



Satellite investigations of ice dynamics at the north-east margin of the Greenland Ice Sheet

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Recent IPCC projections of the sea-level contribution due to the Greenland Ice Sheet (GrIS) fail to account for potential ice mass losses through dynamic thinning. This is due to our limited understanding of the critical processes controlling ice motion, despite the fact that unsteady ice dynamics represent approximately two thirds of the mass lost from Greenland today (Rignot and Kanagaratnam, 2006). The aim of this work is to improve our understanding of the processes controlling dynamics of the GrIS. This is achieved by determining seasonal variations in ice velocity at land- and marine-terminating outlet glaciers using satellite interferometric and feature-tracked synthetic aperture radar observations. Results from an area of Northeast Greenland are reported here. The study area is centred at 74°N 24°W and covers a ~ 20,000 km² region of ice at the ice sheet margin. Within this area there are 14 principal glaciers, 7 of which are marine terminating and 7 land terminating. Early results from interferometry indicate that glacier flow velocities exhibit seasonality in this region of the GrIS. This is exemplified at Walterhausen glacier (74.10°N 25°W) where between September 1995 (late summer) and March 1996 (late winter) the glacier velocity slowed, on average, by almost 30% in the first 35km from the terminus. This pattern is representative of variations at other glaciers throughout this region of the GrIS.