

## A precise climatic sequencing of the penultimate glacial termination

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Based on marine and terrestrial archives, a general mechanism has been proposed for the sequence of events over terminations involving interactions between millennial and orbital scale variability and atmospheric teleconnections. In this classical view, the occurrence of an Heinrich event in the first part of the deglaciation leads to a synchronism between Northern Hemisphere cooling (Heinrich Stadial), Asian monsoon dynamics (weak monsoon interval), CO<sub>2</sub> rise and Antarctic warming, the end of the HS being associated with an abrupt recovery of monsoon activity and Antarctic temperature maximum. Here, we provide new high resolution gas records ( $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}_{\text{atm}}$ , CO<sub>2</sub>) over the strong Termination 2 on the EPICA Dome C ice core and show a highly detailed sequence of events over this deglaciation with no relative chronological uncertainties between the records. We show a clear decoupling between Antarctic temperature and CO<sub>2</sub> increases 2000 years before the end of this deglaciation. This decoupling is synchronous with a clear change in the low latitude hydrological cycle (resumption of monsoon activity), in  $\delta^{13}\text{C}$  of CO<sub>2</sub> and probably a partial recovery of the Atlantic Meridional Overturning Circulation.

## Sulfur cycling in a karstic catchment: constraints from isotopes of dissolved sulfates

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Sulfur cycling in karstic catchments in southwest China is active and has been demonstrated to be coupled with carbon cycling. Therefore, many studies have been carried out to characterize the geochemical characteristics of sulfur cycling in a karstic catchment and to understand its effects on carbon cycling. In order to understand geochemical characteristics of dissolved sulfates in diverse aquatic system of a small karstic catchment, we carried out a research on variations in sulfur isotope composition of dissolved sulfate in precipitation, streams, springs, a well, and subsurface flow in the Mulian catchment of Northern Guangxi, China. This study area with a karstic landform of typical peak clusters depression is located in 24°44' N and 108°19' E, and covers about 1.14 km<sup>2</sup>. Sixty water samples were collected for sulfur isotope analysis in the catchment in summer 2007, including rainwater, well water, spring water. Other samples were collected from and the stream waters..

The average  $\delta^{34}\text{S}$  value of SO<sub>4</sub> is -8.4‰ (n=7) in rainwater during sampling period. The one spring flowing through the clastic rocks has the highest average  $\delta^{34}\text{S}_{\text{SO}_4}$  value (-5.3‰, n=9), while the other spring flowing through the carbonate rocks has the lowest average  $\delta^{34}\text{S}_{\text{SO}_4}$  value (-9.1‰, n=2). There exists a positive correlation between  $\delta^{34}\text{S}$  value and 1/SO<sub>4</sub> for sampled seven rainwaters. The data distribution of all samples can be explained in terms of three-end member mixing. The three main sources include precipitation, the sulfate in soil, and oxidation of sulfide minerals in coal seams, which indicate that the sulfur cycling might have been coupled with carbonate weathering.

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