

The Cryosphere Discuss., referee comment RC2
<https://doi.org/10.5194/tc-2021-202-RC2>, 2021
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Comment on tc-2021-202

Anonymous Referee #2

Referee comment on "Correlation dispersion as a measure to better estimate uncertainty in remotely sensed glacier displacements" by Bas Altena et al., The Cryosphere Discuss.,
<https://doi.org/10.5194/tc-2021-202-RC2>, 2021

General Comments

This paper conducts an excellent study into how the uncertainty of photogrammetry-based ice displacements varies over the velocity field, a neglected subject in glaciological studies. However, I am left wondering exactly how much the proposed method improves on existing isotropic methods.

Line 34: The hypothesis of this paper is stated in line 34-35: "In our opinion the assumption of constant variance (homoscedasticity) does not hold, as displacement extraction is based upon pattern matching of small subsets of imagery, where the image content influences the displacement precision."

Is this demonstrated? I did not find an explicit answer. I am left wondering the degree to which the assumption of homoscedacity is violated and if there are glaciological settings in which this assumption is appropriate or acceptable.

Specific comments

Line 5 and 13: please state how the correlation peak is related to velocity uncertainty. It would also be helpful to the reader if you could explain what a dispersion estimate means in this context or how it relates to uncertainty.

Line 19: change “automatic constructing” to “automatic construction”

Line 47: Insert comma after “In this contribution”

Line 49: remove “then for instance”

Line 61: change “also other metrics can ” to other metrics can also”

Line 68: “ A lot” is a bit informal. Maybe change to significantly or greatly?

Line 69: insert comma after “For example”.

Line 74: change “it are these” to “it is these”

Line 88: Insert comma after “ and in particular its peak”

Line 95: insert comma after “is perceived as a probability density function”

Line 105: Make “a detailed derivation thereof...” its own sentence.

Line 113: Insert comma before “ and correlation ridges with different”

Line 124: Insert “the” between “from” and “standard error axis”. Remove comma before “to a description of standard error ellipse...”

Line 132: Change “wholes” to holes

Line 176: Remove comma following Maslapsina Glacier

Figures 5 and 6: please explain the significance of the regions outlined in red. It would be helpful to the reader if other significant aspects of this figure were described in greater detail in the caption.

Figure 9: Please check spelling, describe what is significant about regions outlined in red. It would be helpful to fill out the figure caption more and describe what is significant or of interest in this figure.

Line 249: Here and elsewhere, terms such as "we think" and "opinion" are used. Have these opinions been validated in this study? It is not clear to me. If yes, this should be stated explicitly. Otherwise, it will be difficult for the reader to know what to do with the results of this study.

Line 274-275: It would be helpful for the reader if you could briefly discuss what would be needed to "extract a clearer signal from noisy remote sensing products"