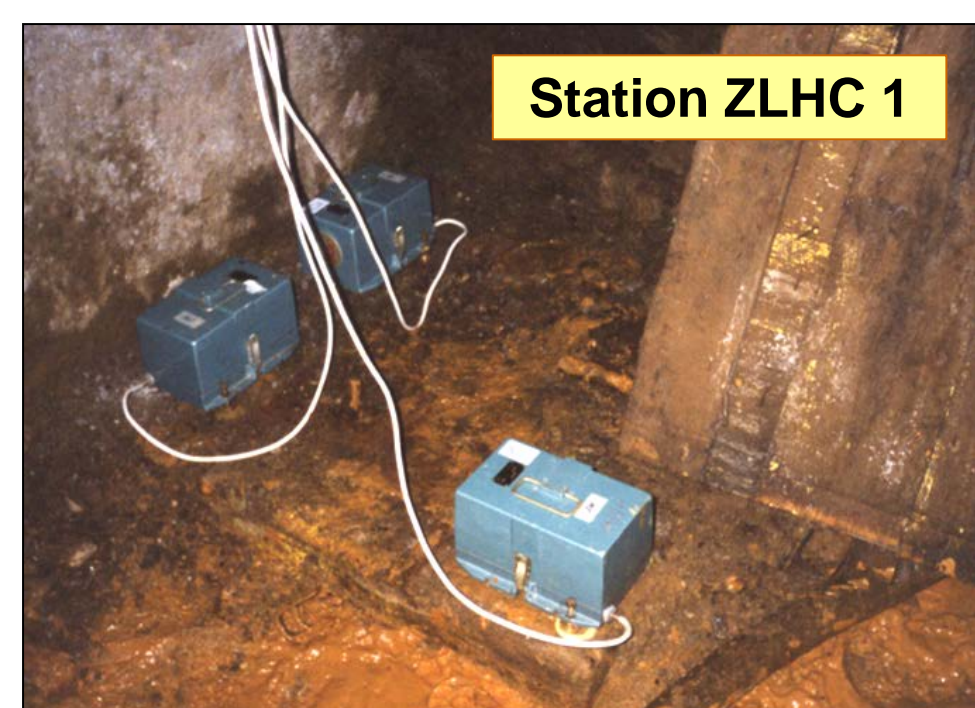


# ZLATÉ HORY SEISMIC STATION

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The Moravo-Silesian region represents the northern part of the significant contact zone between the Bohemian Massif and the Carpathians. Natural earthquake activity is documented both from historical and current observations. Seismic short-periodic stations operated on the territory of Moravia represent virtual network called MONET that is operated by Institute of Physics of the Earth, Masaryk University of Brno, and co-operated by the Institute of Geonics of the CAS, Ostrava. First seismic station at Zlaté Hory locality was built in a gallery at the second mining floor of abandoned mine in 1997. Currently, continuous monitoring is realized in restricted underground spaces of speleotherapy, that is operated by private medical institution for children with respiratory diseases - SANATORIUM EDEL, Ltd.



