

Duan et al. provide a new high resolution 8.2ka speleothem record spanning 9.0-7.9ka BP period in north China. They reconstructed the time series over this period using a variety of indicators, including carbon and oxygen isotopes, ratios of trace elements, and growth rate. The authors identified two drought periods of 8.4 and 8.2ka and found that the behavior of carbon and oxygen isotopes and trace elements was different, which may be responsible for the nonlinear response of the local ecosystem. They suggest that there were several centennial scale climate fluctuations around the 8.2ka event, and that two droughts-one pluvial pattern between 8.5-8.0ka were a widespread event on a global scale and were closely related to the northern high latitude. The manuscript is carefully prepared, this record is relatively rare in northern China, and the age model is accurate, the resolution is super high, after a certain amount of thought and revision this paper is recommended for publication.

General notes

1. Cheng et al.(2009) and your last paper(Duan et al.,2023) reported that the 8.2ka event had a two-stage structure, but this manuscript and Tan et al.(2020) believe that there is a two drought-one pluvial pattern at 8.2ka and 8.4ka, does this similar expression give rise to some misunderstanding? Because in some papers 8.4ka and 8.2ka together constitute the 8.2ka cold event.

2. What are the periodic changes of trace elements, oxygen isotopes and carbon isotopes? Do they have a common period and are they influenced by Solar Output, AMO, PDO or even ENSO on a short time-scale?
3. Can the $\delta^{234}\text{U}_{\text{initial}}$ attached to the dating results be used as an indicator to reflect these climatic events? Can the carbon isotope at 8.4ka be considered a wet event?
4. Carbon isotopes vary much more than oxygen isotopes, as is the case in Hulu cave. It is generally assumed that carbon isotopes are more sensitive to climate change. Why is there a nonlinear response now?

Specific notes

1. Figure 2a, this paper is based on Duan et al., 2023 (GRL) to add new data for research. Please distinguish the ages used in the previous paper and the new ages added in this paper in this figure. Figure 2f, from 9.0-8.5ka, There is a clear decreasing trend in the PC1 index of trace elements in this period, indicating that the climate is becoming wetter, which is not reflected in oxygen and carbon isotopes.
2. Figure 3, in addition to the dating error of LAO you have marked, the marking of the dating error bar of other stalagmites records is conducive to the understanding of this paper.
3. Figure s2, what are the correlation between the three trace elements, if there are calculations of the correlation, you can show their consistency.