Timing and duration of Termination IV using stable isotope records of four stalagmites from Dechencave (western Germany)

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Introduction

Four stalagmites were sampled from different excavations in Dechencave (northwest Germany) and dated to Marine Isotope Stages (MIS) 9e. MIS 9 is a very interesting interglacial due to its comparatively high concentration of greenhouse gasses (Lang & Wolff, 2011) and high temperatures (Platé et al., 1999), which are on the same level as during early industrial times (Robertson et al., 2001). Speleothem records from this time period are rare, in particular from central Europe.

Cave location

![Map of the northern part of the Rhenish Slate Mountains with indication of Bunker and Dechencave](image)

Methods

All four stalagmites were dated with the Th/U-method (MC-ICPMS Neptune, Thermo Scientific), thin sections, as well as stable carbon and oxygen isotope composition (CF-IRMS MAT 253, Thermo Finnigan) were analysed. However, this is work in progress.

Material

![Stalagmite images](image)

Dating

![Stalagmite age models](image)

Carbon and oxygen isotope composition

![Carbon and oxygen isotope composition of the four stalagmites](image)

Conclusion

- The carbon and oxygen isotope compositions of the stalagmites show in most parts the same level
- The age uncertainties varies between 1,900 to 5,100 years
- Termination IV is visible in the isotope data and corresponds within dating uncertainties
- Oxygen isotope values during Termination IV increased within 770 to 1,700 years in comparison to 12,000 years in benthic foraminifera stack record LR04
- The proxy data indicate temperature increase as well as increase in vegetation and soil activity

References