Symposium of the IAG Subcommission for Europe (EUREF)
Riga (Latvia), 14 - 17 June, 2006

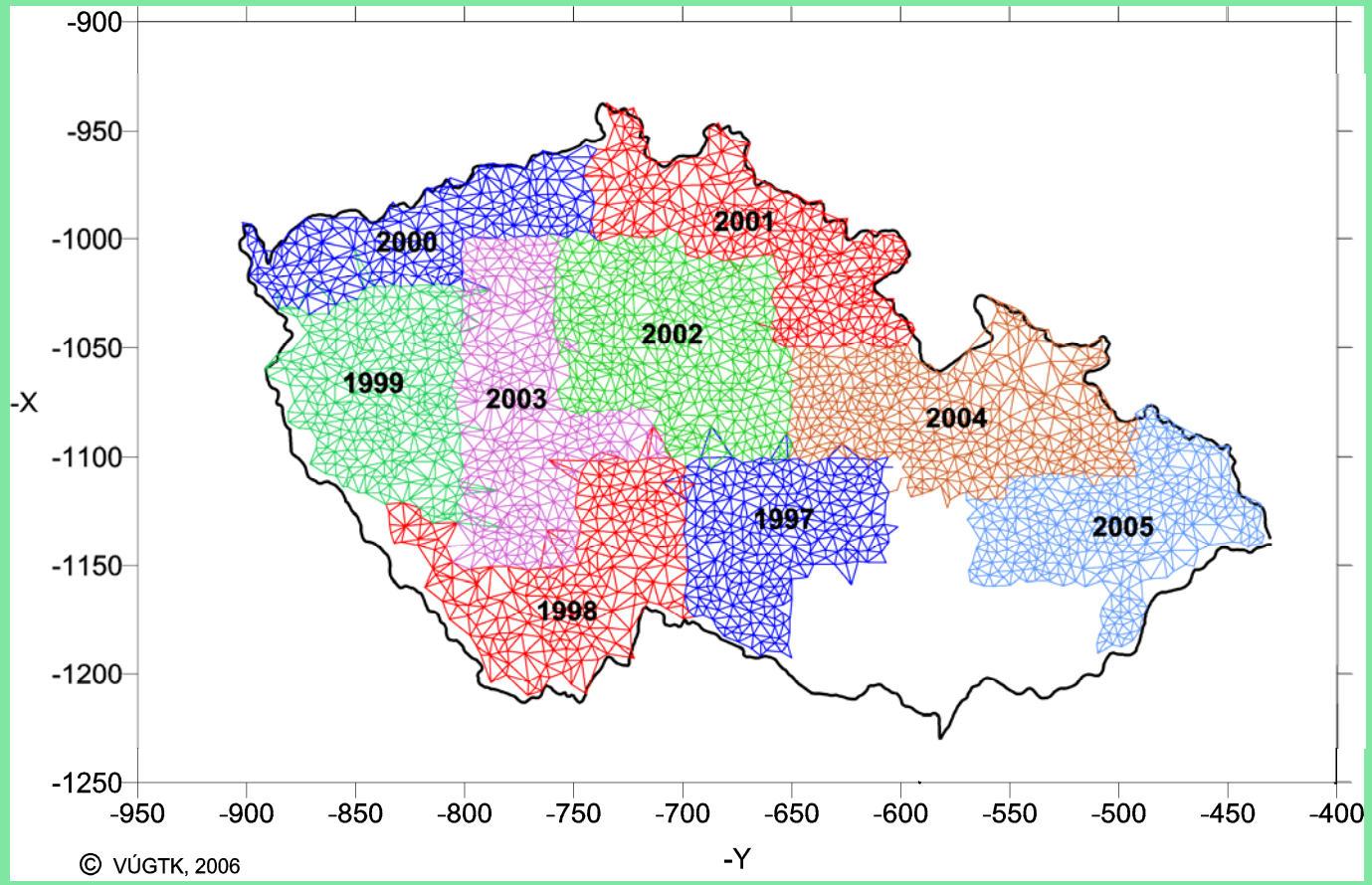
National Report of the Czech Republic

EUREF Related Activities in the Czech Republic 2005 - 2006 National Report

presented by J. Šimek

Status of EUREF in the CR

Progress of densification by „Selective maintenance“ performed by Land Survey Office



