

NGDM 2016 - New Geotechnologies for Disaster Management



Prague, Czech Republic, April 12-13, 2016. The registration and the other information related to the conference you can find on: <http://p-insar.cz/ngdm2016>

Program:

Tuesday, April 12

9:45 - 10:30h - Registration

10:30 - 10:40h Opening Remarks

Pavel Novák

10:40 - 12:00h

On dynamics of the Earth's gravitational field

Pavel Novák, Michal Šprlák, Martin Pitoňák

Czech Republic

Classical and Advanced Methods of Photogrammetry and Remote Sensing for Deformations Monitoring

Karel Pavelka

Czech Republic

Advanced Monitoring Systems for Landslide Risk Reduction in the Siq of Petra (Jordan)

Giorgia Cesaro, Marco Brini, Giuseppe Delmonaco

Jordan, Switzerland, Italy

Leica Geomos Monitoring Solution – Technology and Use Cases

Daniel Šantora

Czech Republic

12:00 - 13:00h - Lunch Break

13:00 - 14:00h

Deformation Monitoring Using Single-Frequency GNSS Technology

Tamás Horváth, Jürgen Alberding

Germany

Deformations of the Bohemian Massif - Measurements, Data Processing and Interpretations

Vladimír Schenk, Zdenka Schenková

Czech Republic

Application of GNSS Technology for the Detection of Post-Seismic Deformation

Jan Kostecký, Jakub Kostecký

Czech Republic

14:00 - 14:15h - Coffee Break

14:15 - 15:15h

Ground Based Interferometry Radar (IBIS) for Soil and Structure Monitoring

Simone Cerella, Francesco Boscagli

Italy

Experiences with Determining of Horizontal Movements of High-rise Buildings and Constructions Using Ground Radar Interferometry

Milan Talich, Jan Havrlant, Ondřej Böhm, Filip Antoš

Czech Republic

Possibilities of Determining Vertical Deflection of Bridge Structures Using Ground Radar Interferometry

Milan Talich, Jan Havrlant, Ondřej Böhm, Filip Antoš

Czech Republic

18:00 - Diner at the restaurant - If anybody like to avail the dinner at the restaurant in Old Prague City (not included in the fee) then please send an e-mail with this note to the Milan.Talich@utia.cas.cz

Wednesday, April 13

9:00 - 10:00h

Estimation of Spatial-Temporal Distribution of Atmospheric Parameters from GNSS Observations
Monitoring System of Tropospheric Water Vapor in the Western Transborder Zone of Ukraine
GNSS Application to Real-Time Atmosphere Monitoring in the Carpathian Region

10:00 - 10:15h - Coffee Break

10:15 - 11:35h

Synthetic Aperture Radar for Critical and Strategic Monitoring in Natural and Engineered Slope
The using of Ground-based InSAR technique for the deformation monitoring of dams
Monitoring of Turag River Dyke Using Ground Penetrating Radar (GPR): a New Approach of Flood Risk Reduction in Dhaka City, Bangladesh
Multitemporal Monitoring of Karvina Subsidence Troughs Using Sentinel-1 Interferometry

11:35 - 11:50h - Coffee Break

11:50 - 12:50h

The strain analysis as a tool for the deformations analysis obtained from geodetic measurements
Estimation of Deformation Tensor on a Hazardous Object under Interferometric SAR Monitoring
Residual-state creep failure prediction model to understand the creeping behavior of clayey soils

12:50 - 13:00h - Closing Remarks

13:00 - 14:00h - Lunch

Nataliya Kablak, Oleksandr Reity, Mykola Kalyuzhnyi, Oleksandr Shulga	Ukraine
Stepan Savchuk, Fedir Zablotskyy, Ambrus Kenyeres, Tivadar Horvath	Ukraine, Hungary
Nataliya Kablak, Oleksandr Reity, Ivan Kalynych, Stepan Savchuk, Ambrus Kenyeres	Ukraine, Hungary

S. Cerella, M. Donati, G. Funaioli, F. Meloni	Italy
Milan Talich, Michal Glöckner, Jan Havrlant, Ondřej Böhm, Lubomír Soukup, Ondřej Michal	Czech Republic
Reshad Md. Ekram Ali, Salma Akter, Mohammad Zohir Uddin, Shahtaj Karim, Rajinder Kumar Bhasin, Fannian Kong	Bangladesh
Milan Lazecky, Eva Jirankova, Pavel Kadlecik, Michala Drozdova	Czech Republic

Milan Talich	Czech Republic
Lubomir Soukup	Czech Republic
Deepak Raj Bhat, Ryuichi Yatabe	Nepal, Japan

Pavel Novák

ESTIMATION OF SPATIAL-TEMPORAL DISTRIBUTION OF ATMOSPHERIC PARAMETERS FROM GNSS OBSERVATIONS

Nataliya Kablak, Oleksandr Reity, Mykola Kalyuzhnyi, Oleksandr Shulga

Abstract

This paper presents the concept of exploitation of networks of active reference GNSS stations for remote sensing of atmosphere to determine the water vapour content in atmosphere as one of the main factors defining weather. Uzhhorod National University in cooperation with the Research Institute "Mykolayiv Astronomical Observatory" has developed the set of programs to estimate spatial-temporal distribution of zenith tropospheric delays (ZTD) obtained from GNSS measurements by means of network of permanent stations. As a universal method of function interpolation on a regular grid in arbitrary dimensions the modified Shepard's method is applied. Using the method of least squares the software is developed to estimate the linear dependence of ZTD on latitude and longitude, as well as the linear, quadratic and exponential dependences of ZTD on altitude. For each of these three functional dependences the algorithms of making ZTD isosurfaces are mapped to the software. In addition, the software for estimating the integrated water vapour (IWV) content based on ZTD measurements is developed taking into account the meteorological observations at sites of permanent GNSS stations. The software package is written in C++ and Python languages and tested basing on ZTD measurements within Ukrainian network of active reference GNSS stations ZAKPOS-UA-EUPOS.

Keywords GNSS, Active Reference Station, Zenith Tropospheric Delays, Integrated Water Vapour.

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