

# AdriaArray

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&

the AdriaArray Seismology Group

AdriaArray Seismology Group Steering Committee online meetings, November 16th & 18th, 2022



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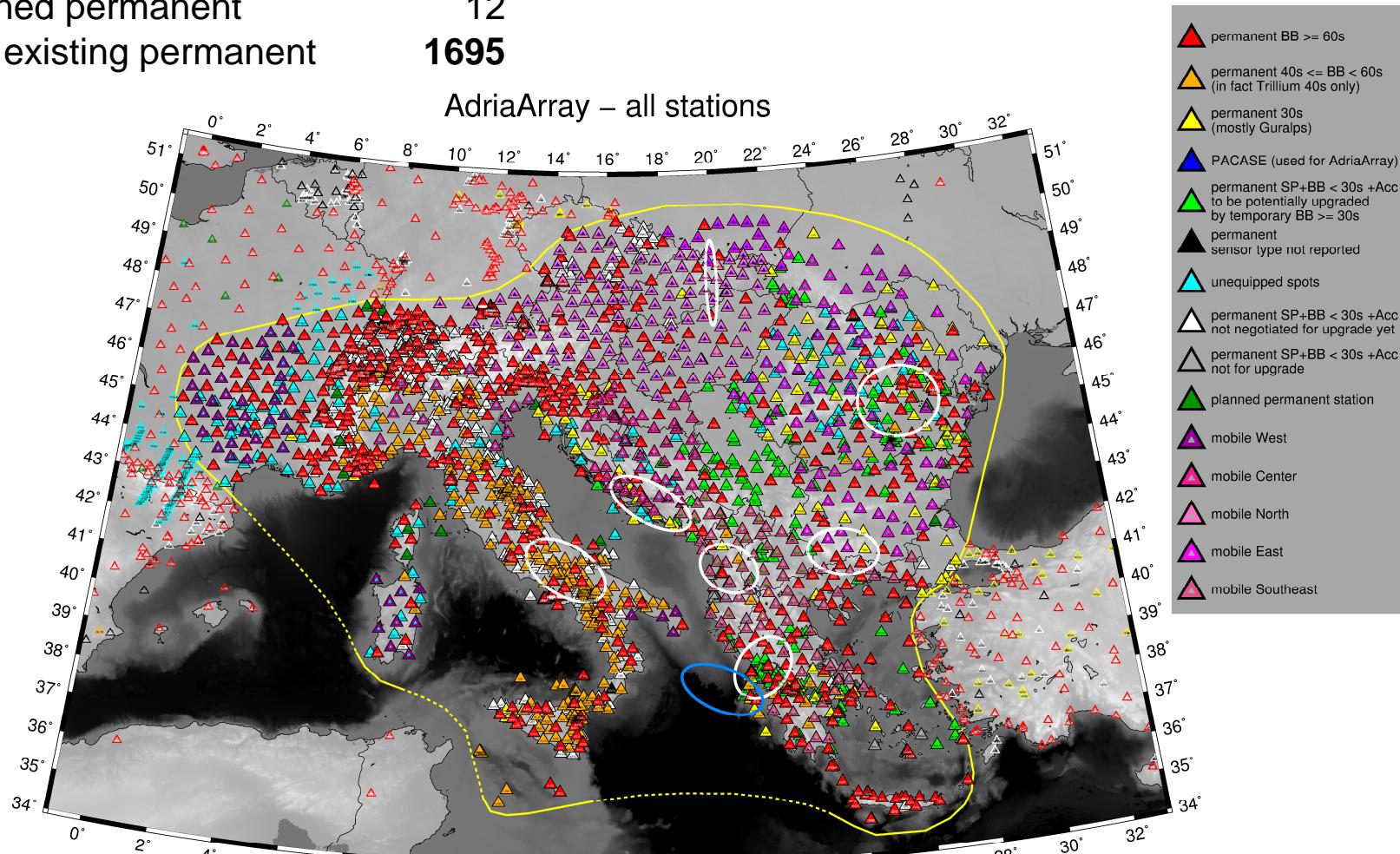
# Adria Array – all permanent stations - update November 2022

