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Advanced processing strategies for an improved GFZ GRACE/GRACE-FO Level-2 data release

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GFZ, as part of the GRACE/GRACE-FO Science Data System, is one of the official Level-2 processing centers routinely providing monthly gravity models. These models are used by a wide variety of geoscientists to infer mass changes mainly at the Earth's surface. While the current release 6 (RL06) is still operationally processed, plans and internal tests for a reprocessed GFZ RL07 time series are already in progress.

In this context, recent developments have been made within the Research Unit (RU) NEROGRAV (New Refined Observations of Climate Change from Spaceborne Gravity Missions), funded for 3 years by the German Research Foundation DFG. The central hypothesis of this RU reads: "Only by concurrently improving and better understanding of sensor data, background models, and processing strategies of satellite gravimetry, the resolution, accuracy, and long-term consistency of mass transport series from satellite gravimetry can be significantly increased; and only in that case the potential of future technological sensor developments can be fully exploited." Two of the individual projects within the RU closely interact on optimized space-time parameterization (reducing non-tidal temporal aliasing error effects) and stochastic modeling regarding instrument data (accelerometer and inter-satellite ranging observations) as well as background models (e.g. by the utilization of covariance information for ocean tides).

This presentation provides an overview of the developed advanced processing strategies, and their individual and combined impact on GFZ's Level-2 products compared to current GFZ RL06 solutions.