Geophysical Research Abstracts, Vol. 8, 04449, 2006
SRef-ID: 1607-7962/gra/EGU06-A-04449

Recovery of marine gravity anomaly from ERS2 and ENVISAT data and its contribution to the geoid of Norway

A. Soltanpour, H. Nahavandchi and K. Ghazavi

Division of Geomatics, Norwegian University of Science and Technology, Trondheim, Norway (ali.soltanpour@ntnu.no / Fax:+47-73597021)

Free air anomalies (FAA) over the earth surface have been widely used in geosciences for many purposes. In geodesy and geophysics, FAA are used to compute a fine resolution and precise geoid surface. While land gravity data are collected accurately using precise gravimeters in a static way of measurement, the precision is degraded over sea to few milli-Gals because of errors and biases due to dynamic behavior of sea and kinematic measurements. Satellite altimetry missions have provided an alternative way for computation of FAA over seas. Data provided in this way can be integrated with marine and airborne data to increase the resolution of data, improve the precision and fill gaps. In this study, FAA over the seas around Norway are computed from satellite altimetry data. 84 cycles of ERS2 along track as well as 25 cycles of ENVISAT along track data are selected to be used here. Data from other missions like TOPEX/POSEIDON and JASON-1 are ignored because of poor coverage and resolution over the interested area. The new geopotential model from the GRACE mission is used to compute long wavelength geoid and FAA. To correct data for mean dynamic topography, the available Levitus Model is used. Corrected data are then used to compute along track gradients in each cycle-pass to suppress systematic errors like orbital and atmospheric biases. Resulted gradients are then stacked and the east-west and north-south components of the deflection of verticals are computed where ascending and descending tracks meet each other. Finally, inverse Vening-Meinesz formula is implemented on the gridded deflections to compute FAA. Results are then compared using available marine and airborne FAA and thereafter used along with land, marine and airborne FAA to compute a high-resolution geoid over Norway.