## inside AdriaArray region:

BB (>= 30s)	992
SP+SM for upgrade	252
SP+SM others	450
unknown	1
planned permanent	12
<b>total existing permanent</b>	<b>1695</b>

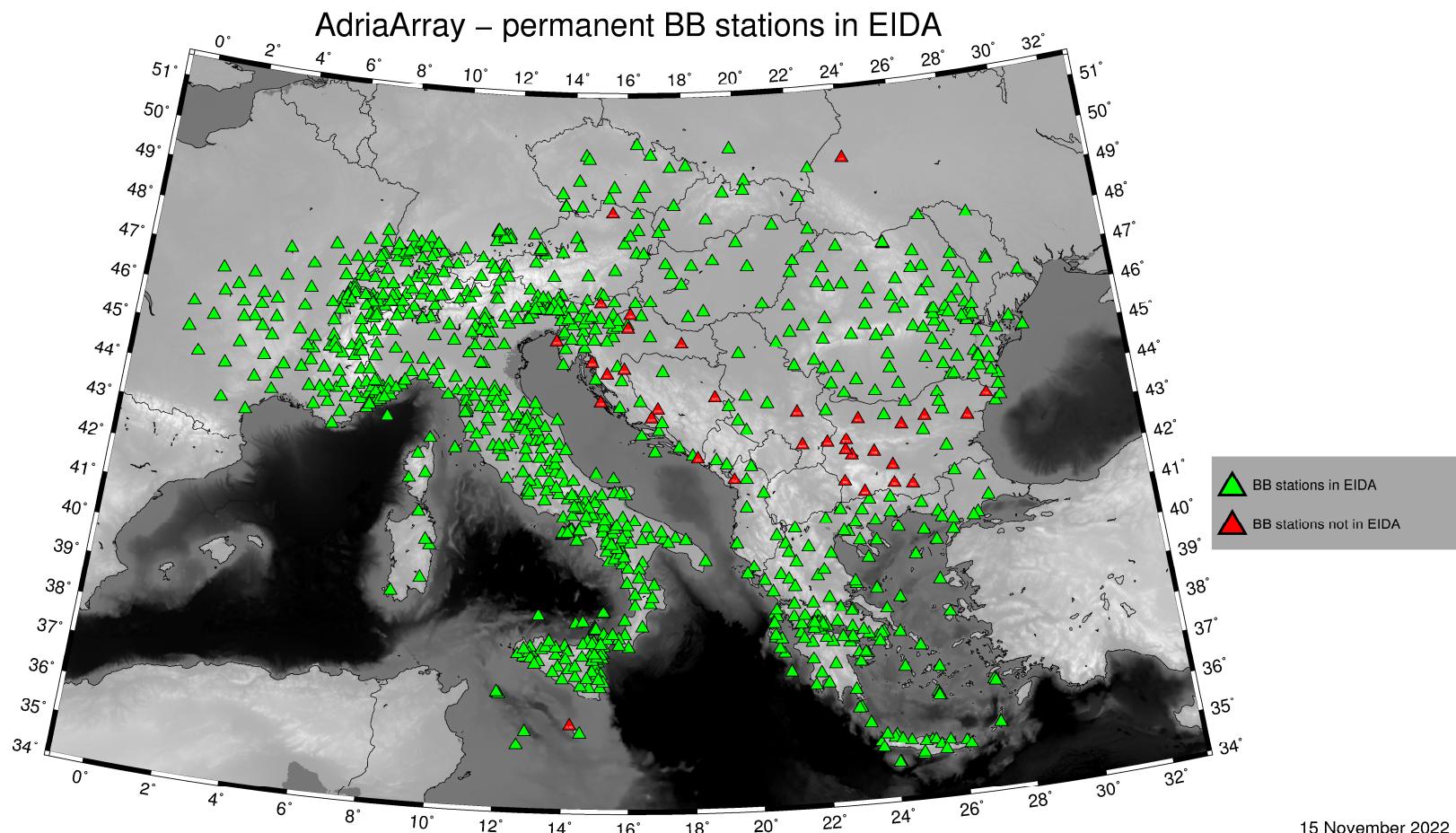
(there are 2300+ stations on the map  
including those outside the AdriaArray region)

