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LAST GLACIAL PALEOTEMPERATURE RECORD FROM SUBTROPICAL BRAZIL BASED ON STABLE ISOTOPE ANALYSIS OF FLUID INCLUSIONS IN SPELEOTHEMS

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Resumo

During the last glacial period (10,000-110,000 years ago) the Northern Hemisphere climate was punctuated by millennial-scale oscillations between relatively warm phases known as Dansgaard-Oeschger (D/O) events and dramatic temperature decreases termed Heinrich (H) events. These climatic fluctuations, identified in several paleoclimate records from both Hemispheres, were recognized to play a crucial role in driving Monsoon variability in Asia and South America. Here we present a paleotemperature record based on oxygen isotope analyses of water inclusions and carbonate from U/Th-dated stalagmites recording the last 110,000 years of Monsoon variability in subtropical Brazil. Long-term temperature fluctuations of the order of 13 to 17 ± 2 deg C are primarily associated with precessional change in insolation, whereas short-term fluctuations of the order of 9 ± 2 deg C occur in phase with D/O and H events. This observation corroborates the idea that increased ice cover in the Northern Hemisphere high latitudes during H events was associated with southward shifts of the South Atlantic Convergence Zone (SACZ) and consequent temperature rises in subtropical South America. Conversely, climate amelioration in the Northern Hemisphere high latitudes during D/O events was associated with northward shifts of the SACZ, advection of relatively cold air masses from the South Atlantic Ocean and consequent temperature decreases in subtropical South America.