

## ***Interactive comment on “GOMOS data characterization and error estimation” by J. Tamminen et al.***

**J. Tamminen et al.**

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We would like to thank the anonymous reviewer for useful comments related to our manuscript GOMOS data characterization and error estimation.

General comment: We will try to improve the language.

Specific comments:

- 1) OK. To be corrected.
- 2) Sec. 3.1.1. The reviewer is absolutely right – this was not what we meant. Thank you for pointing this out. The sentence will be reformulated.
- 3) Fig 7. We will add description on the aerosol coefficients.

4) We agree. We will clarify the sentence.

5) Fig.9. The aerosol extinction is at 500 nm. We will add this to the manuscript as it was obviously missing. The observation that all other than selected quadratic aerosol models give less ozone below 20km is correct in this case. Thank you for pointing this out, since it requires some comments. The comparison that was presented in fig 9 contained a lot of profiles around the equator, and this emphasized this feature. If we choose another case which is geographically more representative the situation is slightly less obvious. We will comment this in the text.

6) Good point, however, the reason for this is that if better resolution were selected the profiles would become rather noisy (i.e., include zigzag features) especially at low altitudes where the signal to noise ratio is low. In addition, the non-perfectly corrected scintillations cause random error whose impact can also be partly smoothed when using coarser resolution (which is still probably the best available resolution from a satellite instrument at the moment). Our choice of smoothing a bit more was also partly based on a study by Sofieva et al 2004 where the smoothness of ozone profiles was studied based on 11 years of ozone sounding measurements at Sodankylä. In that study the vertical correlation length of ozone was found to be around 1.4 km in the lower stratosphere below 25 km (which is not so far from 2 km we use up to 30 km). However, it is true that with brightest stars we could retrieve useful ozone profiles with better vertical resolution.

7) Figure 11. We will add more clarifying text to this figure and re-draw the figure so that the corresponding altitudes are also marked in the figure. We hope that this will clarify it more. In GOMOS vertical inversion the noise level of the measurement is not taken into account. Therefore the averaging kernels in GOMOS do not reflect the information content but they represent the resolution and they should be considered always together with the error estimates. This will be emphasized in the text also.

8) Sec 6.1 – we will add that we refer to aerosol extinction at 500 nm.

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Minor comments – all to be corrected.

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