Reviewer 3 - major comments

Abstract should be rewritten in order of method and application. I also think it is better the abstract is a bit more summarized for readers to easily understand the article.

Order has been changed.

First paragraph in the Introduction is too simple. At least, the relation to monitor glacier velocity (content of the following paragraph should be written.

added "Monitoring changes of ice flow is thus of importance, especially since the velocity of these glaciers seem to fluctuate considerably."

Figure 2 is confusing, especially the right panel of Figure 2. I also think it is better to change the order of Figure 2 and 3.

Order and figure has been changed.

You compare the results from different network, method and smoothing in Figure 5, 6, 7. You also explain the differences in some specific areas (J, K, L and so on). Please add some enlarged figures and explain what differs. I think this is important part to assess your method. Moreover, the result in Figure 7b is too smoothed. How did you consider about this?

Zoom-in are now included into the new manuscript.

The Validation section should be moved before the Glaciological observation in order to validate your result.

done.

I dont understand the comparison in Figure 12a and 12b. Why did you show these Figures? Moreover, what does the cluster at 2 m/day in X axis comes from?

These figures show the distribution of the velocities, if systematic effects are present in the resulting products, such can be identified. The cluster at the X-axis might be due to the inclusion of overarching velocities, where the velocities before the surge front are given a faster velocity. Or it can be a systematic error, but a traceback did not resolve in finding a direct link.

How do you access errors of velocity field in winter in terms of both snow on stable ground and GoLIVE product ?

I assume this is a typo ("access"→ assess). Anyways, the radiometric quality of modern day satellite imagery seem to be sensitive enough to capture features of the snowy surface so displacement estimates are possible [Jeong and Howat, 2015, Kääb et al., 2016]. An error which is present in any optical velocity field is dependent on changes in sun elevation [Berthier et al., 2005], this will be more pronounced in winter and in addition is systematic. Such effects can be filtered through simple heuristics. However, these effects are dependent on topography which has variation in different scales. Hence, it will propagate into the products, but be off less effect.

The last paragraph of the Discussion is too simple. If you mention glacier dynamics deriving from your result, you should write in detail as citing some references.

This is removed, as we keep the paper general, and more focussed on the processing method. The objective is to discover changes in glacier flow, and structure the data in a coherent frame, for later analysis. This is on purpose because the generated data is only surface velocities. Environmental or GIS information is not taken into account, or like ice thickness not available at this scale.

Reviewer 3 - minor comments

p.3 l.3: "and elsewhere: what does 'noisy' mean? Please make it clearer."

changed to "partly populated with erroneous velocity estimates". Noisy here means deviation with long tails, not normal-distributed or *salt & pepper* noise.

p.3 l.7: "therefore"
changed.
p.3 l.27: "Randolph"
"h" was added.
p.4 l.3-4: "Please cite some references"
added Molnia [2008].
p.11 l.12: "Logan"
removed an "o".
p.11 l.17: "ignition → 'initiation' is common to use."
word has been changed.
p.12 l.4-5: "steady velocity → I don't think the propagation speed steady"
True, the velocity pattern is a combination of patterns. This is why it starts with "most clearly". The velocity also seems to have a seasonal oscillation on top of this surge front propagation.
p.12 l.5: "the glaciers widens but the surge does continue → I dont understand what you want to tell here. Please describe in detail."
It seems the glacier front velocity and cross-areal distance are related (following the Bernoulli equation). This can imply that the ice thickness is constant over this part (only for some major glaciers in the region ice thickness measurements are available, see irwis data). Or alternatively, ice thickness does not matter, as it is compensated sub-glacially, or by thickness variation at the glacier surface. But ice thickness is not available for this glacier, neither have we looked at elevation time-series. However, we also found this relation at the surge front of Walsh glacier, hence it is worth it to highlight this observation. Nevertheless, more analysis are needed, to investigate this surge front dynamics.
p.13 l.6: "glacier depth → ice thickness"
changed.
p.13 l.3: "not unique → What does 'unique' mean here?"
changed to more specific formulation "not a special mechanism and similar propagation behaviour ...".
fig.1: "Please add an explanation about 'relative revisit in days'"
included: "The purple text colors annotates the different satellite paths of LANDSAT, while the black text indicates the relative overpass time in days in respect to path 63.".
fig.10: "What is 'the observed period'?"
the whole dataset, included "(2013-2018)" in the caption.
fig.11: "Did the second figure come from raw GoLive product?"
this figure is the best scene (manually picked) from the GoLIVE data.
fig.12: "'GoLIVE' → 'voting'"
changed.

References

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