

LONG-TERM POSITIONAL MONITORING OF STATION VYHL OF THE SNĚŽNÍK NETWORK

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CZECH PART OF THE SNĚŽNÍK NETWORK

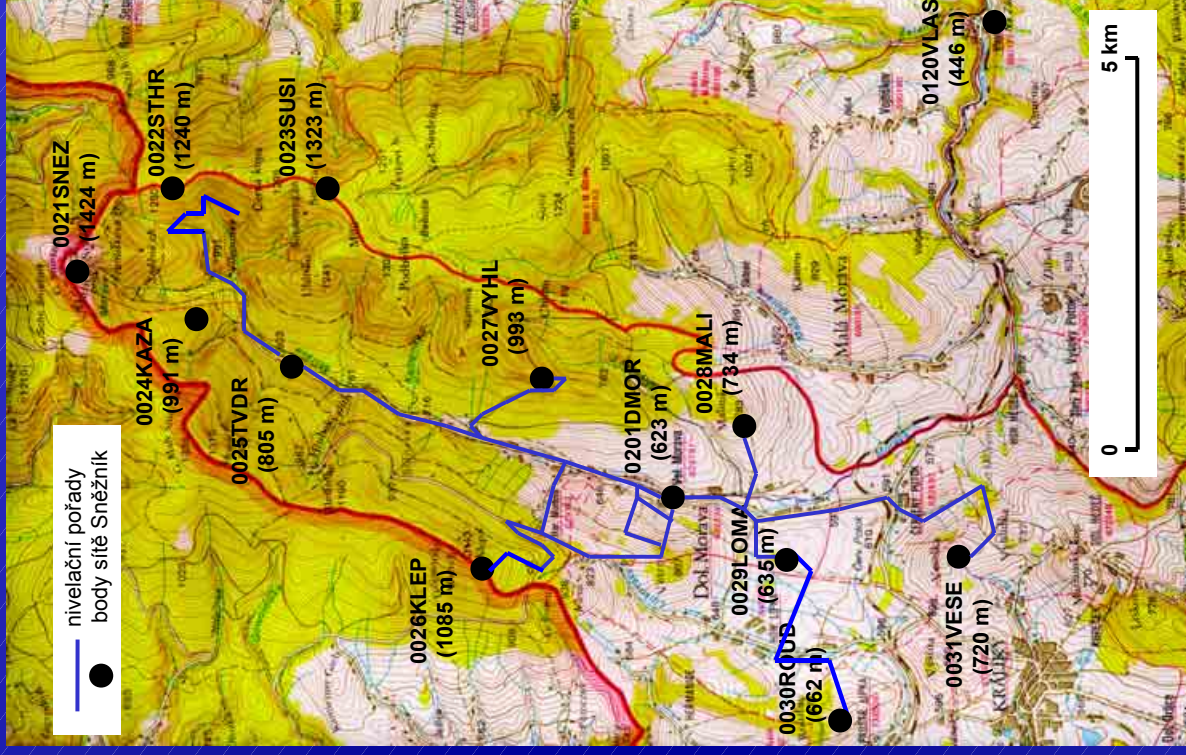
Station VYHL

Approx. Position :

$\varphi = 50^{\circ} 08' 43''$

$\lambda = 16^{\circ} 49' 27''$

$H_{el} = 1036 \text{ m}$



STATION VYHL



STATION VYHL



STATION VYHL CHARACTERISTICS

Monumented in 1992 on solid rock outcrop

Maximum observation time

**Central point of the Czech part of Sněžník
Network**

**GPS Instrumentation: mostly LEICA, also
TRIMBLE and ASHTECH receivers**

**Problematic: Different observation intervals,
different times of day, different periods of year
(especially in early campaigns)**

STATION VYHL PROCESSING AND SOLUTION AIMS

Only data from BUT campaigns processed

**Processing with Bernese GPS Software v. 4.2
and Leica SKI-Pro v. 2.5 and 3.0**

**Solution constrained to weekly EUREF EPN
solution coordinates of selected tie stations**

Different levels of ties to surrounding stations

Velocity evaluation and comparisons

Slope distance series evaluation

STATION VYHL

Coordinate Ties :

