Dear Reviewer,

Thank you very much for your comments on our paper "Validation of GOMOS precision estimates in the stratosphere". Below we present the replies to your comments.

Reviewer #1.

Specific comments

In Table C1, it seems that even if the retrieval gets say 40 ppmv, this would be considered to be a good value for altitudes above 18 km at least. Is there not some other checks that would remove such obviously bad profiles? How often does this happen? A test of the Level 1 (flux) data could probably detect that there is not good enough closure for the forward model versus observed flux/radiance based on such a retrieved profile, no? This could allow for better screening – but maybe if such screening exists (and I missed this), please clarify or explain this better?

Authors:
The probability of getting very large value with relatively small uncertainty estimates is very small. We have not found such data in the GOMOS dataset (all the data were also inspected visually). This screening aims at removing obvious outliers in GOMOS data, which are constitute 2-4% of dark-limb data and can be easily detected by visual inspection. GOMOS disclaimer recommends removing the profiles if vmr >20 ppmv or <-0.5 ppmv is reported at altitudes 15-45 km, or |vmr| > 100 ppmv at any altitude 10-110 km. Both the Disclaimer screening and the screening applied in our analysis efficiently remove outliers.

Reviewer #1:
In Fig. 5, the vertical colored lines representing the uncertainties are too faint to see easily and should be made thicker.

Authors:
We have improved the quality of the figure.

Reviewer #1:
In Fig. 6, the range of altitude (25-45 km) is chosen somewhat arbitrarily (for the stratosphere), and somewhat different numbers would be obtained for slightly different ranges. In part because of this, and just because this will also depend on the stars chosen, I would recommend not using so many significant digits in the resulting percentage variability numbers. If you use 5.8 instead of 5.78 and 5.7 instead of 5.68, this seems sufficient. Discussing the sensitivity to factors such as I mention here could be useful, but the main message probably does not change (i.e. MIPAS and GOMOS results agree quite well, and the curves show the results in more detail than the averages). At least, there is agreement within 1-2% over the whole range.

Authors:
We fully agree with your comment and use less significant digits in the revised version.

Reviewer #1:
Also, the authors should indicate whether the expected future processing changes for dark current and dim stars will affect the precisions only, and not the ozone profile values themselves, as this may not be obvious. If more is currently known about this, it would make sense to expand upon this discussion (even slightly) in this manuscript; however, this could also be better described after a future reprocessing?

Authors:
According to our tests, the correct error budget affects mainly precision estimates. Changes in ozone values themselves are very small. We have added this note in the revised version.

Reviewer #1:
Finally, the methods and results described here can work especially for denser sampling measurements; in the case of GOMOS and for a large part of the stratosphere, results often lead to the belief that the theoretical estimates of precision (random uncertainty components) provide a good minimum value, although larger values are not always precluded (because of atmospheric variability). If indeed true, this could probably be mentioned more clearly; the (mathematical) steps taken to provide the theoretical estimates in the first place should be clearly detailed or referenced as well.

Authors:
As explained in the Sect. 3, it is not necessary to apply the differential method for dense sampling measurements: application of methods 1 or 3 (Section 3.1) is more straightforward. The uncertainty of the experimental precision estimates is also discussed in Sect. 3.

Reviewer #1:
Technical corrections

Authors: Thank you very much for the corrections. All of them are introduced in the revised version.