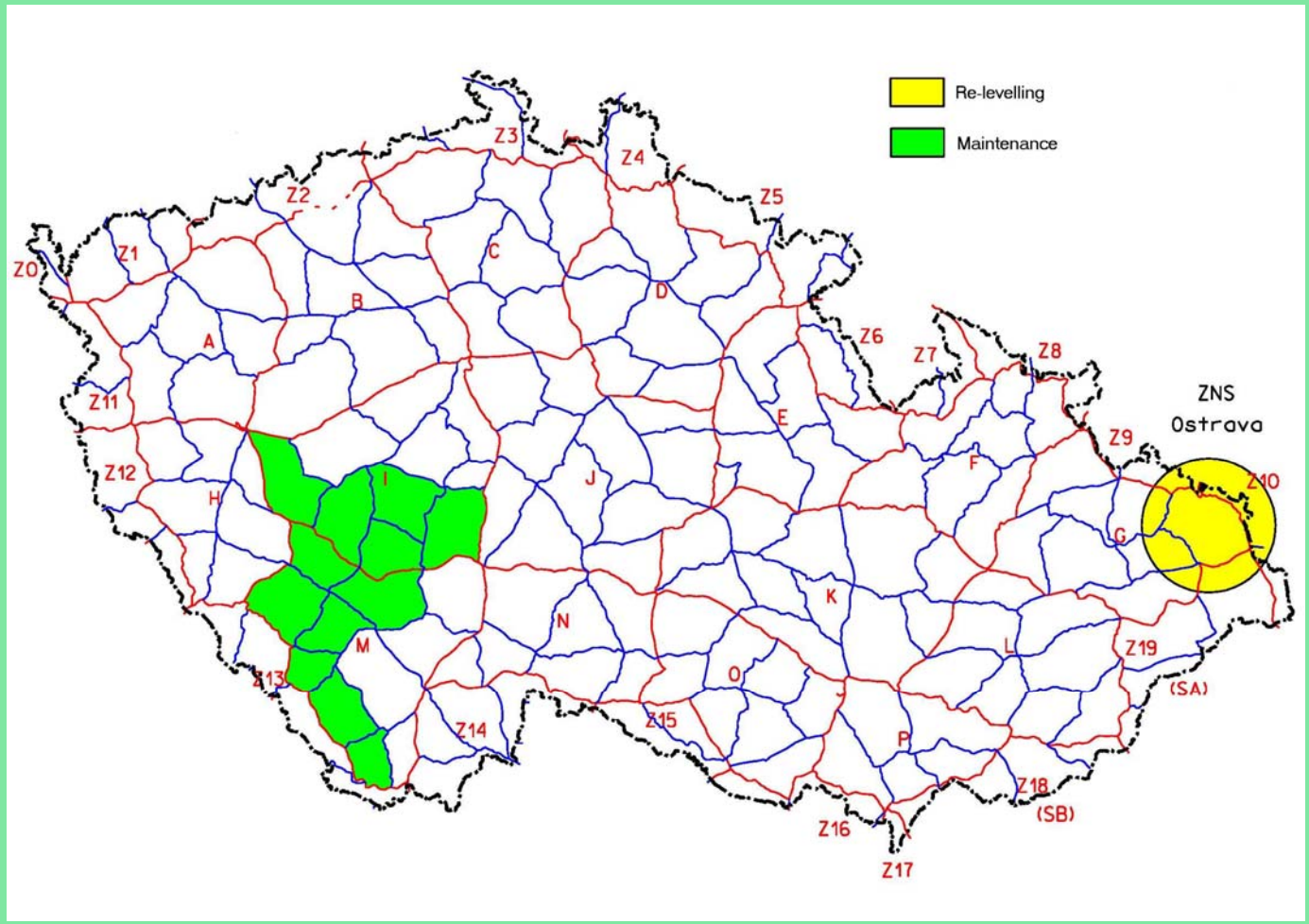
1997 – 2005: new stations, accomplished in 2006 by Land Survey Office

UELN 2000 and UEGN 2002
Related Activities (Land Survey Office)

