Specific comments

Some parts of the text could be better illustrated with statistics and figures in the supplements. There are also minor details in the figures that could be improved (see attached file).

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p. 3, l. 12 Your formulation suggests that "individual image pairs" and ice-sheet-wide mosaics are independent, whereas the latter relies on the former. The "spatial coverage at a given point in time" through the individual image pair time series controls the spatial coverage of the mosaic. Could you clarify this point?

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p. 9, l. 1 "In v2021 of the product, the input SLCs were not coregistered prior to offset-tracking, but coregistration improves coherence for homogeneous scenes where offset estimation relies on speckle (see Solgaard et al. (2021), Sect. 5.3)." Section 5.3 discusses temporal decorrelation. Did you mean Sect. 5.2? Could you provide more details on this, perhaps with illustrations in the supplement? What is the impact of errors in the DEM? You do not mention coregistration as a modification in the introduction—why?

Fig. 3: It would be clearer to highlight the parts that have changed compared to v2021, in comparison with Fig. 3 from Solgaard et al. (2021).

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p. 7 Is the calibration the same as in Solgaard et al. (2021), which comes from Gisinger et al. (2020)?

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p. 9, l. 2 "Using an external velocity map improves the correlation estimate in patches containing both moving and stationary pixels (e.g., at boundaries between glacier and rock), since each pixel is individually resampled." This could be clearer with illustrations in the supplement.

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p. 9, l. 10 Here, you could reference other iterative NCC methods, for example autoRIFT :

- Lei, Yang, Alex Gardner, and Piyush Agram. "Autonomous repeat image feature tracking (autoRIFT) and its application for tracking ice displacement." *Remote Sensing* 13.4 (2021): 749.
- Gardner, Alex S., et al. "Increased West Antarctic and unchanged East Antarctic ice discharge over the last 7 years." *The Cryosphere* 12.2 (2018): 521-547.
- Lei, Yang, Alex S. Gardner, and Piyush Agram. "Processing methodology for the ITS_LIVE Sentinel-1 ice velocity products." *Earth System Science Data* 14.11 (2022): 5111-5137.

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p. 10, l. 10 How do you ensure that the local standard deviations do not also capture real changes in ice flow?

Sect. 5.2 Same comments as above. Have you observed artifacts resulting from errors in the DEM?

Sect. 5.3 Do you have any estimate of the error propagated in the velocity products if there is a deviation from the slope-parallel assumption? See, for example, what has been done for ITS_LIVE velocity: Appendix B from Lei, Yang, Alex Gardner, and Piyush Agram. "Autonomous repeat image feature tracking (autoRIFT) and its application for tracking ice displacement." *Remote Sensing* 13.4 (2021): 749.

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p. 14, l. 12 How does this increase in ice flow scale with spatial resolution? What could be the impact of an even finer spatial resolution?

Fig. 5: It would be clearer to write v2021 and v2026 (instead of PROMICE). The black line corresponds to the difference between v2026 and v2021, and the shaded black contour to the standard deviation, correct? Could clarify the caption ?

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p. 15, l. 1 Could you provide statistics here to show the difference between errors from v2026 and v2021?

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p. 16, l. 1 Could you include a figure in the supplement?

Fig. 7: Panel (c) has a different font size than the other figures.

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p. 16, l. 11 "The updated processing scheme applies stricter outlier removal at the shift map level compared to v2021, resulting in fewer outliers removed during the subsequent image pair culling step (Fig. 7a and b)." This point is not mentioned in the introduction. Why did you choose to change the filtering at the shift map level?

Fig. 8 The numbers are in different colors. Is there a reason for this?

Sect. 8.1 What is the estimated uncertainty of the GNSS data?

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p. 22, l. 18 "If these points were excluded, the statistics would become very similar to the subset values." Please provide values for this statement.

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p. 24, l. 15 ...and probably also because stable areas have different characteristics than the rest of the ice sheet (texture, etc.).

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p. 6, l. 14 Replace « : » with a « . ».

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p. 27 "The values reported from the validation of the current version of the PROMICE ice velocity product are higher than what we reported in Solgaard et al. (2021). This stems from the longer validation period, which includes the period when only S1-A was operational—but lower if you consider the same period. Why don’t you mention this in the conclusion?"
