

Wind Energ. Sci. Discuss., referee comment RC2  
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## **Comment on wes-2021-35**

Anonymous Referee #2

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Referee comment on "High-resolution offshore wind resource assessment at turbine hub height with Sentinel-1 synthetic aperture radar (SAR) data and machine learning" by Louis de Montera et al., Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-35-RC2>, 2021

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### **Review of manuscript "High-resolution offshore wind resource assessment at turbine hub height with Sentinel-1 SAR data machine learning" by Louis de Montera et al.**

As I am providing the second review of the manuscript, and have had the change to go through the first reviewer's comments (referred to as RC1), I can start with pointing out that I fully agree with the raised criticism and recommended changes for an improvement of the manuscript.

Below I list my own major and minor comments, some of them being a repetition of those in RC1 but also including some additional input:

(comments in order of appearance in manuscript)

[I 11] When referring to "Lidar measurements", first time here in the abstract, please specify what kind of measurements you mean explicitly – e.g. Doppler wind lidar, somewhat ground-based, measurements of wind velocity profile in range relevant for wind energy applications, or similar. II Please check the overall manuscript for a sufficiently specific terminology with this respect.

[II 13-14] When stating a bias, you also need to mention the considered reference – please add this here.

[ll 19-20] When reading the sentence “The accuracy of the wind power...” it becomes not clear how you get to the numbers you compare. You should also refer to the process of deriving a power curve from (any) wind data, i.e. the involved derivation.

I am also wondering if you really need to consider this (as I understood later, very simplified power curved derivation) for your study, or instead could focus on a derivation of wind power density.

[l 39] I believe you should refer here to ground- (or bottom-) based Lidars.

[ll 43-44] The sentence seems incomplete – add “... of meteorological conditions [that may impact this extrapolation]”, or similar.

[l 59] Be more specific here: “found to give good results” for what explicitly?

[l 89] Here and at other places where you introduce already available models/methods, please add a reference – in this case, for WRF.

[Figure 1] I suggest to add a larger map to help locating this cut-out. Please also introduce the used abbreviations.

[Figure 1 and Table 1] Are you sure that all these datasets are from floating lidars? I have at least some doubt with respect to LEG and IJM. Please re-confirm.

[l 115] From own experiences and also in line with available recommended practices, I would not fully trust the lower height (as 4 m a.s.l.) measurements from floating lidar systems – mostly from in-situ sensors heavily influenced by the structure itself. Please have some thoughts on this, and possibly consider some added uncertainty.

[Figure 3] This figure is not very informative – please review the design and information included. Overall, I think you can and should reduce the number of figures in the manuscript, possibly combining some of them.

[Figure 4 and Figure 5] In these plots it may be helpful to have the coastline (or something else) as reference.

[section 2.4] As pointed out above, I think, the used power curve is too simplified. I would suggest to either apply a more realistic power curve, or instead consider another quantity as e.g. wind power density for this investigation.

[Figure 6] I do not think that this figure is really needed, instead you could add more details in the text.

[section 2.5] I am confused by your mentioning of "one passage every two days" and "passage times are separated by 12 h" – please be more specific here.

[l 222] As already stated above, please add reference for the applied methods – here the "two types of machine learning regressor[s]".

[l 229] Please specify how "the relative importance" is defined and derived.

[l 239] Also the statement "Random forest was found to outperform neural networks" needs more explanation / details.

[Figure 9] Add a legend to the plots and the details of the red curve (fitting parameters).

[l 266] Again, "machine learning" needs more explanation and details.

[Figure 12 (and Figure 14)] It is not clear to me, why you have not used a smaller range for the vertical axis – please revise.

[l 323] Sentence "In this case, ..." is incomplete.

[Figure 18 and following] Please re-arrange these plots for better comparability – combine several plots in one figure, for instance.

