

Resolving the rapid rate of deglaciation over Termination II in speleothem records

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Records of past melting rates and triggers of deglaciation could provide fundamental constraints on ice sheet stability, but have been limited by sparse chronological control on ice sheet fluctuations prior to the most recent deglaciation. Here, we present new, high temporal resolution records of Termination I and II from geochemistry of speleothems in NW Spain. Our records from the same caves during Termination I allows calibration of speleothem carbon and oxygen isotopes to the rates of temperature change and freshening, respectively, in the North Atlantic. Because vegetation productivity in this region is temperature, rather than moisture, limited, carbon isotope records, suitably screened for degassing effects using trace element ratios, display a close similarity to other regional temperature records over the deglaciation including the structure of the Bolling Allerod and Younger Dryas events. The centennial- millennial scale variability over TII is replicated in three stalagmites from two different cave settings and illustrates an important interplay between freshening and temperature consistent with AMOC shutdown by meltwater. Our record provides a new, independent absolute chronology for the North Atlantic freshening and warming during glacial Termination II (TII).