Supporting Information for

Greenhouse gases modulate the strength of millennial-scale subtropical rainfall, consistent with future predictions

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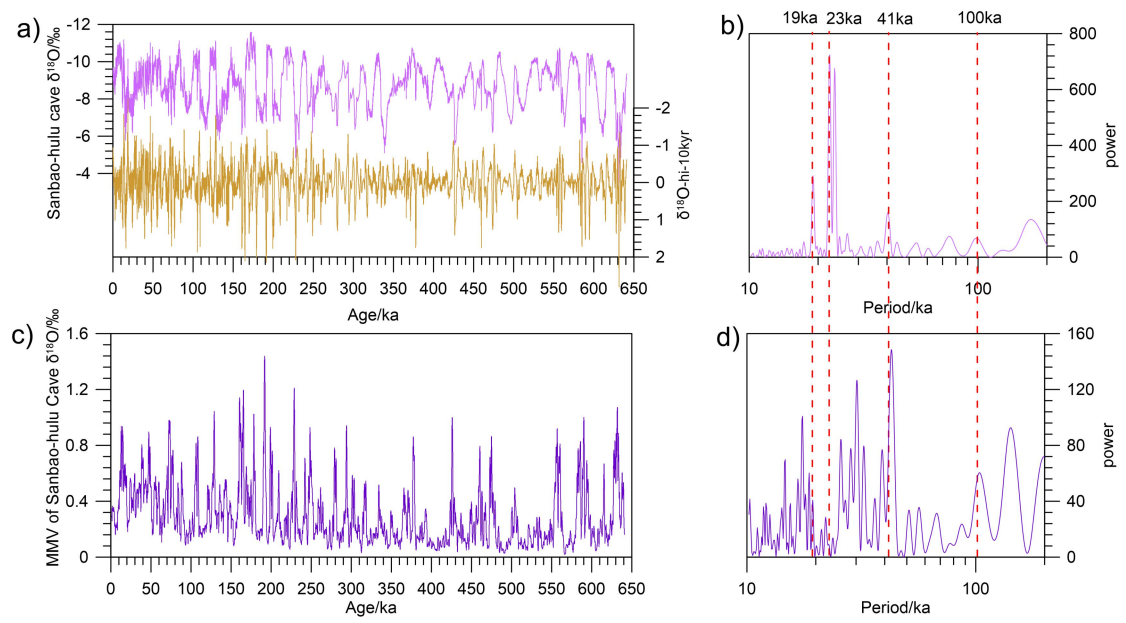
Figure S1 Raw datasets, millennial-scale components (10kyr high pass filtering signals) and MMV of the speleothem δ¹⁸O record over the past 640 ka with their corresponding spectra. The orbital bands are marked with red dashed lines (eccentricity-100 kyr, obliquity-41 kyr ,precession-23 kyr and 19 kyr).
