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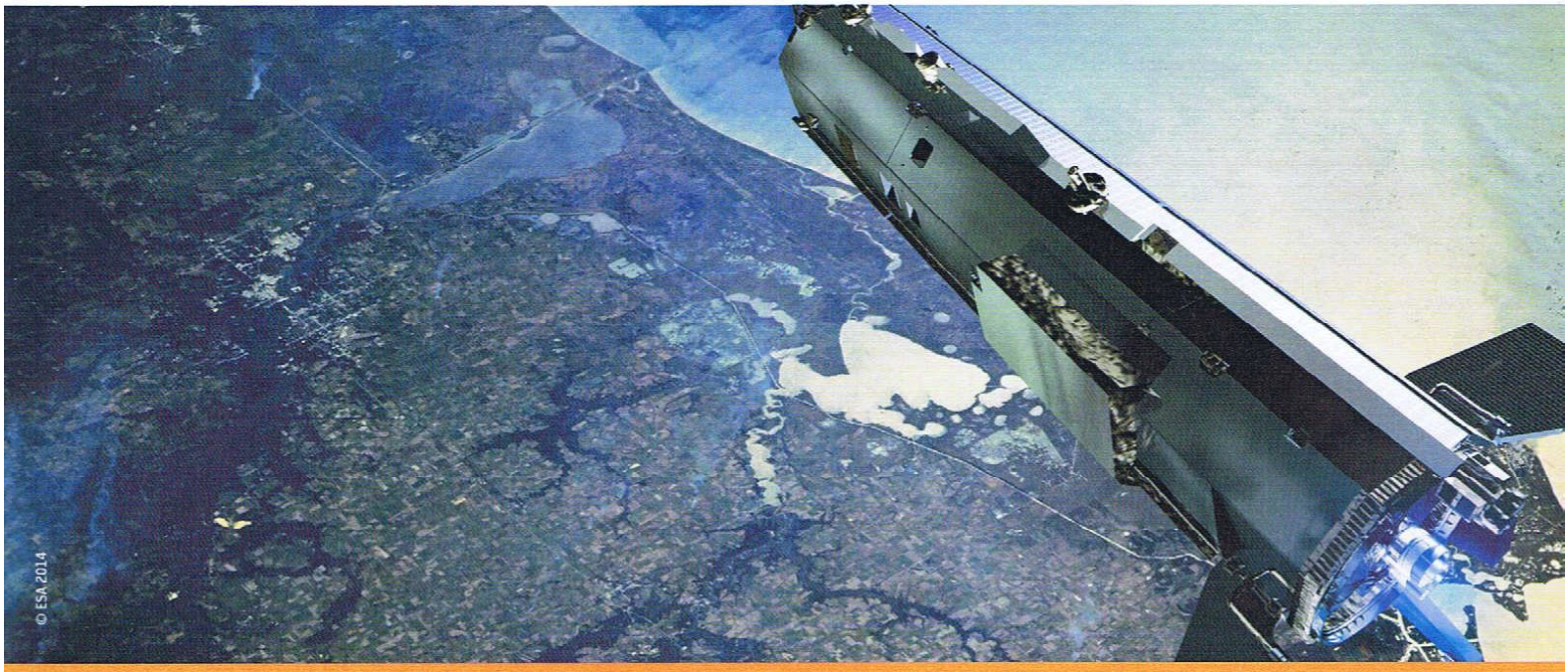
→ 5th INTERNATIONAL GOCE USER WORKSHOP



ABSTRACT BOOK

25–28 November 2014 | UNESCO | Paris, France

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ision despite funding problems and lack of nd data.

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etermination of sub-crustal stress using GOCE gradiometric data

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sub-crustal stress induced by mantle convection been investigated in the context of various cience studies. The examples can be given, but not limited to the interpretation and better erstanding of deep earthquake mechanisms, anism, subduction, mantle convection, heat flow, perlite magmatism, ore concentration and onic and magnetic features. The gravimetric data also be used for determination of this stress. , our goal is to develop some theories for ing the gravity field and steady-state ocean lation explorer (GOCE) gradiometric data to such ess. The method of S function with numerical rentiation will be used for this purpose. hermore, the developed theory will be applied sub-crustal stress determination in Iran, which erienced lots of Earthquakes and contains 8 anos. Good agreements are seen between the s pattern and the distribution of volcanos and tectonic boundary between the Eurasia and ian plates.

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dated Hungarian gravity field solution based on fifth generation GOCE gravity field models

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ESA's GOCE satellite has contributed a lot to desy, providing a knowledge of the global gravity with an unprecedented resolution. With the pletion of the satellite's mission fifth generation ity field models are available from the ESA's E High Processing Facility. No GOCE gravity field el has been derived for regionally Hungary so far. ce our contribution is an updated gravity field tion for Hungary. The solution strategy is nodologically the same as of our previous 108-based model, including terrestrial gravity data (DOV, gravity anomaly, surface gravity gradients) in a Least Squares Collocation process. We've replaced the EGM08 model with GOCE gravity field information in the spectral band where GOCE's gravity field signal content is high. The updated model has been evaluated in comparison with the previous EGM08 based model and conclusions have been drawn on the performance of the new GOCE based Hungarian gravity field model.

