

## ***Interactive comment on* “Overview of mercury measurements in the Antarctic troposphere” by A. Dommergue et al.**

**A. Dommergue et al.**

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Response to Anonymous Referee #2

A revised manuscript taking into account the reviewer’s comments and suggestion is attached. Review comments After going through the paper, following are the review comments for “Overview of mercury measurements in the Antarctic troposphere” by Dommergue et al. submitted for publication in Atmospheric Chemistry and Physics Journal. In summary, the overview of discussion presented in the paper is interesting. Minor revision is suggested before potential publication.

Comments: Some terms have been abbreviated several times (eg. “GEM” in Page 26674, 26675, 26677, Line 4), these are to be avoided.

We have carefully checked the whole manuscript and used the abbreviation Hg<sup>o</sup> only. Corrections are highlighted in yellow in the attached file.

Page 26674, Line 20: “The following article is a current state of Hg measurements in the Antarctic troposphere.” Which article?? Make it clear.

We meant “This article presents a current state of Hg measurements in the Antarctic”

Page 26674, Line 17: “Elemental gaseous mercury (GEM)”. Is not the gaseous elemental mercury (GEM) the proper representation?

The abbreviation GEM for Gaseous elemental mercury or Hg<sup>o</sup> can be used both. As indicated in the first comment, we have corrected the double abbreviation, and used the term Hg<sup>o</sup> throughout the paper only.

Page 26676, Line 10: To be corrected as “The role of the Antarctic continent and its influence on the global geochemical cycle of mercury is unclear today, and is certainly evaluated by current models (Selin et al., 2007).

It has been done.

Page 26677: Should “2.1 Methods be present here under “Results and discussion” or in the “Methodology” section separately?

We wanted to be short on methodology, because these measurements method have been used worldwide and not only in Antarctica. We followed the reviewer’s recommendation by editing a new Methodology section.

Page 26677, Line 6: Use of verb is confusing, please make it clear “GEM is maybe the only gaseous Hg component. . .”

We changed as follow :”Considering these three atmospheric species, Hg<sup>o</sup> is maybe the only component ( . . )“

Page 26684: The title “Tropospheric reactivity in the Antarctic vs. the Arctic” be better

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“Tropospheric reactivity of mercury in the Antarctic vs. the Arctic”

Thank you for this suggestion.

Table 1: “BDL: concentrations below detection limit” is not sufficient, provide the detection limit value. “Please update, if possible.”??

The manufacturer reports a detection limit for 5min samples of 0.10 ng.m<sup>-3</sup> . We added this information in Table 1.

I suggest authors to provide additional information on the areas needing further research.

We thank the reviewer for this suggestion. We already tried in the conclusion to emphasize on the need to carry out research (page 26685 line 23-25): “Significant differences are observed on coastal areas and on the Antarctic Plateau, which is largely unexplored. We believe that it will reveal important discoveries in a close future on the Hg reactivity and its importance on the global cycle of Hg.” We particularly think that measurements on inland sites of Antarctica can bring a lot to the comprehension of the Hg cycle. Only two studies reports measurement in central Antarctica and the preliminary results indicate an unexpected and important reactivity. It is maybe not enough stressed out in the conclusions and the perspective of the manuscript. So we have added the sentence (last paragraph of the conclusion) :”A great deal of attention must be paid to inland sites (i.e. on the Polar Plateau)”.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/9/C9671/2010/acpd-9-C9671-2010-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 26673, 2009.

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