

EUREF Symposium 2015



National report of Slovakia 2015

Branislav Droščák, Karol Smolík, Miroslav Roháček, Miroslav Steinhubel ¹⁾, Juraj Papčo, Marcel Mojzeš, Juraj Janák, Ľubomíra Gerhátová ²⁾

1) Geodetic and Cartographic Institute Bratislava

2) Slovak University of Technology in Bratislava, Faculty of Civil Engineering,
Department of theoretical Geodesy

EUREF 2015, annual symposium
3-5.June 2015, Leipzig, Germany



Outline

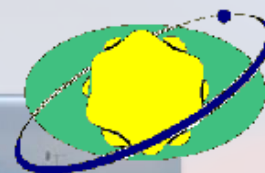
- Slovakian activities and contributions to EPN
- Status, activities and news from
 - **SKPOS** (Slovak real time positioning service)
 - national levelling network
 - national gravimetric network
- Research and development
 - Activities of Geodetic and cartographic institute
 - Activities of Slovak university of Technology
- Other news from Slovakia

Slovakian activities and contributions to EPN

EPN Operational centers



Geodetic and Cartographic Institute
Bratislava (GKÚ)

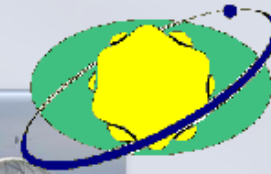


Slovak University of Technology in
Bratislava (SUT)



Slovakian activities and contributions to EPN

EPN Local analysis center



EUREF LOCAL ANALYSIS CENTRE	
Agency acronym	: SUT
Institution	: Slovak University of Technology
Mail Address	: Department of Theoretical Geodesy : Faculty of Civil Engineering : Radlinského 11, 813 68 Bratislava : Slovakia
Primary Contact	
Contact Name	: Jan Hefty
Telephone	: + 421 2 5927 4533
Fax	: + 421 2 5292 5476
E-Mail	: jan.hefty@tuba.sk
Secondary Contact	
Contact Name	: Martina Míňariková
Telephone	: + 421 2 5249 8047
Fax	: + 421 2 5292 5476
E-Mail	: martina.minarikova@tuba.sk
Third Contact	
Contact Name	: Miroslava Haque Igondova
Telephone	: + 421 2 5249 8047
Fax	: + 421 2 5292 5476
E-Mail	: miroslava.igondova@tuba.sk
Software Used	: Bernese GPS Software, v. 4.2, BPE (until 1339 week) : Bernese GPS Software, v. 5.0, BPE (since 1400 week)

Slovak University of
Technology in Bratislava
(SUT)

Slovakian activities and contributions to EPN Permanent stations contribution


EPN CB HOME

EUREF PERMANENT NETWORK


GNSS Res

ORGANISATION	NETWORK & DATA	PRODUCTS & SERVICES	DOCUMENTATION	NEWS
About Group	Station list Maps Tracking status Data access Proposed stations Station log submission Station submission	Data analysis Positions & velocities Tropospheric delays ETRF/ITRF transformation Position time series Satellite orbit & clock correction streams	Formats Guidelines Equipment & calibration Papers FAQ	News FTP


MOPI




MOP2



GANP



BBYS



Map showing the EPN Permanent Network stations in Slovakia and surrounding regions. Red circles highlight the locations of MOPI, MOP2, GANP, and BBYS. The map includes labels for cities like Bratislava, Košice, and Budapest, and various EPN station identifiers (e.g., E462, E65, E75, E58, E71, E59).

Antenna manufacturer: 3S NAVIGATION AOA ASHTECH

Update map

Údaje map ©2015 GeoBasis-DE/BKG (©2009), Google 50 km Zmluvné podmienky

Slovakian activities and contributions to EPN Permanent stations contribution

GANP



EPN CB HOME

EUREF PERMANENT NETWORK

ROB *****
GNSS RESEARCH GROUP *****



BBYS



ORGANISATION	NETWORK & DATA	PRODUCTS & SERVICES	DOCUMENTATION	NEWS, EVENTS & LINKS
About Components Working groups Management Contributors Collaborations Site map	Station list Maps Tracking status Data access Proposed stations Station log submission Station picture submission	Data analysis Daily/weekly positions Positions & velocities Tropospheric delays ETRF/ITRF transformation Position time series Satellite orbit & clock correction streams	Formats Guidelines Equipment & calibration Papers FAQ	News Mails Calendar Workshops FTP server Web history Links

NETWORK & DATA > STATION LIST

As of 21 May 2015, 266 permanent GNSS tracking stations (including 2 inactive) are part of the EUREF Permanent Network.

For a better understanding of the table, see the [legend](#).

Station Identification	Station Location	Data	Receiver Information	Antenna Information	Meteorological Instr.	Additional Information	Station Status
<input type="checkbox"/> Marker Name	<input checked="" type="checkbox"/> City	<input checked="" type="checkbox"/> Quality	<input type="checkbox"/> Type	<input type="checkbox"/> Type/Radome	<input type="checkbox"/> Meteo data	<input type="checkbox"/> Primary data centre	<input type="checkbox"/> Active

Long Station Name	City	Country	DQ (%)		Availability				Latency			Receiver						RINEX 3 data available	Remarks			
			0°	15°	Daily (%)		Hourly (%)		RT (%)	Last Data Available	Hourly (s)	RT (s)	Sat. System									
					BKG	OLG	BKG	OLG					G	R	E	C	J			S		
BBYS00SVK	Banska Bystrica	Slovak Republic	88	94	100	100	97	97	-	2015-05-20	97	96	-	✓	✓	✓	✓	✓	✓	✓	3.02	
GANP00SVK	Ganovce	Slovak Republic	88	96	100	100	98	98	100	2015-05-20	-	96	0.5	✓	✓	✓	✓	✓	✓	✓	3.02	
KIRU00SWE	Kiruna	Sweden	88	100	100	100	100	100	-	2015-05-20	100	99	-	✓	✓	✓	✓	✓	✓	✓	3.02	
WROC00POL	Wroclaw	Poland	95	100	100	89	100	100	100	2015-05-20	100	99	0.4	✓	✓	✓	✓	✓	✓	✓	3.02	
LPAL00ESP	Roque de los Muchachos	Spain	91	100	100	100	99	99	100	2015-05-20	98	96	0.8	✓	✓	-	-	✓	✓	-	-	
STAS00NOR	Stavanger	Norway	94	100	100	100	100	100	100	2015-05-20	0	0	0.8	✓	✓	✓	✓	✓	✓	✓	-	
PRAT00ITA	Prato	Italy	81	99	100	100	100	100	-	2015-05-20	88	83	-	✓	✓	-	-	-	-	-	-	
QAQ100GRL	Qaqortoq / Julianehaab	Greenland	94	100	93	93	97	97	-	2015-05-20	95	92	-	✓	✓	-	-	-	-	-	-	

Slovakian activities and contributions to EPN

EPN Real-time analysis WG

EPN CB HOME

EUREF PERMANENT NETWORK

GNSS Res...

ORGANISATION

About | Components | Working groups | Management | Contributors | Collaborations | Site map

NETWORK & DATA

Station list | Maps | Tracking status | Data access | Proposed stations | Station log submission | Station picture submission

PRODUCTS & SERVICES

Data analysis | Positions & velocities | Tropospheric delays | ETRF/ITRF transformation | Position time series | Satellite orbit & clock correction streams

DOCUMENTATION

Formats | Guidelines | Equipment & calibration | Papers | FAQ

NEWS

News | FTP

NETWORK & DATA > **MAPS**

INTERACTIVE MAP

Legend

Station status (active, inactive, former)

Active Inactive Former

Locate station on map

Select a station -

Antenna manufacturer:

3S NAVIGATION
AOA
ASHTECH

Update

GANP

MOP2

Identification	Equipment	Tracking	Data flow
Marker Name:	GANP		
Marker Number:	11515M001		
Location:	Ganovce, Slovak Republic		
Status:	active		
Networks:	IGS	TOS	ECGN
	yes	no	no
More details:	station information		

Identification	Equipment	Tracking	Data flow
Marker Name:	MOP2		
Marker Number:	11507M002		
Location:	Modra-Piesok, Slovak Republic		
Status:	active		
Networks:	IGS	TOS	ECGN
	no	no	no
More details:	station information		

Slovakian activities and contributions to EPN Monitoring of the official national ETRF coordinates on EPN web (“Elmars activity”)

EPN CB HOME

EUREF PERMANENT NETWORK

GNSS Res

ORGANISATION **NETWORK & DATA** **PRODUCTS & SERVICES** **DOCUMENTATION** **NEWS**

5. POSITIONS PUBLISHED BY THE COUNTRY

The official ETRS89 coordinates used in Slovakia are maintained by **GKU**. This agency is fully responsible for the information kindly provided to the EPN:

Valid (from - to)	epoch t_0	Position (m)			Velocity (m/y)		
		X	Y	Z	V_x	V_y	V_z
111/2012 - now	184/2008	3929181.851	1455236.510	4793653.699	NA	NA	NA
310/2006 - 111/2012	233/2006	3929181.849	1455236.511	4793653.696	NA	NA	NA
310/2006 - 111/2012	184/2008	3929181.850	1455236.509	4793653.700	NA	NA	NA



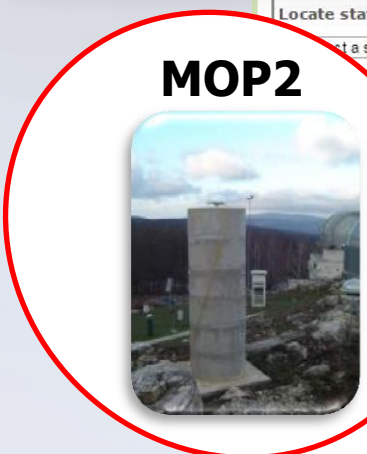
Following a recent initiative of the EUREF Technical Working Group (Monitoring of official national ETRF coordinates on EPN web), the differences between the national coordinates and the latest cumulative EPN solutions (section 1) are regularly monitored. They are given in two maps: [horizontal differences] and [vertical differences].

Active Inactive Former

Locate station on map

Antenna manufacturer: 3S NAVIGATION, AOA, ASHTECH

Update map

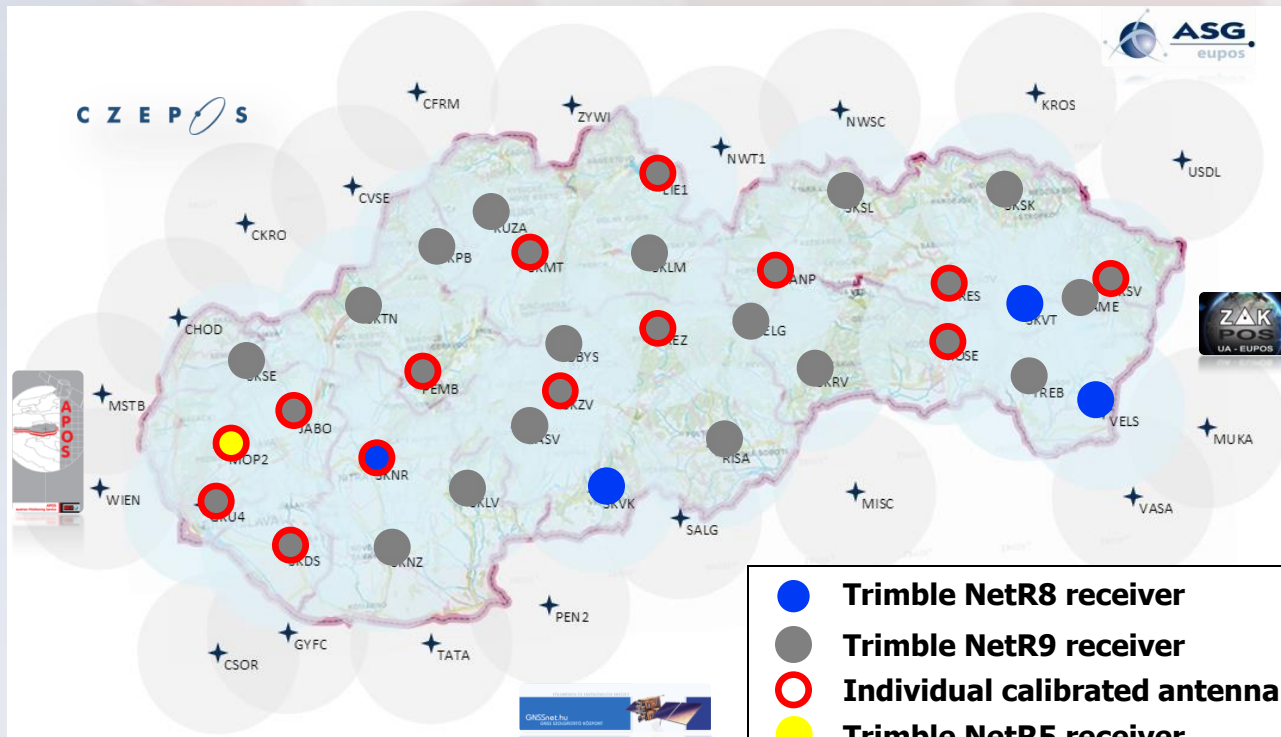




News from national spatial network (GNSS
positioning)

Slovak real time positioning service - **SKPOS**[®] infrastructure (status in May 2015)

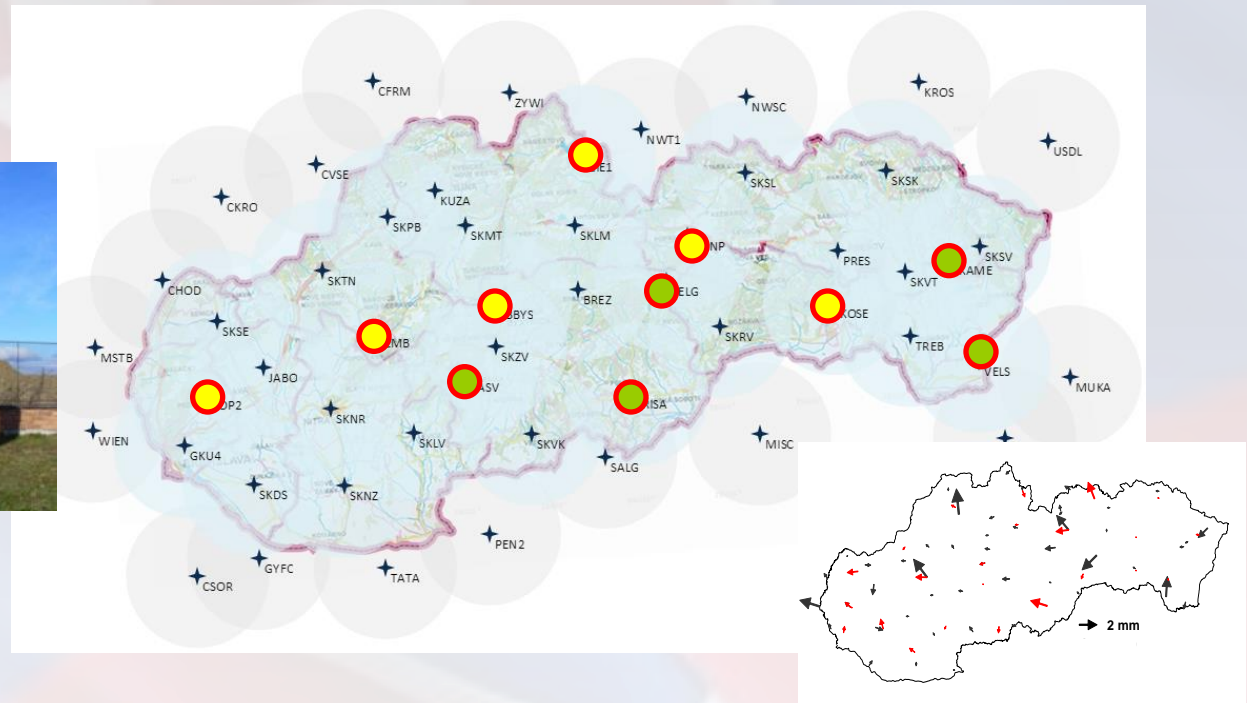
- **33 Slovakian permanent stations (14 individual calibrated)**
 - All stations with TRIMBLE receivers and antennas
 - All stations observe GPS+GLONASS signals (few Galileo)
- **19 foreign permanent stations (APOS, gnssnet.hu, CZEPOS, ASG-EUPOS, ZAKPOS)**



SKPOS[®]

infrastructure for geodynamics research

- 11 from 33 SKPOS[®] permanent stations have monumentation suitable for geodynamic research purposes
 - 6 stations reinforced-concrete pier monumentation
 - 5 stations deep drilled braced mark monumentation (5m deep) – 5 stations

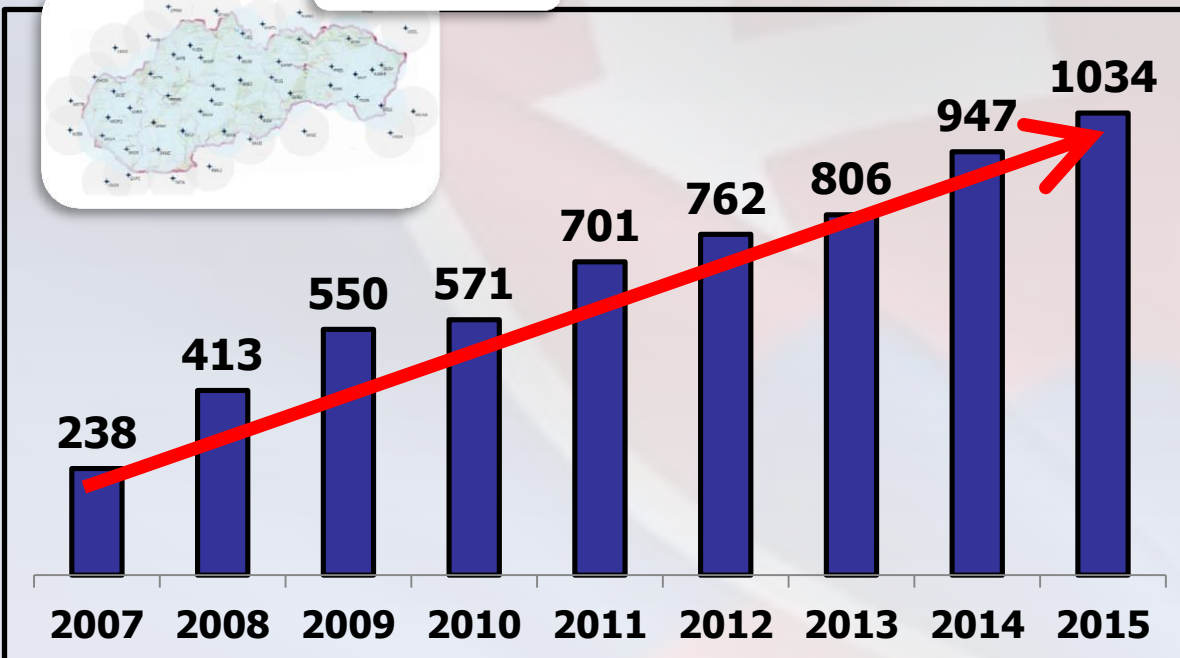


SKPOS®

number of users

- over 1000 registrations (May 2015)
- number is still increasing

SKPOS®

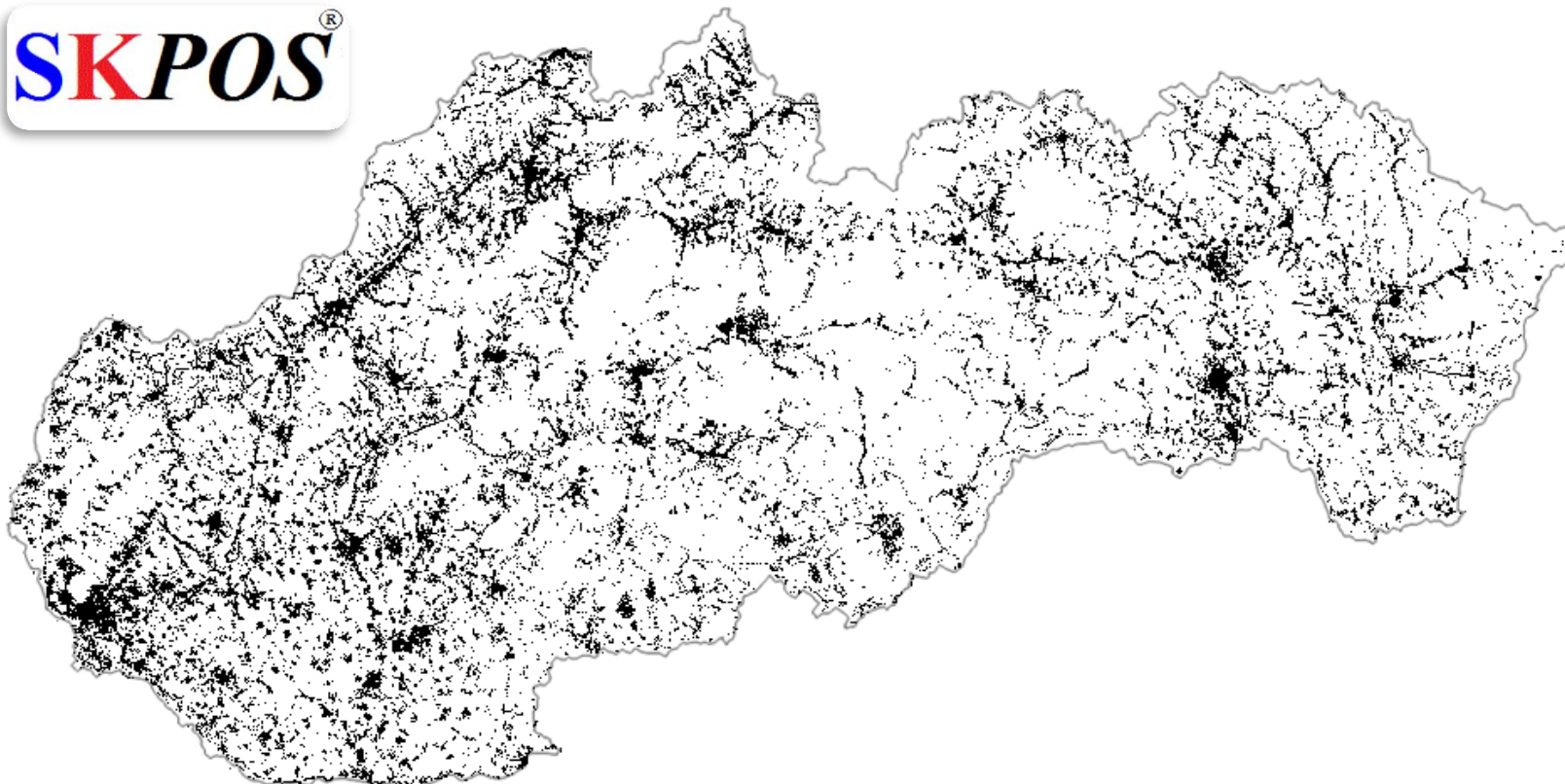


SKPOS[®]

