

National Report of SLOVAKIA 2010

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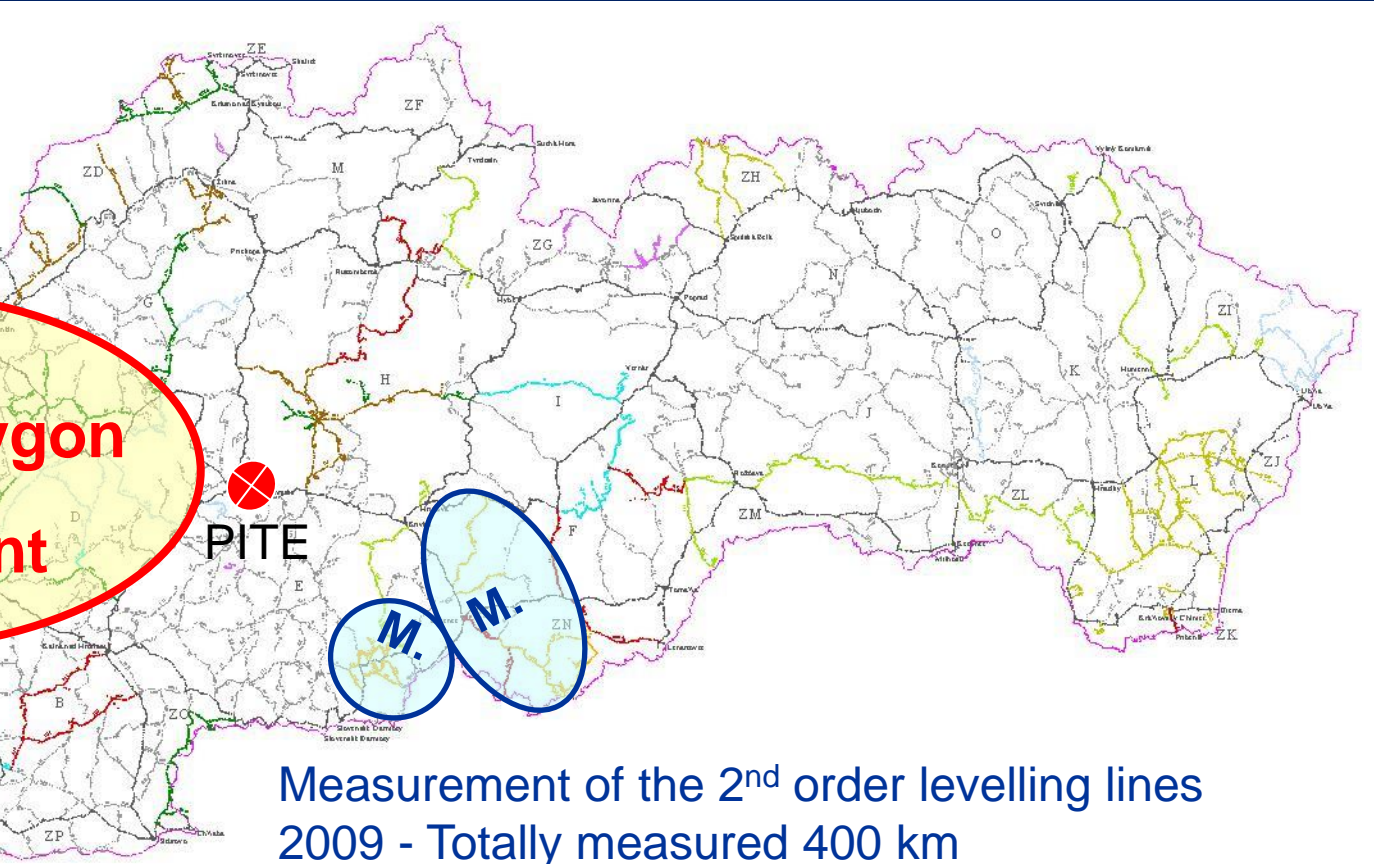


Štátna nivelačná sieť ŠNS National levelling network measurement and adjustment



**C and D polygon
Adjustment**

Measur.



Measurement of the 2nd order levelling lines
2009 - Totally measured 400 km

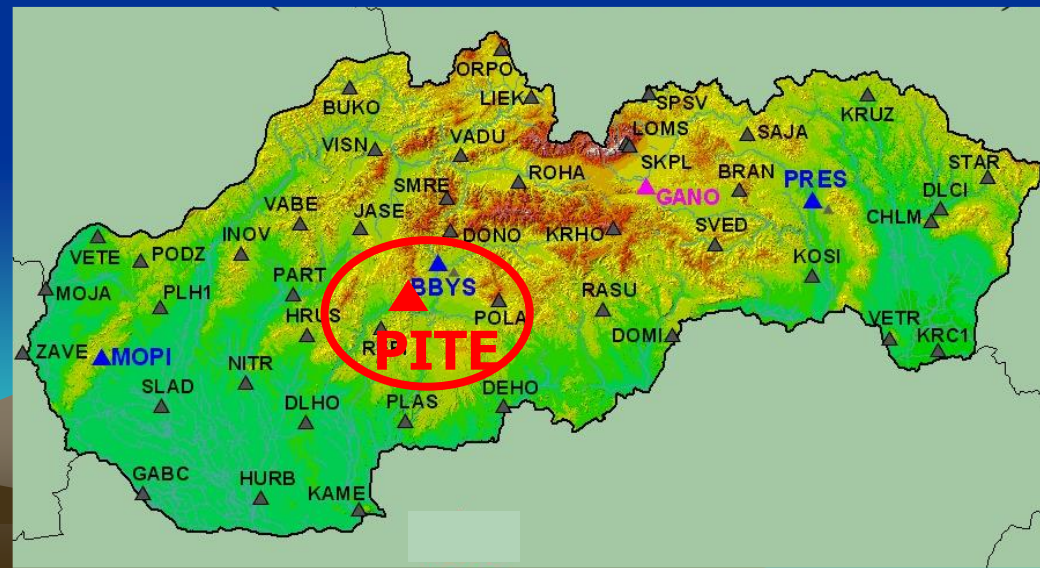
Adjustment of the 2nd orders levelling lines



