Author's response: 'Double dating in the Middle Pleistocene: assessing the consistency and performance of the carbonate U–Th and U–Pb dating methods'

Timothy Pollard, on behalf of all co-authors

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We thank Norbert Frank for his careful reading of the manuscript and encouraging comments. We are pleased to submit a revised version of the manuscript that addresses the Reviewers' comments as discussed in our separate responses to them.

The main changes in the revised manuscript may be summarised as follows:

- We have removed the term 'double dating' from the title.
- We have re-written the abstract to make it more streamlined and precise.
- We have re-written parts of the introduction in order to improve its logical progression and provide better context for our study. We also now explicitly acknowledge that both dating methods are based on the initial part of the ^{238}U decay series, and that this limits our ability to verify their absolute accuracy in this study. We have also provided more background on our evaluation of speleothem $^{238}U/^{235}U$ values.
- We have added an extra sentence on our decision not to apply a correction for initial ^{230}Th (section 3.3).
- We have included more details on our age consistency calculations (section 4.1). This includes adding full details on age uncertainty and uncertainty correlation calculations (Appendix) for completeness.
- For consistency we now used the algebraic uncertainty propagation approach for calculating all ± 2 SE age uncertainties presented in Figure 1 and Tables 1 and 2. We also used these updated values in the collective assessment of age consistency via linear regression (section 4.1) and our assessment of average U–Pb age precision (section 4.3). This results in very minor changes to some values compared to those given in the original submission. This has no effect on any of the findings of the study.
- We have included a short section (4.4) discussing inherited $^{207}Pb/^{206}Pb$ variability in our samples.
- We have re-written the conclusion using dot points to make it clearer and avoid excessive repetition from the abstract/introduction.

We hope these changes have significantly improved readability of the manuscript.