

Interactive comment on “Speleothem oxygen record – thermal or moisture changes proxy? A case study of multiproxy record from MIS 5/MIS 6 age speleothems from Demänová Cave System” by Jacek Pawlak

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Anonymous Referee #2

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The manuscript submitted to CP by Jacek Pawlak discusses an interesting multi-proxy speleothem record from Slovakia that spans MIS6/MIS6.

The new paleoclimate data are very interesting, however, the manuscript is poorly writ-

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ten. The manuscript needs some deep re-structuring/re-writing. The English language style might benefit from a language editor.

The manuscript has a high potential for CP after being revised thoroughly.

My comments are list below: - Abstract:

1- something is missing before you start presenting the JS9 stalagmite. Please present the 'problematic', the questions that you're trying to answer, before talking about JS9.

This part has been rearranged.

Presently the region of central Europe is in transitional climate zone under influence of both oceanic and continental climate and continental climate. However, in the past, the region could be under stronger influence of the continental climate during cold glacial episodes or under stronger influence of oceanic climate during wetter interglacials. The long time speleothem records can adds new helpful data about past climate changes in the region. The multiproxy record of the JS9 stalagmite, collected in Demänová Cave System (Slovakia), represents ca. 60 ka period (143 – 83 ka).

2- please clarify what you mean by "transitional and continental climate"

The whole sentence has been rearranged

Presently the region of central Europe is in transitional climate zone under influence of both oceanic and continental climate and continental climate. However, in the past, the region could be under stronger influence of the continental climate during cold glacial episodes or under stronger influence of oceanic climate during wetter interglacials.

3- why do you have to mention "in opposition to the records from the Alps and the northern Tatra mountains" in the abstract? if it is so important, then please explain what you concluded about this difference with the Alps and Tatra..

In opposition to the records from the Alps and the northern Tatra mountains, the $\delta^{18}\text{O}$ record of JS9 has instant decrease episodes during Termination II. It shows that

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Carpathian Belt was important climatic barrier at that time.

- Introduction:

4- replace 'most suitable' with "most commonly used"

It will be corrected in revised manuscript.

5- line 30: references are missing after "nordic seas" and "Atlantic ocean".

It has been updated

The other potential sources are the Mediterranean Sea, the Black Sea, and Nordic Seas (Ionita, 2014)

6- line 40: please explain what do you mean by stating that the speleothem 18O can be influenced by PCP? and add references to the new statement as well. As far as I know, PCP influences mostly 13C and not 18O, but I might be wrong. Please check...

You are right, It affect the $\delta^{13}C$. It is a mistake and will be corrected in revised manuscript

7- between line 55 and 60: something is missing before you write "we present ca. 60...". Please state why a new speleothem record is needed before you present it.

It has been rearranged

However, in the past, the local climate could be more continental during colder and dryer glacial periods and more transitional at warmer interglacial periods. The new long time speleothem records can adds new helpful data about past climate changes in this region. We present ca. 60 ka long multiproxy record ($\delta^{18}O$, $\delta^{13}C$, Mg, Sr, Ba, Na, P, Fe, Mn, Si) of MIS-5/MIS-6 age stalagmite collected in the Demänová Cave System which is located in Slovakia.

8- before line 85: "several generations of speleothems" doesn't seem like a correct expression here.

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It has been changed to:

several stages of speleothems crystallization

- Methods:

9- write "in terms of" instead of "in a term of"

It will be corrected in revised manuscript.

10- line 95: typo "oof"

It will be corrected in revised manuscript.

11-the steps described between line 95 and 100 require some re-writing

It has been rewritten to

Due to control the efficiency of chemical procedure, at its the beginning the spike (^{233}U , ^{236}U and ^{229}Th) was added into the samples. At first step of chemical procedure, the samples were heated up for the decomposition of potential organic matter. After that the samples were dissolved in nitric acid. Finally the uranium, and the thorium were separated from the solution by chromatographic method using TRU Resin (Hellstrom, 2003).

12- line 105: "calculated by taking into account" instead of "with taking in the account"

It will be corrected in revised manuscript.

13- before line 110: "taken into account" instead of "take"

It will be corrected in revised manuscript.

14- line 110: "modified" instead of "changed"

It will be corrected in revised manuscript

15- after line 115: "minimize" instead of "minimalize"

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It will be corrected in revised manuscript

-Results:

16- line 145: "described by Frisia (2015)" instead of "in the work of"

It will be corrected in revised manuscript

17- same as before (line 150).

It will be corrected in revised manuscript

18- "the" used procedure

It will be corrected in revised manuscript

19- line 160: Hellstrom's procedure. A reference is needed here

The used procedure considers the possibility of contamination not only by ^{230}Th like in original Hellstrom's procedure (Hellstrom, 2006) but also by ^{234}U and ^{238}U (Błaszczuk et al., 2020).

20- "relatively" slow instead of relative

It will be corrected in revised manuscript

21- between lines 170 and 175, replace "since" with "from" whenever you refer to time periods.

It will be corrected in revised manuscript.

22- line 185: write "similar" instead of "like each other"

It will be corrected in revised manuscript

23- replace "at that time too" with " during the same period".

It will be corrected in revised manuscript

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24- general comment: refer to a figure whenever you need to mention information related to specific time periods.

It will be corrected in revised manuscript

- Discussion: 25- general comment: the main results of this paper are not highlighted in a sufficient way. The main conclusions and findings need to be well presented.

In the revised version of manuscript discussion is focused more on the topics like why the response on $\delta^{18}\text{O}$ to TII is different than in other records from Central Europe and possible explanations. The effect which is visible on all proxies around 100 ka and possible explanations.

26- replace "exemplary" with "for example" throughout the manuscript

It will be corrected in revised manuscript

27- replace "in opposition" with "contrariwise or on the opposite" throughout the manuscript

It will be corrected in revised manuscript

28- replace "the JS9 stalagmite" with "the stalagmite JS9" throughout the manuscript

It will be corrected in revised manuscript

29- replace "drier" with "drier" throughout the manuscript

It will be corrected in revised manuscript

- Conclusion: 30- I would rather write the conclusion in the form of a paragraph instead of bullet points.

Ionita, M., 2014 The impact of the East Atlantic/Western Russia pattern on the hydroclimatology of Europe from mid-winter to late spring. *Climate* 2: 296–309.

Please also note the supplement to this comment:

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<https://cp.copernicus.org/preprints/cp-2020-125/cp-2020-125-AC2-supplement.pdf>

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-125>, 2020.