



Assessment of GRACE data by the terrestrial gravity observations

M. Abe (1,,) and C. Kroner (1,,)

(1) GFZ Helmholtz Centre Potsdam German Research Centre for Geosciences, Germany , ()

The GRACE mission whose objective is to provide global and high-resolution estimates of the constant and time-variable gravity field of the Earth has been running since March, 2002. Now six years of time-dependent global gravity field solutions are available. However, there is still argument how to filter and rescale the GRACE gravity data. During the recent past, different filtering methods have been developed and various GRACE solutions are available.

Other types of observations, such as superconducting gravimeter (SG) and repeated absolute gravity (AG) measurements, offer the opportunity to evaluate these methods. By these data sets systematic rescaling and changes in the filtering of the GRACE data are investigated. Thus, constraints for post-processing treatment of GRACE solutions are derived as well as for the significance of GRACE-based temporal gravity changes.

For the studies, 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 to be 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 first comparison between gravity variations derived from SG and GRACE for five European SG stations, a good agreement between the data sets was found by Neumeyer et al. (2008). An analysis of dominant common features based on EOF was done and a strong common annual component was found. From the first eigenvector, a common features and disparities between the data sets were revealed.

In the present study, besides monthly GRACE solutions, weekly solutions are considered as well as GRACE data filtered by various methods.