3rd round of review - Minor corrections

Response to comments by Handling editor Prof. Christian Hauck

Dear authors,

Thank you very much for your revised version of the manuscript, which was sent out again in a second review round. Both reviewers are very satisfied with your changes, and there remain only minor comments to be addressed. From my point of view most of them can be addressed by going line per line through the manuscript again to detect typos and small inconsistencies as mentioned by the reviewer.

Please reply to these again point-by-point - we are looking forward very much to your revised manuscript and the completion of the review process.

Kind regards,
Christian Hauck
Editor

> Dear Prof. Hauck,
>
> Thank you very much for your message and for the opportunity to revise our manuscript once again. We are very grateful to you and the reviewers for the constructive feedback and the positive evaluation of our revised version.
>
> We have now carefully addressed all remaining comments and suggestions. As requested, we have gone through the manuscript line by line to correct typos and resolve minor inconsistencies. Please find below our detailed point-by-point response to the reviewers' final remarks, along with a clean and a tracked-changes version of the revised manuscript.
>
> We hope the revised version meets your expectations and remain at your disposal for any further clarification.
>
> Kind regards,
> Diego Cusicanqui, on behalf of all co-authors

Response to comments by Dr. Jan Henrik Blöthe

Below, I am commenting on the second round of revisions of the manuscript. I commented on the original submission and the first round of revisions before and I am very glad to see that the manuscript has significantly improved in quality and clarity. In their revised manuscript the authors have adjusted the text and figures largely in line with the comments made by the reviewers. The inclusion of additional figures, the more focused presentation of the uncertainties associated with the analysis as well as the condensation of the text has added to the scientific rigour of the work. That being said, there are still quite some typos remaining in the manuscript and some errors in the references to published work (e.g. Halla et al. 2020 is equal to Halla et al. 2021). I am recommending to critically go through the manuscript again and correct these. Additionally, I am outlining a few specific comments below (Line numbers refer to the document

"egusphere-2024-2393- manuscript-version3.pdf") that should in my view be addressed before accepting the manuscript for publication.

> Dear Dr. Blöthe,
>
> Thank you very much for your thorough and constructive feedback on our second revised version. We truly appreciate your positive evaluation regarding the improvements in clarity, scientific rigour, and presentation of uncertainties. We have carefully addressed all the specific points you raised. In particular, we have performed a meticulous line-by-line revision of the manuscript to eliminate remaining typos and inconsistencies.
>
> Please find below our detailed responses to your specific comments, as well as an updated version of the manuscript with tracked changes. We are grateful for your continued support in improving the quality of our work.
>
> Kind regards,
> Diego Cusicanqui, on behalf of all co-authors

there are still quite some typos remaining in the manuscript and some errors in the references to published work (e.g. Halla et al. 2020 is equal to Halla et al. 2021).

> Thank you for pointing out this error. We have carefully re-read the entire manuscript and checked all references. At least 50 typos were found and corrected.

Specific comments:

- L1: This might also just be a typo: The title should read "rock glacier kinematics" not "rock glaciers kinematics"

> Thanks for pointing this typo. We modified as suggested.

- L25-26: While I agree that this is an interesting finding, the reader might be confused why 2% of the data are put forward here. Isn't it more surprising (and therefore worth mentioning here) that 98% of the landforms show rather stable surface velocities?

> Our results show that velocity variations exceeding their respective uncertainties were observed in only 2% of the PMAs (n = 8). This means that for the remaining 98%, velocity changes could not be confidently detected inside the study period, as they remain within the uncertainty range. We have revised the manuscript text accordingly.
>
> *[...] However, decadal velocity changes* ***exceeding uncertainties*** *were observed* ***in only*** *2% of PMAs, where two (one) rock glaciers* ***exhibit*** *significant acceleration (deceleration) over the past two decades. [...]*

> While the hypothesis of stable velocities across these PMAs is plausible, it is not the focus of the present study. We have however added a sentence in Section 6.4 (Andean velocity observations) to emphasize the stability of rock glacier velocities in the region including the latest paper published this year by Blöthe et al., (2025). Now you can read:
>
> *[...] Such a level of acceleration might not be detected by L7/8 imagery, mainly due to the* ***high uncertainties (Fig. 8) and coarse spatial resolution (cf. Sec. 6.1). More recently, Blöthe et al. (2025) reported unchanged velocity change patterns on 175 rock glaciers over the past 50 years in the Valles Calchaquíes region (northwestern Argentina). Overall, our findings confirms limited rock glacier velocity changes in several regions of the Andes.*** *Further studies could benefit from incorporating older datasets, like SPOT 1-4 up to the mid 1980's or Corona images from the 1960s,* ***to extend temporal coverage and improve trend detection*** *(Dehecq et al., 2020; Kääb et al. 2021). [...]*

- L359: “show a linear trend in surface displacment” seems misleading here. The data shown in Fig. 5 show a linear trend in cumulated surface displacement, i.e. stable velocities.

> We modified the text as suggested. Now you can read:
> *[…] show a linear trend in **cumulative** surface displacement […]*

- L362-363: I am surprised to see different numbers here than in the abstract and Table 1. Did I miss the explanation for the number of rock glaciers, landslides and unclassified being lower (rock glaciers, landslides) and higher (unclassified) here?

> We apologize for the error. These were typographical errors left over from the first version of the manuscript. We have changed it accordingly. Now you can read:
> *[…] PMAs (rock glacier = **153**; landslide = **124**; unclassified = **105**) […]*

- L425-432: Like in the abstract, I think the 98% of data with stable surface displacement deserve to be mentioned here?

> We agree. We have added the following text:
> *[…] **Regarding the remaining 98% of PMAs (n = 374), velocity variations could not be confidently detected as they remain within the uncertainty range (Fig. 8; Table 2).** […]*

- L513-514: Would be god to use the consistent terminology instead of “Top 50% pixels” here.

> Modified as suggested. Now you can read:
> *[…] When velocities are computed using the **Top 50% average velocity**, bias resulting from […]*