service usage in 2014

- all users logins in 2014

SKPOS[®]



SKPOS®

type of users

- Surveying fields (cadastre, surveying, mapping, GIS) - **92%**
- Other fields - **8%**



SKPOS®

packages – data formats - charges

Package	Content	Duration	Format	Flat rate
SKPOS_mm	RINEX 1000 h	year	RINEX 2.x, 3.x	50 €
<i>New!</i> SKPOS_cm (year)	RTK unlimited + 50 h RINEX RTK 1000 hours	year	RTCM 2.3, 3.1, CMR _x , CMR+	50 €
SKPOS_cm (month)	RTK unlimited	month	RTCM 2.3, 3.1, CMR _x , CMR+	19 €
SKPOS_dm	DGNSS unlimited	year	RTCM 2.1	20 €

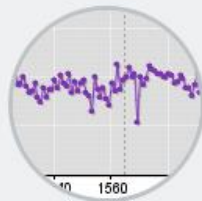
SKPOS®

Applications for analysis and administration



ASMARUP

Analýza inicializačných časov používateľov SKPOS



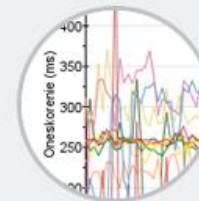
Časové rady

Časové rady referenčných staníc SKPOS



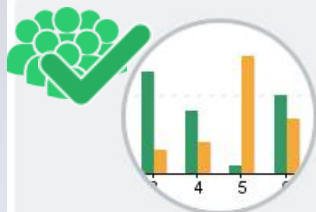
Monitoring používateľov

Počet pripojených používateľov



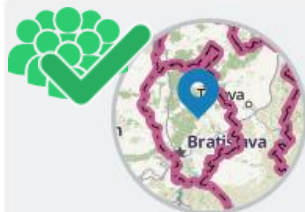
Oneskorenie staníc

Oneskorenie referenčných staníc SKPOS



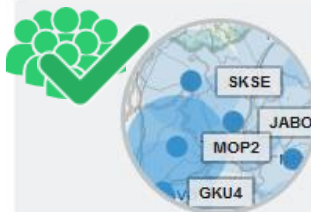
Monitoring sieťového riešenia Desktop

Desktop verzia - Monitoring kvality sieťového riešenia



Monitoring sieťového riešenia Mobile

Mobilná verzia - Monitoring kvality sieťového riešenia



EUPOS monitoring

EUPOS network RTK quality monitoring



NMEA Analyzer

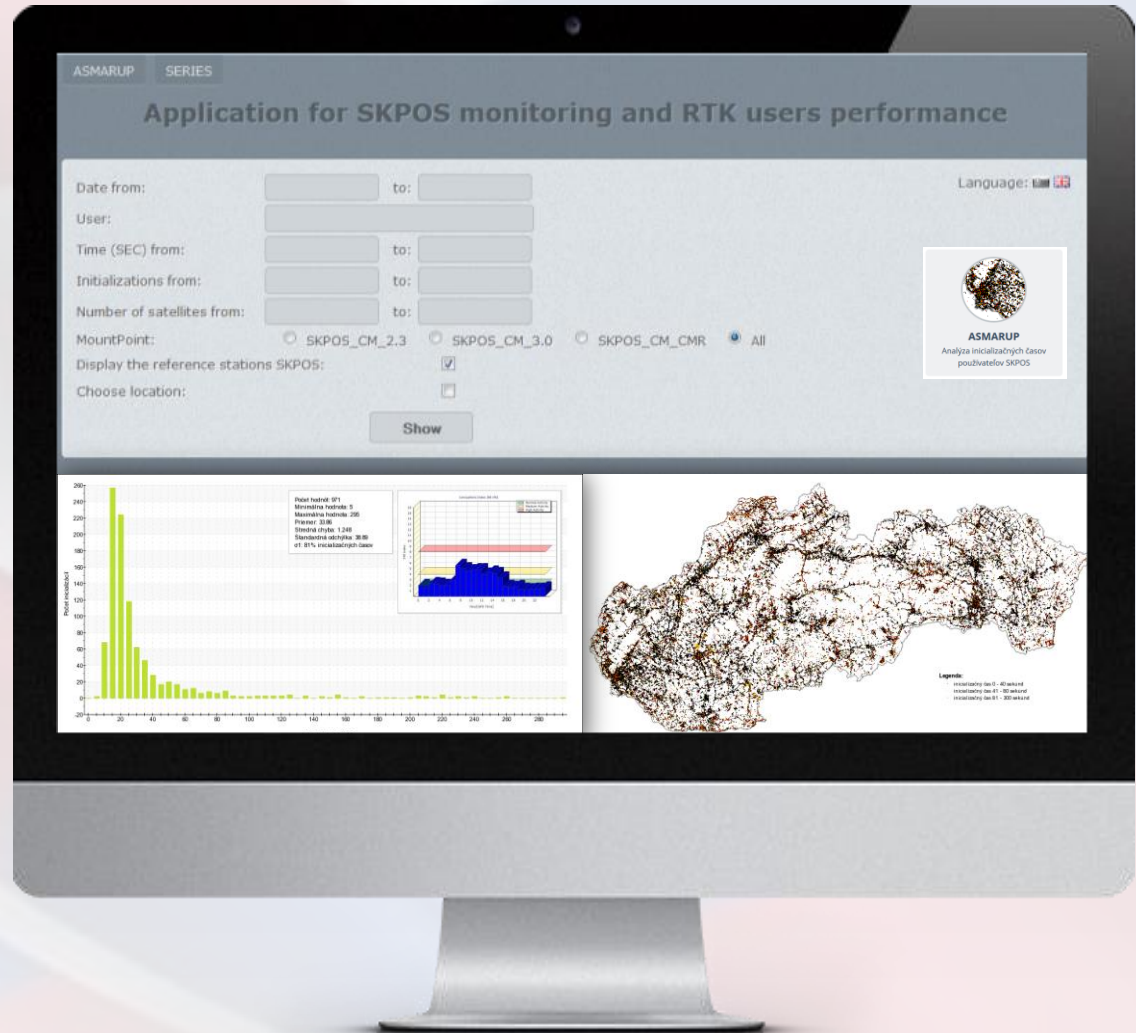
Analýza meraní používateľov z NMEA správy



public available application

Application for SKPOS[®] Monitoring And RTK Users Performance (ASMARUP)

- application for users initialisation times analysis
- analysis enabled according to:
 - date and time,
 - particular user,
 - length of the initialisation time,
 - number of satellites,
 - mountpoint,
 - user position



Application for automatic visualization of **SKPOS**[®] permanent stations time series

- RAW time series input: SINEX from Bernese software
- CLEAN time series input: topocentric coordinates from MathCAD sw



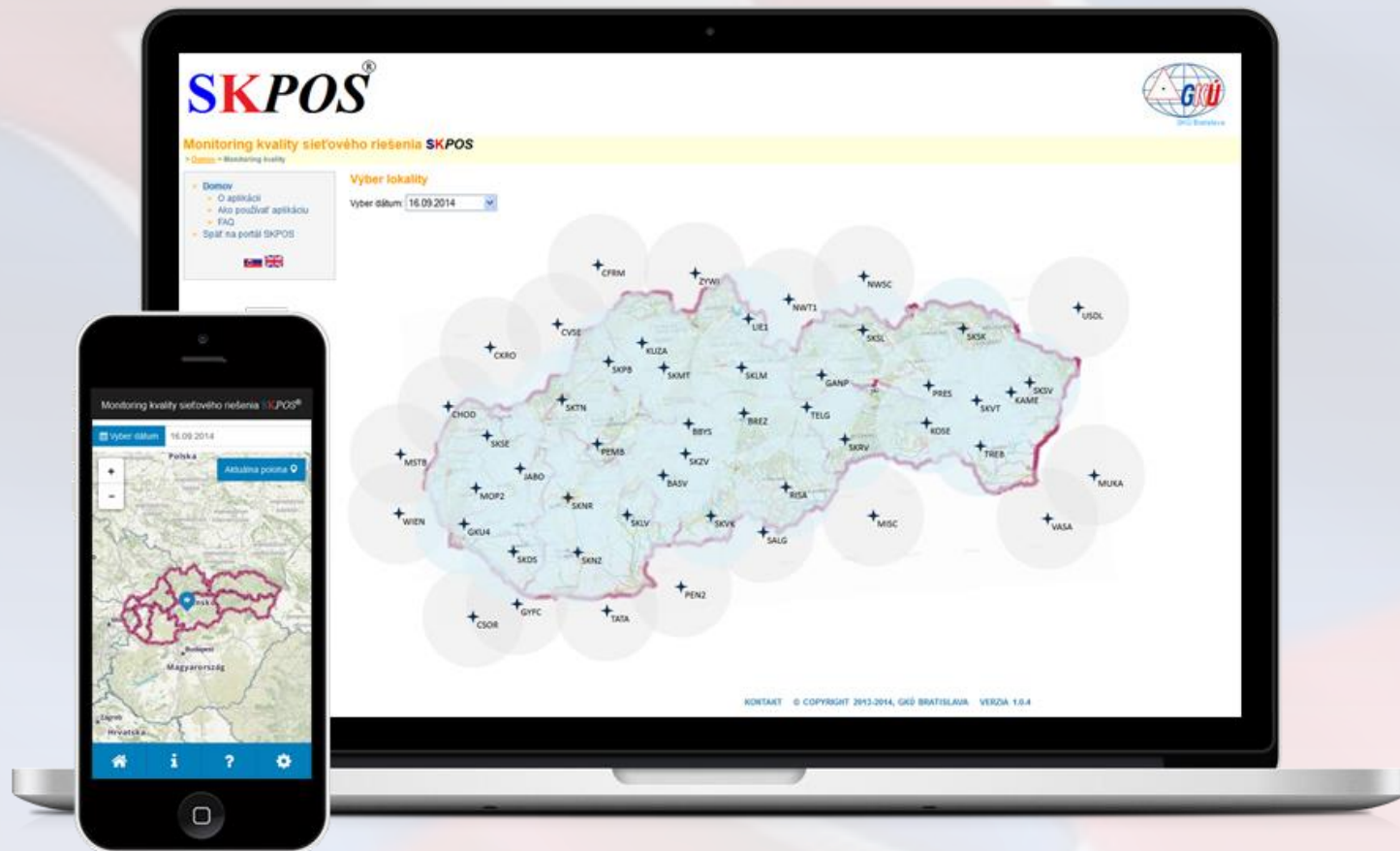
Application „SKPOS[®] network solution quality monitoring“



<http://monitoringSKPOS.gku.sk/m>

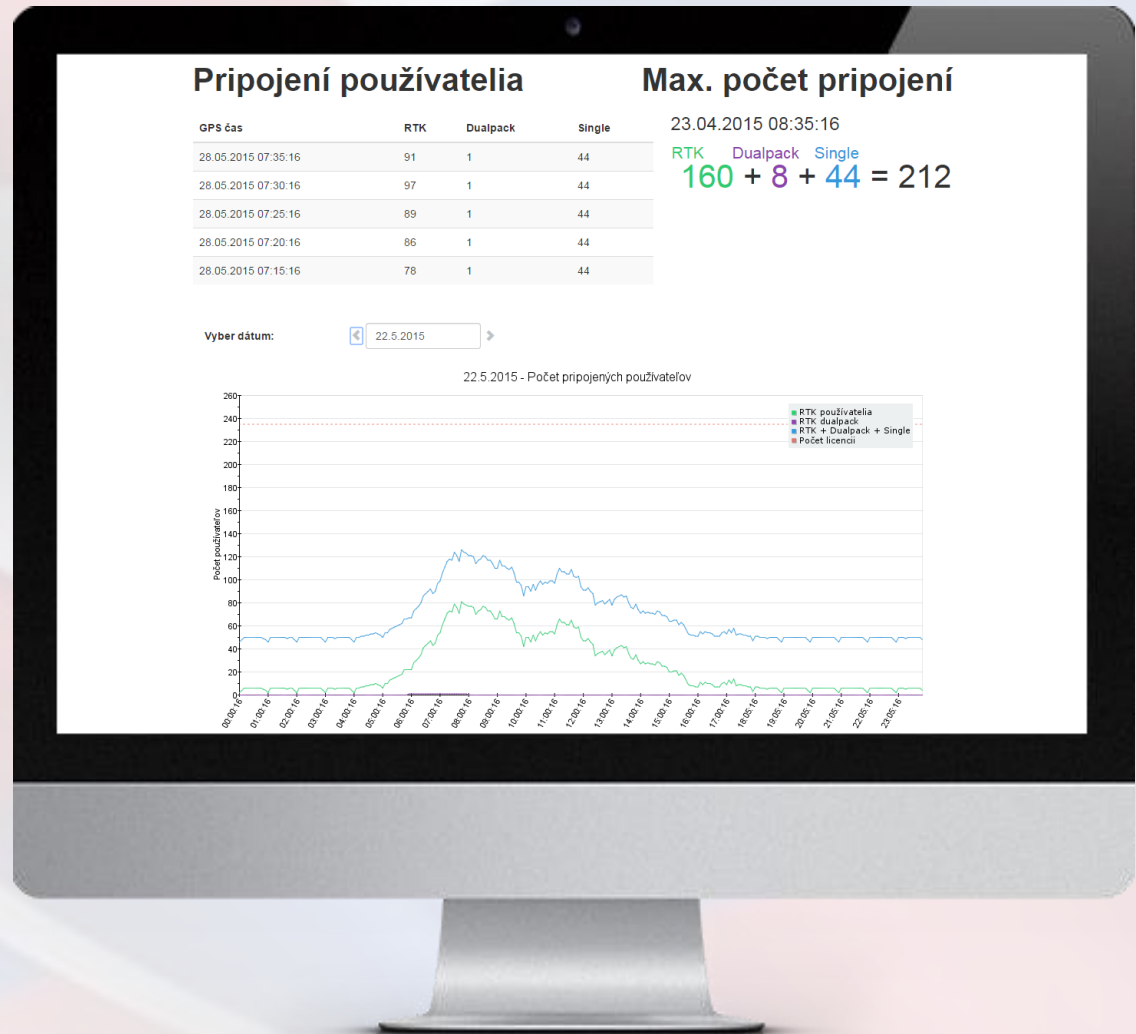


<http://monitoringSKPOS.gku.sk>



Application for Monitoring of number of on-line connected users

- Application visualizes and archives:
 - Number of on-line connected users in graph
 - Maximal number of connected users
 - Graphical history of users connections



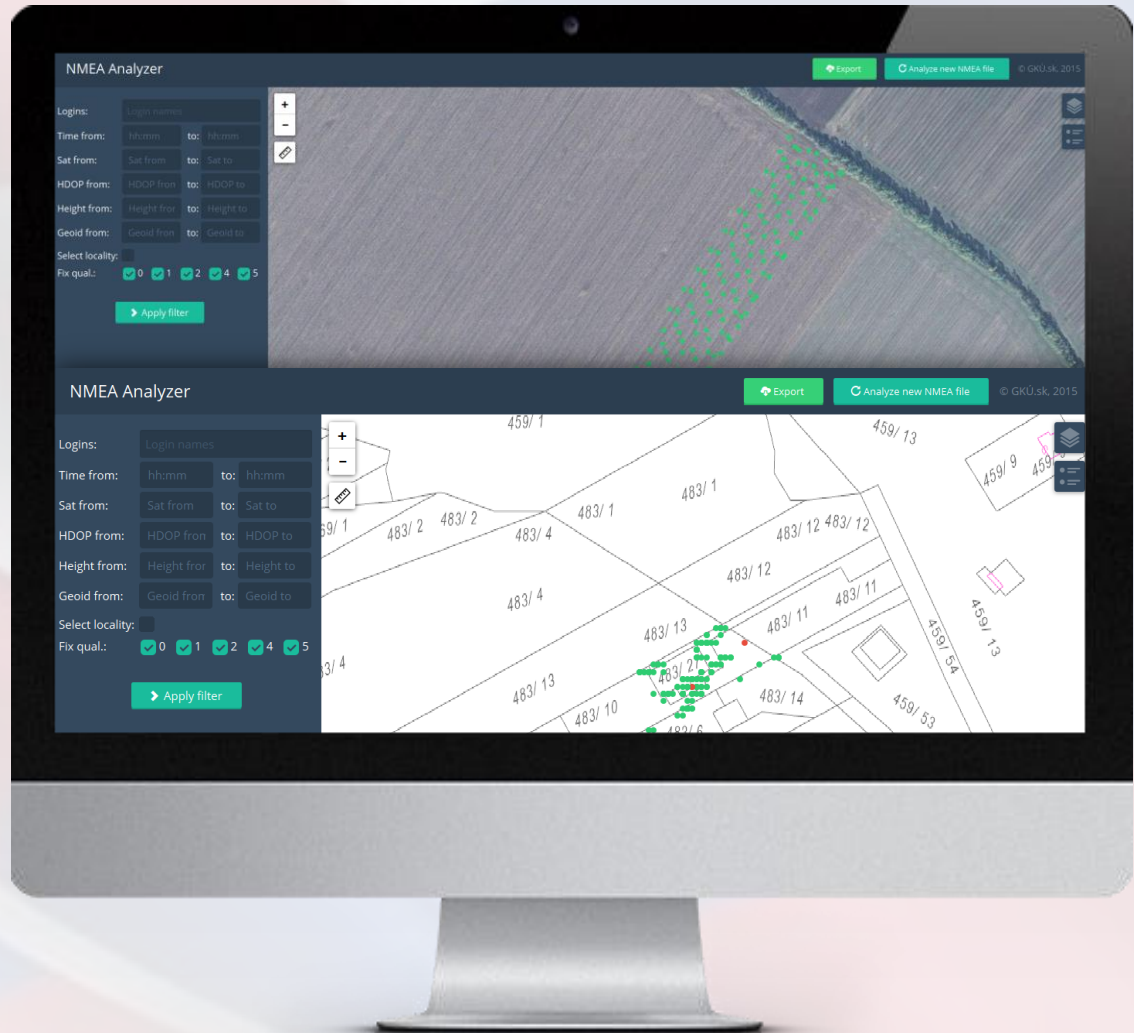
Application for Monitoring of SKPOS[®] permanent station data delay

- All stations monitored
 - Maximal delay values
 - Actual delay values
- Data archived
- Graph of data delays provided



Application „NMEA Analyzer“

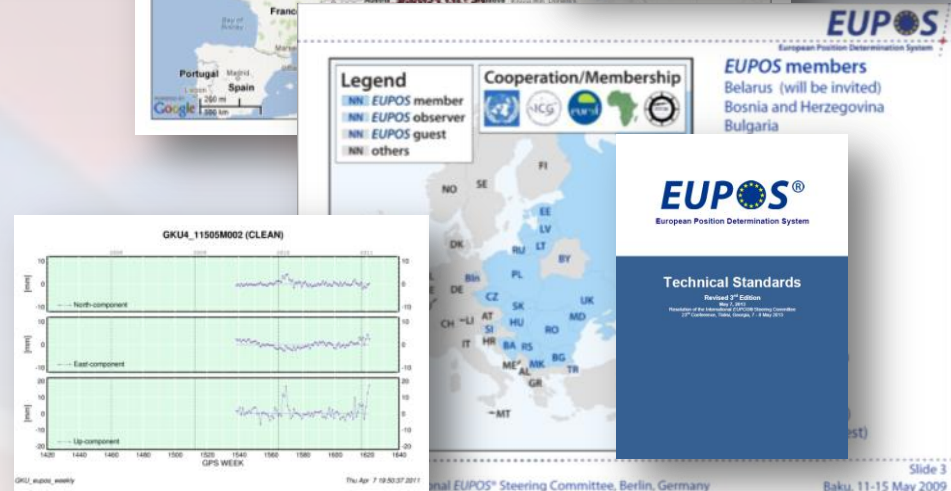
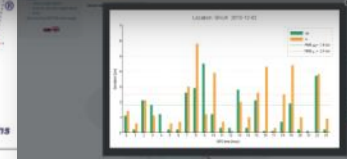
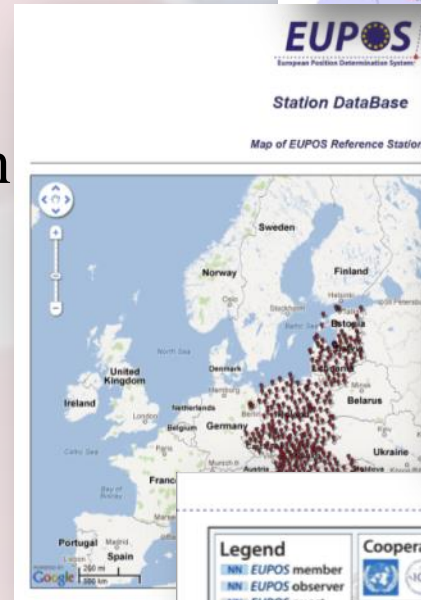
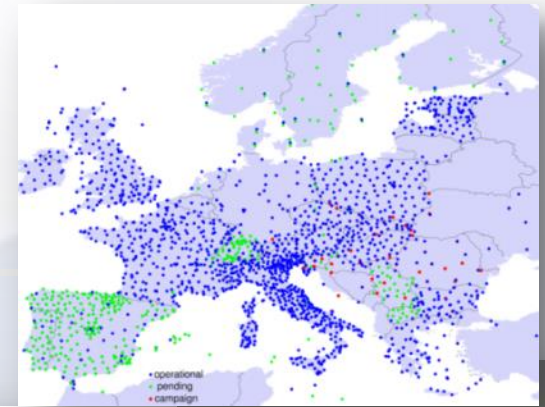
- Application for NMEA data handling
- Application enable:
 - Analyzing
 - Filtering
 - Exporting
 - Visualizing
- Underlay map
 - Terrain,
 - Satellite
 - Cadastral
 - **ZBGIS**[®]
- Color range output (according FIX)



SKPOS[®]

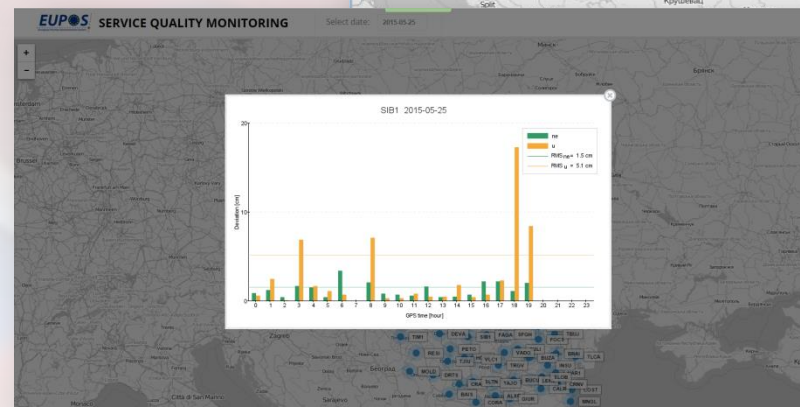
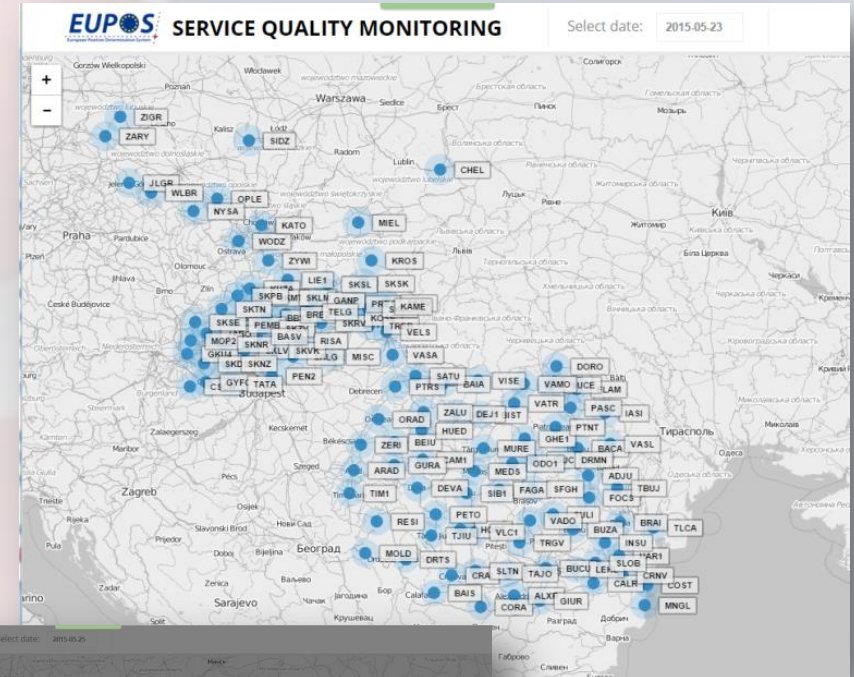
active part of *EUPOS*

- Follows *EUPOS* standards
- Keeps information in *EUPOS* station database
- Contributes to *EUPOS* combination centre (SINEX GKU)
- Leads *EUPOS* WG on Service Quality Monitoring



EUPOS WG on Service Quality Monitoring

- GKÚ Bratislava = administrator of **SKPOS**[®] and *EUPOS* Service Quality Monitoring
- *EUPOS* SQM
 - Application for monitoring of *EUPOS* countries network RTK quality
 - <http://monitoringeupos.gku.sk>





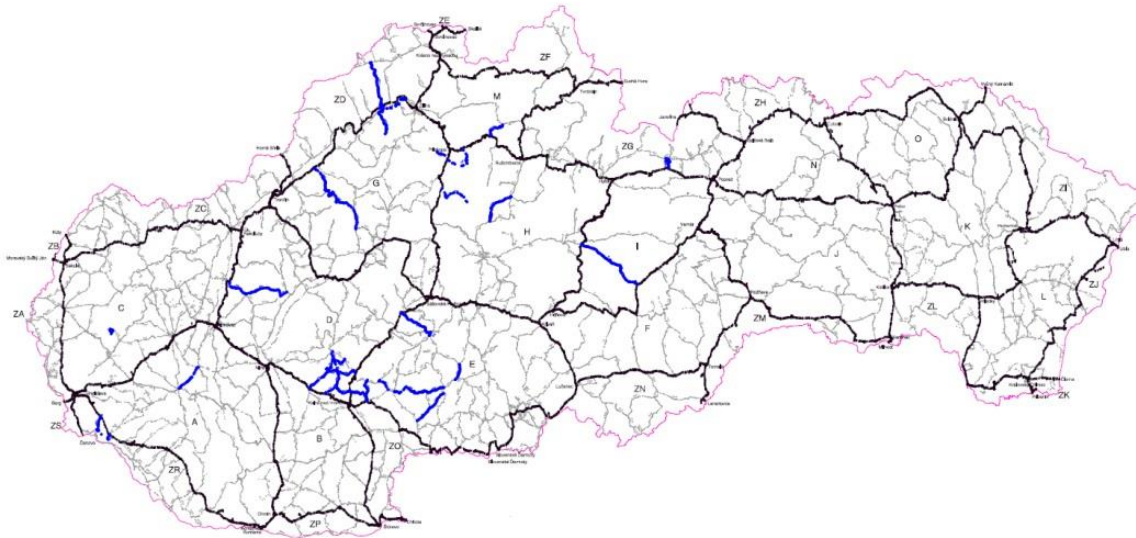
Status, activities and news from national
levelling network

National levelling network (ŠNS)

Measurements on the 2nd order levelling lines

- Measurements in 2014:
 - Totally measured: 601 km
 - 3 levelling groups
- New reprocessing of ŠNS is preparing (Data from 1987 - 2015)

ŠNS 2014

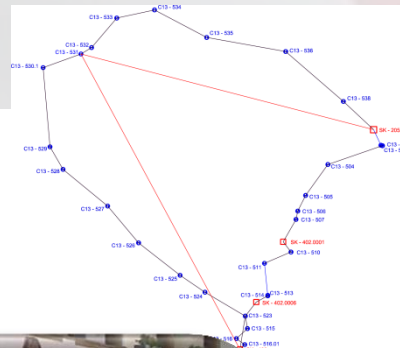




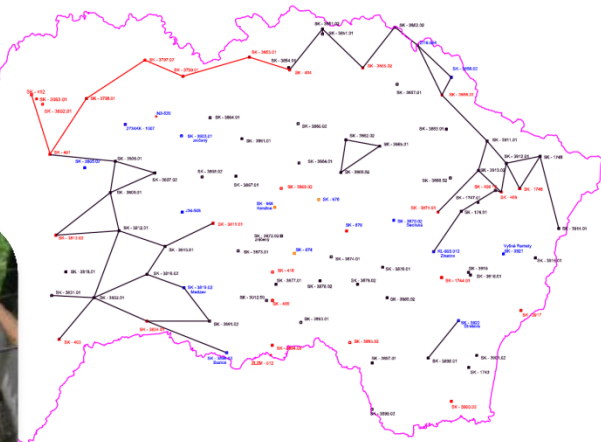
Status, activities and news from national
gravimetric network

National gravimetric network (ŠGS) Relative gravity measurements

- relative measurements on ŠGS network (111 differences)
- 1 measuring group



ŠGS 2014

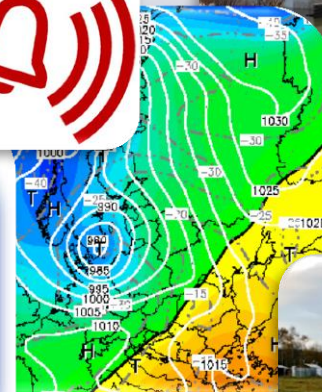
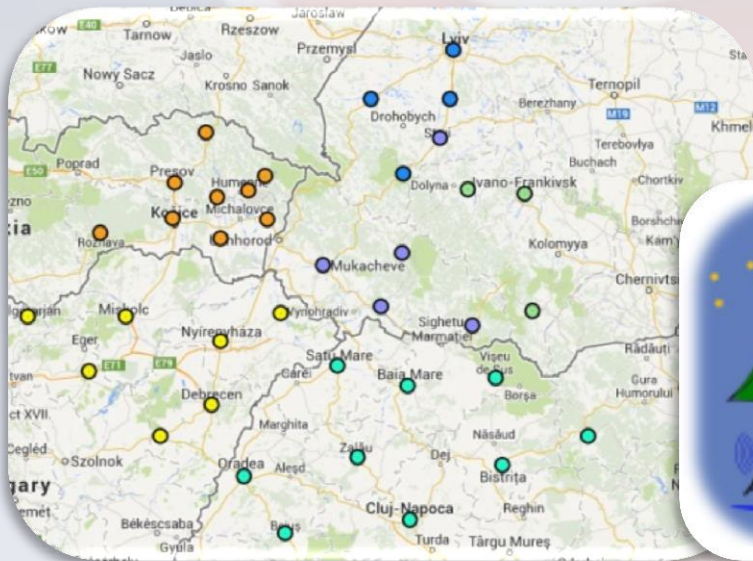




