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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Peroxy radical observations over West Africa during the AMMA 2006 campaign: Photochemical activity in episodes of formation of convective systems on the basis of radical measurements" *by* M. D. Andrés-Hernández et al.

Anonymous Referee #1

Received and published: 12 March 2009

This paper presents an analysis/discussion of specific events in measurements of peroxy radicals during AMMA 2006 from the DLR-Falcon airborne platform. The subject of this paper is important, as there is great interest in quantifying the impact of convection on upper tropospheric composition and the resulting photochemistry. I find the paper generally quite good and suitable for publication. I would like the authors to consider a few points as they revise the paper to the final version.

Title. Part of the title does not really relate to the topic of the paper. That is the "...episodes of formation...". I suggest shortening and simplifying to "Peroxy radical observations over West Africa during AMMA 2006: Photochemical activity in the outflow of convective systems"

Page 1588. It says that RO2 was measured by the DUALER instrument, but isn't it true that the instrument measures HO2 + RO2? If not, then the paper should describe how HO2 was removed from the signal. Also a reference to the Cantrell et al dual inlet instrument is appropriate here.

Somewhere (perhaps in the introduction), it would be helpful to describe the "expected" behavior of peroxy radicals in these outflow situations, since later in the paper comments are made that the behavior was "as expected" or "not as expected". I am talking about the functional behavior of peroxy radical concentrations versus NO concentration, clouds, and other variables.

Page 1592. Plate 2 is referred to, but it should be Figure 2, I think.

Page 1593, line 20. I didn't understand the phrase "...are not enough to make any conclusive interpretation." Perhaps there is a word or two missing here.

Page 1594,line 16. Suggest "until" rather than "till". Suggest removing "down". Page 1594, line 17. Suggest removing "up". Page 1594, line 19. Suggest a semi-colon before "if acetone". Page 1594, line 23. "Statistical error" is used, but don't you mean standard deviation of the averages? Page 1594, line 28. The role of clouds has been often discussed in the literature... Suggest adding one or two references here.

Page 1595, line 1. It says that there was no obvious correlation with formaldehyde, but one wouldn't expect a strong correlation if only a fraction of the HOx were formed from formaldehyde, correct? Page 1595, line 14. Sugest removing "down". Page 1595, line 17. Does "outside the convection zone" refer to within the convective outflow?

Page 1597, line 24. Does the NOy really vary by 20 ppbv?

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Page 1598, line 13. Suggest rewording "..too different parameters and variables..."

Page 1599, around line 8. Suggest adding a reference to the Ridley et al paper about convection as a source of UT NOx. Page 1599, line 13. You mention significant O3 production rates (are these net rates, i.e. P-L) in the outflow. What are typical values in unaffected UT air masses? Page 1599, line 27. "form" should be "from".

Page 1600. Should OH+NO2+M be in the mechanism?

Page 1602, line 1. Suggest "The presence of cumulus clouds are assumed with a ..."

Figures. Suggest making all of the Pressure axes (such as Figure 2a) large at the bottom (1000 mB) and small at the top (like an altitude scale). Alternatively, actually change to altitude rather than pressure. On figures (such as 8) that have a variable plotted versus pressure or altitude, put the latter (P or z) on the y-axis. Also several plots have the x-axis labels at 0, but the y-axis minimum is less than zero (Figure). Suggest moving the axis labels to the minimum of the other axis (like Figure 9c).

It might be worthwhile to describe how "negative" concentrations come about and what they mean in the analysis (e.g. Figure 12a and Figure 13).

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 1585, 2009.

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