**Atmospheric
Chemistry
and Physics
Discussions**

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

Anonymous Referee #2

Received and published: 14 September 2009

Summary: The manuscript: "The ARCTAS aircraft mission: design and execution" submitted to ACPD provides an overview of an intensive field campaign effort conducted by NASA during the International Polar Year IPY POLARCAT activities. The paper itself is intended to be reference material for subsequent submissions to the ACPD special POLARCAT issue. There is limited if any scientific contribution brought forward in the manuscript, yet it could provide an succinct reference of the aircraft capabilities and flights which further papers could reference. As a contribution to ACP, I question whether it merits publication, unless accompanied by 'sister' publications from all the campaigns within the IPY activity, thus creating a complete reference of the program. Alternatively, one individual larger 'summary' paper could be presented highlighting significant findings.

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Of concern is that the amount of information given for individual flights is too limited to be considered a valid substitute for other publications relying on the details for specific analysis. While the reference does provide a good general overview of what was conducted overall, it will not provide specific information on individual flight legs that would be required for a paper presented results from those flights.

1. Does the paper address relevant scientific questions within the scope of ACP? The campaign as a whole was highly relevant to the scope of ACP, thus if the content of the manuscript is deemed suitable for publication, the 'topic' is appropriate.

2. Does the paper present novel concepts, ideas, tools, or data? None, with the exception of the overall campaign. If this is the case – or argument for acceptance – further details regarding the 'unique' aspect of the mission design and execution should be discussed.

3. Are substantial conclusions reached? None, with respect to scientific findings.

4. Are the scientific methods and assumptions valid and clearly outlined? The paper does not delve into detail regarding the scientific methods, relying only on citation of appropriate sources.

5. Are the results sufficient to support the interpretations and conclusions? No significant interpretations or conclusions are drawn.

6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? One question is whether the citations are sufficient to provide a reader with access to the instrument/model background or access to data. In some cases, it seems the citations are an application of the instrument/model.

7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? The paper relies heavily on recent, appropriate citations where required. Further relevant citations are presumed to be found therein.

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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? Mostly, however the paper could benefit from a list of acronyms as each used are not necessarily clearly identified: US NSF DLR CNRS DOE NOAA ISDAC ARCPAC CALIOP/CALIPSO MOZART etc..

13.Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? See #12.

14.Are the number and quality of references appropriate? Yes.

15.Is the amount and quality of supplementary material appropriate? None provided.

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