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[ESSDD]

Interactive
comment

Interactive comment on "SISALv2: A comprehensive speleothem isotope database with multiple age-depth models" *by* Laia Comas-Bru et al.

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Dear Oliver Bothe,
Thanks for your positive comments and suggestions. Please, find our answers below.

General comments

There is one suggestion for the future of the database. I would like to invite the authors
to reconsider the general structure of the database and/or to provide a set of functions
that allow an even easier interaction with the data than is already the case. Obviously,

it is unlikely that there is a set of tools that accounts for all preferences of all potential users, and neither is it likely that there is a database structure that is intuitive even for the most inexperienced user. This suggestion originates from my struggles to access the data.

Accessing and querying any database is challenging for non-specialists but, as the reviewer acknowledges, it would be impossible to provide functions for all types of software and that addresses all the preferences that data users may have. To facilitate potential database users, we have created a set of "example queries" that are available along with the database files. While these 27 queries do not cover all potential needs of the researchers using the database, they provide a starting point. The existence of the example queries is mentioned in the README file available with the database in the data repository, but we will add text in the manuscript to make this clearer.
The structure of the database was agreed with the wider speleothem community as the most efficient way to capture the metadata and data available from speleothem records. A detailed description of the database and all its parameters is available in the paper describing the first version of the database (Atsawawaranunt et al., 2018). We will make sure that this is clear in the text. Note that it is also possible to download the individual tables comprising the database, allowing a user to reconfigure this in any format they prefer.

Minor

Suggestion: Add a list of abbreviations and technical terms. From my point of view, a database and a database paper is of interest for a community that extends beyond the specialists in a field. Therefore it might be advisable to provide a table or an appendix with definitions of technical terms and abbreviations. Otherwise, already Figure 1 may overwhelm some potential users.

In this paper, we did not define all concepts presented in the current database structure

because these are already defined in Atsawawaranunt et al., 2018. This publication is cited in the manuscript as the source to look at for a detailed description of the database (L170-172: "*The structure and contents of all tables except the new sisal_chronology table are described in detail in Atsawawaranunt et al. (2018a). Here, we focus on the new sisal_chronology table and on the changes that were made to other tables in order to accommodate this new table (See section 2.3).*").

We are unsure as to whether providing that information again in the supplementary material of this paper would make things substantially different than referring to a paper previously published in the same journal. However, we will make it clear earlier in the manuscript that all concepts that appear in the database are defined in that publication and we hope that this will address the reviewer's concern satisfactorily.

Line 16: The authors write here 294 and later 293. Obviously "cave sites" and "cave systems" may mean different things, but I would like to ask the authors to clarify.

We used cave sites and cave systems interchangeably but will change it to cave sites throughout.

Line 81: 10.5281/zenodo.3591197 is not a valid doi, i.e. the link is broken.

Thank you for spotting this. The link to the ensemble file is now working.

This occurs again at line 271.

Thank you for spotting this. This link is now working properly.

The doi in line 270 is not valid either.

Thank you for spotting this. This link is now working properly.

Finally, in section 6 (lines 273,274, 276) and in the supplementary materials there are a few dois given as links but missing the "doi.org"-part and therefore not working directly.

Thanks. We will revise the hyperlinks in the manuscript as well as in the supplementary material before submitting a revised version of this manuscript.

Line 96:"This is consistent" implies that there are differences to these previous approaches. If these differences can be summarised shortly, it may be helpful to detail them.

By "this is consistent" we mean that our approach is equivalent, in that it produces highly similar results (apart from small numerical differences we expect due to the choice of random number generator and interpolation depths as well as, for COPRA the different programming language). We will clarify this in the revised document.

Provide a script to reproduce Figure 5. I would like to suggest to provide a script that reproduces Figure 5. Parts of this are already included in the GitHubrepository for SISAL.AM, cf. the plot_sisal_overview.R script. However, the final.plot function is only partially doing this and the script does not run as it is. The reading of the input-files has two errors (that can be easily corrected).

We have updated the GitHub repository for SISAL.AM with a script to successfully produce figure 5 as requested by the reviewer: https://github.com/paleovar/SISAL.AM/ tree/master/SISAL_plot_functions

Technicalities

Some of the following technicalities are purely subjective. Some are meant to capture already at this stage some of the annotations that will come because of Copernicus' copy editing efforts.

