



Geocenter motion due to surface mass transport from GRACE satellite data

R.E.M. Riva, W. van der Wal, D.A. Lavallée, H. Hashemi Farahani, and P. Ditmar
Delft University of Technology, Delft, Netherlands (r.e.m.riva@tudelft.nl)

Measurements of mass redistribution from satellite gravimetry are insensitive to geocenter motions. However, geocenter motions can be constrained by satellite gravity data alone if we partition mass changes between land and oceans, under the assumption that the ocean is passive (i.e. in gravitational equilibrium with the land load and the solid earth). Here, we make use of 8 years (2003-2010) of optimally filtered monthly GRACE-based solutions produced at TU Delft to determine changes in the land load and the corresponding geocenter motion, through an iterative procedure. We pay particular attention to correcting for signal leakage caused by the limited spatial resolution of GRACE. We also investigate how the choice of a model of glacial isostatic adjustment (GIA) affects the estimated geocenter motion trend due to present-day surface mass transport. Finally, we separate the contribution of ice masses from that of land hydrology and show how they have a different sensitivity to the chosen GIA model and observational time-span.