

National report of Slovakia

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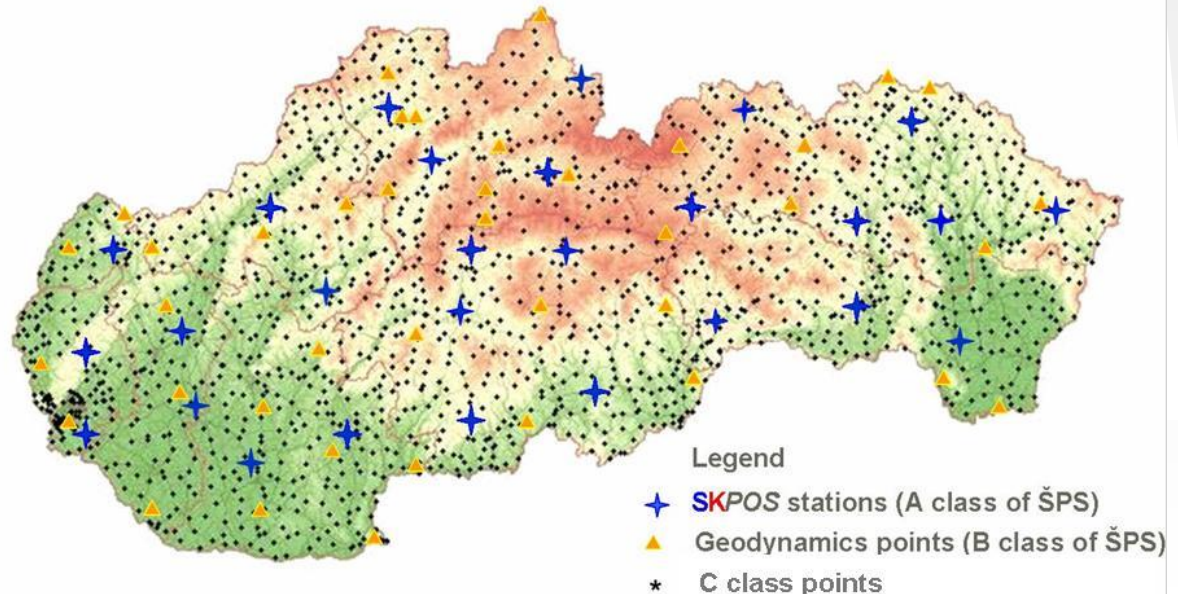
3) Geodesy, Cartography and Cadastre Authority of the Slovak Republic

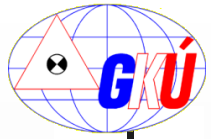


National spatial network - ETRS89

- Active part (permanent stations) – **A** class (**SKPOS**)
- Passive part (passive points)
 - **B** class – points for geodynamical research (Hz 5-6mm, V 12-15mm)
 - **C** class – reference passive points (Hz 1cm, V 2cm)
 - **D** class – other points with ETRS89 coordinates (Hz 3cm, V 5.5cm)

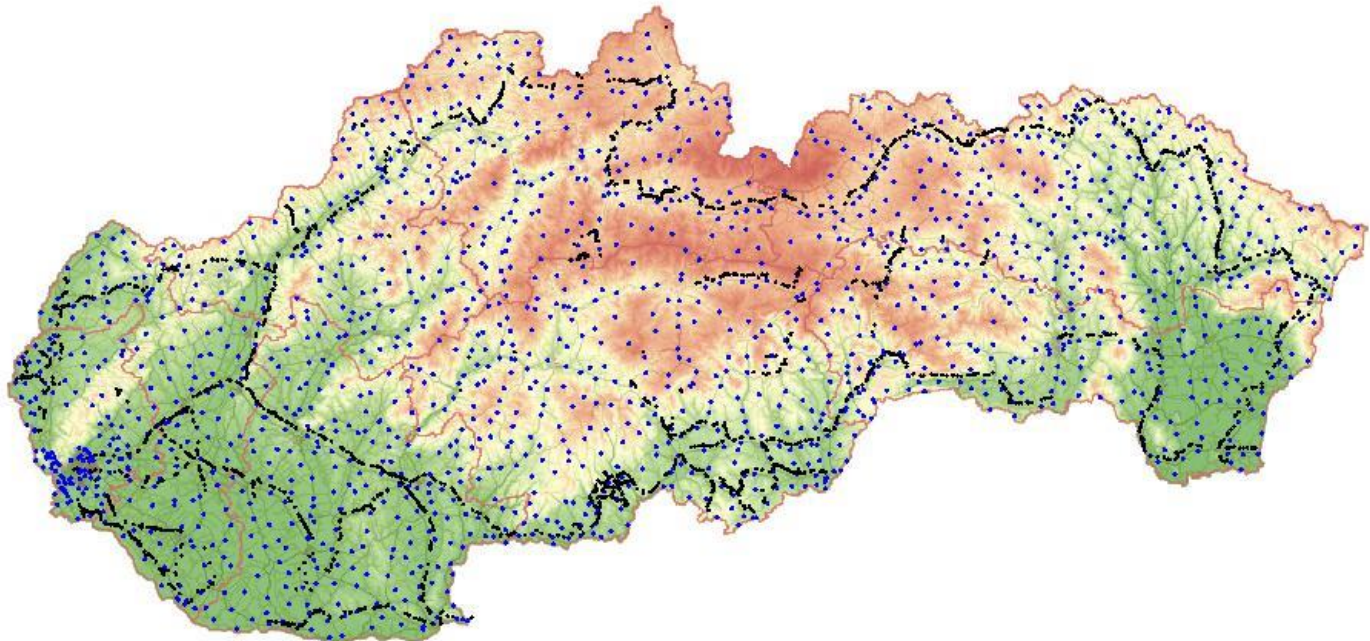
<i>class</i>	<i>amount</i>
A	27
B	71
C	1 650
D	2 900