GOPE 148 km

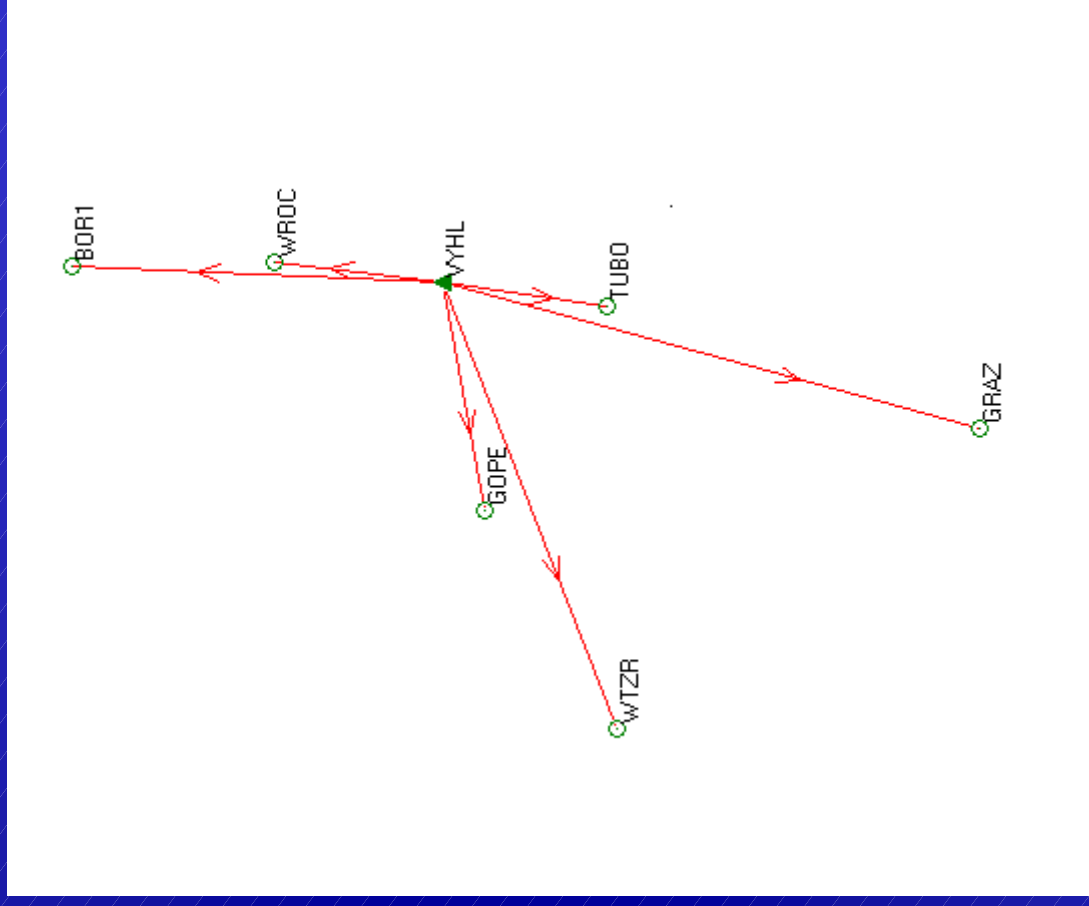
WROC 109 km

TUBO 106 km

BOR1 238 km

GRAZ 356 km

WTZR 306 km



VYHL - OBSERVATION CAMPAIGNS

YEAR	DOY	RECEIVERS	ANTENNAS	# OBS
1994	134	LEICA 200	LEISR299_INT	2,5 h
1995	133,134,135	ASHTECH Z12 LEICA 200	ASH700718 LEISR299_INT	8,2 h
1996	137,139,140	ASHTECH Z12 LEICA 300	ASH700718 LEISR399_INT	7,5 h
1996	255,256,257	GEOTRACER LEICA 300	TRM14532.00 LEISR399_INT	27,0 h
1996	295,296,297	LEICA 300	LEISR399_INT	24,0 h
1997	125,131-132,134-135,138	LEICA 200	LEISR299_INT	64,6 h
1997	265-266,267,268	LEICA 200	LEISR299_INT	50,8 h
1998	129-132,136,137	LEICA 300	LEISR399_INT	83,0 h
1999	139,140,142-143	LEICA 200 LEICA 300	LEISR299_INT LEISR399_INT	38,6 h

