

Interactive comment on “Surface velocity of the Northeast Greenland Ice Stream (NEGIS): Assessment of interior velocities derived from satellite data by GPS” by Christine S. Hvidberg et al.

Matt King (Referee)

matt.king@utas.edu.au

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The authors present a summary of an analysis of a network of stakes on NEGIS which are measured by GPS over a period of several years. They report velocities, strain and elevation and compare these with remote sensing velocities and ArcticDEM. They provide some preliminary glaciological interpretations.

The analysis of the GPS data seems robust. My annotated copy attached suggests the authors consider the potential systematic errors introduced by assuming a static

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Discussion paper



processing method when the site is moving. I looked at this in King et al 2004 J Glac and saw some odd things when you don't fix ambiguities. The authors don't provide lots of detail on their main processing approach so I don't know if they fixed ambiguities or not.

I do not think their approach to quantifying the positioning uncertainty is robust - using exactly the same data in different processing softwares is bound to produce an over-optimistic estimate of uncertainty. I am not entirely sure the best approach to do this - I would normally hope there were some data to subset (perhaps at a site that ran for multiple days). I am sure a GNET site could be used as a guide here, although the site conditions will differ I think the main errors will come from clock and orbit products and modelling approaches which should be similar on nearby rock sites. I don't think modest changes to these uncertainties will affect any conclusions though.

Overall, I think the authors present a useful dataset in an area where satellite-derived products are clearly a little variable (although some velocity products are clearly pretty good).

My other minor remarks are in the annotated copy.

Matt King June 12 2020

Please also note the supplement to this comment:

<https://www.the-cryosphere-discuss.net/tc-2020-103/tc-2020-103-RC1-supplement.pdf>

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-103>, 2020.

