

## **Did a Mantle Thermal Anomaly Cause Uplift of the Scandes?**

**C. Pascal and O. Olesen**

NGU, Geological Survey of Norway, N-7491 Trondheim, Norway

The Scandes is a recent and long mountain range stretching from southern to Arctic Norway and being characterised by a rugged topography and peaks up to 2,5 km high. The origin of this mountain chain far away from any plate boundary remains a matter of harsh debates inside the geoscientific community. Hot mantle “fingers” originating from the Iceland Plume and impacting the base of the Scandinavian lithosphere is one of the most accepted hypotheses for explaining Cenozoic uplift in Norway. In order to test this hypothesis we conducted integrated gravity and thermal modelling. We used the dense NGU gravity grid (i.e. one measurement every ~3 km) and modelled the depth extent and the mass deficit associated to the compensating loads located below the mountain range. Assuming that the density deficit below the Scandes is purely thermal in origin, thermal modelling allowed for testing the magnitude of the potentially associated temperature anomaly and its impact on surface heat flow and lithosphere rheology. Modern heat flow data recently acquired in the framework of the Kontiki (NGU/Statoil) and HeatBar (NGU/Statoil/Research Council of Norway) projects were used in order to validate the results from the thermal modelling.