EMS Annual Meeting Abstracts
Vol. 16, EMS2019-839-1, 2019

Quantification of uncertainty in wind prediction: towards a climatology for the Iberian Peninsula

Mariano Sastre (1), Sergio Fernández-González (2), Francisco Valero (1), and María Luisa Martín (3)

(1) Universidad Complutense de Madrid, Facultad de Ciencias Físicas, Departamento de Física de la Tierra y Astrofísica, Madrid, Spain (msastrem@ucm.es), (2) Agencia Estatal de Meteorología, Santander, Spain (sfernandezg@aemet.es), (3) Universidad de Valladolid, Escuela de Ingeniería Informática, Departamento de Matemática Aplicada, Segovia, Spain (mlmartin@eii.uva.es)

To improve the predictions of the wind resource it is also very convenient to be able to estimate the uncertainty of the wind predictions, particularly when it corresponds to an ensemble prediction. Therefore, this uncertainty needs to be adequately quantified, and in this case, among all the available metrics to do so, it will be done by using the dispersion index defined in Fernández-González et al. (2017). Besides, statistical analysis is performed to guarantee that the method can provide results significantly relevant. The ultimate goal is to build a climatology of uncertainty in the wind prediction for the selected area, which in this case corresponds mainly to the Iberian Peninsula, and analyze the geographical differences. To do these tasks, in this work we use data corresponding to fifteen recent and consecutive years (2003-2018), considering the Ensemble Prediction System (EPS) of the operating forecasts provided by the European Center for Medium-Range Weather Forecasts (ECMWF). Two types of EPS have been considered per day, according to the initialization time (00 and 12 UTC), with a temporal range of 144 h in both cases. A different dataset from the Deutscher Wetterdienst (DWD) is used for comparison. These results can be of great relevance in order to plan new wind farms with appropriate climatic criteria in the Iberian Peninsula, taking advantage of the opportunities posed by the fact of better knowing the climate variability.

Reference:
Fernández-González, S., Martín, M.L., Merino, A., Sánchez, J.L., Valero, F. (2017): Uncertainty quantification and predictability of wind speed over the Iberian Peninsula, Journal of Geofphysical Research: Atmospheres, 122. doi:10.1002/2017JD026533.