

## ***Interactive comment on “NALPS: a precisely dated European climate record 120–60 ka” by R. Boch et al.***

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Received and published: 29 June 2011

Regarding the more or less synchronous behaviour of rapid climate changes in Greenland and Central Europe we added further argumentation in the text. As argued by the referee, this is a reasonable assumption given the location of the selected cave sites at the northern, Atlantic-exposed rim of the Alps, i.e. the influence of N-Atlantic air masses is dominant for both the ice core and speleothem records. In several ways our data support a close linkage and rapid transmission of Last Glacial climate changes between Greenland and Central Europe: the striking similarity of the D-O pattern, the similarity in their progression, i.e. the rapid and the more gradual proportions in the progressions of the same D-O events in Greenland and NALPS. Further, the similarity in the duration of most of the events recorded and their relative amplitudes. Another

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striking argument emerges when looking at the details recorded both in the ice and the stalagmite isotope curves, e.g. the short-lived sub-D-O warming and cooling events. The latter constitute an argument not presented before. Our data therefore strongly argue against an asynchronous or systematically different climate evolution in the two regions, i.e. we see no need to broadly discuss leads and lags or a systematic offset. Looking for a simple and coherent solution (as a paradigm in science) the observed differences in the timing of the D-O events recorded most likely originate from the different timescales, i.e. a problem that can be solved within the respective dating uncertainties of the Greenland and NALPS records. For that reason we discuss chronological issues in the first instance. The O isotope records are very similar, although regional differences exist, e.g. the occurrence of D-O 18 and 18.1. Also, the regional expression of particular events might have been different depending on regional factors, for example when looking at the magnitudes or seasonal characteristics of the rapid climate changes. Compared to most of the published, radiocarbon-dated terrestrial palaeoclimate records of the Last Glacial our U-Th-dated O isotope record provides a robust chronology and straight-forward first-order interpretation of the O isotopic signal (mainly air temperature). The large amplitudes of several per-mille during the D-O transitions, however, suggest some influence of seasonality in NALPS next to air temperature. The authors therefore consider this article as a contribution to the ongoing discussion on the degree of similarity and synchronization of past climate changes in the Northern Hemisphere during the Last Glacial period. With respect to the Greenland ice-core-based chronology of the last 120 ka we prefer the use of the GICC05 and ss09sea timescales. Both of them are widely used in the palaeoclimate community, i.e. we prefer these well known references in combination over the “GICC05modelext” timescale.

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Interactive comment on Clim. Past Discuss., 7, 1049, 2011.

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