

Interactive comment on “Self-regulation of ice flow varies across the ablation area in South-West Greenland” by R. S. W. van de Wal et al.

Anonymous Referee #2

Received and published: 7 November 2014

In this paper the authors present an on an impressive dataset of glacier velocity, bore hole pressure and surface mass balance for the K-transect, South-West Greenland. Such datasets are critical to improving knowledge of glacier response to changes in water supply to the bed, an area of intense debate. The authors do a commendable job at synthesizing the data into a coherent story. The main weakness of the paper lies in the overall strength of the conclusions that are drawn from the data and the poor acknowledgement to previous work that has come to similar conclusions for the same region, as is well detailed in Peter Nienow's comments. The authors also over-generalize their conclusions beyond the K-transect which are not justified by the localized data.

I agree with the review by “Anonymous Reviewer #1” and the comments of P. Nienow so will refrain from repeating their concerns with the interpretation of the data. I have

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little to add in addition to their comments:

P4621L23: Not being a field person I'm not familiar with what "commercial L1 measurements" means... are all commercial L1 measurements the same?

P4622L5-7: I found this sentence difficult to follow

P4622L15: relative acceleration... do you mean seasonal amplitude?

P5623: The discussion of PDD and sonic elevations is irrelevant for the type of analysis that is being done (melt magnitude correlated with velocity). All approaches would likely yield similar results.

P4623L4-5: retrieving accurate net radiation from an unmanned weather station is non-trivial as has been documented by the co-authors.. 5% uncertainty seems low

P4623L18: Why do you need to specify a density for ice?

P4623L22-24: where do these errors come from?

P4623L25: Not accounting for refreeze has HUGE implications with a migrating ELA ... this is clear in your Figure 9 which has little meaning if refreeze is not accounted for.

P4624: the use of the word "instantaneous" throughout the documents is a bit strange.

P4624L17: I am not familiar with the term "over-pressuring"

P4625L7-10: I found this sentence difficult to follow

P4625L24-29: Why would "absolute" water pressure not dive variations in velocity? This seems important. Maybe I'm missing something.

P4627L6: What is a "velocity surplus"

P4628L2: "percent" is one word

P4629: You can not calculate the ELA without accounting for refreeze.

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P4629L25 to P4630L19: This entire paragraph is speculation.

Figure 2: it would improve readability if the same y-axis limits were used for all locations... red and blue circles add little value.

Figure 3: Why make the SNR record a different line size?

Figure 7: Add scatter data to which the lines were fit.

Figure 8: Where is the doubling of velocity in 2012 that warrants further study?

Figure 9: probably not all that useful or accurate.

Interactive comment on The Cryosphere Discuss., 8, 4619, 2014.

TCD

8, C2294–C2296, 2014

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