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comment

Interactive comment on "Free flow wind speed from a blade-mounted flow sensor" *by* Mads Mølgaard Pedersen et al.

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The paper presents the theoretical background of a new method for measuring the rotating frame rotor inflow velocity using a blade mounted flow sensor. It also presents results from the numerical application of the method in two different test cases, concerning two different commercial wind turbines. The two cases are simulated using different computational environments. In the first, the HAWC2 model is applied that shares the same induction model as the one used in the inflow assessment method. In the second, an actuator line simulation is performed using OpenFoam code. The CFD OpenFoam simulation is expected to be closer to what would be measured on a real wind turbine and therefore it is considered as almost equivalent to an in situ assessment of the method. It is a well written paper presenting innovative work. The

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Discussion paper

new method is well described and the numerical results demonstrate its capabilities and in detail interpret and discuss advantages and limitations. A few points that could be considered by the authors are:

1) Both tested methods rely on tabulated CL-CD polars. Additional uncertainty would be introduced due to the known discrepancies of the 2D polars used in BEM and actuator line simulations with respect to actual 3D polars . This should be mentioned in the conclusions section because it is expected to further increase the already recorded maximum deviations of 4 to 5%.

2) In 3.3.6 the skewness effect is discussed. The model (through eq 24) includes the effects on induction due to yaw misalignment and upflow. Perhaps it should be explicitly explained that phi_r is the angle formed between the Vo vector and the rotor axis which includes both effects. It is bit confusing that in figure 5 there is only one x angle and one phi_r angle while in eqs (25) and (26) two x angles are defined. What I understand is that the two x angles are defined over two perpendicular planes (a vertical and a horizontal) while phi_r is defined in 3D.

Editorial changes/modifications and minor comments are discussed in the accompanying pdf.

Please also note the supplement to this comment:
https://www.wind-energ-sci-discuss.net/wes-2017-57/wes-2017-57-RC1-supplement.pdf

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