



## **Insights into the evolution of the Yermak Plateau and the adjacent Lena Trough**

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The Yermak Plateau forms the northernmost plateau of the Eurasian plate. It is believed to be formed as a consequence of relative motions between Greenland and Svalbard. Large parts of the plateau might consist of heavily intruded continental crust and/or are of oceanic origin. The intruded material are most likely erupted during the final formation of the western Gakkel Ridge some 35 Ma. As a consequence of the continuous separation of Greenland and Svalbard an active spreading system, the Lena Trough, in the Fram Strait developed.

This general scenario is well accepted, but details on the crustal structure, sediment distribution and basement origin of the Yermak Plateau and the Lena Trough are unknown. Recent bathymetric, petrological and geophysical investigations have increased the first order information for this region significantly. E.g. the new bathymetry shows that in contrary to older models, no complex geometry of the spreading system is present. The Lena Trough system is only to a minor amount disrupted by transforms.

The problem in detailed dating the spreading history of the Lena Trough, and in reverse the opening of the Fram Strait is the absence of good spreading anomalies. New aeromagnetic data confirm this observation from regional surveys. The magnetic field is extremely smooth south of 82°N. However, linking this information with the latest results from RV Polarstern expeditions in 2004 explains at least these observations. It seems that most of the oceanic crust in the Lena Trough is build up by peridotites.

In addition to the investigation across the Lena Trough new seismic data were acquired in 2004 across the Yermak Plateau to map the shape of the basement. The seismic

data show that the basement is very rough in the oceanic part of the plateau, and that towards the east a major tectonic boundary exists. This boundary is visible also in the gravity and to minor amount in the magnetic data. The seismic data suggest that this boundary might represent an area of different stress directions.

In summary the latest results of the geoscientific investigations in this area will be presented.