

Review by editor

Dear authors:

The reviewers are generally satisfied with your responses. However, a few issues remain.

We really appreciate the revision work done by the editor and the two reviewers.

I agree with the reviewer 1 regarding making available at the least the total ozone data to generate the figures be made available on an archive particularly since the code is not yet available.

The data of ozone 3D fields (hourly values over the full period for Nature Run, Control Run and Assimilation Run) are provided in netcdf format from Zenodo deposit with DOI.

For the Nature Run:

- June 2019 <https://zenodo.org/doi/10.5281/zenodo.12634489>
- July 2019 <https://zenodo.org/doi/10.5281/zenodo.12635956>
- August 2019 <https://zenodo.org/doi/10.5281/zenodo.12643523>

For the Control Run:

- June 2019 <https://zenodo.org/doi/10.5281/zenodo.12570356>
- July 2019 <https://zenodo.org/doi/10.5281/zenodo.12570536>
- August 2019 <https://zenodo.org/doi/10.5281/zenodo.12570745>

For the Assimilation run:

- June 2019: <https://doi.org/10.5281/zenodo.12547820>
- July 2019: <https://doi.org/10.5281/zenodo.12565863>
- August 2019: <https://doi.org/10.5281/zenodo.12567704>

The Data availability section has been modified accordingly.

Regarding the addition of figures by Rev. 1, I agree that this will enhance the paper. I prefer the R2 set as this is what is more commonly shown.

Some additional text will be needed and I do not understand the one weighting function which is so different from the rest, so that may need some explanation.

While investigating this behavior, we have identified that the average values displayed on figure R2 were affected by only a dozen of profiles over the domain (fig. RR1). After liaising with the RTTOV infrared development team on that behavior, we have been told that RTTOV struggles in the simulation of Jacobian computation for a few channels (Jérôme Vidot, pers.comm.). After discarding those profiles, the average Jacobians have a more regular behavior. We have not further investigated why these profiles were causing troubles.

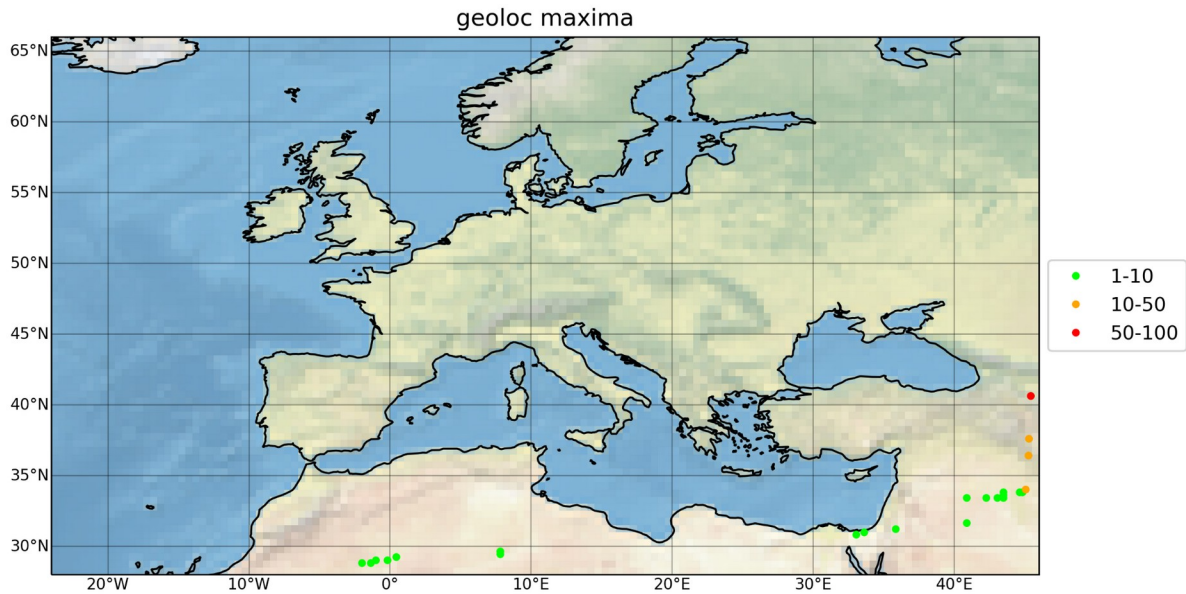


Fig. RR1: Location of outlier profiles that cause problems in channel 642 jacobian computation.

Figure 10 has been added (in between figures formerly named Fig9 and Fig10) and commented through the text that follows:

“Finally, the simulated ozone Jacobians, averaged over the regional domain, are shown in Figure 10. Both simple Jacobians and Jacobians times 10% of the ozone profile itself are illustrated. In the first case, a strong sensitivity to an atmospheric layer ranging from model level 40 to 45 (i.e. 320 to 538 hPa) can be observed. On the other hand, when switching to a representation of the Jacobians multiplied by 10% of the ozone profile itself, the maximum sensitivity moves up to a layer found between model level 20 and 25 (i.e. 27-50 hPa). Negative values of sensitivity are also found between level 10 and 5, 5 to 1 hPa, i.e. in stratosphere.

As a consequence, the information is retrieved along the whole vertical column. It mainly comes from very specific atmospheric layers. Nevertheless, roughly two groups of channels can be identified: one sounding stratosphere and the other sounding the troposphere.”