

***Interactive comment on* “Measurements of OH and HO₂ concentrations during the MCMA-2006 field campaign – Part 1: Deployment of the Indiana University laser-induced fluorescence instrument” by S. Dusanter et al.**

Anonymous Referee #2

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The authors outline the deployment during the MCMA-2006 campaign of a new FAGE instrument capable of measuring OH and HO₂. They give an overview of the specifications, capabilities and limitations of the instrument. The paper is part one of a two part set of papers, both to be part of the MILAGRO/INTEX-B special issue. The second paper will be dedicated to the report and analysis of the measured HO_x data, although a brief overview of the data is presented here in part one. The paper is well written and I recommend publication after the following comments and suggestions are taken into consideration.

General Comments and Suggestions:

1) P. 13705, lines 25-29: It seems premature to predict that "strong evidence that the detected signal arises solely from the OH radical" will be found when these tests have not yet been performed. If there is reason to believe that this evidence will be strong from preliminary tests, then this should be stated and the reasons for the "strong evidence" wording stated. Otherwise, simply state that these proposed tests will be done at a later time and will provide quantitative evidence regarding possible interferences or lack thereof.

2) P. 13706, lines 5-10: What, if any, were the concentration ranges tested by Ren et al. for the interferences? Is there a quantitative limit reported? Are the reported concentrations of these species in MCMA within these limits?

3) P. 13707, lines 1-2: Describe briefly (more explicitly) what "a change in the efficiency of the chemical modulation" implies.

4) P. 13710, lines 4-9: The information detailing the variability in the detection limit seems very key, especially based on the "observed minimum detectable" reaching as high as $2.6 \times 10^6 \text{ molec cm}^{-3}$. Some reassurance to the reader that these periods of non-ideal detection limits were factored into the reported data and quantifying the proportion of data coverage that was affected by the noise would be highly valuable. Obviously many measured concentrations during the MCMA-2006 campaign were significantly above $2.6 \times 10^6 \text{ molec cm}^{-3}$, but there are a number of reported data points that are at or below this detection limit.

5) P. 13712, lines 2-3: The reported OH "asymmetric profile with higher concentrations measured at this site during the morning hours" is not clear from Fig. 11. Perhaps it would be more fitting to report that on days where OH exceeded $10^7 \text{ molec cm}^{-3}$ that this is the case? Similarly, the statement on line 5 that "high levels of OH are clearly observed" is not as clear to me. The concentrations on March 15 look higher than those on March 16, but there is also missing data from the morning hours. Perhaps

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another faint line marking the local noon on the figure would help.

6) P. 13714, lines 11-12: The authors state that only data with $\text{NO} > 8$ ppb are shown in Fig. 14, but the figure looks as though there are points at lower [NO].

Minor corrections:

7) P. 13690, line 19: Define NO_x.

8) P. 13696, line 6 and P. 13697, line 22: "insure" should be "ensure".

9) P. 13705, line 9: "exhibits" should be "exhibit"?

10) P. 13705, line 20: Define GTHOS and/or give a quick description of it.

11) P. 13705, line 26: "presents" should be "present".

12) P. 13705, line 27: Remove comma ("excited state can be compared...")

13) P. 13707, line 9: "than" should be "to"?

14) P. 13712, line 29: Define RO_x either here or earlier.

15) P. 13713, line 13: Rather than stating "an even lower correlation coefficient", give the actual numerical value.

16) P. 13713, line 14: The statement "J(NO₂) is used instead of J(HONO)" is vague. Add a phrase or two to describe for what was J(NO₂) used instead of J(HONO).

17) P. 13714, line 2: Add a comma after "in the MCMA" before "NO_x".

18) P. 13714, line 12: "Fig." should be "figure" Or "Figure"?

19) P. 13730, Fig.7: The distribution shapes in this figure would be clearer if the scales for the first and second half were adjusted such that the two distributions were more similar in width. The scales need not be the same, as they already aren't.

20) P. 13736, Fig. 13: The caption "between HO_x radicals and J(HONO)", should likely

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just read "between OH radicals...";

21) General comment for Figures 9, 10, 11, 12 and 14: The scales and axes titles on these figures are difficult to read with the pixilation that has occurred during the graphics formatting for the website. It would be ideal for the figures to be made with fonts that are slightly larger (such as those in Figures 4, 5, and 13.)

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 13689, 2008.

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