

“Media Day” at ESTEC

GOCE is introduced to the international media

The first satellite in the European Earth Explorer series is now ready for launch. The Gravity Field and Steady-State Ocean Circulation Explorer (GOCE) will give the scientists the exact survey over the Earth's gravity field, a field that is the basis for many of the processes on Earth and phenomena such as ocean circulation, climate, etc. Originally the first satellite in this series was the ice explorer Cryosat, but the launch was unsuccessful and GOCE is now the satellite to open the programme.

During a day especially designed for the media, arranged by ESA at ESTEC, the Netherlands this April, key persons in the project informed the journalists about the ESA's Living Planet Programme, the background for GOCE, industrial challenges, ground segments and data products. Chairman for GOCE Mission Advisory Group, Rainer Rummel from the University of Munich introduced his presentation with – A dream Comes True – and followed up with examples for why GOCE is so unique, what the satellite can monitor and what the satellite can contribute with concerning solving different types of scientific questions and problems. The satellite which is now ready for launch is placed in the so-called “clean room”, and when the media representatives had been correctly dressed; they were given the opportunity to see for themselves.



Key persons from the mission team given information about the mission for the media.



GOCE in the clean room, already for launch in April, now scheduled for launch

Successful docking for Jules Verne

A second part of the “media day” the representatives witnessed the successful docking of the European cargo ferry Jules Verne to the International Space Station. Following the docking process metres by metres, ESA personnel held the media continuously updated about the project and of what happened near the station. No wonder that the affirmative word “contact” provoked spontaneous ovation, not only from the media, but also from the personnel connected to the project.



Relaxed atmosphere at ESTEC after successful docking for Jules Verne



Parts for the next large scientific missions, HerchelPlanck ready for integration.

Ground Segment & Science Data Processing Facilities for GOCE

Rational and effective ground segment and data processing facilities are necessary for missions like COCE. Without a system to take care of the large amount of data from the satellite the investment in a satellite will be nearly wasted.

Developing this part of a programme has therefore nearly the same focus as developing the satellite itself. Mission Manager for this part of the project is Rune Floberghagen, originally from Norway, now connected to the ESA facility, ESRIN in Frascati, near Rome, Italy.

Primary ground stations for the project are Kiruna, Sweden and Svalbard, Norway, but also the Troll station in Antarctica can be used in some cases. Together they cover all daily orbits for the satellite, and the stations are used alternating, dependent of the capacity the ground stations have when a new passage is coming.

The Flight Operation Segment is located at ESOC, Germany and this centre has all contact with the satellite, both for operation and for data receiving. However the data is forwarded to the Payload data Ground Segment at ESRIN, Italy where all basis- and value adding processing are carried out. From ESRIN again data is forwarded to High Level Processing Facilities (HPF) around Europe for further adapting to the users' request. One of these HPF is placed at the Institute of Geophysics, University Copenhagen, Denmark.

Mission Manager Rune Floberghagen, told to us that data can be distributed to the level the customers wish, some receive uncorrected data for special tasks, others again will receive corrected data, while others again demand processed data at different levels.

GOCE data at different levels

The definition for the different levels of GOCE products are:

- Level 0 – time ordered raw data as measured with GOCE. The satellite downlinks the data during contact with a dedicated ground-receiving station.
- Level 1b time series is calibrated and corrected instrument data along the orbit. These data include the primary instrument data: gravity gradients, satellite-to-satellite tracking observations and GOCE satellite position; ancillary accelerations and satellite altitude.
- Level 2 time series or models of key GOCE science data, primary gravity field models and ultra precise science orbits.

The Level 2 data are regarded as the starting point for further scientific solutions. Level 2 products include gravity gradients, precise orbit solutions, as well as gravity field models. All level 2 data products are generated by the High-Level Processing Facilities.

The raw data received directly from the satellite must also go through a series of different corrections before they can have some value for the users. The data is for example corrected for gradient, centrifugal acceleration, angular acceleration, the Coriolis force, cage, drag, self-gravity, magnetic coupling etc.

Applications products, based on the Level 2 products, are sometimes referred to as Level 3 products and are thus value-added products. These products will be the customer's application for further studies within fields such as solid-earth physics, ocean circulation, geodesy, sea-level rise etc.



Mission Manager Rune Floberghagen together with a model of GOCE

The Ground Segment Readiness Review was successfully completed in February this year and currently the segment is undergoing final tuning of operational configuration. The Flight Operations Segment performing extensive launch and early operation simulations in these days, said Rune Floberghagen.

GOCE data for all.

ESA strives for the widest-possible use of the Earth observation data in research and application areas. All missions' data products described here are therefore available free of charge to scientific and other non commercial users worldwide. Our data, says Rune Floberghagen, will not be spectacular pictures of the Earth, but a precise definition of the Earth's geoid, and with that a basis for new and better knowledge about physical reactions and phenomena on Earth. The scientists have until now, says Floberghagen, not had accuracy and well defined geoid to found the research on. With COCE the theoretical foundation will be well defined, and therefore further research will be based on a correct starting point.