



NALPS19: a revised Northern Alpine speleothem chronology over the interval 120–60 ka

Gina E. Moseley, Christoph Spötl, Susanne Brandstätter, Hai Cheng, Marc Luetscher, and R. Lawrence Edwards
University of Innsbruck, Institute of Geology, Innsbruck, Austria (gina.moseley@uibk.ac.at)

Speleothems from the northern rim of the European Alps (NALPS) have provided a number of important, high-resolution, precisely ^{230}Th -dated records of both orbital and millennial-scale climate variability during the last glacial and interglacial periods. The isotopic signatures of such records have helped improve fundamental understanding of the effect that changes in atmospheric and North Atlantic circulation have on European climate, whilst the robust chronologies have provided important information about the timescales upon which the climate can change in this well-populated region. Furthermore, the pattern and timing of isotopic excursions in $\delta^{18}\text{O}$ as recorded in the calcite of northern Alpine speleothems during the last glacial cycle has been shown to be synchronous within dating uncertainties with the sawtooth-pattern of changes in the $\delta^{18}\text{O}$ of Greenland ice cores (known as Dansgaard-Oeschger cycles), thus reflecting the shared North Atlantic moisture source and integrated climate system.

Here we present a revised chronology over the interval 120–60 ka. We have added an additional 5,000 $\delta^{18}\text{O}$ measurements dated by 145 precise U-Th ages to the NALPS chronology of Boch et al. (2011), and subsequently taken the most reliable and precisely dated records for the final NALPS19 chronology. Within the interval 118.3 to 63.7 ka, the record is now 90 % complete, compared to 76 % in Boch et al. (2011). Where speleothems grew synchronously, major transitional events between stadials and interstadials (and vice versa) are all in agreement within uncertainty. The NALPS19 chronology is considered with respect to other Northern Hemisphere climate records. Furthermore, we consider the controls that operated on $\delta^{18}\text{O}$ during the entire NALPS record over the interval c.120–20 ka.