

Response letter – Community comment (Giacomo Medici)

Comments of reviewers in black, [author responses in blue](#)

General comments

Very good research on paleo-research with angle on the climate of the past. Please, follow my straightforward comments to improve the manuscript.

[Dear Giacomo Medici, we thank for the positive feedback to our manuscript!](#)

Specific comments

Line 14. “Natural formations”. I would use another term like “natural features”. “Formation” is a term used in lithostratigraphy with another meaning.

[In response to the comment of another reviewer, we will change the wording of the abstract, and the term “formations” is no longer used in the abstract. However, we will change the wording throughout the manuscript, where appropriate.](#)

Lines 33-35. “Reconstructing past environmental and climatic variability relies on archives that combine continuity, sensitivity to climate, and robust dating methods. Speleothems fulfil these criteria, as their layered carbonate growth can be precisely dated using U-series disequilibrium dating”. Insert two recent papers on speleothems in carbonate deposits with a paleoclimate link:

- Koltai, G., Scholger, R., Knipping, M., Wang, J., Cheng, H., Frisia, S., ... Spötl, C. 2026. Ancient speleothem giant preserved in a high-Alpine cave (Dolomites, N Italy): Rare insights into the Neogene. *Palaeogeography, Palaeoclimatology, Palaeoecology*, 113619.

- Medici, G., Marianelli, D., Cornacchia, I., Gori, F., Brandano, M. (2026). Multi-disciplinary approach to paleokarst occurrence in the Eocene–Oligocene succession of the Apulia Carbonate Platform (Salento, Italy). *Facies*, 72(2), 17.

[We thank for the suggestions and will add these where appropriate.](#)

Line 103. Clarify and describe the specific objectives of your research by using numbers (e.g., i, ii, and iii).

[Thank you for the suggestion, we will add numbers to this paragraph.](#)

Line 113. Insert more detail on the depositional paleoenvironment for all the sedimentary deposits described in this research.

[In the revised manuscript, we have expanded the description of the cave and sedimentary context in the Study site section \(2.1\), including the nature of the *kankar* red clay infill, the range from dry to muddy conditions, and the position of the sampled stalagmites relative to water bodies and flooded passages. The speleothem material is described in detail in section 2.2. Since the primary focus of our work is on U–Th systematics and age-model construction rather](#)

than on a full sedimentological reconstruction of Áaktun Kóopo' Cave, we consider this level of detail sufficient to contextualize the samples without diverting from the main scope of the study.

Line 205. "Subsamples". This terminology is unclear. I suggest a change.

Thank you for the hint, we will change to "*samples*".

Figures and tables

You might want to add images of the study site, and the specific cave.

At present, we have opted not to include additional photographs of the cave, because we do not have a consistent set of images that would be directly informative for the U–Th dating strategy or the age-model results, and arbitrary views of individual chambers could be misleading rather than helpful. The existing location map and cave plan already show the spatial setting of the sampled stalagmites and drip sites, which we consider sufficient to support the methodological focus of this manuscript.

Figure 1. Issues of graphic resolution. The coordinates are un-readable.

Figure 1. The current version of this figure is not very informative. The scope of Figure 2b is unclear.

We thank for the hint. We will revise Figure 1 to improve resolution and readability. In addition, we will remove panel b.

Figure 2a. I would add a correlation/regression equation and relative line/curve.

In Figure 2a, our goal is to illustrate the overall first-order mixing trend and the large spread in activity ratios, rather than to derive or use a specific regression for quantitative interpretation. Adding a fitted line and equation would visually dominate the panel without changing any of the subsequent analysis (which is based on local isochrons and stratigraphic constraints), and we therefore prefer to keep the figure focused on the data distribution itself.

Figure 4. I would increase the size of numbers and letters. They are difficult to read.

We appreciate this suggestion. We will increase the font size for the small labels to increase readability.

Figure 4. You might consider inserting a spatial scale for the speleothems.

To clarify the spatial scale of the speleothems relative to the depth axis, we will explicitly state in the Figure 4 caption that the speleothem scans are at the same vertical scale as the y-axis depth (dft) values.