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Interactive comment on “Short-lived brominated species – observations in the source regions and the tropical tropopause layer” by S. Brinckmann et al.

Anonymous Referee #1

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This manuscript presents new field measurements of very short lived brominated compounds over the oceans. The new data add significantly to the atmospheric data base of these compounds. The data are of significance for evaluating the contribution of these species to the stratospheric Br burden. The manuscript does a good job of detailing the methodology used to obtain the data and the accuracy of the measurements. The science in this paper is certainly worthy of publication.

A minor question - given that the mixing ratios of these gases are so low, it seems unlikely that they are normally distributed. Is there any evidence that they are? I could imagine that the atmospheric levels over the oceans represent a dilution of the

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emissions with "zero air" from above. In that case, wouldn't a log-normal distribution better describe the data? If so, then a geometric mean (and variance) might be more appropriate.

Another issue relates to the importance of coastal emissions. I see from the data that levels are higher over coastal regions so I agree that the emissions must be higher. However, it is not clear to me that that means coastal emissions are important to the stratosphere. Is it not just as likely that coastal emissions are not important because the oceanic levels are lower? The coastal regions are very small in extent, so there needs to be some other argument made to show coastal fluxes are quantitatively quantitatively important (perhaps based on modeling).

To be honest, I had a very hard time focusing on the scientific content of this manuscript because of a myriad of grammatical errors. To be honest, I do not think this manuscript received the level of editing required prior to submission to a high quality journal. Many of the problems here stem from sentence structures that are far too complex for the author to handle or the audience to understand easily. The author should strive to master simple sentence structures and seek clarity above all else. The senior authors should take responsibility for this - it is not fair to ask outside reviewers to do so.

Solely because of the difficulty in reading this paper, I recommend that the manuscript either be rejected or undergo major revision prior to re-review. I do not make this recommendation lightly because I appreciate the difficulty of writing English for the non-native speaker.

A list of specific grammatical issues is given below for illustration. It is not exhaustive.

page line 22200 first sentence of abstract "up to the five". Very awkward 22202 13 "free grass area in about 100m distance..." Is that a grass-free area? grammar 22205 19 - "low concentrated", is not acceptable. Also ppt is not concentration anyway. 22205 4 upper case "Univ" 22205 10 "Observations source regions" ?? What does that mean? 22205 19 low-concentrated...0.10 ppt 22205 25 - symbol types should be in the figure

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caption not the text 22206 1 run-on sentence. Way too many parenthetical expressions in this section. 22206 "originating in the beginning" redundant. "exemplary" also line 10. 22206 "five important as analyzed for the TransBrom air samples - this is poorly worded, run-on, and painful to read 22206 when citing literature one should not routinely use eg. 22206 "exemplarily" is not a word 22207 7 it does not make sense to refer to UM measurement and "our" measurement, since both groups are authors of this paper. 22207 26 "The three polyhalogenated compounds reveal average mixing" I don't think the compounds reveal anything. Typically averages are given with some estimate of variance. 22208 6. This is unnecessarily wordy. For example, "indicating that very similar or the same sources contribute to the atmospheric concentrations of these substances." could be just "they have the same source" 22208 11. There are numerous occurrences of dashes in the middle of sentences. Is this permitted in this journal? It is not standard English grammar, and is difficult to read. 22209 15 "high correlations" doesn't make sense. Correlation is significant at some level or not. Not high or low. 22209 20 poor wording - "A very intuitive approach to derive emission ratios from the data of well correlated compounds with identical sources is the use of plots of, for example, [CH₂Br₂]/[CHBr₃] versus [CHBr₃]." 22217 LZRH is defined in the abstract only. needs to be defined in the manuscript. 22221 12 "A relatively independent variability as found for CH₂BrCl indicates specific sources for this substance." poorly written. 22233 Table 8. Abbreviations SGI and PGI should be defined (briefly) in caption.

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