

We would like to thank the reviewer for the time and effort they dedicated to reviewing our manuscript. We greatly appreciate the comments, which helped to improve the quality and clarity of our work. Below are our point-by-point responses to each of the comments (shown in red). Our replies and the corresponding changes made to the final manuscript are highlighted in blue.

Response to the referee

- **Comment 1:** line 97-onward: I am not sure that this description is very clear: "Since the tangential velocity varies along the blade span, a uniform angle of attack would lead to suboptimal performance" => this is true, but only because the airfoil section changes with the spanwise location too (you do not mention it). When you say "Therefore, the angle of attack must be tailored along the blade span" => this is the role of the twist angle. And in region 2 of the IEA 15MW turbine (page 19, fig 3-1 of the reference technical report), it is the variable rotational speed and not the pitch angle that is used to maintain the angle of attack at its best value (reference to line 103 of your modified manuscript, where what you say corresponds to region 1). => this to say: do not go into too much detail, or give enough details for it to be comprehensive. The last paragraph (starting at line 110) is very clear about the control strategy and its consequence on the blade angle of attack and pitch angle: it may be enough.

Response: We agree with the reviewer that the previous description included unnecessary details that could lead to technical ambiguity. Following this suggestion, the passage (lines 97–110) was simplified by removing ambiguous information.

- **Comment 2:** Fig. 1: It is good to illustrate the blade angle of attack and the pitch angle, but be careful with (a):
 - "near rated wind speed" is not very well chosen since the twist angle should be 0° when the turbine operates slightly below the rated wind speed. Make clear that both drawings correspond to above rated wind speed operating points.
 - "Near cut-out wind speed": there is a mistake with the pitch angle "theta", it should extend up to the chord line, it is not supposed to stop at V_{rel} .

Response: We thank the reviewer for the careful check. The caption of Figure 1 was updated to clarify that both cases correspond to operating points above the rated wind speed. Furthermore, the diagram in Fig. 1(b) was corrected to show the pitch angle θ extending to the airfoil chord line, as requested.

- **Comment 3:** I still see no detail on the y^+ values used in your simulations. Please give the values (a figure showing the chordwise distribution at a challenging angle of attack would be ideal), mentioning the use of "adaptive wall-functions", as you do in the appendix, is not enough. Not to mention that changing the kinematic viscosity to change Re also affects the y^+ values and it would be good to mention if y^+ remains in the expected range.

Response: We thank the reviewer for the suggestion regarding the mesh resolution details. As requested, a new figure illustrating the chordwise y^+ distribution at $\alpha = -15^\circ$ was included in the manuscript. Although the Reynolds number is varied by changing the kinematic viscosity, we confirm that y^+ remains within the expected range for the adopted adaptive wall-function formulation.

- **Comment 4:** Fig. 10: It is good to see the distribution of C_f . However, it could (should) be more commented (where does separation takes place? evolution with AoA? difference upstroke vs downstroke?). It is a little difficult to extract the important information from the sub-figures as they look like each other.

Response: We agree with the reviewer that the original presentation of Figure 10 lacked sufficient depth. The manuscript was updated with a comprehensive discussion of the C_f distributions.

- **Comment 5:** Comment 12 of Rev #2: I do not see a modification of your manuscript that mentions the number of periods run for each simulation. To be mentioned.

Response: We would like to apologise for missing this. The manuscript was updated to explicitly state the number of oscillation periods simulated.

- **Comment 6:** Line 277 you replace "local" by "effective" AoA and in the caption of Fig. 11, you replace "effective" by "local" AoA. Please correct it.

Response: We thank the reviewer for identifying this inconsistency. The term 'effective angle of attack' is now used consistently.

- **Comment 7:** Comment from Rev #2 about the Figure showing the mesh: none of what you mention in your reply seems to have been included in the article... never mind. + you should refer to your new Appendix A in section 2.3. (especially when you mention the numerical schemes).

Response: We apologise for the oversight. A formal reference to Appendix A was added to Section 2.3.