

Comments for revised version (v4):

Surface fluxes of bromoform and dibromomethane over the tropical western Pacific inferred from airborne in situ measurements

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This is a very good revised version of the manuscript. The authors made very effective changes and also added new key material that further supports this study. For instance, adding the posterior model simulations in Figure 2 clearly and nicely illustrates the improvements obtained when having and using observations. Another example is Figure 6, which shows the impact of the choice of the a priori on estimating a posteriori fluxes when observations are available.

In reviewing this new version, I am left with one unanswered question (or perhaps I missed the answer) and a few specific suggestions that I would like to offer.

Question

- 1- Why is the agreement between model and observations better for CHBr_3 , which has a shorter lifetime, than for CH_2Br_2 (lines 24-26)?

Suggestions

- 1- The addition of the new material illustrated in Figure 6 was very interesting and provides a very important finding (lines 400-401) that should be mentioned in the abstract and in the conclusion, namely that the choice of a priori plays a small role in determining a posteriori fluxes when atmospheric measurements are combined with the framework presented in this study (Geos-Chem and MAP).
- 2- Line 130: as with many acronyms properly defined throughout the manuscript, "GC/MS" should be spelled out as well.
- 3- Lines 134-145: the two data sets (CAST and CONTRAST) are calibrated using different scales, as the authors described. Are there any differences in scales? If so, were they accounted for in this analysis? The authors mentioned an offset between the two data sets (line 360-362) that were found when comparing to model outputs. Could that be due to the difference in scales?

- 4- Lines 145-148: how were these errors determined – this work or Andrews *et al*? If the latter, then it should be referenced.
- 5- Line 351: “This model bias...”. Which bias, the negative one? Clarify this statement.
- 6- Multi-panel figures: consider using labels (e.g., (a), (b), (c)) in the panels and then add them to the captions for more efficient referencing. In some cases, for instance, Fig 3 and Fig 4, the labels were present in the panels, but not added to the captions.
- 7- Figure 2: provide acronym in caption for “GC” legend in rightmost panel.
- 8- Figure 2: was the GC analysis for CHBr₃ also done for CH₂Br₂? If so, what were the results?
- 9- Figure 2: the left panel shows that the model has a positive bias at all altitudes. The middle panel, however, shows both positive and negative biases, granted they are smaller in magnitude. What are the uncertainties or error bars in these vertical profiles, which can help assess the relevance of the model-observation differences?
- 10- Figure 6: are similar results obtained when examining CH₂Br₂? A few sentences on those results could be added to the text without the need to create new panels or figures.
- 11- Figure 6: include axes labels (lats/lons) in plots on the right.