Wind Energ. Sci. Discuss., referee comment RC2
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Comment on wes-2020-134

Anonymous Referee #2

Referee comment on "Seasonal effects in the long-term correction of short-term wind measurements using reanalysis data" by Alexander Basse et al., Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2020-134-RC2, 2021

Review of the manuscript WES-2020-134

Seasonal effects in the long-term correction of short-term wind measurements using reanalysis data

By Alexander Basse, Doron Callies, Anselm Grötzner, and Lukas Pauscher

Summary: This papers aims to test two MCP (measure-correlate-predict) methods for a series of re-analysis products and analyze whether errors in the mean or in the variance contribute most to the total error or not. The paper is an interesting analysis and presents useful insights in the math behind the MCP methods. The paper is however difficult to read and needs major revisions.

Recommendation: major revision required

Major remarks:

- My main concern is that the paper is not easy to read. Many parts of the text have very short paragraphs of only one or two sentences, so here and there the text is very fragmented. Also the paper does not provide sufficient explanation of the parameters used. The further I got into the paper, the more often I had to go back to the beginning of the paper to find out what was exactly meant by different terminology. So more physical/dynamical meaning should be given to the parameters that are introduced.
- The paper concerns only the MCP methods for mean wind and energy (u^3). But I was wondering whether extreme events in the wind field like ramps (up and down), low level jets and wind shears would also be interested to study, since they have a big impact on the wind energy production variability in time and on the wind turbine installations.
- In terms of re-analyses that were used in the study I was surprised the COSMO REA family (https://reanalysis.meteo.uni-bonn.de/?Download_Data___COSMO-REA2) was not present, since it was especially made for Germany.
- It is a pity that the paper only use the different re-analysis products as illustration for their mathematical exercise. I think for many WES readers it would be interesting to be more specific under which meteorological conditions which product "is best" or "performs less accurate". Also it would be interesting whether more detail can be added about the physics/dynamics behind the variability. Is the error due to missed sea breezes, or Alpine pumping events or low level jets etc. The observational data across Germany is very rich so more of this kind of info might be extractable.
- The Conclusion section should be rewritten since I find there is too much jargon in it. Conclusions are based on the beta parameters, but this makes the conclusion difficult to read as a separate text, which many people do. Please reword.

Smaller remarks:

Ln 19: please cite in chronological order, here and please check complete manuscript.

Ln 45: overperform: do you mean "outperform"?

Ln 55: Strange sentence: if the costs are so low, it is an argument to do more rather than less experiments.

Ln 95: Better to refer to the Hersbach 2020 paper in QJRMS.

Ln 134-135: Maybe I misunderstand the strategy here, but if you have taken 90 day

periods with each 3 days intervals, then you still sample from a complete year (I read it as i you take 1 Jan, 4 Jan, 7 Jan .....). So this is not how a measurement campaign occurs where maybe only one or two months are sampled.

Ln 134-135: if you complete the series at the end of the series with the new year, is the winter overrepresented in this analysis?

Ln 170: please explain more early in the manuscript what are umeas, Umeas, uref and Uref.

Ln 202: a one-year time series is generated: but this is inconsistent with was written in line 134-135 where you say you sample 90-days periods.

Ln 217: extent

Ln 216-219: this paragraph is extremely abstract

Ln 257: explain why "true" is between "".

Ln 260: representativity: do you mean representativeness??? Please check several places in the manuscript.

Ln 312: Differences occur in the amplitudes.: short and weird sentence. What do you want to say?

Figure 1: please add in the caption how the normalization was done, so the reader does not need to go through the manuscript again to look it up.

Ln 326: might be caused .....: this is speculative. Please prove what you would like to say here.

Ln 330: Please explain more what you want the reader to learn from Fig 3.

Figure 5: caption: please reword caption. You do not show seasonal bias, but the bias through the different months. The plot does not show bias for DJF, MAM, JJA, SON...

Ln 391: “or rather because of the erroneous seasonal course of the ERA5 data.”: this is not clear to me since Fig 1 says that ERA5 has a correct seasonal cycle.

Ln 405: However, the authors expect it to be rather small: argue why, prove with data or physical reasoning.

Ln 413: these: please indicate to what “these” refer to

Ln 428: From that it is likely that not all the reference: messy sentence that makes the reader lost.

Ln 446: “The authors” -> we. Now it sounds as if you place it beyond yourself.

Figure 9: the variables on the x and y axes should be switched, since the observation is the known and the MERRA is the modelled/predicted.