

# ***MOBNET - pool of temporary stations of the IG CAS in passive seismic experiments***

J. Plomerová, H. Munzarová, L. Vecsey, V. Babuška, H. Kampfová, P. Jedlička and Working teams of the AlpArray, Bohema, EgerRift etc. temporary Seismic Networks

*Institute of Geophysics, Academy of Sciences of the Czech Republic, Prague*

## Outline:

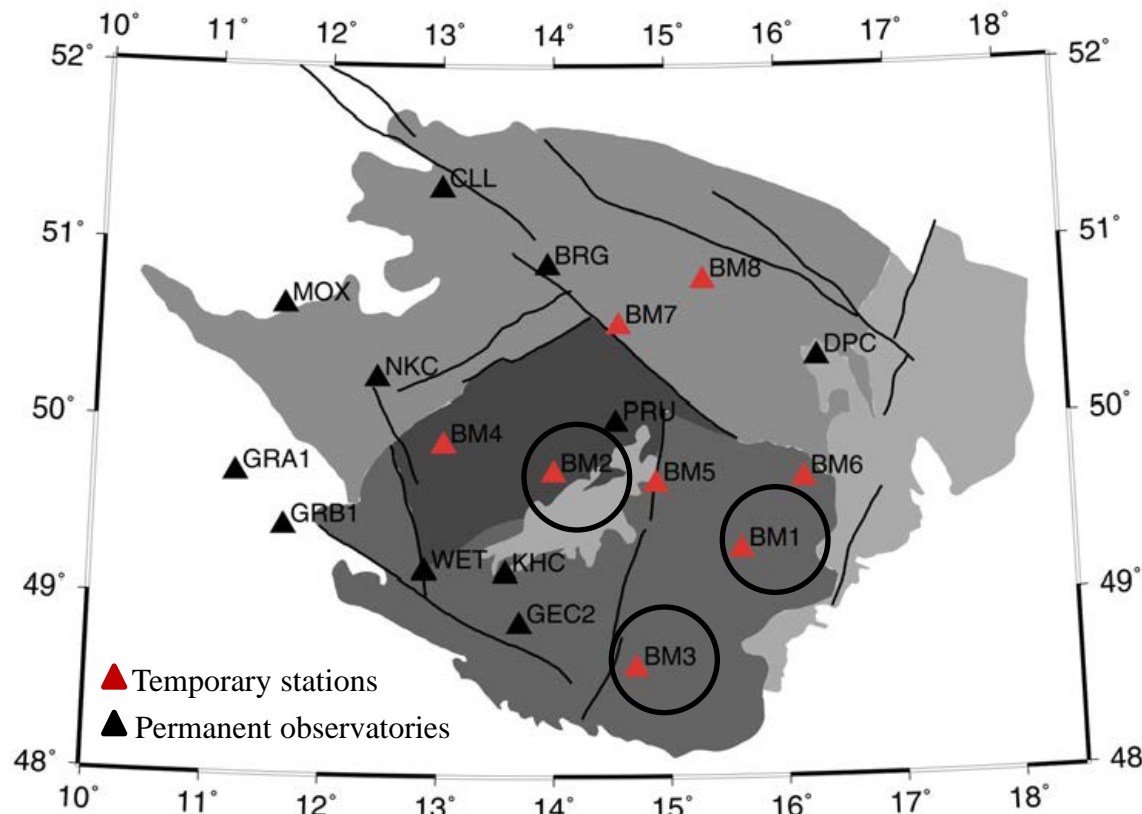
1. History of development of the seismic pool in the IG CAS
2. MOBNET integration in different networks in forgoing passive seismic experiments
3. Current engagement of MOBNET stations in **European collaborative project AlpArray**

# MOBNET pool – built from late 90ths

*Main target: Lithosphere and upper mantle structure*

- First three BB stations – 2 Guralp CMG 3T and 1 CMG 40T (30s)
- + VISTEC - Jupiter DAS

