

The Cryosphere Discuss., referee comment RC2
<https://doi.org/10.5194/tc-2022-40-RC2>, 2022
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Comment on tc-2022-40

Anonymous Referee #2

Referee comment on "GBaTSv2: A revised synthesis of the likely basal thermal state of the Greenland Ice Sheet" by Joseph A. MacGregor et al., The Cryosphere Discuss., <https://doi.org/10.5194/tc-2022-40-RC2>, 2022

Review of MacGregor et al. 2022: GBaTSv2, a revised synthesis of the likely basal thermal state of the Greenland Ice Sheet.

This manuscript updates the previously published basal thermal state of the Greenland Ice Sheet (GrIS), GBaTSv1, from MacGregor et. (2016). I welcome this updated product with updated methodology and use of more recent modeled and observed products. I have no doubt it will be of great use to the scientific community.

I found the manuscript to be very well written and organized with enough information to make it approachable to general readers. I appreciated the authors took the time to pinpoint approaches that were both similar and different compared to the previous product, easing the comparison between both products. Also, I was delighted about the effort spent on the figures which are easy to follow and understand. I wish all submitted manuscript would be of this quality!

I was able to download the data very easily.

I only have a few comments for the authors before this manuscript can be published.

Comments

In your paper, you list the names and location of some deep borehole in table 1. You locate NorthGRIP and Summit in Fig8. I would find it useful to locate NEEM, DYE-3, and Prudhoe lobe on the same map as well. Maybe it would be suitable to locate them all in Fig.1 especially since you explain the change of state of the NEEM borehole from likely frozen to likely thawed in Sec. 2.1.

Throughout the text you make several references to Cuffey and Paterson 2010 (e.g., p2, line2). Since this is a book that is over 650 pages long, I would suggest you adding the chapter and/or the page number/range of the book as you refer to it.

This is me being curious here: did you find any correlation in diagnosing the basal thermal state between ISMIP6 models using the SIA or hybrid SIA (if any) along with surface velocity from Joughin et al. (2016, 2017) and your method of minimum basal slip ratio? (I know it is more complicated than just using SIA in an ice sheet model, but still, I'm curious.)

P8, line 179: Do you mean "Uncertainty" instead of "Uncertainly"?