Atmos. Chem. Phys. Discuss., 10, C8999–C9001, 2010
www.atmos-chem-phys-discuss.net/10/C8999/2010/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "NDACC UV-visible total ozone measurements: improved retrieval and comparison with correlative satellite and ground-based observations" *by* F. Hendrick et al.

Anonymous Referee #1

Received and published: 22 October 2010

The manuscript discusses the recommendations made by the NDACC WG for the analysis of ground-based zenith sky UV-visible observations and AMF calculations for the conversion of slant into vertical columns. These recommendations aim at improving the homogeneity of the data submitted to the NDACC data base. The details of the analysis recommendations and AMF look-up table calculations are discussed. The impact of the analysis suggestions regarding the retrieved ozone columns are investigated using measurements made as part of the SAOZ network. The revised SAOZ ozone data is then compared to satellite overpass observations and a collocated Dobson and Brewer instrument, and the findings based on the observed differences are discussed in detail.

One general concern here is the question of suitability of these observations for monitoring the total ozone columns (and this is used as the overall motivation in the manuscript!) given that these observations provide little sensitivity to tropospheric ozone. This is stated clearly in the text e.g. "the seasonal variation of the tropospheric column to which SAOZ is little sensitive" or "provides measurements of stratospheric ozone with little sensitivity to tropospheric ozone and clouds". Given these statements, how effective can the SAOZ observations really be in accurately measuring the long-term changes in total column ozone?? This needs to be clearly addressed before the manuscript can be published.

Scientific comments:

Page 20407, line 19/20 (abstract): the SAOZ data is only compared to one Dobson and Brewer instrument, not several as indicated by using the plural.

Page 20408, line 17: ". . . with moreover little sensitivity to the cloud cover." Can you please very briefly explain why that is.

Page 20412, lines 17-19: similar comment as above, please explain somewhere in the text briefly why. Also - and more importantly - this begs the questions if it is then such a good technique for measuring total ozone columns if it is indeed little sensitive to tropospheric ozone (see also general comment above).

Page 20415, lines 12/15: " . . . the three groups . . ." The three groups or retrieval teams should be briefly described somewhere.

Page 20420: V2 SAOZ data performs better in many cases but not all (as shown in Table 6) – any thoughts about why not in some cases?

Page 20421, lines 26-28: "Figure 8 shows . . ." It should be pointed out that the satellite – SAOZ V2 differences discussed here are only investigated for one station each per geographic area and not several, e.g. the Arctic is represented by Sodankyla only and not also by other Arctic stations such as Thule, Ny-Alesund etc. – why??

Page 20422, line 26: ". . . for all stations .." But not for all 16 stations listed in Table 5, right? At least it doesn't quite look like this to me. But it is also not just the subset used in Figure 8; please clarify.

Technical comments:

Page 20408, line 5: replace "the first . . .. and the last" with "the former . . . and the latter"

Page 20414, line 23: ". . . uncertainties in . . ." not on

Figures: most of the figures should be enlarged, in particular Figures 1, 3, 4 and 8 are difficult to read in their current size.

Page 20415, line 1: replace "Beyond this issue, . . ." with "In addition to this issue,"

Page 20415, line 5: better: "This is achieved through . . ."

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 20405, 2010.