Line 22: Please rephrase the sentence in combination with the parentheses. I am also unsure whether the tense of the verb in the parentheses is correct.

We will rephrase this sentence to: "Speleothems are a rich terrestrial palaeoclimate archive that forms from infiltrating rainwater after it percolates through the soil, epikarst, and carbonate bedrock."

Line 23: I stumbled between the first and second sentence of the paragraph as I felt

they were rather badly connected. But that is rather subjective.

We agree with this comment and we will revise these two sentences to: "Speleothems are a rich terrestrial palaeoclimate archive that forms from infiltrating rainwater after it percolates through the soil, epikarst, and carbonate bedrock. In particular, stable oxygen and carbon isotope (δ18O, δ13C) measurements made on speleothems have been widely used to reconstruct regional and local hydroclimate changes."

Line 25: Again subjectively, I felt there should already be a new paragraph here.

We agree with the reviewer and we will move the sentence starting with "The Speleothem Isotope Synthesis..." to a new paragraph.

Line 40: I assume it should read "pointed to the" instead of "pointed the".

We agree and we will apply this change.

Line 48: The authors use two different notations for COPRA; COPRA and copRa. It may be that copRa is meant only to refer to the implementation of COPRA, but that does not become clear. I invite the authors to either only use one notation or to clearly specify that copRa is COPRA for R. In this context, I also would invite the authors of copRa to make copRa publically available. Giving an official acronym to the author's COPRA implementation in R already suggests such an availability.

Indeed, copRa is the R implementation of COPRA created specifically for this paper. We will revise the text to make this clear.
As stated in the data availability section, this new copRa implementation is already publicly available at https://github.com/paleovar/SISAL.AM.

Similarly it would be nice, if the authors' updated version of StalAge could be made available. This may be already the case, then I missed the pointer. It may be that all what I am writing here is already fulfilled by Roesch (2020, https://github.com/paleovar/SISAL.AM). If that is the case then please put the link at all positions where it is relevant.

Yes, as stated in the data availability section, the modified version of StalAge is already publicly available at https://github.com/paleovar/SISAL.AM. We will add the links were appropriate in addition to the "data availability section" to make this clear.

Oh, and the link to github.com/palaeovar/SISAL.AM given by the authors does not work.

Apologies, the correct link is https://github.com/paleovar/SISAL.AM (without the "a" of palaeo). We will correct the link in the manuscript.

Line 154: The authors mention the function *pchip* but not the package. I ask them to add the package and a citation for it. There may be other instances where this is necessary.

The *pchip* function comes from the signal R package, we will add this in the reference list.
We will provide the package name and a citation for it every time that an R function is mentioned in the manuscript.

Personal communications: If I remember correctly, Copernicus' editors are asking authors to provide the year of personal communication and also full names.

We will revise this to: "(Christoph Bronk Ramsey, personal communication, 2019)."

Similarly, the copy editors/typesetting editors are going to check for completeness of citations. I think I noted some missing information, e.g., the DOI for Rehfeld and Kurths (2014). Maybe the authors want to check all citations for completeness already at this stage.

Thanks for spotting this. We will revise all DOIs and references before submitting a revised version of the manuscript.

All links: please provide last accessed dates for all URLs.

We will do.

R packages: I did not check in detail - and I do not always follow this idea myself - but I think it would be nice if the authors could not only mention the R packages they use but also provide references for each of them. It may be that they already do this. I only noted that, e.g., for rBacon there is not a direct reference given, but maybe this is already fulfilled with the references in line 124. Another example is the mentioning of Hmisc on line 99.

We will make sure that all R packages that we used are cited were appropriate and that links are always copied where relevant.

There is an R package with rBacon. We mention it in the data availability section: "rBacon package (version 2.3.9.1) is available on CRAN (https://cran.r-project.org/web/packages/rbacon/index.html)." but we will also add its citation where appropriate in the text.

We will also cite the packages of Hmisc (L99) and pchip (L154) in the manuscript.

Software in general: The last comment, obviously, also applies to all other sorts of software, e.g., github-links in the manuscript. Similarly, the authors probably should also provide references for the zenodo-dois in the manuscript.

We will double check that all links are properly working before submitting a revised version of the manuscript. We will also properly cite the zenodo-dois mentioned in the manuscript.