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Multiproxy constraints on hydroclimate and temperature during the LGM–deglacial transition in Mainland Southeast Asia

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Rapid sea-level rise and meltwater forcing during the Last Glacial Maximum–deglacial transition drove substantial hydroclimate changes in Mainland Southeast Asia, yet the magnitude of regional precipitation $\delta^{18}O$ variability and temperature change remains uncertain. A speleothem $\delta^{18}O$ record from central Vietnam exhibits pronounced variability across this interval; however this record is complicated by prior calcite precipitation (PCP), an in-cave process that can overprint precipitation $\delta^{18}O$ signal in the calcite. Here, we present new fluid inclusion $\delta^{18}O$ data from the same speleothem to independently reconstruct $\delta^{18}O$ variability. Because fluid inclusions are not affected by PCP, direct comparison between fluid inclusion $\delta^{18}O$ and calcite $\delta^{18}O$ provides an independent constraint on the precipitation $\delta^{18}O$ signal. In addition, we pair fluid inclusion temperature estimates with TEX_{86}-derived temperature reconstructions to investigate the magnitude and timing of temperature change across this interval. Together, these multiproxy data provide new constraints on hydroclimate and temperature evolution in Mainland Southeast Asia during a period of rapid climate change.