National levelling network ŠNS

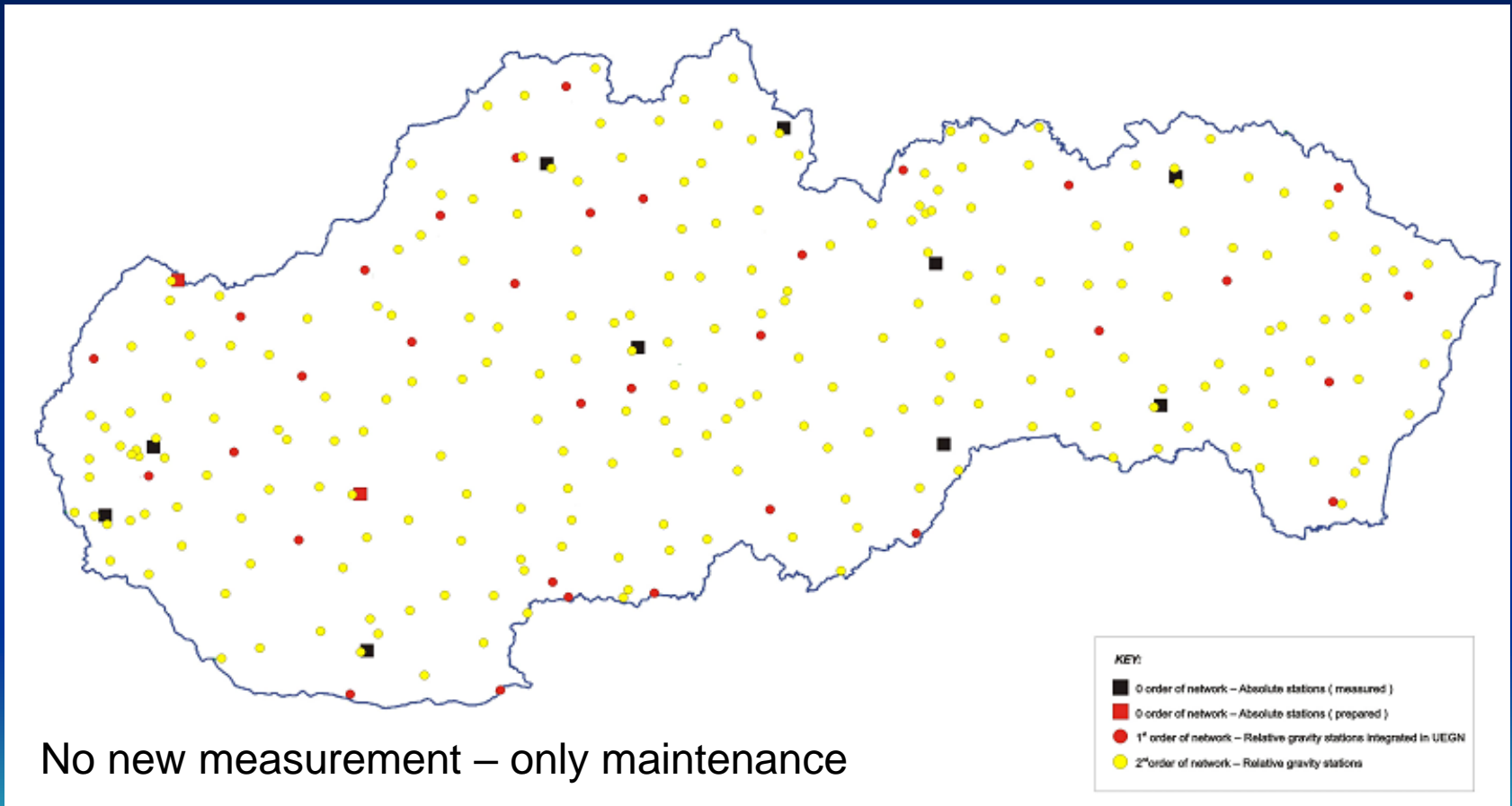
Basic levelling benchmark Pitelova

- Creation of the integrated point Pitelova (PITE)
 - ŠNS Base Levelling benchmark
 - ŠPS B class point (precise ETRS89 coordinates)





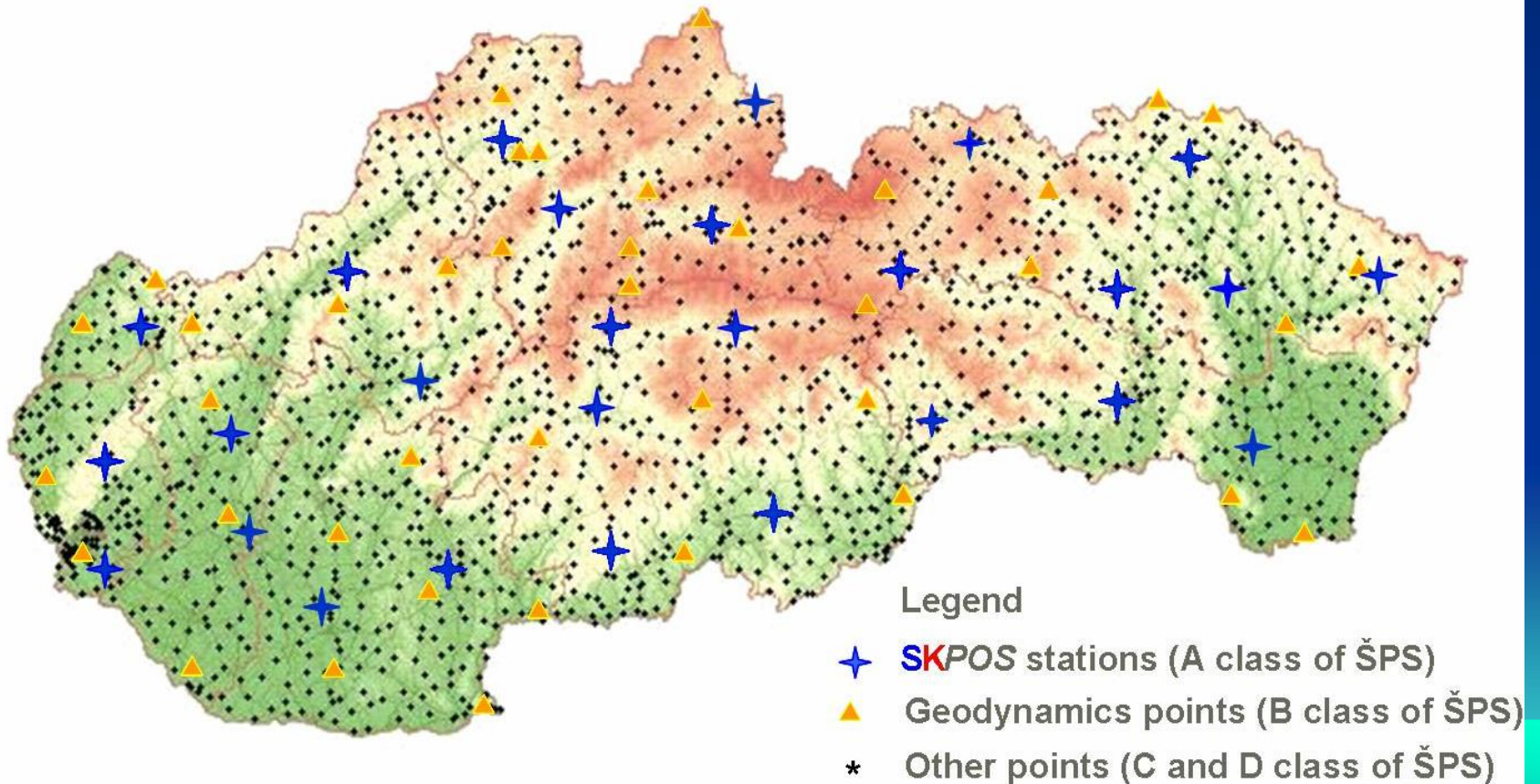
Štátna gravimetrická sieť ŠGS National gravimetric network





