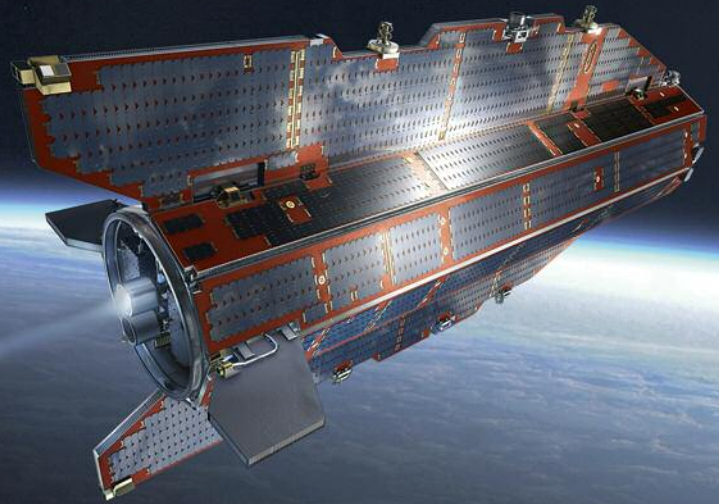


goce

→ ESA'S GRAVITY MISSION



Background

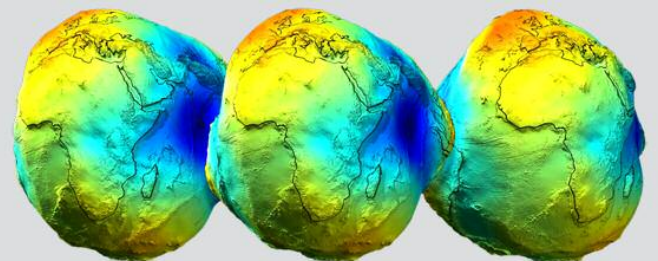
Marking a significant achievement, GOCE is the first in the series of ESA's Earth Explorers in orbit.

The data now being received from GOCE will bring about a whole new level of understanding of one of Earth's most fundamental forces of nature – the gravity field.

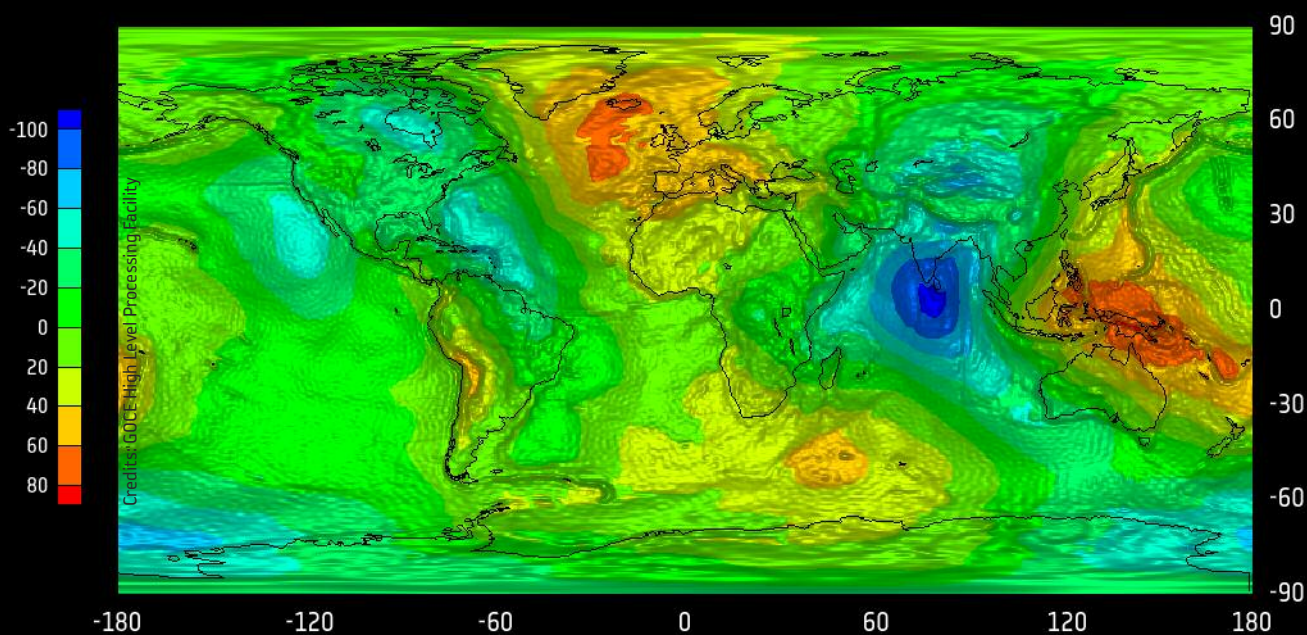
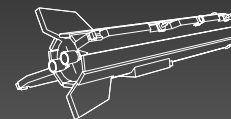
Status overview

Since its launch in March 2009, GOCE has successfully gone through the commissioning and calibration phase and is now delivering gravity data. In May 2010, ESA made available the first dataset based on Level 1b data covering the period 1–30 November 2009.

Level 1b products are the time series of converted, calibrated and validated measurements taken by GOCE. These products contain data from the three principle sensors on GOCE, namely the star tracker, the electrostatic gravity gradiometer and the satellite-to-satellite tracking instrument.



The Level 1b data have subsequently been processed to Level 2 – the first gravity model – which is being released at ESA's Living Planet Symposium in Bergen, Norway, on 29 June. This first release of gravity model is expected to mark the beginning of a long and successful series of gravity field models based on GOCE's novel measurement techniques. The final gravity map and model of the geoid will provide users with well-defined data products that will be instrumental in advancing science and applications in a broad range of disciplines, ranging from geodesy, geophysics and surveying to oceanography and sea-level research.



The first geoid based on only two months of GOCE data illustrates the excellent capability of GOCE to map tiny variations in Earth's gravity field

Data access

The Earth Observation User Services in ESA-ESRIN ensures a user-friendly interface between the satellite system and the data users. Services include: help from the Earth Observation

Help Desk Team, user registration, order handling via the Order Desk, mission planning and production planning, maintenance of catalogues and ordering tools, on-line information services.

Facts and figures

Mission	Earth Explorer: Gravity field and steady-state Ocean Circulation Explorer (GOCE) – looking into the forces that shape our planet
Launched	17 March 2009
Science	GOCE is mapping global variations in the gravity field with extreme detail and accuracy, resulting in a unique model of the geoid. A precise model of the geoid is crucial for deriving accurate measurements of ocean circulation and sea-level change, both of which are affected by climate change. GOCE-derived data are also much needed to understand more about processes occurring inside Earth and for use in practical applications such as surveying and levelling.
Objectives	<ul style="list-style-type: none"> – Determine gravity-field anomalies with an accuracy of 1 mGal (where 1 mGal = 10^{-5} ms^{-2}) – Determine the geoid with an accuracy of 1–2 cm – Achieve the above at a spatial resolution better than 100 km
Instruments	<ul style="list-style-type: none"> – Electrostatic Gravity Gradiometer – GPS receiver used as a Satellite-to-Satellite Tracking Instrument – Drag-free and attitude-control system – Laser retroreflector for tracking by ground-based lasers