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Climate of the Past Discussions

Interactive comment on "Simulating the temperature and precipitation signal in an Alpine ice core" *by* S. Brönnimann et al.

S. Brönnimann et al.

stefan.broennimann@giub.unibe.ch

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Reply to T. Laepple

Major comments

Many thanks for this review, which makes some excellent suggestions and points us to further literature.

1) We agree that the original manuscript is rather short on discussing the literature (see also reviewer #1) and we appreciate the suggestions, specifically as this is an active research field. The revised manuscript will incorporate the suggestions as well as other references.

2) Results are limited to the Grenzgletscher ice core because here we have the situation that accumulation correlates well with precipitation, but temperature does not correlate well with dO18. It is these situations that our conceptual approach may help to understand. The focus of the paper is not so much on individual ice cores, but conceptual (the results are mainly based on meteorological data). In this sense we appreciate the suggestion to produce a correlation map in Sec. 4.4 (a map based on 34 years of ERA-Interim data, assuming calendar year dating). This fits very well with the general aim of the paper and is a good addition.

As to the individual choices (wiggle matching, calibration, etc.) they are better justified in the revised paper. However, again, the goal of the paper is not to produce a new ice core record based on these choices, but to demonstrate that a very simple conceptual model may be helpful.

3) The Monte Carlo resampling is indeed unfinished. As pointed out in the paper, the sampling of 15-day window may not be the best weather generator, and again, the goal is conceptual as we do not want to reconstruct climate from the Grenzgletscher ice core. In the revised manuscript we expand the section and use a published weather generator and discuss the concept more thoroughly.

Specific comments

P6118, l.24: We add a sentence comparing c1 values with literature.

P6119, l. 6: A sentence is added.

P6120, l.17: Yes, this is true and stated several times (but elsewhere) in the manuscript; we rephrase this sentence.

P6124, l.26: There are still stationarity assumptions, but these assumptions are closer to the actual processes. Specifically, possible changes in the seasonal cycle of precipitation should have a much smaller influence now. We rephrase the sentence.

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Interactive comment on Clim. Past Discuss., 8, 6111, 2012.