

Interactive comment on “The imbalance of glaciers after disintegration of Larsen B ice shelf, Antarctic Peninsula” by H. Rott et al.

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helmut.rott@uibk.ac.at

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We are grateful for the encouraging comment by Mauri Pelto, emphasizing the importance to provide accurate observations on glacier speedup phenomena in order to understand the governing processes. He correctly points out the very limited information on ice thickness as a main problem, which we also mention in the paper. We are revising the paper taking into account the two issues he addressed:

1. Methodology for ice depth determination at the flux gates other than Crane glacier: This is based on the assumption that the glaciers were approximately in equilibrium at the time when ice motion was retrieved using ERS interferometric data in 1995 and 1999. The mass flux through a glacier gate in those years is computed using the estimated accumulation rate. The mass flux and ice velocities (mass transport) are

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the basis for estimating the cross section of the gate for these glaciers. Further details are described in the paper. According to our understanding a similar procedure was applied by Rignot et al. (2004, 2008) for estimating the mass fluxes.

2. Further information on the basis how the mass fluxes are calculated: We agree that is essential to provide details on the numbers for flux gates and velocities used for computing the mass fluxes, in order to understand differences between our results and previously published data. We included relevant information in Table 2 and in the text, and will submit additional information on flux gates of the different glaciers as supplementary material. For understanding the reasons for the differences, it is also necessary to obtain detailed information on the observational data and assumptions leading to the previously published fluxes (not available to us). To clarify another minor issue, referring to the comment “mean velocity” versus “centreline velocity . . . not (being) the value used”: We did not use the mean velocity to compute the mass fluxes, but used equation (1) and thus the derived velocity profile across the gate, together with the estimated profile of ice thickness. Therefore the centreline velocity is a good indicator for describing acceleration.

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