

### General response to the managing editor, associate editor, and referee

We thank Tom Coulthard and Heather Viles for their positive feedback and for accepting our paper for publication in Earth Surface Dynamics. We also acknowledge Stefan Grab’s effort to read the revised manuscript once again. His critical and constructive remarks during the review greatly enhanced the structure and quality of the paper.

### Specific response to minor technical issues raised by Stefan Grab (Referee 1)

Dear Authors

This manuscript is substantially improved and I commend you for it. In my view this is now an excellent paper certainly worthy of publication. Just a few small technical issues to sort:

1. The term 'patterned ground' is widely accepted within periglacial science as a collective term for the patterns concerned and hence the plural that you use in this paper seems strange and incorrect (i.e patterned grounds). Almost all papers on patterned ground refer to it as such and the plural form used in your submitted paper would not conform. Please change to 'patterned ground' throughout.

Thanks for the clarification. We now use the term “sorted patterned ground” in singular form throughout the paper.

2. Figure 4 part b - I understand that this part of the Figure displays 'seasonal' temperature patterns as you say in the caption. In fact the seasonal pattern is very beautifully shown! However, the resolution is much finer than only seasonal...it is at least monthly. Hence the data resolution does not comply with the resolution implied (i.e. seasonal) in the caption. The same issue applies with Figure 7. So this requires the captions to be changed accordingly...maybe something like '....indicating monthly to seasonal temperature resolution.....'. Please also check the text re compliance in this regard.

We agree with the referee that the temporal resolution is actually higher than implied in the caption. We have therefore changed the captions of Fig. 4 and Fig. 7 accordingly:

**Figure 4.** Hourly ground temperatures in 2, 10, and 50 cm depth on the southern Sanetti Plateau (3877 m) from January 2017 to January 2020. (b) Smoothed hourly ground temperatures using a simple moving average with a window size of 91 days, highlighting seasonal ground temperature variations. Note that the increase of the seasonal ground temperature amplitude over the measurement period is also confirmed for other sites on the plateau and is not caused by a shift of the thermistors.

**Figure 7.** Simulated daily mean ground temperatures in (a) 2 cm, (b) 10 cm, and (c) 50 cm depth on the southern Sanetti Plateau (3877 m) corresponding to a decrease in air temperature of  $7.1 \pm 1.3$  °C and a decrease in global radiation of  $30 \text{ W/m}^2$  relative to the present-day conditions. (d) Smoothed daily ground temperatures using a simple moving average with a window size of 91 days, highlighting seasonal ground temperature variations.

3. Page 15, line 5: '...stripes split up into multiple...' is a colloquial read. Perhaps consider something like '....stripes diverge into multiple branches....'

We modified the sentence following the referee’s suggestion.