

Abstract Details

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Title: A first Last Glacial Maximum stalagmite record from southern Portugal

Content:

A newly launched research program permitted the sampling of speleothem deposits in the Algarve area (Southern Portugal). Unfortunately, this stalagmite yielded very small amounts of U (~ 20 ppb), making the setting of a U-series chronology difficult due to both the relative importance of a detrital contaminating fraction and the lack of precision on overall ^{230}Th measurements. Nevertheless, based on the top and most recent sample, we extracted a first order estimate for the $^{230}\text{Th}/^{232}\text{Th}$ ratio of the contaminating fraction and for its $^{234}\text{U}/^{232}\text{Th}$ and $^{238}\text{U}/^{232}\text{Th}$ ratios as well, assuming a secular equilibrium between ^{234}U and ^{238}U in this fraction. Thus with some caveat about impacts of climatic changes on U and Th systematics of the detrital fraction, ages of approximately 26.6 ± 1.3 , 18.0 ± 0.9 and 16.5 ± 0.9 kyr were obtained. The oldest seems to have been emplaced during a late MIS 3 - early MIS 2 intervals. The other two ages, suggest an assignment of the maximum growth period to the early deglaciation, possibly during an interval spanning the Heinrich event 1-Younger Dryas cold spells. Information about paleoclimate conditions during the two major precipitation intervals was searched using stable isotope measurements. Hendy tests were performed at three levels in the stalagmite. Accordingly, the deglacial sequence may be interpreted in relation with paleoclimate/paleovegetation conditions in the overlying environment. Oxygen isotope delta values range from -2 ‰ (vs. VPDB), at the bottom, to -3 ‰ near the top of the stalagmite. Carbon isotope values range from -9 to -7 ‰ (vs. VPDB), and suggest a recharge with a soil CO_2 composition intermediate between those of C4 and C3 plant covers. From this preliminary study, we may conclude that if more humid conditions during the isotopic stage 2 led to carbonate deposition in caves, they were not necessarily accompanied with drastically lower temperatures than at present.

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