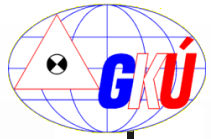




D class ŠPS points determination

- Coordinates determination in ETRS89 national realisation
- RTK method – tied to *SKPOS*
- 2 independent measurement = 2 initialization
- Quality – Horizontal 3 cm. Vertical 5.5 cm

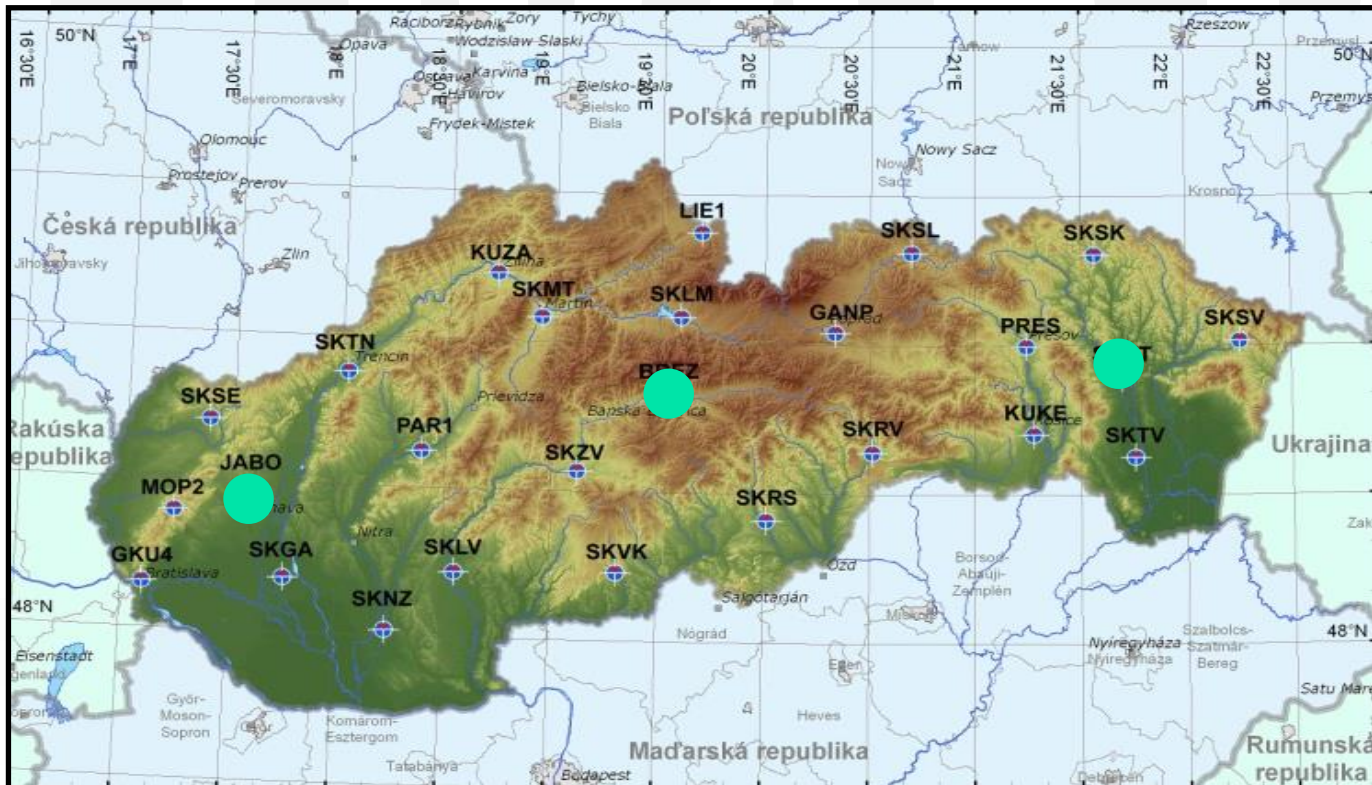




SKPOS status in May 2011

infrastructure

- **26 permanent stations** (3 new stations)
 - All stations equipped with the same brand of receivers and antennas
 - All stations observe GPS+GLONASS signals
 - 13/26 antennas have individual absolute APCV calibration (50%)





