Earth Syst. Sci. Data Discuss., 6, C73–C76, 2013
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Open Access Earth System Science Data Discussions

Interactive comment on "Harmonized dataset of ozone profiles from satellite limb and occultation measurements" *by* V. F. Sofieva et al.

Anonymous Referee #2

Received and published: 11 August 2013

1 General

The manuscript describes a harmonized dataset of ozone profiles measured since about 2001 by European and Canadian satellite instruments. Given the large variety of existing processing algorithms, data formats, and data providers, operational and otherwise, for these instruments, I think generating this harmonized data set is a very important and highly needed step. In my opinion, the HARMOZ data set has the potential to become THE one-stop shop for ozone profiles from the above satellite instruments. I hope that the newly acquired data (and the yet missing data from the last year of ENVISAT) will also be added in the near future.

Like the other reviewer, I think a bit more discussion of the conversion from instrument coordinates (e.g. number density vs. geometric altitude) to the HARMOZ coordinates (mixing ratio vs. pressure) is necessary. Most instruments seem to use ECMWF (operational?), so at least that is consistent. But this conversion can introduce errors / uncertainty, and change over time as the operational system changes (over the 2001 to 2012 period this is probably not as critical as, e.g. around 1978/79). It would be good to have some discussion of this.

Different from the other reviewer, I had no problem accessing the data on the web. Looking around, I also found a level 3 HARMOZ data set (zonal monthly mean time series for all the instruments). I would strongly suggest to also include that dataset (briefly) in the current paper. For many users, the level 3 data are more relevant than the many single profiles in the level 2 data set discussed in the paper.

Like the other reviewer, I find it a little bit sad that much of the interesting results (trends, drifts between instruments, ...) are deferred to a separate paper. But I guess that can be the nature of "data-set" papers.

Overall, I think this is a well-written summary of an important user-oriented data set. Many issues are addressed. The authors have restricted themselves well to presenting the main information, and not get lost in too many details.

2 Specific comments

pg 196: One thing that I am missing is a comment on the uncertainty in GOMOS signal background correction. That has become a problem in the last years of GOMOS data, and has resulted in increasing numbers of unrealistically low ozone profiles (Keckhut et al., 2010). Even if that might be resolved with version 6, I think it should still be commented on here.

pg 197: With MIPAS, it should also be mentioned that the instrument was working in high resolution mode for the 1st year (or so), encountered technical problems, and was then switched to low resolution mode, in which it worked ok since 2004/5. However, differences between the two modes result in a systematic difference of the retrieved ozone profiles. Currently this is not resolved (?) and only the consistent low-res mode profiles after 2004/5 are used.

pg 198: Like MIPAS, SCIAMACHY ozone profiles are also available from different processors. I think it would also be worthwile here, to mention the different processors and motivate the choice of using the IUP processor.

pg 199: From what I remember, pointing accuracy was one of the main problems in generating the SCIAMACHY long-term limb data-set. Since it is an important issue (also for the other instruments?), it should be mentioned here.

pg 203, Eq. 3: I think it should be mentioned here that the $\sqrt{N}$ in the denominator is only valid for statistically independent samples. When N gets large, e.g. comparing MIPAS and SCIAMACHY, and the compared N profiles are correlated (e.g. because the use the same a-priori, algorithm, ECWMF input, ...) , the true uncertainty will be much higher than suggested by Eq. 3.

Table 1: I think it would be good to add a few more colums: typical measurement uncertainty for each instrument (best in %), systematic errors (in %, e.g. using the info from the bias tables), number of profiles per day (for a quick idea about the sampling).

Fig 6: I think it would be very helpful to also have line graphs showing the average bias (e.g. averaged of latitude) as a function of altitude, and some information about it's uncertainty (2 sigma error bars). The false color plots do not provide "hard" numbers easily, and also do not convey much information about uncertainty.

3 References

Keckhut, P., Hauchecorne, A., Blanot, L., Hocke, K., Godin-Beekmann, S., Bertaux, J.-L., Barrot, G., Kyrölä, E., van Gijsel, J. A. E., and Pazmino, A.: Mid-latitude ozone monitoring with the GOMOS-ENVISAT experiment version 5: the noise issue, Atmos. Chem. Phys., 10, 11839-11849, doi:10.5194/acp-10-11839-2010, 2010.

Interactive comment on Earth Syst. Sci. Data Discuss., 6, 189, 2013.