Authors reply to the comments by Editor Dr. Kirsten Elger and Dr. Jan Beutel

of the manuscript essd-2020-106

"An integrated observation dataset of the hydrological-thermal deformation in permafrost slopes and engineering infrastructure in the Qinghai-Tibet Engineering Corridor"

by Lihui Luo et al.

We thank Editor Dr. Kirsten Elger and Dr. Jan Beutel for valuable feedback, which helped us improve the manuscript and data quality. Please find below the Referee comments in black, Author responses in green, and Changes to the manuscript in blue.

Response to Editor's comment:

Comments to the Author:

Dear Lihui Luo and co-authors,

please address the new review report from 8 June 2021. It mostly addresses the some inconsistencies between the data and their description.

In addition, please cite the data from the Xidatan station that you have retrieved from the National Tibetan Plateau Data Center (https://doi.org/10.11888/Meteoro.tpdc.270084). For this, I suggest to change the following sentence (line 149/150 in the track change mode version) from "Their data can be combined with the data obtained from the Xidatan field station to analyze the spatiotemporal dynamics of the permafrost slopes in the corridor"

to

"Their data can be combined with the data obtained from the Xidatan field station (Zhao, 2018) to analyze the spatiotemporal dynamics of the permafrost slopes in the corridor"

and add the following reference in the "references" section:

ZHAO Lin. Meteorological Datasets of Xidatan station (XDT) on the Tibetan Plateau in 2014-2018. National Tibetan Plateau Data Center. https://doi.org/10.11888/Meteoro.tpdc.270084, 2018.

Many thanks and best regards

Kirsten Elger

Response: Thank you for the insightful comments. We have cited the data and added the reference accordingly.

Response to Referee's comment:

Dear authors,

the last revision is greatly improved w.r.t. consistency and completeness. It is commendable that you also took the time to update some of the data up to the year 2020 (in part). However again here, consistency is key and consistency across the four data/code packages as well as the paper supplement you supply is not given. There are a few discrepancies left that you should/may address in order to facilitate re-use of this dataset:

- The README files given should be synchronized. The new README file in the supplement is different to the one in R-code/TLS data. Filenames, listings, license.

Response: Thank you for the positive and valuable feedback. As you recommended, we kept a README file with complete details and put the README file into each dataset. In addition, in the first TLS experiment, we also used Nikon D-series digital cameras to uninterruptedly photograph slope A along the Qinghai-Tibet Highway and finally generated point cloud data. This data has previously been put into the TLS data set, and we have added this information in the README file. Meanwhile, we have standardized the file names in the TLS data.

- The data files in the R-Code https://zenodo.org/record/4686141 are not in agreement with the data files in https://zenodo.org/record/4879639. Not concerning the data duration and especially not concerning the format. Therefore it is unclear to me which data is which? And what benefit the R-code really brings, apart from generating your two figures for the paper. It is certainly not a show killer, but it requires some manual checking by everyone that wants to build on your paper/data.

Response: Sorry for not updating the data in the R code, this time we put the latest data into the R code. The function of the R code is to calculate the two permafrost indices, MAAT and MAGST, in which the changes of the indices are closely related to the hydrological-thermal deformation of permafrost slopes. The variable name in the R

code is consistent with the variable name in the meteorological data. Only when users use their own data to calculate the permafrost indices, they need to change the variable name in the R code. In addition, we added an explanation in the R code.

- w.r.t. figure 2 my gap filling comment earlier was specifically geared at the one year+ gap on the wind data for 2014-2016. Here the green line should really removed as the wind speed is not deviating that much. Also it is a pity you supply data up to recently (2020) but do not show this data in one of the plots.

Response: Thank you for reminding us to pay attention to this problem again. We removed the green lines. As recommended, we have redrawn Figure H1 so that the data in the figure is updated to 2020. Meanwhile, we updated the R code and corresponding data.

- The data files in https://zenodo.org/record/4879639 have different formats. While the data in the .CSV is explained in detail (README, tables, columns, quality control, corrections) Meteo_00000_Xidatan_2014-2019.xlsx and GT_00000_Slopes_2014-2019.xlsx are not explained. Specifically, if these files are not quality controlled/checked this should be specifically mentioned.

Response: We converted Meteo_00000_Xidatan_2014-2019.xlsx to Meteo_XDTMS_Xidatan_2014-2018.csv. Another sheet of this file contains the description information of the data, and this station has an internal ID (XDTMS) and it is mentioned in Table 1. We added the data description of the Xidatan and Slope in REAME.md file. Regarding quality control, we have added the following sentence:

However, the meteorological data of Xidatan field station and the ground data of the study area are manually sorted and verified, and no standardized quality control is adopted.

- the xidatan Meteo data already has a DOI citation 10.11888/Meteoro.tpdc.270084. this one should be specified in full as it allows the reader to obtain regular updates

autonomously.

Response: Thank you for the insightful comments. We have cited the data and added the reference accordingly.

- It is great that your UAV/RBG/TIR data now works.

Response: Thank you for the positive and valuable feedback.