

Clim. Past Discuss., author comment AC1
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Reply on CC1

Chao-Jun Chen et al.

Author comment on "The 4.2 ka event in East Asian monsoon region, precisely reconstructed by multi-proxies of stalagmite" by Chao-Jun Chen et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2021-20-AC1>, 2021

Dear Dr. Nick Scroxton,

I'm happy to discuss it with you. Happy that we have a common interest in research. I have read your manuscript (cp-2020-138). It is also a new way to analyze the 4.2 ka event recorded by regional paleoclimate by using this Monte Carlo principal component analysis method. On the whole, our viewpoints are similar, and the data can support each other. Thank you for affirming the scientific significance of our work. This will change the understanding of 4.2 ka event in the past. Accurate calibration of the 4.2ka event in low latitudes is not only helpful to the reconstruction of the paleoclimate, but also contribute to the evolution of ancient civilization.

We think that the variation of trace elements in YK1306 is well matched with isotope (Figure 3 and Figure S1), and PC1 is significantly correlated with isotope (Table S1). The slight difference in detail is due to the different resolution of trace elements and isotopes. Please see the section of Method. In addition, the Yangkou Cave is located on the top of the Jinfo Mountain (2100-2250 m a.s.l), about 1600 m higher than the Sichuan Basin. The Jinfo Mt. is a national reservation park, there is now industry, nor much anthropic activities, and the regional vegetation is subtropical evergreen broad-leaved forest. In addition, we monitored the trace elements in rain outside Yangkou cave during the period of 2012-2016. According to our monitoring results (unpublished, in preparing now), the impact of trace elements carried by the Asian summer monsoon is negligible. According to the monitoring work of cave drip water, we think that the variation of speleothems' elements in this cave and nearby cave are all modulated by the regional hydrological conditions which closely correlated with the Asian summer monsoon (**Chao-Jun Chen, Ting-Yong Li***, 2018. *Geochemical characteristics of cave drip water respond to ENSO based on a 6-year monitoring work in Yangkou Cave, Southwest China. Journal of Hydrology*, 561: 896-907. <https://doi.org/10.1016/j.jhydrol.2018.04.061>. **Jian Zhang, Ting-Yong Li***, 2019. *Seasonal and interannual variations of hydrochemical characteristics and stable isotopic compositions of drip waters in Furong Cave, Southwest China based on 12 years' monitoring. Journal of Hydrology*, 572: 40-50. <https://doi.org/10.1016/j.jhydrol.2019.02.052>.)

We are also very willing to share the original data in NOAA, as we did in the past. While, we hope to upload the data after the acceptance for publishing of this manuscript.

Great appreciation for your comments and constructive suggestions. Any further comment will be welcome.

Thank you very much.

Dr. Chao-Jun Chen and Prof. Ting-Yong Li

(on behalf of coauthors)