SKPOS control software

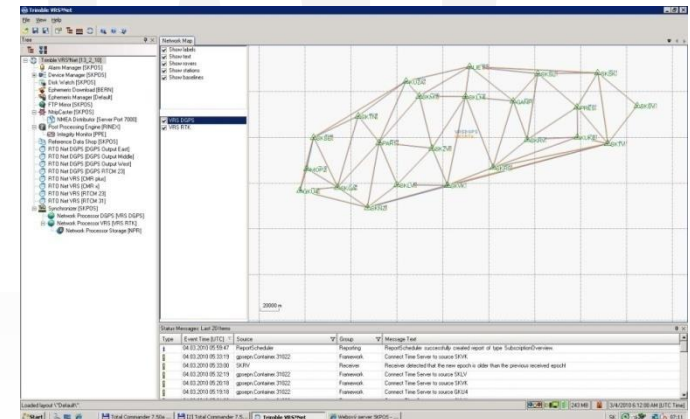
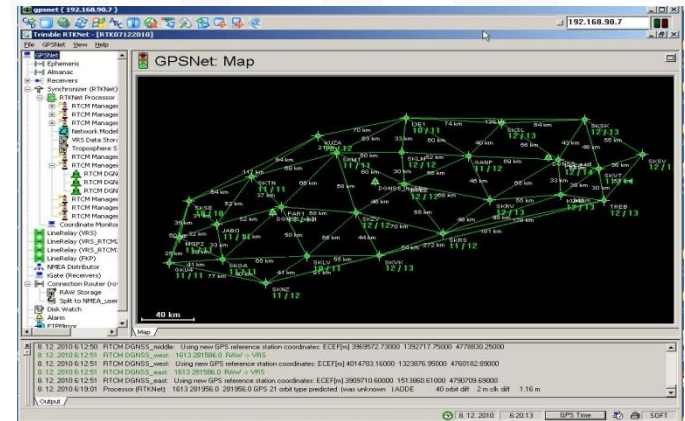
- **Trimble GPSNet software**

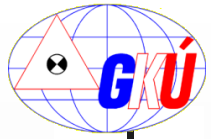
- still running
- will be replaced



- **Trimble VRS3Net software**

- purchased in April 2010
- actually tested
- some problems
 - NMEA storage
 - foreign station introduction (proxy)
- plan for introduction: Jul 2011





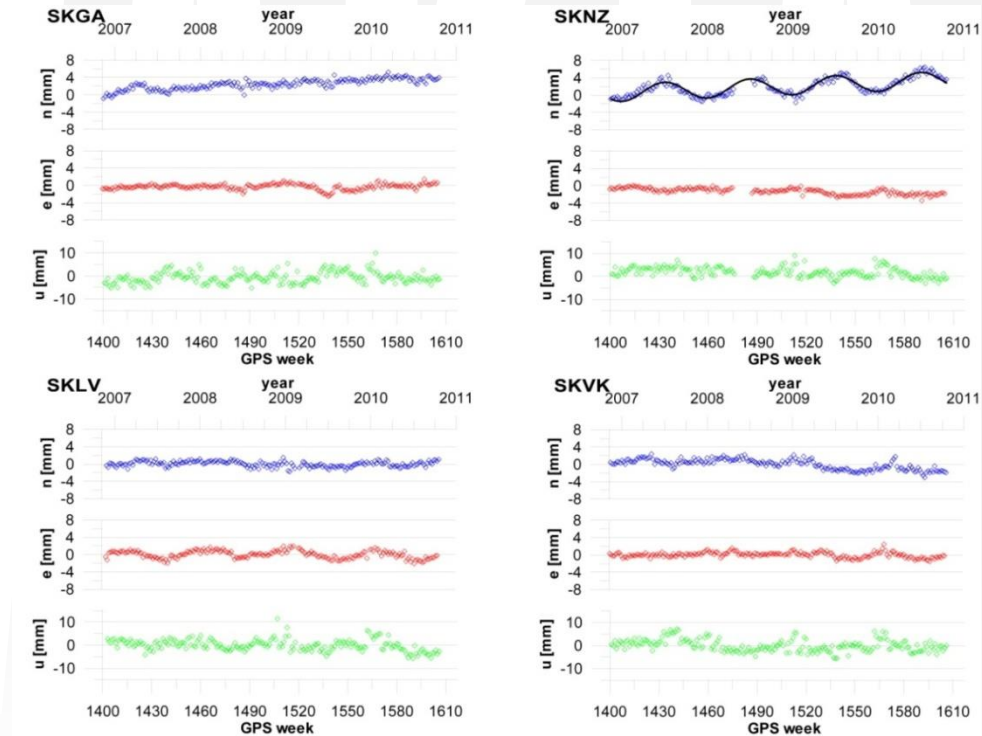
SKPOS users, charges

- Number of users (registrations)
 - **April 2011**
 - around **500** registrations;
 - **710** account
- Field of applications
 - 99% - surveying, GIS
- SKPOS is charged by flat rate per technical year
 - technical year means 365 days from date of registration
 - price **90 EUR** (last year it was **365 EUR**)



SKPOS permanent stations time series analysis

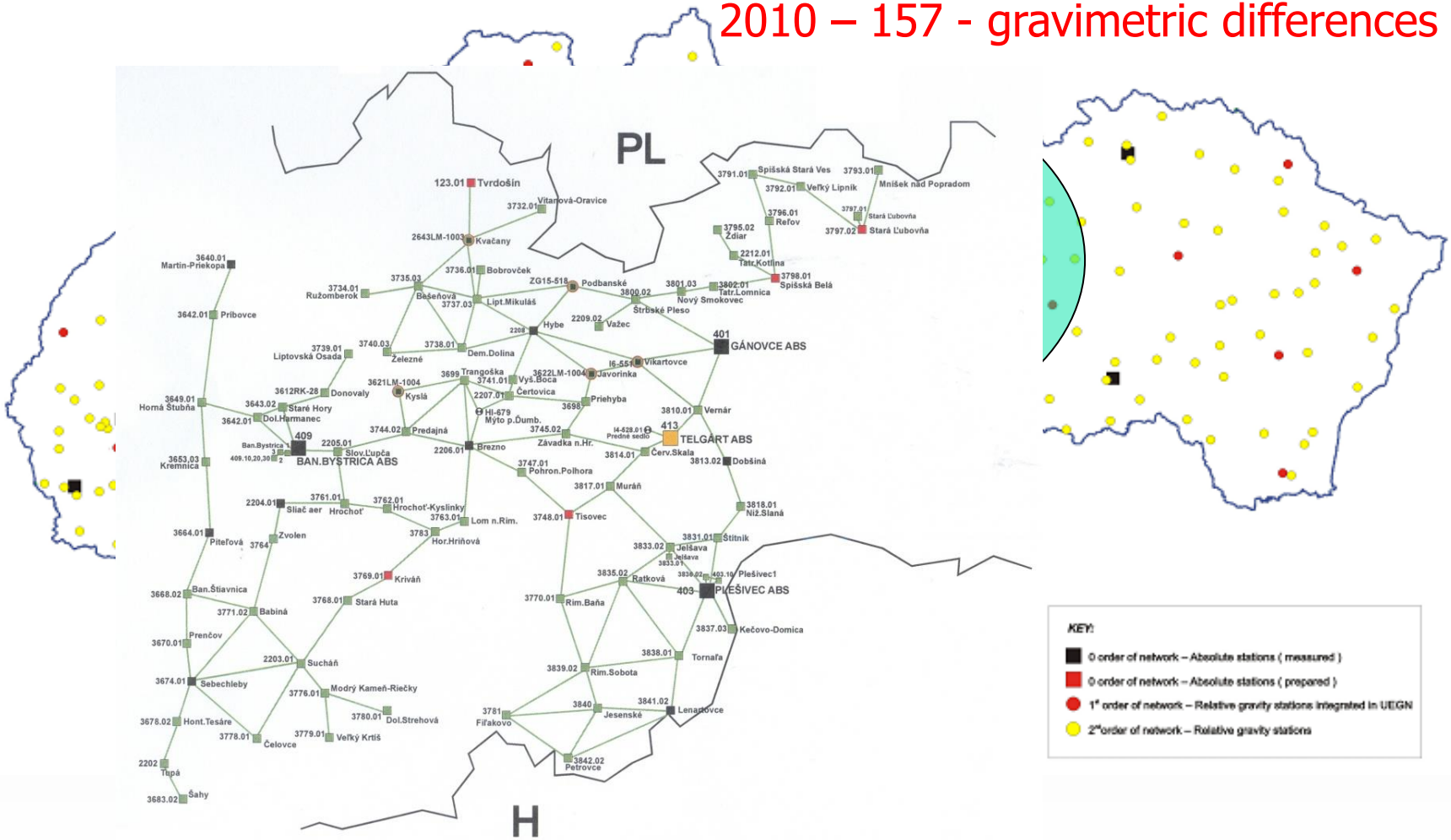
- period 2007-2011
- Coordinates determination
 - Bernese software 5.0
- Timeseries analysis
 - MathCAD 14 software
 - Every 3 months
- Analysis for
 - Trend
 - Seasonal variation
 - Anomalous behavior





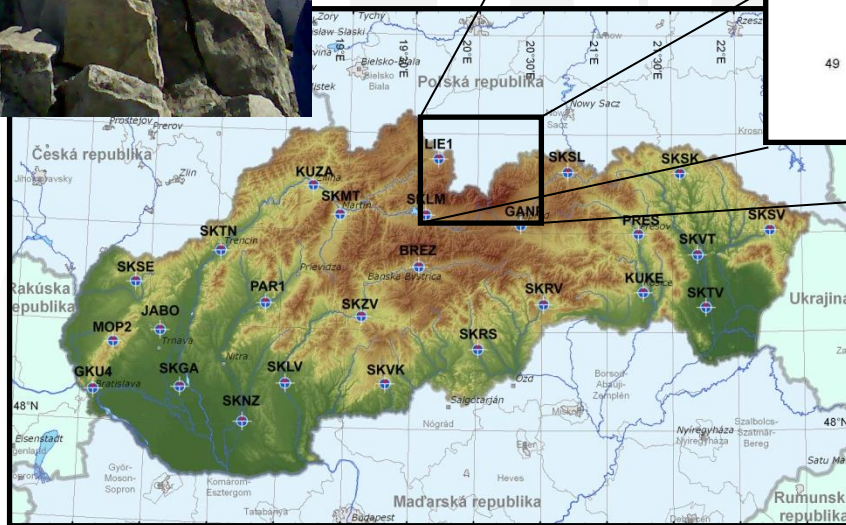
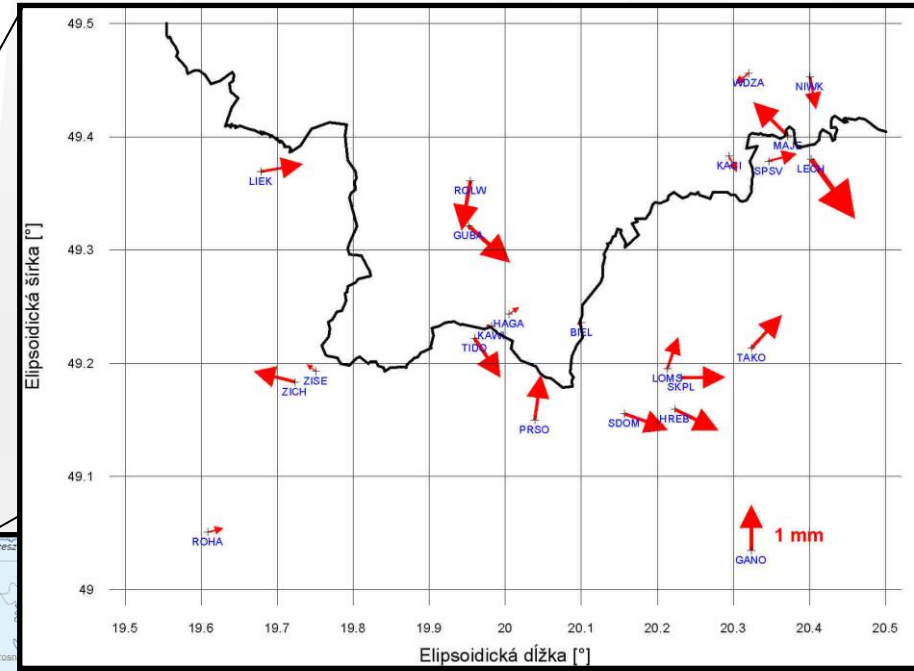
National gravimetric network