VYHL - OBSERVATION CAMPAIGNS

YEAR	DOY	RECEIVERS	ANTENNAS	# OBS
2000	128,129,134-135	LEICA 300	LEISR399_INT	48,5 h
2001	126,127,132-133	LEICA 300	LEISR399_INT	48,7 h
2002	129-130,132-133,138-139	LEICA 200	LEISR299_INT	73,6 h
2003	134,135,136,137-138	LEICA SR520	LEIAT502	71,0 h
2004	132-133,136-137	TRIMBLE 5700 LEICA SR520	TRM41249.00 LEIAT502	58,3 h
2005	132-133,136-137,141-142	LEICA SR520	LEIAT502	75,8 h
2006	127-128,133-134	LEICA SR520	LEIAT502	48,8 h

PROCESSING PARAMETERS

IGS PCO/PCV antenna parameters introduced
(for LEICA antennas from own calibration)

IGS precise ephemerides and EOP parameters

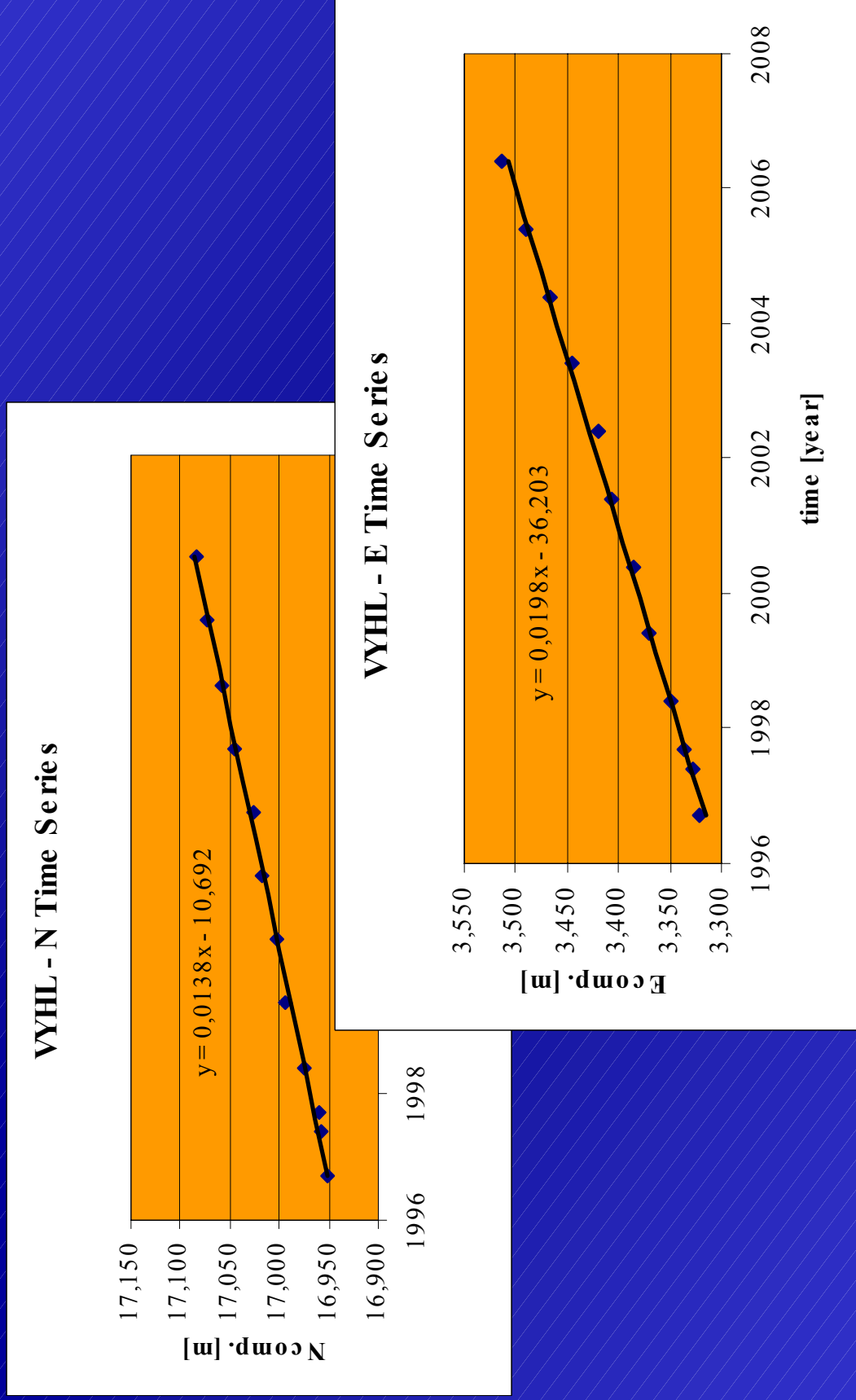
2 ambiguity resolution strategies (QIF, Wide
Lane and Narrow Lane)

