



Active seismics on Ekströmisen, Antarctica

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Halfvarryggen is a small ice dome bordering the catchment area of Ekströmisen and a candidate for the drilling of one upcoming IPICS 2k/40k ice core. Its internal structure imaged with airborne radar indicates upwarping internal layers, so-called isochrone arches or Raymond bumps.

Modelling studies indicate that the crystal orientation fabric (COF) at larger depths at ice domes should be highly anisotropic. As changes in COF also change the acoustic impedance contrast, such changes should also be detectable with seismic methods. We present an overview and preliminary results of a geophysical LIMPICS campaign at Halfvarryggen in 2009/10, involving reflection seismics, radar and other glaciological studies. Main scientific goals are to detect internal seismic reflection horizons along two perpendicular profiles nearby the ice dome, detect the ice-bed interface and image the upper tens of meters of the underlying bedrock. In addition, the expedition employs a conventional vibroseis truck for data acquisition to test its feasibility as a controlled surface-seismic source on polar firm in comparison to commonly used explosives in boreholes.