

## ***Interactive comment on “PERICLIMv1.0: A model deriving palaeo-air temperatures from thaw depth in past permafrost regions” by Tomáš Uxa et al.***

### **Anonymous Referee #3**

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I read and totally agree with the comments from reviewers 1 & 2. The main issue is the mismatching between the title and content. From the title, as a reader, I would like to know how we can use active layer thickness to inverse palaeo-air temperature. However, the ‘inversion’ model seems not to be able to look backward for past years, decades, or centuries. Based on previous studies about this theme, the climate signal was stored in deep permafrost thermal condition (e.g., Clow (1992), Huang et al., (2000)) while the active layer is only several meters below the ground surface, which is strongly influenced by seasonal variation. The current study is only to calculate the present (rather than palaeo-) mean annual air temperature by using active layer thickness given fixed other parameters. Furthermore, assuming  $A_a$  maybe not acceptable for reconstructing palaeo-climate.  $P$  should be 365 (or 366) rather than ranges from

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300+ to 400+(in Table 2).

Thus, the current version is not able to be published but I would be willing to suggest this work for publication once the authors will show some palaeo-climate reconstructions results using active layer thickness.

## References

Clow, G. D. (1992). The extent of temporal smearing in surface-temperature histories derived from borehole temperature measurements. *Global and Planetary Change*, 6(2-4), 81-86.

Huang, S., Pollack, H. N., & Shen, P. Y. (2000). Temperature trends over the past five centuries reconstructed from borehole temperatures. *Nature*, 403(6771), 756-758.

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Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2020-5>, 2020.

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