Review: The five main influencing factors on lidar errors in complex terrain, wes-2021-26

The manuscript has improved considerably compared to the initial version in many aspects. The authors responded to all comments and updated the article accordingly. I am glad to see the paper on this level now. However, there are few points are overlooked or may be were not very clear in my first review:

General comments:

- Although turbulence plays an essential rule in atmospheric flow, it is ignore in this analysis. Examining turbulent intensity and/or turbulent kinetic energy could give some insights about the predicted results.

    - The turbulence level which is influenced with the five factors investigated here could shed some light on the difference between different cases. The speed-up factor could be very sensitive to the turbulence intensity.

- The current study depends on steady state flow models which quite understandable for the scope and the applications of this work, but the authors could at least discuss this effect. In the end, Lidars do not measure stationary wind conditions.

    - This point hasn't addressed. The highest fidelity model used in this work is steady RANS which is for stationary isotropic turbulence which is far off the wind conditions measured by the Lidar. The point here, if one predict the error as proposed, has to be very careful when applying the correction.

Specific comments:

L380: I think this subsection is essential for this study because it shows the two error parts. So it is essential to show the effect of the model on the error distribution. For example, the speed-up error ratio (with respect to the total) should be relatively higher in RANS model compared to potential flow model. Showing the ratio of each part across the three models will enrich the discussion.

Thank you very much for your comments.
We are happy to hear that especially the separation of the total error into its two parts is getting so much positive feedback. Detailed results on this can be found in the dissertation of the main author. Considering your feedback, we have decided to include a paragraph that discusses the error parts for the two other models in the newly introduced 'Discussion' section. We have thought about adding more result figures, which show the different error parts or ratios for the different model (and for different parameterizations). However, we have come to the descision that this will lengthen the manuscript too much. We would therefore like to keep the already included figures and discuss the other models in the text.

Regarding showing the two parts of error which was mentioned more than once in the first review round, I agree with the author that it would be too much to show it for all models for the five parameters. I find Figure 7 very interesting, it shows the different behaviour of the two parts and the order of each one. I think it would be a missed opportunity to not show a similar plot for the other factors.

L178 models repeated

L240 A constant horizontal resolution of 10 m was used in the proximity of the lidar location and the minimum resolution is 25 m.

- It is not clear what that does mean

L555 forest parameter influence on error

- This conclusion isn't very clear. From modelling perspective, there is no doubt that if the site has forested area, it must be included in the model with the right parameters. In Klaas (2015), since measurements were available, it was clear the right forest parameter reduce the gap between the model and the measured data which is expected. This work shows that increasing forest height reduce the error which a good point stress on. Typically a forsted site is considered to be complex and this study finding states that forest does not add error compared to less forested site. That make the L27(abstract) and here kind of misleading to some readers.