Geophysical Research Abstracts
Vol. 12, EGU2010-8347, 2010
EGU General Assembly 2010

Rapid and Precise Orbit Determination for the GOCE Satellite

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The ESA GOCE Core Explorer Mission carries a 12-channel, dual-frequency GPS receiver for high-accuracy precise orbit determination. Precise GOCE orbit solutions are used to accurately geolocate the observations taken by the primary science instrument, the gradiometer, that aims at collecting medium to short wavelength gravity information. In addition, the orbit solutions provide complementary information for the long-wavelength gravity field part.

A rapid (RSO) and a precise science orbit (PSO) product are provided by the GOCE High-Level Processing Facility (HPF) with a precision of about 10 cm at 1-day latency and 2-3 cm at 1-week latency, respectively.

The adopted orbit determination strategies for RSO and PSO are presented together with first results. The validation and quality control of the orbits is done using independent satellite laser ranging (SLR) measurements.