2010 – 157 - gravimetric differences



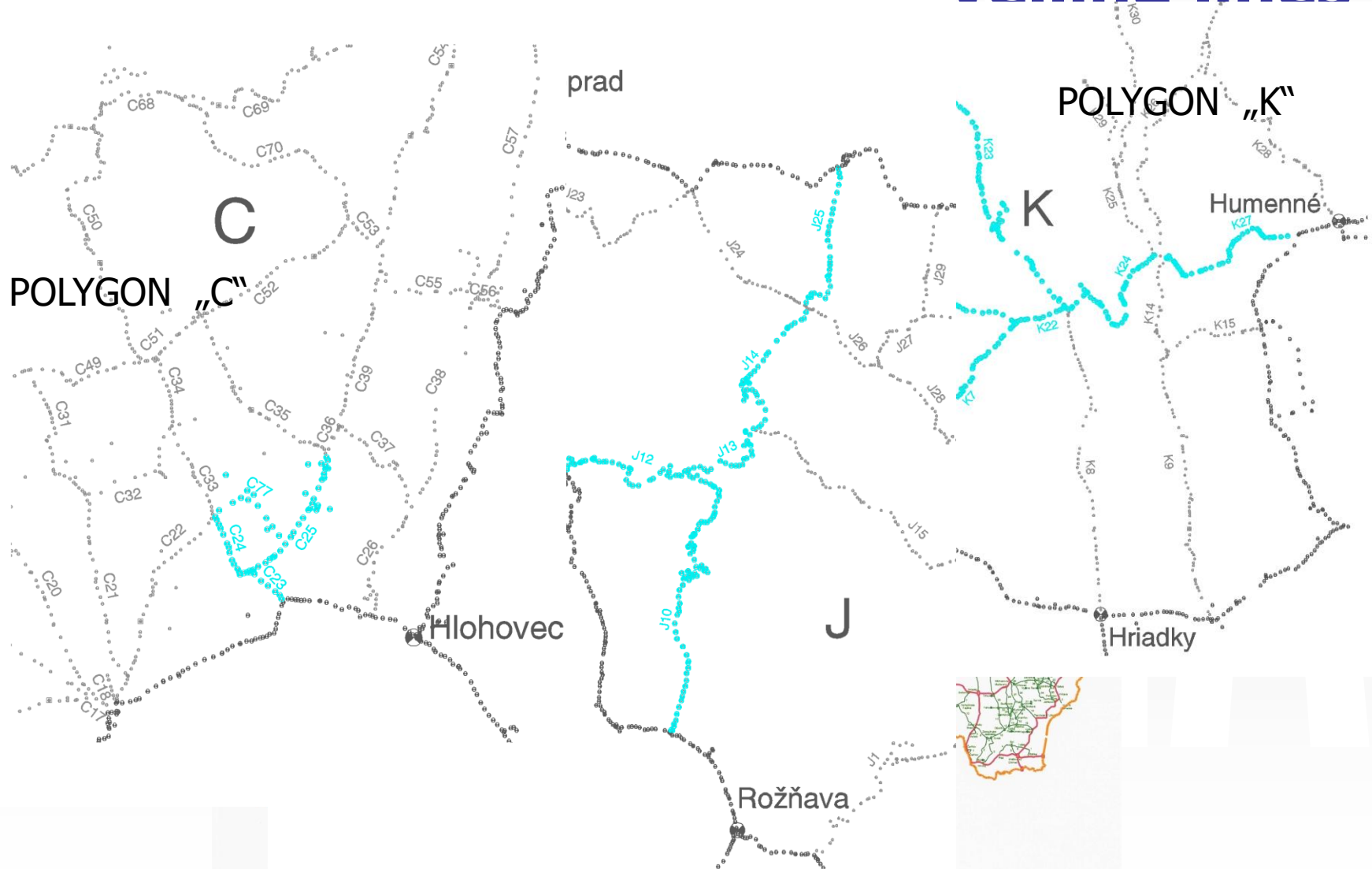


Local geodynamic network TATRY





Precise levelling of 2nd order levelling lines



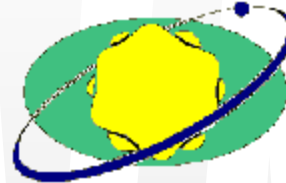
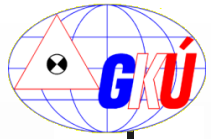


Other news from Slovakia

- Introduction of the new realization of national CRS - JTISK03
 - valid from 1st April 2011
 - new realization = new set of coordinates
 - realization introduced by the regulation of UGKK SR
 - JTISK03 based on GNSS (also *SKPOS*) measurement

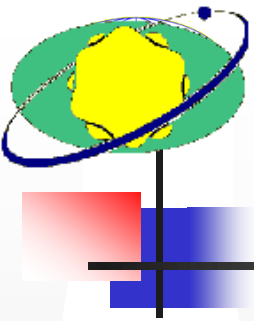


- Topographical database is stored in ETRS89



Slovak University of Technology activities

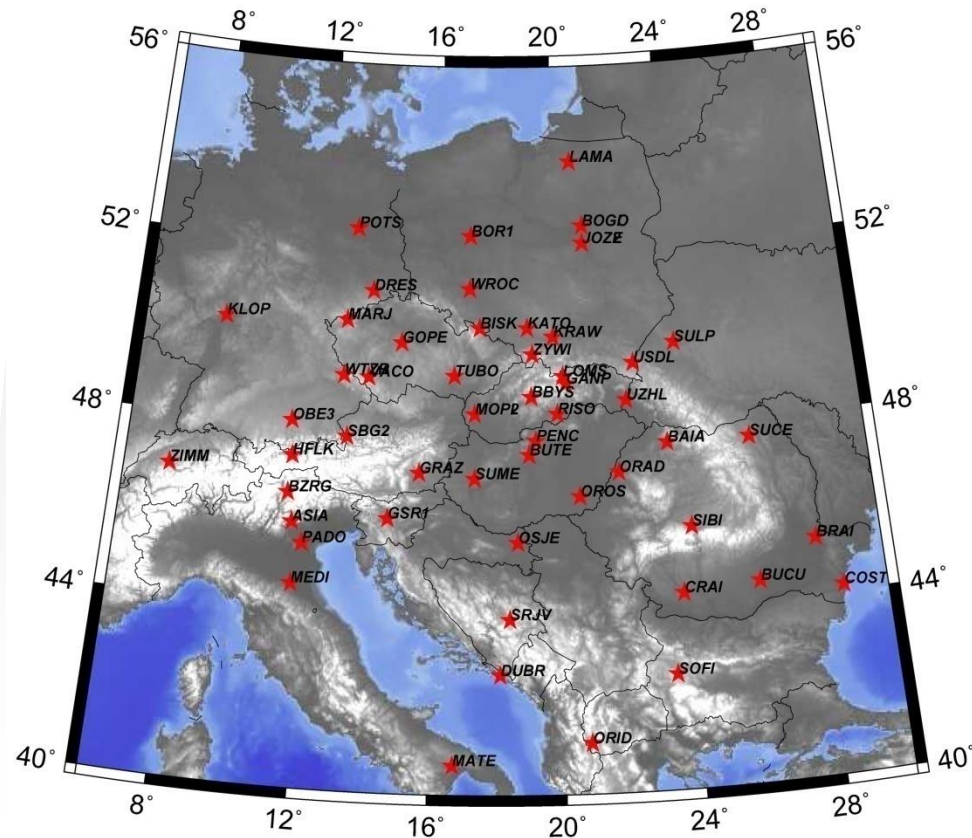
EPN Local analysis center

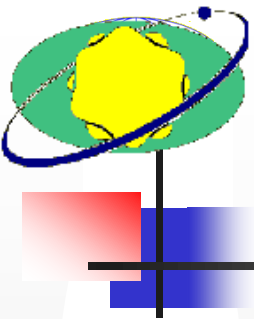


Refinement of the velocity field in Central Europe based on reprocessed permanent and epoch-wise GPS observations