Troposphere parameters estimated

L3 (iono-free) final solution with elevation
mask $\varepsilon = 13$ deg

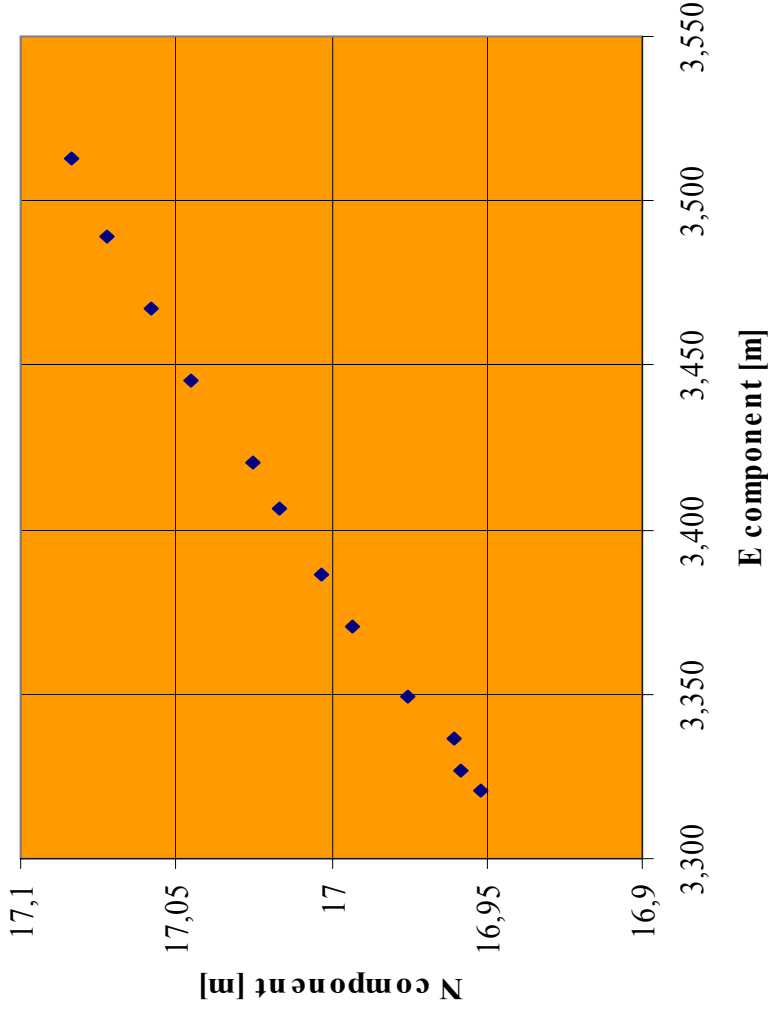
Cases of combination of more short intervals

