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The Cryosphere Discussions
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Interactive comment on "Representativeness and seasonality of major ion records derived from NEEM firn cores" *by* G. Gfeller et al.

G. Gfeller et al.

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italic: referee 4

bold: Gfeller et al.

The authors present a detailed study of ion concentrations in an array of firn cores from around the NEEM deep ice core drilling site. I applaud the authors for their rigour and attention to detail in this very important study validating the ion data that is often used to make overarching statements about hemispheric and/or global climate. The manuscript is clear and well-written and suitable to the readership of The Cryosphere. I recommend publication in its current form with only the following small changes.

Detailed comments:

Abstract: Include the years after "modern" and "pre-industrial". e.g. pre-industrial (AD 1623-1750) p.2533, line 19 (and later in the text, e.g. p.2534, l.27).

The time range after "modern" and "pre-industrial" have been added at the first use in the abstract.

It doesn't make sense to mention H+ measurements if the technique is not described and the results are not shown. If you are going to describe the results, the technique should be described in more detail.

A reference to the used measurement technique has been added.

p.2533, line 28. To avoid confusion, you should include the drilling year when referring to S1 core ("NEEM-2008-S1" is the full name but can be shortened to "2008-S1") as other papers refer to other shallow cores from NEEM.

S1 has been changed to NEEM-2008-S1

p.2535, l.1 The standard practice is to use 3 std deviations for LODs. Do you have any reason for choosing 2 standard deviations?

LODs have been changed from 2 standard deviations to 3 standard deviations.

p.2547, l.24. The authors provide an excellent and thorough analysis of ion signals in this work, and I would appreciate it if they also extended this approach to H2O2. Even if it suffers from post-depositional remobilisation, H2O2 does have a "meaning" at depth and it is important that the glaciological community is aware of what produces the apparent seasonality of the H2O2 signal. It would be very helpful to show a figure of H2O2 seasonality at surface and at depth, when it has "locked onto" the dust signal.

Pre-industrial H2O2 has been added to figure 8.

p.2558. line 1 - Include the journal name in this reference

The reference has been changed to the data reference suggested by gcnet:

TCD
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Steffen, K., Box, J. E., and Abdalati, W.: Greenland Climate Network: GC-Net, Colbeck, S. C. Ed. CRREL 96-27 Special Report on Glaciers, Ice Sheets and Volcanoes, trib. to M. Meier, pp. 98–103, 1996.

also:

Please check the order in which tables and figures are listed - they should follow the order in which they are mentioned in the text. Please be careful to write "metres" and not "meters" when discussing distances

Done

Interactive comment on The Cryosphere Discuss., 8, 2529, 2014.