

A point-by-point response to the reviewers and handling editor

Reviewer #1

This paper is excellent as is and should be published. I commend the Authors for this fine and most important work.

Our Reply: We would like to express our gratitude to Dr. Donelick for his diligent efforts in preparing this review, which has significantly improved the final version of this manuscript.

Minor edits if possible:

Lines 16-17: Close quotation on “compromising data quality and integrity”

Lines 64, 170, 366, and Table 1: Replace 37 instances of acceptable with suitable.

Our Reply: Edited.

Reviewer #2

I have read through the authors' comments on the 1st round of reviews and gone through the Author's tracked changes revised text. I think that the authors have done a very good job of addressing the comments from the 1st round. I found numerous problems with the language usage; I have listed many suggested corrections below, but I doubt that I caught all of the problems. The co-authors are urged to go through the final version of the text.

Therefore, I think that the ms is only requires technical corrections. This will be a useful paper, particularly for teaching new trackers.

Reviewed by E. Sobel

Our Reply: We extend our gratitude to Dr. Sobel for his constructive feedback and for dedicating his time to this review.

13 show a higher percentage of selecting unsuitable grains

selected a higher percentage of unsuitable grains

if selected (not select), then next line should be changed to provided

Our Reply: Edited.

14 Less analysis experience

analytical?

Our Reply: Edited.

20 re-analysed, a global guidance

..., this will provide a global...

Our Reply: We changed the sentence.

21 for new approaches for zeta calibration

...to zeta...?

Our Reply: Edited.

28 With the precondition

of gathered from suitable grains, Six essential 'ingredients' are required for

With the prerequisite that suitable apatite crystals are available, six

Our Reply: Edited.

47 analyst-driven, although

Delete period

Our Reply: We are unsure of which period the reviewer is referring to; no change made.

60 participants has their

had

Our Reply: Edited.

62 there has been limited ability to

...been a limited...

Our Reply: Edited.

73 underestimation of the presence of overlooked defects

This is poorly phrased. underestimation of the number of defects

How can you quantify a feature that you didn't observe?

Our Reply: Sentence rephrased.

73-74 may cause the analyst

to lean toward "defect" for questionable features

Unclear - please rephrase

Our Reply: Edited.

75-6inaccurate,

thereby affecting

replace 'thereby' with 'and'

Our Reply: Edited.

108 both effects will bias ages lower.

... bias the ages towards lower values

Our Reply: Edited.

115 The typical number of grains for age measurements for igneous-type samples is ~10 (

I know that the other reviewer didn't like your citation for 20 grains. However you cite it, I don't think that many labs aim for 10 grains. 20 is indeed typical - just look at a handful of data tables.

Our Reply: We have extended the text to include sedimentary rocks, for which we found another recommendation for 20 grains.

125 a .xml file

an, not a

Our Reply: Edited.

170 and 711 add full URL

Our Reply: Edited.

172 results we repeated

results, we repeated

Our Reply: Edited.

206 Additionally, heterogeneous U distribution within the grain, judging from the distribution of spontaneous tracks, can be a complicating factor, especially if LAICPMS spot analysis is used for U determination, but also from misalignment of the spontaneous and induced track regions of interest using the EDM.

This sentence is jumbled. Judging the U distribution is more complicated in the absence of an EDM print or if the mount and print are misalignment.

Our Reply: Sentences separated, second one rewritten.

211 A confined track length is measurable as long as both ends are not exposed (Fig 1 m, n) at the surface

If an end is exposed at the surface, the track is not confined. Please rephrase.

Our Reply: Sentence rephrased.

213 delete oily. fluid, not fluids (2 fluids in 1 track is probably quite rare).

Our Reply: Edited.

230 The percentage of valid measurements is reported as the confined track length measurement validity percentage

Not a great sentence. Perhaps reported as the percentage of measured tracks/total valid tracks ? Add : see section 3.4 for details.

Our Reply: Edited.

Figure captions - especially Fig. 1 - when possible, please put panel labels - e.g., (a) before the relevant text rather than afterwards.

Our Reply: Edited.

309 312. Hmm. The 30% variation discussed here is so big because of one outlier analyst. Although zeta values may typically vary by 20%, there are also outliers.

Our Reply: We have changed the sentence to place the emphasis on whether we might be asked the zeta calibration to do too much, which is the point we were getting at.

336 based on the number of grains selected of each type

based on the number of each grain type

Our Reply: Edited.

337 total confined

track length measurements

total number of ...

Our Reply: Edited.

339 reviewer but by some analysts.

... but were measured by ...

Our Reply: Edited.

340 not specifically how well-etched they are.

not specifically by how well etched the tracks are.

Our Reply: Edited.

342 density estimates on suitable grains

... based on ... OR derived from

Our Reply: Edited.

343 density estimates on suitable

of, not on

Our Reply: Edited.

347 ~0.3 μm , well beyond the precision limit estimated by the standard error,

Please state this precision limit

Our Reply: Edited.

354 The participants didn't vary; their results did. How about

The confined length histograms indicate that both the number and the choice of tracks measured varied considerably between participants.

Our Reply: Edited.

355 measurements on suitable grains

from OR of Same comment 357

Our Reply: Edited.

356 provide

have

Our Reply: Edited.

Table 3 caption the number of grains selected of each type

the number of grains of each type selected,

Our Reply: Edited.

Table 4 caption the total confined track length measurements for each analyst

the total number of confined track length measurements for each analyst

Our Reply: Edited.

620 but number

but the number

Our Reply: Edited.

635 the track density increases by ~35%.

increased

Our Reply: Edited.

641 Excluded defect areas and tracks.

This sentence fragment is missing some words. What are the green tracks? This should be stated in the caption - ah - the missing words!

Our Reply: Edited.

649 delete 'to'

Our Reply: Edited.

651 delete 'for'. Change 'against' to 'using

Our Reply: Edited

668 perhaps you should add a reminder: "The analyst should remember that not all samples yield usable data."

Our Reply: Edited.

681 Perhaps note something like "However, it is presently unclear how such data can be modelled with the existing annealing equations.

Our Reply: We added a statement to this effect.

"668 change 'to avoid' to 'that should be avoided'

Our Reply: Edited.

690 Exposure is a poor word. Publication.

Our Reply: Edited.

691 change 'to' to 'in'

Our Reply: Edited.

693 also pathways

also presents pathways

Our Reply: Edited.

704 beginning of the fission-track dating method

fission-track dating method was first established

Our Reply: Edited.

711 Here's a question - is it possible for people to not just look at the grains in this study but also to analyze them in the same way as was done in this study? I.e. - to use this study as a teaching tool.

Our Reply: Someone could easily use this image set as a teaching tool, but since we did not design it as one, we do not necessarily want to put it forward as one.

724 We appreciate all the participants

appreciate the work (or some other word) of all of the participants.

Our Reply: Edited.

905 yes, the copy editor will fix this, but references should be in alphabetical order.

Our Reply: Edited.

Handling editor

Two reviewers confirmed that the previous review comments were adequately addressed in the revised manuscript. From a scientific point of view, I judge that the manuscript has reached a level worthy of publication in the GChron journal. The reviewers have suggested some additional corrections to the wording of the text, and I would like to ask the authors to address these technical corrections before the publication. Also, of the previous AE comments, the comment on Figure 3 was not addressed, so please consider this as well, if possible.

Our Reply: We thank the editor for the comments and handling the manuscript. The histograms in Fig 3 are arranged accordingly.