

Editor Decision: Publish subject to minor revisions (review by editor) (16 Oct 2020) by Barbara Stenni

Comments to the Author:

Dear Dr. Bădăluță and Dr Perșoiu

I appreciated the work that you have done for restructuring the manuscript and I decided not to send the last version to another referee round. I understand from your comments that the chronology cannot be further improved. Nevertheless, the chronological uncertainties and limitations should be clearly stated in the conclusions (see my comments below). As I said in my previous comments, I think that the ice cave deposits should deserve more attention in the paleoclimate community.

Dear editor,

Thank you for the swift analyses and decision for our manuscript. We appreciate your time, patience and support during the editorial processes.

Yours,

Aurel Persoiu and Carmen Badaluta.

In my opinion there are still some minor comments to resolve before being accepted. Please, see the list below:

We have addressed all issues, please see below the point-by-point responses. The manuscript has been altered accordingly.

Although in your answer to editor and referee 2 comments about solar irradiance, you said that you are going to remove it from the text there are still several places where the solar induced changes are nominated. These are in the abstract (page line 21, page 7 line 12, 25 and 34). Please, change the sentences accordingly. I would also remove from fig 7 the record of solar irradiance by Steinhilber, as well as the reference itself. Pay attention that changing the figure 7 will necessarily need some changes in the text when referring to the single panels of the figure 7.

The text was modified to remove references to solar changes. We also removed the TSI data from figure 7 (it is now figure 6, see comments below) as well the corresponding reference.

Page 3, line 38: The sentence on “old wood effect” should be better linked/explained to the 2 sentences before..... otherwise it is not completely clear...

We rephrased the sentences to read: “As a consequence, wood with an age older than that of the newly forming ice can be incorporated in the ice block, resulting in sample ages much older than the ice layers (“old wood effect”).”

Page 4, line 20: As expected Maggi et al (2008). Please, explain better and make a link to the “old wood effect”.

We altered the sentence to make reference to the “old wood effect” and Fig. 1. In now reads: All our rejected ages are older than those of Maggi et al. (2008), and we suspect that these were based on dating old wood that was already in the cave for decades before being incorporated in the ice (see the “old wood effect” discussion above and Fig. 1c).

Page 5, line 18: may you check the distance between Ghețar and the drilling site? Here is 10 km south of the cave and at page 3 (line 22) is 15 km SE.

Corrected to 13 km.

Page 5, line 33: here I would suggest referring to a figure showing the entire record and the d18O values as well, so figure 6 or 7. In the manuscript I am still finding some difficulties in the figure sequence....

The entire paragraph was moved further down, after the discussion of the links between $\delta^{18}\text{O}$ and the instrumental record. Accordingly, we switched the order of figs. 6 and 7.

Page 6, line 3: The figure should be 3a and not 3b.

We have removed this sentence, as the number of data points is low.

Page 6, line 15: “ the last four decades ...”. The figure 4 stops at 2000 AD.
Corrected to read “and enhanced warming after AD 1980”

Page 6, lines 35-37: Please, refer to fig. 7.
Done.

Page 7, Conclusion: please add or include in a sentence the limitations in the past reconstructions due to the chronology. For example, saying at line 32, ... “Given the strong relationship” sounds too much. I would introduce here the possible limitation linked to chronological uncertainties.

We agree. We removed the word “strong” and added the following sentence: “However, we emphasize that given the ± 30 years uncertainty in the chronology, detailed studies using better constrained age models (e.g., tree ring-based proxies) are required to test this hypothesis.”

Page 15, fig. 2 caption: Please add what the two-colour envelope is meaning.
Done.

Page 17, fig. 4 caption: please add “summer (JJA)” before air temperature.
Done.

Page 20, fig. 7 caption: after removing panel a, re-arrange the caption accordingly.
Done.

Technical comments:

Page 3, line 2: change acve into cave ...
Done.

Page 3, line 19: check the English, perhaps there should be a comma before and after the words “considering also the annual layering”.
Rephrased.

Page 4, line 19: delete “it” at the beginning of the line.
Done

Page 4, line 32: add “the” before “ short-term”.
Done.

Page 5, line 8: check the English “.... a possibly” ... sounds not correct.
Corrected to “potentially suggesting a regional signal”

Page 7, line 9: add a space before “The ...”.
Done.

Page 8, line 9: change CBD to CAB.
Done

Page 8, line 15: pay attention to figure panels after removing the Steinhilber record from Fig. 7.
Done.

Page 8, line 24: three referees instead of two.
Done.

Page 13, lines 30-31: remove Steinhilber.

Done.