## MOSAIC 1998-1999



*Plomerová et al., SGG 2005*

**Czech-French passive seismic experiment**

**Pilot project** for following series of **BOHEMA** field passive experimental measurements

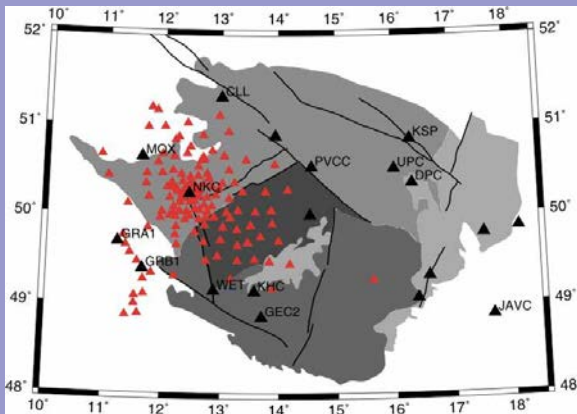
Data processed from

- temporary stations
- CRSN
- Surrounding stations in Germany

# Passive seismic experiments in the BM with MOBNET stations

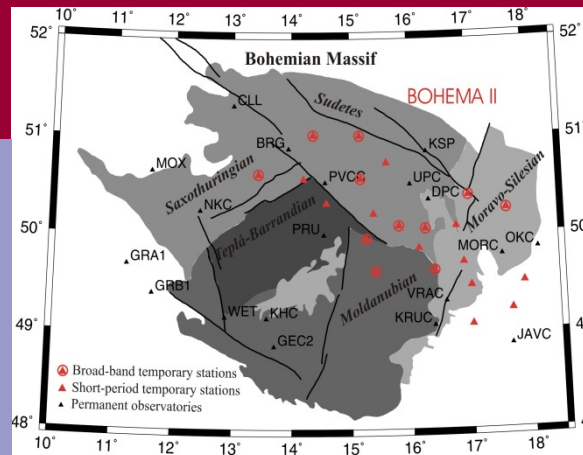
**BOHEMA 2001-2003**  
**CZ-F-G**

NW of the BM with  
about 150 stations

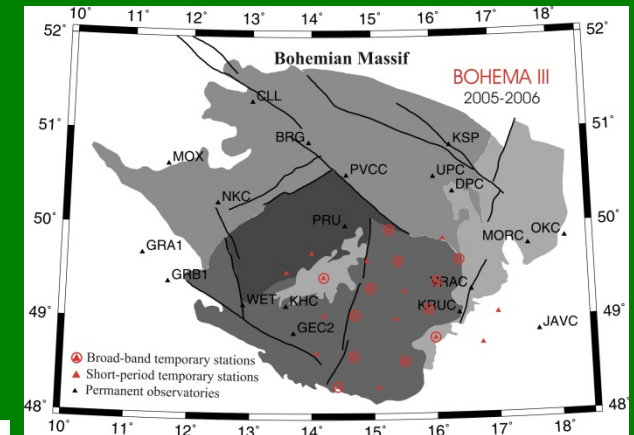


**BOHEMA II 2004-2005**

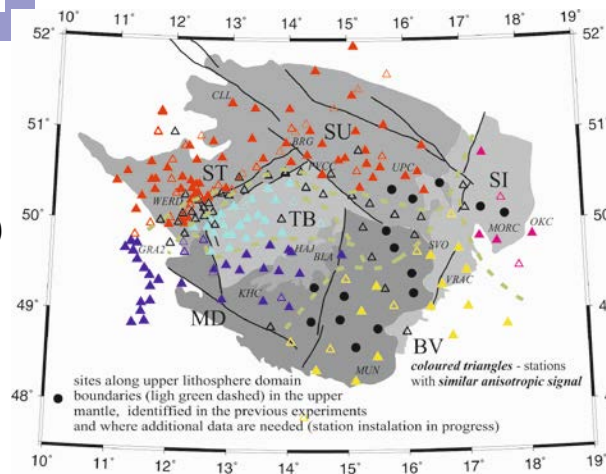
CZ, N-NE of the BM



**BOHEMA III 2005-2006 CZ,**  
**Southern part of the BM**



**BOHEMA IV 2012-2014**



**MOBNET – passive exp.**  
15 BB STS2  
6 BB CMG (3T, 3ESP, 40T)  
15 Le3D  
VISTEC-GAIA das

E.G.  
*Plomerová et al., GJI 2007*  
*Babuška et al., Tectonophysics 2008*  
*Vecsey et al., Tectonophysics 2008*  
*Plomerová et al., Tectonophysics 2012*  
*Karousová et al., Tectonophysics 2012, 2013*  
*Babuška and Plomerová, Gondwana Res. 2013*

