

Interactive comment on “Results from the International Halocarbons in Air Comparison Experiment (IHALACE)” by B. D. Hall et al.

Anonymous Referee #2

Received and published: 25 October 2013

This is a very well written paper detailing a truly international study, and involves a significant proportion of the halocarbon community. The improvement in analysis and calibration of major halogenated species is highly evident from this work, and agreement between laboratories on the same scales mostly shows improvements on earlier comparisons. A large amount of time had passed since those studies (~1978-1979) and so this work is highly needed and respected and should be published.

General comments: This study has highlighted issues in the quoting of the use of scales, which have perhaps been inaccurately applied to data (through, it is said, simply poor communication of calibration scale changes). If these measurements are to be compared globally such basic issues need to be addressed quickly. One concern for me as a reviewer therefore, is the timeliness of these results. The analysis of the

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canisters by the individual groups was completed in 2006 with the final analysis at NOAA done in 2007. The results were available to the participants from 2008 but do we then assume that the findings of this paper are accurate now, five years on, or has more work been done on some of the outcomes since then? For example, the similar UK based intercomparison for very short-lived halocarbons (VSLH) was published within a year of the experiment (Jones et al, 2011). The VOC community have carried out two major intercomparison experiments within the same timeframe and there have been many developments in knowledge between. The statement (section 2.2, line 5) suggests, “the IHALACE experiment was conceived as a first step toward assessing the variability of a number of common calibration scales....”. Although there are some references to subsequent work (e.g. Montzka and Reimann 2011, Jones et al., 2011), this paper would benefit from an extra section on what plans have been developed for the next step and whether any common scales have been adopted as a result of this work. To say only that communication has improved leaves the reader a little unsatisfied. Is there any evidence to support this improved communication?

These types of comparisons are invaluable and should be adopted by many others. That said, some of the methodology and discussion was a little heavy and difficult to read and so I would recommend simplifying some of it to appeal to a more general audience.

Reference was made to the use of laser-based systems for CH₄ and N₂O but no results have been presented. Perhaps this study is more out of date for these species considering the recent improvements to instrumentation and direct techniques that don't require calibration. The title of the paper suggests the focus is on halocarbons so perhaps the work on those greenhouse gases should be removed from this paper? Alternatively, could any additional information or references be added relating to the laser techniques and how they now agree with the GC analyses? Have the laser-based instruments been run alongside the GC systems at any time in field experiments for example? This would at least put the results of this older study into the current context.

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Specific points: The abstract should include explicit reference to all the groups of species studied to facilitate future literature searches.

Page 8026, line 3: Replace "To the extent" with "As far as possible"

Section 2.1. Please add in to this section how you determined the initial stability of the cylinders. How often were they analysed? Can reference be made to previous work done on the stability of the species in the cylinders?

Page 8028, line 1. Define "minor differences". Were these minor differences different for the set that was returned in 2006 and the set that was returned a year later? It looks like this data may be plotted in Figures 1-6? If so, please reference the figures and highlight the results in more detail in the text.

Page 8030 Line 6 says across six scales with reference to Table 5, whilst table 5 says five? Please clarify.

Page 8030 Line 8: Do you mean three scales (1,2 and 17)?

Page 8031 line 29-Page 8032 line 1: Can you summarise at this point whether closer linked laboratories such as 2, 9, 14 and 17 show smaller scale transfer errors on the whole?

Page 8045, line 2: Define "major scales"

Table 5: Although detail is in the supplement it may be useful to include another column referencing the actual scales that were used for these statistics for clarity, unless the table becomes too busy as a result?

Figures 1-6: Are the results plotted from left to right in order of analysis date? Please indicate whether in general the concentrations derived from the individual laboratories are compared to the initial or final analysis of the canisters?

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