Štátna priestorová sieť ŠPS (ETRS89) National spatial network

- **National spatial network (ŠPS) = cca 1700 points**
 - Active part (permanent stations) – A class
 - Passive part – B, C, D class

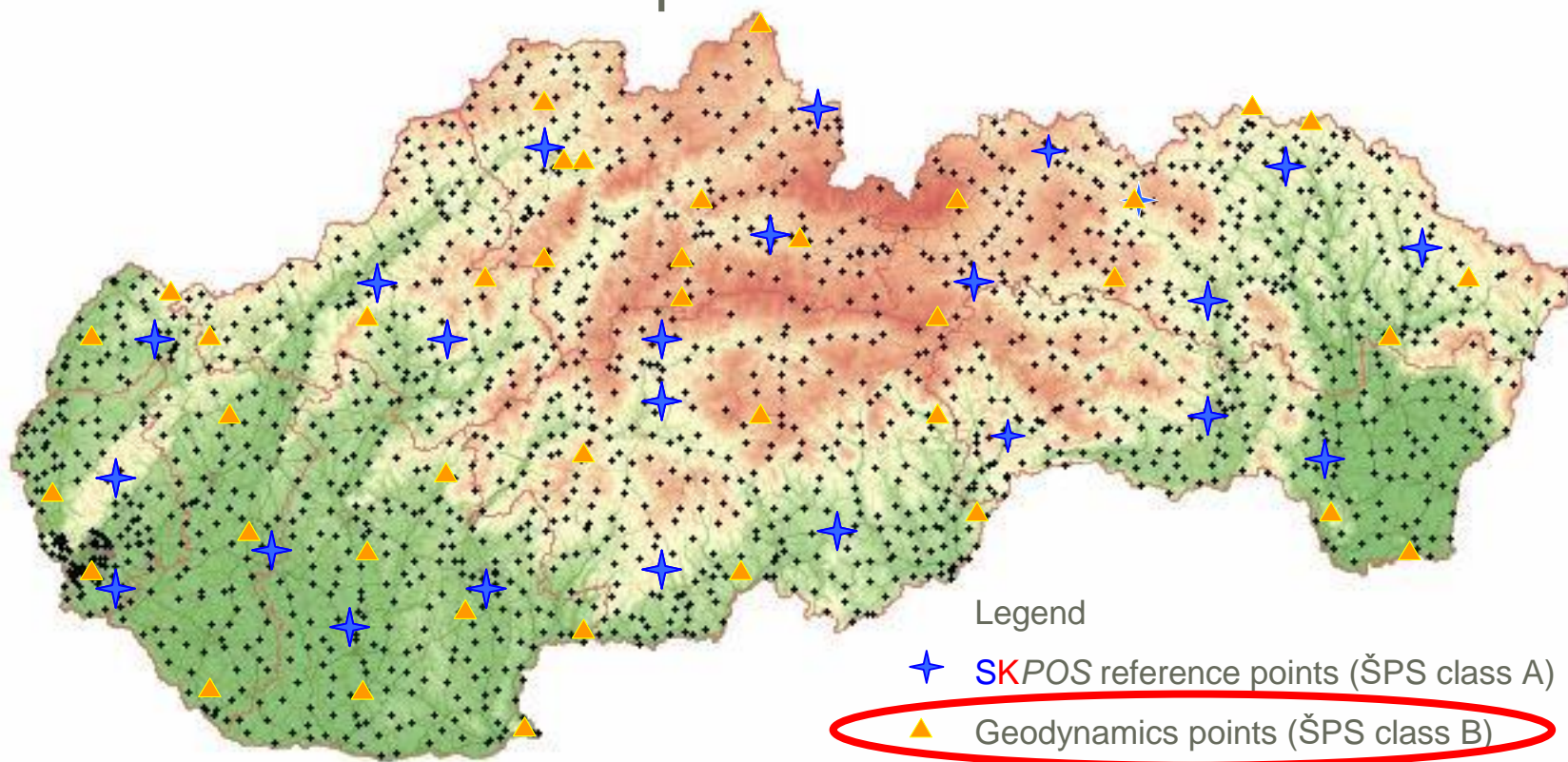




Štátna priestorová sieť ŠPS National spatial network

Kriváň peak (LCS TATRY)

National spatial network





SKPOS Modernization program

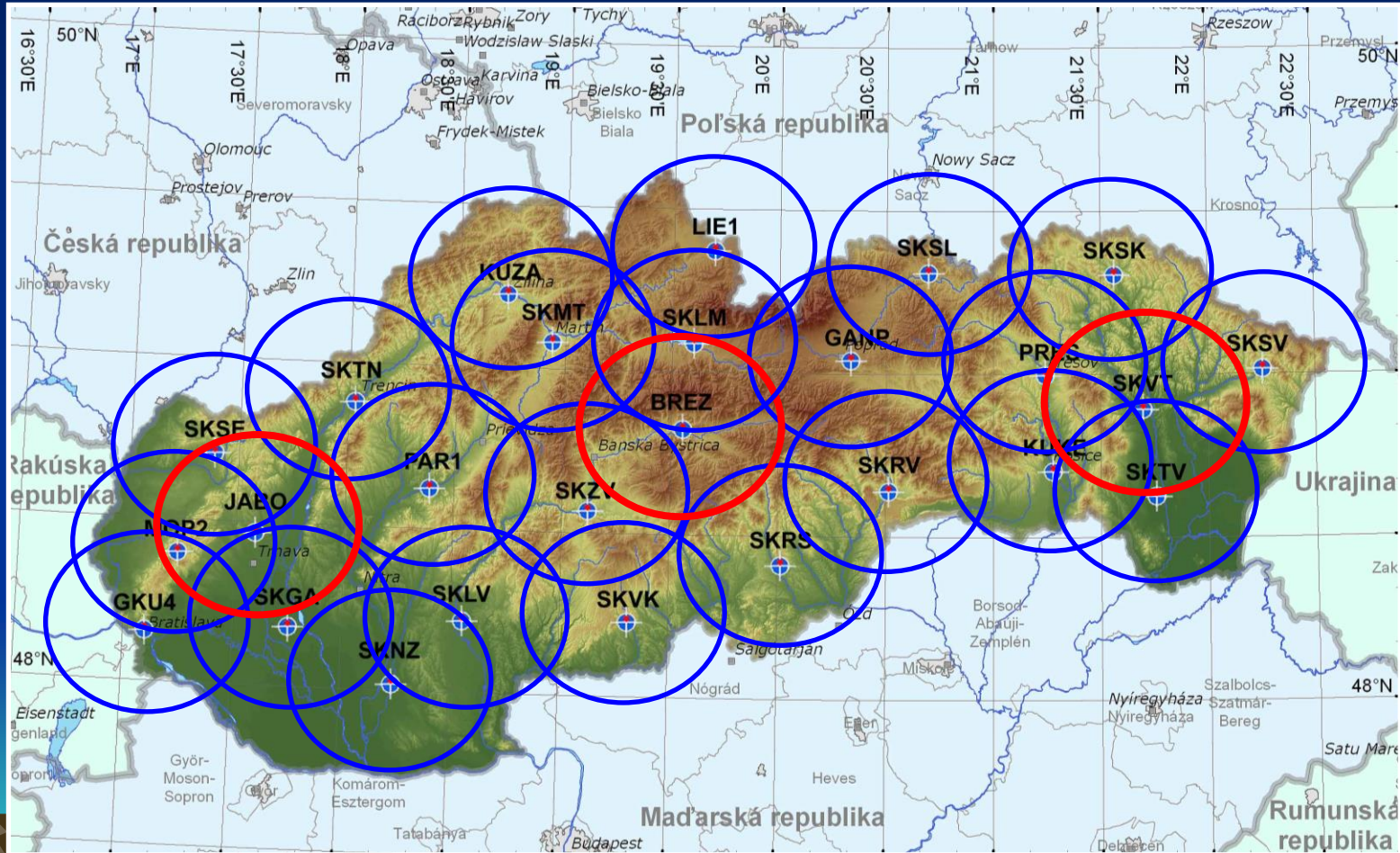
New stations

- April & May 2010 – 3 new stations were introduced to SKPOS
 - **SKVT** (Vranov nad Toplou)
 - **BREZ** (Brezno)
 - **JABO** (Jaslovske Bohunice)
- internal resort stations
- roof stabilization - forced centering
- Trimble NetR8 and Zephyr geodetic model 2 antennas (individual absolute calibration from Berlin)



SKPOS Modernization program

SKPOS stations distribution



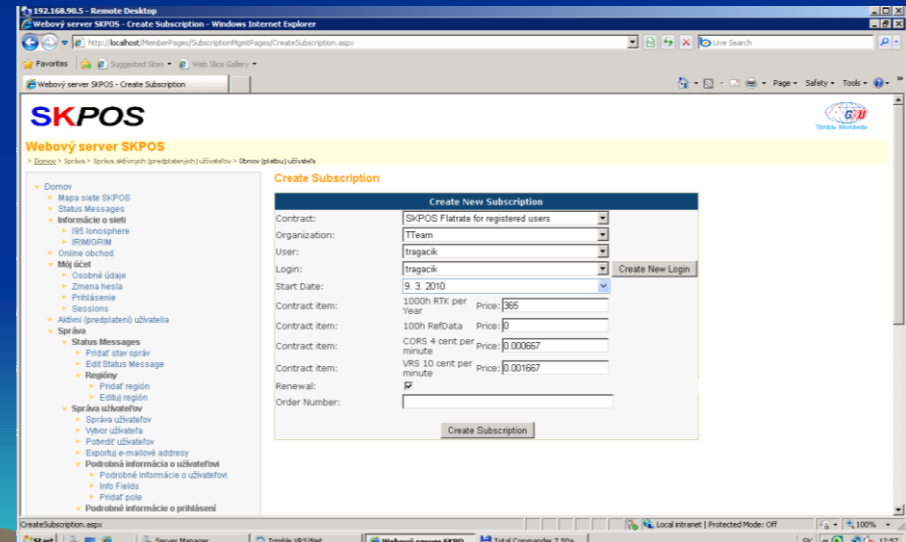
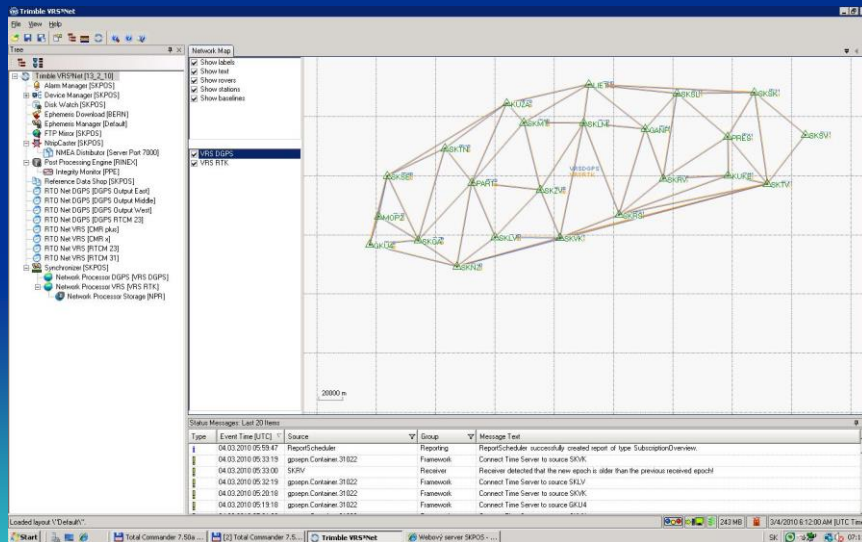
2010 year SKPOS = 26 permanent stations



