

Dear Editor,

We are pleased to **resubmit our revised manuscript** entitled “*How ice apron loss and permafrost degradation promote the Platteikogel rock slide: A thermo-mechanical reconstruction*” – title of the submitted version.

Based on the Reviewer comments - RC1, Herman Reginalds, and RC2, Florence Magnin - we made the **subsequently summarized modifications to the manuscript**.

Minor remarks were answered in detail in the response to the reviews, corrected/addressed within the revised manuscript, and were not addressed **in the following**.

The major remarks of RC1 are addressed first, followed by the remarks to RC2 (#1 to #6).

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Both reviewers addressed the inappropriate use of **the landslide classification** term “rock slide” throughout the manuscript. Therefore, we substituted it with the more general term “rock slope failure”.

As motivated by RC1, we now address the **failure kinematics** in a specified section, which was added to the **discussion section**. To support this discussion, we **added two new figures (kinematic model and detailed, high-resolution map of the post-failure state)** to the supplementary material.

We modified Figure 2 (Overview of the event) with a **pre- and post-failure slope map** (d,e); to better illustrate the topographic gradient of the terrain, which was requested by RC1.

We modified the following figures to increase readability by enlarging sizes/text/color scales or rearranging material: Fig. 2,5,6b,9, A3. Figure 11 and A5 were split from one figure with 10 subfigures into two figures with 5 subfigures, respectively. Stimulated by comments of RC1 and RC2 (#6).

The title was adapted with the new term, and the present tense of the verb “promote” was switched to past tense (suggested by RC2 (#1), as we describe a past failure event. The new title is now:

*How ice apron loss and permafrost degradation promoted the Platteikogel **rock slope failure**: A thermo-mechanical reconstruction*”.

As addressed by RC2 (#2), the mechanical modeling scenario regarding hydrostatic pressure is less well constrained than other scenarios. Therefore, **we differentiated this scenario from the others and tightened the boundary conditions** by adding core references and specifications to the existing framework within the Section Methods. We extended the paragraph for scenario 2.

Moreover, we made an attempt to **quantify the underlying processes** that promote the Platteikogel rock slope failure by **compiling the many results of individual scenarios simulated in one, newly created figure** (Figure 13 in the resubmitted version). A paragraph was

added accordingly within the Results Section. This was a major remark (#3) by RC2, and indeed, we believe that it substantially improves the manuscript, allowing for intercomparability between individual processes and their impacts on the overall destabilization.

RC2 (#4) stated that **the proposed conceptual model and our own results are not clearly distinguishable in the Discussion Section**. A paragraph has **been rewritten accordingly, and Figure 12 was essentially modified in response to the critics**. With the modified Figure and text, we now **clearly differentiate between theory (a) and our results (b)**; which support the theoretical framework.

The Confusion of RC2 (#5) about the depth of the basal shear plane and V/A ratio has been answered in the response. Table 1 was adapted with depth information and reference to the profile. The terminology of the V/A ratio was now specified in more detail within the table.

We believe that the revisions have improved the clarity, quality, and focus of the manuscript.

We thank you for your consideration of our revised manuscript and look forward to your response.

Sincerely,

Felix Pfluger, on behalf of all co-authors

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