Geophysical Research Abstracts
Vol. 12, EGU2010-8404-2, 2010
EGU General Assembly 2010

Evaluation of GRACE data using terrestrial gravity observations

Maiko Abe (1), Corinna Kroner (1), Christoph Foerste (1), Adelheid Weise (2), Andreas Guentner (1), Benjamin Creutzfeldt (1), Thomas Jahr (2), Gerhard Jentzsch (2), Herbert Wilmes (3), Hartmut Wziontek (3), and the BKG Team

(1) GFZ German Research Centre For Geosciences, Potsdam, Germany , (2) Friedrich-Schiller University Jena (FSU), Institute of Geosciences, Jena, Germany, (3) Federal Agency for Cartography and Geodesy (BKG), Frankfurt/Main, Germany

The GRACE twin satellite mission has been running since March, 2002 and now seven years of time-dependent global gravity field solutions are available. The sensitivity of the GRACE data is that they can detect variation in continental hydrology in the range of several μGal.
However, there is still argument how to filter and rescale the GRACE gravity data. During the recent past, different filtering methods have been developed. GRACE solutions provided by different institutions show 15 % discrepancies in the annual cycle for the Amazon area (Bruinsma et al. 2009).
Other types of observations, such as superconducting gravimeter (SG) combined with repeated absolute gravity (AG) measurements, offer the opportunity to evaluate the filtered and rescaled satellite data. By these constraints for post-processing treatment of GRACE solutions can be derived as well as information on the significance of GRACE-based temporal gravity changes will be gained. For this assessment it is necessary to bridge the gap in the spatial and temporal resolution of the terrestrial and satellite-based time series. Empirical Orthogonal Functions (EOFs) are used to overcome the different resolutions. For comparisons of the signal content, coherence and principal component analyses of the data sets are carried out.
In this study, GFZ, JPL, CSR, and CNES/CRGS RL-2 GRACE solutions are used and for the filtering techniques a non-isotropic filter presented by Kusche (2007, 2009) and Gaussian filter for various radii are compared. From coherence analyses between SG and GRACE time series, good coherence is found for the periods of longer than semi-annual.