



Short-time-scale variations in flow speed observed at Helheim Glacier, East Greenland

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We have obtained a suite of detailed geophysical observations, spanning two summer seasons, at Helheim Glacier, East Greenland. This interdisciplinary dataset includes geodetic, seismic, radar, and lidar observations, in addition to tidal, weather, and satellite remote-sensing data. Continuous high-rate GPS observations from a period of 50 days in July–August, 2007, extend a 60-day summer-season time series obtained in 2006. This dataset also includes continuous observations for periods as long as four weeks on the lowermost part of the glacier, within a few km of the calving front.

We observe significant changes in glacier behavior between 2006 and 2007. The 2006 summer season saw a substantial readvance of the calving front compared with the minimum position recorded in 2005; a retreat of the front was observed in 2007 with respect to 2006. The 2006 summer season was seismically quiescent, with 2007 marking a return to glacial-earthquake activity. We also observe significant variations in glacier flow speed during the 2007 summer season, including accelerations along the length of the glacier trunk occurring on timescales of less than one day. We will present a joint analysis of seismic and geodetic data focused on elucidating the nature of short-time-scale variations in glacier flow, including glacial earthquakes.