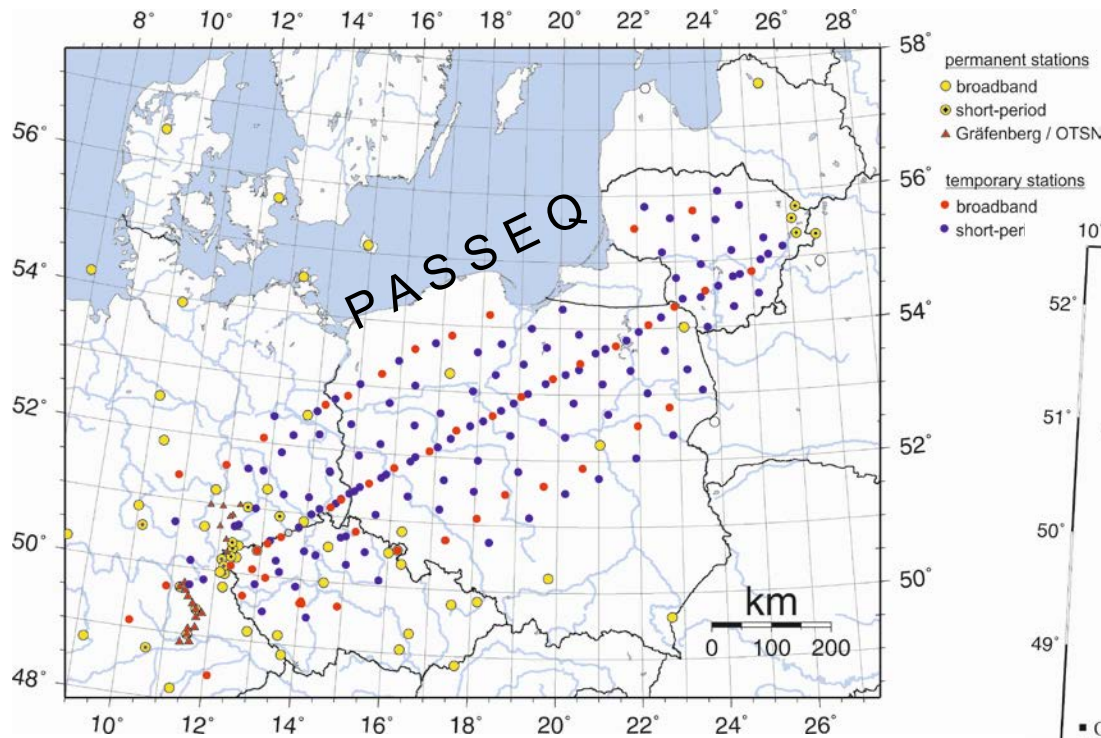
# Passive seismic experiments in the BM with MOBNET stations

Other projects within or including the BM:

*PASSEQ 2006 - 2008* international, MOBNET station in Poland

*EgerRift 2007-2010* CZ

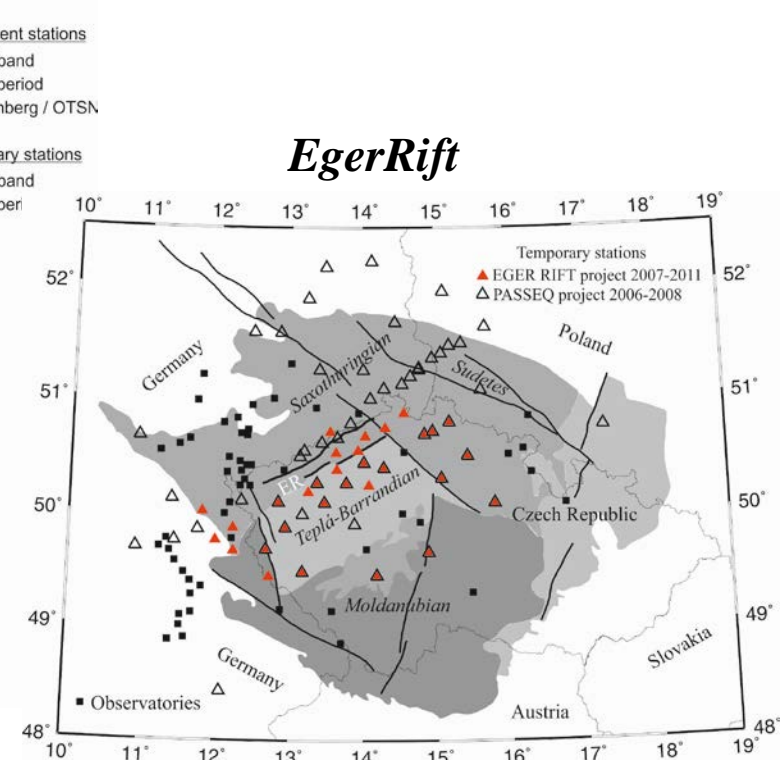
*ALPASS 2005-2006* AT, international, contemporary with BOHEMA III



