

# ***Interactive comment on “Relationship between climate, environment, and anthropogenic activities in coastal North China recorded by speleothem $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ ratios in the last 1 ka” by Qing Wang et al.***

## **Anonymous Referee #1**

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The manuscript entitled "Relationship between climate, environment, and anthropogenic activities in coastal North China recorded by speleothem  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  ratios in the last 1 ka" by Wang et al. extends the previous Kaiyuan cave record (Wang et al., 2015 Marine Geology and Quaternary Geology; Wang et al., 2016 Clim. Past) from ~AD1200 further back to AD 900. While the  $\delta^{13}\text{C}$  record is new, the  $\delta^{18}\text{O}$  is essentially the same as the data published previously. The majority of the discussions/conclusions is not only tentative and/or ambiguous (see examples as listed below), but also already published in Wang et al., 2015 Marine Geology and Quaternary Geology and Wang

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et al., 2016 *Clim. Past.* As such, this manuscript is not suitable for considering publication in *Climate of the Past*.

Overall, the manuscript has no significant new contributions. Additional comments are listed below:

1. More than half of the abstract is virtually as same as those in Wang et al., 2015 *Marine Geology and Quaternary Geology*, and Wang et al., 2016 *Clim. Past.*
2. The link between the Kaiyuan record and Chinese cultural history is not convincing. For instance, if the Kaiyuan record is indeed a rainfall amount proxy on large spatial-scale in China, how about the differences with other existing records (such as Wangxiang, Heshang and Shihua records)? It really requires a detailed discussion how a record from 'the warm temperate zone (also need a definition)' can affect hydrological condition in China and thus the Chinese culture history.
3. It is necessary to give the reasoning why the 230Th age at  $\sim 45\text{mm}$  was discarded.
4. The extended portion of the record has very poor age control and the methodology is problematic (e.g., the assumption of linear-growth is too weak). Thus, the new record cannot be used to address the issues in the way that presented in the current manuscript.
5. The age uncertainties are not carefully considered throughout the manuscript when discussing relevant issues such as age comparison, and the lead/lag among climate forcings. For example, the Five Dynasties and Ten Kingdoms has a duration less than the age uncertainty of the cave record at the time, and thus their correlation in the Figure 5 needs a justification.
6. The authors interpreted the  $\delta^{13}\text{C}$  record as an indicator of the land use. Given the fact of significant correlation between the  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  data ( $r=0.46$ ,  $p<0.01$ ), what about the  $\delta^{18}\text{O}$ ? Any anthropogenic (e.g., land use) effect? The data of land use are an overall summary from Shandong Province, which are not necessary to be equivalent to or describe the local variations at the cave site.
7. The authors had published the "Hendy Test" data already. In addition, the simple test presented in the manuscript is not necessary to be a robust verification of 'sample deposition under isotopic equilibrium'.
8. The statement, "This report is the first example of a high-resolution study", is

not proper, regarding many existing records, including that in authors' last paper (Wang et al., 2016 Clim. Past). 9. The  $\delta^{18}\text{O}$  variation is causally linked to the rainfall amount effect. This requires a very careful assessment. 10. The reinterpretation of other cave records in the manuscript is problematic. For instance, the Wangxiang record is also an East Asian monsoon record, rather than a typical Westerlies record. 11. Many climate records are now available for the last millennia in the East Asian monsoon region. I suggest considering a more comprehensive comparison. The comparison with records from Turkey and Europe is ambiguous and not helpful here, unless the authors provide a mechanism to explain their correlations.

13. Almost all reported data in the manuscript have too many significant digits, which is obviously impossible. 14. The conclusion part is unusually long with many redundant contents. 15. The current manuscript is not sufficiently comprehensible, including English. 16. Some references are not very appropriate and some need to update. 17. Check the unit of U contents: ppt or ppb?

Please also note the supplement to this comment:

<https://www.clim-past-discuss.net/cp-2017-73/cp-2017-73-RC1-supplement.pdf>

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2017-73>, 2017.

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