Geophysical Research Abstracts, Vol. 9, 05006, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-05006

Is the anomalous topography of southern Norway compensated by a deep-seated thermal anomaly?

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The southern Scandes, southern Norway, is a recent and wide mountain range 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 postulated 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 gravity grid (i.e. one measurement every $\sim$3 km) collected and maintained by NGU. Gravity modelling places constraints on the depth extent and the mass deficit associated to the compensating loads located below the mountain range. In turn and assuming that the density anomaly below the Southern Scandes is purely thermal in origin, thermal modelling allows for testing the magnitude of the temperature anomaly and its impact on surface heat flow and lithosphere rheology. Modern heat flow data recently acquired in the framework of the NGU-Statoil Kontiki project are used to discuss modelling results and their implications.