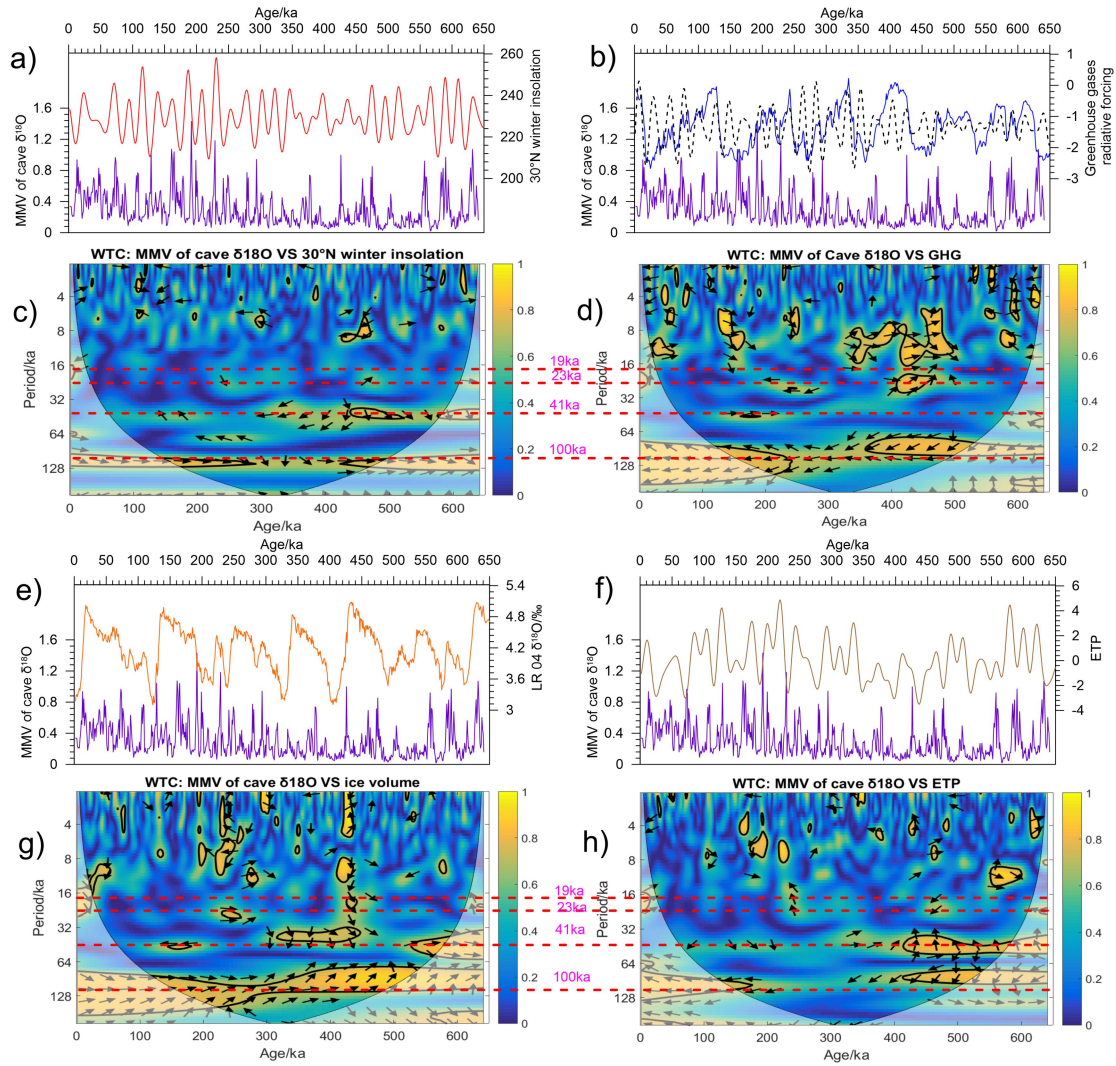
Figure S2 Comparison of a) 30°N winter insolation, b) GHG radiative forcing (black dash line donates the precession band-pass filtering results of ΔRF_{GHG}), e) ice volume and f) ETP forcing for MMV of speleothem $\delta^{18}O$; Wavelet coherence between c) 30°N winter insolation, d) GHG radiative forcing, g) ice volume, h) ETP and MMV of speleothem $\delta^{18}O$ over the past 640 ka. The orbital bands are marked with red dashed lines (eccentricity-100 kyr, obliquity-41 kyr , precession-23 kyr and 19 kyr). The black outlines denote coefficients of determination greater than 0.76. The black arrows represent the phase relationship with rightward, upward and downward arrows indicating in-phase, leading and lagging phase, respectively. Strong ice volume, GHG and winter insolation modulation at 100 kyr band, relative weak ice volume and winter insolation forcing at the 41 kyr band as well as unclear precession band modulation are observed for MMV of speleothem $\delta^{18}O$.