

Comment on **essd-2021-429**

Anonymous Referee #2

Referee comment on "Permafrost, active layer, and meteorological data (2010–2020) at the Mahan Mountain relict permafrost site of northeastern Qinghai–Tibet Plateau" by Tonghua Wu et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-429-RC2>, 2022

As a staff focusing on model development and application on frozen ground and cold region hydrology, I have read this manuscript with great interest. Permafrost is an indicator of climate change. The response of permafrost to climate change is one of the critical issues in cryospheric science. The 10-year record of permafrost, active layer and meteorological data presented by Tonghua Wu et al. from a relict permafrost site of Mahan Mountain in the northeast of Qinghai-Tibet Plateau is a valuable dataset for permafrost and climate research community, especially important for model development and validation. This is a clearly written paper and the overall structure of the manuscript is well organized. In my opinion, this manuscript and dataset are an important contribution to permafrost science. Therefore I recommend that the manuscript to be accepted after some minor revisions. And I also look forward to an open access for this dataset as soon as possible after protection period.

Here are my major comments:

- 1 I strongly suggest to add more detailed temporal variations analysis for active layer hydro-thermal condition and permafrost temperature, particularly for ALT; in addition, the comparison analysis with other permafrost regions is suggested to add.
- 2 In the introduction section, the authors need to state the particularity of the relict permafrost site at this site, including why permafrost could be relict here.
- 3 In Figure 5, some low-values of soil moisture occurred in the depth of 40-80cm, and some high-values occurred near 100cm or so, what's the reason?
- 4 In Figure 7, I suggest to add data sources of topographic base in Figure 1a, and to add unit for DEM in Figure 1b.
- 5 The language should be polished by English-native-speakers before its acceptance for publication.