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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Lightning-produced NO_x over Brazil during TROCCINOX: Airborne measurements in tropical and subtropical thunderstorms and the importance of mesoscale convective systems" *by* H. Huntrieser et al.

Anonymous Referee #1

Received and published: 29 March 2007

This manuscript presents very interesting results from the recent TROCCINOX campaigns above South America. With the recent widespread interest in convection and its impact on upper tropospheric chemical composition these detailed results from South America will serve as an important benchmark for researchers as they build a global view of the important impacts of deep convection. This paper is entirely appropriate for ACP and I recommend it be published once quite a few, but relatively minor, changes are made, as listed below.

General Comments:

My only strong criticism of this paper is the small size of the figures, many of which are difficult to interpret, or contain text so small that it is illegible. The smallness of the figures may be due to the formatting of the paper by ACPD, since I often make this complaint about ACPD papers. Regardless, all but Figures 6, 8, 9,10, 13 and 14 need to be increased in size by at least 50%.

In the discussion of Figure 18 it is not clear which air masses are “Pacific” or “Amazon.” Are these just air masses from the Feb 18 flight, or are they combinations of data from several flights? It would be helpful to circle these data points in Figure 18. And on page 2585, lines 21-23, I don’t see the positive or negative correlations that are discussed.

Specific Comments: Abstract, line 9 What do the authors mean by “proper” wind direction?

Page 2563 line 1: Drop the first word of the sentence, “The” line 10: drop “at least”

Page 2564 line 5: change access to assess

Page 2565 lines1-2: would sound better as “DLR Falcon research aircraft”

Page 2569 lines 14-15, would sound better as: “ The convective systems occur on a wide range of temporal and spatial scales.”

Page 2571 line 14: Do you mean to say “connected to low northerly and easterly wind velocities” ? Was FLEXPART also used in the air mass classification?

Page 2572 line 13: I disagree that the CO profile has a pronounced C-shape. To me it looks like a very flat C. The only way it could be pronounced is if the x-axis were stretched by a factor of 2 or 3. line 23: How does this paper differ from Mari et al?

Page 2575 line 4: change “area” to “NOx plume”

Page 2577 line 24: I don’t understand what is meant by “grouped to flashes”

Page 2578 line 12: Here you say that the trajectories ascend as they circulate within

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the high, but the general understanding of circulation within a high would suggest the trajectories would descend. Why the discrepancy? line 24: change usually to usual

Page 2579 line 6-7: The parentheses are not closed, making this sentence confusing. line 27: the use of seconds past midnight is not helpful. Only UTC should be used and figure 6 should be changed accordingly.

Page 2582 line 1: Would be more clear as: “The values represent averages of the lowest 100 m layer of the atmosphere at take-off or landing” line 16: drop “the” at the beginning of the line

Page 2583 line 21: change to “trace gas correlations” line 25: would be clearer as “above the Pacific Ocean”

Page 2586 line 8: change to “in great detail” lines8-9: change to “This paper presents”

Figure 1. Stretch the x-axis to pull the data lines apart

Figure 2: the text on the plot is illegible

Figure 2 & 3. Label the figure with S or T to distinguish tropical from subtropical events.

Figure 3: what do the circles (or ellipses) represent?

Figure 4. locations of the radars are not visible. Please overlay the flight tracks.

Figure 5. Figure 5b is the same as Figure 4b. The locations of the radars are not visible. Please overlay the flight tracks.

Figure 6 Change x-axis to UTC and remove the red numbers and roman numerals from the x-axis as they are not used in the text.

Figure 7 Indicate the position of the MCS with arrows.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 2561, 2007.