

The Cryosphere Discuss., author comment AC2 https://doi.org/10.5194/tc-2021-191-AC2, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

## **Reply on RC2**

Yi Zhao et al.

Author comment on "Convective heat transfer of spring meltwater accelerates active layer phase change in Tibet permafrost areas" by Yi Zhao et al., The Cryosphere Discuss., https://doi.org/10.5194/tc-2021-191-AC2, 2021

Dear Reviewer #2,

We would like to thank you for these valuable comments and suggestions. We have thoroughly reviewed all the comments and revised the manuscript accordingly. In particular, we addressed the following points:

(1) Reorganized and improved the Introduction and Discussion sections.

(2) Added a model uncertainty analysis experiment, by which parameter sensitivity was performed and model uncertainty in simulating soil moisture were measured.

(3) Analyzed the role of snowmelt on the convective heat transfer and discussed it in a specialized section in the revised manuscript.

We also conducted an additional experiment at another site, QT08, to further verify our findings obtained from the TGL site at your request. Since hourly meteorological data are not available for this site, we used a gridded meteorological forcing dataset instead to drive the model. Although the results at the QT08 site are not perfect, they can reproduce what we observed at the TGL site. Due to data limitation, we don't want to include them in the manuscript, but show you here for your information.

We have included a supplementary response letter explaining what we have modified in response to each of your comments. Please refer to that for all details.

Thank you for your time and consideration.

Sincerely,

Yi Zhao, on behalf of the authors

Please also note the supplement to this comment: <u>https://tc.copernicus.org/preprints/tc-2021-191/tc-2021-191-AC2-supplement.pdf</u>