

Wind Energ. Sci. Discuss., referee comment RC2  
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## **Comment on wes-2021-49**

Christian Navid Nayeri (Referee)

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Referee comment on "Experimental study of the effect of a slat on the aerodynamic performance of a thick base airfoil" by Axelle Viré et al., Wind Energ. Sci. Discuss., <https://doi.org/10.5194/wes-2021-49-RC2>, 2021

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### **General Comments**

This paper describes the effect of a slat on the aerodynamic performance of a thick airfoil commonly used for wind turbine rotors near the hub. The experimental results include lift and drag, pressure distributions and flow visualization.

The paper is well written and the scientific quality is very good. I have some general remarks:

I would like to see a comparison of the pressure distribution and lift and drag values of the baseline airfoil with data from the literature. This would help to validate the experimental setup.

The pressure distribution on the slat is measured with only 11 pressure ports which is a low resolution. Did you make an assessment on the possible error on the lift computation?

Section conclusions: I miss some recommendations based on the observations on when and how to apply slats on airfoils (guidelines).

### **Specific comments**

69: I would insert a reference to Fig 2. here and highlight the hexagonal rod in Fig 2.

Fig 2: It would be helpful to include the locations of the 11 pressure ports in the figure in order to understand the pressure distribution.

87: Based on which knowledge was this position chosen:  $x/c_{\text{main}}=0.35$ ?

134 & Fig 5,6 etc: As you state that for  $\alpha > 20^\circ$  the results should be disregarded, I suggest to eliminate these data from the plots in the related figures because they are misleading and you would increase the resolution in the plots.

132: „Therefore, a possible reason for this small disparity could be related to three-dimensional wall effects“ Did you observe this with the tufts? I’m asking because later you state „tuft visualisations demonstrate that the tuft visualisations demonstrate that the flow is rather two-dimensional as expected (Fig. 8)“ which implies that you observed some three-dimensionality...

143: “For larger angles of attack, the drag coefficient is reduced due to the presence of the slat”. I see that the slat configuration represented by the red dots has a larger drag.

Fig. 8: Which flow conditions are used here?  $Re$ ,  $AoA$  etc...

204: I have a hard time recognizing this statement in Fig 15: “Also, the presence of the slat leads to a more uniform flow on the main airfoil”. What do you mean by “uniform flow”?

### **Technical corrections: typing errors, etc.**

109: comma after “Pre-stall” is not needed

111: “Therefore, post-stall, the pressure lift and drag are used” This sentence reads strange.