Research and development

Collaboration with Vihorlat observatory Space emergency system

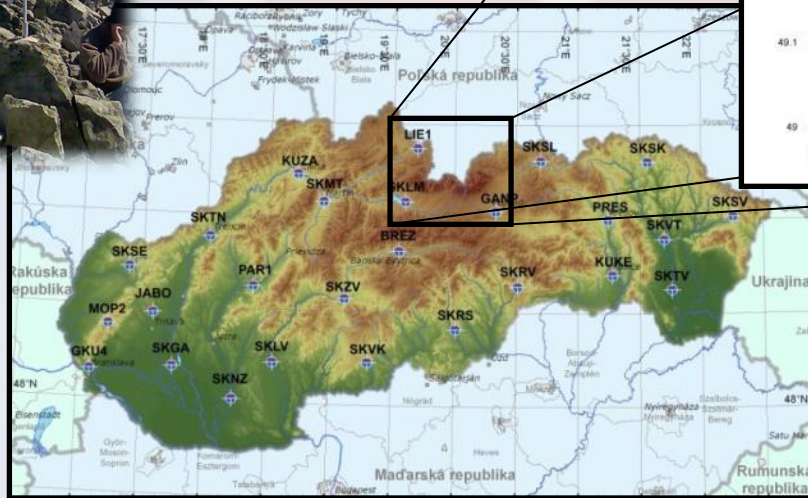
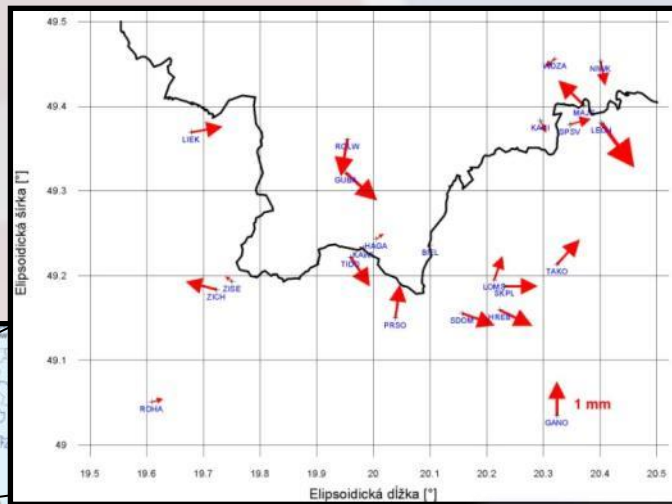
- Multilateral project: Ukraine-Slovakia-Hungary-Romania
- Agreement signed in December 2015
- new KOLS permanent station will be part of **SKPOS**[®]
- goal: creation of Space emergency system
- www.meteognss.net

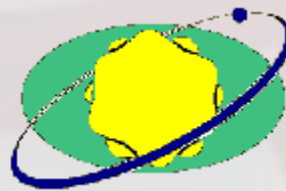


Geokinematics research of Tatra mountains

GNSS Campaign measurement

- Re-measuring of local geodynamics network LGS Tatra
- Method: min. 72 hours GNSS campaign every year from 1998
- Cooperation: Slovakian institutions (TOPU, STU) and Poland TUW
- Processing in Bernese software
- Velocities – in millimeters





Slovak University of Technology
Research and development activities

National center for diagnosing the earth surface deformations in Slovakia

- ITMS research project (<http://www.geokinematika.sk>)
- Surface deformations monitored on 9 geodynamics points by
 - Permanent GNSS stations
 - Absolute gravity measurements

The screenshot shows the website for the National Center for Diagnosing the Earth Surface Deformations in Slovakia. The page includes a navigation menu, a header with logos for the project and funding sources (EU, STU), and a main content area with the following text:

NATIONAL CENTER FOR DIAGNOSING THE EARTH SURFACE DEFORMATIONS IN SLOVAKIA
ITMS: 26220220108
START OF THE PROJECT: 1 DECEMBER 2010 / END OF THE PROJECT: 30 NOVEMBER 2013

ABOUT THE PROJECT

MONITORED SITES NETWORK
The aim of the National Center For Diagnosing the Earth Surface Deformations in Slovakia is to identify the Earth surface deformations on the basis of research results by applying the satellite, gravimetric and tropospheric measurements.

SATELLITE AND GRAVIMETRIC MEASUREMENTS ANALYSIS
The output of the national center is a permanently updated database of earth crust dynamics in Slovakia focused on determination of risk areas for construction and monitoring of large structures.

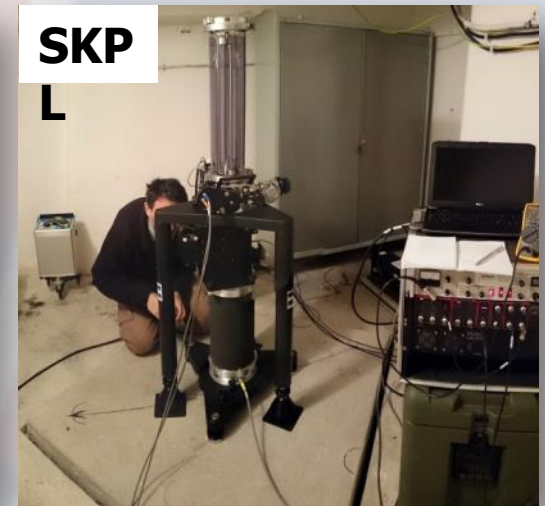
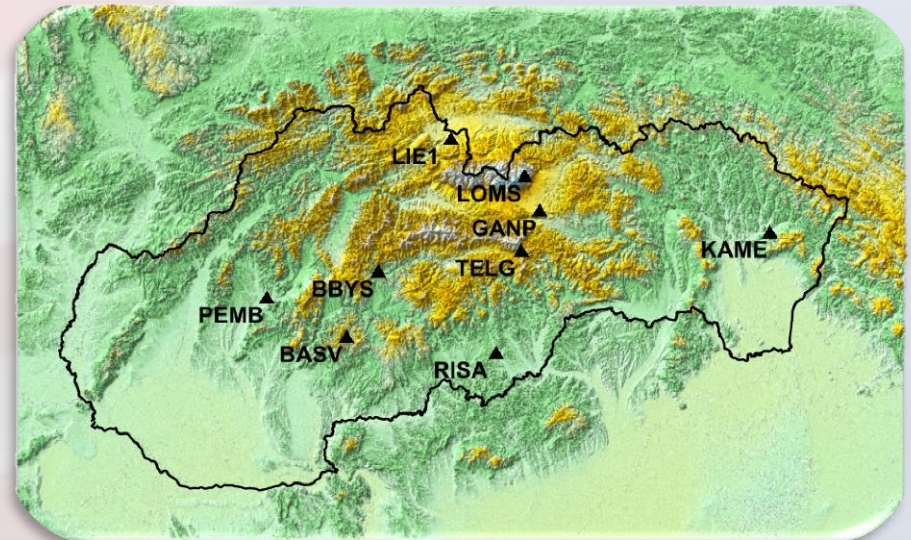
PROJECT OUTPUT
The national center carries out the measurements of geometric and physical variations on the Earth's surface on 9 reference stations of the monitoring network.

CONTACT
The position variations at all sites of the monitoring network are continually tracked by GNSS receivers. On the regular basis, the absolute and relative gravimetric measurements are carried out at the network sites as well as levelling measurements for improving the vertical deformation information.

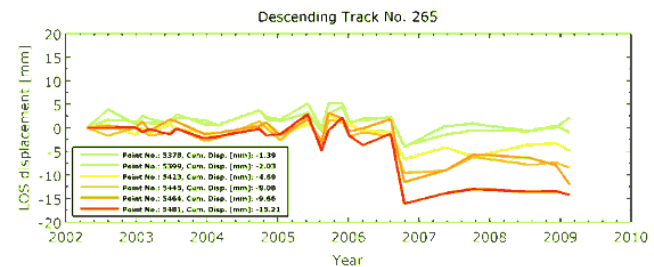
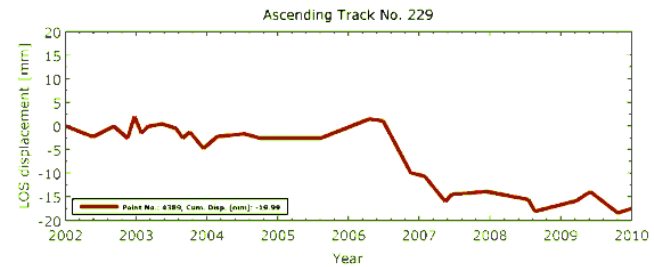
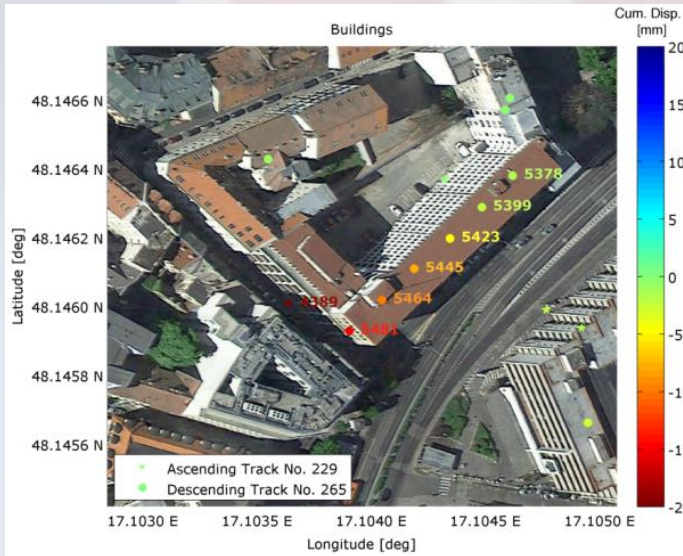
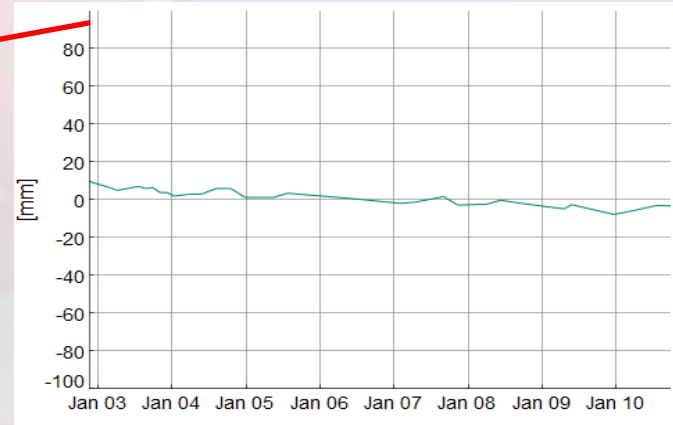


