

Interactive comment on “Wind Field Reconstruction from Nacelle-Mounted Lidars Short Range Measurements” by Antoine Borraccino et al.

Antoine Borraccino et al.

borr@dtu.dk

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Dear Sir Feeney,

We thank you for your time and comments on the article. Your positive feedback is much appreciated. Below is our reply to your comments before the revision of the article, point by point.

———— Page 1, line 2:

It is correct that such lidar systems are rather recent.

Revision: the sentence will be reformulated.

C1

———— Page 2, line 1:

the 0.7% comes from applying the simple induction model (eq. 10) with a canonical value of axial induction factor equals to 1/3. This 0.7% value is conservative for an isolated turbine – as the turbine-mast direction is rarely perfectly aligned with the wind direction. It is NOT conservative in the case of a row of turbines or in the case of a complete wind farm (e.g. offshore): wind farm effect extends the induction zone further than in the case of a single turbine, thus yielding higher axial induction factors.

The 0.5% value used further in the paper is indeed coming from the presented results (see page 17, lines 10-11).

Revision: adding details on the source.

———— Page 2, line 31:

These paragraphs were discussed with the two lidar manufacturers, as they concern the in-house reconstruction algorithms.

Revision: removing "arbitrary"

———— Page 9, line 18:

Revision: removing "the".

———— Page 11, line 3:

The point here is to inform that this algorithm may differ slightly from the one of the lidar manufacturer.

Revision: suggestion accepted.

———— Page 15, lines 12-14:

Unfortunately, the article we refer to is not yet published. The work reported in this article shows that the self-similarity assumption (essential for using the same simple induction model for any wind turbine) is not valid very close to the turbine rotor. This is

C2

because the blades' aerodynamic profiles will differ from one rotor design to another, and that the aerodynamic profiles was shown to matter only very close to the rotor plane. Hence the 10m range was discarded from the analysis.

Moreover, this range was poorly sampled with the used lidar configuration: its purpose was only to provide a means to detect fog events.

Revision: none planned.

————— Page 16, line 6:

On principle, it could be due to some extent to mast shadowing effects. The boom direction was however checked and the cup anemometer's measurement should not be affected that significantly.

Revision: maybe add a comment on this.

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Interactive comment on Wind Energ. Sci. Discuss., doi:10.5194/wes-2017-10, 2017.