

## ***Interactive comment on “Robust Isochron Calculation” by Roger Powell et al.***

**Roger Powell et al.**

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The manuscript was not written for a reader like reviewer 3! There is a collision between what this reviewer would like and what, e.g. reviewer 4 would like, but clearly in the original manuscript we did not meet the needs of either cohorts of readers. We accept that the manuscript should be made more approachable and we have now tried to make it so, following the suggestions of this reviewer, as well as reviewer 4.

It is disappointing that the main aim of the work was invisible to reviewer 3. This aim is spelt out in several places in the original manuscript, including the Introduction and the Discussion—that HUBER allows many more datasets to be called isochrons than classical methods do. This message is now expanded in the Introduction, as asked for by the reviewer, and as well relevant background material is added there. Also we do see now that our case can be, and now is, made more strongly. In particular, there is no

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discontinuity in calculation method with increasing excess scatter as in ISOPLOT, and the ages gained from the additional datasets that are isochrons under HUBER are more reliable than they would be if calculated with YORK. For example, for new simulations of 10,000 datasets with  $n = 10$  and scatter from 10%10N, using the approach in Appendix B, such additional datasets show that the 95% confidence limit on the ages is 3.97 to 4.03 Ma with HUBER, but 3.91 to 4.09 Ma under YORK, a significant increase in reliability with HUBER.

The idea behind `mswd` is now explained better, and what is meant by “pass”/“fail”. As far as we are aware all symbols are defined when they are first used, as is the convention, and what the reviewer calls jargon are mainly technical terms that are needed for clarity? Regardless, we hope that all the changes to the manuscript will allow readers like reviewer 3 to make progress understanding what we are suggesting.

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Interactive comment on Geochronology Discuss., <https://doi.org/10.5194/gchron-2020-4>, 2020.

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