AdriaArray – all stations



15 November 2022

from that **992** permanent stations, **958** are already in EIDA (96.6%)  
=> 34 are not in EIDA

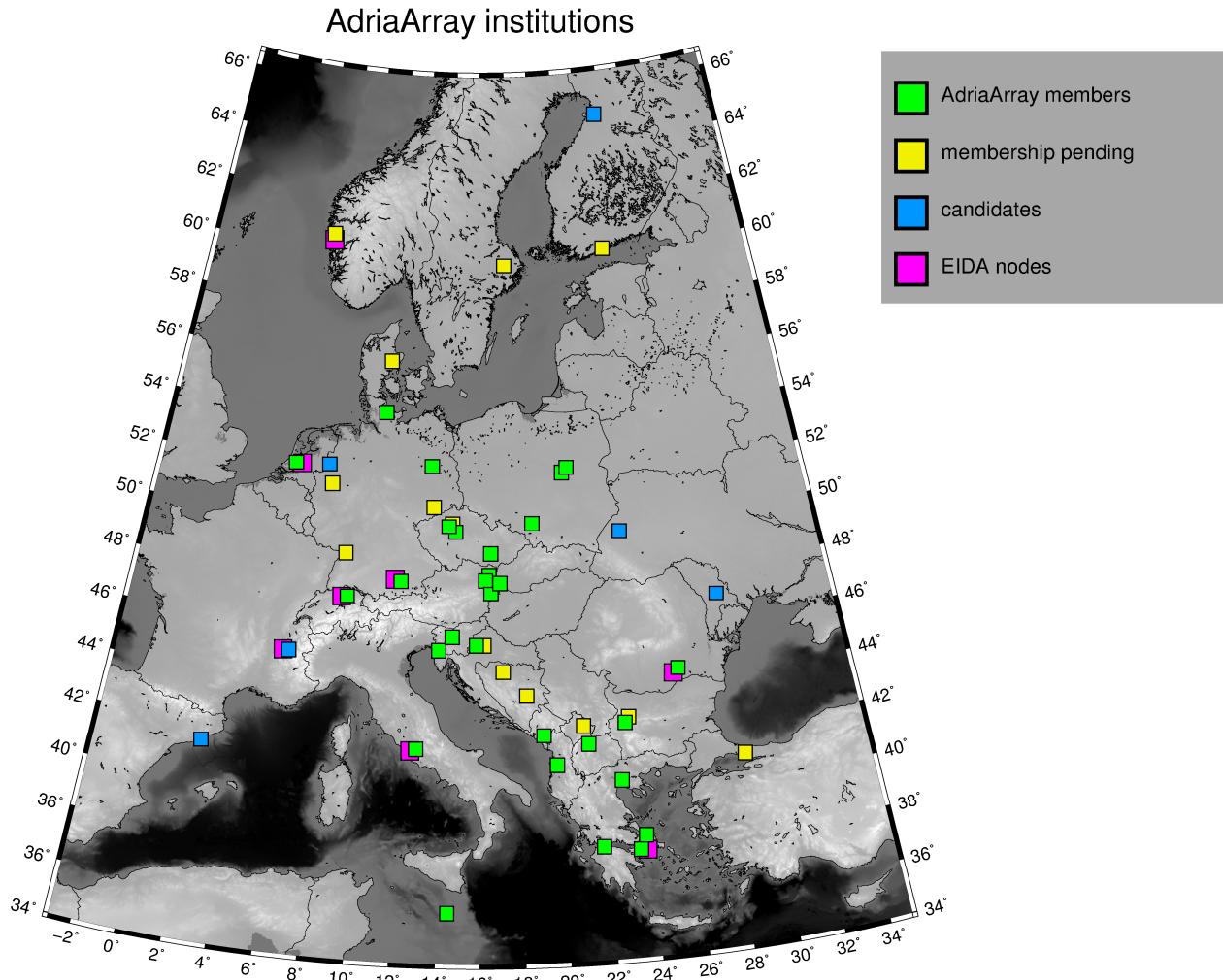


# AdriaArray

## Seismology Group

(November, 2022)

