

Response to Reviewer 1

We would like to thank the reviewer for their kind words. We have addressed all points raised by the reviewer in the manuscript and you can see our specific comments to them here below.

Best regards,
the authors

I) In row 17 of your introduction you write about AMVs derived from satellite radiances. Can you specify that a little clearer, For example “AMVs, derived from tracking cloud and water vapour image sequences.

Suggestion added to the manuscript.

II) In row 28 I think it would be better to wright shift in the backscatter signal from the onboard laser.

Suggestion added to the manuscript.

III) In row 30 the satellite did not observe the wind speed. Maybe it is better to wright “wind speed derived from the satellite measurements” is perpendicular etc.

Suggestion added to the manuscript.

IV) In row 67 the Fig. numbering is ?? and the following sentence is not clear.

There was a typo in the latex-reference for the figure number. It has now been corrected. Likewise there was a missing word in the sentence, which has now been added, making it less clear than it should have been.

V) Between row 100 and row 103 there is a double sentence

Double sentence is now removed.

VI) In row 112 you write that you use the same LBC date for both experiments. I don't understand that. I thought, that you use the ECMWF boundary data for Laser A were the ECMWF has not assimilated the AEOLUS data and for the second period the ECMWF assimilate the Aeolus date. That is a a major difference. Don't you think?

Yes, this is correct. For the laser A period there are no Aeolus data in the ECMWF boundary data, whereas for the laser B period, ECMWF do assimilate Aeolus data. For this study, all model runs within the same period use the same data as LBCs. What we would have liked to do, as is explained here, is to run a further set of experiments with our regional model, one experiment using LBC data with Aeolus data in the assimilation and one experiment with LBC data where the Aeolus data is not used in the assimilation. If we had this set of experiments we would have a better idea of what the total influence of the Aeolus data in our model and what is the impact is from the LBCs and what is the impact from the model's own assimilation of Aeolus.

VII) In row 142 you said that the horizontal distamce is 90 km and 12 km. in raw 125 you write 80 km an 10 km. What is correct ?

The reference we used for these numbers stated the distances as 86.4 km for Rayleigh and 12 km for Mie. In places in this manuscript we have rounded these numbers, we have changed these and use 86 and 12 km throughout the text now.

VIII) In raw 142 you inflate the observation of Mie data but I think you probably inflate the observation error ot he Mie winds ?

Indeed, that is what we did. Thank you for spotting it. The missing word has now been added.

As a final remark. I recommend to introduce a small section describing in a list or so all our experiments you have done (Ctrl, All winds, only Mie winds, only Rayleigh winds) It seems to me this would give more structure and clarity in our paper.

We have added a list at the end of section 2 to clarify which experiments we run.