



Workshop CzechGeo/EPOS

GEONAS network

Cajthamlová Milada

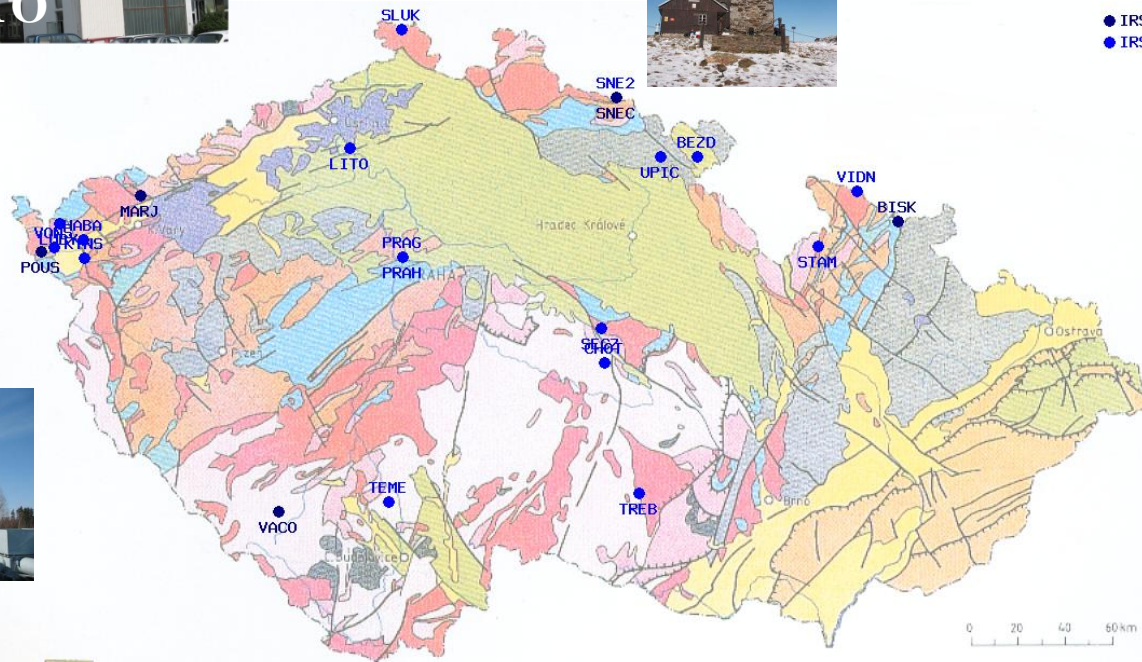


*INSTITUTE OF ROCK STRUCTURE AND MECHANICS
of the Czech Academy of Sciences*

GEONAS

- GEOdynamic Network of the Academy of Sciences
- 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.
- consist of 18 permanent GNSS observatories
 - 3 stations are embodied in the network EUREF
- www.geonas.irms.cas.cz
- the Earth surface monitoring
 - the long term changes and present movements of Bohemian Massif's individual geological structures

The permanent observatory of the GEONAS network



● IRSM/EPN
● IRSM



CHOT



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

System cooling



Undervoltage protection

Feeder main

Ethernet switch 100 Mbit/s

GPRS modem

GPS receiver

Charger Pb accu.

Modem switch

Minicomputer



**Accumulator 225Ah
(25-30 hours operation)**

- processor VORTEX86 / 166 MHz
- 40 Gbyte HDD (for data storage for a period of one year)
- Debian GNU Linux

The permanent observatory of the GEONAS network

- elevation mask 5°
- registration interval 1 or 5 second
- accumulator for independent power supply of observatory for minimally 24 hours
- 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 and OLG

GPS data available - 5/2016

Station\Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
BEZD	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

BISK	1	1	1
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CHOT	1	1	1
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HABA	1	1	1
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KYNS	1	1	1
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LITO	1	1	1
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LUBY	1	1	1
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POUS	1	1	1
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PRAG	1	1	1
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SECZ	1	1	1
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SLUK	1	1	1
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SNE2	1	1	1
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STAM	1	1	1
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TREB	1	1	1
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UPIC	1	1	1
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VACO	1	1	1
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VIDN	1	1	1
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Legend: 1 sec

GPS station TREB - data available for year 2016

Month\Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Jan 16	100	100	98	99	99	100	99	99	99	99	99	99	99	99	100	100	100	100	100	100	99	99	100	100	99	99	99	100	100	99	99
Feb 16	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	100	100	99	100	99	100	99	99	100	99	100	100	100	100		
Mar 16	99	99	99	99	99	99	99	99	96	99	99	99	100	100	100	100	100	100	100	100	100	99	100	100	100	100	100	100	99	99	
Apr 16	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	100	100	100	99	99	99	99	99	99	100	99	99	88	
May 16	100	100	99	99	99	99	100	99	99	99	99	99	100	99	99	99	99	99	100	99	99	99	99	98	99	99	99	99	99	100	100
Jun 16	99	99	99	99	99	99	100	99	99	99	100	99	99	99	99	99	100	99	99	99	99	100	99	99	96	99	96	96	99	99	
Jul 16	99	99	99	99	99	99	98	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	99	100	99	99	99	97	
Aug 16	100	99	99	99	99	99	99	99	99	99	99	99	99	100	100	99	99	99	100	100	100	99	99	100	99	100	99	100	99	99	
Sep 16	99	100	95	100	99	100	99	99	99	99	99	99	99	99	99	99	99	99	98	99	99	99	99	99	99	99	99	99	100		
Oct 16	100	99	99	99	99	99	100	100	99	99	99	99	99	99	99	99	100	99	99	99	100	100	100	100	99	99	99	99	100	99	
Nov 16	99	99	100	100	99	99	99																								
Dec 16																															

Table shows number of registered epochs in % of all possible epochs.

Legend: > 95 % > 75 % > 50 % > 25 % > 0 % No data * Data processing in progress

Station: TREB Year: 2016 Parameter: % of registered epochs [Redraw]

Data processed since 1984-01-02 [Change]

Optional actions: [View RINEX creation log]

- % of registered epochs
- Registration interval
- % of registered epochs
- % of registered observations
- Missing data

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

Conclusion and Outlooks

- the permanent GNSS measurements in the Bohemian Massif started in 2001 by observations on permanent stations (GEONAS network)
- relative long-term period of the GNSS observations guarantees high accuracy, the standard deviations of determinations of the horizontal movements are less than 1 mm/year
- the further continuation of the GNSS measurements is necessary to increase the accuracy of position determinations, especially of the vertical movements



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The end

Thank you for your attention



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