

## ***Interactive comment on “Ice genesis and its long-term dynamics in Scărișoara Ice Cave, Romania” by A. Perșoiu and A. Pazdur***

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Response to comments and suggestions by C. Yonge

Comment: While I can accept the modeling of the mechanisms of ice formation and ice dynamics, I have some questions in respect of the stable isotope data. Figure 3: while the trends are convincing in terms of the freezing model, Core A shows a step in the curve, which should be explained: e.g. was there loss of ice at this point and what caused it? The authors write that similar trends to the modern cores are seen during the MWP and LIA, but where is the stable isotope data? Was it published elsewhere? Perhaps a long core should be taken, in which one might observe (isotopically) a cyclical banding, reflecting summer and winter ice formation over the years. Perhaps this work is intended for the future?

C1302

Response: We do not have an explanation for the step in the stable isotope profile of core A. We did not notice any loss of ice during sampling, nor signs of melting followed by refreezing. One (speculative) explanation could be that the freezing at that particular section proceeded fast, and that each of the three analyzed segments are formed synchronously (the freezing of the lake could take between a few weeks and two months, depending on the air temperature). Stable isotope data for ice originating in the LIA and MWP has been added. Processing of a 22.5 m long core extracted from the cave is in progress and the results will be published in the near future.

Comment: Page 1910 1. ...has been remarked "on"

Response: Corrected.

Comment: 2. ...a "lack of" understanding

Response: Corrected.

Comment: 23. ...hence resurrecting...

Response: Corrected.

Comment: 24/25. ...is hampered by "the understanding the complex systematics of" ice genesis

Response: Changed to: "is hampered by the lack of understanding of the complex systematics of ice genesis"

Comment: P.1911 1. program "has" been...

Response: Corrected.

Comment: 6. ...make "it" impossible

Response: Corrected.

Comment: 22. ..with "an" ice covered...

C1303

Response: Corrected.  
Comment: 24. "an" not "a"  
Response: Corrected.  
Comment: 25. "form" not "forms"  
Response: We refer to the "field" that "forms"  
Comment: P.1912 5. "speleothems have" developed. Take out first two commas  
Response: Corrected.  
Comment: 18. ...to "be" 150-180 days...  
Response: Corrected.  
Comment: 20. ...is "a" direct consequence...  
Response: Corrected.  
Comment: P.1913 2. ... the spatial "partition".....is reflected in "the"  
Response: Corrected.  
Comment: 7. "closely follows"  
Response: Corrected.  
Comment: 17. ...Great Hall, "where"  
Response: Corrected.  
Comment: 18. "displacing"  
Response: Corrected.  
Comment: 25. "rising" not "uprising"  
Response: Corrected.

C1304

Comment: P.1914 2. ...study "has" two aims...  
Response: The sentence is redundant, and it was deleted.  
Comment: 7. The cores were cut "respectively" in...  
Response: Corrected.  
Comment: 11. Take out comma  
Response: Done.  
Comment: 13. take out "tall"  
Response: Done.  
Comment: 24. "set" not "sets"  
Response: Corrected.  
Comment: P.1916 1. "the" not "that". ...is "built up"...  
Response: the text has been changed as follows: "Observations over the past 10 years have shown that the ice block is built up by in situ freezing of water."  
Comment: 2. shouldn't in situ be italicized?  
Response: It should. But the journal's style does not allow for this (the same for e.g., i.e.).  
Comment: 6. from "top" to bottom. Is this the right sense?  
Response: Yes. The word "top" has been omitted in the initial manuscript due to a typing error.  
Comment: 13. ...melting begins, "driven by the infiltration"...  
Response: Corrected.

C1305

Comment: P.1917 2/3. PDB should not be subscripted  
Response: Corrected.  
Comment: 7. take out comma  
Response: Done.  
Comment: 10. take out first comma  
Response: Done.  
Comment: 22. take out first comma  
Response: Done.  
Comment: P.1918 9. "grow" not "grew"  
Response: Corrected.  
Comment: 11. filled the cave completely  
Response: Corrected.  
Comment: 15. ...must have evolved into the shape of a pyramid, with "a" flat...  
Response: Done.  
Comment: 25. frozen  
Response: Changed to: "would have frozen and built up as ice"  
Comment: P.1919 2. "has" not "have"  
Response: Done.  
Comment: 10. the modern "rate"  
Response: Corrected.  
Comment: 17. ...will "lead" ...

C1306

Response: Corrected.  
Comment: 24 "flow" not "flowing"  
Response: Corrected.  
Comment: P.1920 4. ...acting only...  
Response: Corrected.  
Comment: 5. take out "the"  
Response: Done.  
Comment: 10. take out "of it". It could possibly be that...  
Response: Done.  
Comment: 14. ice-forming  
Response: Corrected.  
Comment: 18 ... is being built up by...  
Response: Corrected.  
Comment: 25. "has' allowed...  
Response: Corrected  
Comment: 26. ....ice block has not been directly determined, but...  
Response: Corrected

The order and numbers of figures has been changed as follows: Fig. 5 was renamed Fig. 3 as it is the next after fig 2 to be cited in the text (following text reorganization). The depth-age model is inserted as Fig. 4. Fig. 3 became Fig. 5. Fig. 4 became Fig. 6.

C1307

The radiocarbon ages have been recalibrated using the newer OxCal 4.1 and the INT-CAL09 dataset of Reimer et al. (2009).

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Interactive comment on The Cryosphere Discuss., 4, 1909, 2010.

C1308