

Associate Editor Decision: Publish subject to minor revisions (further review

by editor) (24 Feb 2021) by Richard Staff

Comments to the Author:

"Towards an improvement of OSL age uncertainties: modelling OSL ages with systematic errors, stratigraphic constraints and radiocarbon ages using the R package 'BayLum'" (gchron-2020-40) by Guérin et al. provides a well written, detailed discussion of a robust statistical approach to dealing with uncertainty in luminescence dating.

The two reviews are very thorough, and overwhelmingly positive towards the manuscript (e.g., "...this is a significant step forwards, and there are several aspects I particularly find attractive..."), and the authors' responses to the comments/suggestions of the reviewers are similarly thorough.

I therefore recommend that the paper be accepted, pending incorporation of these revisions.

I have only a couple of additional, extremely minor (wording) comments myself:

* In the first line of the Abstract, I would be inclined to spell out "OSL" upon first usage (as you already have in the first line of the Introduction). (I realise that the abbreviation is VERY well known and understood, and so do not propose that the authors also introduce it to the Title, which might be too cumbersome. Nevertheless, for the less specialist reader – who might, sadly(!), only read the Abstract – I suggest the inclusion for completeness.) **Agreed.**

* L24: I suggest insertion of "...the R package 'BayLum', [introduced/described/presented herein,] allows..." (or similar wording). **Agreed.**

* L35: change "...allowing to reproduce..." to "...allowing the reproduction of...". **Agreed.**

* Per the final suggestion on page 4, and your first response on page 5 to the comments from Reviewer 2, I would also think that you mean "with respect to thorium", rather than "respectively Th"? The same is true later in the inserted paragraph where you give, e.g., "resp. σ_{Th} " where, again, I would think that you mean "with respect to σ_{Th} "?

I replaced 'respectively Th' by 'and that of Th'. I also replaced 'resp.' everywhere.

* I understand your response to the first comment of Reviewer 2 on page 7 (of your responses). However, I personally would agree with the Reviewer that I think that it would make sense to number all equations in the manuscript, whether referred to herein or not. Part of the logic of this suggestion is that subsequent authors (including in PhD theses) may wish to refer to your work and potentially wish to cite these currently un-numbered equations.

Agreed – all equations are now numbered.

Finally, may I thank the authors, once again, for their interesting and detailed manuscript, which will provide a worthy addition to "Geochronology". I wish them well for their on-going research.

Thank you!

Non-public comments to the author:

Although I have had to categorise the decision as "minor corrections", all this means is the minor corrections that you have already noted in your responses to reviewers

Thanks once again for your very interesting manuscript.

With very best wishes,

Richard