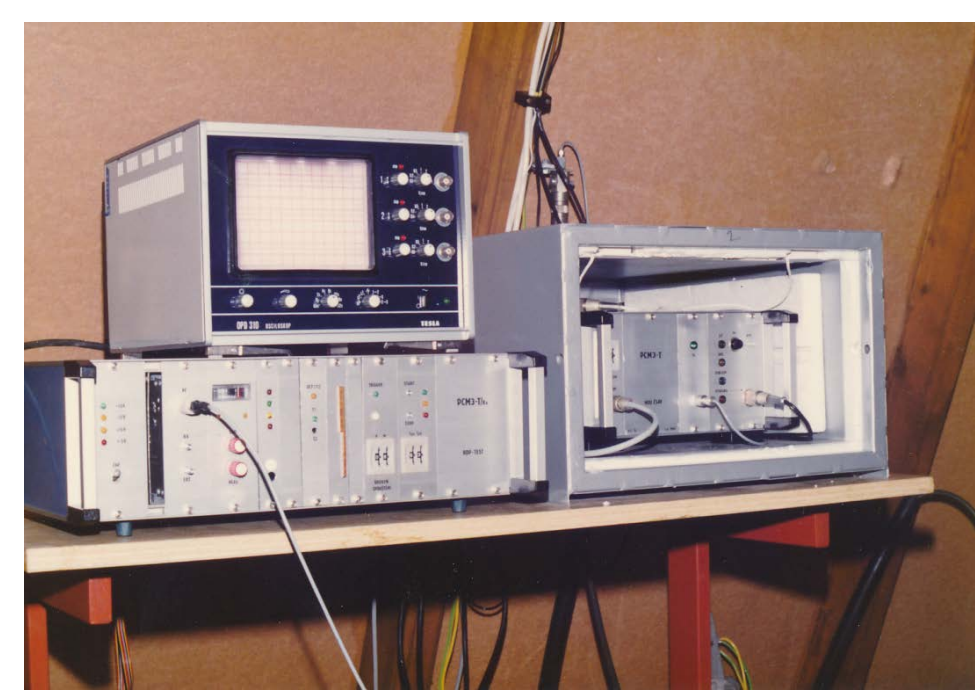
Station ZLHC 1



Station ZLHC 2



Station ZLHC



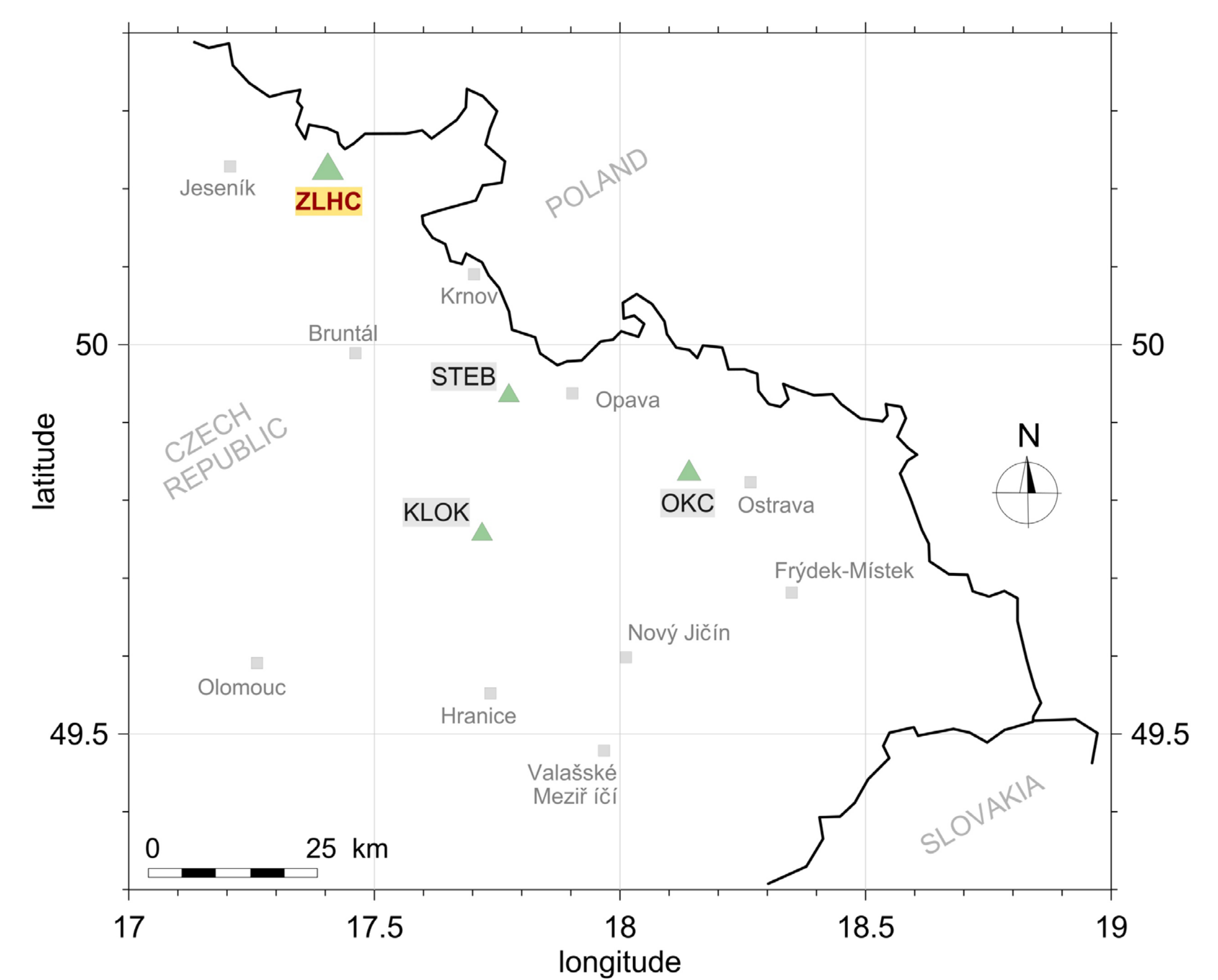
Seismometers SM3 in mine in the depth about 300 m below the surface; data transmission using mine network; apparatus PCM3-T in machine room on the surface.



