Climate
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Discussions

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Interactive comment on "Greenland accumulation and its connection to the large-scale atmospheric circulation in ERA-Interim and paleo-climate simulations" *by* N. Merz et al.

Anonymous Referee #2

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The manuscript of Merz et al. presents an analysis of reanalysis and model data over different time periods. The aim is to link local accumulation rates on the Greenland ice sheet to large-scale atmospheric patterns in order to determine how well such patterns can be reconstructed from ice core data. This is a very interesting advance on previous work and provides a thorough analysis of all relevant factors. The paper is very well written, engaging and accessible. Some minor grammatical errors could be found (noted below), therefore I would suggest a further careful proofreading of the manuscript. I would recommend the manuscript for publication with only minor revisions.

I find the statistical methods used for the analysis to be appropriate and thorough.

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However, I think the description of the statistical analysis is rather short and some-what unclear. Please consider revising and, particularly, separating some sentences to define each concept and method clearly. Also, the phrase "pseudo accumulation records are generated" (p 3833, line 9) is confusing. As far as I finally understood, these are simply the detrended and standardized time series from the model output, but this phrase seems to imply new time series are produced (eg, from atmospheric indices).

Finally I wonder why the analysis is limited to the 3 regions originally defined in Hutterli et al. (2005). In particular, it would be very valuable to additionally see the analysis applied to a Northwest region encompassing the NEEM ice core. Would this be possible and worthwhile?

Minor comments

Page 3828, line 29: "time-scales" => "time scales"

Page 3828, line 29: "annually" => "annual"

Page 3829, Sect 2.2: The model description is generally very clear, but some model components have been used in a reduced way (ie, ocean from CCSM3, sea ice in thermodynamic mode only). Could you add some sentences discussing the effect, or lack thereof, of these model choices?

Page 3844, line 16: "patterns" => "pattern"

Page 3844, line 29: "lead" => "leads"

Page 3845, line 1: "expense rain" => "expense of rain"

Page 3850, line 18: "Both changes in" => "Changes in both"

Interactive comment on Clim. Past Discuss., 9, 3825, 2013.