



From GRACE to GRACE Follow-On and Beyond (Vening Meinesz Medal Lecture)

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The 15-year long data record of mass flux variability from the US/German Gravity Recovery And Climate Experiment (GRACE) has provided us unprecedented insights into the complete range of Earth System processes. To obtain these insights, the analyst community has revisited the conventional space-geodetic analysis methods in a variety of ways, to work with the precise inter-satellite ranging, accelerometry and GPS tracking data from on-board GRACE.

In this talk, we review the methods of modeling and extraction of the gravity field from GRACE data, and put them in the perspective of what we wish to accomplish from the GRACE Follow-On (GRACE-FO) mission. The GRACE-FO mission, once again a US/German collaboration with an intended August 2017 launch, will carry both a microwave as well as a laser interferometer for inter-satellite ranging. We may reasonably expect improved quality of data from GRACE-FO, when compared with GRACE. The user expectations, at the same time, of what may be accomplished from GRACE-FO mass flux variability data have grown. Within this context of growing applications, we review methods that may therefore improve the precision and spatial resolution of the gravity field extracted from future gravity field missions.