



EUROPEAN UNION
European Structural and Investment Funds
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Development and Education



GEONAS network

Cajthamlová Milada

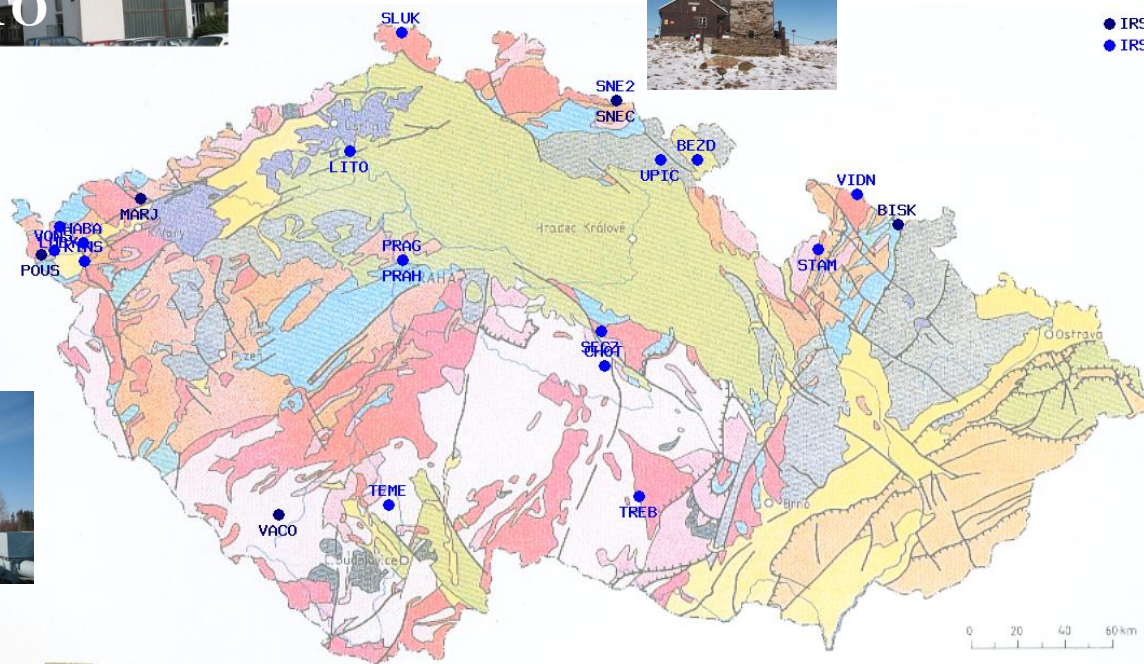


INSTITUTE OF ROCK STRUCTURE AND MECHANICS
of the Czech Academy of Sciences

GEONAS

- GEOdynamic Network of the Academy of Sciences
- to make regular geophysical and geodetic observations for geodynamic studies of the Bohemian Massif and the adjacent areas
- the permanent GNSS measurements started in 2001
- consist of 18 permanent GNSS observatories
- 3 stations are embodied in the network EUREF
- is part of the CzechGeo project
- cooperation with academic and private sector
 - data used by The Czech Technical University in Prague (CTU) and Geodezie Brno s.r.o.
- www.geonas.irms.cas.cz