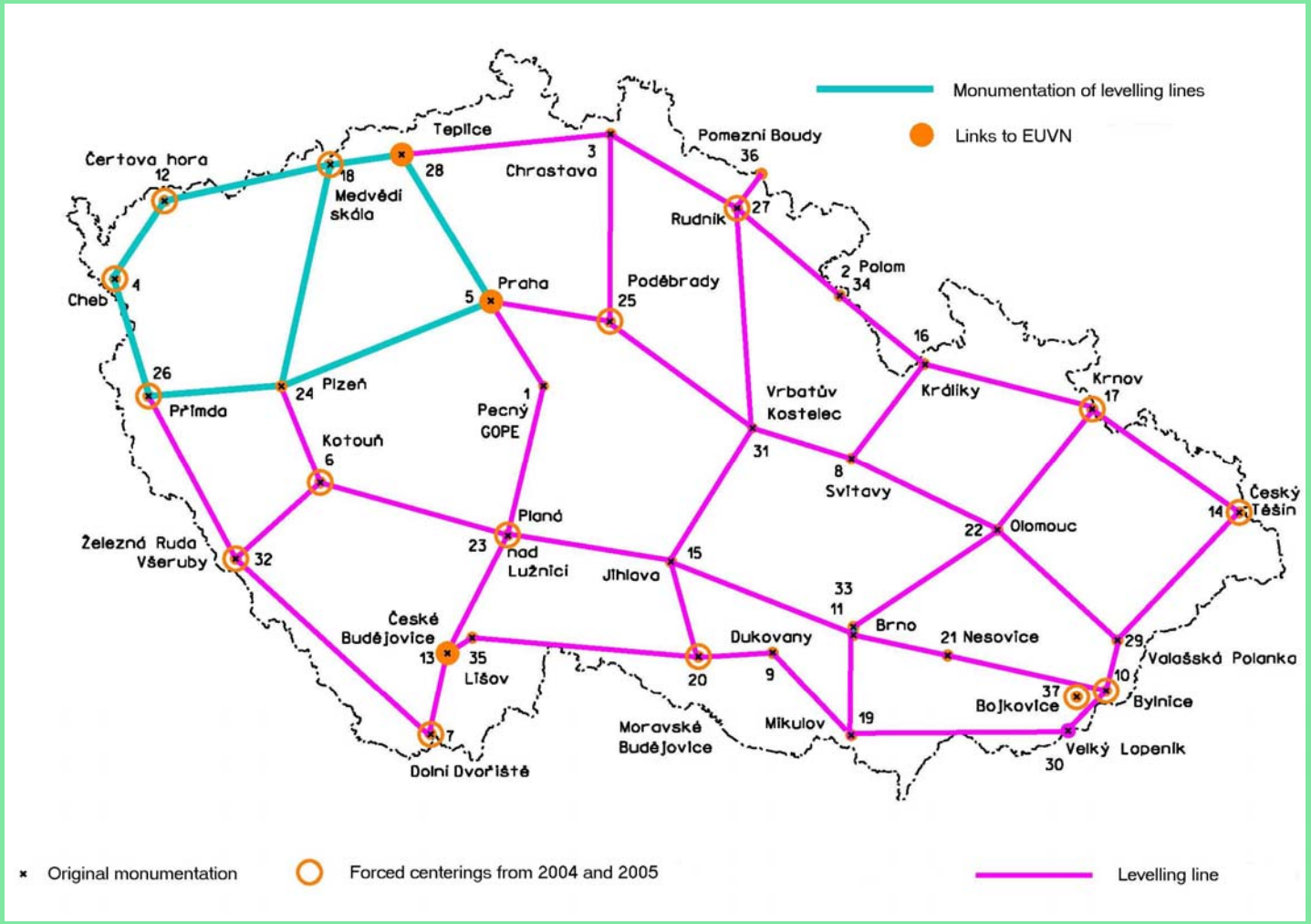
Kinematic levelling network in the Czech Republic

- leveling connections CR – Slovakia
- remeasurement of the 3rd order levelling lines 500 km in 2005
- Special levelling networks (SLN): measurement (Ostrava), maintenance (South Bohemia)

UELN 2000 – Related Activities (Land Survey Office)

