Dear authors,

The article is of high scientific significance and an important contribution to the Wind Energy Science community. The improvement of rotor blades by means of an innovative tip design is investigated, comparing wind tunnel tests with various different simulation methods. The scientific quality is very good. A wide variety of numerical approaches have been applied, taking the important (and tricky) effect of wind tunnel walls into consideration. The measurement methods and results, which are based on the surface pressure distribution could be backed up in some more detail. The study is well-structured and presented in a concise way. However, both introduction/motivation and conclusions should still be improved.

More detailed remarks and suggestions are listed, as follows:

23: „(…) *which could drive rotor upscaling in a modular and cost effective way.“* Please clarify what you mean with modular upscaling, and how it is supposed to be cost effective.

26: „*Moreover, there is no <u>relevant</u> research work focusing on details of tip shape aerodynamics <u>relevant</u> to the application of tip extensions for blade upscaling*.“ It would be helpful to specify the difference between „tip extension“ (add-on?) and the „curved tip shape“. A graphical representation of a rotor blade with such a curved tip might be helpful as part of the introduction.

30: „*…within load constraints compared to an optimal straight tip, for testing in an outdoor rotating test rig (RTR).“* It is not really clear at this point, whether the “optimal straight tip“ and the RTR tests are part of this study or merely considered as next steps, i.e. the outlook of this project. Please specify.

65: „(…) *the average of the pressures at the last <u>tap</u> on each side.“* An explanation or reference regarding the validity of this approach would be helpful.

Table 1: Please mention if possible as part of the table 1.) the respective Re numbers 2.) the AoA-steps during the measurements and 3.) a reference or calculation of the ZZ tape-height: is it the same height (0.2mm) along the whole span? Is it 70° or 60° between the serrations of the ZZ tape?

Fig. 7: The graphs are hard to read, especially when printed out.

Fig. 9:

- How does the simulation of cn evolve for the AoA towards and after stall?
- The effective local AoA of each section is [AoA(root) minus local twist angle], correct ?

198 -202: “(*…) most of the tunnel effect on the isolated blade is included by simulating the effect of only the mounting wall (…)”.* Don’t the results (Fig. 9 and 10) contradict this statement, i.e. that including all tunnel walls plays a significant effect on the results?

218: It might be worthwhile mentioning how the resulting local velocity is deducted from the stagnation point (cp=1).

Fig. 12: For readability, please consider presenting clean (trans) and tripped (turb) cases separately. At S4 there seem to be two outliers in the tripped case (red crosses) on the suction side at around 5%c to 10%c. Is it possible that the ZZ tape is interfering with these pressure tabs, e.g. by covering the holes?

226: *“It should be remarked that, due to the relatively poor discretization used for the pressure tabs installation, an integration error should be considered for the experimental results.”* The amount of sensors seems rather sufficient. A literature reference would be helpful in terms of the amount of pressure tabs. Did you perform an estimation of Standard Deviation or uncertainty of the pressure values?

234: *"The coefficients are shown as function of the angle of attack at the root section. The local AOA differs due to the twist distribution, see Figure 3."* It would be helpful to have this explanation already earlier on, e.g. when looking at Fig. 3.

256: Side note: We have had similar problems with airfoil measurements. The effect of the wall boundary layer might be alleviated by attaching one (or two) VGs close to the root.

259: "*Further, it appears that the flow was tripped quite aggressively in the measurements, see also the comparison of the pressure distributions in Figure 12, which might cause the airfoil performance in the tripped case to be worse than expected."* A simulation of the local boundary layer thickness versus the ZZ tape-height could clarify this issue. Also, the ZZ tape seems to work fine for S3 and S4. Besides, is the specific 3D effect of ZZ tape simulated in any of the codes?

269: "*As an example, at AOA=5 the Reynolds variation led to relative differences in the order of 2% and -12% for the lift and the drag coefficients respectively."* -12% of drag variation sounds like a relevant Re-number dependency, even though the 2% on lift might be negligible.

Fig. 13 and 14: Is there a reason for not presenting…

- the LLTunnel results?
- some of the post stall results in reference to Table 1 (AoA=-180/180°)?

286: The comparison in the tripped case looks OK at S3 and S4.

289: The conclusions end rather abruptly. "*Future investigations (…)*": it would be interesting to close the loop to the introduction and mention next steps e.g. in terms of field tests (RTR) as well as an outlook of whether you consider the research of the curved tip design to be promising compared to conventional or straight tip designs.