The permanent observatory of the GEONAS network



● IRSM/EPN
● IRSM



The permanent observatory of the GEONAS network

Station	Place	Date	Latitude	Longitude	El. height	Receiver	Antenna
BEZD	Bezděkov nad Metují	16.12.2005	50.50870277	16.22926031	537.728	TPS GB-1000	TPSCR3_GGD CONE
BISK	Biskupská Kupa	6.9.2001	50.25672330	17.42859875	950.867	ASHTECH Z18	ASH701946.2 SNOW
CHOT	Chotěboř	10.08.2006	49.71170820	15.67264081	607.445	TPS GB-1000	TPSCR3_GGD CONE
HABA	Habartov	03.08.2010	50.18546903	12.55229860	576.364	TPS GB-1000	TPSCR3_GGD CONE
KYNS	Kynšperk-Kolová	19.12.2005	50.11282809	12.55601142	569.958	TPS GB-1000	TPSCR3_GGD CONE
LITO	Litoměřice	01.09.2006	50.54215782	14.14480306	244.695	ASHTECH Z18	ASH701946.2 SNOW
LUBY	Luby	21.12.2005	50.24813459	12.40771465	587.868	TPS GB-1000	TPSCR3_GGD CONE
MARJ	Mariánská	15.05.03-4.9.15	50.35688985	12.89347340	904.730	ASHTECH Z18	ASH701946.2 SNOW
POUS	Poustka	12.11.2003	50.13843445	12.29785666	572.177	TPS GB-1000	TPSCR3_GGD CONE
PRAG	Praha-Holešovice	15.05.2006	50.11810136	14.46361902	293.731	TPS GB-1000	TPSCR3_GGD CONE
SECZ	Seč	11.08.2006	49.84293455	15.64941357	581.978	TPS GB-1000	TPSCR3_GGD CONE
SLUK	Šluknov	17.08.2006	50.99988785	14.46024839	424.157	TPS GB-1000	TPSCR3_GGD CONE
SNEC	Sněžka	21.10.01-10.6.09	50.73587968	15.73974170	1651.582	TPS GB-1000	TPSCR3_GGD CONE
SNE2	Sněžka	10.10.2008	50.73574202	15.73987949	1648.715	TPS GB-1000	TPSCR_G3CONE
STAM	Staré Město	23.08.2006	50.16232012	16.94776447	598.976	TPS GB-1000	TPSCR3_GGD CONE
TEME	Temelín	17.08.2006	49.17396461	14.37993066	562.789	TPS GB-1000	TPSCR3_GGD CONE
TREB	Třebíč	14.05.2008	49.20406499	15.87866901	528.786	TOPCON NET-G3	TPSCR_G3CONE
UPIC	Úpice	21.12.2005	50.50713162	16.01093213	468.089	TPS GB-1000	TPSCR3_GGD CONE
VACO	Vacov	20.10.2004	49.13378401	13.72417612	799.401	ASHTECH Z18	ASH701946.2 SNOW
VIDN	Vidnava	22.08.2006	50.37293401	17.18544542	287.546	TPS GB-1000	TPSCR3_GGD CONE
VONS	Vonšov	19.5.10-19.6.13	50.15648415	12.37990975	515.823	TOPCON NET-G3	TPSCR_G3CONE

The observatory of GEONAS network

- GNSS antenna on the roof
- GNSS receiver
- minicomputer
- GPRS modem
- accumulator for independent power supply of observatory



Equipment changes



- two new receivers TOPCON NET-G5
- Třebíč (TREB) and Vidnava (VIDN) observatories
- now testing on the PRAH station located in the IRSM CAS CZ

The permanent observatory of the GEONAS network

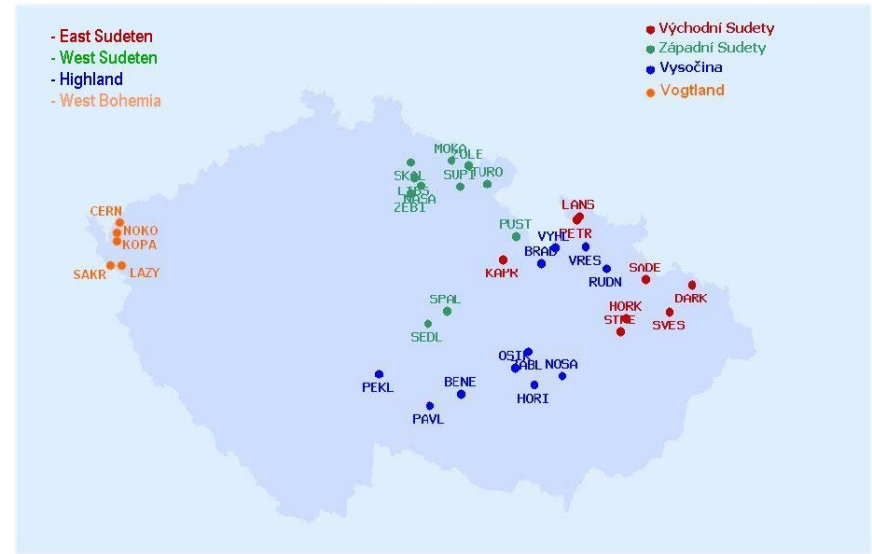
- elevation mask 5° or 0°
- registration interval 1 or 5 second
- data transfer to the server of operational center IRS located in the IRSM
- data checking and storage in the database (in the case of missing data the transfer is repeated)
- data archivation
- data transfer from observatories included in the EUREF EPN into the operational centers BKG in Frankfurt and BEV in Wien

Processing of GNSS data from permanent observatories

- data processing by software Bernese 5.0 edition using BPE
- precise satellite orbits and satellite clock data, precession of the Earth's rotation parameters were used from CODE - Bern
- geocentric and geographic coordinates were computed in ITRF2000 reference frame
- stability of daily solution is done using four stations EPN: Wetzel (WTZR), Graz (GRAZ), Potsdam (POTS) a Borowiec (BOR1)
- time series positions GNSS antennas

Epoch GNSS networks

- East and West Sudeten networks build in 1997 and 2001 with together 23 stations (observed 1997 - 2009)