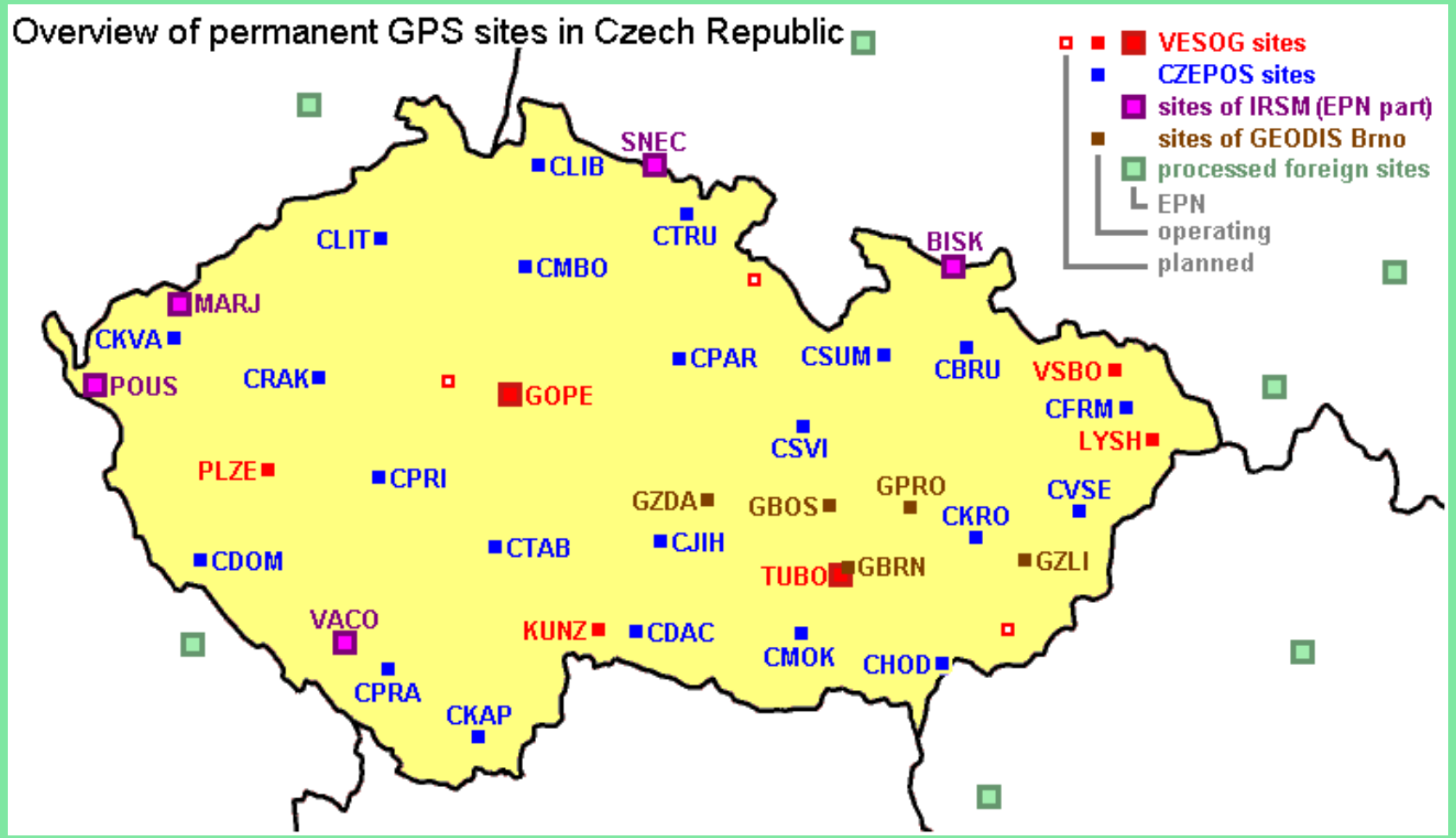


EUVN – Related Activities (Land Survey Office)



