

Interactive comment on “Recession, thinning, and slowdown of Greenland’s Mittivakkat Gletscher” by S. H. Mernild et al.

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Received and published: 28 June 2012

Mernild et al (2012) provide a valuable record of the changes in velocity of a small Greenland glacier. The velocity record is unique in its length, but also in the companion surface mass balance record. My comments focus on reducing the emphasis on the surface mass balance record that has already been published in detail and increasing the focus on the surface velocity record. This group of authors are continuing to provide a detailed and valuable record of the response of a small Greenland glacier to climate change. This paper will add to this comprehensive examination.

2009-19 to 2010-6: Most of this can be removed as it is duplicative of Mernild et al (2011).

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2010-19: How many stakes total? How many years for most stakes?

4.1: This section should be shortened as the key to this paper is not the details of seasonal mass balance but surface velocity. As a result it is only Figure 3c that is crucial.

2016-13: More detail is needed here illustrating the variation of velocity spatially and temporally: 1) Illustrate the variation of velocity with elevation, note Figure 4 Palmer et al (2010a) or Palmer et al (2010b) or Berthier and Vincent (2012). Just as the balance gradient for the glacier has been shown to be similar from year to year in shape (Knudsen and Hasholt, 2004), just shifted with respect to x-axis, it would be interesting to see if the pattern is similar with velocity and elevation from year to year. 2) How has the velocity variation progressed with time, did the increase occur steadily or more suddenly. This would be illustrated by providing a temporal view of velocity change at specific stakes or sets of stakes (Berthier and Vincent, 2012). 3) The mean annual surface velocity change map in Figure 5 is nice, but this should be its own figure along with the same map scale showing the percent change in velocity.

2017-3: Would a figure such as Figure 9 from Berthier and Vincent (2012) be useful in identifying the various roles in velocity change?

2019-22: Compare the changes in velocity seasonal changes to those from Flade Isblink where ablation is less (Palmer et al, 2010)

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Interactive comment on The Cryosphere Discuss., 6, 2005, 2012.