Response to the review of C. Glotzbach. Original comment is in black, responses in red.
Richard Ketcham, 8 July 2025

I enjoyed reading your manuscript. It presents an important contribution to the community, and given that this functionality is implemented in **HeFTy**, I am confident it will be widely used in the future to enable more accurate interpretation of thermochronological data.

The technical note is well written and pitched at a level that will be understandable and useful to the intended audience from the thermochronological community.

I thank the reviewer for the endorsement.

One point I would encourage the authors to consider relates to the **automatic assignment of samples to positions along the sine-shaped topography**. While the approach is elegant, real topography is often more complex. I could foresee potential issues where samples collected from short-wavelength features (e.g., secondary peaks) might be incorrectly positioned, particularly in landscapes where the dominant wavelength is much larger. A brief discussion of this limitation or potential strategies to mitigate it would strengthen the manuscript.

Agreed. In the revised version I've added another sentence to the data entry section discussing this limitation.

Please also see my **technical comments:**

Technical corrections:

Line 47-50: A quite similar dataset was compiled by Glotzbach et al. (2015) in combination with a Fourier approach to empirically estimate the perturbation of isotherms in complex 2D-3D topographic situations. You may want to cite this work.

This is a good reference to add, but it goes better with the new text added in response to the other reviewer's comments about multiple wavelengths and their potential effects on lower-Tc systems.

Line 54-55: The choice of parameterisation would require some justification or showing a few alternative models, e.g. running until steady-state or with a different thermal conductivity. This would allow for the estimation of the uncertainty introduced by the choice of parameterisation.

One can always run more models. I'm not sure what running until steady state would contribute; as demonstrated by Fig. 4, the mid-slope-normalized offset barely evolves in time. The mid-slope normalization also accounts for differences in thermal parameters. Changes in conductivity and diffusivity are effectively equivalent to changes in geotherm and exhumation rate, respectively (via Eq. 1, 5, 6, 7), and so the large variations modeled in the latter should adequately cover the comparatively modest expected variations in the former. A sentence expressing the latter point has been added to section 3.3. I also note that Glotzbach et al. (2015) did not mention varying thermal parameters in their 142,000 models.

Line 155: This is not very clear, maybe you can also give the relative deviation and have a figure showing the difference between numerical and empirical solution, taking into account the uncertainty in c2.

Table 1 already provides the difference between numerical and empirical solutions, the latter based on both c2 and all of the other equations.

Line 211-212: Would be good to investigate under which boundary conditions the temperature difference is larger than 10°C and report this, to prevent users from stating that they can model their data without taking into account the topographic deflection effects

I've clarified that 10°C really means ±10°C, or a range of 20°C, which hopefully will grab more attention.