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Contribution of the GOCE gradiometer components to regionally-derived gravity field solutions

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[1]Institute of geodesy

The contribution of the GOCE ultra-sensitive gravity gradients to regionally derived gravity field solutions is investigated here. We employ the spherical radial base functions to analyze the gravity field over Amazon as our target region. In the first step, four individual solutions based on the more accurate components Txx, Tyy, Tzz and Txz are derived. Results show, that the Tzz component gives better solution among others despite its less accuracy compared to Txx and Tyy. In the next step, we derived additional solutions based on all possible combination of the gradient components. The Tzz component is shown to be the main contributor in all combined solutions whereas the Txz adds the least values to the solutions. Results will be given and discussed in detail.

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Improvement of latvian geoid model using gnss/levelling, GOCE data and vertical deflection measurements

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Development of a digital zenith telescope prototype, improved zenith camera construction and analysis of experimental vertical deflection measurements for the improvement of the Latvian geoid model has been performed at the Institute of Geodesy and Geoinformation, University of Latvia. At first, the prototype camera has been constructed and tested. Original optical system, zenith camera construction design and control and data processing software was

developed and hardware components were integrated. A number of observation sessions were performed in Riga and outside Riga and a huge amount of observation data has been processed in order to evaluate prototype zenith camera properties, such as influence of fundament vibrations, convection, background lights, to find optimal structure of observation sessions. According to obtained results the design of improved zenith camera construction, based on acquired experience, has been completed. Expected accuracy of vertical deflection measurements is about 0.1". An experimental geoid model computation has been performed. Data from GO_CONS_GCF_2_DIR_R4 - Earth's gravitational field model obtained by GOCE satellite was used to compute geoid model for the for the Riga region. The mean square error for this geoid model, according to the GNSS/levelling data, is equal to 5 cm. European gravimetric geoid model EGG97 and 102 data points of GNSS/levelling was used as input data in the calculations of Latvian geoid model. RMSE value of the obtained model is 1.6 cm. In order to increase scientific capacity and professional cooperation Sciex (Switzerland grant) project "REG - Research on Earth Gravity by zenith cameras" for zenith camera collocation is commenced. Additional vertical deflection field measurements and inclusion of more dense GNSS/Levelling data will be performed for the geoid improvement in coming year. The task now is to acquire a representative set of real observations as a proof of digital zenith camera's qualities and capacity and implement the obtained vertical deflection measurements, GNSS/leveling data and GOCE gravity data in calculations of Latvian geoid model.

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An evaluation of recent GOCE geopotential models in Brazil

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Several global geopotential models based on Gravity field and steady-state Ocean Circulation Explorer (GOCE) have been published in the last few years. Some of these models use combinations of different satellite missions, while others use only GOCE data. This paper presents the evaluation and analysis of each approach using GOCE data in Brazil. Two assessments have been made. The height anomalies derived from GOCE-based models with the geoidal heights from 1112 GPS stations on leveling benchmarks (GPS/BM) have been compared. The RMS difference for go_cons_gcf_2_dir_r5 (n=m=300) is 0.668 m; for go_cons_gcf_2_tim_r5 (n=m=280) 0,664 m; for goco03s, (n=m=250) 0.665 m; for gogra04s (n=m=230) 0.662 m; for jyy_goce04s (n=m=230) 0.664. Finally for eigen-6c3stat (n=m=1949) the RMS difference is 0.599m. The second evaluation dealt with the comparison in terms of gravity disturbances between terrestrial gravity data and the models. The results, in terms of RMS, are 19.065 mGal; 19.135 mGal, 20.327 mGal, 19.710 mGal and 19.065 mGal, respectively; the eigen-6c3stat resulted in 10.198 mGal. The only-satellite models showed close results with GPS/BM and terrestrial gravity data. The largest differences in terms of GPS/BM are in the northeast and north of the country. The GOCE-based models show an improvement in the mean wavelength.

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Poster Session 5: Aeronomy / Novel applications

GOCE Observations of the Topside Ionosphere

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[1]IPGP

During last several decades dual frequency GPS measuring technique is well proved and widely used for studies of the near-Earth plasma environment. The ionized atmosphere surrounding the Earth at the altitudes' range of about 80-100 km up to 3-5 RE represents a dispersive medium for the GPS signals which propagate through the oxygen-dominated plasma of the ionosphere and the tenuous hydrogen-dominated plasma of the plasmasphere on their way to a GPS receiver. Low Earth Orbit (LEO) satellites, as an essential part of multi-instrumental research of the upper atmosphere, can provide the unique measurements from the satellite altitude. LEO satellites with high inclination orbit can cover areas such as oceans, deserts with absence of ground-