

## ***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 #1**

Received and published: 30 May 2007

Review of "Civil aircraft for the regular investigation of the atmosphere based on an instrumented container: the new CARIBIC system" by Brenninkmeijer et al for Atmos. Chem. Phys. Discuss.

One can't help but be impressed with the scope of the CARIBIC program. The instrument package and deployment strategy yield opportunities for process studies as well as constructing chemical climatologies in a relatively inaccessible region of the atmosphere, the UT/LS. This is an article about instrumentation and as such it should be judged only on the basis of how well the instrumentation is described. There is no question that the manuscript should be published with perhaps some minor modifica-

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

tions for clarity. These are given below.

Yet, there are interesting questions that lie outside of the scope of the article. This article ends with data written on a storage medium. To go from that to useful information reported in the peer reviewed literature is a many step process. Aside from individual PIs reporting results, the overall concepts behind the use of CARIBIC data should become part of the public record. The combination of routine flights (monitoring) with an extensive suite of instruments is unique. Should CARIBIC be managed as a resource to the community similar to a satellite or should it be managed in a more proprietary fashion such as a dedicated aircraft campaign? This is not an either or question or a question of access to data, but rather a question of emphasis.

Comments P 5297 Abstract PCASP not mentioned

P 5284. Could Lufthansa use the CARIBIC aircraft on polar routes? Perhaps Frankfurt to San Francisco. Is this of interest?

P5288 Inlet system Aerosol inlets are heated (in places?). Do all of the instruments measure dry size distributions?

P 5289. 210-380% cloud particle enrichment. This is a large factor and a large range. How precisely is this factor known? What is the uncertainty in cloud water?

P 5297 line 5297-5298 precision at ambient pressure and 150 hPa. Confusing. Ambient pressure is 200-250 hPa during cruise, which is stated elsewhere. What relevance is 150 hPa? Pressure in instrument?

p 5301 line 2-3 Technique for NO and NO<sub>y</sub> measurements similar that used on the DLR Falcon. Au converters are widely used. Is there something special about the instrument on the Falcon such as using H<sub>2</sub> as a reducing gas?

P 5300 Section 4.4 Nitrogen oxides. NO<sub>y</sub> converters are typically mounted outside the airframe because of loss of HNO<sub>3</sub>. Has the (heated) CARIBIC inlet system been tested for loss and memory effects. Will the heated inlet dissociate PAN and interfere

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

with a future NO2 detector.

P 5304 line 19, Use of 256 size channels instead of 32. Not clear if the additional size resolution is useful. Mie resonances limit the accuracy to which a scattering signal can be converted into a size.

P 5307 Variations in O2/N2 ratio This section discusses the O2 measurement. How is the ratio determined?

P 5312 line 8-9 Altogether 3 sets of sample canister units were built to secure availability .. Not sure what this means. Are there extra sets on the ground as a contingency?

P5313 During the return flight, half of them are vented and refilled Why?

Wording

P5287 line 19 "was absolved" was conducted

P 5289, line 23 Units "vol-l/min" l/min

P 5289, line 23 "A second also heated ..." Awkward. A second heated ...

P 5292, line 13 "airccraft" spelling

P 5292 lines 27-28 Awkward phrasing.

P 5294 line 15-16 "Extensive use is made of exclusively aviation quality ..." Awkward. Extensive use is made of aviation quality ...

P 5294 line 23 and other places, height of instruments given in HU. This is jargon. Either define or use inches.

P 5295 line 8 "is no more limited" Is no longer limited

P 5295 line 17 " is standard available in civil aircraft" standardly

P 5300 line 21 "At daytime.." During the daytime, or At sunrise

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

P 5308 line 2 "Exactly this process ... Awkward. This process... or This exact process ...

P5314 line 19-20 "This all renders the DOAS ....., if not highly relevant"

---

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

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper