Symposium of the IAG Subcommission for Europe
(EUREF)
Chisinau, Moldova, 25 – 28 May, 2011

National Report of the Czech Republic
EUREF Related Activities in the Czech Republic 2010 - 2011
National Report

presented by J. Šimek (RIGTC – GOP)

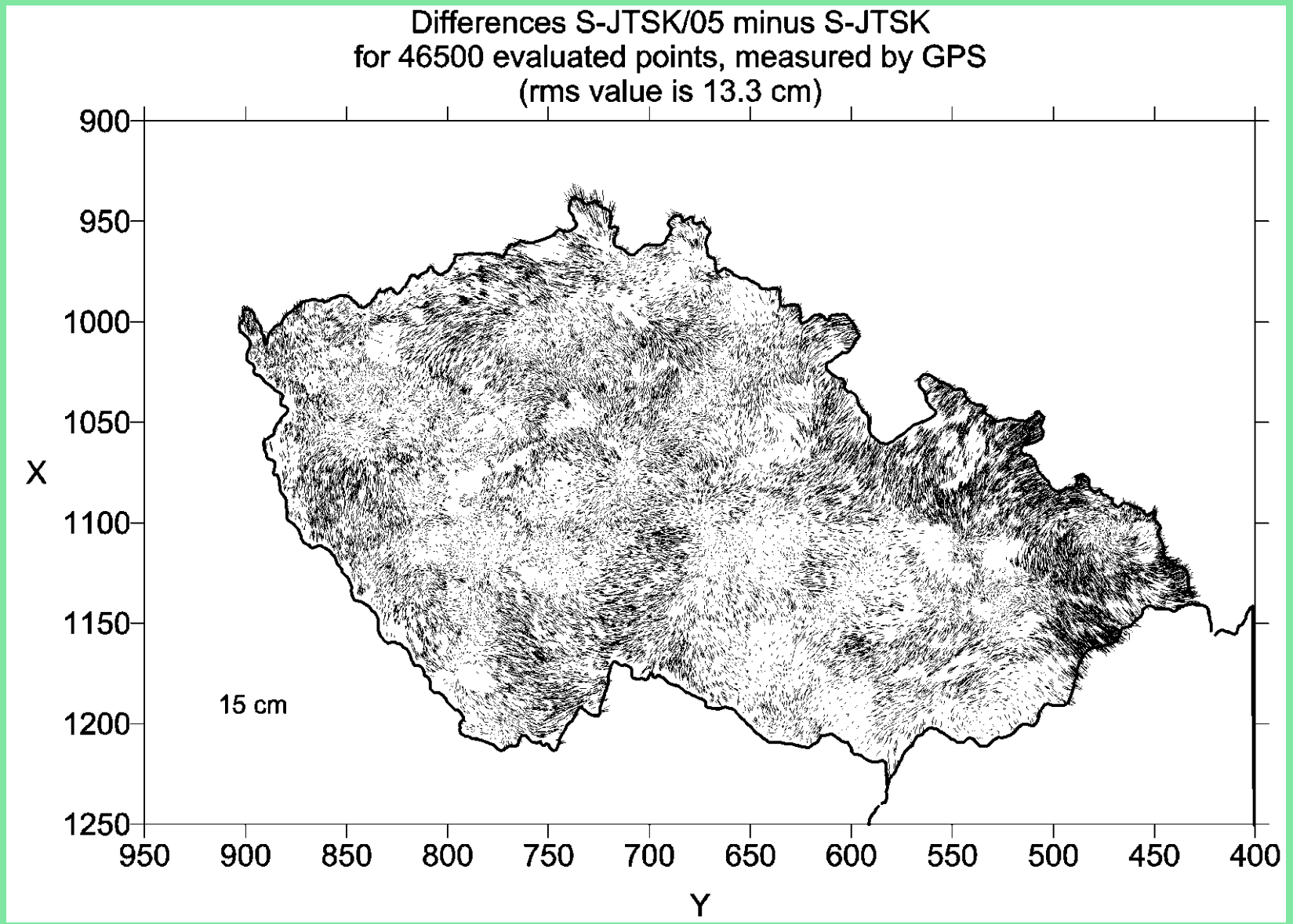
The report was prepared by

- **Land Survey Office**: J. Řezníček, M. Lederer, J. Nágl
- **RIGTC - GOP**: J. Douša, V. Filler, J.Kostelecký, J. Kostelecký jr., V. Pálinkáš, J. Šimek

New ETRS89 realization and modernization of the S-JTSK

- ETRS89/ETRF2000 accepted by Resolution No 1 of the EUREF 2010 Symposium as Class B standard
- ETRF2000 implemented in the CZEPOS positioning system since January 1st, 2011
- New national S-JTSK/05 system based on ETRF2000 partially implemented since January 1st, 2011
- Old S-JTSK still one of the mandatory reference systems
- Conversion between S-JTSK/05 and S-JTSK by means of correction tables computed for 2 x 2 km grid
- Conversion of heights by the CR 2005 quasigeoid model (1´x 1.5´grid fitted to 1,024 GPS/levelling heights)

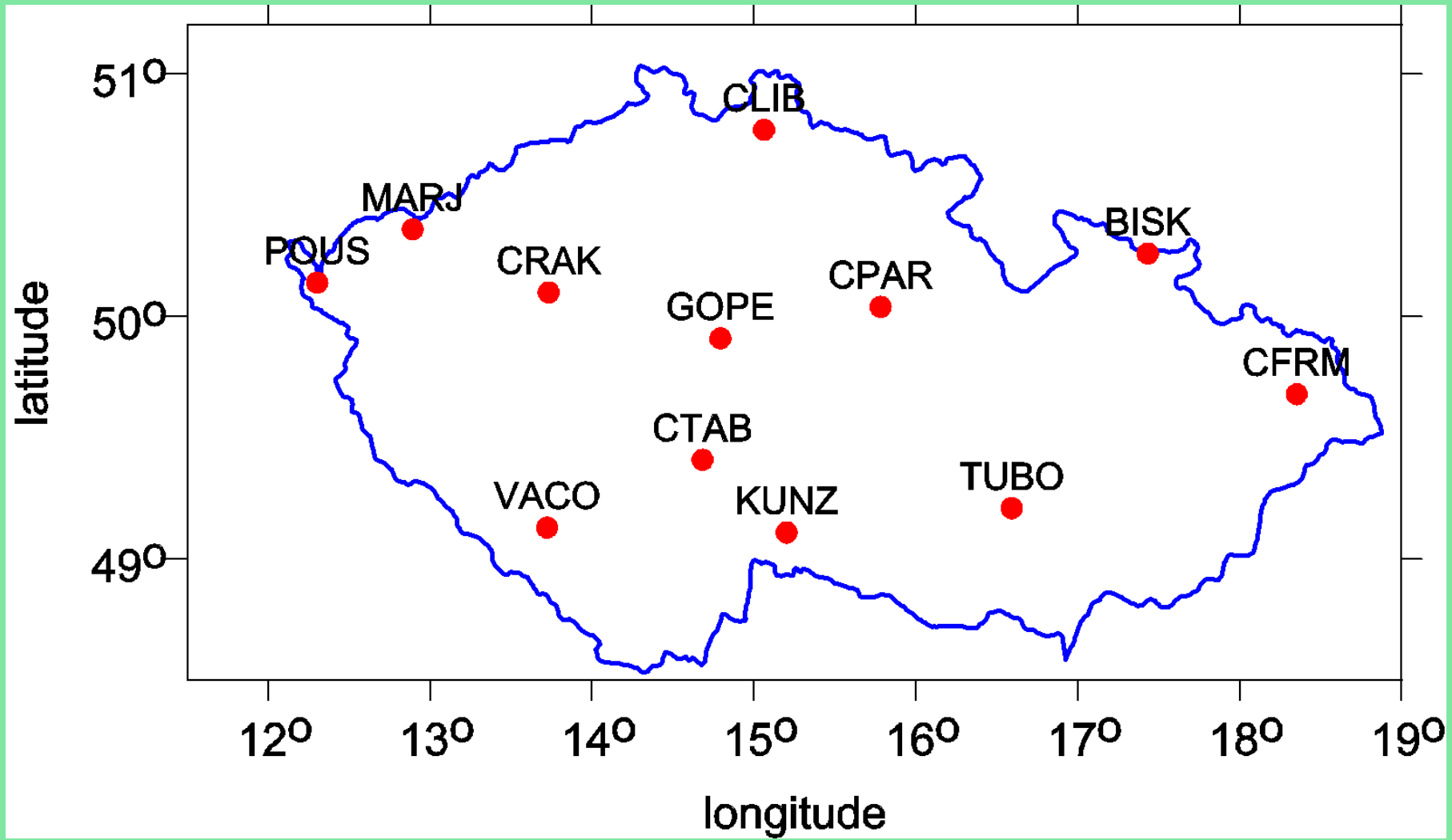
Differences between the old and the new national user system: S-JTSK/05 – S-JTSK



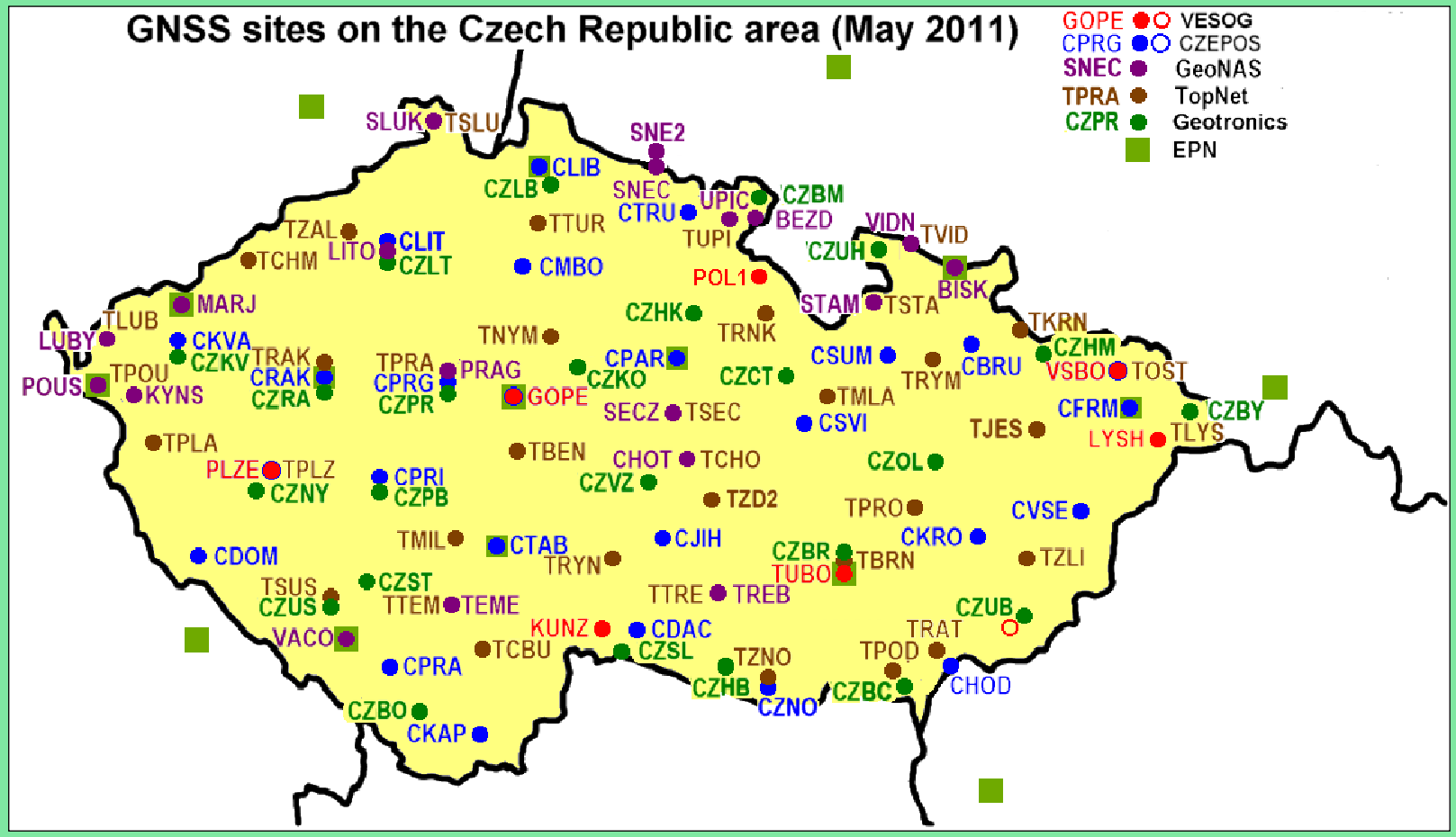
Permanent GNSS networks in the CR (1)

- CZEPOS: http://czepos.cuzk.cz, Czech Positioning System, 27 PS, operated by the Land Survey Office + 27 PS of neighbour countries
- GEONAS: http://geonas.irsm.asc.cz, 19 PS, experimental monitoring network operated by the Institute of Rock Structure and Mechanics, Acad. Sci. CR
- VESOG: http://pecny.asu.cas.cz/vesog/, research and experimental GNSS network operated by the RIGTC GOP and academic institutions, 7 PS, 1 PS proposed
- TopNet: http://www.geodis.cz, 23 PS, includes also 11 GEONAS and 3 VESOG PS, operated by the private company GEODIS Brno
- Trimble VRS NOW Czech: http://www.geotronics.vrsnow, 24 sites + 8 sites of Trimble VRS NOW Deutschland, operated by Geotronics Praha, s.r.o. private company
- several smaller networks, operated by private companies, e.g. *byS@T* and others
- **Total: 97 permanent stations, 12 of them EPN**

EPN stations in the Czech Republic

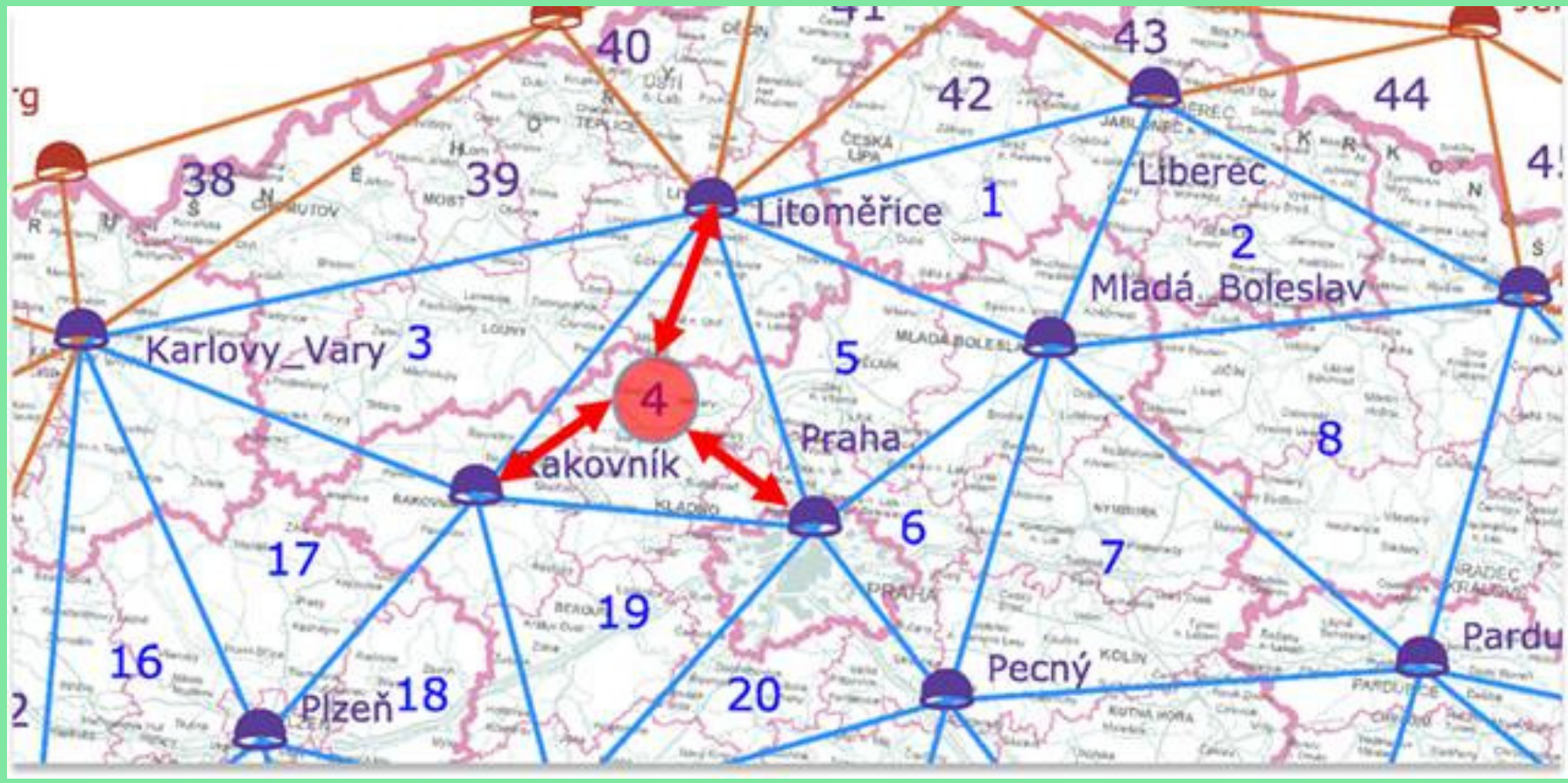


Permanent GNSS networks in the CR (2)

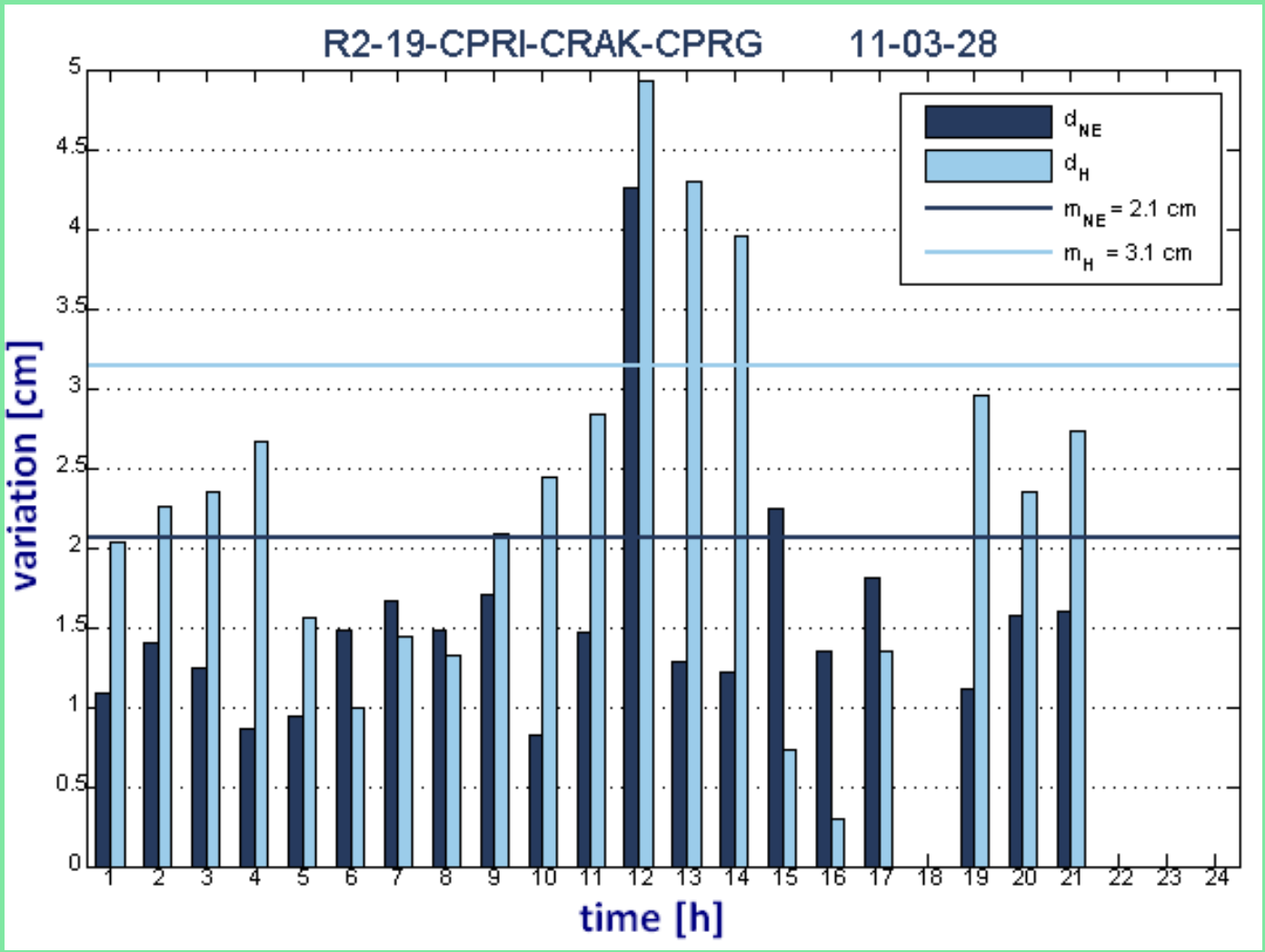


CZEPOS and its cross-border links

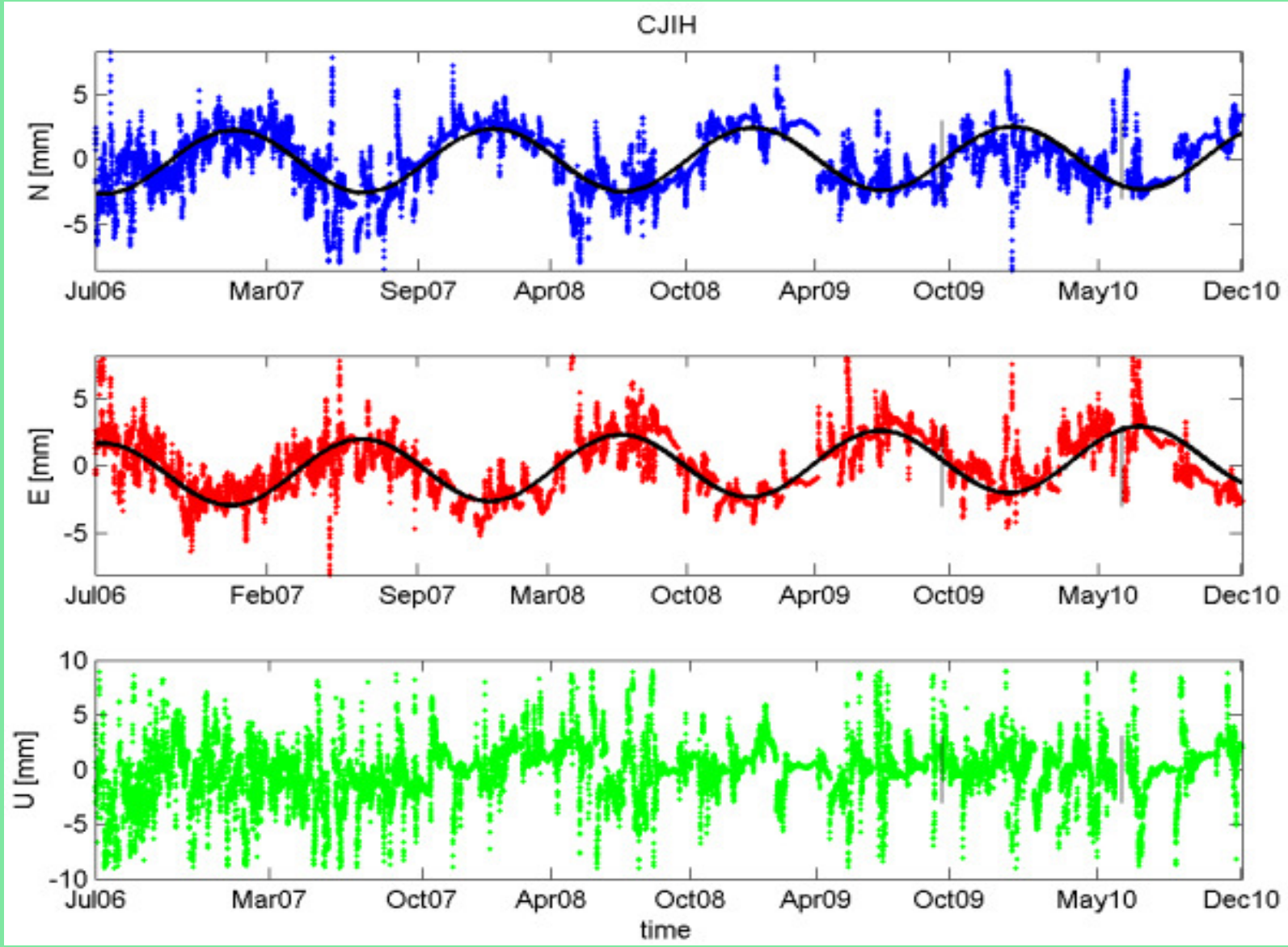
CZEPOS – permanent check of the network solution - approach



CZEPOS – permanent check of the network solution - results



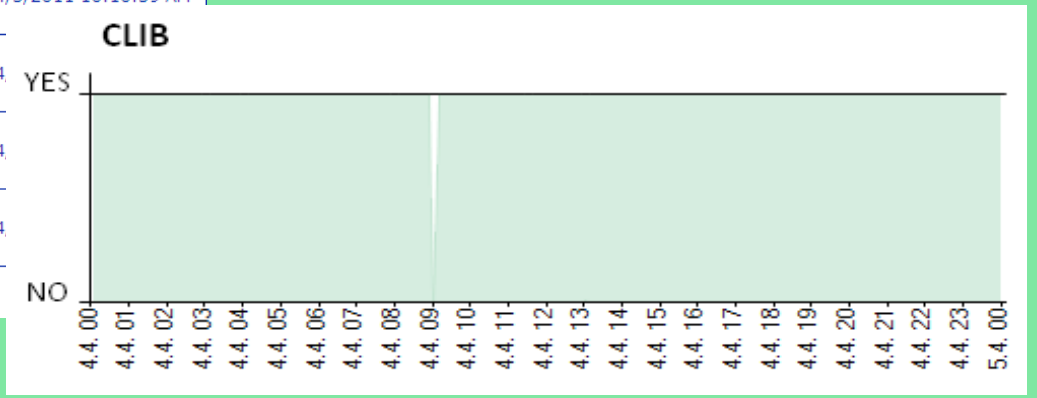
CZEPOS – monitoring of stability



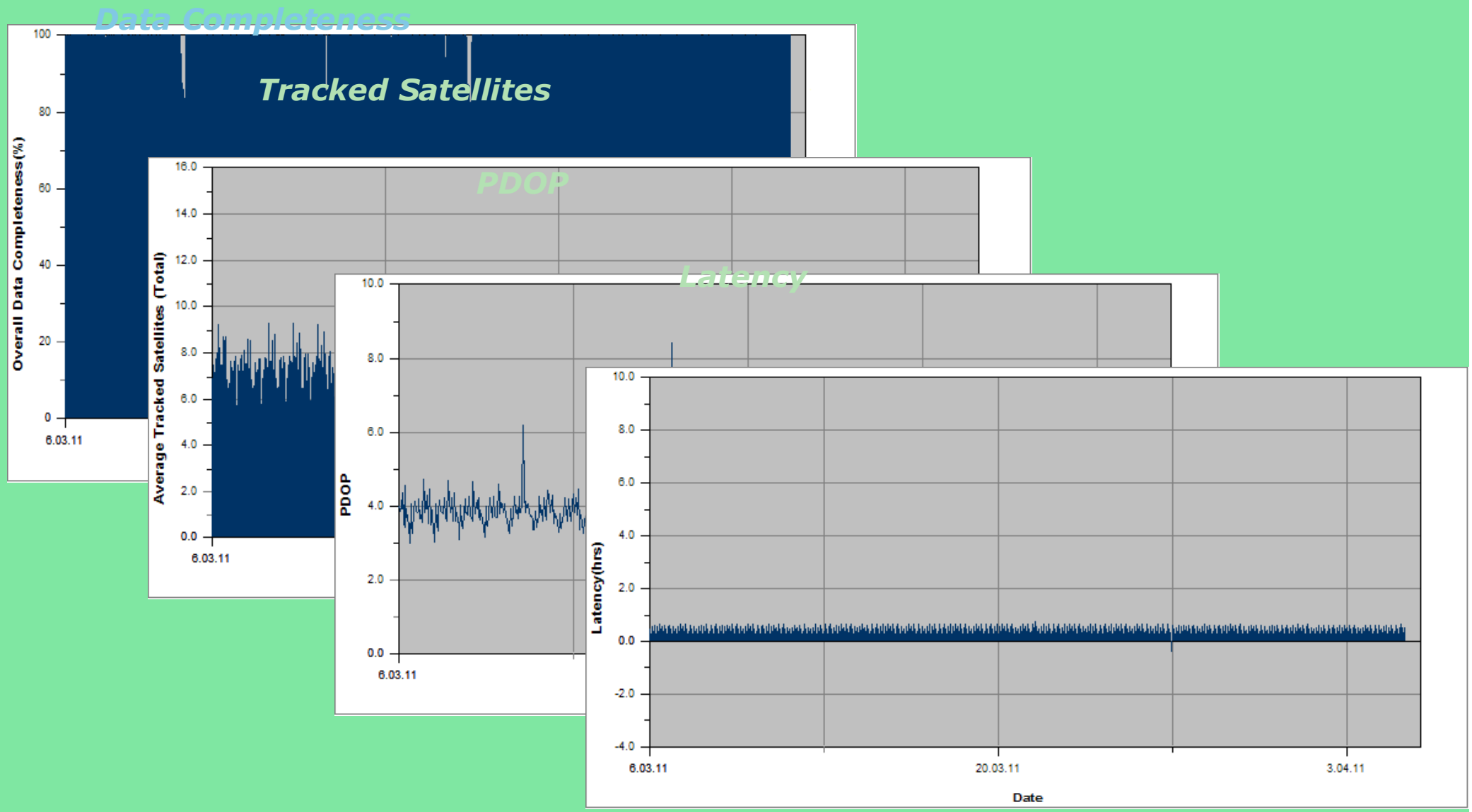
CZEPOS: Functionality of services

service	status	testing time
FKP	YES	4/5/2011 10:16:59 AM
PRS	YES	4/5/2011 10:15:59 AM
RTK3-NS	YE	
VRS3-iMAX	YE	
VRS3-MAX	YE	

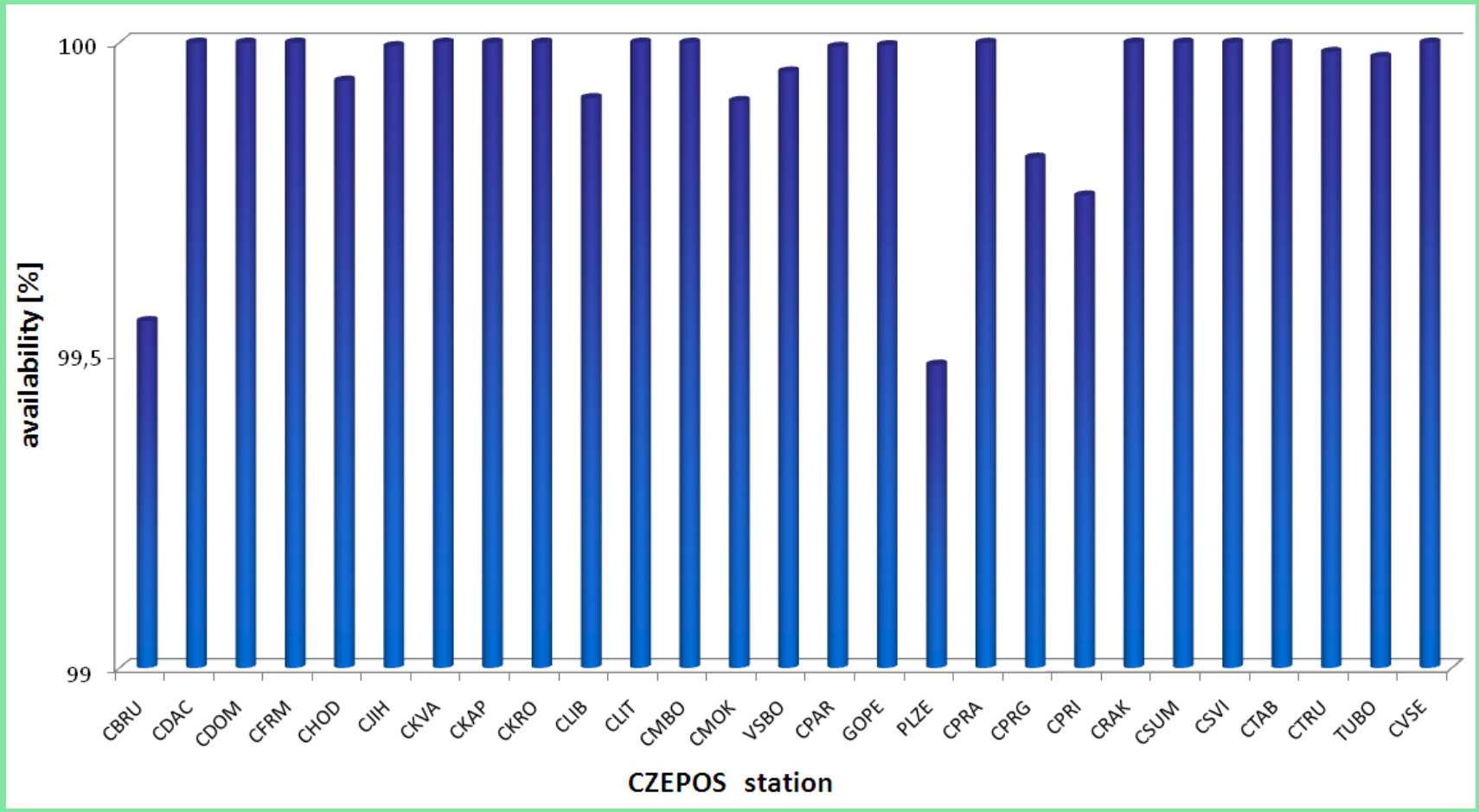
n	station	code	RTK status	DGPS status	testing time
1	Pardubice	CPAR	YES	YES	4/5/2011 10:06:00 AM
2	Svitavy	CSVI	YES	YES	4/5/2011 10:07:00 AM
3	Jihlava	CJIH	YES	YES	4/5/2011 10:08:00 AM
4	Dačice	CDAC	YES	YES	4/5/2011 10:09:00 AM
5	Tábor	CTAB	YES	NO	4/5/2011 10:10:00 AM
6	Příbram	CPRI	YES	YES	4/5/2011 10:10:59 AM
7	Karlovy Vary	CKVA	YES	YES	4
8	Domažlice	CDOM	YES	YES	4
9	Prachatice	CPRA	YES	YES	4
:	:	:	:	:	



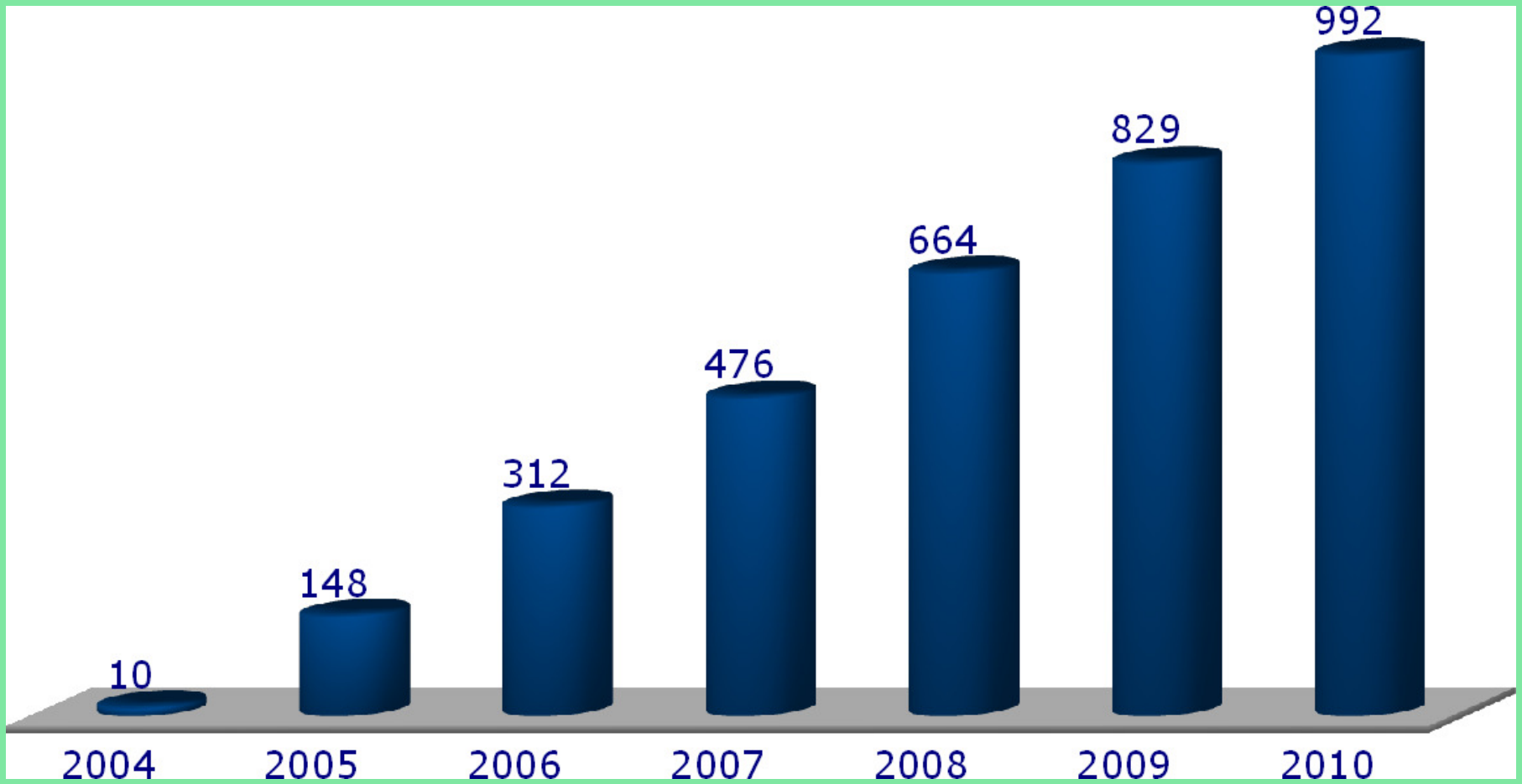
CZEPOS – monitoring of quality of PP products
based on Leica Geosystem GNSS QC SW



CZEPOS – availability of PP data



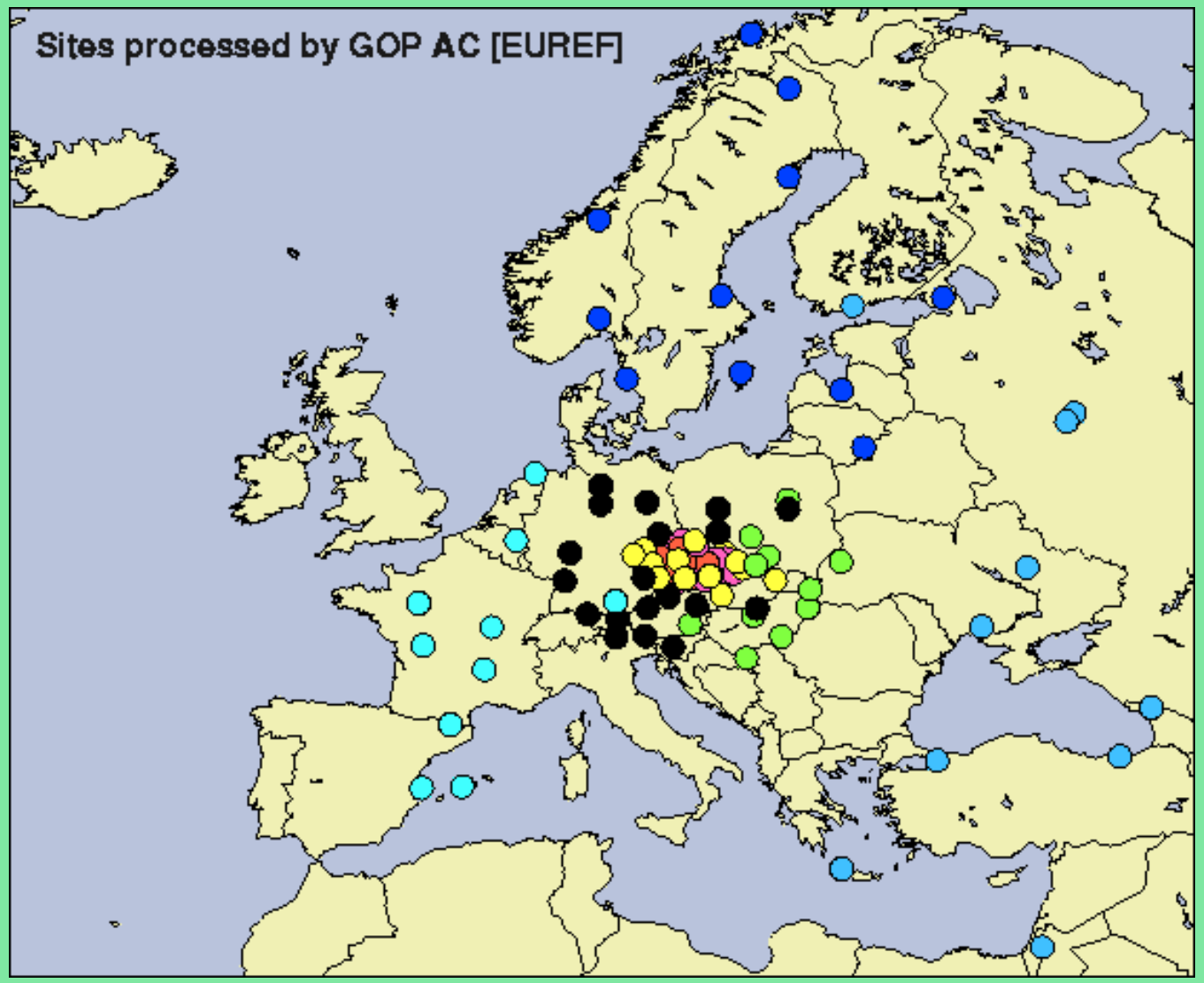
CZEPOS – increasing number of users: May 2011 – 1030 users



EPN Local Analysis Center GOP

- data analysis from 79 IGS/EPN + 49 Czech PS
- EPN standards and processing strategy
- Interruption in summer 2010; resumed Feb 2011
- Reprocessing of 85 stations 1996 – 2008 (Repro 1 project), extended to June 2010
- precise GLONASS ultra-rapid orbits
- hourly data files from RT streams
- NRT ZTD procedure extended to GLONASS
- EPN routine processing extended to rapid and hourly solutions
- GPS week 1632: IGS08, new IGS phase centre model
- Monitoring of permanent stations in the Czech Republic

EPN Local Analysis Center GOP: EPN subnetwork processed by LAC GOP



GNSS Meteorology at GOP

- NRT troposphere products for numerical weather forecasting: E_GVAP II project
- GOP strategy revised in 2010, global product developed
- Global NRT solution estimating ZTDs (90 stations) routinely since August 2010
- Global solution sufficiently stable, accuracy equivalent to that from GOP regional solution

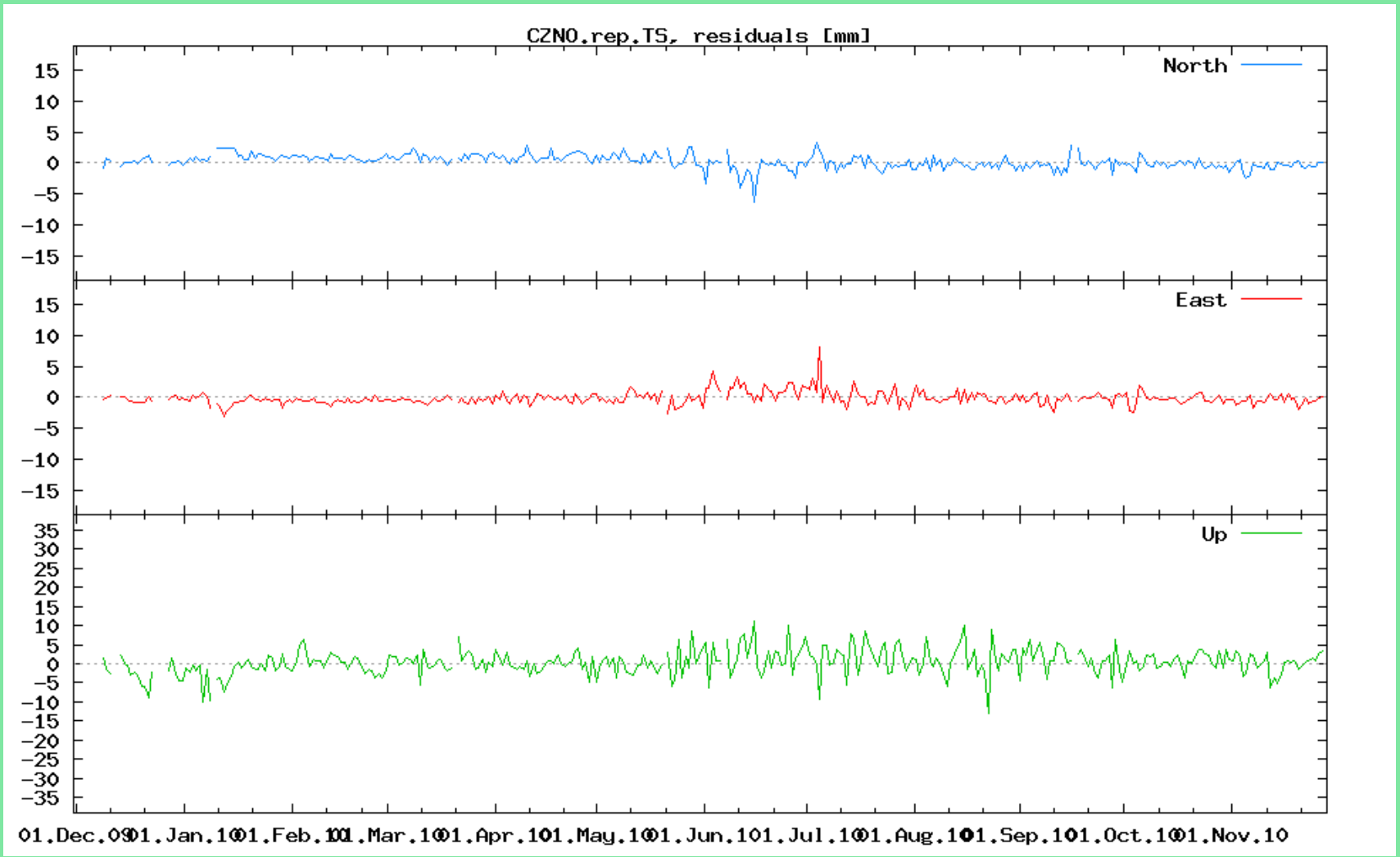
GOP rapid orbits

- Since June 2010 – routinely GPS+GLONASS ultra-rapid orbits
- GLONASS solution biased w.r.t. GPS (2 mm in ZTD) due to inconsistency of GPS and GLONASS antenna offsets from IGS05 ATX file
- Testing IGS08 ATX model commenced

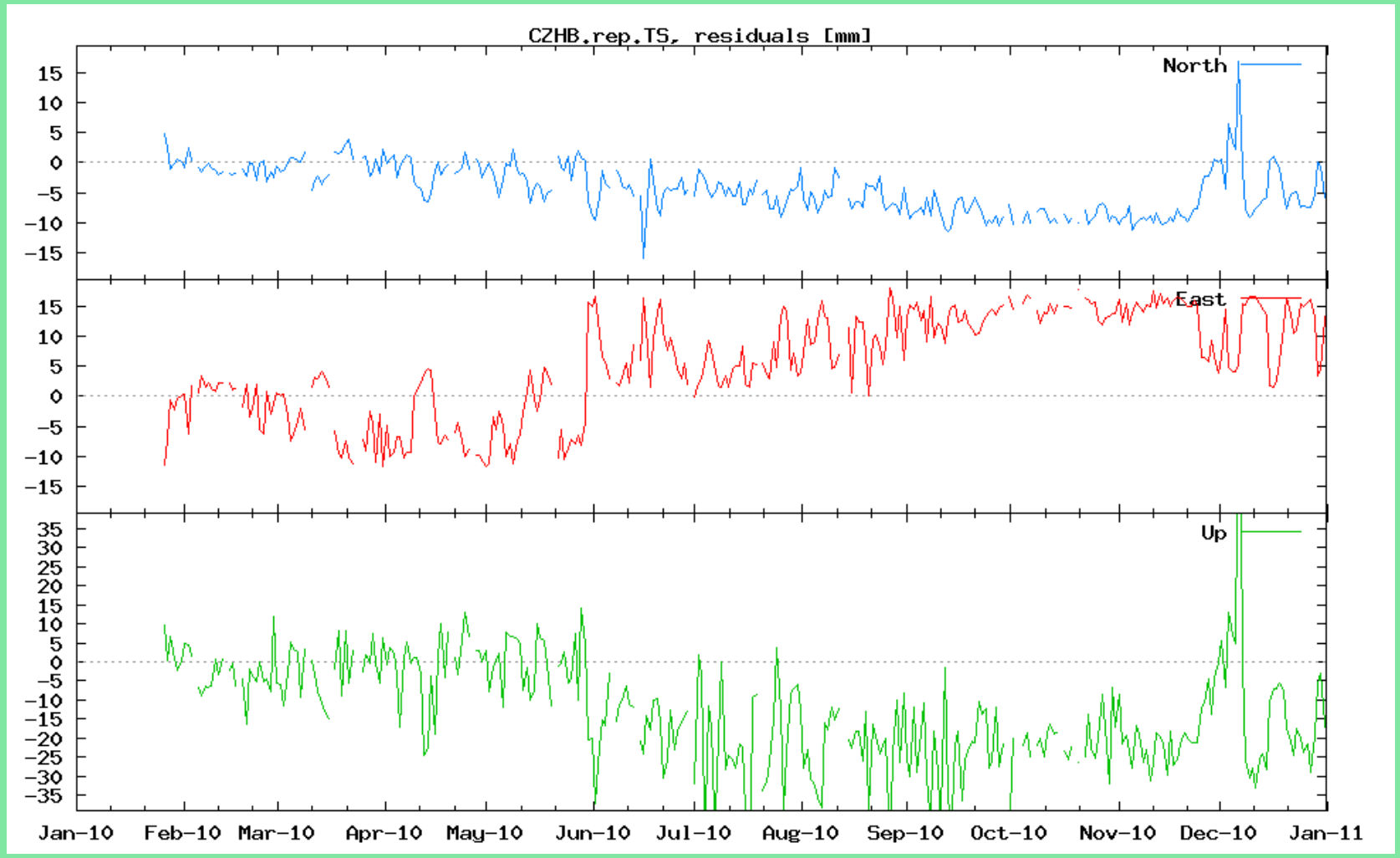
Monitoring of the Czech permanent sites

- Check of stability and quality
- Rapid solution used as a basis
- EPN processing standards and guidelines
- 8:00 UTC the daily solution compared with coordinates + statistical test
- Limits: 7mm, 7 mm and 15 mm for N,E,U components

