



Observed vertical strain rates and basal melt rates in Roi Baudouin ice shelf

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Precise measurements of basal melting have been made at a series of sites on the Roi Baudouin ice shelf, Antarctica. The observation is based on ApRES (autonomous phase-sensitive radio-echo sounder) radar, which allows long-term, unattended and precise monitoring of ice shelf thinning. The study includes measurements of the vertical displacement of both internal reflecting layers and the ice-shelf base. Vertical strain rates within the ice shelf were determined from the relative motion of internal reflectors. With both spatial and temporal fluctuations in the vertical strain rate accurately quantified it was possible to estimate the vertical motion of the ice shelf base in response. Differences between the calculated and observed motion of the basal reflector arise because of basal melting. Two weeks repeat measurements are made at sites across the channels near the grounding line and also on an englacial lake. A full year with hourly measurements is made at a site on a channel near the ice front. In this way, we detect spatial and temporal features of melting on Roi Baudouin ice shelf, and compare the result with melting calculated from remote sensing data.