VYHL - ITRS TIME SERIES



VYHL - ITRS TIME SERIES

VYHL - ITRF Time Series



$$V_N = 0,0138 \text{ m}$$

$$V_E = 0,0198 \text{ m}$$

GOPE

$$V_N = 0,0125 \text{ m}$$

$$V_E = 0,0200 \text{ m}$$

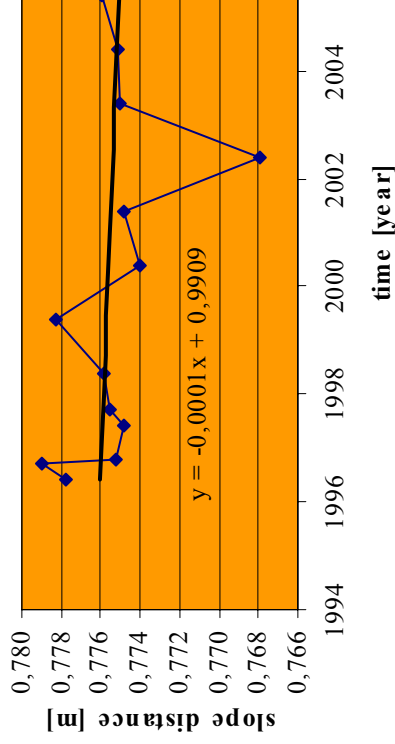
WROC

$$V_N = 0,0132 \text{ m}$$

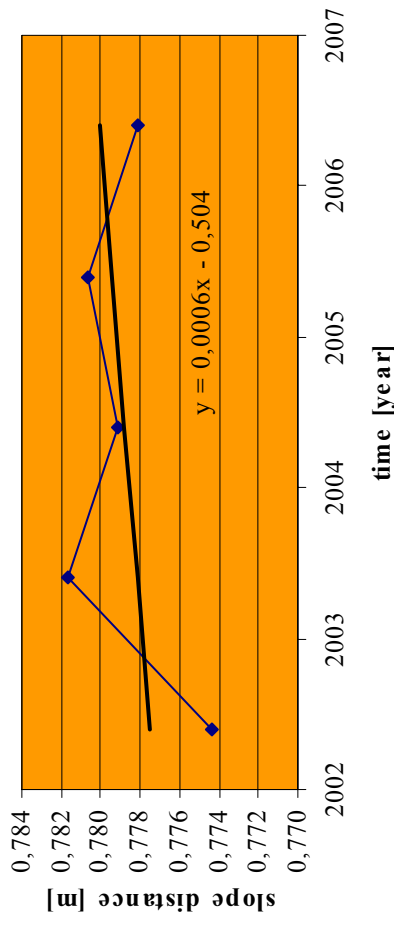