Seismometers SM3 in restricted part of gallery of speleotherapy in the depth about 90 m below the surface; digitalized data were transferred by telemetric transmitter to apparatus PCM3-EPC.



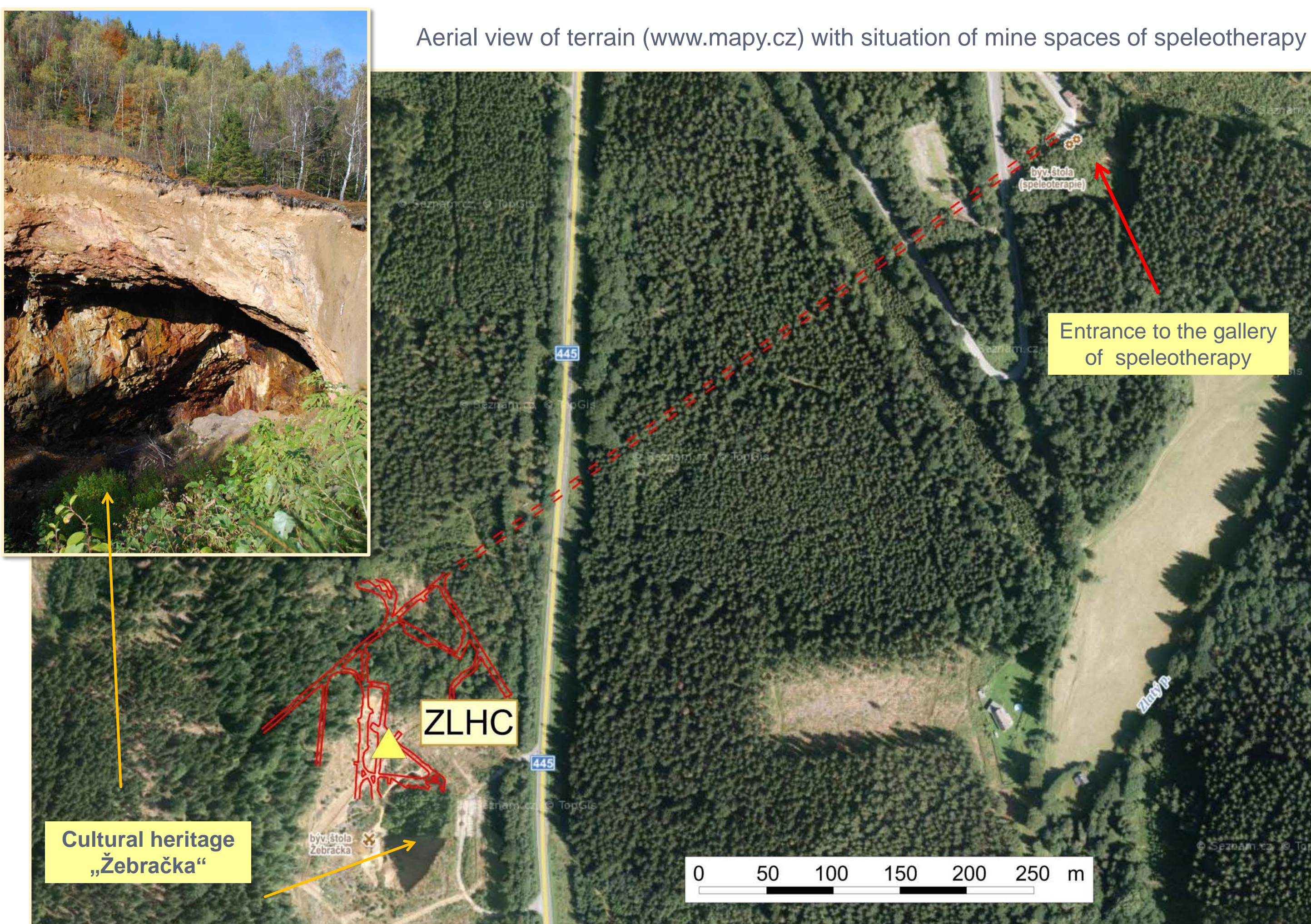
Seismometer LE-3Dlite with apparatus BRS32 in restricted part of gallery of speleotherapy in the depth about 90 m below the surface; view of concrete seismic pillar.



Location of seismic stations currently operated by the Institute of Geonics included into MONET network; station OKC is included in the Czech Regional Seismological Network and it is operated in cooperation with Institute of Geophysics of the CAS and VSB-Technical University of Ostrava.

Basic parameters of individual seismic stations

Station	ZLHC 1	ZLHC 2	ZLHC
Operation	4. 11. 1997 – 7. 7. 1998	12. 9. 2003 – 17. 5. 2018	since 17. 5. 2018
Coordinates	$\phi$ 50.2232°N $\lambda$ 17.4063°E h = 540 m	50.2088°N 17.4028°E 630 m	50.2088°N 17.4028°E 630 m
Seismometer	3 x SM3, $T_0 = 2$ s	3 x SM3, $T_0 = 2$ s	LE-3D lite, $T_0 = 1.5$ s
Apparatus	PCM3-T (IGN)	PCM3-EPC (IGN)	BRS32 (Arenal)
Registration	Triggered	Triggered	Continuous
Sampling frequency	100 Hz	100 Hz	250 Hz
Time synchronization	DCF	DCF	GPS



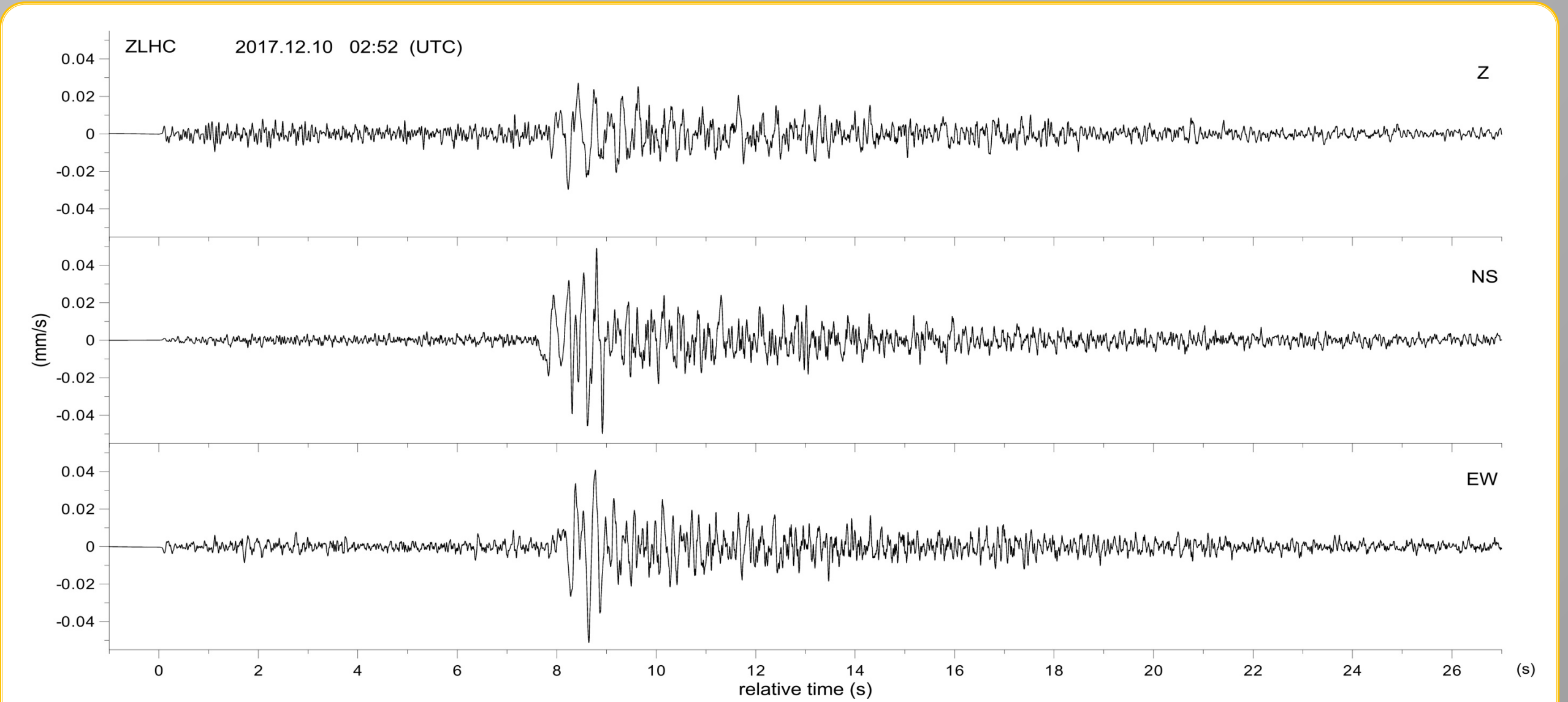
Aerial view of terrain (www.mapy.cz) with situation of mine spaces of speleotherapy



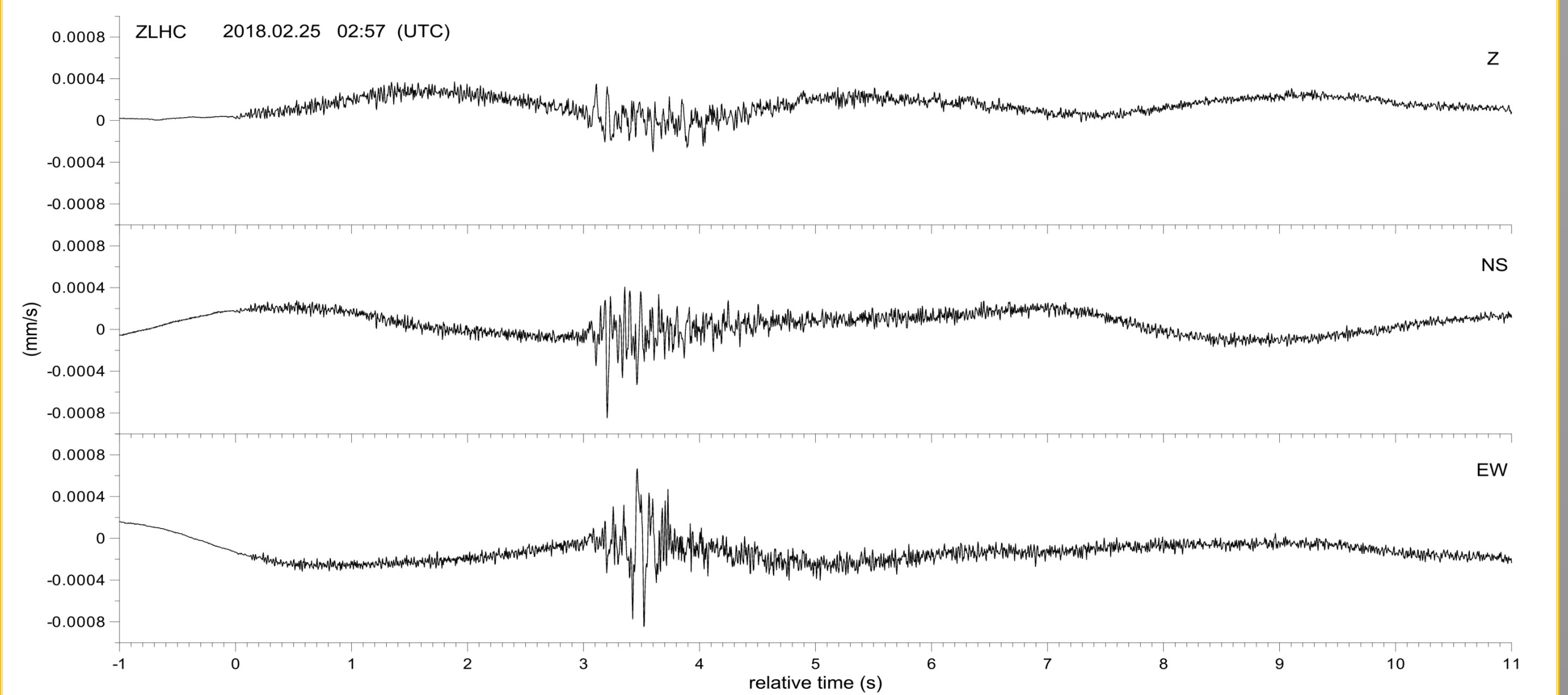
Seismic concrete pillar in the depth about 90 m below the surface

