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Interactive comment on “Multi-proxy fingerprint of Heinrich event 4 in Greenland ice core records” by M. Guillevic et al.

L. Skinner (Editor)

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Dear Myriam Guillevic,

Two referees have now commented on your manuscript and have raised a number of important issues, in particular regarding the speculative nature of many of the manuscript's interpretations/conclusions.

The referees are divided on whether or not the manuscript is likely to reach an acceptable and publishable state, though my recommendation on the basis of their comments is that a fully revised manuscript should be submitted after major revisions, along with a detailed response to the reviewers' comments. This revision will then be reconsidered for acceptance and publication.

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In your revision and response i would urge you to focus particular attention on the comments of Referee 1, who I think raises some fairly robust criticisms that I suspect might only be addressed by mollifying the manuscript text to tone down its claims and to render them more clearly of a tentative or premised nature. Comments regarding the consistency of your interpretation of the proxy measurements across the paper, the suitability of MSA as a sea-ice proxy, and regarding the failure to test the claim of identification of a ‘Heinrich event signature’ in the ice cores through comparison with a non-Heinrich stadial (e.g. GS8, for which you have data), all deserve careful attention. Furthermore, I would add that the section dealing with the marine/ice-core comparison is particularly speculative; Figure 6 does not at all support the statements made in Section 3.3, and this figure certainly does not show a clear 3-phase structure to Heinrich Stadial 4 (especially one that would differ from any other D-O event in those marine cores). Curiously, there are previous studies, e.g. on the Iberian Margin, that have identified a clear 3-phase structure to HS4 (and HS5), but these are omitted from the manuscript.

In summary, I would urge you to provide a significantly revised manuscript that aims to fully address the Referee’s comments (i.e. that takes them on board), and that in particular aims to state clearly what is (robustly) observed versus what is subsequently interpreted and what is speculated. This is likely to require a significant re-organisation of the manuscript text and figures, but I do think that it could result in a publishable manuscript that presents first and foremost some interesting new data, but that also comes with some intriguing speculations that are clearly stated as such.

I look forward to receiving your revised manuscript.

Sincerely, Luke Skinner

Interactive comment on Clim. Past Discuss., 10, 1179, 2014.

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