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An assessment of wind energy resources in the Iberian Peninsula by using dynamical downscaling

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One of the main problems in evaluating the wind resources of a given area is the lack data. Usually the existing wind records has not the desired spatial distribution, the altitude of measurements is not adequate or the temporal coverage is too short in order to catch the interannual variability. An usual approach for obtaining some information of the wind energy potential is the use dynamical downscaling techniques.

In this work the capability of a Regional Climate Model in reproducing the main statistics of the hourly 10m observed wind over the Iberian Peninsula (IP) is examined. For this task a 50 years (1968-2007) 10km resolution using a climate version of the MM5 model covering the Iberian Peninsula has been performed. wind speed and direction hourly measurements at more than 700 sites spread over the IP covering the period (1998-2007) are used to evaluate de simulation performance.

Main results indicate that the model tends to overestimate the wind module in low lands and to underestimate in the top of the mountains, while in general a good reproduction of wind direction is found. It is shown that the daily and annual cycle is reasonably well capture by the simulation but the range of variability is underestimated.

It has been observed that the simulations can be used in order to test the quality of data at interannual time scales and therefore to use them as a tool in a preliminary data quality control. On the other hand it is proposed a simple method for correcting the simulated wind for each direction as a function of the roughness length, and the differences of altitude between the model and real orography obtained from a 25m data base.