Geophysical Research Abstracts
Vol. 17, EGU2015-10496-1, 2015
EGU General Assembly 2015

GRACE follow-on sensor noise with realistic background models

Matthias Ellmer and Torsten Mayer-Gürr
Institute of Geodesy, TU Graz, Graz, Austria

We performed multiple simulation studies of a GRACE-like satellite mission based on the current K-Band ranging instrument (KBR). We also simulated a laser-ranging instrument (LRI) configuration as a drop-in replacement for GRACE low-low satellite to satellite tracking, the remaining parameters of the simulation are shared between the two scenarios. Our simulated data are based on real GRACE observations for April 2006, which allows us to compare our results to published gravity field models for this particular month.

The variational equation approach was employed to generate independent reduced-dynamic orbits for both GRACE satellites. These orbits were then fitted to the actual GRACE kinematic orbits. The resulting orbit was then used to synthesize artificial satellite ranging, star camera, accelerometer and kinematic orbit data. We synchronized all simulated instruments with real instrument data for the simulated month, which guarantees realistic data gaps. Appropriate noise was added to all observables.

In the recovery step, the AOD1B de-aliasing product – previously used in the generation of the fundamental reduced-dynamic orbit data – was degraded with partial constituents of the updated ESA earth system model dataset. Specifically, the atmosphere, ocean, and hydrology components were used. This has the effect that the computed gravity field possesses the characteristic structure associated with a residual time-variable gravity field signal. An overview of the achieved results is given in the presentation.