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Interactive comment on "First validation of Aeolus wind observations by airborne Doppler Wind Lidar measurements" *by* B. Witschas et al.

Anonymous Referee #1

The manuscript by Witschas et al. provides first results on the evaluation of the space-borne ALADIN wind lidar by comparing its measurements with those collected by an airborne coherent wind lidar. The comparison shows the results of two different validation campaigns and discusses the different possible sources for the observed differences. The paper is well organized and provides very valuable information for the lidar and atmospheric science communities. I recommend publishing on AMT after the following minor concerns are addressed:

1) My main concern is related with the technique used to retrieve the 2um lidar data. If I understand the procedure correctly, a sliding window on the LOS measurements is applied to increase the spatial coverage of the retrieval. I expect this sliding window (floating window in the paper) filter to introduce a spatial shift in the data which might

lead to an increase in the systematic error. A difference plot between the two retrievals shown in Fig. 2 (one scan vs five scans) might help to show the effect of this sliding window filter. For future evaluations, it might be worth using the ALADIN retrieval grid to group all the 2um lidar LOS measurement and retrieve 2um data natively on the ALADIN grid. It might be even possible to retrieve directly HLOS winds using the MFAS algorithm instead of retrieving first 3D winds and projecting them after into the ALADIN HLOS.

2) The authors use a threshold (8 m/s for Rayleigh and 4 m/s for Mie retrievals) based on the error reported in the L2B files to leave out from the evaluation some of the ALADIN retrievals. Do you know if during the assimilation of the ALADIN data by ECMWF similar filtering criteria are used? If that is the case, it would be good to use the same criteria for this study.

3) Although I expect the vertical component of the wind to have a small effect in the evaluation (considering the long spatial averaging), it might be worth mentioning it and maybe show an example of the retrieved 2um vertical component as a proof.

Specific comments:

1) Fig. 4: The Y axis scale could be reduced to -40/40.

2) Pag. 9, line 203: should be 'assess' instead of 'asses'