The impact of a GOCE gravity field model on estimating the ocean's mean dynamic topography

Silvia Becker, Jan Martin Brockmann, and Wolf-Dieter Schuh
University of Bonn, Institute of Geodesy and Geoinformation, Theoretical Geodesy, Germany

Independent estimates of the ocean's mean dynamic topography are used to improve estimates of the general ocean circulation. In principle the mean dynamic topography as difference between the altimetric sea surface and the geoid height can be easily computed, but the data types have different representations and resolutions. A rigorous combination method including a consistent treatment of satellite altimetry and geoid height information has recently been developed. This approach allows for estimating the normal equations of the mean dynamic topography on arbitrary grids in a straightforward way; i.e. we have direct access to the target quantities required by ocean models.

However, the spatial resolution of these rigorously combined mean dynamic topography models is mainly limited by the integrated gravity field model. Results obtained by including a GRACE gravity field model and a GOCE gravity field model are presented and compared to demonstrate the impact of GOCE.