

Interactive comment on “First investigations of an ice core from Eisriesenwelt cave (Austria)” by B. May et al.

Anonymous Referee #1

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Review of the manuscript “First investigations of an ice core from Eisriesenwelt cave (Austria)”

submitted to The Cryosphere by B. May, C. Spötl, D. Wagenbach, Y. Dublyansky, and J. Liebl

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General Comments:

The manuscript presents a study on a 7 m ice core obtained from the Eisriesenwelt cave. Dating of the ice is attempted applying radio-isotopic techniques, possible ice formation processes are discussed, and the potential for retrieving palaeo climatic information is critically evaluated. Most of the findings are inconclusive, especially the

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radiocarbon dating and the ice stable isotope record. The interpretation of ice formation processes is rather speculative, and not really supported by in-situ data. As realistically concluded, even if dating would be possible in the future, the climatic information would most likely be limited, since the water isotope record is influenced by many factors. However, few studies have been published on cave ice. In view of the fact that utilization of cave ice as natural archive is a relatively new field, this is nevertheless a valuable contribution to assess the potential of cave ice. The manuscript is generally well written and is relevant for the journal.

Specific Comments:

The maximum age of the ice body is assumed to be related to the onset of its formation. Is there no melting at the bottom and no corresponding mass turnover? Do you consider the ice body stagnant, losing mass only by melting and sublimation at the surface?

The radiocarbon dating chapter is hard to follow and (probably therefore) inconclusive. A table with the data would help. Out of the four samples analyzed, three ranged between 65 and 76 pmC, whereas one was super modern and was considered as contaminated. The correction for the blank contribution just on the basis of the lower C mass is speculative. With this questionable quality of the radiocarbon data, giving an age and annual layer thickness estimate is not really justified.

Why does melting and refreezing result in elongated, vertical bubbles?

Technical corrections:

Figure 1: Increase font

Figure 6 and 7: Red and pink is difficult to discern.

Figure 8: Blue and black lines are difficult to discern.

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