



Greenland mass variation from GOCE gradients expressed as changes in reduced point masses

Matija Herceg (1) and Carl Christian Tscherning (2)

(1) University of Copenhagen, Department of Geosciences and Natural Resource Management, Copenhagen K, Denmark (matija.herceg@geo.ku.dk), (2) University of Copenhagen, Niels Bohr Institute, Copenhagen Ø, Denmark

GOCE maps variations in the gravity field by observing second order derivatives (gradients) of the Earth gravitational potential. Flying in the low altitude of around 250 km and having a spatially dense data distribution of short wavelengths of the gravity field, GOCE may be used to enhance time varying gravity coming from K-band ranging between GRACE satellites.

The GOCE gradients may potentially be used for determination of residual masses in local regions. This can be done by the use of the Reduced Point Mass (RPM) method. Point-mass functions or multipole base-functions are harmonic functions, which may be used to represent the (anomalous) gravity potential T either globally or locally. The changes of the reduced point masses can not be interpreted directly in the term of mass changes but may aid in localizing the areas where (positive or negative) changes takes place.

Different gravity field solutions were calculated by the use of RPM method and GOCE gradients. Gravity field and reduced mass time series were created for six consecutive months of GOCE gradient data.