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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Observations of OH and HO_2 radicals over West Africa" *by* R. Commane et al.

Anonymous Referee #1

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The article presents results of the OH and HO2 radical airborne measurements over tropical West Africa during the monsoon wet season. The vertical and diurnal distributions of the radicals are presented for several specific conditions identified on the basis of simple correlations. The measurements were performed in the frame of the AMMA campaign on the board of the FAAM aircraft and were accompanied by a large number of ancillary measurements providing possibility for further detailed analysis of the presented in the article data. The airborne measurements of the OH radicals are extremely difficult and presented results make significant contribution to other few airborne measurements of the radicals in the tropics, the important most photochemically active region. Therefore the article is appropriate for the publication in the ACP with some modifications I would like to suggest. They concern mostly the presentation of the data and the discussion of the measurement uncertainties.

Measurement uncertainties and reliability

1) It is not clear from the presented data what was the uncertainty of the measurements. I would suggest presenting a short description of the procedure used for the estimation of the data accuracy and precision. The corresponding error bars, at least for several points, should be presented on Figures 9-20.

2) To give more clear idea about measurements quality, it would be very helpful to include in the article the figure showing the raw signal and background data for one measurement cycle obtained during the flight. I would suggest adding this figure instead of Fig.3.

3)How the uncertainty of the calibration coefficient has been estimated? Does the given in the article 20% uncertainty account for the uncertainties of the calibration parameters (lamp flux, humidity, etc)? Based on the data presented in Fig.6, it seems that alone the precision of the calibration measurements is about 20%. What is the influence of the humidity on the calibration coefficient and what was the range of the water vapour concentrations for different flights? How important is the influence of the gas temperature in the transport tube and in the fluorescence cell on the calibration coefficient? How different were the calibration coefficients measured before and after the campaign?

4)Verify the values given in Table 1. I obtain quite different LDL using these values. The background deviation for use with equation (7) should be in units cts/s/mW.

Presentation of the data.

1) Provide more detailed information about different flights. I suggest adding a Table with some flights details (altitude, location, time) and atmospheric conditions (range of concentrations of O3, CO, H2O, NOx, VOC, isoprene). Alternatively, the figures showing the individual flights data could be presented

2)Fig.8. Add the legend explaining the correspondence of the colours and the radical

concentrations.

3)Fig.11, 12. Indicate by different colours the data corresponding to the identified specific cases (free troposphere, high isoprene, burning plume, clouds). Indicate error bars for the points corresponding to the median values on Fig.12.

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 7265, 2010.