# GOCE gravity field simulation based on actual mission scenario

R. Pail (1), H. Goiginger (1), R. Mayrhofer (1), E. Höck (2), W.-D. Schuh (3), J.M. Brockmann (3), I. Krasbutter (3), T. Fecher (4), and T. Gruber (4)

(1) Graz University of Technology, Institute of Navigation and Satellite Geodesy, Graz, Austria (pail@geomatics.tu-graz.ac.at), (2) Space Research Institute, Department of Satellite Geodesy, Austrian Academy of Sciences, Graz, Austria, (3) Institute of Geodesy and Geoinformation, University of Bonn, Bonn, Germany, (4) Institute of Astronomical and Physical Geodesy, Technical University Munich, Munich, Germany

In the framework of the ESA-funded project "GOCE High-level Processing Facility", an operational hardware and software system for the scientific processing (Level 1B to Level 2) of GOCE data has been set up by the European GOCE Gravity Consortium EGG-C. One key component of this software system is the processing of a spherical harmonic Earth's gravity field model and the corresponding full variance-covariance matrix from the precise GOCE orbit and calibrated and corrected satellite gravity gradiometry (SGG) data.

In the framework of the time-wise approach a combination of several processing strategies for the optimum exploitation of the information content of the GOCE data has been set up: The Quick-Look Gravity Field Analysis is applied to derive a fast diagnosis of the GOCE system performance and to monitor the quality of the input data. In the Core Solver processing a rigorous high-precision solution of the very large normal equation systems is derived by applying parallel processing techniques on a PC cluster.

Before the availability of real GOCE data, by means of a realistic numerical case study, which is based on the actual GOCE orbit and mission scenario and simulation data stemming from the most recent ESA end-to-end simulation, the expected GOCE gravity field performance is evaluated. Results from this simulation as well as recently developed features of the software system are presented. Additionally some aspects on data combination with complementary data sources are addressed.