Anonymous Referee #1

Dear Reviewer,

We would like to thank you again for reviewing the updated version of our manuscript and for the comments provided.

You can find our answers below each of your comments. In *italic blue*, you can find how we addressed the comment within the manuscript. The references included in our answers can be found in the revised manuscript.

Regards,

The Authors

I thank the authors for the improvements made in their article. The new version is OK for me. I just have the following few comments:

Reviewer Comment
Regarding the new equation (1) added in order to define the wind shear exponent, is z defined anywhere? and V? V is the horizontal velocity rather than the vertical velocity?
Authors Response
The coordinate *z=0* is defined at ground level, while V is the average horizontal wind speed. *We have included the definition of V and z in the text (l. 154).*

Reviewer Comment
Regarding the comment "Lines 62 and 66: 20 microns, 25 microns", my concern was not that the unit is written microns or μm but the values. 0.2 and 0.25 microns seem small to me.
Authors Response
Thank you for clarifying it. As you state, the correct values are 20 microns and 25 microns.
We have updated the values in the manuscript (ll. 82 and 87).

Reviewer Comment
In the new paragraph from line 34 to line 45, it would be better to cite more recent codes or references, like the ones related to the AIAA-IPW1. Especially for FENSAP-ICE: https://doi.org/10.2514/6.2022-3311 and ONERA's codes: https://doi.org/10.2514/6.2022-3310. Maybe add GlennIce too for NASA's codes: https://doi.org/10.2514/6.2022-3309.
Authors Response
Thank you for the suggestion. The references were taken from the report we were reviewing and have now been updated.
We have updated the manuscript by referring directly to the IPW1, adding the suggested references, our contribution to the IPW1 (Morelli et al., 2022), and the review of all the results (Laurendeau et al., 2022) *(ll. 44-47)*.

Reviewer Comment
line 206: Von K\'arm\'an
Authors Response
Thank you.
We have updated the text (l. 205).

Anonymous Referee #3

Dear Reviewer,

Thank you for taking time to read through the previous review iteration and for reviewing our manuscript.

You can find our answers below each of your comments. In *italic blue*, you can also find how we addressed the comment within the manuscript. The references included in our answers can be found in the revised manuscript.

Regards,

The Authors

After reading through the paper and comparing the previous reviews against the modified version of the paper, I have only few comments to add.

Reviewer Comment
In the intro it is stated that wind energy represents 16% of the total energy mix. This is not correct; It is only 16% of the electricity production and only 3-4% of the total energy production in Europe.
Authors Response
Thank you for the correction.
We have corrected the text and included more recent data about 2022, which state that electricity production was 15% (Jones et al., 2023) (ll. 13-14).

Reviewer Comment
In the intro, it is also stated that higher wind speeds and air density guarantees a higher wind power density in cold regions, and it is essentially the creation ice that lowers down the power production. However, it should also be mentioned that cold climate often leads to stable ABL with less mixing, which subsequently means stronger wake effects, and a reduction of the power production in wind farms. So, it is actually not only ice effects that lower the energy production.
Authors Response
Thank you for this comment.
We have updated the text to include this information (ll. 17-20).

Reviewer Comment
The geometry of the horn seen in the ice accretion in Figs. 14 and 15 looks very complicated and must be very challenging for the grid generator to capture. I suggest that the grid associated with these figures are also shown in order to demonstrate the quality of the grid.
Authors Response
It is indeed challenging to generate the grid in highly concave regions. To retain grid quality, uhMesh adopts a hybrid advancing front technique to generate a boundary layer in which triangles are added in concave/convex region. For the computation of the aerodynamic coefficients, grid quality was further improved by reducing the extent of the concave regions in Sections A and B. This didn't affect the overall ice shape but allowed faster reduction of the residuals of the simulations at all the angles of attack. This information was not included in the original manuscript. Thus, it has been added.
We have updated Fig. 15 by superimposing the computational grid used for the aerodynamic coefficients onto the ice shape coming from the ice accretion simulations. A red box was also added to highlight the region shown in the new Fig. 16, where the orthogonality of the grid is presented. The text was updated to introduce these figures and the modification of the concave regions (ll. 437-442).