

Technical note: Disentangling pre- and post-depositional thermal histories in partially reset samples

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Dear Editor,

we thank you for the additional suggestions on our manuscript that helped to improve the structure and readability and to remove inconsistencies. We accepted most of the minor comments and split the description of the PaRACAS notebook from the Discussion section. Below we explain the specific changes in our replies (**A**) to the *editor comments* (**E**).

With these adjustments, we hope that the revised manuscript is now ready for publication.

Kind regards,

Birk Härtel for the co-authors

E: *Most important point: I do not think the section about PaRACAS notebook is ideally placed in the Discussion. To me, this material is more complementary to the methodology and would fit better in Section 2.*

A: We agree that this section is not actually part of the discussion. We initially placed it at the end of the discussion to build a structure that starts with the theory (section 2), shows a specific example (section 3), discusses possibilities and limitations (section 4) and then – after the reader has learned about the approach – introduces the software implementation. As we prefer not to disrupt this structure, we decided to make the PaRACAS subsection a new section (section 5) between the Discussion and Conclusions sections.

E: *The paragraph describing the other capabilities of the PaRACAS notebook (l469-474) feels somewhat out of place in the current context. I suggest either deleting this paragraph or referring the reader to the Supplement/Appendix for a more detailed description of the other capabilities of the codes.*

A: We understand that the paragraph on the additional capabilities is odd in this section. Both of the described functions briefly appear earlier in the text (L. 253 and L. 363 in the tracked-changes file). We therefore integrated these additional capabilities in the main paragraph of this section with specific references to the text and Appendices. We decided to keep, but slightly rephrase, the future plans for PaRACAS in this paragraph, as they were a specific request by reviewer #1.

E: *I also advise revising the abstract accordingly, so that it better reflects the revised structure of the manuscript.*

A: After revising the section on PaRACAS, we slightly adjusted the abstract.

E: *Typo/grammar/style suggestions: L140: The sentence “If the least-reset grain is more retentive than the average grain, eq. (2) determines too low pre-depositional model ages” does not read super well. Maybe replace by: eq. (2) determines pre-depositional model ages that are too low or by: eq. (2) underestimates the pre-depositional model ages*

A: We agree that the phrasing is not ideal and chose the second option.

E: *L250, Caption of fig 3 and fig 4: Replace “2s” by “2 sigma” or “2 σ ”*

A: We prefer to stick to 2s, which denotes an uncertainty estimate based on the measurements on a sample rather than a standard deviation of a theoretical population (see IAG guidelines, <https://www.geoanalyst.org/sigma-is-out/>).

E: *L256 and 257: To me it would read better this way: $20 \text{ to } 120 \times 10^{16} \text{ a/g}$*

A: Corrected.

E: *L374: As a non-native English speaker, I was not familiar with the meaning of “impede” before reading the manuscript. Consider replacing it with a simpler word.*

A: We rephrased this sentence as “In this case, modeling is not infeasible but may require ...”

E: *L446 and Conclusion: “Temperature-time” appears several times instead of “T–t.” Please check the manuscript for consistency and make sure the spelling is consistent throughout the final version.*

A: Yes, these must have slipped through our previous revision. We checked all appearances in the manuscript and in the Appendices again for consistency and spelling. We kept “temperature-time” in the abstract (to avoid abbreviations there), at the first appearance in the text and in each figure caption to make sure the figures remain self-contained.

E: *“Forward modelling” appears without a hyphen in most of the manuscript, except in the PaRACAS section and the Appendix, where it appears as “forward-modelling.” Please check and make sure the spelling is consistent throughout the final version.*

A: We checked the manuscript and made sure it appears as “forward modeling” without a hyphen unless used as a compound adjective (as in “forward-modeling algorithms”). We also checked the spelling for every instance.