GEODYN

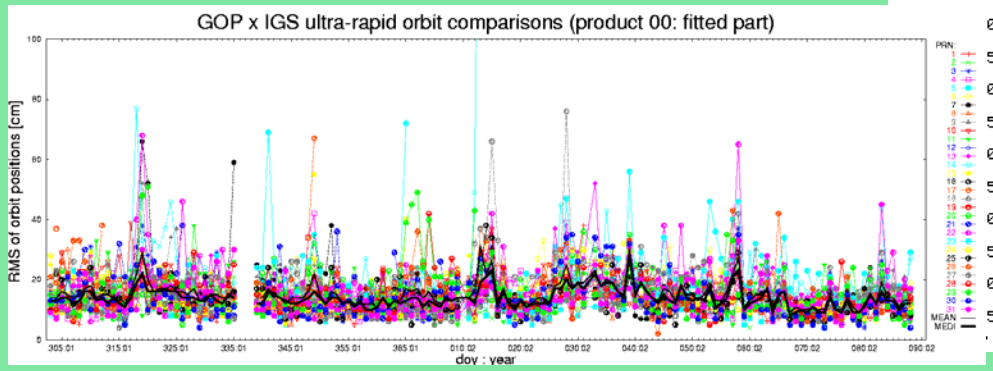
Permanent GPS Observations

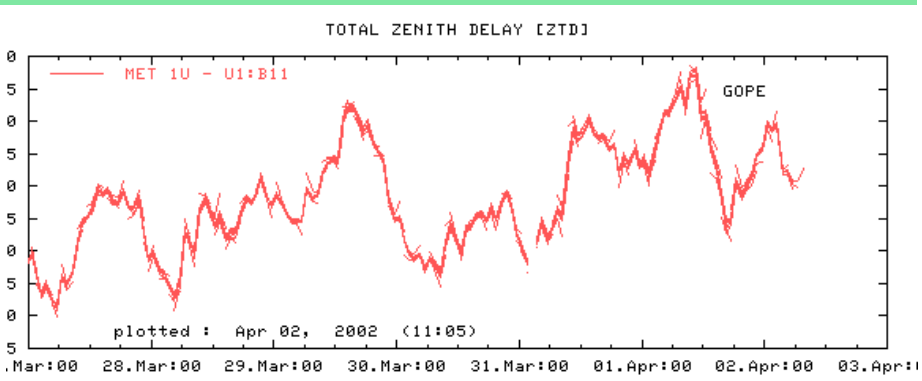


Research and Experimental