Response to the Editor Mark Weber

Dear Mark

We appreciate very much for your additional effort to improve our manuscript. Please find below our answers to your comments and suggestions in blue.

Your Comments

Dear Luca and Julian,
responses to the reviewer's are adequate, but I still have a few minor issues that should be resolved.

First of all the ATMOZ ozone cross-sections has been put into a data repository and are citable: Gorshelev, Victor, Weber, Mark, & Burrows, John P. (2017). ATMOZ Gorshelev Huggins Ozone Band Absorption Cross-Section (1.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.5847189.

We have added this reference in the revised manuscript (line 248 and 499-501)

I am not so happy with the abbreviations IUP and IUPA for our x-section data. I would prefer SG14 for IUP and G17 for IUPA. It would be nice to change these names.

Many thanks for this clarification. We have clarified your abbreviation in the revised manuscript and changed all figures accordingly. IUP is labelled now as SG14 and IUPA is now G17. The changes are made thorough the entire manuscript. We have also clarified that the in Gröbner et al a different nomenclature is used. Line 59.

Here are some further points:

l. 188: add "surface" (surface pressure)

Done (line 188)

l. 191 "negelectable" --> negligible

Done (line 190)

l. 307 if --> is

Done (line 310)

l. 314 within --> with (or do you mean no seasonal dependence on the correlation? Please rephrase.

Done (line 318)

l. 333-338: Does the retrieval uncertainty not include uncertainties from input data used in the retrieval, e.g ETS, eff temp., and so on, so some double counting occurs here?

We assume that the uncertainty from the fitting originates from short term atmospheric perturbations such as moving clouds, cirrus clouds or other atmospheric effects (stated in line 338 - 339). ETS and cross sections are constant for the entire retrieval and the effective temperature is constant over a day. Therefore, these uncertainties are not double counted. Evenmore, we have used this parameter as a criterion to select unfeasible TCO retrievals, with disturbed direct solar irradiance, which corresponds to own observations at some specific days.

l. 400: "which might lead to a lower sensitivity ..." am not sure if this holds. The satallite retrievals using effective temperatures show less seasonal variations in the differences to the Brewers than to Dobsons. This makes sense as Brewers have negligible temperature sensitivity compared to Dobsons (Kerr 2002). As I understand QUASUME does not retrieve effective temperatures like the Dobsons, so it seems that this could explain the higher similarity. Can you comment on this?

Since we have included the effective ozone temperature as input for the Dobson and the Quasume retrieval, the effect of effective temperature should not affect the intercomparison. However, we agree that our statement is rather speculative. Therefore, we have removed this sentence in the revised manuscript (line 402 – 403)

l. 400: as for --> and

Done (line 403)

Best wishes,
Mark