SKPOS Modernization program

The new control software

- **Trimble VRS3Net** - The new control sw
 - Necessity of hardware upgrade as well (high requirements)
 - Recently tested on the test server

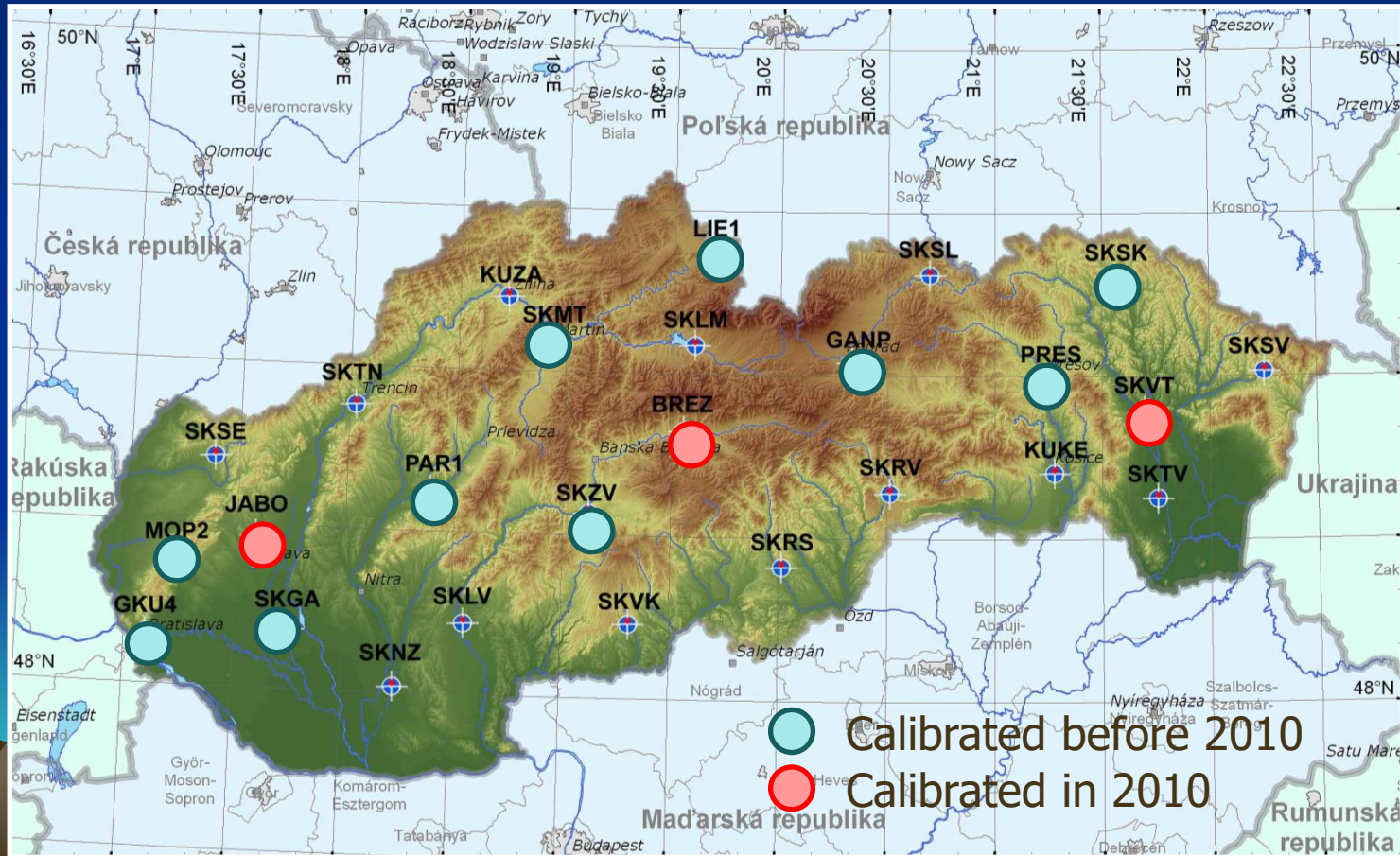




SKPOS Modernization program

More individual antennas calibration

- 13 antennas from totally 26 SKPOS stations have individual absolute antenna calibration (50%)



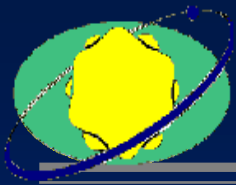


Modernization program

New ETRS89 coordinates determination

- Bernese software 5.0
- EPN strategy (EPN guidelines for ETRS89 densification)

	Input data	Antenna phase center model	Adjustment	Ephemeris	Result
Active part (SKPOS)	GPS weeks 1400-1556 (3 years)	absolute	Minimal constraint condition	IGS05	ITRF2005 for particular weeks
Passive part	All relevant campaigns	absolute	Minimal constraint condition	PDR, IGS05	ITRF2005 for particular campaigns



Reprocessing and combination of permanent and epoch GPS networks in Slovakia and close regions