Network for GNSS observations (VESOG)
status June 2006

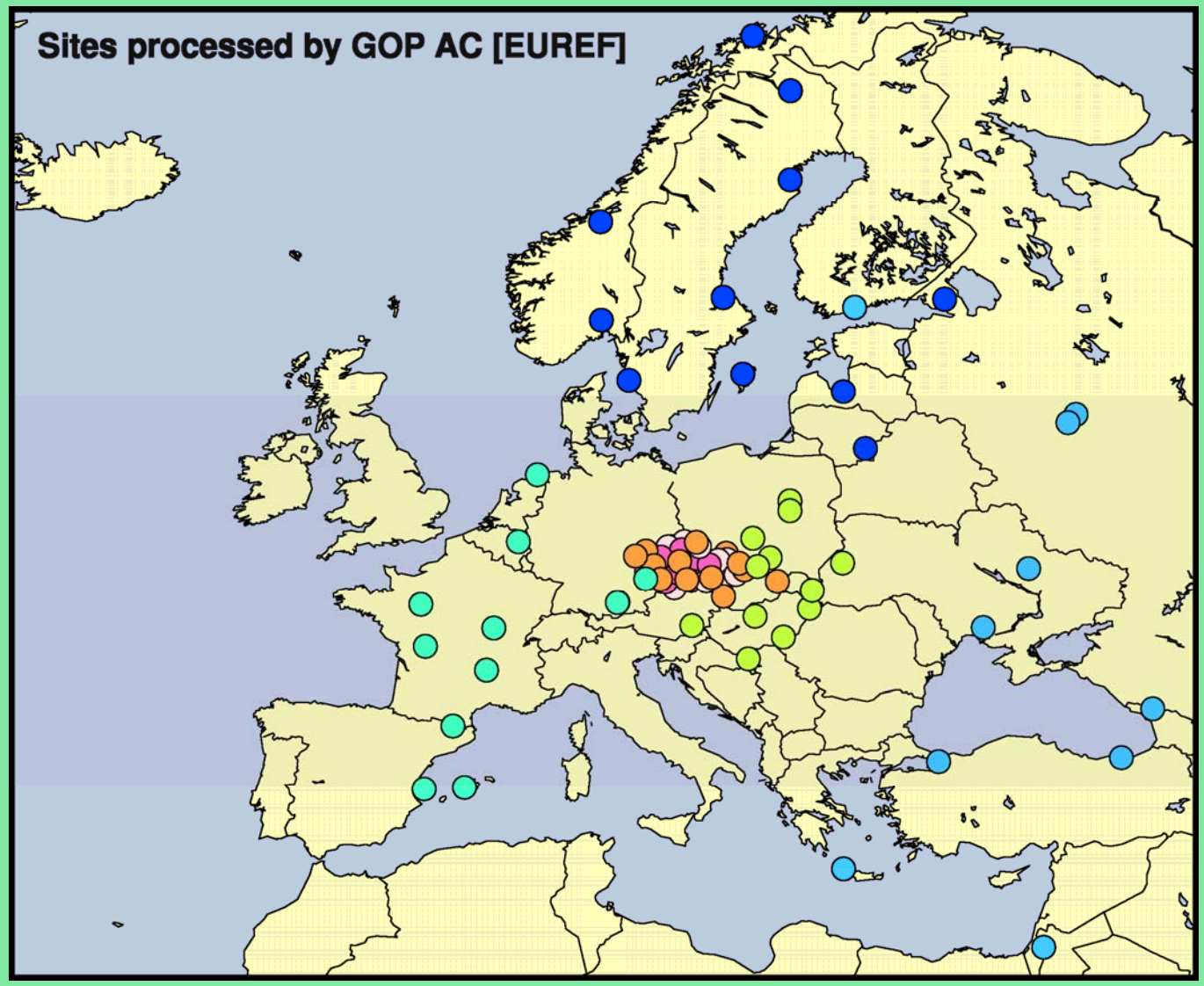
Activities of EUREF Local Analysis Center GOP

