Response to Referee #2

Comment on amt-2022-73

General comments:

The authors have made some significant improvements upon the structure of the manuscript. The different sections are better separated and furthermore they added a new section "Discussion" which seems very helpful to the reader for this kind of manuscript with so much information. The authors have also improved the quality and description of the figures. In my opinion, the "Conclusions" section needs a little more work as the current version feels incomplete. I suggest to include the values for the most important findings of the study in this section. Regarding the scientific context, I do not have any additional comments. It is a study that could be particularly useful for researchers working with wind lidar measurements. Please find my technical comments below.

We are glad to hear the changes have been effective in improving the manuscript and making the material accessible to the reader. We would like to thank the reviewer for their time reviewing the edits and for the additional suggestions.

Technical comments:

P8 Table 1: The second line displays the azimuth angle, however the name of the variable is elevation angle. It should be corrected. Fixed.

P8 Table 1: Above the table 1, there are two references "Cariou and Boquet (2010); Bodini et al. (2019)", which are not clear to me to which part of the text they refer to.

Since citations are given in the text when the Windcube parameters in the table are introduced, we have omitted the references describing the instrument from the table.

P8 L196-199: This sentence needs rephrasing as it describes a simple functionality of the lidar in a confusing way. In addition, I am not sure that the term "complex options" needs to be supported by the reference "Clifton et al., 2015".

We've tried to simplify the idea about the scan being performed quickly. We added "as in e.g. Clifton et al., 2015" to make clear that the reference is included to point the reader to further information about other possible complex scan strategies.

P9 L205: Maybe "during" is more correct than "through" in this context.

Rotating through the scan reads more cleanly to us than rotating during the scan, but we will happily leave it up to the editor if the other wording is better.

P13 L304: Correct the typo "explicitly". Fixed.

P14 L314-315: One sentence is written inside a parenthesis "(Different notions...representation to measure.)". If the parenthesis was included in the previous sentence written with fewer words or remain as it is without the brackets, the text would flow better. We've omitted the parentheses.

P17 L414: Replace "An" with "A". This sentence was reworked.

P17 L414-416: The first two sentences of the paragraph "An common representation...reconstructed velocity components" could be simplified as it is a bit confusing in its current state.

We've reworded these sentences to try to make them simpler and more clear.

P22 L539-542: The sentence "Analysis of the limiting...(Rosenbusch et al., 2021)." seems to either miss some information or have some extra words that are not needed. Maybe "when" has to be removed and "whereas" has to be replaced by "on the contrary"?

We've broken the sentence in two and reworded it to render the inequalities in words as well.

P27 L619: Is the word "across" necessary in this sentence?

We wanted to make clear that the range of lengths referred to the diameter. We've stated that explicitly instead of saying 'across'.

P31 L707-708: The sentence "As in Rahlves...in the stable case, Fig. 13)." likely misses a conjunction to connect the verbs.

We didn't see where a conjunction might be needed but reworded the sentence slightly to hopefully make it read more clearly.

P31 L710: Add "to" after "due". Fixed.

P32 L729: Do you mean "In select flat conditions,..." instead of "In select, flat conditions"? Fixed.

P36 L790-793: No need to use parenthesis for this text. Parentheses have been removed.

P41 Conclusions: In the conclusions, the authors summarize their work without providing the values for the most significant results. I believe that the section with conclusions works better when it can be read as a stand-alone text. In that regard, I recommend to include some values of the results in the conclusions similarly to the abstract.

We have reworked the conclusion (P 41 L 931-949) so that it stands better alone as a summary of the key findings and corresponding values, reflecting the information in the abstract.