Geophysical Research Abstracts
Vol. 13, EGU2011-11502-2, 2011
EGU General Assembly 2011

A validation toolbox for time variable gravity fields from GRACE

Ilias Daras, Christian Gruber, Martin Schmeer, Christoph Dahle, and Frank Flechtner

Helmholtz Center Potsdam - GFZ German Research Center for Geosciences, Department 1: Geodesy and Remote Sensing, Germany

Numerous global gravity field series have been published by different processing centers since the launch of GRACE mission in March 2002. These series provide a direct measurement of mass exchange and are widely used by geoscientists to investigate time-varying mass variation phenomena for applications in Earth system sciences. The German Research Center for Geosciences (GFZ) as part of the GRACE Science Data System (SDS) is routinely processing its current EIGEN-GRACE05S (or RL04 in the SDS nomenclature) time series since end of 2006. Using updated background models and modified processing standards, a consistently reprocessed time series of the complete GRACE mission called EIGEN-GRACE06S (RL05) will be provided by GFZ within the next few months. An integrated validation toolbox for computing the external accuracy of those series and compare them with RL04 as well as series from other centers is currently being developed in GFZ.

The structure of the validation toolbox is multifold. GRACE is capable of observing oceaning mass redistribution. Hence GRACE gravity time series are compared with in-situ ocean bottom pressure (OBP) recorder series located worldwide and their correlation is computed. On the other hand, by apropriate treatment of the data, surface displacements derived by GRACE are also compared with GPS coordinate time series, as well as GNSS leveling. Another statistical subtool uses regional masks and retrieves extreme, mean and wRMS values of gravity functional for “quite” regions where low or minimal variability is expected. The near-zero expected mean value of those regions (ex. Sahara desert) serves as a criterion for the quality of the gravity field. The same statistical inspection is also performed in basin regions (ex. Amazon), exploiting hydrological models and annual/semiannual signals. Another indication is the correlation of GRACE fields to flow accumulation by analyzing DEMs representing sloping terrain in selected basins.

This poster will focus on the results of the validation toolbox for EIGEN-GRACE05S (RL04) series as well as results for EIGEN-GRACE06S (RL05).