian Sea Air-Sea Interaction Experience (LASIE), which took place from 16 to 22 June 2007. High resolution simulations (6 km and 2 km) are compared to near surface observations from a spar buoy. Radiosonde profiles from two research ships, in the vicinity of the buoy, are also compared to the models.