CRSN (operated by IG, IRSM, IPE, Ch.Uni.), WEBNET

Structure of the upper mantle around the TESZ

Wilde-Piorko et al., SGG 2008; Vecsey et al., Solid Earth 2014, Chyba et al., PEPI, in review



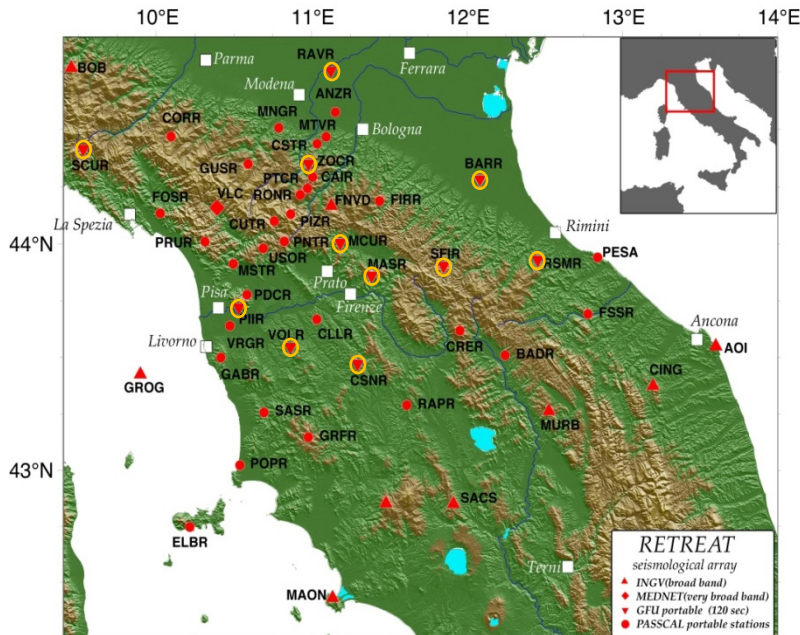
Lithosphere structure around the Eger Rift, extend of the rift beyond the MLF and EFZ

Babuška and Plomerová, Gondwana Res. 2013

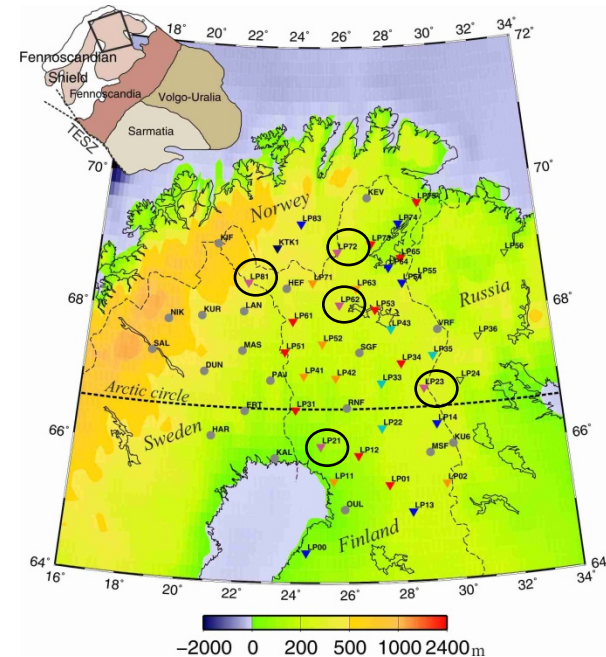
# Passive seismic experiments out of the BM with MOBNET stations

## RETREAT 2003-2006

10 BB stations (STS2, GAIA) –  
backbone of tree year array in the  
Northern Apennines



## LAPNET 2007-2009



5 BB stations (STS2, GAIA) –  
in the Northern Fennoscandia

Targets: LAB depth, anisotropy of the mantle lithosphere, appl. of new  
anisotropic tomography code (H. Munzarova)

