

General Remarks

The manuscript presents an interesting approach to determine CHBr₃ emissions by using an inversion method. This novel approach helps to improve the emission estimates of CHBr₃ which are still poorly constrained. The paper is well written and the authors did an excellent job in discussing the strengths and limitations of their approach. I can clearly recommend the manuscript for publication with only minor changes.

We thank the reviewer for the positive review of the paper, and address specific remarks below.

Specific Remarks

Section 3.1: I can't really understand how the dilution matrix is calculated since important details are missing. As this matrix represents an integral component of your approach please describe its generation in more detail.

We received a very similar comment from reviewer 1, and have suggested a more detailed description of the process used to convert the trajectory calculations into the dilution matrix.

Table 3: I find Table 3 rather confusing and I am not sure what it tries to convey. Perhaps the corresponding paragraph (p. 20480, l. 16f) can be expanded or rephrased to make its purpose more clear.

Reviewer 1 also found this paragraph and table confusing, and, in our reply to reviewer 1, we have suggested removing them from the paper.

Figure 7: It is not clear for me where the modeled timeseries does come from. On page 20478 line 16 you state that it was derived from experiment A emissions but how do you calculate the mixing ratios? Forward trajectories? By using the p-TOMCAT model?

As above, we received a similar comment from reviewer 1. We have attempted to improve our description of equation 1, which allows us to use the estimated emissions and the dilution matrix to calculate the modelled timeseries at the measurement sites(s).

Minor Remarks

I think it would be a nice feature to mark the observation sites (or rather, a single marker at the averaged position) in the dilution matrix map in Figure 2.

We are happy to add this detail.

p. 20474, l. 22: typo "a prior"

For consistency with the rest of the paper we will write ‘a priori’.