**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.

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Many thanks for the review and the suggestions, which will contribute towards improving the paper.

Major comments 1) It is true that the original manuscript does not well discuss the literature. We appreciate the suggestions by this reviewer (and by reviewer T. Laepple). A more detailed discussion is helpful also because this is an active field of research with many recent publications. The revised manuscript will incorporate these suggestions as well as other additional references.

2) In the revised manuscript we will add more information on the variables neglected. In fact, the only process that is taken into account is precipitation (i.e., it's seasonal

distribution). The paper has a rather conceptual focus. We do not want to provide a comprehensive model that accounts for all processes, but demonstrate that even this one very obvious and very simple factor can destroy the correlation even in a perfect ice core with no other uncertainty whatsoever.

We will compare our results of c1 to those of the literature and thank the reviewer for the suggested literature. Summer melting does not play a significant role for d18O, as is also discussed in Mariani et al. (2013). We state this more explicitly and refer to Mariani et al. (2013).

3) We will add discussion of the amount effect.

4) In the revised paper we will improve the link to the Mariani et al. paper (and vice versa). This paper here is more conceptual (the real ice core is not in the foreground and the main results arise from the meteorological data), whereas Mariani et al. (2013) focus stronger on the actual ice cores (and on many more processes than only the seasonality of precipitation).

5) We add a statement that d18O changes can occur after the snow fall event (but note again that our focus is on the distribution of precipitation; we do not aim at incorporating more mechanisms).

6) Section 4.6. is indeed unfinished (see also reviewer T. Laepple). The goal of this part is again conceptual as we do not want to reconstruct climate from the Grenzgletscher ice core. Rather, we want to point to possible future directions, which apart from Monte Carlo techniques will include data assimilation. In the revised manuscript we will expand the section, use a published weather generator and discuss the conceptual side in more detail, however without actually applying the method.