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Interactive comment on “Gas phase acid, ammonia and aerosol ionic and trace element concentrations at Cape Verde during the Reactive Halogens in the Marine Boundary Layer (RHAMBLE) 2007 intensive sampling period” by R. Sander et al.

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Received and published: 9 November 2013

I would like to thank the authors for their patience during the peer review process and the reviewers for their time and efforts. The interactive discussion thus far could have benefited from more in depth comments and in consultation and agreement with the editorial board and the corresponding author, I decided to have an additional review. Dr. David Carlson, with his wonderful expertise in reviewing and experience in data

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sharing within the community, was accordingly invited to submit a prompt review. The review by Dr. David Carlson is posted below and I would urge the authors to take into consideration the very constructive points raised in the review. I look forward to the authors' response and revised manuscript.

Review by Dr. David Carlson: Received by Topical Editor on 09.11.2013

In reading this paper, and supporting both the topical editor and the reviewers, I recognised some peculiar challenges with this particular data set and data description. Therefore, with the agreement of the topical editor and the tolerance of the submitting author, I take the opportunity to intervene with some observations and suggestions which will improve the data description while also resolving some of the issues raised by the reviewers.

Sander et al. "Gas phase acid, ammonia and aerosol ionic and trace element concentrations at Cape Verde during the Reactive Halogens in the Marine Boundary Layer (RHAMBLE) 2007 intensive sampling period" - on-line as doi:10.5194/essdd-6-1-2013 - provide a small (in volume) but important subset of data collected as part of the larger RHAMBLE program, data collected more than 6 years ago. In particular they offer 'final' data on some of the more challenging chemical species - soluble, volatile and reactive compounds in both gas and particulate phases - sampled and analysed - often by highly-specialized techniques - during a 25-day intensive observation period from an island in the eastern tropical Atlantic.

I composed this introduction for myself, but also to serve as an example for the authors. Nowhere do they give us such a useful short description, of a type that might invite other users to explore these data! At the same time I applaud these authors for their persistence and effort to share these data. We can identify many other once funded now forgotten atmospheric chemistry projects that have ignored completely their data sharing responsibilities! Here, we have a good example of still-relevant quality-controlled data presented for evaluation and wide-spread use and re-use.

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For the reviewers, and even for me as a well-worn editor and reviewer, the data set needs a bit more context. These authors cite Lee et al. 2010 as the definitive overview of chemical and meteorological measurements and context of RHaMBLe (open access at doi:10.5194/acp-10-1031-2010), and, in fact use short phrases verbatim from that overview paper, but I had to read that paper carefully before I could assess this paper. Because I do not feel that we can expect all other reviewers and subsequent users to likewise read Lee et al. in depth, some broader introduction here would help? I do note that these authors employ several improvements on the Lee et al. paper, namely they revert correctly to IUPAC units and they provide much better descriptions - and pictures! - of the gas and aerosol sampling locations and technologies. Here, also, we read about potential general impact of the data on “tropospheric” halogen chemistry, whereas Lee et al. focused particularly on marine boundary layers. I hope and anticipate that this data does have wide general impact, but the authors have not made that point, at least not very effectively.

These authors provide their definitive description of sampling technologies and analytical methods, state-of-the-art then and, for the most part, now as well. And I applaud the use of Zenodo as their mechanism for distribution and permanent identification. But these authors have used an unfortunate format for the data, something called NASA Ames (*.na) format. I know this format from many years of exposure to aircraft chemistry data, but I suspect - and one of the reviewers confirms - that many users will find it unfamiliar, at best, or, in worst case, inaccessible. I know to re-label the files as .txt and then to import them into a spreadsheet (e.g. Excel, although my first effort at import did not succeed - I failed to get the data section parsed into clean columns), but again I do not think we can or should expect most users to follow this somewhat circuitous route to small (and well described!) ASCII data sets. Some minor steps and simple conversions by the authors would make a substantial improvement from the point of view of most potential users.

Finally, I recognise the approach these authors have taken, to describe - very com-

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petently - the data themselves but to avoid, for the most part, drawing scientific conclusions or engaging in scientific discussions. For ESSD, I do not disagree with their approach. I do think a short summary, of the unique aspects of the data and of their potential utility in marine or atmospheric chemistry research and modelling would improve this description for the benefit of many readers. I also wonder if some re-arrangement and re-ordering of the two data 'example' sections - one of bulleted 'conclusions', in the section now called 'Data Summary' and the second consisting of all the multi-panel data figures - might provide clarity and stronger impact for many readers? The 'conclusions' actually contain a mixture of analytical (e.g. NAA results correlate well with IC results), chemical (Al correlates with Mn) and contextual (presence or absence of enrichment factors or diel concentration patterns) information. Likewise for the figures - a mixture of concentrations, time series, enrichments or deficits, and instrument correlations (often, as for Figure 9, lacking sufficient explanation of the data as displayed). As it stands, we seem to get a series of almost random phrases and thumbnail images, only weakly connected each to the other. Pulling the conclusions and the relevant figures together into some systematic organisation - those that prove instrument performance, those that show interesting temporal patterns, those that suggest dominant chemical conditions or pathways, even, if necessary, with many fewer images, could give the present reader and future user better hints and enticements to the data?

Overall, I strongly encourage the publication of this data, for its substantial inherent value and as a good example to the larger atmospheric chemistry community. But I ask the authors to consider these three changes - a little more background and context, friendlier formats for the data files, and a refinement and revised organisation of the examples - as improvements for the present reviewers (I think they and our patient topical editor will agree) and for (many - we hope) subsequent users. I would support the topical editor in a decision to accept on the condition that the authors make these revisions.

D. Carlson

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