

Response to the associate editor's line-specific comments on gchron-2021-6

All replies to comments are in italics.

Technical corrections:

1. Line 14: “no established tool” to “no established software tools” to highlight this as a software contribution and distinguish it from the algorithms (also tools) used by the other practitioners and studies you cite.

Done

2. Line 112: change ‘successively’ to ‘later’.

Done

3. Figure 4 caption: “Polygons show...”

Done

4. In Figure 5, I know of no (weighted) linear regression algorithms that yields a bumpy uncertainty envelope. Please verify that the spurs in the gray region of the inset are not an artifact of plotting/export code.

We did thoroughly check this. The uncertainty envelope of a linear regression can inform either of (1) the standard error of the mean of predictions (smooth); (2) the confidence interval for the mean of predictions, at the chosen significance level alpha (smooth, probably the most common); (3) the prediction interval for future observations, at the chosen significance level alpha (bumpy). We employ the latter, more conservative and bumpy uncertainty envelope, at 1 sigma confidence. We have clarified this in the caption of Figure 5.

5. Define statistical power before using it in section 5.4 and Figure 7.

Done, please see lines 264-268 of the corrected manuscript

6. Start a new paragraph at line 273, at “If the confidence...” to distinguish the discussion of power from the discussion of ‘confidence’.

Done

7. Throughout manuscript: when grain ages and uncertainties are needed as input or used in a calculation, additionally include the word ‘uncertainties’ for clarity.

Done

8. Line 284: I believe this is correct, but please be more clear with the ‘detect such scenarios’ phrase by defining ‘detect’ and specifying which scenarios (i.e., the tested $E >$ or $< Z_{med}$ scenarios). This will help readers avoid easy misconceptions.

Done, please see lines 289-292 of the corrected manuscript.

9. Line 300: I think the term ‘plausibility’ is used appropriately (and colloquially) in lines 293 and the Figure 8 caption, but as Lukens and Riebe suggest, the term “false negative rate” should be included alongside the explanation here of how it’s calculated.

Done, please see lines 310-311 of the corrected manuscript.

10. Line 343: Spell out the words in “...equals two and five times...”, and likewise “five times” in line 344.

Done

11. Line 346: insert a comma after functions.

Done

12. Figure 10 caption: replace the numbers 2 and 5 with “two” and “five”.

Done

13. Line 372: “statistical” instead of “statical”

Done

14. Line 373: “sample size” instead of “samples size”

Done

15. Line 417: delete “by any reason”.

Done

16. Line 421: Note that the first review was signed anonymously.

Yes, but he came out at a conference shortly after the review got to me, so I thought I could include his name too.