

Review of the paper „Evaluating the use of Aeolus satellite observations in the regional NWP model Harmonie-Arome“

Dear authors,

first of all I think it is a very interesting paper concerning the impact of Aeolus wind lidar observations in a regional model for higher northern latitudes, where the impact of Lidar wind profiles show a substantial impact in global models. So far, the impact of Aeolus wind lidar observations in global models is documented very well, but the impact in regional models is not so well investigated. You nicely pointed out, that there are differences in quality between laser A and laser B and that the results are somehow independent of the observation error used as long as it is substantially higher than the pure instrumental error. You also showed nicely that the use of flow dependent analysis due to the use of a 4-DVAR would help to benefit more from the Aeolus wind observations as this is visible in a 3DVAR system.

In the following I have only some small suggestions for some minor revisions.

- 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.
- II) In row 28 I think it would be better to right shift in the backscatter signal from the onboard laser.
- III) In row 30 the satellite did not observe the wind speed. Maybe it is better to write “wind speed derived from the satellite measurements” is perpendicular etc.
- IV) In row 67 the Fig. numbering is ?? and the following sentence is not clear.
- V) Between row 100 and row 103 there is a double sentence
- 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 where the ECMWF has not assimilated the AEOLUS data and for the second period the ECMWF assimilates the Aeolus data. That is a major difference. Don't you think?
- VII) In row 142 you said that the horizontal distance is 90 km and 12 km. in row 125 you write 80 km and 10 km. What is correct ?
- VIII) In row 142 you inflate the observation of Mie data but I think you probably inflate the observation error of the Mie winds ?

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.