

The Cryosphere Discuss., referee comment RC1  
<https://doi.org/10.5194/tc-2022-139-RC1>, 2022  
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## **Comment on tc-2022-139**

Anonymous Referee #1

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Referee comment on "200-year ice core bromine reconstruction at Dome C (Antarctica): observational and modelling results" by François Burgay et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2022-139-RC1>, 2022

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Overall the manuscript contributes new and important understanding of bromine preservation and potential environmental influences at Dome C. The manuscript objectives, methodology and results are mostly clear. Minor revision suggestions below:

### **Method suggestions:**

- move equations from the results section to method section. e.g. equation 1. Discuss only results / discussion in results / discussion section.
- move the matlab function description to the method section
- move the correlation analysis methods + note the 3-yr moving average (& why this time period was chosen) used for correlation to the methods section - currently in the results / discussion and table 2.

### **Results / Discussion suggestions:**

- First sentence (line 204) is repeated from methods / add to methods.
- Suggest moving Figure S1 to main figures - its your first result that you discuss and you refer to it alot throughout your manuscript

- Line 214 / Figure 1: the recent increase / peak that you mention look similar to previous increases in Na over the record presented. Recent increase in line with past conditions? The current text is misleading suggesting that the recent abrupt Na increase are unprecedented.

Line 228 - reference needed after 400km inland

Line 260: replace regions with wavelengths?

Line 263: reference need at end of line

Line 280: add wavelengths after 340nm

Line 398: add a reference to Figure S1 (but suggest moving this to main text)

Line 401: sentence unclear. Is the 800km referring to Dome C or a different site. Suggest adding the values from the 800km from coast site for comparison.

Line 407: is the correlation seasonal / annual / inter-annual time period. 3 yr moving average mentioned in table but no reference in methods or discussion. Also recommend stating the resolution / dating error of Dome C and the temporal resolution that can be explored for correlations.

Line 410: reference for Law Dome MSA record

Line 418: can you expand on why Br and Br enrich have a different correlation result with SAM?

Line 426: suggest adding 'defined through back trajectory analysis (Figure S1)'.

**Minor revision suggestions:**

- multiple long sentences throughout the manuscript. Suggest splitting these into 2 sentences to make the message clearer. Examples start on: line 10, line 42, line 225, line 228, line 242, line 316

- abbreviations - need to be consistent with using them. Recommend only adding an acronym if you refer to it more than 5 times.

- spelling mistakes - line 194 and 195