Network of selected permanent stations in Central Europe

- Reprocessed at LAC SUT Bratislava
- 45 EPN and 9 non-EPN permanent stations (from 18 in 1996 to 56 in 2011)
- Observation interval 1996 – 2010

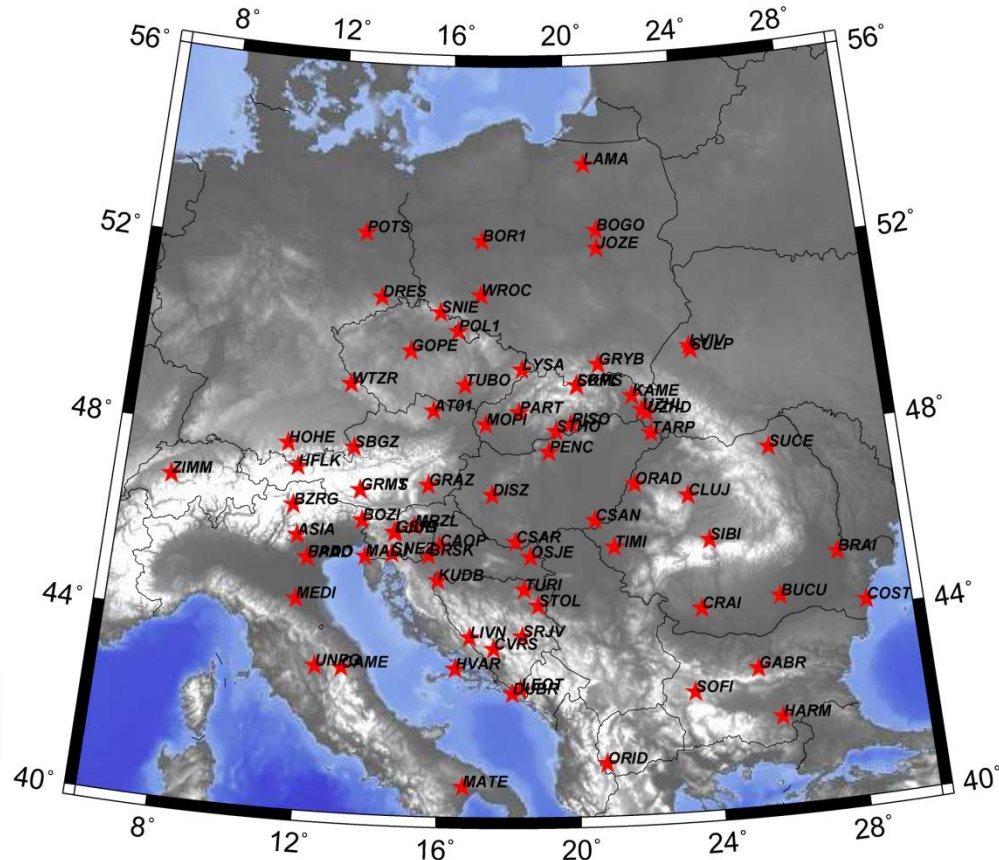


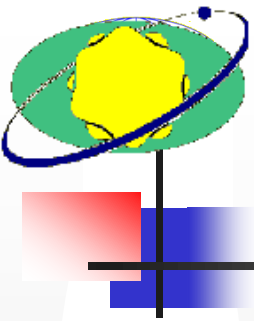


Refinement of the velocity field in Central Europe based on reprocessed permanent and epoch-wise GPS observations

Central European Geodynamic Reference Network

- Epoch observations from 1994 to 2009 (in one or two year intervals)
- Number of stations: 27 in 1994, 84 in 2009 (max. in 2005: 98).
- Processing strategy: similar as in network of permanent stations in Central Europe

