Geophysical Research Abstracts
Vol. 17, EGU2015-5879, 2015
EGU General Assembly 2015

Combination of monthly gravity field solutions from different processing centers

Yoomin Jean, Ulrich Meyer, and Adrian Jäggi
Astronomical Institute, University of Bern, Switzerland

Currently, the official GRACE Science Data System (SDS) monthly gravity field solutions are generated independently by the Centre for Space Research (CSR) and the German Research Centre for Geosciences (GFZ). Additional GRACE SDS monthly fields are provided by the Jet Propulsion Laboratory (JPL) for validation and outside the SDS by a number of other institutions worldwide. Although the adopted background models and processing standards have been harmonized more and more by the various processing centers during the past years, notable differences still exist and the users are more or less left alone with a decision which model to choose for their individual applications.

Combinations are well-established in the area of other space geodetic techniques, such as the Global Navigation Satellite Systems (GNSS), Satellite Laser Ranging (SLR), and Very Long Baseline Interferometry (VLBI), where regular comparisons and combinations of space-geodetic products have tremendously increased the usefulness of the products in a wide range of disciplines and scientific applications. In the frame of the recently started Horizon 2020 project European Gravity Service for Improved Emergency Management (EGSIEM), a scientific combination service shall therefore be established to deliver the best gravity products for applications in Earth and environmental science research based on the unified knowledge of the European GRACE community. In a first step the large variety of available monthly GRACE gravity field solutions shall be mutually compared spatially and spectrally. We assess the noise of the raw as well as filtered solutions and compare the secular and seasonal periodic variations fitted to the monthly solutions. In a second step we will explore ways to generate combined solutions, e.g., based on a weighted average of the individual solutions using empirical weights derived from pair-wise comparisons. We will also assess the quality of such a combined solution and discuss the potential benefits for the GRACE and GRACE-FO user community.