Felix
Landerer
NASA Jet Propulsion Laboratory, California Institute of Technology, United States
David Wiese(1), William Klipstein(1), Sebastian Fischer(2), Frank Flechtner(3), Christoph Dahle(3), Himanshu Save(4), Krzysztof Snopek(3)
1: Jet Propulsion Laboratory, California Institute of Technology, United States
2: Germany Space Agency at DLR, Department Earth Observation, Germany
3: Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences, Germany
4: University of Texas at Austin, Center for Space Research, United States
Oral

GRACE-Continuity (GRACE-C) is a joint NASA (US) & DLR (Germany) mission, scheduled for launch in Dec-2028. It will continue the essential climate data record of Earth system mass change initiated by the original GRACE mission (2002-2017) and currently enabled by the GRACE-FO mission (2018 – present). The GRACE-series provides foundational observations of monthly to decadal global mass changes and transports in the Earth system derived from temporal variations in the Earth's gravity field. These data are a core component of GCOS's Essential Climate Variables and have become indispensable for climate-related studies that enable process understanding of the evolving global water cycle, including ocean dynamics, polar ice mass changes, and near-surface and global ground water changes. Mass Change data enable the monitoring of flood potentials as well as droughts by tracking freshwater availability, groundwater and aquifer volume changes. These observations and integrated tools built around them have become indispensable for 'water intelligence' to inform data-driven water-management in a changing climate.

Like its predecessor missions, GRACE-C will fly in a polar orbit at an initial altitude of 500 km. With the primary science goal of maintaining gap-free continuity in the essential record of mass change data, the mission design, implementation and international partnerships considerably leverage heritage elements to ensure mission success with a fast-paced schedule and minimal cost impact. One departure from heritage is that the primary ranging instrument on GRACE-C will be a higher precision laser ranging interferometer, capitalizing on the successful demonstration of this technology on GRACE-FO.

In this presentation, we will present a brief update on GRACE-FO in the context of satellite operations, data processing, science/applications highlights and prospects

for achieving gap-free continuity between GRACE-FO and GRACE-C. We will further provide a detailed update on the status of the GRACE-C project design, analyses, hardware build and measurement system performance assessments during its current Final Design and Fabrication phase. We will conclude with an outlook on expected science performance, as well as plans for low- and high-level data products and algorithms to enable optimal science and application mission return.

Presentation file

landerer-felix-GRACE-C.pdf

Meeting homepage

GRACE-FO 2025 Science Team Meeting