$$V_E = 0,0195 \text{ m}$$

SLOPE DISTANCE TIME SERIES

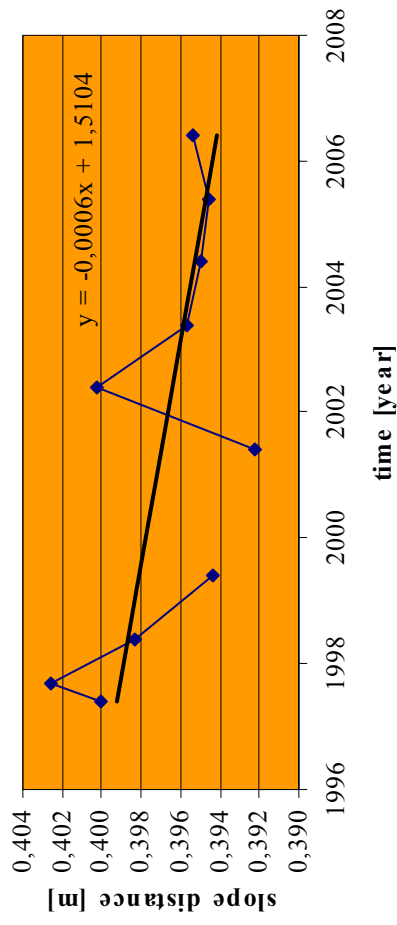
VYHL-GOPE Baseline Evolution



VYHL-TUBO baseline evolution



VYHL-WROC baseline evolution



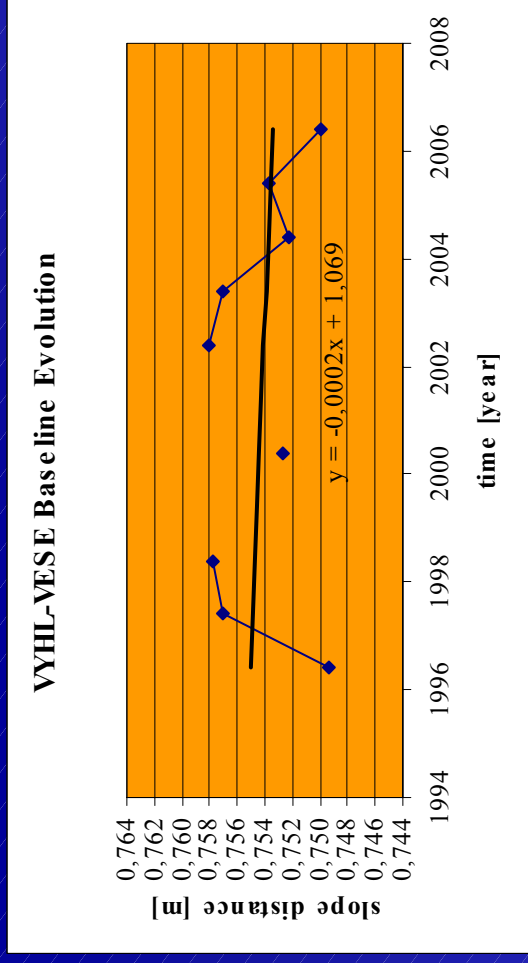
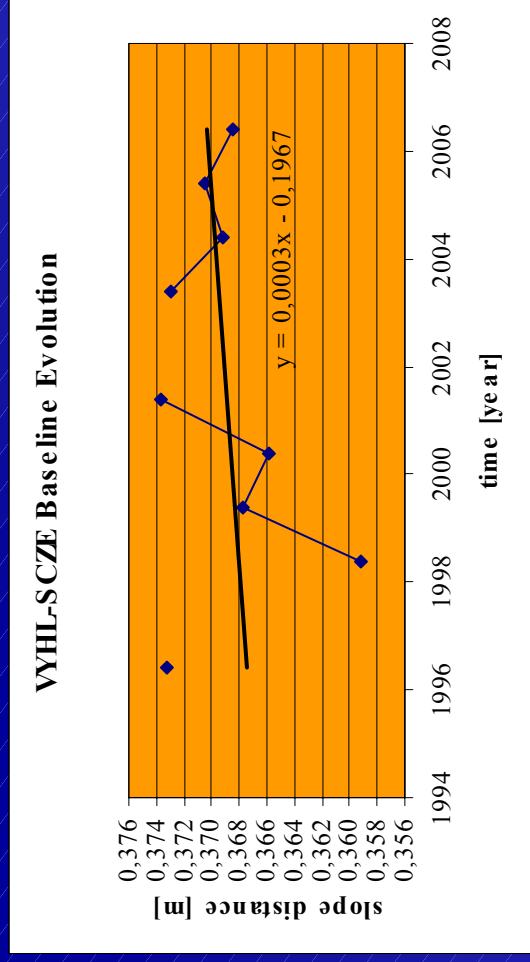
Bernese 4.2

