



A Younger Dryas speleothem record from the northern Alps

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At the end of the last glacial period some 13 ka ago a rapid outburst of meltwater into the North Atlantic weakened the thermohaline circulation sufficiently to dramatically affect the European climate. Various archives in this region suggest a temperature anomaly of up to -7°C , but numerous questions remain with respect to the precise chronology, the temporal structure, and amplitude of the recorded proxy signals. Here, we present a biannually resolved $\delta^{18}\text{O}$ record from a speleothem from Bärenhöhle, a cave located on the northern ridge of the Alpine belt. A chronology based on 28 U-Th MC-ICPMS analyses shows that this stalagmite was deposited between 13.8 and 7.8 ka b2k. The age model suggests growth rates of ca. $100 \mu\text{ma}^{-1}$ during the Younger Dryas, whereas a significant increase to $300 \mu\text{ma}^{-1}$ is noticed after 11.5 ka b2k. Stable isotopes, measured at $200 \mu\text{m}$ increments along the stalagmite growth axis, show a marked decrease of nearly 2\textperthousand in $\delta^{18}\text{O}$ between 12.9 ± 0.1 and 11.6 ± 0.1 ka b2k in good agreement with the GICC05 ice core chronology. Preliminary interpretations point to a cooling of ca. 5.7°C and further insights in the paleoenvironmental interpretation of this record will be achieved by ongoing analyses of fluid inclusions and trace elements.