

Interactive comment on “Technical Note: Ensuring consistent, global measurements of short-lived halocarbon gases in the ocean and atmosphere” by J. H. Butler et al.

J. H. Butler et al.

thomas.bell@uea.ac.uk

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The three referees for this manuscript converged on several key items, most of which we agree with. These are as follows:

1. All referees noted that "a coordinated effort should be made to ensure that laboratories across the world are inter-calibrated" (Quote from Referee #3).
2. The paper should be made shorter or else strengthened substantially. There's too much repetition and ambiguity.
3. Referees did not like the figures, suggesting that they were unnecessary.

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4. Our choice for a preferred approach was not substantiated.
5. We presented no mechanism for accomplishing the goal.

The remaining comments were either minor or very specific and are addressed later.

Of the five categories above, we only disagree with #3. The manuscript does need the figures and they do tell a story, but we did not make that clear in the text or the caption. We've made an effort to alter this in the revised manuscript, condensing the two figures into one. It is important to have figures that demonstrate the variability in both the ocean and the atmosphere. We have taken the recommendation of Referee #3, who suggested that perhaps this paper might best be presented by focusing it on the outcome of the conference, and shortened the paper considerably by removing repetition and clarifying the main points.

Responses to specific comments by the referees:

Referee #1

- Iodine may not be important in the stratosphere, but it is important for oxidation in the marine boundary layer (Read et al., Nature, 2008).

- Very short-lived chlorine gases are not mentioned here mainly because they constitute a small source of atmospheric chlorine – longer lived species (for which intercalibration programs are well established) are important in the stratosphere whereas the main source of chlorine in the marine boundary layer is acid displacement from sea salt aerosol, which mostly releases HCl (e.g. von Glasow and Crutzen, 2007, Treatise on Geochemistry). The pressing issues are with Br and I, but Cl is certainly not excluded – some of the so-called "bromine" gases contain Cl (CHBr₂Cl, CH₂BrCl).

- In truth, hard evidence for the difficulty in drawing conclusions from multiple data sets is in the figure, which shows the observed variability in both the atmosphere and the surface ocean. We have fleshed out the caption to make this point more clear.

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- The distinction between long-lived and very short-lived is underscored twice in our revision.
- The fact that the figures do not provide information on the variations being real or instrumental artefacts is exactly our point. We need the calibration and comparison information to do so. Note that the absence of evidence is not evidence of absence. We need the latter if we are to interpret the data responsibly.

Referee #2

- The reviewer captures a practical problem in the comment about which strategy is to be chosen. We have revised this discussion to focus on the 4 activities that are needed on an on-going basis. Some are possible in the near-term, but in the end, all are necessary. These are (1) a commonly used and maintained reference scale for each gas, (2) a mechanism for participating laboratories to trace measurements to those scales, (3) routine exchange of flasks of air, whether through round-robins or distribution of samples from batch preparations, and (4) periodic intensive studies involving a large number of investigators. Owing to a scarcity of funds, no effort has been successful yet to pursue any of these systematically, but efforts are being made to bring WMO Global Atmospheric Watch into the process.
- Upper troposphere has been noted along with lower stratosphere.
- Chlorine - see reply to Referee #1.
- "Short-lived" has been replaced with "very short-lived" in the text. This is consistent with terminology and definitions used in the quadrennial WMO Scientific Assessments of Ozone Depletion.

Referee #3

- Referee #3's comments captured the essence of the others.
- This referee also provided the best solution to getting this message out – shorten and

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focus the paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 11287, 2009.

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