**Climate
of the Past
Discussions**

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

Anonymous Referee #2

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Ice core record is an important way to understanding the past climatic and environmental changes. However the climatic significances of proxies in ice core should be clarified firstly. This paper simulated the temperature and precipitation signals in an ice core from Grenzgletscher, Switzerland, using a simple forward model, and found that there was a significant correlation between accumulation and precipitation over the study period (1938-1993) and there were some limitations to the use of ïĄďʹ18O for temperature reconstructions. The results acquired and the method used in the paper have made very important contributions for the Alpine ice core study and assimilating ice core data into climate models. The manuscript could be published after some revisions. The suggestions are as follows: 1) owing to that there are big differences among the number of precipitation days in the three meteorological data sets during 1980-2008, it should be analyzed that if there are differences among the monthly/seasonal

variations in precipitation days and/or precipitation amounts in the three data set, and evaluated the possible influences of the differences for the coefficient before the parameters in the forward model and thus for A-P and ïĄďʹ18O-T correlations. 2) it should be pointed out that if there is a difference between the precipitation-weighted average temperatures and annual mean temperatures, this can help us to understand if the mean temperature over the precipitation days in the year (and thus the mean ïĄďʹ18O in the year) could represent annual mean temperature. 3) adding a figure to show the variations in precipitation at the meteorological station and point out the wet and dry periods, and then analyzing the ïĄďʹ18O-T correlations during the different periods. 4) the significant levels of A-P and ïĄďʹ18O-T correlations have been stated in Table 1, these should also be stated in other parts of the text, meanwhile please note that the degree of freedom can be decreased sharply when calculating the correlations using 3yr or 5yr running average data sets.

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