## ***MOBNET***

1998	VISTEC–Jupiter	3 pc	DAS	grant GACR 205/98/K004	JPL
	CMG-40T	1 pc	Seism.	grant GAAV A3012908	JPL
	CMG-3T	2 pc	Seism.	large investment IG CAS	JPL/JHR
1999	VISTEC III	2 pc	DAS	grant GAAV A3012908	JPL
2000	CMG-3ESP	3 pc	Seism.	grant GAAV A3012908	JPL
2001	VISTEC IV	1 pc	DAS	grant GACR 205/04/04	VB

**6 portable units**

2003	GAIA 1	26 pc	DAS	large investment IG CAS	VV
2003	Accessories			MZP project	VB
2003	GAIA 1	1 pc	DAS	-	JHR
2003	STS 2	15pc	Seism.	large investment IG CAS	VV
2003	Le-3D	15pc	Seism.	large investment IG CAS	VV
2004	GAIA 1	3 pc	DAS	grant GAAV A3012404	JPL

**+30 portable units**

2004	GAIA 2	17 pc	DAS	large investment IG CAS	BR
2005	LE-3D	17 pc	Seism.	large investment IG CAS	BR

**+17 portable units (DSS)**

2007	GAIA 3	8 pc	DAS	large investment IG CAS	JPL
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alternation of old VISTEC

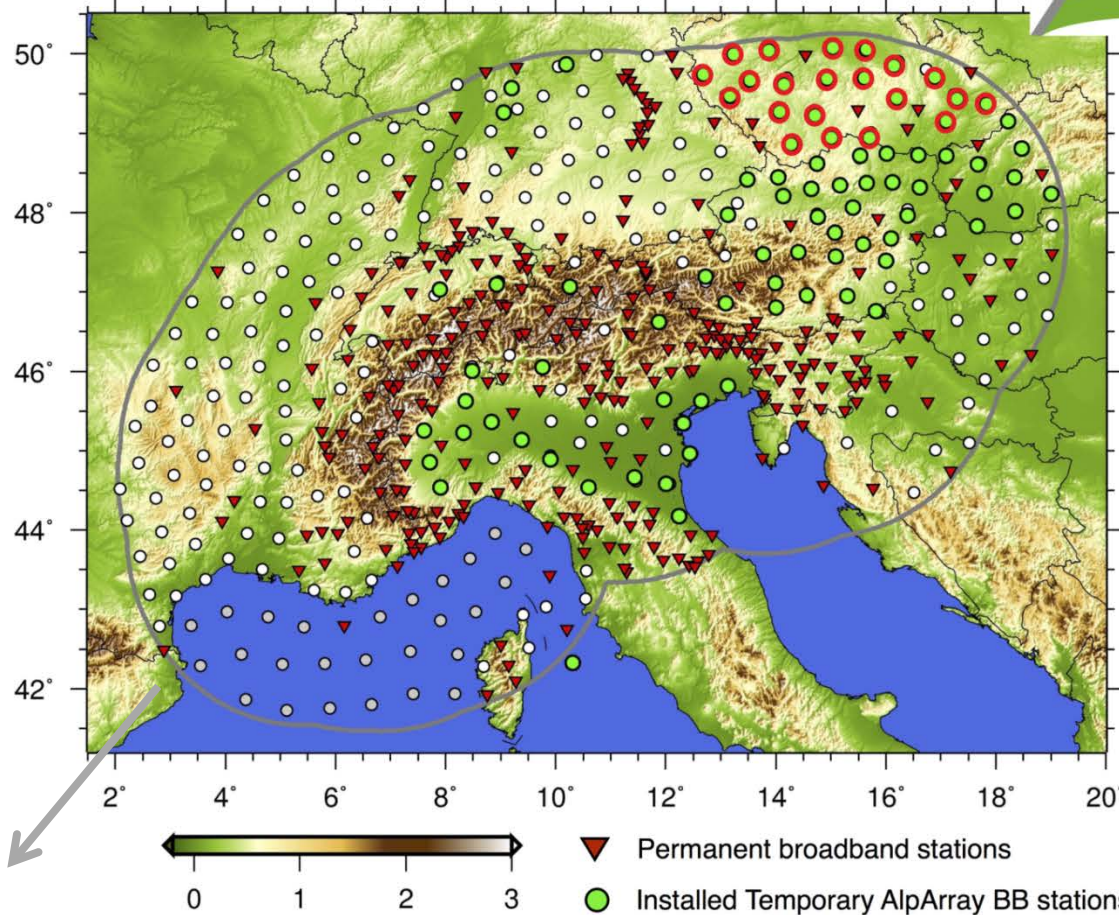
2016	GAIA 5	10 pc	DAS	large investment IG CAS	JSI/BR/JPL
2016	CMG-3ESP	10 pc	Seism.	large investment IG CAS	JSI/BR/JPL <b>+10 portable units</b>

