



EGUsphere, referee comment RC1
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Comment on egusphere-2022-349

Anonymous Referee #1

Referee comment on "Mountain permafrost in the Central Pyrenees: insights from the Devaux ice cave" by Miguel Bartolomé et al., EGU sphere,
<https://doi.org/10.5194/egusphere-2022-349-RC1>, 2022

Dear Editor, Dear Authors,

The manuscript (egusphere-2022-349) presents a detailed speleoclimate monitoring in a mountain permafrost area and a unique cryomineral association. The study is principally well-written, follows a logical structure and the illustration material is of high-quality. The study provides the first report about the co-occurrence of cryogenic calcite and gypsum and the presented $\delta^{34}\text{S}$ data of cryogenic gypsum are also novel. Therefore, I strongly support the publication of the study following some minor revision.

Major comments:

The title of sub-section 3.3 needs revision. The current title is misleading. The section is not about sampling but about the methodology of the applied mineralogical and geochemical analyses. It is also quite strange that there is not any reference for the applied methods. Please consider citing the proper references in the revised manuscript. An additional related comment is that it is stated in section 4.4.2 that "*XRD analyses yielded ...gypsum, calcite, ... pyrite and goethite,*" however no evidence is presented. I suggest adding some annotated diffractograms (at least in a supplementary document) in the revised version.

Minor comments:

lines 73-78: This sentence somehow doesn't fit to the other parts of this paragraph. Please consider omitting it or moving it to another place where it fits better.

line 210: I suggest expressing the lapse rate as $5.5^{\circ}\text{C km}^{-1}$ because the current expression is confusing. It suggests 0.55°C change by 0.01 m.

line 214: Please capitalize "Midi"

line 244: Maybe "Bragg-Brentano geometry" or " $\theta/2\theta$ -mode" would be the appropriate expression.

line 290: Please explain it a bit more what is "an increase of $\sim+1.5^{\circ}\text{C}$ ". A trend value? or the difference between the mean of a certain period at the beginning and at the end of the record? or what?

line 299: Please check the dimension.

lines 321-329: I cannot see the usefulness or necessity presenting the correlation year-by-year in these lines? I suggest simplifying this part similarly to lines 334-337.

line 346: I suggest replacing "small" with "weak".

line 511: I suggest replacing the term "beginning of the Industrial Era" with "late 19th century". As far as I know the Industrial Era begun much earlier than the PMBS record.

lines 546-552: Discordancy without visible detrital layer could also indicate unconformity. A nice example can be found in Fig5 of Hercman et al., 2010 (http://www.geochronometria.pl/pdf/geo_36/Geo36_05.pdf). This type of discordancy/unconformity could be also considered in this part of the discussion.

line 554: Maybe "These" instead of "Our".

lines 574-575: I suggest omitting the bracketed comment.

lines 676-679: I think that this info could be moved forward in the section.

line 723: Please consider adding "ice mass" between the word large and loss to clarify the meaning of the sentence.

line 816: I think "Minimax Workshop" should be deleted here.

line 854: Please capitalize the name of the ice cave.

line 1034: Please correct the publication date of this paper. 2014 instead of 2013.