

# ***Interactive comment on* “Contribution of very short-lived substances to stratospheric bromine loading: uncertainties and constraints” by J. Aschmann and B.-M. Sinnhuber**

## **Anonymous Referee #3**

Received and published: 18 January 2013

Review of:

Contribution of very short-lived substances to stratospheric bromine loading: uncertainties and constraints

by J. Aschmann and B.-M. Sinnhuber.

This paper is a very comprehensive quantitative study of the factors controlling the degree to which Very Short Lived Substances (VSLs) can contribute to the bromine loading of the stratosphere. The authors have taken a very careful and robust approach to this quantification and it is explained very well indeed, both in terms of the text, and the figures which are particularly clear and well chosen.

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In my reading of this paper I found no areas where I felt more (or, for that matter, less) information or work was needed, nor do I find any fault with the authors thorough approach. I do have some minor suggestions for improvements in the text and one of the figures. Overall, the standard of English is excellent.

On reading comments from the other reviewers, I echo reviewer #2's wish for a little more information on the performance of the vertical transport in the model, and appreciate the authors intent to include more information.

I am very happy to recommend this paper for publication with only very minor suggestions for revision.

Minor technical comments:

Page 30286, line 22: 'One' -> 'Everyone'?

Page 30287, lines 16-18: This is a little awkwardly worded. I presume the Salawitch reference is another part of the example that includes von Glasow, yes? If so, I'd say you should put a comma after it (and perhaps change the semicolon before to a comma if the copy editor lets you). Alternatively, you could place everything from "as suggested by..." to "Salawitch (2006)" in parentheses.

Page 30292, line 27: "rely" -> "assume"?

Page 30297, line 4-5: "similar as in" -> "similarly to"

Page 30300, lines 1-4.5, then "Actually" 4.5-8: Forgive my initial ignorance/confusion, but I was not 100% sure on reading the start of this discussion whether the second point "Actually..." is supposed to argue against the likelihood of the first or argue for it. The first point is talking about the efficiency of washout while the second talks about large hydrometeors. A little more connective discussion would help. Bigger particles fall out faster, but presumably have less total surface area to adsorb, so was not sure what net impact is supposed to ensue.

Page 30300, line 18: "is" -> "are" (two occurrences)

Page 30302, line 16: "highbiased" -> "high biased"

Page 30304, line 25: "The most crucial factor for..."?

Figure 7: If this is intended to be a single column figure, I worry that some of the text might be a little small. While the black labels are clear enough (at least on my printer), I fear that the color ones, even though they are the same size, will be unclear.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 30283, 2012.

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