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

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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

Differences S-JTSK/05 minus S-JTSK for 46500 evaluated points, measured by GPS (rms value is 13.3 cm)
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
- 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

![Graph showing variation in network solution over time](image)
CZEPOS – monitoring of stability
CZEPOS: Functionality of services

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CLIB

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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