49 interested institutions from **27** countries (alphabetical order by countries)



### MEMBERS: 27 (29)

IGEWE-PUT, Tirana, Albania  
Uni Vienna, Austria  
ZAMG, Austria  
NIGGG, BAS, Bulgaria  
Uni Zagreb, Croatia  
Charles Uni, Prague, Czech Republic  
IG, CAS, Prague, Czech Republic  
IPE, Masaryk Uni, Brno, Czech Republic  
Uni Kiel, Germany  
LMU München, Germany  
GFZ Potsdam, Germany  
NOA, Greece  
Uni Athens, Greece  
Uni Thessaloniki, Greece  
Uni Patras, Greece  
EPSS, Hungary  
INGV, Italy  
OGS, Trieste, Italy  
Uni Sts. Cyril and Methodius, Skopje, N. Macedonia  
Uni Malta  
MSS, Podgorica, Montenegro  
IG PAS, Warsaw, Poland  
Uni Silesia, Katowice, Poland  
Uni Warszawa, Poland  
NIEP, Romania  
ESI SAV, Bratislava, Slovakia  
SSS, Ljubljana, Slovenia  
ETH, Zürich, Switzerland  
ORFEUS

### PENDING: 12 (15)

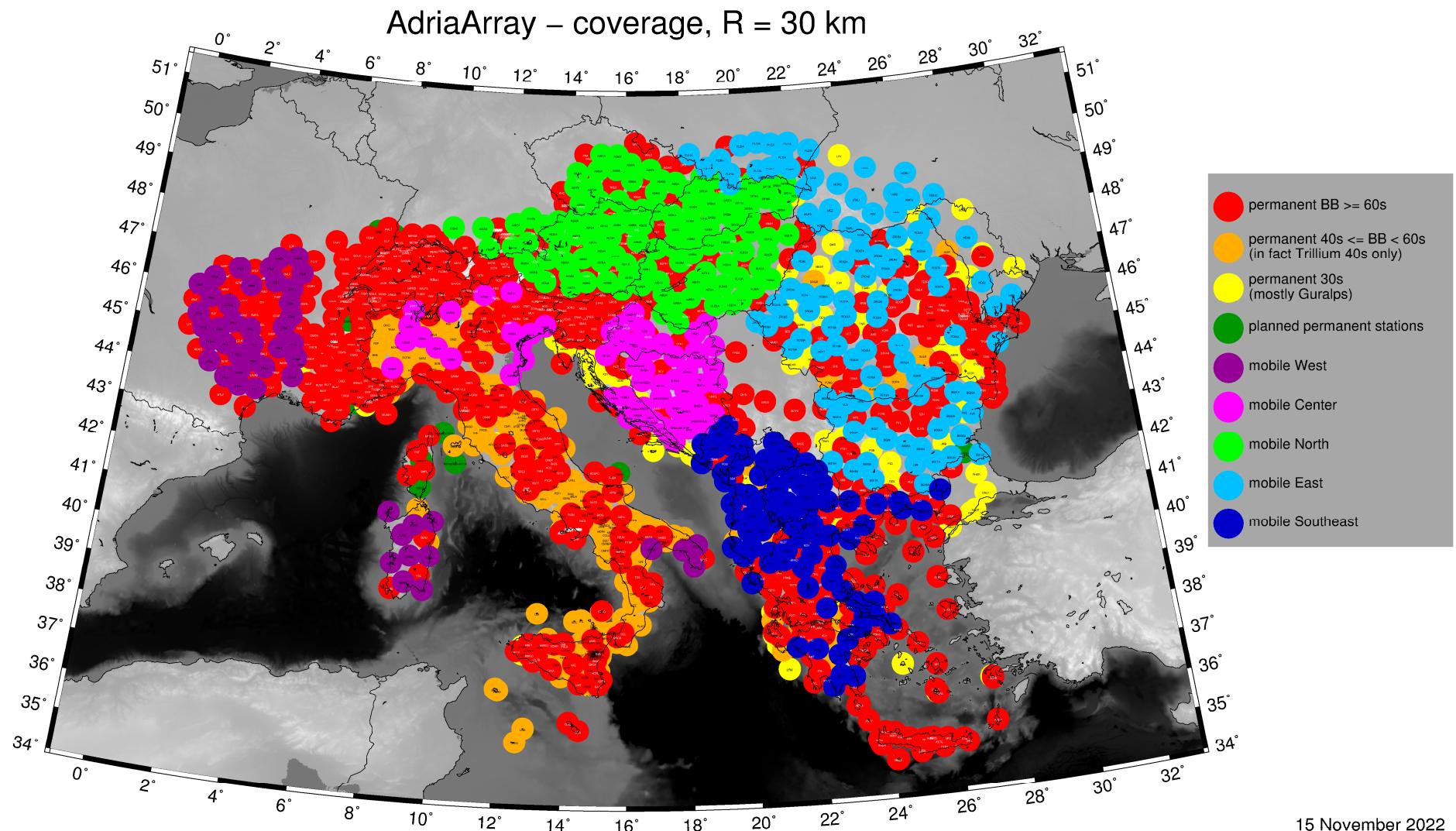
SC FHMZ, Sarajevo, Bosnia and Herzegovina  
GS Republic of Srpska, Bosnia and Herzegovina  
Uni Sofia, Bulgaria  
CSS, Zagreb, Croatia  
IRSM, CAS, Prague, Czech Republic  
Uni Aarhus, Denmark  
TU Freiberg, Germany  
GS Kosovo, Pristina, Kosovo  
Uni Uppsala, Sweden,  
KOERI, Turkiye  
Uni Bochum, Germany  
Norwegian Broadband Pool, Norway  
Uni Oulu, Finland  
Uni Helsinki, Finland  
Karlsruhe I.T., Germany