Entrance to the gallery of speleotherapy

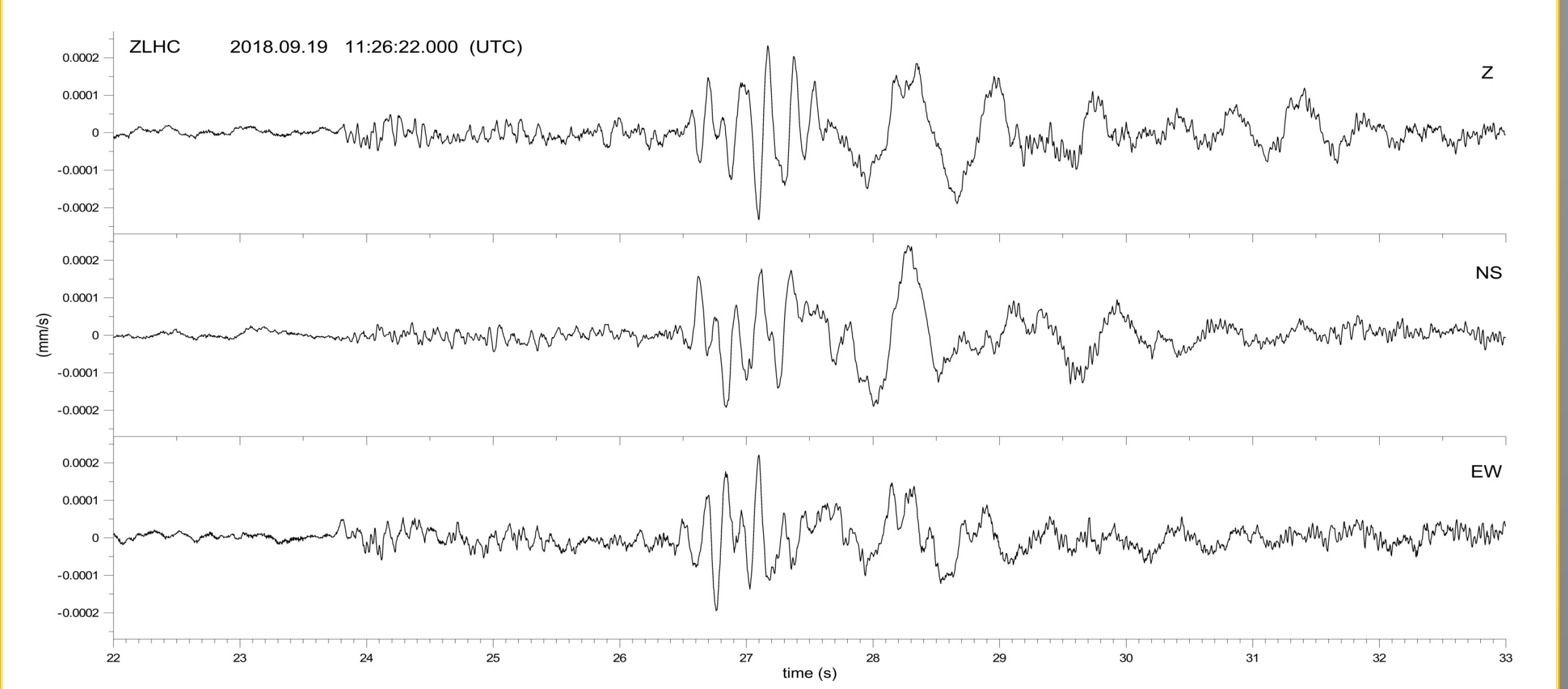
Axonometric projection of mine spaces at Zlaté Hory locality



