Response to comments from editors and reviewers

Part 2: Joint multifractal analysis of available wind power and rain intensity from an operational wind farm (npg-2024-6)

preprint in Nonlinear Processes in Geophysics from 02 Feb 2024
Editor's decision received on

The authors would like to thank the reviewer for evaluating the paper and providing a detailed feedback. Please find below our point-by-point response to the comments (Reviewer comments are shown in black and author responses are in blue).

Anonymous Referee #2, 19 Mar 2024

This study entilted « Joint multifractal analysis of available wind power and rain intensity», investigates the quantification of the effect of rainfall on wind power through the scale invariant framework of Universel Multifractals.

This manuscript is structured as follows : after an introduction part, in the part 2 the authors describe the framework of UM and JMF. In the part 3 the results of analyses of UM and JMF are presented for respectively individual and jointly data fields. The part 4 concerns a discussion part on the influence of rain type as well as that of wind direction on power production. Section 5 concludes the study and summarizes the results.

Thank you very much for taking the time to read and review our manuscript. We greatly appreciate the feedback. Please find our response to the points raised below.

In this study, the authors propose a new parameter JMF, from UM framework, to quantify the effect of rain on wind power output. This is represented a novelty for the scientific community and can be interest the eolian energy scientific community. However, the power output analyzed are values of available power output, instead of actual power output due to the presence of biais as indicated by the authors. For the understanding, this would relevant to insert the reference explaining this point or add in the manuscript the corresponding simulations.

Thank you. This point is addressed in Part 1 of the paper where the presence of rated value in actual threshold caused biases in estimation. To avoid this, and also due to this limitation, actual power had to be used. Though this is mentioned in section 2.3.3, with mention to part 1, we agree that a proper reference to previous paper is needed. For now, only a reference to preprint is added. Reference to final paper will be included.

Minor Revisions

I suggest to authors to zoom the following result figures n°3, 4, 11-14, A1 and A2.

We have increased the size of Fig. 3, 11 and A1. For the rest the size is limited by the width of the page. We believe them to appear bigger in final format since the pdf of first draft used more side margin space in general and has line numbers.

In fig. 3, K(q) curve represented in dotted red line is not visible.

Since there is no second scaling regime in the considerations, the line is redundant.

Typos : line page 16 line 358 (see section ??)..

Thank you, this is corrected now.

References