

## **Seasonal land ice-flow variability in the Antarctic Peninsula (tc-2022-55)**

### **Author Response to Reviewers (30/08/22)**

1. L27. "Since 1992". I suggest rather providing the start and end date of the IMBIE estimate. The paper being from 2018 I assume the end date of this estimate is not "now" (as understated while using "since") but sometime in 2015 or 2016 (or 2017?). An end date is thus needed.

Sentence now reads:

*'... from which resulting land ice losses are estimated to have totalled an average of  $\sim 109 \pm 59$  gigatons per year between 1992 and 2017 (The IMBIE Team, 2018).'*

2. L30. Authors do not need to include "cf." before a reference. It is implicit (to be removed elsewhere also, several occurrences).

Instances of 'cf.' have been removed throughout the text.

3. L131. Calculation of the standard error in equation (1). Dividing by the square root of the number of pixels implies independence (i.e. no spatial correlation) of neighbouring pixels. Do the authors have a justification for this choice? For example, in the field of DEM differencing, accounting for spatial correlation is key (and now standard) to reach a proper uncertainty estimate, otherwise the standard error is way too small (Rolstad, C., Haug, T., and Denby, B.: Spatially integrated geodetic glacier mass balance and its uncertainty based on geostatistical analysis: application to the western Svartisen ice cap, Norway, *J Glaciol*, 55, 666–680, 2009.)

The calculation of the standard error was carried out on a per-pixel basis. We divided by the square root of the valid pixel count, which is the number of non-NaN observations used in the production of each monthly estimate, rather than dividing by the number of pixels. The text has been edited to clarify this point, and now reads:

*'... the mean per-pixel standard error totals  $0.005 \text{ m d}^{-1}$  ( $1.8 \text{ m yr}^{-1}$ ). This value is comparable to that of other SAR-derived velocity products (Rignot et al., 2017; Friedl et al., 2021), and was calculated for each pixel...'*

4. L166. A dot is missing after the parenthesis.

A full stop has been added to the end of this sentence.

5. L169. Should not the authors state "Pixels for which velocity was falling within..."?

The sentence has been rephrased to read:

*'Pixels where the velocity fell within standard error bounds (Sect. 3.2) were also discarded.'*

6. L514. I tried to access your data (26 August) and the doi was not found. Maybe the repository will be opened later, at the time of final publication. To be double checked.

The link to the data in the repository will be minted upon receipt of the DOI of the accepted paper.