

Interactive comment on “AerGOM, an improved algorithm for stratospheric aerosol retrieval from GOMOS observations. Part 2: Intercomparisons” by Charles Étienne Robert et al.

Anonymous Referee #3

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The paper presents result of aerosol extinction coefficient comparison between the modified GOMOS retrieval (AerGOM) and various space-borne instruments at different wavelength. It also investigates the influence of various stellar occultation parameters. There is a separate paper that discusses the algorithm in more detail. The topic of the manuscript is of importance for the scientific community and suitable for publication in AMT. The paper should be accepted for publication after addressing the concerns mentioned below.

Major comments

The paper title clearly states that the analysis presented are for data Intercomparisons not validation. I suggest that the authors provide a proper validation and discussions of

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the observed biases and data quality rather than just present data Intercomparisons. To do so, they need to use officially released and validated correlative measurements, and expand on the discussion, mainly in section 5. Furthermore, its not clear to the user what is the AerGOM end product, is it aerosol extinction at selected wavelengths or fitting parameters or both.

Abstract: Abstract should include summary of key findings.

Section 2: The authors need to describe the new data product format and retrieved aerosol wavelengths, if any.

Section 2.3, p5: “These profiles are easy to identify and were discarded for the inter-comparisons of this paper”, is it also valid for section 6?

Section 3: Did you screen any of the correlative measurements for clouds? SAGE II and III provide separate cloud product which can be used for cloud screening, and OSIRIS v5.0x is already screened for clouds.

Section 3.4: Can you provide referenced uncertainty estimate for MAESTRO? The authors stated that MAESTRO have issues that affect its measurements. If these issues are significant and impacting the quality of the data, then the data is not suitable for validation studies.

Section 3.5: Is OSIRIS aerosol extinction profiles V6.0 a released or research product? Why not use V5.0x, which is the officially released and validated OSIRIS product? As noted by the authors, V6.0 is noisier and saturate at low altitudes. The comparison with OSIRIS V6.0 can also be affected by the angstrom coefficient used. The authors should be careful using an angstrom coefficient derived using long wavelengths to calculate the aerosol extinction at shorter wavelengths. OSIRIS uses a fixed aerosol model in version 5.0x which can be used to convert the aerosol profiles at different wavelengths.

Section 5: To establish a baseline accuracy of the AerGOM aerosol profiles, the au-

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thors need to discuss the comparison with each instrument separately, and in more details, citing reported biases to explain the differences.

I don't understand why SAGE II and III comparison show different biases, since both instruments agree well with each other. The difference might be related to AerGOM retrieval accuracy in southern hemisphere high latitudes measurements. Also, why SAGE III comparison only used above 15km.

The comparison between old and new GOMOS profiles don't really prove the authors claim that AerGOM is an improvement over IPF (figure 3). The authors need to better support their argument, maybe showing time series comparison with SAGE II.

Section 6: This section should be shortened to include comparison with SAGE II, SAGE III and OSIRIS only. The authors already shown that POAM III sunset and MAESTRO measurements have larger biases than SAGE and OSIRIS.

Figure 8 and section 6 is difficult to follow because of incorrect legend.

Conclusion: The authors should rewrite this section without bullets. Also, the authors need to provide recommendations of the wavelengths range useful for scientific studies.

Minor comments: Table 1: Change measurements method "limb" to "limb scattering".

The authors need to provide better text and caption describing each figure.

Figures 3,5,6,7, and 8 x-axes range should be changed to [-100, 100]

Figure 8: The legend box shows wrong zones, please fix it.

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