

Interactive comment on “Global distribution of tropospheric ozone from satellite measurements using the empirically corrected tropospheric ozone residual technique: Identification of the regional aspects of air pollution” by J. Fishman et al.

C. Clerbaux (Referee)

catherine.clerbaux@aero.jussieu.fr

Received and published: 7 May 2003

General comments

This paper reports the derivation of tropospheric ozone column amounts using satellite measurements from TOMS (total columns) and SBUV (stratospheric columns). It is an improved version of the tropospheric ozone residual (TOR) technique (see previous publications from the same authors) that proved to be useful to generate tropospheric ozone climatologies. The longer time period considered, combined with the use of

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper

SBUV data instead of SAGE data, allows to derive better resolved pictures from which regional variability can be studied, as demonstrated by the authors. The paper is well written and interesting.

1) A more detailed discussion of the error budget could be useful, although I guess it is not easy to provide. E.g. what comes from TOMS (+land-sea contrast), SBUV, tropopause level uncertainty, or stratospheric variability? Which data/parameter used to calculate the TOR has the most critical impact on derived tropospheric O₃ accuracy?

2) The paper discusses the validation of the TOR technique versus other methods based on TOMS data, and ozonesondes. The GOME instrument could at least be mentioned. Any tries to compare with tropospheric measurements derived from the GOME data?

3) Note: Forthcoming nadir looking infrared instruments (TES/AURA, IASI/METOP) will provide tropospheric amounts of ozone. Expected accuracies are around 15% for total column amounts.

Specific comments

- Introduction: Why not use TOMS/Meteor 3 (until November 94) and TOMS/ADEOS (until June 1997)?

- Section 2.1: Do you used TOMS Level 2 or Level 3?

- Section 2.2: How is the empirical correction of SBUV profile done? Is it a scaling? Did you compared SBUV+correction versus TOMS?

- Section 3.2: Average difference of 4 DU (13%): is it a bias or a rms?

- Section 3.2: Figure 5 indeed shows a correlation between population density and elevate levels of ozone, except above Jakarta, why?

- Section 4: Also quote TES, that should fly on AURA and will be able to directly monitor tropospheric O₃

[Full Screen / Esc](#)[Print Version](#)[Interactive Discussion](#)[Discussion Paper](#)

Technical corrections

- Section 2.1 Version of the retrieval algorithm should be mentioned here (it comes too late in the text).
- Section 3.1: TRACE-A is not defined
- Section 3.2: 3rd paragraph : I suggest to say from where surface ozone data plotted in Fig. 4 come from earlier in the text
- Section 3.2: correct: ...a considerable portion of the lower tropospheric (troposphere?)
- Section 4: correct:...As is the case will all satellite (with?)
- Reference Vukovich missing (or maybe I missed it!)

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 1453, 2003.

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper