

## ***Interactive comment on “The contribution of natural and anthropogenic very short-lived species to stratospheric bromine” by R. Hossaini et al.***

### **Anonymous Referee #2**

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This paper presents a well written, concise study of the natural and anthropogenic short-lived species to stratospheric bromine. It provides an interesting contribution to the current discussion concerning the role of very short-lived substances in the stratospheric Br budget. I recommend this paper for publication in ACP after the following (mostly minor) issues are addressed.

Major comments: Pg 23864, line 8-10 – have you tested the implications of the simplistic assumption of surface vmr being constant with latitude and longitude? The study of Warwick et al., [2006], showed CHBr<sub>3</sub> profiles considerably different depending upon source region, what are the implications of this for the results presented here?

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Minor comments: Pg 23867, line 5 on, please state the initial concentration for the idealized tracer, and in a related point it may be valuable to express Figure 4 in terms of % or rather parts per 1000 (I am assuming here the initial tracer concentration or surface concentration is 1 pptv).

Pg 23867, line 26 Note here that the equivalent lifetime plots of  $\text{CHBr}_3$  and  $\text{CH}_2\text{Br}_2$  can be found in Hossaini 2010.

Pg 23868, discussion of table 2 – table 2 presents a very nice presentation of data and especially useful will be the percentages of BL concentrations that reach the stratosphere. While beyond the scope of this (bromine focused) paper, could you please quote the numbers for  $\text{CH}_3\text{I}$  and/or  $\text{i6hr}$  expected as a % of BL concentrations for entering the stratosphere? Since these have very short lifetimes, perhaps equal to some of the new anthropogenic bromine species (but with higher BL concentrations), this could be worked into the text at this point.

Technical corrections: Pg 23864, line 23 – yr – years Pg 23870, line 12 – ‘a low bias’ this should be ‘a high bias’ ?

Reference: Warwick, N. J., J. A. Pyle, G. D. Carver, X. Yang, N. H. Savage, F. M. O’Connor, and R. A. Cox (2006), Global modeling of biogenic bromocarbons, *Journal of Geophysical Research-Atmospheres*, 111(D24305), D24305, doi: 24310.21029/22006jd007264.

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