We thank the second referee for his constructive comments.

Obvious grammatical or syntax errors have been changed without further comment. Otherwise, all the comments by the referee were considered, and the text in the publication has been adapted accordingly. We have emphasised that the model results are of course the result of assumptions and abstractions, and that their use in, for example, selecting potential measurement sites, must be seen within this context. Further, we have added model runs showing a higher, cold location, where uncertainty with depth varies more as a result of phase changes (i.e. we are near the melting point). And finally, we have made clearer the assumptions and parameters selected in our model.

Comments second referee:

1. I read the review of M. Hoelzle as he provided the review early. I agree with his major points, such as that blocky material is not part of the analysis. This choice should at least be discussed and mentioned, why this important substrate for mountain environments is not part of the study. It is probably difficult to model because of air advection etc, but this should be discussed or mentioned. As with clay or thick layers of organics above mires, which are probably not the most common material in steep mountain environments. On the other hand, organics are important in Arctic environments or in relation to sporadic permafrost (palsas), but then topography normally is gentle.

For the first part of your comment, please check the answer to M. Hoelzle's general comment: “We fully agree with that statement. Representing coarse blocks such as typically found on rock glaciers is important for modeling permafrost in the Alps. In this setting, we parameterize them with the hydrologic conductivity of gravel and a high porosity. This allows a free drainage of the pore space and the corresponding air content is accounted for in the calculation of ground thermal conductivity that constitutes one element of the importance of coarse blocks for permafrost (Gruber & Hoelzle 2008). The advection of air in blocky surfaces, however, is not included in the model, which is a complex problem that we are not yet in the position to address. “

Second comment: we agree that organic soils are important when modeling permafrost at high latitudes. Therefore, we included the soil type peat in our study. To keep the study setting consistent and to make the results comparable, peat was also modeled for steeper terrain (30°).

2. Abstract. The abstract is far too long and should be shortened to the major points and results of the paper.

The abstract was shortened.

3. The result chapter is important but not very exiting to read, give the major results and illustrate them properly. Some of the figures are hard to read, like fig. 5, fig. 7, fig 8 and fig 9 because of small annotations etc. I would suggest reorganising the figures somehow; maybe you do not need to show everything, but restrict you to some major points.

Some sections of the results were shortened or changed to improve the understanding. The labeling of the figures was enlarged to ensure readability. Otherwise, the figures are kept since we think they are important to show the results, also from the view of the many different simulations that were performed. We think once they are properly integrated in the final paper (and not just at the end as done for discussion), they will be more easily to understand within the context.

4. Give clear conclusions and recommendations based on your study, and not a summary.

We rewrote the conclusions to make them more concise.

5. Consider removing the Outlook, such comments could e.g. be given in the discussion section.

The outlook was removed, and the important points outlined there are now included in the discussion chapter.

Some minor comments:

p. 797, l4: The target variable is here MAGST, later you use MAGT and ground temperatures in several depths. Please check.

We meant MAGT and not MAGST, thank you for this observation.

p. 802, l. 21: Ground type, see comment above and by Hoelzle

See answer to first comment by M. Hoelzle.

p. 803: Target variables, now MAGT. And: 10 m depth, how deep is the domain, and how is it initialised?

The following text was included in chapter „Model specific parameters“: The ground column in the model is 10\m deep, and is initialized by repeatedly modeling GT down to 1\m (40 years), then using the modeled GTs as initial condition to repeatedly simulate GT down to 5\m (40 years) and finally simulating GTs down to 10\m depth. Preliminary analyses have shown that this procedure produces stable initial conditions of the ground. To test possibly different responses that may take place if the initial condition is given by unfrozen and frozen ground, a sensitivity study with negative (-1°C) and positive (+1°C) initial ground temperatures is performed.

p. 806, l 3: lapse rate units seem wrong Fig. 11: I struggle a bit with the Fig 11, probably I do not understand, but 13 C at 10 m depth is somewhere at least quite far outside high-mountain environments. I guess the density is frequency?

Thank you for this comment. In the first version of the paper, we plotted a location at 1000m elevation where the conditions are too warm for permafrost. This was changed, and now a figure at 3500m is plotted, to show cold ground conditions.