



Combined global gravity field determination by using terrestrial and satellite gravity data

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The first combined satellite-only gravity fields of GOCE and GRACE define a new standard concerning spectral resolution and achievable accuracy of satellite-only models. Nevertheless, terrestrial and altimetry data have to be considered to get high resolution global gravity field models. Thus, the consistent combination of satellite and terrestrial data is necessary.

High spectral gravity field determination puts high demands on computer resources, because full normal equations systems become very large, so that the assembling and solving processes are challenges in respect to memory and computing time. Therefore parallel methods have to be applied.

At IAPG synthetic calculations up to degree/order 600 have been performed which have shown, that very large normal equation systems can be handled, concerning the steps assembling, solving, inversion as well as the error propagation. In the next step, real data shall be applied. Here, further challenges like handling of inconsistent data sets and preparation of the terrestrial data sets occur.

This contribution shall present our initial results of gravity field determination by using real terrestrial data. The preparation and the relative weighting of the data sources shall be illustrated, analyzed and discussed. Also an analysis of the accuracy of the results applying different validation methods will be presented.