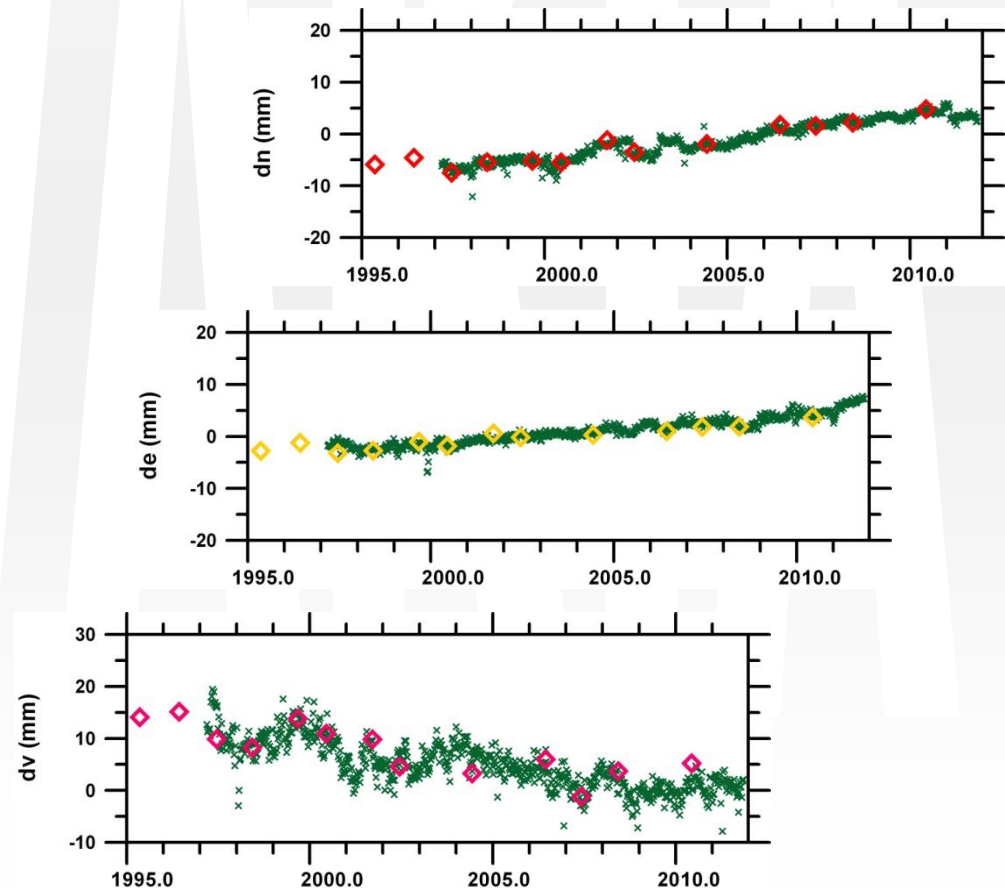


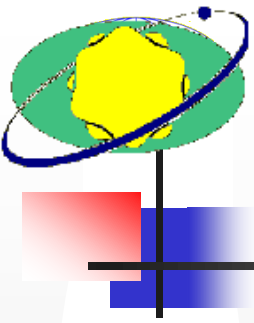


Refinement of the velocity field in Central Europe based on reprocessed permanent and epoch-wise GPS observations

Example of combination of epoch and permanent networks - PENC

- Typical station situation: good coincidence of epoch-wise and permanent observations both in horizontal components and in height
- Estimated velocity is identical for permanent and epoch-wise observations

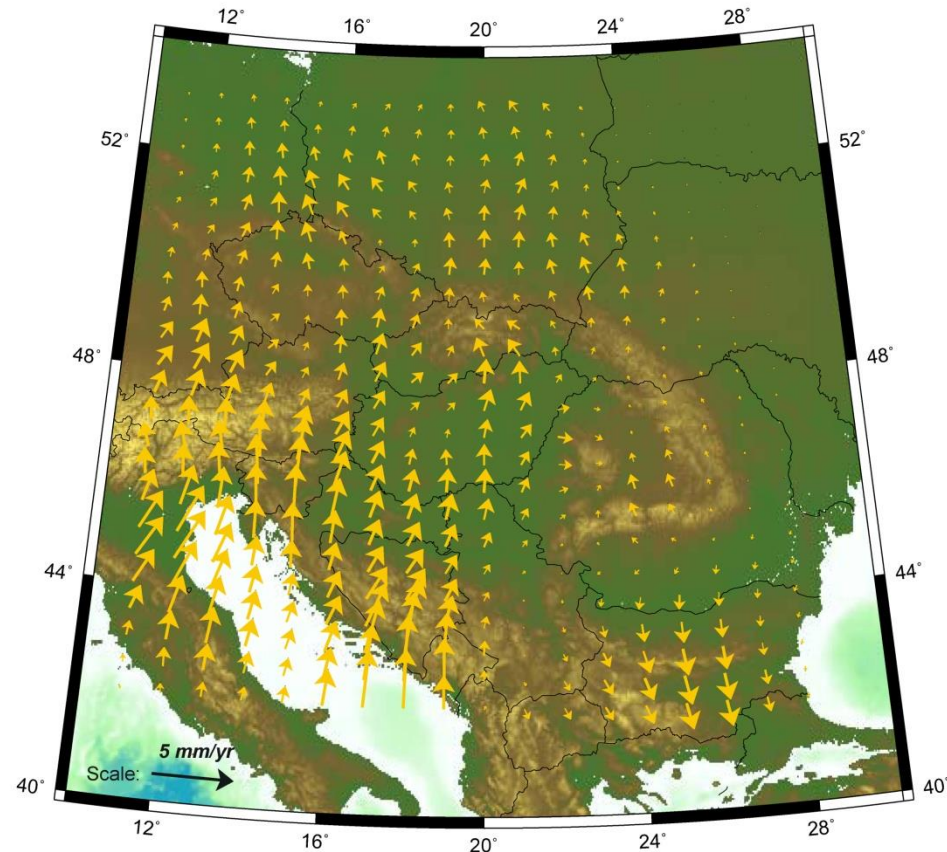


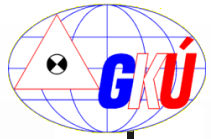


Refinement of the velocity field in Central Europe based on reprocessed permanent and epoch-wise GPS observations

Final refined CE velocity field pattern

- Interpolated horizontal velocity field estimated by using least square collocation
- Based on data from 110 permanent and epoch sites (7 sites excluded)
- Maximum difference between interpolated and observed velocity ~ 1.5 mm/year.
- This velocity pattern is characteristic for the Central Europe region and can be used as limitation for intraplate velocities in regional scale





**Thank you for your
attention**