Tectonic event occurring on December 10, 2017 near Hlučín recorded at the ZLHC seismic station; epicentral distance  $d \approx 67$  km

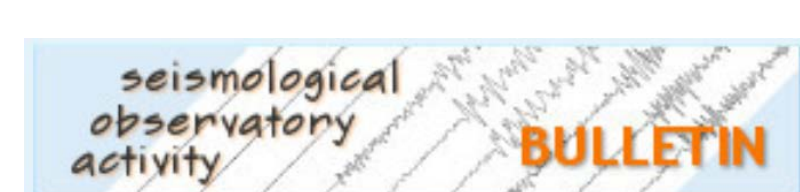


Tectonic event occurring on February 25, 2018 near Karlov pod Pradědem recorded at the ZLHC seismic station; epicentral distance  $d \approx 22$  km



Blasting operation recorded at the ZLHC seismic station on September 19, 2018

Example of local bulletin on the web of the Institute of Geonics <http://ugn.cas.cz/?l=en&a=&v=&p=bulletin/bulletin.php>



Interpretation carried out by the IGN is focused on picking up Pn, Pg and Sg phases corresponding to local tectonic events, seismic events induced by coal mining in the Czech and Polish mines within the Upper Silesian Coal Basin and ore mining in Poland denoted usually as „Lubin“, quarry blasts and other seismic phenomena.

Local bulletin

Year	ZLHC	STEB	KLOK	OKC
2018	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12
2017	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12
2016	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12
2015	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12
2014	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12
2013	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12	01 02 03 04 05 06 07 08 09 10 11 12

Illustration of seismic bulletin based on data of ZLHC from August 2018

24.8.	Pg 14:04:53.344 Sg 14:04:55.824 EXP	tectonic event
24.8.	Pg 20:23:40.976	Poland
24.8.	Pg 22:22:20.040 Sg 22:22:39.032 EXP	Poland
27.8.	Pg 05:20:06.128 Sg 05:20:08.008 EXP	Poland
27.8.	Pg 07:59:23.860 Sg 07:59:31.940 EXP	Poland
27.8.	Pg 11:38:35.560 Sg 11:38:41.672 EXP	Poland
28.8.	Pg 01:31:10.280 Sg 01:31:24.348 EXP	Poland
28.8.	Pg 09:48:52.080 Sg 09:49:06.440 EXP	Poland
28.8.	Pg 11:14:06.680 Sg 11:14:09.432 EXP	Poland
28.8.	Pg 22:18:19.356 Sg 22:18:28.200 EXP	Poland
29.8.	Pg 07:27:54.220 Sg 07:28:01.064 EXP	Poland
29.8.	Pg 08:08:05.616	EXP
29.8.	Pg 09:34:57.900 Sg 09:35:06.912 EXP	Poland
29.8.	Pg 20:30:23.560 Sg 20:30:45.176 EXP	Poland - Lubin
29.8.	Pg 21:45:14.632 Sg 21:45:24.424 EXP	ORCB
30.8.	Pg 11:26:02.140 Sg 11:26:11.200 EXP	EXP

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