

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

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We appreciate the great effort that Review #3 has put into their review. This review has caused us to re-examine our analyzes and suggested mechanisms. As some of the review comments are similar we would like to summarize the reviewer’s major points (in our order of importance) with our responses 1. The paper relies too heavily on Arctic studies which may not reflect the Antarctic continent where the vast polar plateau influences chemistry and the export of these potential oxidants (OH, HO<sub>2</sub>) to the coastal environment – We have made revisions that now emphasized the near surface oxidation canopy over the sunlit plateau which shows enhanced OH and NO from snowpack processes, and the production of O<sub>3</sub> in the lowest 200m (Eisele et al., 2008) of the atmospheric column. As the reviewer points out, near-surface ozone

production and bromine radical chemistry are, in a sense, contradictory. We have therefore restricted our discussion of halogen oxidation to the Antarctic coastal regions, and have emphasized the potential importance of OH/HO<sub>2</sub>/O<sub>3</sub> Hg oxidation over the Plateau and the export of these species, via katabatic advection, to the coastal environment, where these species may play a role in Hg oxidation along with the halogens (Br, Cl, I). Further, we have presented the mercury oxidation mechanism(s) as a major unresolved issue. 2. The paper lacks a detailed comparison of the differing methods (historical and recent) of determining Hg concentrations within Antarctica – We have added a table of the methods (manual silver traps and Tekran automated speciation suites), accuracies and detection limits to the paper. 3. Speculation contained within the paper must be clearly stated – We have gone through the text and have attempted to clarify where our comments are purely speculation. The Antarctic continent lacks the long-term Hg monitoring of the Arctic and the polar plateau chemistry may likely be totally different from the published Arctic Hg phenomenon. Many of our datasets are for short time periods. We still have a great deal to understand about Hg dynamics on the Antarctic continent. A fully revised version of the manuscript is thus proposed.

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/9/C11632/2010/acpd-9-C11632-2010-supplement.pdf>

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

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Discussion Paper