



Crustal architecture of a continental large igneous province

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The northern Barents Sea was strongly affected by the Cretaceous High Arctic Large Igneous Province through abundant mafic intrusions, eruption of flood basalts, and regional uplift. Recently acquired geophysical data in this region provide a unique opportunity to study in detail crustal architecture of large igneous provinces. A giant dike swarm is identified based on magnetic anomalies coherent over a distance of hundreds of kilometers. Coincident ocean bottom seismometer, multichannel streamer, and gravity data indicate that the surface basalts and shallow sills were associated with feeder systems cross-cutting the entire crust. At the same time, the distribution of dikes exhibits more complex pattern than radially symmetric with respect to the presumable magmatic center in the Alpha Ridge region. Thus, the preferred orientation of dikes could be controlled by both paleostress and pre-existing weaknesses (Early-Late Paleozoic faults). The data do not indicate a thick igneous mafic lower crust while the existence of heavy ultramafic cumulates below the Moho has not been resolved yet. In view of these observations different models of magma transport and related paleo-surface topography are discussed.