



The use of multiple potential field data-sets in regional, geophysical modeling

J. Ebbing (1,2), M. Aarset (2), R.F. Reynisson (2,1), and T. Vattakar (2)

(1) Geological Survey of Norway, Trondheim, Norway (joerg.ebbing@ngu.no, 0047 7390 4494), (2) Department of Petroleum Engineering and Applied Geophysics, NTNU, Trondheim, Norway

Modeling of potential field data suffers from the ambiguity problem and constraining data are needed to minimize the uncertainty of forward and inverse models. Useful information which can limit the uncertainties is contained in the source dependency of different potential field data. Routinely, wavelength filtering and methods like power-spectrum have been used in the past for depth estimates from potential field data. However, geological structures are often not limited to a certain wavelength and overlap in their characteristic wavelength with deeper originated anomalies (e.g. basin structures).

The availability of gravity and magnetic data sets at different levels, e.g. ground data, ship borne data, airborne data and satellite data, allows nowadays simultaneous potential field modeling. Models can be tested immediately against their response in multi-level data-sets, which increases the uncertainty of the solutions. Especially, in inversion of potential field data the use of multiple potential fields minimizes the uncertainty in the analysis of source geometry and depth. Synthetic and real models from the mid-Norwegian margin are presented, where multiple data sets have been used to model volcanic intrusives and the crustal structure underlying sedimentary basins.