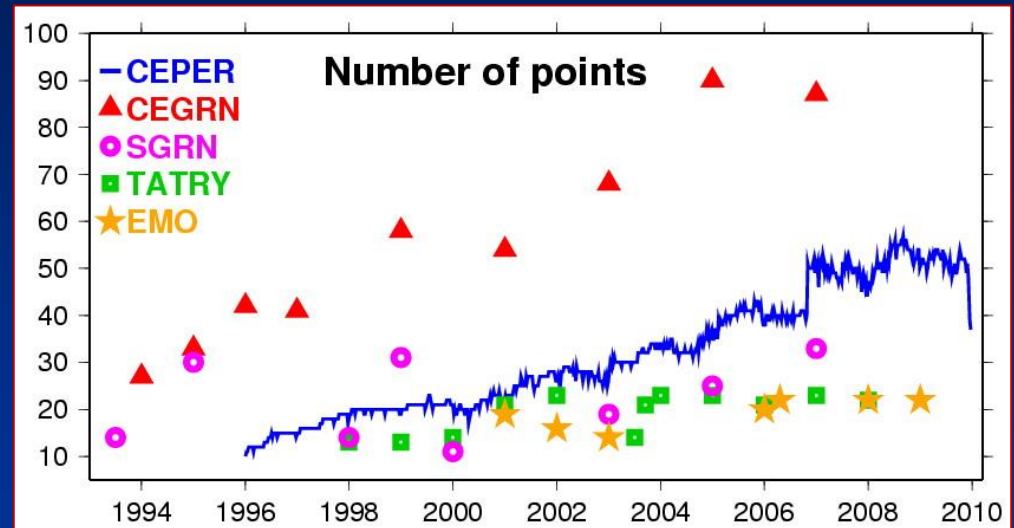
CEPER 1996 – 2010

CEGRN 1994 – 2007

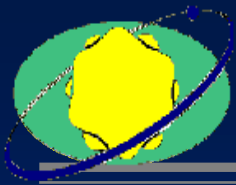
SGRN 1993 – 2007

LN TATRY 1998 – 2008

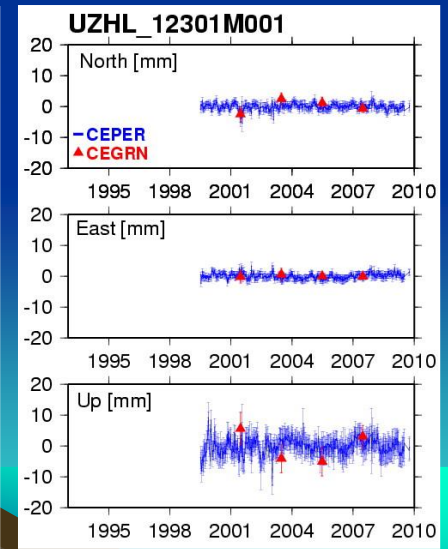
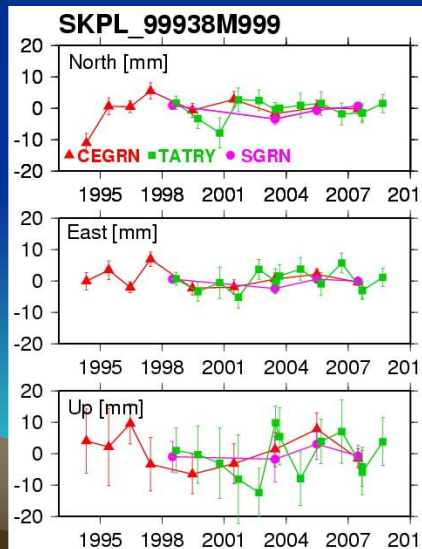
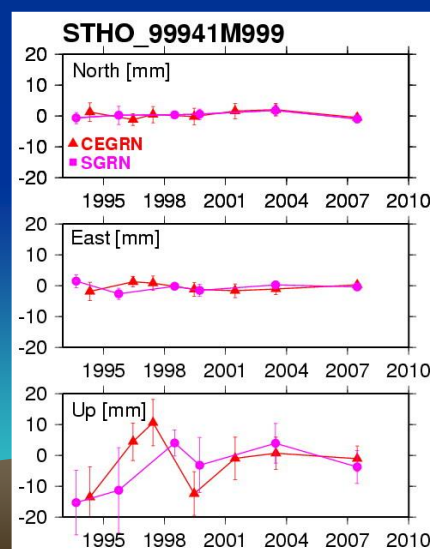
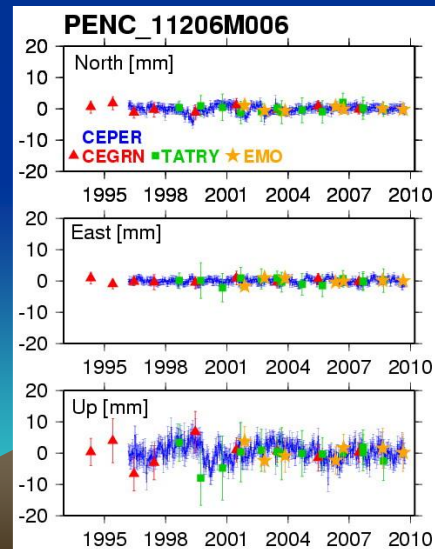
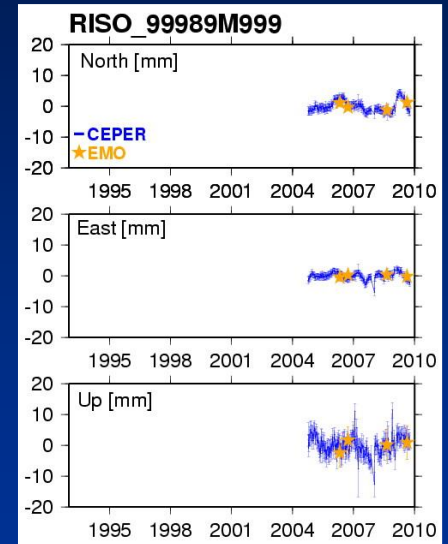
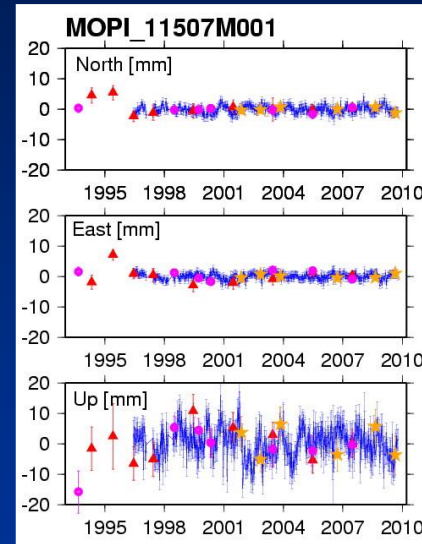
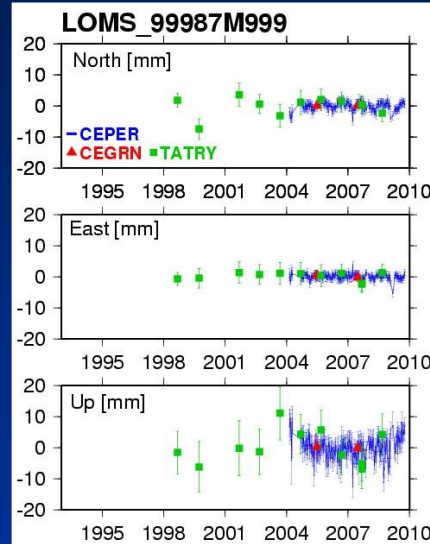
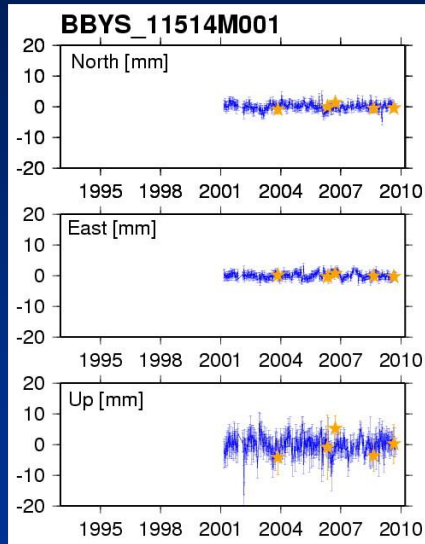
GN EMO 2001 - 2009

