NWP Models Wind Forecast Evaluation Over Complex Terrain

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A full five years (2001-2005) of numerical simulations with MM5 mesoscale model are used to evaluate the
performance of this model in wind forecast in the Island of Madeira. Simulations test the sensitivity of the model to
horizontal resolution, vertical resolution and options in the parameterization of the boundary layer. In the later year
(2005) the results are compared against simulations of the WRF and MesoNH mesoscale models. The simulations
use ECMWF reanalysis data as initial and boundary. Results are compared with field observations in 6 masts at
the mountain plateau of Paul da Serra, 1.5 km above sea level. The quality of the simulated fields is evaluated to
assess wind energy distribution in a very complex terrain. Results don't reveal a positive response to the increased
horizontal resolution for the MM5 model, but, in general, all models overestimate wind speeds and MesoNH shows
a slightly better performance than the American models.