

Interactive comment on “Civil aircraft for the regular investigation of the atmosphere based on an instrumented container: the new CARIBIC system” by C. A. M. Brenninkmeijer et al.

Anonymous Referee #3

Received and published: 20 May 2007

CARIBIC is an impressive project that will undoubtedly lead to many new and significant atmospheric observations over the next decade. The manuscript by Brenninkmeijer et al. is really an overview paper on the design of the project: no parts of the CARIBIC system -inlet system and instrument package- are described in a lot of detail. A more detailed manuscript of the newly developed probe with the gas and aerosol inlets is promised for later publication, and the instrument descriptions are relatively brief; some may be too brief for scientific discussion of the obtained results. Nevertheless, the paper gives a comprehensive overview of the CARIBIC design and as such serves an important purpose that deserves publication in ACP.

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I agree with the assessments by both other reviewers. The manuscript does contain unnecessary detail, although I do not find this to be a major distraction: the manuscript is easy to read and interesting. Also, measurement uncertainties should be discussed in more detail, either in this manuscript or at a later stage when the results of individual measurements are presented.

An additional issue that I would like to bring up is the measurement of vertical profiles during ascents and descents. Most of the discussion focuses on measurements in the upper troposphere and lower stratosphere. However, the vertical profiles obtained over the home and destination airports are of equal value, and the manuscript gives very little idea of what can be expected in this regard. An added section on what data will be available from ascents and descents would be of great interest.

Minor comments:

Page 5301, line 18: The distance between inlet and the NOy instrument is 2 meter. Is heating the PFA tubing to 40 C really sufficient to avoid losses of HNO₃?

Page 5304, line 16: How was the upper size cut-off determined?

Page 5304, line 28: I do not know what teething means in this context.

Page 5312, line 5: What are the sample flow through the canisters and the canister volume? How well is the sampling time determined?

Page 5313, line 9: Have the authors looked at the removal of ozone inside the hydrocarbon measurement system? If any ambient ozone reaches the canister, chemistry in between the sampling and analysis times could cause biases in the measurements of alkenes and other reactive hydrocarbons.

Page 5335, Fig. 10: It is not clear from the legend and caption what the grey peaks at the bottom of the figure are.

Page 5336, Fig. 11: The ozone measurement seems to be somewhat noisier earlier

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on in the flight. Is that true? Also, the NO measurement shows some extended periods with really high values up to 3 ppbv during the second half of the flight. What is the explanation?

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 5277, 2007.

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