

Atmos. Meas. Tech. Discuss., referee comment RC1  
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## **Comment on amt-2021-96**

Anonymous Referee #1

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Referee comment on "Comparison of scattering ratio profiles retrieved from ALADIN/Aeolus and CALIOP/CALIPSO observations and preliminary estimates of cloud fraction profiles" by Artem G. Feofilov et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-96-RC1>, 2021

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Review: Feofilov et al.

The paper deals with comparing the CALIOP and AEOLUS climatological backscatter data (half year in 2019). While the idea is good and has a high potential, the methodology and the presentation style are poor.

The wavelength difference between the two different lidars in space is only poorly accounted for, using an empirical 50-years old formula. Here, the authors should have used temperature and pressure profiles from NWP (as e.g. provided with Aeolus data) to calculate the molecular backscatter in the UV and visible range (i.e. at 532 nm) to make a real conversion of the scattering ratio and compare apples to apples.

Besides that, I also have the feeling that misinterpretation of Aeolus data is done while not taking into account the high contribution of molecular backscatter to the scattering ratio (see for example specific statement in the attached pdf under 7.).

Thus, the manuscript suffers from a significant methodological weakness and any conclusion drawn from the current applied methodology is very questionable.

Furthermore, the presentation style needs to be improved. The language is hard to read and sometime really not understandable. E.g., already the abstract is hard to understand.

Also, the title does not at all reflect the content of the paper.

Furthermore, I could not follow some of the argumentations. Often, statements are made without justification.

Therefore, I recommend the rejection of the manuscript, while at the same time encouraging the authors to re-submit a paper once the methodology and presentation style has been significantly improved.

For more detailed comments, please refer to the attached pdf.

Please also note the supplement to this comment:

<https://amt.copernicus.org/preprints/amt-2021-96/amt-2021-96-RC1-supplement.pdf>