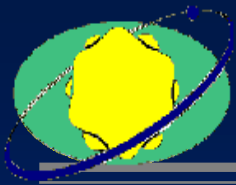


Network Name	N° of points	Time span [year]	N° of campaigns	From – To [year]	Length of campaign
CEPER	10 – 56	9.76	732 weeks	1996.00 – 2010.03	permanent
CEGRN	27 – 90	13.14	9	1994.33 – 2007.47	120 h
SGRN	14 – 33	13.82	9	1993.66 – 2007.48	36 - 120 h
TATRY	13 – 23	10.20	12	1998.67 – 2008.69	120 h
EMO	14 – 22	7.76	7	2001.87 – 2009.63	48 h



Combination with CARTEF





Intraplate velocities and different plate motion models

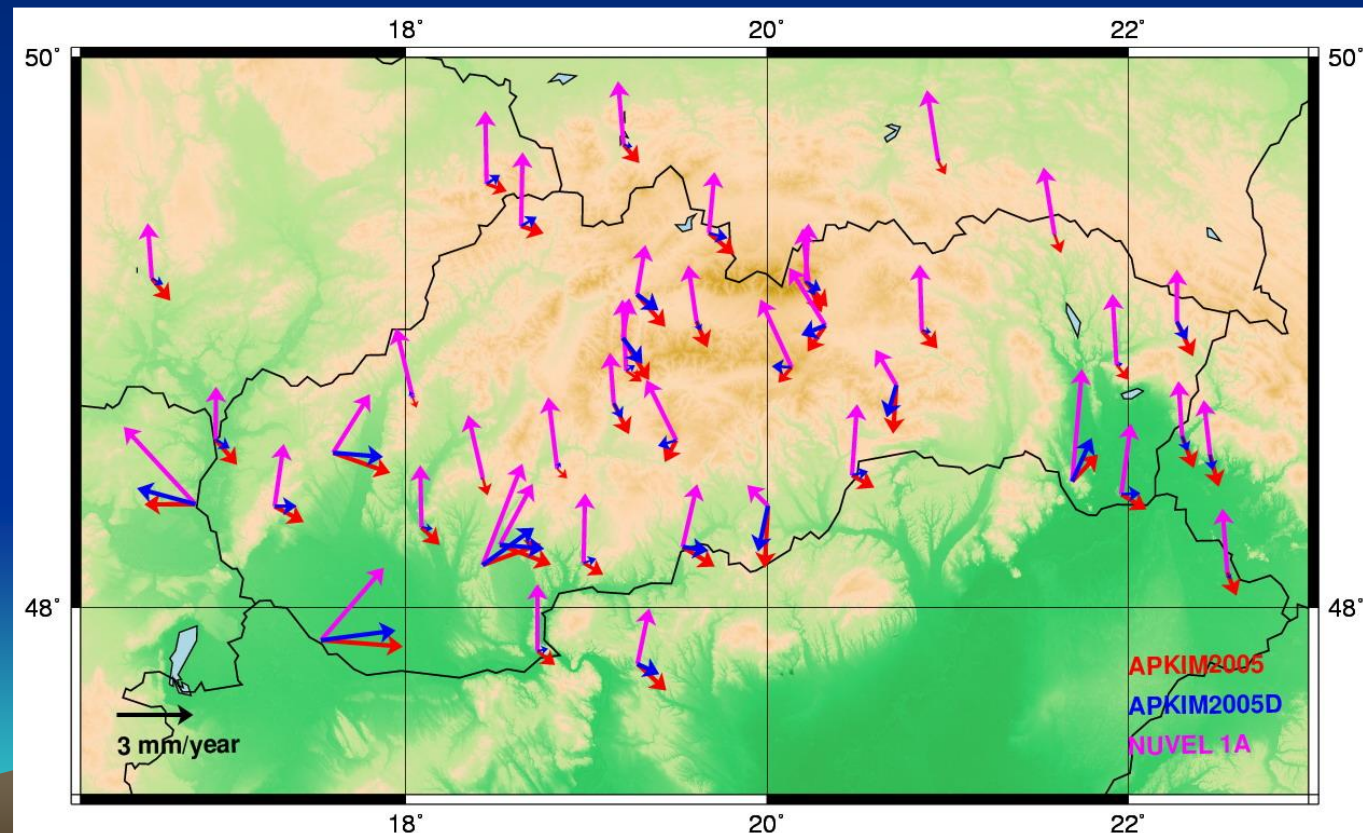
- Three plate motion models were tested in order to find the most representative one

