

## ***Interactive comment on “Technical Note: A trace gas climatology derived from the Atmospheric Chemistry Experiment Fourier Transform Spectrometer dataset” by A. Jones et al.***

**A. Jones et al.**

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We want to thank Dr Jens-Uwe Grooß for his helpful comments. We have addressed the major and minor issues as listed below.

### **Major Issues:**

**1. The data of the climatology are available for download from the ACE-FTS website for registered users. The real value of this paper is to have these data available. Therefore it would be extremely valuable if the climatology**

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**data would be added to the ACP website as supplement to this paper. Thus I would recommend the paper only to be accepted for publication if the data are added as supplement. It is pretty clear that there may or should be further updates of these climatologies due to updates of the retrieval algorithm or due to a possible later contribution of data for a longer time period, or due to removal of more suspicious data. These may be stored at the ACE website, at a later time, and it would also be helpful to have the location of potential updates written in the paper. But a reference to these data should be kept at ACP.**

We agree that the climatological data set can be added as a supplement to this paper. We will make updates to this initial data set available through the ACE website. Our motivation for asking users to register is to be able to inform the data users of updates to the data set and to provide usage statistics for future funding applications. We have added text to explain this.

“These products are available as a supplement to this paper. In addition, updates to these data products (to include additional years of data) will be made available via the ACE website (<http://www.ace.uwaterloo.ca/climatology.html>).”

**2. A further improvement would be to add the accuracy of the data derived from the validation efforts. Although this may not be an easy task to add this information, it would be helpful to have available for interpretation, e.g. if the climatology is compared with a model output. The authors of the paper are those who know best the accuracy of their data, for other users of the climatology it would be much harder to reconstruct this from what is written in the sections 2.1 to 2.14. Therefore I suggest to add the accuracy derived from the validation to the electronic data set, that is potentially altitude and latitude dependent.**

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As noted in the text, we have provided a short summary of the validation results for each of the species in the climatology and direct the users to the original papers in the ACE validation results special issue. We feel that it is beyond the scope of this paper to derive accuracies for each altitude and latitude for each of the species in the climatology. In addition, the ACE-FTS climatology is part of the SPARC Data Initiative, a project that was undertaken to provide a detailed intercomparison of climatologies derived from space based measurements. The report on this SPARC project is currently being completed. We have included information on this initiative and the report in the text.

“In addition, the ACE-FTS climatology has been compared with other satellite climatologies as part of the SPARC Data Initiative. The user is directed to the report from this initiative for additional comparisons and assessments (SPARC Data Initiative, in preparation).”

#### **Minor Issues:**

**1. page 29859, lines 17-20: I don't think, the information about single occultations is meaningful in this context. If the authors think, this information should accompany the data, they should include it into the data supplement. Otherwise I would leave out this comment.**

To improve the clarity of this section, we have removed this sentence from the manuscript and we will make this information available through the ACE website.

**2. Species with larger diurnal validation as NO and NO2 etc. do typically have the largest change rates during or just after sun rise and sun sets exactly**

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**when the observations take place. This has to be considered when comparing it to model output. It should therefore be clearly emphasized, especially for the AM and PM climatologies of species with strong diurnal variation, that the obtained value does probably not correspond to a noontime value or a diurnal mean but rather to sunrise or sunset at 90 degrees solar zenith angle.**

To make this clear to the data user, the local solar time information (mean, standard deviation, median, maximum, and minimum) is provided for each grid bin in the data files. Also, we have clarified the text. This has been changed from:

“In order to account for this, we consider the local solar time (LST) of the measurements, such that separate climatologies are produced for AM (before local solar noon) and PM (after local solar noon) in addition to a climatology based on all occultations (AM + PM).”

to:

“In order to account for this, we consider the local solar time (LST) of the sunrise and sunset occultation measurements, such that separate climatologies are produced for those measurements taken before local solar noon (AM) and for those taken after local solar noon (PM) in addition to a climatology based on all occultations (AM + PM).”

**3. The NetCDF data format allows for a certain degree of self-explanation. The NetCDF data files on the data base do not confirm the common standards that would help e.g. having the data displayed by standard NetCDF viewing software. These would be**

- **the coordinate variable (pressure or press instead of nlev) lower case and having the same name as the corresponding dimension**
- **a meaningful recognizable variable name for the calculated fields, e.g. O3, N2O, etc instead of "species" and probably O3\_var and O3\_err, etc.**

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**I strongly suggest also adding attributes containing description of the variables (description similar to units, long\_name) as well as well global attributes (history, title, pi info) to include ACE-FTS data version number and a citation to the ACP paper as a reference. It would also be possible to combine then all of the single species climatologies to a single file instead of having 14 individual files for all species.**

We have improved the netCDF file format by revising the names of some of the fields and including additional information following this recommendation. However, we prefer to keep the files separated by species rather than having a single file.

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 29845, 2011.

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