WIND ENERGY SCIENCE DISCUSSIONS

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Interactive comment

Interactive comment on "Very short-term forecast of near-coastal flow using scanning lidars" *by* Laura Valldecabres et al.

Anonymous Referee #1

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By analyzing data from the so-called RUNE experiment, the authors demonstrate in this piece of work that wind speeds at a downstream position can be forecast by using measurements from a scanning lidar performed upstream in a very short-term horizon. This topic relates to a very interesting and innovative (and at the same time relevant) field of work, and this is why I would rate also the scientific significance of the paper as rather high. Also the scientific quality is good – all steps of the investigations are explained in sufficient detail and quality. What I am missing – this as a more general comment – is a further discussion of the forecast horizon in relation to the range of the lidar measurements. The authors explain why they only could use data with a reach of up to 6 km. But I would think that is rather a weak point of the specific experiment, and data with higher ranges (possibly up to 10 km or beyond) may be available for

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Discussion paper

very near-future analyses. How would this impact the results of the study? A further general comment relates to the structure of the manuscript, which I think should be overworked by the authors. The sections 'Wind data analysis', 'Wind conditions' and 'Modelling coastal effects' amount to a major part of the paper before the actual key part (the section on the forecasting itself) is reached – I do not think that the proportions are fair here, and I am also missing the central theme at some points. Furthermore, I think the partitioning of the individual sections may be revised – the description at the beginning of section 2 is e.g. followed by sub-section 2.1 (and two sub-subsections) but no further sub-section. Sections 4 and 5 then have another structure. Please check again carefully if the structure of the manuscript really supports the logical chain and development of the argumentation or if this can be improved.

Some minor comments – in the order of their appearance in the document:

[p.1 l.10] A figure from 2015 is given here – but the manuscript is from end of 2017. Please try to find a more up-to-date figure.

[p.3 first paragraph] Readers who do not know about the RUNE experiment already may miss that RUNE is the name of a publicly funded project run by DTU and partners. Please add these details. Also the Hovsore test site may not be known by all readers.

[p.3 Figure 1] I would prefer to have the explanations of the numbers/positions (only type of measurement system maybe) in the caption.

[p.3 l.10] Here it says that position 6 and 7 are for a short-range lidar – which is actually a floating lidar – but in the remainder of the text it is only referred to the data from a wave buoy. This needs to be clarified. Was the wave buoy deployed at the same position (twice) as the floating lidar?

[p.4 Figure 2] Figure needs to be reworked. For instance, I can see only one black line – and also details are not easy to be depicted.

[p.4 l.10] Here it says that 'Observations close to the lidar systems were also discarded

since here the angle between the beams approaches 180°'. This should be explained in some more detail (why this is bad), and the beams' geometry may be shown to define a certain threshold.

[p.8 l.1] ... 'shows the [averaged] reconstructed 10-min-mean wind speeds', I guess – this should be explained/specified in some more detail.

[p.10 Figure 8] 'top' and 'bottom' in the caption should be left and right I guess – please correct, and/or add identifications (a) and (b) or similar. Beyond, it is rather difficult to read and understand the figures – please add some more explanation and also make the scales better comparable.

[p.11 eq.(4)] This needs to be explained/specified further – I guess the bold letters refer to vector quantities (?)

[p.12 l.4] Here it says that only 'periods with wind speeds below 17 m/s' were selected, but this is not the case for period 3. Please comment on this or correct statement, respectively.

[p.19 l.4] ... 'were able to predict the wind speeds better than the benchmarks'. Please quantify this better (for your conclusions). Can you estimate the corresponding impact on a possible application?

[p.22 ll.20-21] The reference seems not to be complete, please add details. Is this an article?

Thanks again for this very interesting and informative manuscript – I am looking forward to seeing a revised version.

Interactive comment on Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2017-48, 2017.