

TC-2022-237

Brief communication: Rapdi $\sim 335 \times 10^6 \text{ m}^3$ bed erosion after detachment of the Sedongpu Glacier (Tibet)

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General comments

The authors have analyzed the changes of the Sedongpu valley following the 2018 glacier detachment. Given its incredibly high mass movement activity, the Sedongpu catchment is currently of high interest to the scientific community. In that sense, any contribution is of interest and additional data is surely welcome. While I think that the submitted manuscript is interesting, I do question its brevity and the would therefore like to suggest a few amendments.

I have two suggestions to increase the value of the presented contribution:

- 1) The authors initially make the connection with long-term landscape evolution, but later provide only one sentence where this topic is picked up again (L100). I would encourage a more detailed discussion of the topic. I am no expert at the topic, but a brief literature search reveals that the observed erosion rates at Sedongpu are far beyond the norm. Of course, long-term erosion rates are unlikely to be a good indicator of short-term peaks, but a more detailed literature review can surely shed more light on this than what I have done here. For example:
 - a. Delaney et al. (2017) report an average of 5.4 cm yr^{-1} over 28 years at Griesgletscher, Switzerland
<https://onlinelibrary.wiley.com/doi/10.1002/esp.4239>
 - b. Hogan et al. (2020) report from values from Peterman Ice Stream that range from 0.5 mm yr^{-1} to 1.5 mm yr^{-1} during deglaciation cycles.
<https://tc.copernicus.org/articles/14/261/2020/tc-14-261-2020.pdf>
 - c. Hinderer et al. (2013) up to $7000 \text{ t km}^{-2} \text{ a}^{-1}$ from glacierized basins in the European Alps (5 to 10 times larger than non-glacierized basins)
<https://www.sciencedirect.com/science/article/pii/S0012825213000032?via%3Dihub>
- 2) I very strongly encourage the authors to make their datasets open access to anyone. This would hugely increase the impact of this brief communication and surely provide the community with a really valuable dataset.

Specific comments:

L48: How far to the confluence with the Brahmaputra?

L40/41: *the* warmest months, *the* coldest month

L44: How much do you think the elevated bed contributed to the overall erosion volume?

Can you quantify this?

L47: *ran* not run

L52: This statement sounds a bit like the glacier slid off its sediment bed without any entrainment, which is likely not true. Can you quantify how much subglacial material was removed in the initial event (maybe using the ice thicknesses from [Farinotti 2019](#) or [Millan 2022](#)?)

L66ff: Can you try to specify whether references to 2018 are before or after the detachment?

L78: *gradually*, not gradual

L81: *worth mentioning*

Table 1: Can you additionally express the changes in erosion rates (e.g. m yr^{-1})? You say that the changes happened gradually, but it is hard to compare the different time periods because the time steps are very different. Would you expect some seasonality based on the strongly varying precipitation amounts? Does the data show this? If not, why not?