



## **Mid-Holocene climate anomaly in 5.5ka B.P.: evidence from stalagmite records in central China**

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Evidence for abrupt climate change in the mid-Holocene has been reported globally. However, its pattern, intensity and the dynamics remain unclear. This study, a 9yr-resolution stalagmite from Xiniu cave, central China, established with 1119 O-C isotopes and 14 precise  $^{230}\text{Th}$  ages, reconstruct a continuous history of East Asian Summer Monsoon (EASM) intensity and soil humidity from 12.5 to 2 ka B.P.. During the mid-Holocene, our  $\delta^{18}\text{O}$  records show a gradual weakening of the EASM intensity, corresponding with a decrease in Northern Hemisphere summer insolation, supporting the idea that tropical/subtropical monsoons respond dominantly and directly to changes of insolation on orbital scale. Similar variation is absent in our  $\delta^{13}\text{C}$  records, which characterizes by three oscillations at centennial scale. Interestingly, the  $\delta^{13}\text{C}$  records exhibit a pronounced drop from  $-11.5\text{‰}$  to  $-10\text{‰}$  at around 5.5ka B.P., is synchronous with the termination of Holocene Optimum, calibrating by the abrupt analysis of  $\delta^{18}\text{O}$  records. This synchronous hints that, climate anomaly at around 5.5ka B.P. is likely resulting in a more rapid reorganization of ocean circulation and atmospheric process. By comparison with the multi-scale records, we propose this centennial scale climate anomaly may relate to the interaction of weaken solar activity, polar vortex southward moving and more active ENSO.