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The 8.2 ka event in the northern Alps

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The 8.2 ka event has been identified as a widespread climate excursion affecting most of the Northern Hemisphere. High-resolution records from ice cores and speleothems constrain the chronology of this event to between 8.21±0.02 and 8.08±0.03 ka BP (Vinther et al. 2006, Cheng et al. 2009). A distinctive asymmetrical pattern in d18O is consistent with modelling results suggesting rapid input of freshwater into the northern Atlantic due to catastrophic drainage of ice-marginal lakes (LeGrande et al., 2008). Despite an increasing amount of data, the regional expression of this event is still poorly understood.

Here, we present a new speleothem record from Gasselhöhle in the Northern Calcareous Alps, Austria. The 205 mm-long GAS19 stalagmite was analysed at high resolution for stable isotopes (100 μm) and trace elements ($\sim$10-15 μm; continuous LA-ICPMS profiles). Twelve individual MC-ICP-MS U/Th ages underline an annual growth rate of ca. 60 μm during the Early Holocene. The d18O averages -8.9‰ only slightly more depleted than modern carbonate precipitates from the same cave chamber. The 8.2 ka event is marked in GAS19 by a ca. 1‰ excursion with a minimum value of -9.9‰Ŀargely invariant trace element concentrations (e.g. Mg, U, Sr, Ba) indicate essentially no changes in the local hydrological regime and therefore support the hypothesis of a temperature-dominated signal.

The proximity to the lacustrine isotope record from Mondsee (eg. Lauterbach et al. 2011) opens new perspectives for the interpretation of the oxygen isotope signal using two archives at different elevations. Moreover, several coeval speleothem records are available across the Eastern Alps fostering a spatial comparison of the proxy signals associated with this event.

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