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Being part of the GRACE/GRACE-FO Science Data System, the GFZ Helmholtz Centre for Geosciences is one of the official Level-2 processing centers routinely providing monthly gravity field models. These models are used by a wide range of geoscientists to infer mass changes at the Earth’s surface to study climate related phenomena. While its operationally processed monthly gravity fields are currently still based on release 6 (RL06) standards, GFZ aims to distribute a reprocessed and improved RL07 time series in fall 2025. Most of these improvements have been developed within the Research Unit “New Refined Observations of Climate Change from Spaceborne Gravity Missions” (NEROGRAV) funded by the German Research Foundation DFG.

When developing the new GFZ RL07 processing standards, the main focus was on an optimized stochastic modeling during the GRACE/GRACE-FO gravity field determination. This includes the extension of the stochastic instrument error models, the optimization of the combination of the different observations, and the inclusion of temporally changing non-tidal background model error variance-covariance matrices in the adjustment process. Further changes compared to GFZ RL06 comprise the parameterization as well as the applied background models, e.g., the ocean tide model and the static gravity field model.

This presentation provides an overview on the expected GFZ RL07 performance compared to RL06. It also discusses the effectiveness of including background model error variance-covariance information to reduce temporal aliasing. Additionally, an outlook of the performance of monthly GRACE-FO gravity fields based on LRI will be given.
Presentation file
hauk-markus.pdf
Meeting homepage
GRACE-FO 2025 Science Team Meeting

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