- data analysis from >50 EPN permanent stations (April 2006)
- ground-based GPS meteorology – projects COST 716 and TOUGH – processing of >80 stations
- GOP ultra-rapid orbits accepted as IGS product for combination



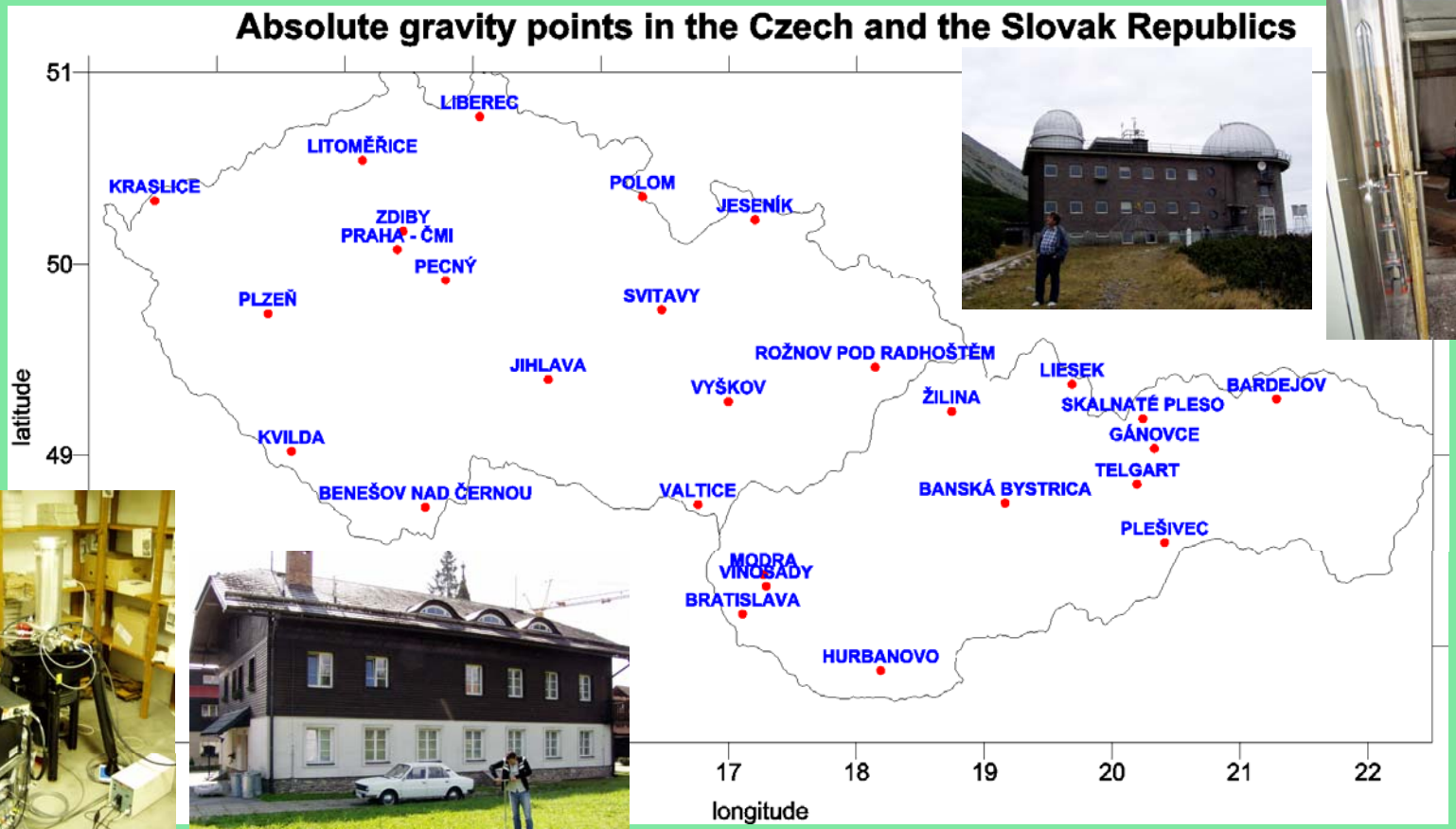


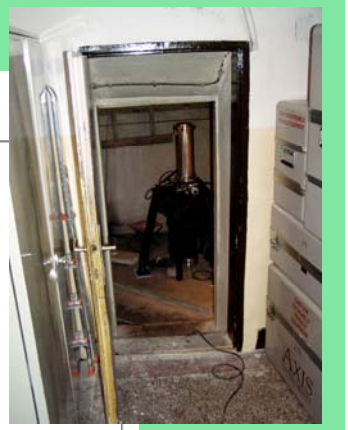
Activities of EUREF Local Analysis Center GOP



Absolute Gravimetry in 2005 - 2006 with FG5 No. 215 (RIGTC)

(cooperation with Land Survey Office, Prague, Geodetic and Cartographic Institute, Bratislava, and STU Bratislava)