**In total: 63 portable units** (BB/SP seismometers + GAIA das)

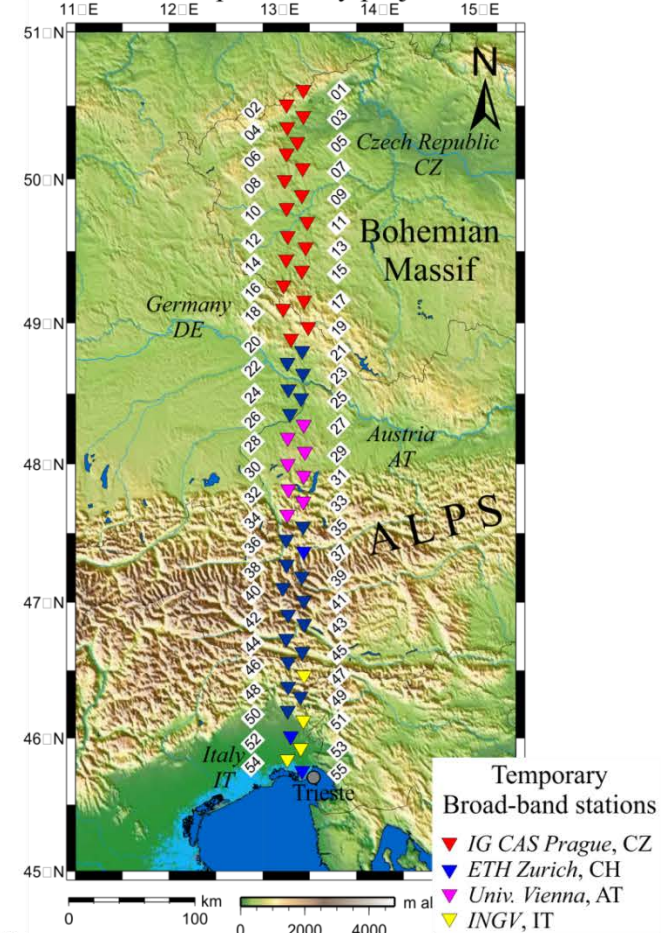
**Current deployment:** **AlpArray** - central Europe (JPL), **Reykjanet** – Iceland (JHR)

# *MOBNET stations in the AlpArray project – currently installed AASN array of European initiative*

AlpArray passive seismic experiment



AlpArray - EASI  
complementary project



Contour copies Topography (km)  
the 800m altitude isolin in the Alps  
at a distance of 250km.

- ▼ Permanent broadband stations
- Installed Temporary AlpArray BB stations
- Temporary AlpArray BB stations - plan
- Temporary BB stations of MOBNET, IG CAS Prague

Installed September-October 2015

2014-2015

Installation plan: stations within 1.5 km of the target location, as much as topographic, field and infrastructure condition allowed;

- fulfilled at 31 sites; the fastest station was 4.4 km away;
- the highest elevation station is at 1846m, the lowest at sea-level (average: 646m)





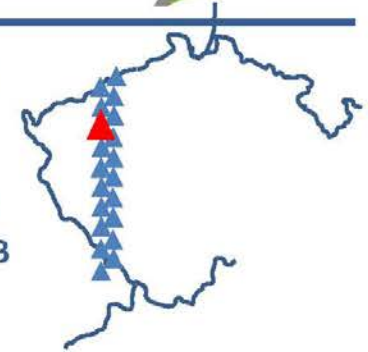


**AAE06**  
**Valeč**

**INSTALLATION**

**EQUIPMENT**

Start : 1.7.2014	Sensor : CMG 3T 120 s
Stop : 25.8.2015	Depth : 2 m
Lat : 50.1746	Recorder : Gaia 1
Lon : 13.2519	Power : electricity grid
Alt : 545 m	Data : miniSeed, 6 GB