### CANDIDATES: (5)

RESIF-Sismob, France  
IGS-CES, Chisinau, Moldova  
Uni Twente, the Netherlands  
ICTJA-CSIC, Barcelona, Spain  
IoG, NAS, Ukraine

coverage

30 km

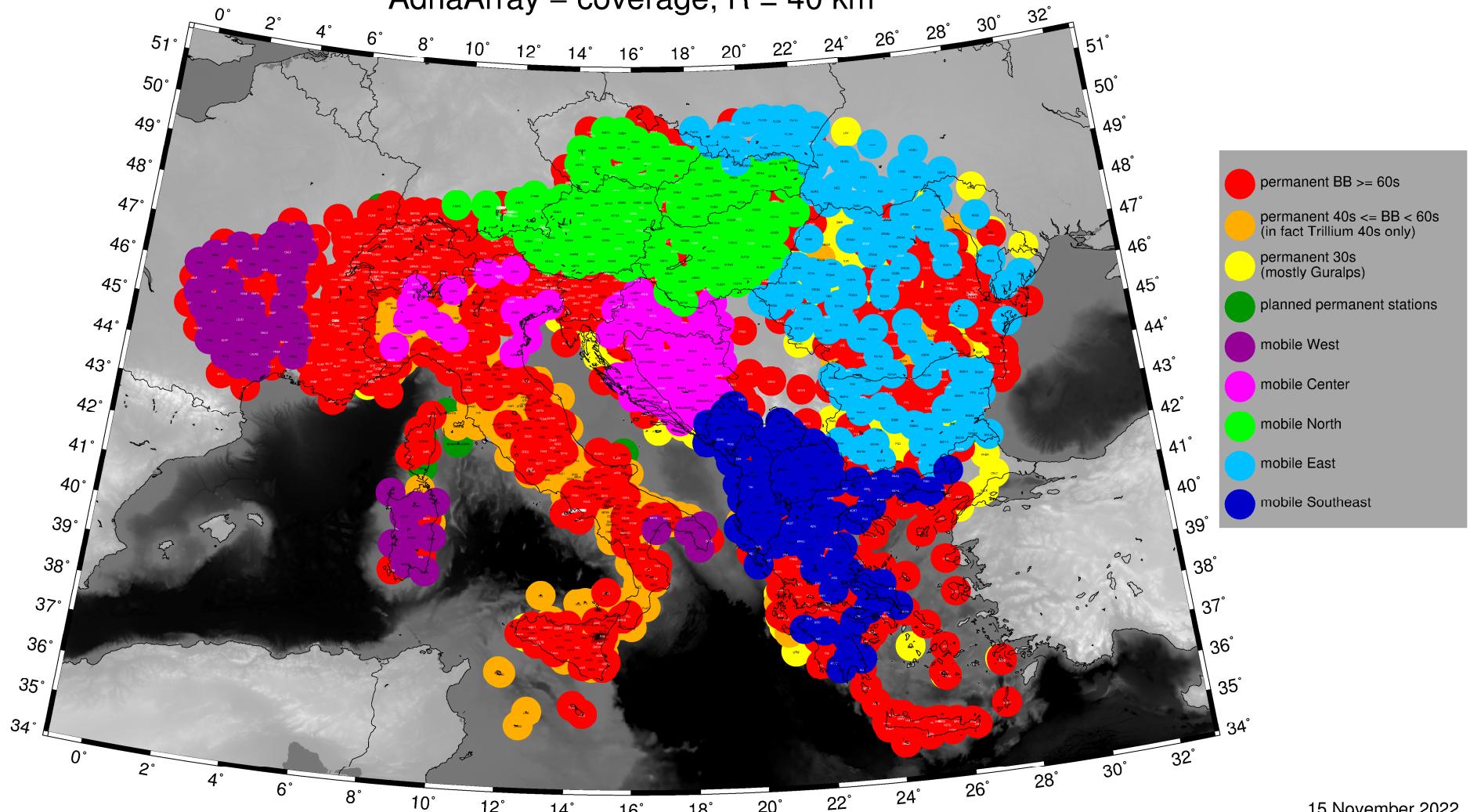


15 November 2022

coverage

40 km

AdriaArray – coverage, R = 40 km



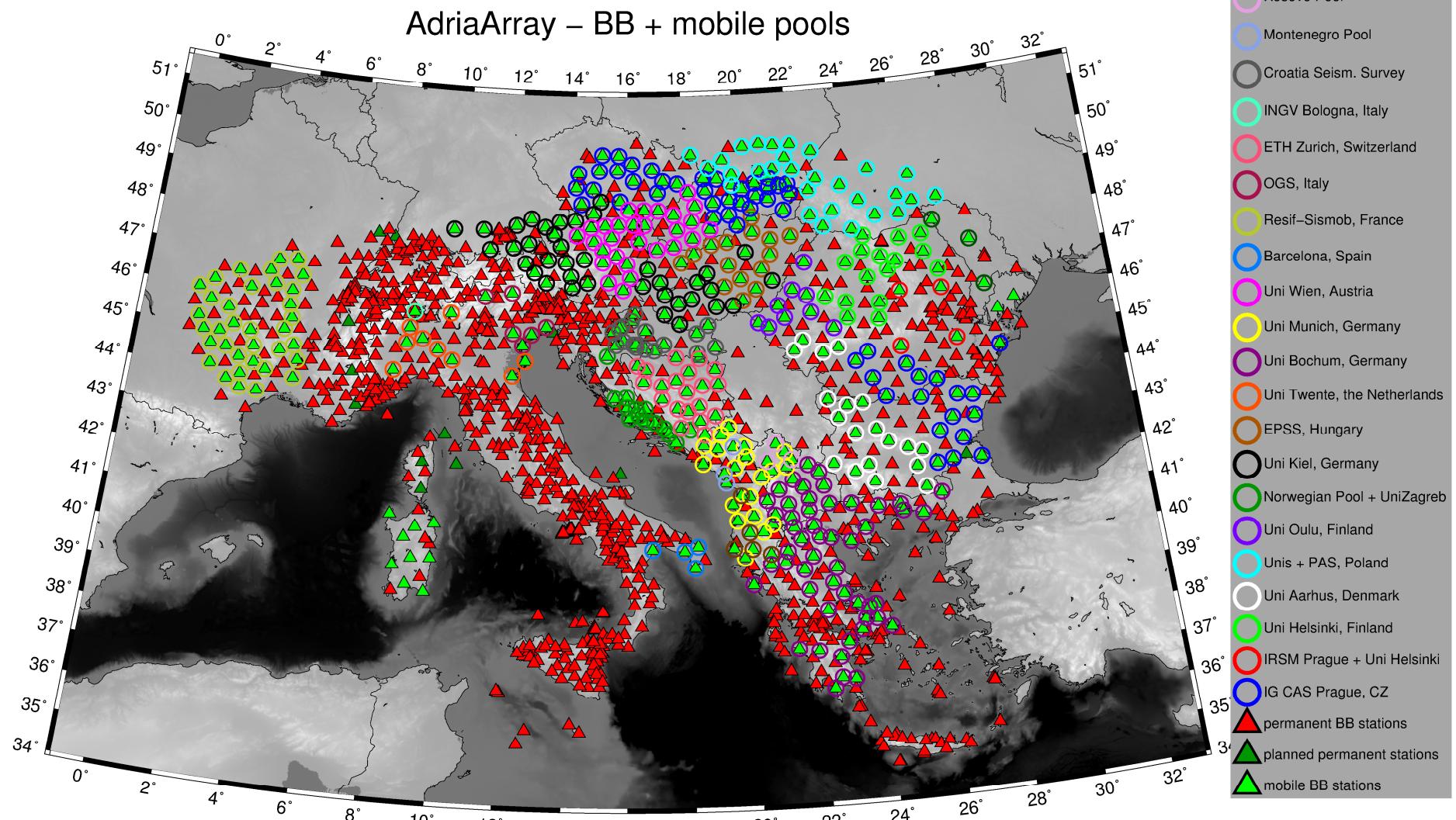
15 November 2022

mobile pools assigned to the stations

**414 BB mobile stations**

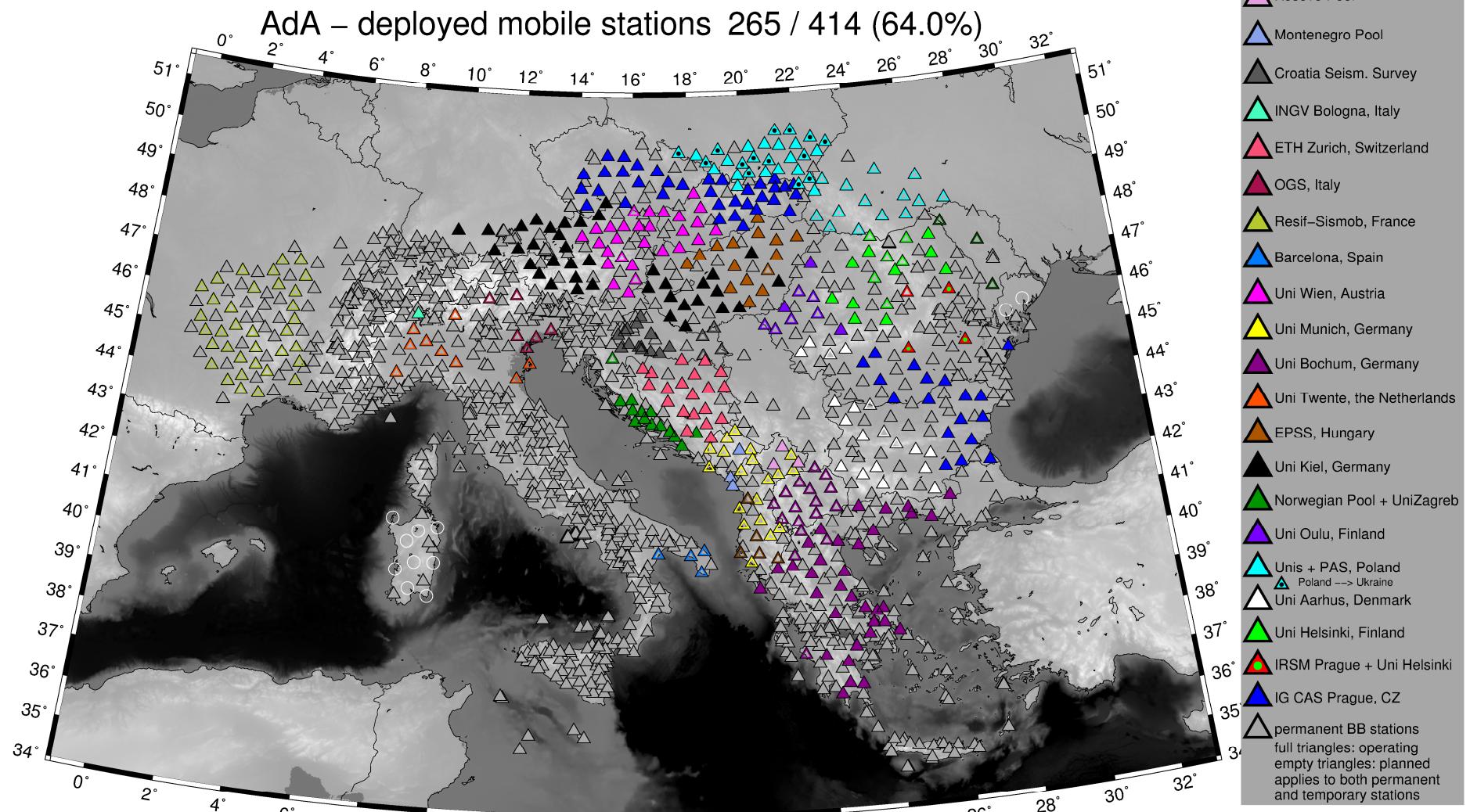
**992 BB permanent stations**

**--> 1406 BB stations in total**



15 November 2022

# deployed stations



15 November 2022

## virtual network

EIDA node	network code	mobile pool	open / embargo	country
