Atmos. Chem. Phys. Discuss., 11, C12846–C12849, 2011
www.atmos-chem-phys-discuss.net/11/C12846/2011/


Atmospheric Chemistry and Physics Discussions



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

**Anonymous Referee #3**

Received and published: 7 December 2011

Jones et al., Technical Note: A trace gas climatology derived from the Atmospheric Chemistry Experiment Fourier Transform Spectrometer data set

Jones et al. present climatologies on a monthly and 3-monthly basis for several species measured by ACE- FTS. The ACE-FTS data set and especially the provided climatologies are a valuable data set. However, I have some constraints concerning the argumentation of the authors on the applicability of these climatologies for model evaluation. I am afraid that modelers will use these climatologies as sole data set for model evaluation and then state that their models are in good agreement with measurements without discussing the limitations of using the ACE-FTS climatologies for a

model evaluation. In such comparisons they only get the rough picture and thus such a comparison would rather serve as a quick check if the model results are on the right track than as a sophisticated model evaluation. Further, I do not really see the point why should one use the ACE climatologies while there are climatologies from other satellite instruments with a much better spatial and temporal resolution. What are the advantages of the ACE-FTS climatologies? Why should one use instead of the ones provided from other satellite groups?

Specific Comments:

- I would suggest to change the title to "Trace gas climatologies....." (thus plural instead of singular) since the authors present climatologies for different species. Further, I would suggest to add “ACE-FTS” in brackets.

- p29847,l9: "Quality-controlled climatology": The authors should clarify what they mean with quality controlled.

- p29847, l9: A vertical resolution of 3-4 km is somewhat sparse, especially, since ACE-FTS is a solar occultation instrument and thus cannot compensate the somewhat sparse vertical resolution with a high spatial (horizontal) and temporal resolution. Therefore, there is the problem of limited sampling. This is quite obvious in the monthly climatologies. How does that affect a model evaluation? How suitable are these climatologies for a “real”model evaluation? In my opinion, only the 3 month climatologies are really valuable for model evaluation (however still with some restrictions).

- p29848, l7: Unfortunately, all models have some deficiencies and thus comparisons of models with each other in the frame of a model evaluation should always be accompanied by measurements.

- p29848,l28: Why do the HALOE climatologies (e.g. Grooss et al.) look so much better though this instrument is also using the solar occultation technique? Where are the differences in the absolute values coming from?



ACPD

11, C12846–C12849, 2011

- p29849, l23: Why should one use the ACE climatologies though there are climatologies available from other instruments with a much better spatial and temporal resolution? The authors definitely should motivate that better.

- 29851 and following pages: How do the differences affect the climatologies? A comparison to climatologies from other satellite experiments would be nice to show how good the ACE-FTS climatologies are despite the limited sampling problem.

- p29856, l11: Here, the authors themselves state “ACE obtains global latitude coverage over a period of approximately three months”. Why then providing monthly climatologies? I do not see any advantage in using these especially since there are a lot of other instruments providing the same climatologies with a better spatial and temporal resolution. Does ACE has a better precision/accuracy or other advantages why one should use these monthly climatologies instead of the ones from other satellite instruments?

- p29863: I would appreciate that the authors would compare their climatologies to climatologies from other satellite instruments and then discuss the differences as well as the advantages and disadvantages of the different data sets. I know this goes beyond the frame of a technical study, but in my opinion it would be worth the effort to extend the paper into a more scientific paper to better motivate and discuss the appplicability of the ACE climatologies.

- Figures: Figure 1 could be improved with using somewhat larger font sizes. The y-axes text has a bad resolution and should be improved as well.

- Figures 4-9: The figures are somewhat sad. The resolution is quite coarse and there is so much data missing for filling up a global plot. As stated above the authors should really motivate why these climatologies could be still of value for scientific studies.

- Figure 11: I definitely like the three months climatologies most. As stated above I would appreciate a comparison to climatologies from other data sets and a discussion



ACPD

11, C12846–C12849, 2011



on the differences in the climatologies from different instruments as well as a discussion on which information gets lost due to the limited sampling of ACE-FTS.

---

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