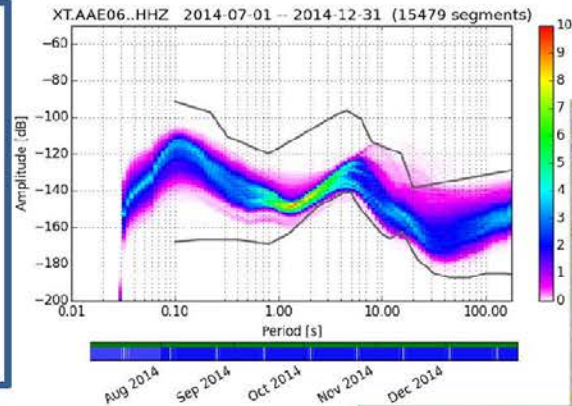
The station is located in the cellar below the Valeč chateau.

Seismometer is built in a wall niche.

The GPS antenna is brought out through the vent, length - 5 m, direction - S, the view is free.

Geomorphology: Doupov Mountains.

Subsoil: pyroclastic rock.





**A076A**  
**Maková Hora**

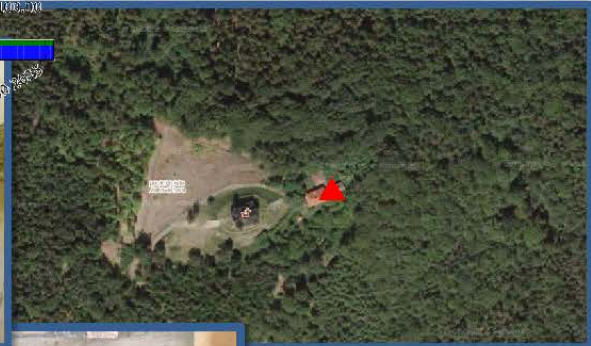
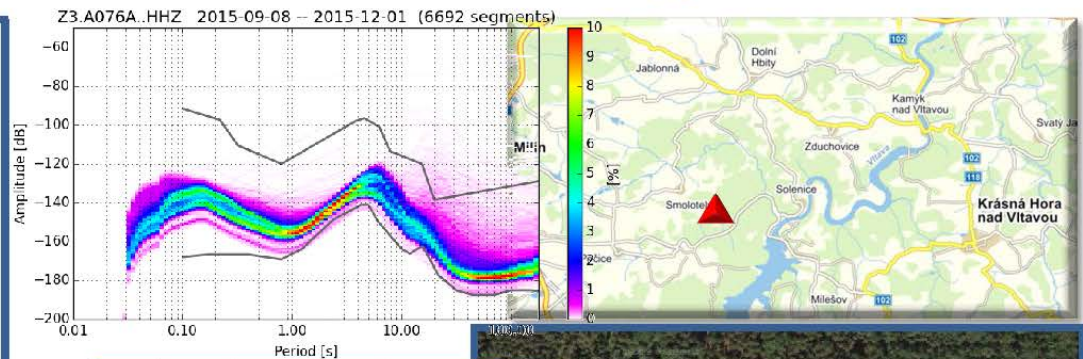
**INSTALLATION**

Start : 8.9.2015  
 Lat : 49.6168  
 Lon : 14.1494  
 Alt : 532 m

**EQUIPMENT**

Sensor : CMG-3T 120 s  
 Depth : 3 m  
 Recorder : Gaia 1  
 Power : electricity grid

The station is located on the lower ground floor of the former rectory pilgrimage church at Maková Hora (Poppy Mountain). Upper ground floor is occasionally used for recreational purposes. Seismometer is installed in the shaft on concrete pillars built on bedrock. The GPS antenna is brought out through the window, length - 5 m, direction - S, view open. Geomorphology: Benešov Uplands. Subsoil: orthogneiss.



### ***MOBNET operation/reparation costs***

- Mostly covered by grants (GACR, GAAV) until now
- Extension of the pool – 2016: new 10 BB stations: CMG 3ESP + GAIA 5 das
- All units continuously exploit in different experiments – none “sitting” in vault

### ***Technical Plans***

- Next years – substitution of MOBNET units behind their life span to keep the MOBNET in the high-standard of its operation
- Developing additional calibration boxes for seismometers (CMG) and GAIA das (P. Jedlicka)

### ***Main targets of Research Plans***

- Continental lithosphere and the upper mantle structure
- Crustal studies – receiver functions
- Tomography of the upper mantle
- Anisotropy of the mantle lithosphere

***Thanks for your attention***