

Rev. 1 (Lutz S.)

*Thanks for your review. Overall, we deeply appreciate your high score the paper in term of East Siberia permafrost knowledge value. Hope it will useful for permafrost community. Please find below our comments (in italic) to your advice.*

### **1) Originality (novelty)**

The manuscript to be reviewed here contains important results that have scarcely been published in this form from the region of the East Siberian Mountains. The manuscript fits very well into the concept of the journal TC.

*We expect the paper may be useful for the enhancement of permafrost research in the region.*

### **2) Scientific quality (rigour)**

Yes, the goal of the paper is clearly expressed in the introduction.

The note in the introduction to taliks " Thaw zones (taliks) in cold climate conditions with MAAT down to  $-12^{\circ}\text{C}$  is extremely rare (Walvoord and Kurylyk, 2016)." is not sufficient in my view. And large parts of the Arctic have a MAAT of  $-12^{\circ}\text{C}$  (see attached figure "Annual\_Average\_Temperature\_Map")

*Sorry for that miscommunication. The correct sentence has listed below.*

*Change to "In a cold climate with MAAT down to  $-12^{\circ}\text{C}$ , taliks are almost certain to be avoided"*

The measurement methods in the two boreholes and those of the air and ground temperature correspond to the modern and usual methods with regard to the measuring devices and sensor distances. Unfortunately, there is no more detailed information on the types of drilling equipment.

*We suppose that the drilling process and drilling equipment is not so important in this regard. The boreholes have a equilibrium/nature temperature regime. The drilling process has no more relief on the temperature of freeze and thaw ground.*

In some places, locations of relevant sites ("Pole of Cold Oymyakon and Verkhoyansk" and "the closest weather station") could be better identified through coordinates or WMO identifications.

*Updated. Line 20-21; Line 58-59;*

### **3) Significance (impact)**

Such measuring points in the poorly accessible permafrost regions in the mountains are of great importance. The practical application for the permafrost regions also concerns the correlations with increased precipitation and its effects on permafrost.

*Unfortunately, the site of long-term monitoring is quite far away from the weather station. For mountainous terrain the redistribution of precipitation can be such significant, which does not allow us to estimate the influence of this factor.*

#### **4) Presentation quality**

The results and conclusions as well as the figures and the table are very well presented. As a non-native speaker, I cannot say much about the appropriate use of the English language. I can state that the quality of the manuscript has been substantially enhanced by the inclusion of the editor's notes. A review by a native speaker would certainly be beneficial, though perhaps difficult at the moment.

*Thank you for the suggestion. The language has been polished according to journal requirements and editor comments. We suppose the article will be able to understand for everyone.*

#### **Rev. 2 (Unknown)**

Comments on egusphere-2023-49:

Brief communication: Alternation of thaw zones and deep permafrost in the cold climate conditions of the East Siberian Mountains, Suntar-Khayata Range

Robert Sysolyatin, Sergei Serikov, Anatoly Kirillin, Andrey Litovko and Maxim Sivtsev

*We thank you for your time and effort in providing helpful and constructive feedback on our work. We agree with most of your suggestions and has revised the manuscript accordingly. Please see the attached document for our comments (in italic).*

#### **1) Originality (novelty)**

This paper presents some important new ground temperature data in different boreholes in the Suntar-Khayata Range in Eastern Siberia. This data is important to the overall collection of new ground data in permafrost environments at different places in the polar and mountain areas. The paper discusses the temperature evolution with time, some special floodplain talik formations and the impact of heavy rainfall on the ground thermal regime in connection with the slope stability.

*Thank you for the review. In general, you have correctly pointed out the purpose of the article. However, more thorough research will help to better understand the interaction of permafrost, temperatures, and geomorphology processes in the region.*

#### **2) Scientific quality (rigour)**

In this sense, the data should be published. However, the paper is currently not ready to be published as the authors have to remarkably improve the readability of the paper. An example, see text in the paper lines 84 to 93. This information would be better readable in the format of a table. Overall, the English language has to be improved, often sentences are not concise and clear.

*We have carefully checked the English language, the style of the publication corresponds to recent publications, specifically on geothermal topics. Regarding the text on lines 84-93, we are of opinion that the information on logger systems has been published many times and the details of its implementation are more important for the reader. We have tried to make this clear.*

### 3) Significance (impact)

The paper contains important information about the ground thermal regime measured in a region where not so much data is available. This study site should be further developed in research and should be continuously monitored in the future.

*I am appreciative that you share our point of view. Permafrost research cannot be limited to local areas. Such a vast area as the mountains of eastern Siberia cannot be ignored. We hope that this article will highlighting the attention of researchers to this region.*

### 4) Presentation quality

Line 18-19: As an example, please improve the English language in your paper. I try to give an example, but I am also not native English speaking: sentence in the paper: The East Siberian Mountains is one of the largest territory of east Siberia, but at the same time is researching how frontier permafrost region. Maybe change the sentence to: *The East Siberian Mountains encompass a vast area in eastern Siberia, which is still one of the least studied alpine permafrost environments in the world.*

*Within the context of this article, we would not like to discuss the differences between mountain and alpine permafrost. Especially since there are a number of areas with a very low degree of study besides eastern Siberia. In our opinion, the English language corresponds to the style of publications in Q1 journals and will be understandable for permafrost researchers.*

Line 24: introduce a comma: *(Osterkammp and Gosnik, 1991), which ...*

Line 33: Please directly use the word talik as it is a common word in permafrost research. *Taliks in cold climate conditions ...*

Line 56: delete point: *(Lytkin and Galanin, 2016) and boulders ...*

Line 65: correct word: *monitoring*

Line 73: correct word: *Organic material ...*

Line 84-93: Format these text within a table.

Lien 132: Please change the sentence to: *According to Balobaev et al. (1985) the Suntar-Khayat Range ...*

Line 133: delete comma: *geothermal heat flux up to 0.08-0.10 Wm<sup>-2</sup> usually concentrating ...*

Line 156: insert space character: *... 5°C (Gisnås et al. 2014) ...*

Line 164: why is this (i) introduced here if you have no additional items?

*All the above technical comments were taken into account and modified as suggested in the new version of the manuscript.*

Supplement: Maxar Images are very dark, and the reader cannot recognize any changes on the given images in the supplement.

*Corrected. If the editor agrees, we are willing to put this picture in the main manuscript.*