

Interactive comment on “Digitizing scanning lidar measurement campaign planning” by Nikola Vasiljević et al.

Anonymous Referee #1

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1 General comments

In the manuscript by Vasiljevic et al. a software library is presented which allows campaign planning for wind farm site and yield assessment with Doppler wind lidar measurements. The tool seems to be a benefit for people who have experience with lidar measurements and need an initial guess for good lidar positions in the field and for these reasons the work is technically significant and important. However there are some major concerns that can be raised with regard to its scientific significance:

- Experience with meteorological measurement campaigns, especially in remote

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locations, shows that logistical constraints are often dominating the site selection for instrument placement. The authors mention this issue, but only suggest to generate multiple layouts and select the one that is feasible in the end. In my opinion, the logistical constraints should be included in the selection process a priori, because it is a criterion for exclusion, while other criteria like the elevation angle and representative radius only increase the uncertainties which could potentially be negotiated.

- To my understanding the three examples for campaign planning are not actual campaigns, but generic cases. It is not shown if the defined positions would be realistic at all, neither if the tool proved to be efficient compared to a "normal" planning by site visits and expert knowledge. The manuscript does not show if and how the tool and process improves energy yield assessment at all.
- A great benefit would be generated if the tool allowed inexperienced users to design scanning lidar campaigns, but in multiple places in the manuscript, the authors state themselves that expert knowledge is necessary to define for example the expected range of the lidar.
- A part of the software that is very useful is the optimization of complex trajectories. I think this part is not presented very well. A mathematical description with a definition of the variables that are included in the optimization instead of the text-based description would be much better in my opinion. I also wonder if existing python libraries (or-tools) that are available to solve traveling salesman problems could not be applied. What is special about this problem and what makes the developed algorithm better or more suitable than others?
- In general, the manuscript is very text heavy, describing simple or trivial problems in much detail while the challenging problems are not targeted. Especially the topics mentioned in section 4.2 are scientifically challenging and significant and I think that at least one of those should be tackled in a scientific paper. A topic that

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could be added to the list is the question of how many separate measurement points are reasonable to get a representative average wind measurement, i.e. what is the required sampling rate?

- A major concern about the paper is that in many parts it reads more like a manual and advertisement than a scientific report and therefore could be considered inappropriate for the Wind Energy Science journal.

For all these reasons I want to encourage the authors to resubmit a manuscript that focuses on a specific research topic associated with yield assessment and lidar measurements which can be solved with that useful campaign planning tool.

2 Specific comments

2.1 Introduction

p.2, ll.8f: Some references should be given here. In general the introduction and manuscript are rather weak on citing relevant work.

2.2 Section 2

p.3, l.12: The *optimal* measurement positions...!?

p.3, l.29: Some references for the radius limits that are given should be provided.

p.5, ll.11-19: This seems trivial and does not need that much explanation.

p.5-6, ll.30-10: Public landcover maps can be quite erroneous and with a low resolution. The canopy heights can be particularly wrong, which would then lead to completely wrong results for possible lidar locations or unnecessary constraints.

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p.6, ll.29ff. Very technical and not really relevant in this context.
p.7, l.7: There are many other older and peer-reviewed references for that.

2.3 Section 3

Tables 1-9: I do not think that these tables are actually necessary. The actual numbers for the measurement positions, the lidar angles etc. are irrelevant to the reader. The information that the authors want to convey should be condensed and given explicitly.
Figures 2,6 and 10: It is very hard to read the small white numbers in these plots. The red circle is not visible for colorblind people on green background.
Figures 2,6 and 10: The symbols should be a bit larger and/or in better contrast to the background.

3 Technical corrections

p.1, l.1: Strange grammar in the first sentence.
p.1, l.2: .. wind turbine locations.
p.1, l.23: I do not think that 'produce' is the right word here
p.2, l.10: ease of deployment
p.2, l.15: lays?
p.2, l.23: something is wrong in this sentence

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