

# Response letter

## Long-term firn and mass balance modelling for Abramov glacier in the data-scarce Pamir Alay

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Felix Pertziger

Dear Editor,

thank you very much for your feedback. We have finalised the manuscript following your suggestions and made the following technical corrections:

1. We corrected the spelling mistake.
2. We removed "where".
3. Table 2 is referenced in line 270, we added a reference to table 2 when describing  $z_{lim}$  on line 135.
4. We completed the caption of Figure 11: "Modelled and measured subsurface temperature for a station located nearby site 2 ( $\sim 4400$  m a.sl.) for four selected dates visualising the constantly temperate conditions at depths below  $\sim 10$  m in spring 2018. The data are plotted for days around the onset of modelled surface melt occurring in March 2018 (a,b) and subsequent subsurface warming (b,c,d). The 6th of June visualized in d corresponds to the date with the coldest measured temperatures at a depth of about 7 m in 2018. The location of the site is indicated in Fig. 1b)."
5. We completed the discussion with a statement regarding the sub-daily variation of cloud cover and precipitation (L484): "Furthermore, the cloud cover forcing from the period with measurements is another source uncertainties which are related to the observational nature of the data and our choice to implement sub-daily cloud cover variations throughout the year while keeping precipitation constant throughout a day."
6. We changed L500 as suggested and added a statement regarding equifinality (L504): "The sensitivity model runs for the modified parameters (Figs. S7 and S8) highlight that parameter perturbations have strong impacts on mass balance and internal accumulation and that equifinality might be an issue, which has not been addressed in this study."

Marlene Kronenberg

*Fribourg, November 15, 2022*