P1L9: To monitor the influence of climate change long-term monitoring is necessary which is only applied by PERMOS using geophysics. Please rephrase.

A: We will rephrase to state that geophysical methods are widely used to monitor permafrost dynamics whereas a long-term monitoring required to assess the influence of climate change is only applied by PERMOS.

P1L15: Active layer is the area that seasonally thaws. Is there any study that monitors active layer variations throughout the year? Technically, RST is used to monitor annual variations of active layer thaw.

A: We thank the referee for this remark and will use 'annual' instead of 'seasonal' in the revised manuscript.

P1L26: Maybe "layers" is the better term from a permafrost point of view.

A: We agree with the referee and intend to substitute 'units' with 'layers'.

P2L6: You cannot prevent geohazards such as rockfalls but you can "mitigate" the consequences.

A: We will rephrase accordingly in the revised manuscript.

P2L7: Floods is too general. Better use Glaciel lake Outburst Floods (GLOFs).

A: In the revised manuscript we will use the more precise term provided by the referee.

P2L15: Please cite Alpine not Arctic Litereature. Boreholes are much easier to drill and more common in Arctic terrain.

A: References to Arctic literature will be removed.

P2L23f: Can you rephrase it and avoid the brackets to increase the reading flow?

A: we appreciate the remark regarding the reading flow and rephrased the sentence.
"Methods sensitive to the electrical properties are the most popular for permafrost investigations due to the strong contrast in the electrical resistivity corresponding to the highly resistive lithological media, the highly conductive liquid water and the electrical insulator ice."

P2L25f: A lot of references. You can delete the references of Arctic studies. Do not focus on Austrian ones. You should cite more classical and pioneer studies such as:

Hauck, C. and D. Vonder Mühll (2003). "Evaluation of geophysical techniques for application in mountain permafrost studies." Zeitschrift für Geomorphologie, Supplement 132: 161-190.

Hauck, C. and C. Kneisel (2006). "Application of Capacitatively-coupled and DC Electrical Resistivity Imaging for Mountain Permafrost Studies." Permafrost And Periglacial Processes 17: 169-177.

Hauck, C., et al. (2011). "A new model for quantifying subsurface ice content based on geophysical data sets." The Cryosphere 5: 453-468.

A: We thank the referee for the suggested list of references. We intend to include them in the introduction of the revised manuscript and, following the remark of the referee, we intend to remove the references of Arctic literature.

Figure 1: I can understand your point, however, the model CURRENTLY is not improving the initial starting model due to the chosen topography. In the topography you apply, you would expect heat flow from South to North and (a) would be the better model (see Noetzli et al., 2007). In addition, such topography is completely unrealistic.
I suggest to demonstrate your approach on a more realistic slope incorporating realistic slope lengths and an inclined slope with ledges or overhangs or a ridgeline with North and South exposed slopes.

Noetzli, J., et al. (2007). "Three-dimensional distribution and evolution of permafrost temperatures in idealized high-mountain topography." Journal of Geophysical Research - Earth Surface 112: F02S13.

A: We kindly refer the reader to our reply to comment #7 made by referee #1.

Figure 2: Same as above. Use a more realistic topography. In addition, the colour scheme is strange. What is the brownish colour refers to. If it is low p-wave velocities than the little peak with orange colour has higher p-wave velocities than the underlying layers which is unrealistic, thus, the overlaying stress of the little peak would increase p-wave velocity below. The model is correct from a geophysical point of view but unrealistic in nature. Please choose more realistic examples.

A: We kindly refer the reader to our reply to comment #7 made by referee #1.

P7L13: What kind of construction? Is this information necessary?

A: Due to instabilities the summit pyramid of Hoher Sonnblick had to be reinforced. In frame of the construction works the three boreholes were drilled. However, the referee is right, this information is not necessary and will be removed in the revised manuscript.

P7L13ff: If the borehole data is of no use, than this part is not necessary for your manuscript. You could add some general argument of the use of borehole data to your method section.

A: Based on comments from both referees we intend to present borehole temperature data to support the interpretation of our results (see our replies to comment #13 made by referee #1).

P7L19f: Please add some information on transect length. Do you use offset shots? Do you stack shots to increase signal-to-noise ratio? Why you measure in May? Usually the measurements are applied in late summer to derive the depth of active layer thaw.

A: Based on the comment of the referee we will provide information regarding the transect geometry and acquisition parameter in the revised manuscript. Regarding the time of the data acquisition we kindly refer the reader to our answer to comment #11 made by referee #1.

P8L7ff: Please add information of transect length. Is the transect identical to RST transect?

A: The GPR transect is identical to the RST transect. Information about the transect geometry will be provided in the revised manuscript.

P8L13: et al. is probably missing. However, this is a not peer-reviewed conference abstract. Please delete.

A: We appreciate the comment from the referee pointing out a not peer-reviewed reference and will remove said reference.

P9L12f: How do you know these? Are these possible scenarios based on other investigations or studies?

A: We built the conceptual models following the models presented by Draebing (2016). However, we increased the complexity of the models to evaluate the possibilities and limitations of the refraction seismic tomography based on the seismic velocities summarized in Table 1 of the submitted manuscript.

P9L14: How coarse is the debris? It is pretty unrealistic that ice fills up the voids in Fig. 5 a. The rocks forming together the debris layer will be frozen but not the voids. Water will run off on the impermeable permafrost layer due to slope inclination and voids will no be saturated in contrast to the rock pores.
P10L2: Why end of winter period? Snow cover can preserve the frozen conditions until late spring or early summer.
P10L6: Water will simply drain. Water-filled voids are not existing in nature.

A: We appreciate the detailed revision (P9L14, P10L2 and P10L6) of our conceptual models and kindly refer the reader to our answer to comment #9 made by referee #1.

P12L3f: Why?

A: We subjected the synthetic data to Additive Gaussian White Noise (AGWN) to account for factors negatively affecting the data quality of real data sets, such as complex layer geometries, an unfavorable station layout or ambient seismic noise