

Interactive comment on “A new 1 km digital elevation model of the Antarctic derived from combined satellite radar and laser data – Part 1: Data and methods” by J. L. Bamber et al.

Anonymous Referee #1

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The authors present a new DEM for Antarctica, based on a combination of radar and laser satellite altimetry. This work represents an important step forward, because it reduces the overall elevation error from previous DEMs by about half. Additionally, it provides a more accurate representation of drainage basins than previous DEMs, particularly between 81 and 86 degrees south, due to blending of radar and laser data. This new DEM has already been used in several studies, so it is important that this work (including the follow on paper examining the errors in the DEM) is published to provide a record of how it was generated and its validity. I recommend this paper for publication subject to addressing the minor comments below.

General Comments:

While there is some discussion of the original RAMP dataset (Liu et al. 1999), there is no discussion of the newer version of RAMP (Liu et al. 2001). If applicable, can the authors briefly discuss how their new DEM differs from that of the latest version of the RAMP DEM?

Page 817: With regards to the temporal correction you applied with the Davis et al. (2005) results to account for the surface elevation changes between the acquisition periods: Zwally et al. (2005) was somewhat critical of the dH/dt estimates of Davis et al. (2005), suggesting (I think) that they were too large. Could you provide a rough estimate of what the difference in your correction would likely have been for the regions where the dH/dt correction was largest, had you used the Zwally (2005) rather than the Davis et al. (2006) dH/dt estimates? Presumably the correction is small, but it may be worth mentioning briefly in your text anyway. Perhaps this is discussed in more detail in part II of your paper, in which case please disregard this comment.

Specific comments:

1. Page 816, lines 18-19: 'except in areas where the second derivative of the surface is small'. Do you mean the second derivative of the surface slope?

Interactive comment on The Cryosphere Discuss., 2, 811, 2008.

TCD

2, S472–S473, 2009

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