

Interactive comment on “Influence of stratospheric airmasses on tropospheric vertical O₃ columns based on GOME (Global Ozone Monitoring Experiment) measurements and backtrajectory calculation over the Pacific” by A. Ladstätter-Weißmayer et al.

Anonymous Referee #1

Received and published: 19 April 2004

The paper describes a case study in which the influence of stratospheric ozone on tropospheric ozone in the tropics is documented based on measurements of the satellite GOME and backward trajectories. The analysis seems basically sound to me. The work is within the scope of ACP and the study provides according to my knowledge novel results.

MAIN CRITICS:

[Full Screen / Esc](#)

[Print Version](#)

[Interactive Discussion](#)

[Discussion Paper](#)

1. The reference list seems to short to me. I miss some references to other groups which also studied tropical ozone using GOME satellite data, e.g. Valks et al.: Variability in tropical tropospheric ozone: Analysis with Global Ozone Monitoring Experiment observations and a global model, J. geophys. Res., 108, 4328, doi:10.1029/2002JD002894, 2003 (the reference list seems to have some bias to the work of the own group).

2. I miss the information whether the authors have been the first to document the influence of stratospheric intrusions in the tropics or not.

SPECIFIC COMMENTS (mainly technical):

3. I suggest to give the coordinates of the sites of Tahiti, Am. Samoa and Fiji not only in the Abstract but also in the text.

4. p. 2, first paragraph: the list of all species that can be measured by GOME is not particularly important in the context of the study and could be omitted.

5. p. 2: an error of 1.5 DU seems pretty low to me: It looks a little optimistic to me, is this low value justified?

6. A brief description of the type of backward trajectory should be given (isentropic?)

7. p.3. Why did you use $pV=3.5$ as threshold for air of stratospheric origin? Did you made any sensitivity analysis?

8. Legend of Fig. 3 is not clear to me, the color code is missing.

9. The authors use climatological values for lightning tracing. Is this appropriate, or how large is the interannual variation of lightning in this region?

10. Lightning tracing was used by others before e.g. by Jeker: Measurements of nitrogen oxides at the tropopause: Attribution to convection and correlation with lightning, J. geophys. Res., 105, 3679-3700, 2000.

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

11. Is this case of stratosphere troposphere a unique event in the tropics?

12. The acknowledgment seems a little funny: Parts of this work have been funded and thereafter, this work has been funded by: Did you obtain funding for more than 100%?

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 1773, 2004.

Full Screen / Esc

Print Version

Interactive Discussion

Discussion Paper