National center for diagnosing the earth surface deformations in Slovakia

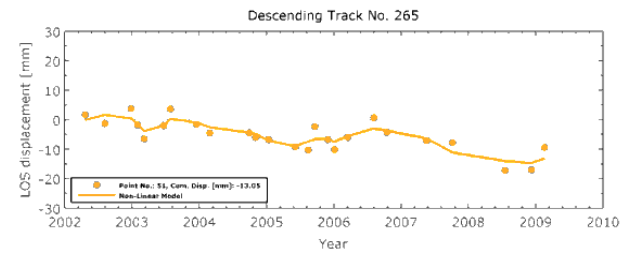
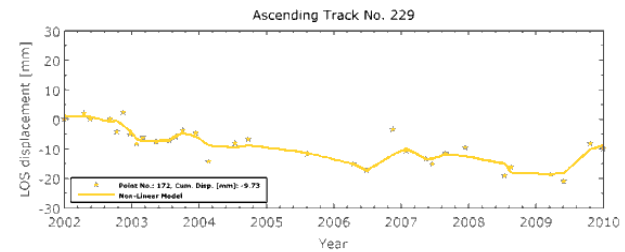
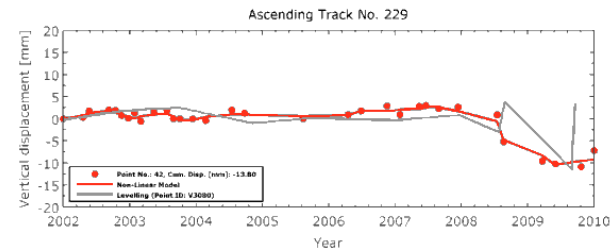
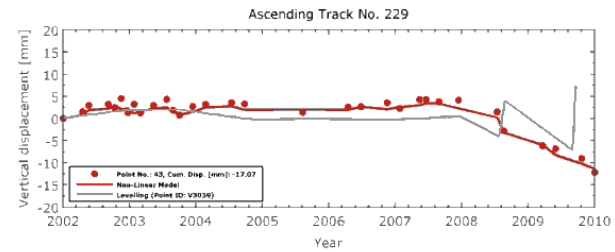
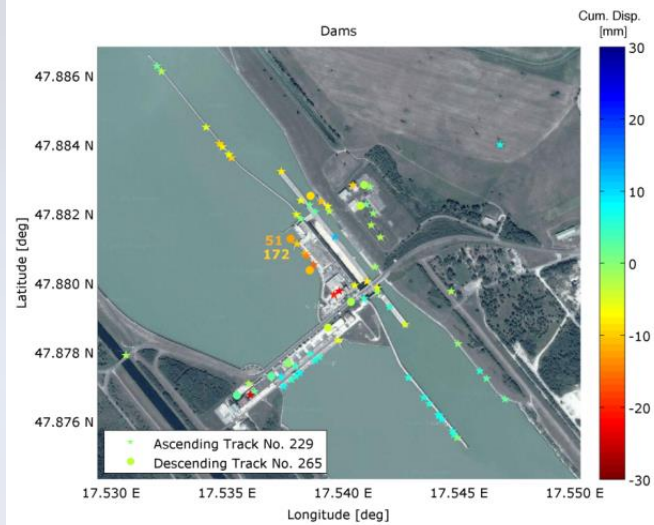
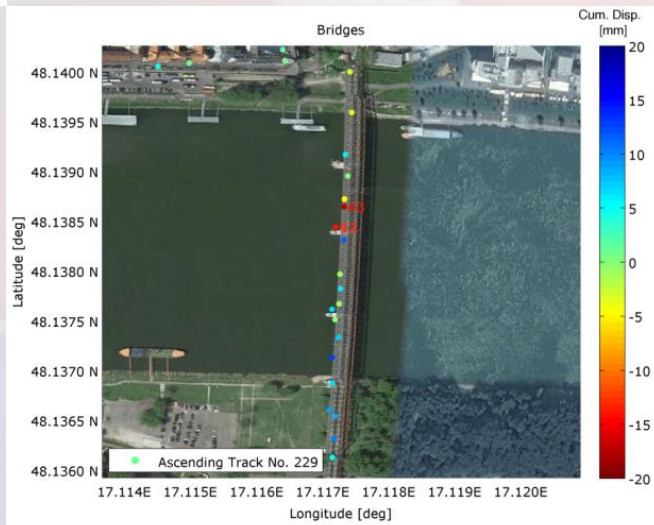
- Repeated absolute gravity measurements
- absolute gravimeter FG5X-247
- 3 campaigns performed:
 - June 2014 - October 2014 - April 2015



Ps InSAR monitoring - urban targets



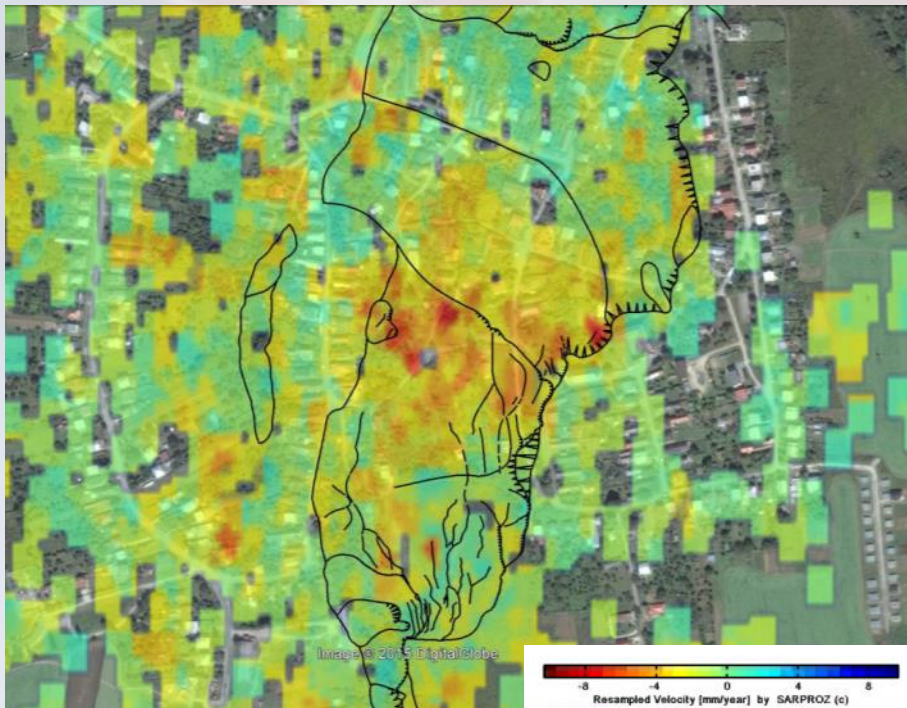
Ps InSAR monitoring - urban targets



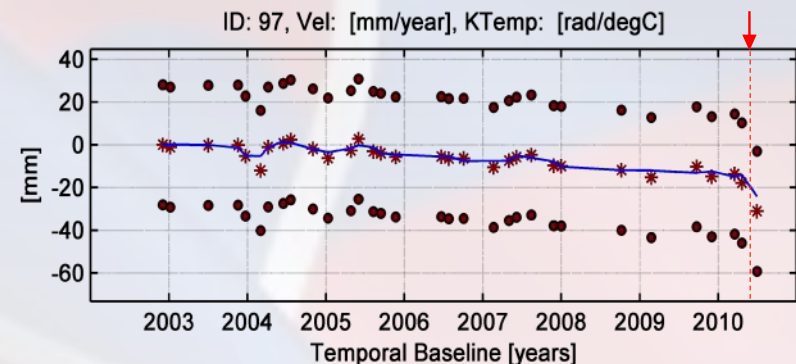
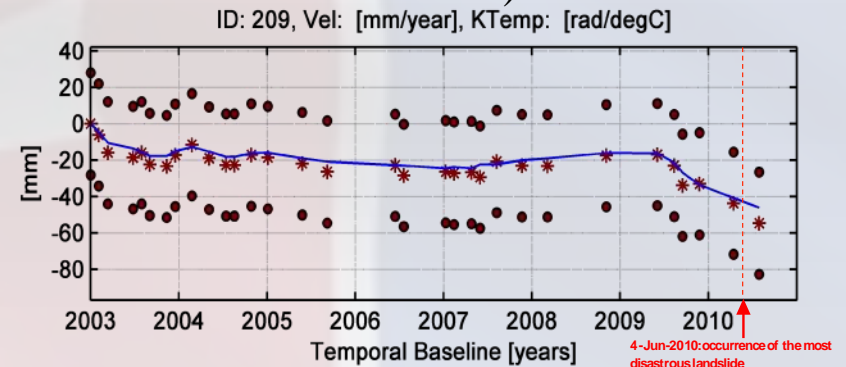
Ps InSAR monitoring - landslides

Devastating landslide in Nižná Myšľa (SE Slovakia) - 4th of June, 2010
Monitoring of possible prerequisites – ERS & ENVISAT – period 1992 - 2010

QUASI-PS INSAR approach ERS (1992-1999)



PS INSAR approach ENVISAT (2002-2010)



GrafLab (GRAvity Field LABoratory) software

Spherical harmonic synthesis (SHS)

The screenshot displays the GrafLab software interface, which is organized into three main sections:

- Geopotential model and reference system selection:** This section includes a 'Browse...' button for selecting a model, a checked checkbox for 'Use maximum degree of GGM', and a table of parameters: GM of GGM (m3.s-2) is 3986004.415E+8, R of GGM (m) is 6378136.3, nmin is 0, nmax is empty, and the Ellipsoid is set to GRS80.
- Point type selection:** This section allows for 'Type of the input coordinates' (Ellipsoidal or Spherical), with 'Ellipsoidal' selected. It also includes checkboxes for 'Grid', 'Load data', 'Point-wise', and a 'Browse...' button. Below these are input fields for latitude and longitude ranges and steps, and options for 'Height above the reference surface (m)' and 'Ellipsoidal height/Spherical radius (m)'.
- Calculated parameters and output selection:** This section features several dropdown menus, checkboxes for 'Commission error' (unchecked) and 'Export data' (checked), a 'Computation of fnALFs' button, 'Export report' (checked), 'Display data settings', 'Export data in *.mat' (unchecked), and an 'Output folder and file' button.

At the bottom of the interface are 'OK' and 'Close' buttons.

