

Determination of the Angle of Attack on a Research Wind Turbine Rotor Blade Using Surface Pressure Measurements

Reply to Referee #2

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Dear Referee #2, below you can find the answers to your comments

L274, 297, 324-26, 330-31, 353-56 and 364-66: Rephrase

- Reply: Each of these sentences will be rewritten in order to be fully clear.

L139 Is there a reason for this very high logging frequency?

- Reply: The reason was to use the data as raw as we could. It will be included additional information regarding the filtering and its effects.

L148 Check how the references are referenced

- Reply: Reply: Thanks, it should have been a parenthesis in the reference there, it will be fixed.

L187 Can this fit be shown and has the fit been checked with measurements from the blade at standstill? If this is possible?

- Reply: Adding a Figure with this information, will only provide a linear fit (in the range of AoA that this study focus). It will be added the direct reference (equation fit) from Klein et al where this issue is highlighted. (Equation 1 in → Klein, A. C., Bartholomay, S., Marten, D., Lutz, T., Pechlivanoglou, G., Nayeri, C. N., Paschereit, C. O., and Krämer, E.: About the suitability of different numerical methods to reproduce model wind turbine measurements in a wind tunnel with a high blockage ratio, *Wind Energy Science*, 3, 349–460, 2018.)

L200 Can you elaborate a little more on this? Why is it neglected and what (if any) consequences does it have?

- Reply: This will be discussed. This could imply an extra added mass over the cases on transient conditions, which are out of the scope of this study.

L227 It would be good with a comment on how good the fit is or perhaps a figure that shows the fit.

- Reply: Agreed, I think that including the coefficient of determination will make the information more complete, as the fit constants are included in L226.

L231 Why did you choose this position and not one where there were pressure taps, so you can avoid the interpolation?

- Under the criterium of applying the Gaunaa's Method, is necessary to choose this position in order to avoid added mass effects due to the pitching. This will be explicit.

L247 Change "Equation 7 it can..." to "Equation 7 can..."

- Reply: Will be fixed.

Table 1 What is "FSR"?

- Reply: FSR stands for Full Scale Range, it is also included in the list of symbols.

L303 & List of symbols Missing expression for the tip speed ratio.

- Reply: The tip speed ratio is included in the list of symbols, in the fifth position.

Figure 12 Legend is different from Figures 13, 14 and 15.

- Reply: Agreed. This will be set as a unique type of legend.

Figure 12 Perhaps repeat that $AoA_{geo} = 5.1$ deg from Line 249 and L321 Can the uncertainties be added on the figure?

- Reply: This will overload the Figures. The way that is commented through the description of each Figure, it is clear and avoids the overlapping of lines in the plot while keeping the information.

L324-26 Can the effect of the walls be quantified, e.g. by the method from H. Glauert The elements of aerofoil and airscrew theory?

- Reply: Additional information regarding the blockage effects will be provided, considering the methods mentioned.

L363 Is there an explanation on the difference in slope? Why is the measurements not showing a slope of -1?

- Reply: Taking into account the equation (7), it can be noticed that the slope should be -1, but only if the other variables are independent of pitching the blades. In this case, the change of the slope is attributed to the change in the induction factor over the specific radial position. In other words „a“ and „a'“ are functions of the pitch angle. This will be discussed with more detail in the final version.