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Subglacial geology of Halvfarryggen ice dome, Antarctia, inferred from seismic measurements

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We carried out a combined vibro-explosive seismic survey on Halvfarryggen, a local ice dome south of the German research station Neumayer III. The Vibroseis survey was grid shaped to provide spatial information about the glaciological and geological substructure. The center survey line was also surveyed with explosive reflection and refraction seismic set-ups.
The ice bed contact we interpret as a frozen till layer overlaying bedrock. From velocity analysis of refractions seen in far offset data, we obtain a pressure-wave velocity >5000 m/s. We therefore interpret the bedrock as igneous, which supplements previous magnetic and gravimetric data sets. The data set demonstrates that fast vibroseismic measurements for larger spatial coverage in combination with wide-angle explosive measurements in conjunction with airborne radar surveys provide a optimal means to illuminate subglacial conditions.