

## ***Interactive comment on “Measuring dynamic wake characteristics with nacelle mounted LiDAR systems” by Inga Reinwardt et al.***

**Vasilis Pettas (Referee)**

pettas@ifb.uni-stuttgart.de

Received and published: 4 February 2020

This study presents the results of a measurement campaign, using nacelle mounted lidar pulsed lidars, focusing on the wake of a small, closely-spaced wind farm in a mostly flat terrain. The lidar measurements aim to capture the behavior of the wake in terms of deficit and meandering and compare with numerical predictions of different variations of the dynamic wake meandering (DWM) model. The measurement results are used to calibrate the parameters of one of the variations of the DWM in order to better fit the numerical results to the measurements. The analysis is mostly qualitative.

1. In terms of language the text is well written and clear. Some improvements are needed on the structure and phrasing used. See specific comments.

C1

2. Good literature review especially regarding previous campaigns.
3. The analysis is mainly qualitative. Quantitative analysis should also be used to back up the arguments. More explanation on why we see what we see not only explaining what we see is needed.
4. The data don't seem to be enough especially in higher TIs to generalize the conclusions.
5. Clearer explanation of the tools/methods used especially for the numerical part. How were the virtual lidar measurements done, what software was used, what are the assumptions...? This will improve reproducibility and make the work more transparent.
6. More discussion is needed on the uncertainties like yaw direction, sampling rate, low sample size, distance of met mast (especially to WTG2), other wake interactions, LOS reconstruction, etc. How much do all these affect the results? More thorough discussion is needed on these points.
7. Some more tangible results would be good in order for this work to be more useful for the research community. Can the data sets and the codes used to post process and fit the DWM model be made publicly available? Under which condition are the recalibrated parameters valid (terrain, ambient conditions, turbine types etc.)?
8. Language and argumentation need to be more concise. Avoid qualitative terms like "quite", "relatively", "probably", "becomes apparent", "almost" etc. A lot of argumentation is based on oral and visual argumentation instead of quantitative and causal analysis.

The data sets from the measurement campaign and the findings of a recalibrated variation of a specific DWM model can be useful for the wind energy community and is relevant in the context of the journal. Showing the shortcomings of current engineering models as well as issues associated with measurement campaigns has a value for the wind energy research community. I suggest the manuscript for publication after

C2

addressing the comments suggested here.

Please also note the supplement to this comment:

<https://www.wind-energ-sci-discuss.net/wes-2019-89/wes-2019-89-RC1-supplement.pdf>

---

Interactive comment on Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2019-89>, 2019.