

MS No. : gchron-2024-26

Title : The Need for Fission Track Data Transparency

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Comments to the Author:

Thank you for submitting your manuscript to GChron. The two reviewers agreed in principle on the value of the paper, but differed somewhat in their assessment. Reviewer 2 suggested a major revision mainly because of the need to reorganize the manuscript, while reviewer 1 suggested that a minor revision is more appropriate since it is a compositional issue anyway. My opinions in this point and some other comments are as follows, and I believe that this manuscript is potentially suitable for publication in the GChron journal after minor to moderate revisions.

- I agree that the 6+ points mentioned by reviewer 2 are essential elements of the FT analysis, but I do not think that points not fully addressed in this manuscript need to be included in the structure of this manuscript. It would be sufficient to first state the 6+ essential ingredients of FT analysis in the introduction part (not in abstract) and then state which of them are mainly addressed in this manuscript (e.g., in L69-73). This will give the readers an overall picture of the FT analysis procedure and where this manuscript contributes or not.
- A common point made by the two reviewers is the recommendation to define the criteria of suitable/unsuitable/borderline grains and to use more quantitative expressions in describing the characteristics of the reported FT data. This is an important point in objectively evaluating the validity of the results/interpretations in this paper. The authors responded that they have added some important values to the main text and provided new tables to address this point. Although I cannot access the revised manuscript at this stage, I hope that this point has been carefully addressed.
- Reviewer 2 pointed out that etching apatite with 5M HNO₃ at 20C for 20 seconds results in under-etching, but this seems to be beyond the scope of this manuscript. Since this etching recipe is widely used in FT labs around the world, this issue is too important to be discussed here. It is appropriate to provide further discussion in another paper with presenting sufficient data and evidence. The authors do not need to address the comments on this and similar issues.

In addition to the referees' comments, I will make some minor comments and technical corrections. Please consider these as well.

L20-21	I think this point is not clearly stated in the main text. The only mention of the zeta calibration in Chapter 4 is in L284-291, where the selection bias caused by differences between near-ideal standards and actual unknowns is mainly focused on, rather than improvements of the zeta method related to differences in uranium measurements and etching protocols.
L25	Balestrieri et al. 1999 should be 1991 (cf. L356-358)
L31-32	Hasebe et al. 2014 should be 2004 (cf. L420-421)
L37	2003a --> 2003
L278	Cogne et al. 2020 is missing from the reference list.
Table 1	It would be better to include the definition of the selection rates and validity rate in the caption. Without a clear denominator and numerator, it is difficult to understand how each number is viewed. Especially for “unsuitable grain selection rate”, it is difficult to know whether a larger or smaller number is better.
Figure 3	The graphs are arranged horizontally, but they would be easier to read if they were arranged vertically. For example, if the graphs are arranged in order from the left column, FT density for participants 1-8, FT density for participants 9-, FT length for participants 1-8, and FT length for participants 9-, the same types of graphs are arranged vertically, which makes it easier to see comparisons between participants.
Reference	Green 1981 is not cited in the main body.
Reference	There are two “Boone et al. 2023”. Distinguish between the two by adding a and b.
Whole text	Superscripts and subscripts do not seem to be reflected correctly in some terms, such as, Dpar (e.g. L30), 238U (L30), and HNO3 (e.g. L81). Please check this throughout the manuscript.