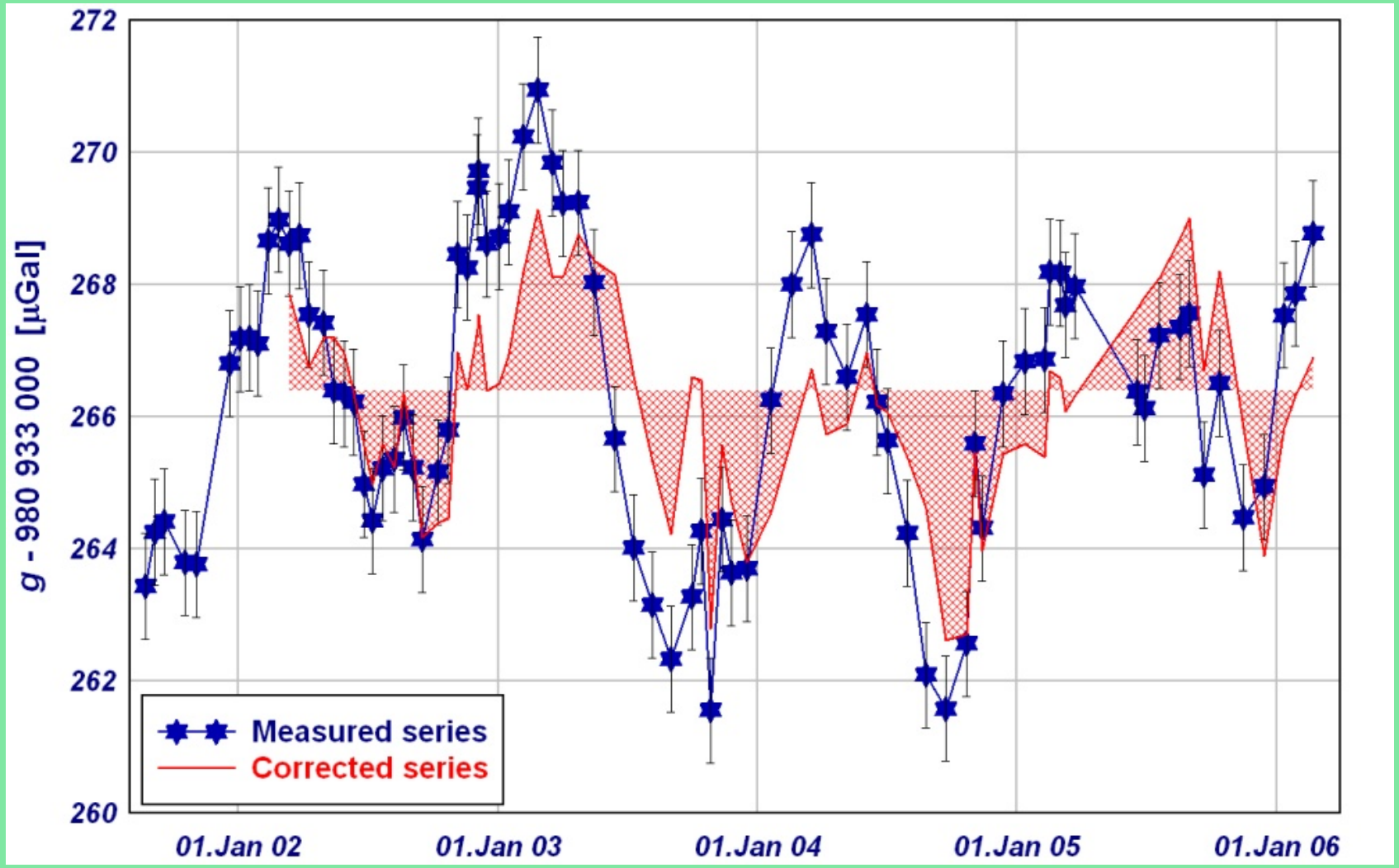




Tidal Gravimetry at GO Pecný and Environmental Effects

- gravity time series by Askania Gs15 No. 228 and by LCR 137
- calibration by FG5 No. 215 absolute gravimeter
- climatological station (of Charles University)
- meteorological parameters
- soil moisture
- ground water level

Absolute gravity measurements at GO Pecný



Determination of the value of geopotential on the geoid (Burša et al.)

$$W_{geoid} = f(R_{geoid}, C_{lm}, S_{lm}, GM, \omega_{\oplus})$$

R_{geoid} can be measured by satellite altimetry
(SSH vs. geoid corrections must be applied)
GM, C_{lm}, S_{lm} are taken from EGM
$\omega_{\oplus}$ is rotational velocity of the Earth

$$W_{geoid} = 62\,636\,856.0 \pm 0.5\ m^2.s^{-2}$$

Determination of the differences between different height systems (Burša et al.)

$$W(P) = f\left[R(P), C_{lm}, S_{lm}, GM, \omega_{\oplus}\right]$$

R(P) can be measured by GPS

$$W'(P) = W_{origin} + \int_{origin}^{P} g.dH$$

determined from levelling and surface gravity measurements, *P* is surface point

$$W(P) - W'(P) = W_{geoid} - W_{origin} = \Delta H.\gamma,$$

ΔH is „height of origin above geoid“

γ is normal gravity

Determination of the differences between different height systems (Burša et al.)

we have two height systems i,j
difference between both is

$$\Delta H_{ij} = \Delta H_i - \Delta H_j$$

system i	system j	difference cm
NAVD (North America)	AHD (Australia)	96
NAVD (North America)	IGN (Europe)	-13
NAVD (North America)	BHD (South America)	58
AHD (Australia)	IGN (Europe)	109
AHD (Australia)	BHD (South America)	-38
IGN (Europe)	BHD (South America)	71

This Report is result of cooperation

- **Land Survey Office**: J. Provázek, J. Řezníček, M. Lederer
- **RIGTC**: J. Douša, V. Filler, J. Kostelecký jr., J. Kostelecký, V. Pálinkáš, J. Šimek
- **IRSM**: V. Schenk, Z. Schenková, F. Mantlík, P. Kottnauer
- **MGHO-CAF**: V. Vatrt, M. Vojtíšková