



## **Analyses of Seismic Anisotropy and calculations of Receiver Functions at Dronning Maud Land (Antarctica)**

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With analyses of shearwave splitting and calculations of receiver functions, we applied two common seismological methods in order to derive detailed information about the earth's interior and geological structures of Dronning Maud Land (DML), Antarctica.

Several geological and tectonic events during earth history formed the present-day Antarctic continent and, within the area of investigation, DML, outcrops were formed during several phases: (1) The Grenville, at 1.1 Ga, during building of the supercontinent Rodinia, (2) the Ross-/Panafrican, at 500 Ma, during building of the supercontinent Gondwana and due to collision between West and East Gondwana. (3) The break-up of Gondwana at 180 Ma started in the Weddell Sea (the oceanic area off DML) and was accompanied by voluminous volcanism, magmatism and major outpourings of continental flood basalts. The present-day ice coverage of the continent makes it difficult to map these geological structures in detail but, with our investigations, we are able to make conclusions about the existence of separate regions with different structures.

Previous studies of shearwave splitting, from seismograms recorded at the German Polar Research Station Neumayer, show a two-layer subsurface model that fits the apparent splitting parameter sufficiently well. This is not the case for measurements made at the Southafrican Polar Station, Sanae (SNAA), because even for narrow backazimuth segments the (apparent) splitting parameters and receiver functions show strong variations. Hence, a much more complicated (anisotropic) subsurface structure seems likely, and the strong variations have to be interpreted in terms of the region's complicated history.

Furthermore, we introduce results from temporarily deployed seismometers. During several polar expeditions in the years 2000 until 2004, seismometers were situated in primarily ice free regions along mountain ranges such as Wohlthat Massif in central DML, Heimefrontfjella with Kottas Mountains in western DML, and at the Jutul Penck Graben.