VYHL – BASELINE REPEATABILITIES

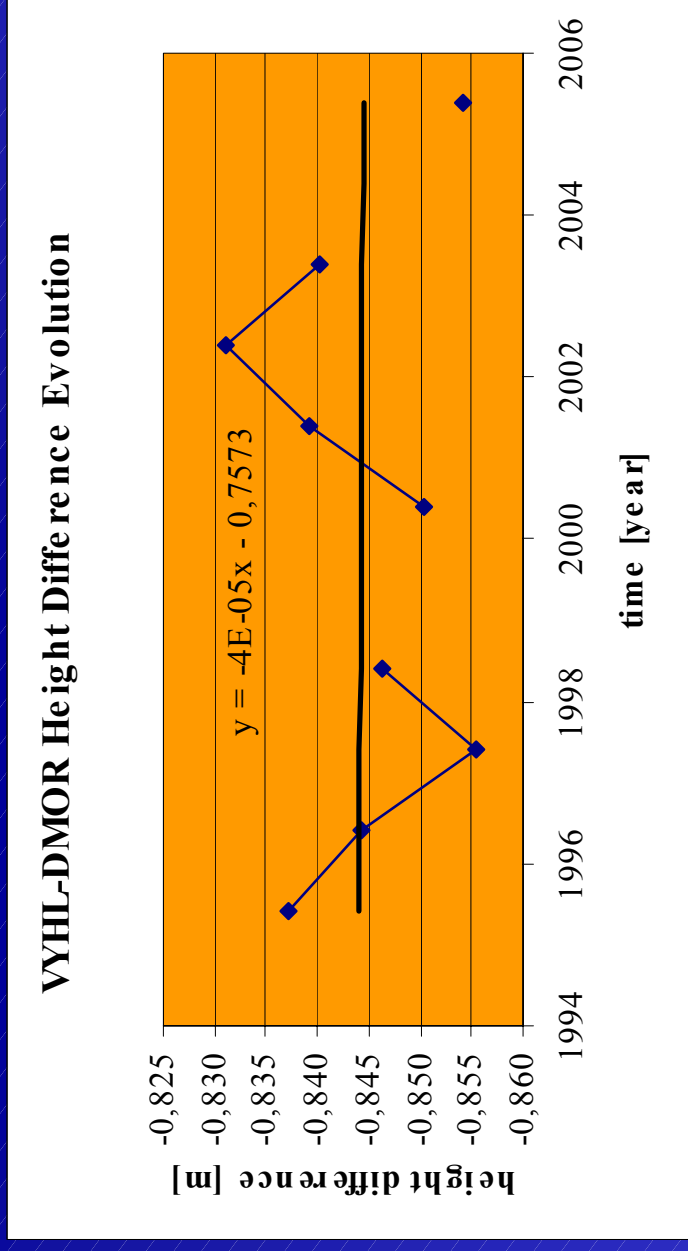
YEAR	BASELINE	REPEATABILITY	BASELINE	REPEATABILITY
1996	VYHL-GOPE	16,4 mm	VYHL-BOR1	8,6 mm
1997	VYHL-GOPE	5,4 mm	VYHL-WROC	3,2 mm
1998	VYHL-GOPE	3,8 mm	VYHL-WROC	5,7 mm
1999	VYHL-GOPE	7,6 mm	VYHL-WROC	6,2 mm
2000	VYHL-GOPE	2,1 mm	VYHL-BOR1	1,3 mm
2001	VYHL-GOPE	5,1 mm	VYHL-WROC	4,8 mm
2002	VYHL-GOPE	5,7 mm	VYHL-WROC	3,0 mm
2003	VYHL-GOPE	1,7 mm	VYHL-WROC	1,3 mm
2004	VYHL-GOPE	1,2 mm	VYHL-WROC	2,3 mm
2005	VYHL-GOPE	2,7 mm	VYHL-WROC	2,0 mm
2006	VYHL-GOPE	2,1 mm	VYHL-WROC	2,8 mm

SLOPE DISTANCE TIME SERIES

Leica
SKI-Pro



HEIGHT DIFFERENCE TIME SERIES



**Leica
SKI-Pro**

CONCLUSIONS

Ambiguity resolution strategies QIF and Wide-Narrow Lane give practically identical results for baselines up to 300-400 km

No problems with troposphere parameters estimation even for short observation intervals (1,5 - 2 hours)

For local network (like Sněžník N.) with baselines under 15 km the results obtained with Bernese GPS SW and Leica SKI-Pro are practically identical

According to the results obtained there is no reason to suppose movements of station VYHL (95 % alpha)

Some processing runs and analyses not yet finished, will be published lately in Acta GG