- **GrafLab (GRAvity Field LABoratory)**
 - SHS up to ultra-high degrees (tens of thousands or even higher)
 - Point-wise and grid modes
 - Computes 38 frequently used gravity field quantities: e.g. geoid, height anomaly, gravity anomaly/disturbance, tensors, ...
- **isGrafLab (Irregular Surface GRAvity Field LABoratory)**
 - A modified version of GrafLab
 - Fast SHS on grids at irregular surfaces (e.g. the Earth's surface)
 - Based on the lumped coefficients approach and Taylor series expansion

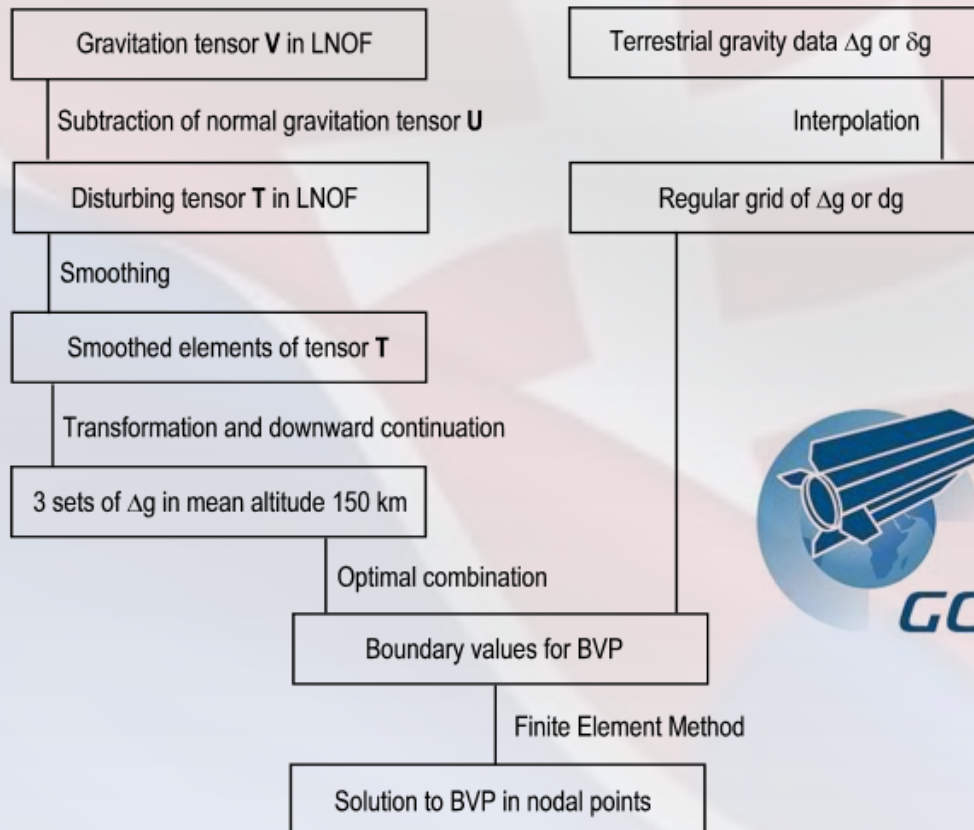
References:

- Bucha, B., Janák, J., 2013. A MATLAB-based graphical user interface program for computing functionals of the geopotential up to ultra-high degrees and orders. DOI: <http://dx.doi.org/10.1016/j.cageo.2013.03.012>.
- Bucha, B., Janák, J., 2014. A MATLAB-based graphical user interface program for computing functionals of the geopotential up to ultra-high degrees and orders: Efficient computation at irregular surfaces. DOI: <http://dx.doi.org/10.1016/j.cageo.2014.02.005>.

Available at:

- www.svf.stuba.sk/en/departments/department-of-theoretical-geodesy/science-and-research/downloads.html?page_id=4996

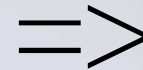
Determination of regional quasigeoid from combination of GOCE and terrestrial measurements



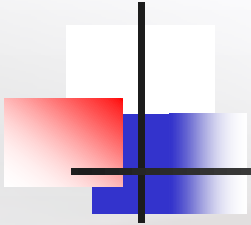
Development of effective combination of satellite gravity gradiometry (SGG) from GOCE and terrestrial data gravity anomalies or gravity disturbances.



Gravity anomalies or gravity disturbances



Reference: Janák J., Pitoňák, M., Minarechová Z.: Regional quasigeoid from GOCE and terrestrial measurements. Stud. Geophys. Geod., 58, pp. 626-649



Other news

Geodesy, cartography and cadastre authority of Slovak republic – www.geoportal.sk

The screenshot shows the Geoportál website in a browser window. The browser's address bar displays www.geoportal.sk/geoportal.html. The website header includes a search bar with the text "Vyhľadavanie", a language selector for SK and EN, and a "Prihlásenie" (Login) button. The main navigation menu contains links for "GEODETIKÉ ZÁKLADY", "KATASTER", "ZBGIS A ŠMD", "ARCHÍV", "APLIKÁCIE", "SLUŽBY", "INSPIRE", and "FAQ".

A yellow box titled "Podmienky použitia" (Terms of Use) is prominently displayed, containing the following text: "Akékoľvek kopírovanie alebo zverejňovanie celého kartografického diela alebo jeho podstatnej časti bez súhlasu autora, a to aj pre osobnú potrebu a na účel, ktorý nie je priamo alebo nepriamo obchodný, je v zmysle zákona č. 618/2003 Z. z. (autorský zákon) zakázané. Nerešpektovanie tohto zákazu svojvoľným kopírovaním produktov zverejnených na tomto webovom portáli zakladá občianskoprávnou aj trestnoprávnou zodpovednosť protiprávne". A "Súhlasím" (I agree) button is located to the right of the text.

The main content area is divided into several sections:

- ODKAZY** (Links): A list of links including "GKÚ", "Produkty a služby", "SKPOS®", "Katastrálny portál", "ÚGKK SR", "Objednávky", and "VÚC/mesto/obec".
- KONTAKTNÉ ÚDAJE** (Contact Information): "Geodetický a kartografický ústav Bratislava", "Chlumeckého 4, Dodacia pošta 212", "827 45 Bratislava", "Tel.: 02 / 2081 6000", and a "Všetky kontakty" (All contacts) link.
- Mapový klient ZBGIS**: "Mapový klient ZBGIS je webová aplikácia, ktorá slúži na prácu s údajmi ZBGIS, zobrazovanie, vyhľadávanie a analýzu priestorových údajov." (The ZBGIS web client is a web application that serves for working with ZBGIS data, displaying, searching, and analyzing spatial data.)
- Transformačná služba**: "Aplikácia Transformačná služba vykonáva autorizovanú transformáciu súradníc bodov medzi záväznými geodetickými systémami." (The Transformation service application performs authorized transformation of point coordinates between binding geodetic systems.)
- Konverzná služba**: "Konverzná služba slúži na konverziu formátov. Je to komplexný nástroj pre konverziu údajov rôznych formátov." (The Conversion service is used for format conversion. It is a complex tool for converting data of various formats.)
- Vyhľadávacia služba**: "Služi na vyhľadávanie metaúdajových záznamov publikovaných pripojeným katalógovým serverom." (The Search service is used for searching meta-data records published by the connected catalog server.)
- Mapy**: A button with a map of Slovakia and the text "Mapy".
- OZNAMY A AKTUALITY** (News and Updates): A section with a "DVRM" update dated "01.03.2015" titled "Digitálny výškový referenčný model je voľne dostupný na stiahnutie" (Digital elevation reference model is available for download), and an "Aktualizácia technickej správy" update dated "19.02.2015" titled "Zverejnenie aktualizovanej technickej správy definujúcej vzťah medzi S-JTSK a ETRS89 (verzia 2.0)" (Publication of the updated technical specification defining the relationship between S-JTSK and ETRS89 (version 2.0)).
- Technická správa**: "10. október 2014 Zverejnenie technickej správy definujúcej vzťah medzi S-JTSK a ETRS89" (10 October 2014 Publication of the technical specification defining the relationship between S-JTSK and ETRS89).
- Transformačná služba**: "14. august 2014 Implementácia EVRS do Rezortnej transformačnej služby" (14 August 2014 Implementation of EVRS into the National Transformation Service).

The bottom of the page features a "Všetky aktuality" (All news) link and a Windows taskbar at the very bottom showing the system date and time as 14:59 on 28.5.2015.

ETRS89 – S-JTSK relation

Official technical report published on Geoportal

The screenshot shows the Geoportal website interface. The browser address bar displays www.geoportal.sk/sk/geodeticke-zaklady/na-stiahnutie/. The page features the Geoportal logo and a navigation menu with categories: GEODETICKÉ ZÁKLADY, KATASTER, ZBGIS A ŠMD, ARCHÍV, APLIKÁCIE, SLUŽBY, INSPIRE, and FAQ. A dropdown menu is open under 'GEODETICKÉ ZÁKLADY', with 'Na stiahnutie' highlighted in red. The main content area includes a breadcrumb trail 'Domov > Geodeticke zaklady > Na stiahnutie' and a list of items under 'GEODETICKÉ ZÁKLADY'. The 'Na stiahnutie' item is selected, leading to a page titled 'Geodetický a kartografický ústav Bratislava Chlumceého 4, 827 45 Bratislava'. The page content includes the title 'SÚRADNICOVÝ SYSTÉM JEDNOTNEJ TRIGONOMETRICKEJ SIETE KATASTRÁLNEJ A JEHO VZŤAH K EURÓPSKEMU TERESTRICKÉMU REFERENČNÉMU SYSTÉMU 1989 (Verzia 2.0)', the author 'Ing. Droščák Branislav, PhD.', and a 'Tlač' button. The Windows taskbar at the bottom shows the system time as 15:07 on 28.5.2015.

Transformation service EVRS (EVRF2007) implemented

Súbor Upraviť Zobrazit' História Záložky Nástroje Pomocník

Prihláste sa - Účty Google Slovenská technická univer... Referáty 2015 Google Translate

https://zbgis.skgeodesy.sk/zbgistransform/

Transformačná služba ETRS89 - S-JTSK
Úradu geodézie, kartografie a katastra Slovenskej republiky

Transformačná služba

Formát vstupných údajov Transformácia bodu jednotlivo Pomoc

Výškový systém

Vstupný súradnicový systém ETRS89-LatLonh Vybrať

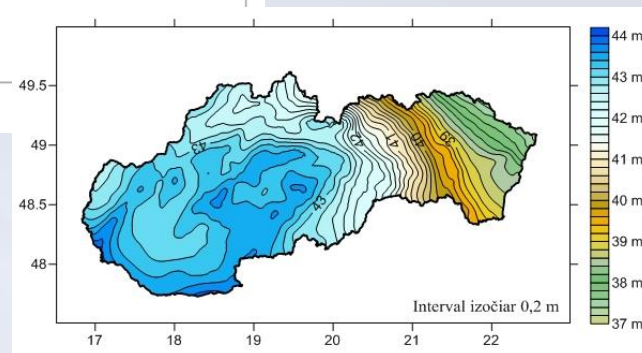
Výstupný súradnicový systém Vybrať

Transformovať

NEW

EVRS (EVRF2007_AMST)

DMQSK2014-E = Digital model of quasigeoid
ETRS89-h (ETRF2000) ↔ EVRS (EVRF2007)







**Thank you
for your attention**