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Interactive comment on "An integrated observation dataset of the hydrological-thermal-deformation dynamics in the permafrost slopes and engineering infrastructure in the Qinghai-Tibet Engineering Corridor" *by* Lihui Luo et al.

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Dear authors,

This paper gives an overview of measurement data derived from permafrost study sites in the Kunlun Mountain Pass area of the Qinghai-Tibet Plateau, China. The paper describes the locality with focus on the collocated engineered structures of the Qinghai-Tibet highway, railway and power lines. The paper is a companion to data and

processing code published on zenodo.org (Meteo/ground measurements, TLS, UAV images). This paper supersedes further publications by the authors that are based in part of this data.

It is highly appreciated that the authors take the extra effort to collate and describe multiple datasets into one common format and data publication. However, in the present form, the paper is incomplete w.r.t. to a number of details, the metadata describing the data as well as the processing code provided. Two datasets mentioned (Xidatan weather, ground observations, sentinel InSAR data) are not provided. Apart from textual issues I will elaborate below and in the attached commented manuscript pdf file the main issue is that I was not able to run the code in conjunction with the datasets provided. Furthermore some references are missing/misleading. Some of the figures in this paper have already appeared elsewhere (other papers by the authors). Therefore they should be clearly marked as references.

Specific comments:

You are using the term "hydrological-thermal deformation dynamics" and "hydrological-thermal deformation" interchangeably. I understand the first term with dynamics, but am not sure the second is correct. What exactly is a hydrological deformation? I understand thermal deformation (contracting/expansion of a material under thermal stress) and I think I know what you want to say. I would rather talk about permafrost or ground dynamics or ground deformation in the context of landslides or precursory patterns rather than combining process origin (thermal/hydrological) with the observed effect (deformation) in one long term.

Much of your intro argumentation centers around the impact of engineering structures (man made interference through the immediate built environment) on permafrost in QTP and resulting hazards. While this is clearly an important issue a number of references given do not relate to this or should be explained in a different context (see annotations). Also in your data description it is not clear what data are influenced by

engineering (and possibly how much) and what data are not influenced by QTH/QTR etc.

The data should be described concisely with correct metadata. Your data packages and references to the data in the paper do not match, file/directory naming is not explanatory. Please provide a global inventory of the data provided and exact file descriptors. Also it seems your dataset covers data from 1955-2020 (in some parts) but your paper mentions the period 2014-2019. Please clarify. Most importantly the files for ground observations are missing!

You are using a time-domain reflectometer (TDR) probe (model CS615-L, Campbell Scientific) for assessing the soil volumetric content. The probe is specified by the vendor (followup product CS616) for operation in 0-70C only. However you present data in figure 4 down to -16C. https://www.campbellsci.com/cs616-reflectometer Operating Temperature Range $0°$ to $+70°C$

Furthermore âẮ Or, Dani, and Jon M Wraith. 1999. "Temperature Effects on Soil Bulk Dielectric Permittivity Measured by Time Domain Reflectometry: A Physical Model." Water Resources Research 35 (2): 371–83. https://doi.org/10.1029/1998WR900008. âẮ Overduin, Pier & Yoshikawa, Kenji & Kane, D. & Harden, J.. (2005). Comparing electronic probes for volumetric water content of low-density feathermoss. Sensor Review. 25. 215-221. 10.1108/02602280510606507.

detail that it is not at all straightforward to measure these quantities in the frozen state. Therefore I suggest to (1) remove moisture data below T=0C or (2) at least mention that this data must be treated with utmost care as it is outside the spec of the instrument you are using.

Figure 4 should be labeled correctly.

You mention: "This study analyzes the thermal impact of engineering operations 240 on permafrost slopes. The results show that the QTH has the greatest thermal impact on

permafrost slopes, followed by the QTR and finally the power/communication towers."
I can see one figure. But where is the analysis, how is it performed and what is the
quantitative outcome?

The R code provided cannot be used. Please provide comments/readme and explain
the filenames used/origin of the input files. E.g. this file referenced in the code is not
available: xdt <- read.csv("PLOT/XDTMS2014-2018_PLOT.csv", header = TRUE)

Please also note the supplement to this comment:
https://essd.copernicus.org/preprints/essd-2020-106/essd-2020-106-RC1-
supplement.pdf

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Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2020-106,
2020.