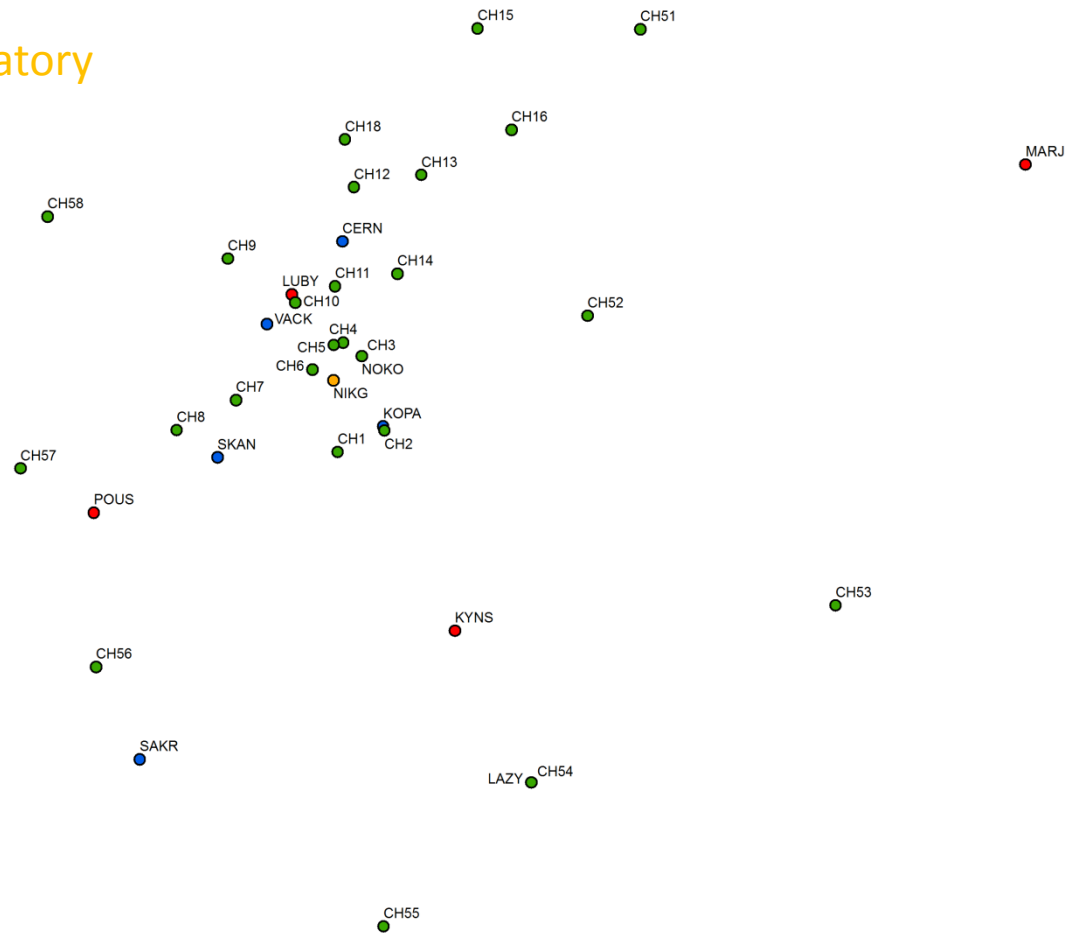
- Highland network with 7 stations established in 2005 (observed 2005 – 2010)
- West Bohemia network took place in 2007 with 5 stations (observed 2007 – 2011)

Reprocessing the West Bohemia data

- together with colleague from The Institute of Geophysics
- reprocessing historic data from IRSM epoch sites (CERN, NOKO, KOPA, LAZY, SAKR) and permanent observatories in nearby area (LUBY, KYNS, POUS, MARJ) together with data from 25 IG epoch sites Cheb (CH1 – CH16, CH18, CH51-CH58) and IG permanent observatory in Nový Kostel (NKIG)

The chart of reprocessed sites

- IRSM permanent observatory
- IRSM epoch site
- IG permanent observatory
- IG epoch site



Reprocessing the West Bohemia data

- starting with the year 2007
- reprocessing the whole year
- data processing by two softwares Bernese 5.0 and Gamit
- stability of daily solution will be done using ten stations IGS: Borowiec (BOR1), Frankfurt (FFMJ), Ondrejov (GOPE), Graz (GRAZ), Huegelheim (HUEG), Penc (PENC), Potsdam (POTS), Braunschweig (PTBB), Wroclaw (WROC), Bad Koetzting (WTZZ)
- comparison of the results



Workshop CzechGeo/EPOS

The end

Thank you for your attention



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