

Estimation and Validation of Oceanic Mass Circulation from the GRACE Mission

J.-P. Boy¹, D. D. Rowlands², T. J. Sabaka², S. B. Luthcke² & F. G. Lemoine²

¹EOST/IPGS (UMR 7516 CNRS-UdS), Strasbourg, France; ²Planetary Geodynamics Laboratory (Code 698), NASA GSFC, Greenbelt, USA

Since the launch of the Gravity Recovery And Climate Experiment (GRACE) in March 2002, the Earth's surface mass variations have been monitored with unprecedented accuracy and resolution. Compared to the classical spherical harmonic solutions, global high-resolution mascon solutions allows the retrieval of mass variations with higher spatial and temporal sampling (2 degrees and 10 days).

We present here the validation of the GRACE global mascon solutions by comparing mass estimates to a set of about 100 ocean bottom pressure (OBP) records, and show that the forward modelling of continental hydrology prior to the inversion of the K-band range rate data allows better estimates of ocean mass variations.

We also validate our GRACE results to OBP variations modelled by different state-of-the-art ocean general circulation models, including ECCO (Estimating the Circulation and Climate of the Ocean) and operational and reanalysis from the MERCATOR project.