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Interactive comment on "A glaciochemical study of 120 m ice core from Mill Island, East Antarctica" *by* Mana Inoue et al.

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Dear Dr. Isaksson,

On behalf of my co-authors, I'd like to express my thanks for your constructive comment on our article "A glaciochemical study of 120m ice core from Mill Island, East Antarctica". We were happy to receive your suggestions to improve our manuscript.

Please find below a response to each comment. We feel that the manuscript has been enhanced by incorporating these comments.

Kind Regards,

Mana Inoue

Responses to referee's comments:

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Discussion paper

1) Suggestion to combine “Results” and “Discussion” to get a better structure. Other suggestion to eliminate the many short sub-chapters and integrate the text together with the longer sections.

Thank you for the suggestion. Short sub-chapters (2.3.1, Wind direction and wind speed; 2.3.2, Sea ice concentration; 5.2.1, Possibility of analytical error in measurement or methodology; 5.2.2, Possibility of snow/firn melt; 5.2.3, Possibility of true environmental signals; 5.3.1, Wind direction and wind speed at Mill Island; 5.3.2, Relationship between sea ice concentration and sea salt; 5.3.3, Local ice shelf variability) have been eliminated. However we have decided to maintain the Results and Discussion chapters as before because we think this enhances the flow of the paper.

2) Suggestion to collect the general glaciology and meteorology information in a separate chapter. For example, the wind direction and wind speed information (chapter 5.3.1) and the local ice shelf variability (chapter 5.3.3) should be in the general introduction.

Thank you for this suggestion. All general glaciology and meteorology information including wind direction and wind speed are now given in the introduction as a table. However, we’ve chosen to keep sub-chapters, 5.3.1 and 5.3.3 in the “discussion” as they are a part of the general discussion.

3) Provide information about the ice depth and calculation of the vertical strain rates used for correction of the annual layers.

This information is now included in the aforementioned general information table in the introduction.

4) Provide accumulation record.

As above: The annual accumulation rate is now included in the general information table. The full details of the accumulation record are out of scope for this paper.

5) Could the variation in sea salt seasonality etc be related to accumulation and density

variations?

The variation in sea salt seasonality does not appear to be related to accumulation and density variations. To demonstrate this, a figure of density profile (Fig. 9) has been included in the manuscript. The density profile matches well with Law Dome density profile.

6) How does Mill Island record represent local or wider area system?

Mill Island record is strongly inflenced by local conditions rather than wider area system. A statement has been included in the manuscript.

7) Tables 2, 3, and 4 are unnecessary. Adding a table including all the glaciochmical data would be more useful.

Thank you for the suggestion. The tables 2, 3 and 4 have been removed from the main text, and are now provided as supplementary information.

8) Figures 10, 12, 13, 16, 17, 19, 20, 21, and 22 should be removed, figures 4 and 7, 5 and 6 better be combined.

Thank you for the suggestion. Figures 12, 13, 17, 19, 20, and 21 have been removed and are now given as supplementary information. However, Figures 10, 16, and 22 have been retained in the manuscript as they are important for the discussion. Figure 4 has been removed and Figures 5 and 6 have been combined.

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