

## **Ice discharge from north and northeast Greenland as observed from ERS interferometry**

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### **Abstract**

**ERS radar images of north and northeast Greenland were assembled to determine the location of the grounding line of its outlet glaciers, and the velocity of the glaciers. Combined with a digital elevation model of north Greenland (provided by Kort-Matrikelstyrelsen (KMS) Denmark) utilized to estimate the glacier ice thickness in regions of hydrostatic equilibrium, we estimated the ice discharge from north and northeast Greenland at the grounding line. The results were compared to calf-ice production which represents the ice discharge at the glacier front, several tens of kilometers downstream from the grounding line. The grounding line discharge is on average 3.5 times larger than the ice front discharge. The difference between the two estimates is attributed to basal melting of the floating regions of the glaciers. The basal melt rates are high and demonstrate that basal melting is a significant process of mass loss in the Arctic. This result calls into questions previous estimates of the mass balance of the Greenland Ice Sheet which all assumed that basal melting was not a significant factor.**

*Keywords: Interferometry, glaciology, change detection*