Monitoring results for the site CZNO (good) based on ultra-rapid solution



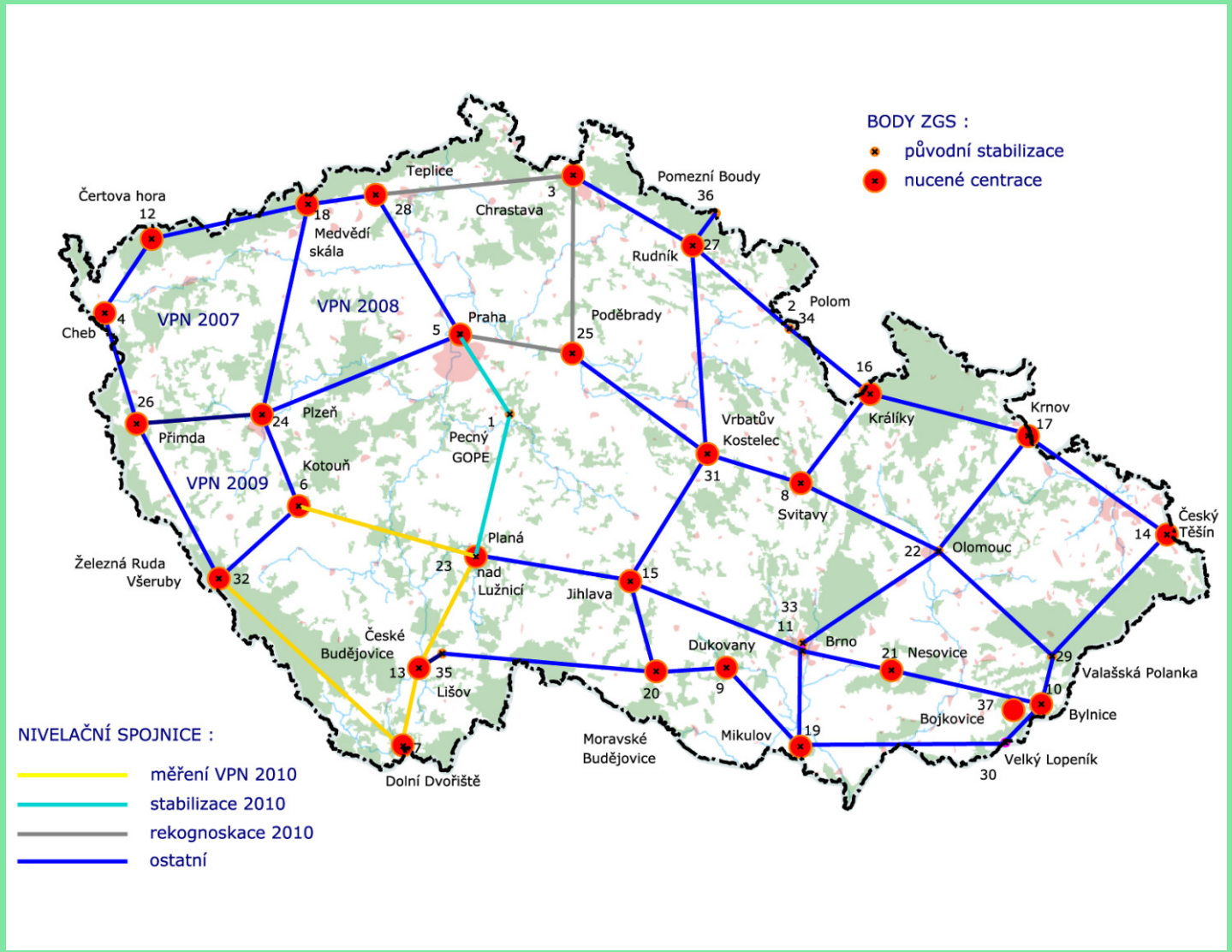
Monitoring results for the site CZHB (bad) based on ultra-rapid solution



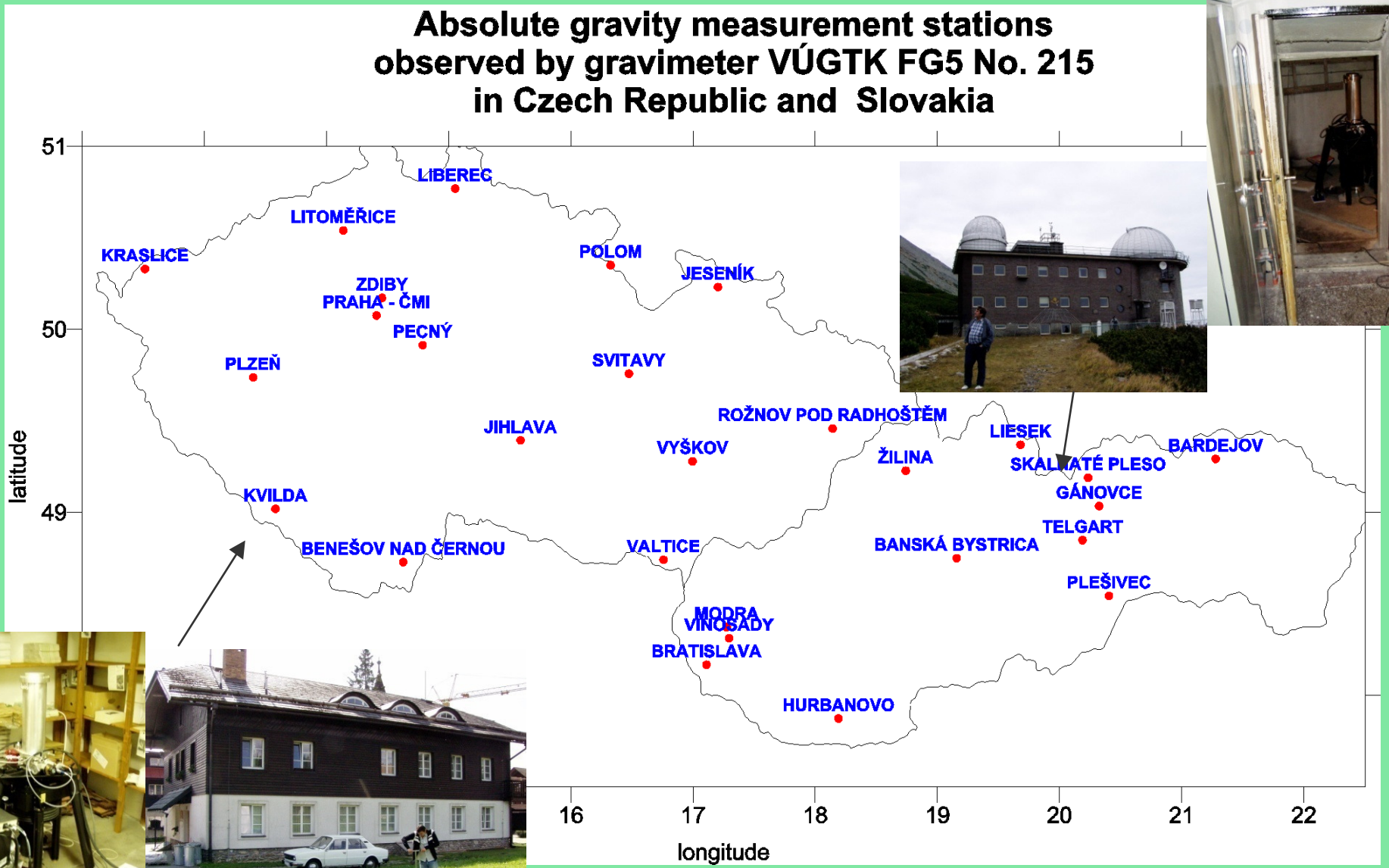
ECGN, gravity, geodynamics

- 14 stations of the Czech Geodynamic Network in EUVN_DA_database
- 600 km of levelling lines in the geodynamic network (rms/1 km error 0.40 mm)
- Gravimetric measurements at 3 stations of the geodynamic network, geodynamic polygon Lišov, local gravity network GOP, vertical gravity gradients (performed by LSO)
- superconducting (OSG-050) and absolute gravimetry (FG5 No. 215) at GOP, environmental effects on gravity
- ICAG at Wettzell (6 absolute measurements)
- Absolute gravity measurements: Slovakia (4 sites), Hungary (3), Czech Republic (9 sites)
- Repeated absolute gravity measurements at GNSS permanent stations GOPE (14), POL1 (2), KUNZ (2) and ZDIB (3)

Geodynamical network of the Czech Republic
Land Survey Office



Absolute gravity networks in CR and Slovakia measured by RIGTC-GOP with FG5 No 215



Tidal Gravimetry at GO Pecný and Environmental Effects

- gravity time series by GWR OSG-050, Askania Gs15 No. 228 and by LCR 137
- calibration by FG5 No. 215 absolute gravimeter
- very broadband 3-D seismometer
- climatological station
- meteorological parameters
- soil moisture
- ground water level

Thank you for your attention !

for more detailed information please visit

http://czepos.cuzk.cz

http://www.cuzk.cz

http://pecny.asu.cas.cz