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Vibroseimic measurements on an ice shelf and sheet

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We present first-time-ever results of active seismic measurements with a vibroseismic source conducted in the 2009/10 field season in Dronning Maud Land, Antarctica.
A Failing Y-1100 with a mass of 16 t was used on the Ekströmisen ice shelf where ice is about 200 m thick, and at the summit of Halfvarryggen, where ice is about 900 m thick.
Goal was to investigate the feasibility of vibroseismic operations on a porous firn layer to image the internal structure of the ice as well as its thickness with true surface measurements, which do not require any drilling whatsoever as is usually necessary for explosive seismics where explosives are detonated in 20-m deep boreholes. In combination with a snow streamer the vibroseismic operation would enable long seismic traverses in comparably short time periods.