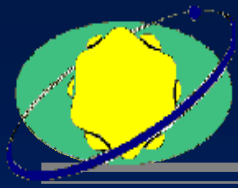
- APKIM2005D

- NUVEL 1A

- APKIM2005

- APKIM2005d is considered as the most representative for the territory of Slovakia



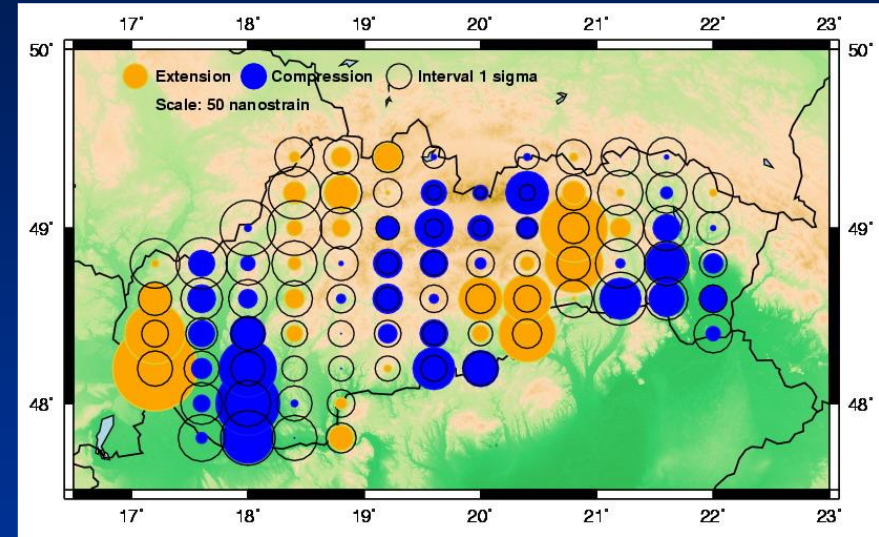


Surface deformation parameters computed from interpolated velocities

SURFACE DEFORMATION

- Extension
- Compression

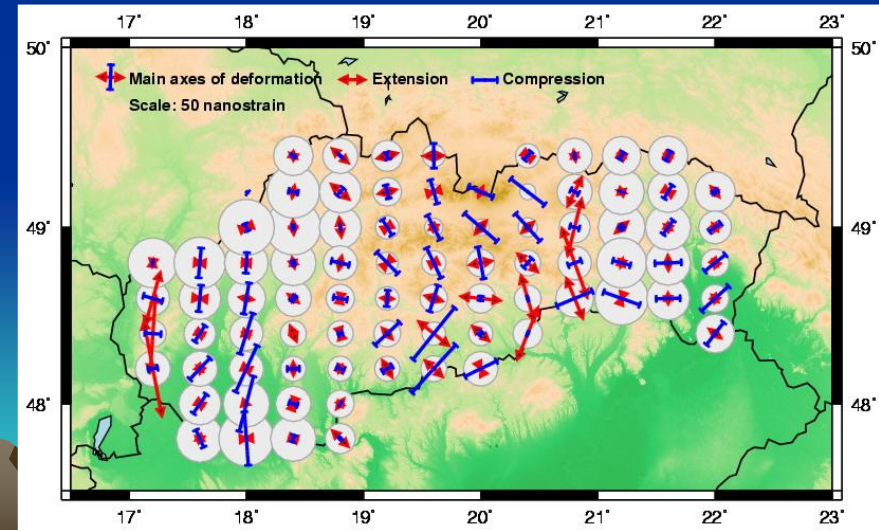
- Range from 8 to 45 nanostrain/year (1 nanostrain = 1 mm/1000 km)
- Distribution of compression and extension areas is varying from east to west but their amplitudes only exceptionally exceed the 2-sigma interval.



MAIN AXES OF DEFORMATIONS

- ↔ Extension
- Compression

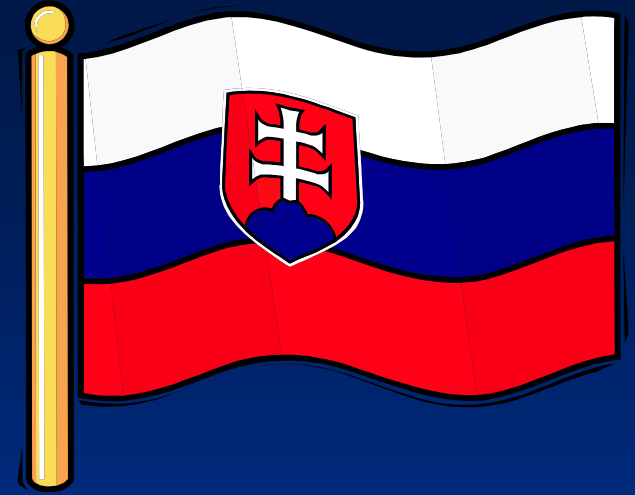
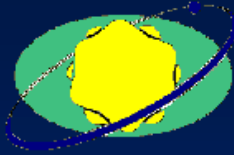
- Observed deformations are not significant.
- Range from 8 to 45 nanostrain/year
- Only the N-S oriented extension in west Slovakia and compression and extension in central Slovakia are above the 2-sigma interval.





EUREF related projects activity

- Contribution to:
 - Elmar Brockman initiative/project – comparison of national and EPN cumulative official ETRS89 coordinates
 - 3 stations EPN and SKPOS
GANP, BBYS, MOP2
 - EUVN_DA
 - 8 B class EPN points from the territory of Slovakia



Thank you for your
attention!

