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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A novel tropopause-related climatology of ozone profiles" *by* V. F. Sofieva et al.

Anonymous Referee #1

Received and published: 16 October 2013

The manuscript by Sofieva et al. presents a new ozone climatology derived from ozone sonde and SAGE II satellite observations that as a novel feature categorizes ozone also with respect to tropopause heights. This has clear advantages for the upper troposphere and lower stratosphere where the tropopause height explains much of the ozone variability. It is reassuring that the new climatology agrees well with the previous climatology of McPeters, Labow and Logan in most regions when averaged over the tropopause height distribution. As one practical application, the benefits of this new climatology for the retrieval of ozone from the OMI satellite instrument are presented. In addition to this important application, there are numerous further applications where this new climatology has interesting further applications.

The paper is generally well written and I recommend publication in Atmos. Chem.

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Phys. after consideration of the following, mostly minor, comments.

Specific comments

p.21353, l.17 I am surprised by the statement that the difference between pressure altitude and geometric altitude is small (less than 1km) in the UTLS. I would expect differences of 1km or larger rather common. Please comment.

p.21356, l.16 Can you give more background why a 5-point linear transition was used in this case? Why not, say, 3km or 10km?

p.21357, l.6 and Fig. 8 The large differences in stratospheric ozone over Antarctica for different tropopause heights were surprising for me. Can you show (or provide a reference) how closely the ozone hole actually correlates with tropopause height?

p.21358, l.15 Can you provide a direct comparison with the ML climatology, rather than the indirect comparison by referring to Fig. 8 of McPeters and Labow?

p.21360, l.25 Please provide more information on the definition and meaning of the precision as shown in Fig. 13. Also a short discussion or explanation on why the new climatology improves precision would help.

Are Figs. 14 and 15 really needed here if the same information is also given in the README file? In addition I would like the authors (and the editor) to consider providing the climatology as a supplement to the paper in Atmos. Chem. Phys.

Technical corrections

p.21347, l.1 and the chemical -> and chemical

p.21350, l.1 (Homeyer et al., 2010) -> Homeyer et al. (2010)

p.21352, l.8 (Anel et al., 2008, ...) -> Anel et al. (2008), ...

p.21355, l.11-12 "Sa" -> "SA"

p.21361, l.23 compared to a

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