



Mantle investigations of Norwegian Uplift Structure (MAGNUS) - a temporary broadband network in southern Norway

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The geological history of Norway shows a complex series of periods of convergence and divergence. The last period of divergence in the Cenozoic resulted in the opening of the North Atlantic Ocean. An important issue in the geodynamics of this region is the substantial vertical movements experienced during the Cenozoic by the North Atlantic margins, including Southern Norway. Isostatic response to unloading contributed significantly to the Neogene uplift, however, this cannot be the only operating mechanism. The mechanisms controlling the broad uplift remain enigmatic but its long wavelength is suggestive of mantle processes, possibly related to the presence of the Icelandic plume in the North-Atlantic. Discussions on this issue are controversial and interpretations mostly based on published models that are 15-20 years of age.

Recent studies lead by the University of Aarhus concluded that the region of maximum topography beneath Southern Norway coincides with a thickened crust which partly comes up for the gravitational deficit beneath the south Norwegian mountains. Our new tomographic model for northern Europe (Weidle et al., An upper mantle S-wave velocity model for Northern Europe from Love and Rayleigh group velocities, EGU 2008) reveals also an intriguing reduction in S-wave velocities beneath southern Norway although with distinct deficits in resolution at shallow depths up to 100 km. To improve our understanding of the mantle structure beneath Southern Norway, a regular network of 31 broadband seismometers from the KABBA instrument pool

(University of Karlsruhe) was deployed in September 2006 in the study area with the operational period due to end this summer. Together with permanent installments in the region, the virtual MAGNUS network in Southern Norway sums up to 40 broadband instruments.

In our contribution we will introduce the scientific background, concept and planned investigations of the ongoing experiment. As an international collaboration between the Universities in Oslo (NOR), Karlsruhe (GER), Copenhagen and Aarhus (DEN) and NORSAR (NOR), this project is a flying start into the impending Topo Europe initiative.