

Interactive comment on “The ARCTAS aircraft mission: design and execution” by D. J. Jacob et al.

Anonymous Referee #3

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Summary: The manuscript; “ The ARCTAS aircraft mission: design and execution” by D.J. Jacob et al., gives an overview about the scientific objectives and flights of aircraft campaigns which took place in the Arctic in 2008. However, given that the paper precedes the publication of results coming out of these campaigns, it does not contain any summary of scientific highlights and therefore very little new scientific material. Also, the description of the objectives, whilst interesting, is not in itself very novel since there are already published reviews on some aspects such as transport of pollutants to the Arctic and snow chemistry which need to be referenced. In addition, the description about the flights is very brief in the main text and supported by long summary tables which don't really help the reader know what was observed.

Whilst I can understand the interest of such a paper to the ARCTAS (and wider PO-C5706

LARCAT) community, it really needs to provide information about, for example, the meteorological conditions in spring and summer (I suggest taking some of the material from Fuelberg, submitted), the quality of the measurements and to discuss first general results about the campaigns – what was observed on average, types of air masses, their chemical/aerosol characteristics etc. It needs to be made clearer which scientific objectives were met and to show some examples. When were the “golden days” etc. In this respect, the paper will have to undergo major revision before it can be published. Alternatives are either to publish this paper as a technical note or to wait and to update it with a summary of scientific highlights once more papers have been submitted on the analysis of ARCTAS data.

1. Does the paper address relevant scientific questions within the scope of ACP? The paper discusses the objectives of the ARCTAS missions and reviews current issues related to the sources, transport and processing of pollutants in the Arctic. However, it doesn't really address any questions because very few results are presented.
2. Does the paper present novel concepts, ideas, tools, or data? No, apart from providing information about the campaigns.
3. Are substantial conclusions reached? Not really apart from the successful execution of the campaigns – first results or scientific highlights are not discussed.
4. Are the scientific methods and assumptions valid and clearly outlined? The rationale for the campaigns are discussed and the aircraft payloads are given although there is no discussion about how well the instrumentation performed or about the difficulties of making satellite measurements in polar regions.
5. Are the results sufficient to support the interpretations and conclusions? Very few results are presented.
6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? No, see point 5.

7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? The scientific objectives are discussed but there are references missing to recent reviews published on pollution in the Arctic, snow chemistry (e.g. Grannas et al., 2007, Law and Stohl, 2007).
8. Does the title clearly reflect the contents of the paper? Yes.
9. Does the abstract provide a concise and complete summary? Yes.
10. Is the overall presentation well structured and clear? Yes.
11. Is the language fluent and precise? Yes.
12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Some abbreviations need to be defined.
13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? Yes, I suggest removing the discussion about the CARB campaign since the objectives are very different from the rest of ARCTAS and presumably can be dealt with in papers published on this campaign.
14. Are the number and quality of references appropriate? See point 7.
15. Is the amount and quality of supplementary material appropriate? Not applicable.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 17073, 2009.