Comment on amt-2021-38

Anonymous Referee #2

Referee comment on "Sensitivity of Aeolus HLOS winds to temperature and pressure specification in the L2B processor" by Matic Šavli et al., Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2021-38-RC2, 2021

This manuscript presents a study on the sensitivity of Aeolus HLOS wind retrieval to temperature and pressure in NWP models used in the L2B processor. This is an interesting study because it is important to have a good characterization of uncertainties in observations to assimilate them in NWP systems. In order to estimate correctly the HLOS sensitivity in the Rayleigh-Brillouin channel, it is necessary to know the temperature and the pressure. These quantities are estimated using the information provided by NWP models. The study confirms that in more than 99% of the cases, the impact of temperature and pressure errors have a negligeable impact on HLOS wind retrieval taking into account the relatively large errors of Aeolus HLOS data. However, it will be necessary to better estimate this impact for Aeolus follow-on mission where the expected quality of the observations will be hopefully improved. The originality of the approach is to estimate the errors in NWP temperature and pressure fields from the difference between two NWP models IFS and ARPEGE. However it is not obvious that the difference between two NWP models is really representative of the model errors. This assumption needs to be discussed in the manuscript.

I agree to anonymous reviewer #1 to consider that some technical details in section 3.1 and 3.2 could be removed to render the paper easier to read for non-specialists of NWP data assimilation.

Despite these remarks, I consider that the paper brings new and useful information on characterization of Aeolus HLOS wind retrieval.

Specific comments:

Line 36: I do not understand the comment on the deviation of Rayleigh-Brillouin deviation from the Gaussian spectrum. Is it not due to acoustic waves rather than atmospheric stratification?

Lines 217: Please explain what is the median absolute difference (difference between percentiles 75 and 25). This quantity is not so frequently used in the atmospheric community.