

***Interactive comment on “Brief Communication  
“Importance of slope-induced error correction in  
elevation change estimates from radar altimetry””  
by R. T. W. L. Hurkmans et al.***

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This paper examines the effect of the slope-induced error in estimating  $dH/dt$  from ERS-1/2 radar altimeter cross-over analysis. The authors employed a Greenland DEM (generated mainly using ERS-1 and Geosat altimeter data) to compute the slope and aspect over the Jakobshavn Isbræ. They used ATM/ICESat measured  $dH/dt$  for comparison of the corrected  $dH/dt$ , and showed that the corrected  $dH/dt$  will lead to increased volume change by 32% over the study region. This study examines the effect that have been presumably canceled out when repeated elevation change measurements are of interest. Therefore, I recommend publishing the manuscript, but after a

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revision considering the following issues. From Fig. 3b, even corrected  $dH/dt$  show large discrepancy with the ATM/ICESat  $dH/dt$  from a location that is about 45 km away from the grounding line, where the ice velocity starts to increase rather exponentially. However, the reason is not explained in the manuscript. The difference between them is shown to be as large as 4 m/year, a large number considering that basin-GH in West Antarctica is observed to have 2 m/year of  $dH/dt$  recently (Lee et al., 2012). It is speculated that some of the error could be due to the DEM accuracy near the coastal region because the accuracy of radar altimeter measurements (used to generate the DEM) over the rough topographic surface is expected to be poor. In other words, some error budget analysis can be performed to show how the DEM error can result in the corrected  $dH/dt$  error. Although it may be out of the scope of the paper, some brief discussions about the retracking method may be included as well. What retracking has been used? Will different retracking method help to reduce the discrepancy with the ATM/ICESat  $dH/dt$ ?

Minor comments: 1) Volume change number from ATM/ICESat should be included. 2) Fig 1: please add explanation about ICESat tracks (maybe use different color?) 3) Fig 3b: the dotted line seems to be velocity profile, but a legend can be included.

Reference: Lee, H., C. K. Shum, I. Howat, A. Monaghan, Y. Ahn, J. Duan, J. Guo, C. Kuo, L. Wang, Continuously accelerating ice loss over Amundsen Sea catchment, West Antarctica, revealed by integrating altimetry and GRACE data, *Earth and Planetary Science Letters*, 321-322, 74-80, 2012.

Interactive comment on The Cryosphere Discuss., 6, 159, 2012.