



What happens when we remove GRACE or Ocean Bottom pressure from a GRACE+GPS+OBP joint inversion?

Roelof Rietbroek (1), Sandra-Esther Brunnabend (2), Madlen Gebler (3), Mathias Fritsche (4), Jürgen Kusche (1), Christoph Dahle (5), Frank Flechtner (5), Schröter Jens (3), and Dietrich Reinhard (4)

(1) Bonn University, Institute of Geodesy and Geoinformation, Bonn, Germany (roelof@geod.uni-bonn.de), (2) Institute for Marine and Atmospheric research Utrecht, Utrecht University, (3) Alfred Wegener Institute Bremerhaven, (4) Technical university, Dresden, (5) Helmholtz centre Potsdam, GFZ German Research centre for geosciences

The movement of large masses, originating from hydrological and oceanographic variations, causes detectable variations in gravity and surface deformation. These may be detected by satellite gravimetry and a network of permanent GPS stations respectively. Alternatively, additional information on ocean bottom pressure(OBP) variations may be retrieved from simulations.

Joint inversions offer a way to combine different data sources in order to obtain improved estimates of surface loading. This technique can be used to compensate for weaknesses in one dataset, by the strengths of the others. But what happens when one datasets is taken out of the equation?

Here, we compute a joint inversion using a GPS+GRACE+OBP combination. Additionally, we purposely deteriorate the solution by removing either data from GRACE or OBP. The accuracy and resolution of the solutions is discussed. Furthermore, regions are identified where the restricted inversion is consistent with the full inversion, and where the results show strong hydrological signals.