NOA	1Y	Uni Bochum	embargo	Greece Northern Macedonia
NIEP	Y8	MOBNET IG CAS CZ	embargo	Romania Bulgaria
		Uni Aarhus	embargo	Romania Bulgaria
		Uni Oulu		Romania
		Uni Helsinki		Romania
		Polish Ada Group	embargo	Poland Ukraine
		NIEP		Moldova
		IRSM CAS CZ	embargo	Romania
LMU	Z6	MOBNET IG CAS CZ	embargo	Slovakia Czech Republic
		Kiel	embargo	Germany Austria Hungary
		EPSS Hungary	embargo	Hungary
		LMU	embargo	Albania Montenegro Kosovo
		Montenegro pool	embargo	Montenegro
		KIT		Albania
		Kosovo pool	embargo	Kosovo
ODC	7B	UniWien	open	Austria Slovakia
		Croatian Seism. Survey	open	Croatia
Bergen	9H	Uni Zagreb+Norwegian Pool	embargo	Croatia BiH
ETH	Y5	ETH	open	BiH
INGV	2Y	OGS	embargo	Italy
	?	INGV Bologna		Italy
		Uni Twente		Italy
		Barcelona		Italy
RESIF	?	Resif-Sismob	open	France

\_ADARRAY

permanent networks  
included in the moment

temporary to be added soon  
(Greece already in)

# ORFEUS + EPOS

support from Orfeus/EPOS is crucial for the AdriaArray

AdriaArray idea and Orfeus/EPOS are aiming  
in the same direction, focusing on different aspects

## infrastructure + science + networking

- archival of data at regional EIDA nodes
- support to AdA workshops via EPOS SP

Datacenter ID	Description and Focus Region
ODC - KNMI	European-Mediterranean, Netherlands
GFZ	European, Global, temporary deployments
RESIF	France + Global temporary deployments
INGV	Italy, European-Mediterranean (MedNet)
ETHZ	Switzerland
BGR	Germany
LMU	Germany (BayernNetz)
NIEP	Romania
KOERI	Turkey
NOA	Greece
UIB - NORSAR	Norway
ICGC	Spain

from the Orfeus web page:

**ORFEUS** Observatories & Research Facilities for European Seismology

**ORFEUS** is the non-profit foundation to coordinate and promote digital, broadband seismology in the European-Mediterranean area.

**EIDA** is the European Integrated Data Archive infrastructure within ORFEUS to provide access to seismic waveform data in European archives.

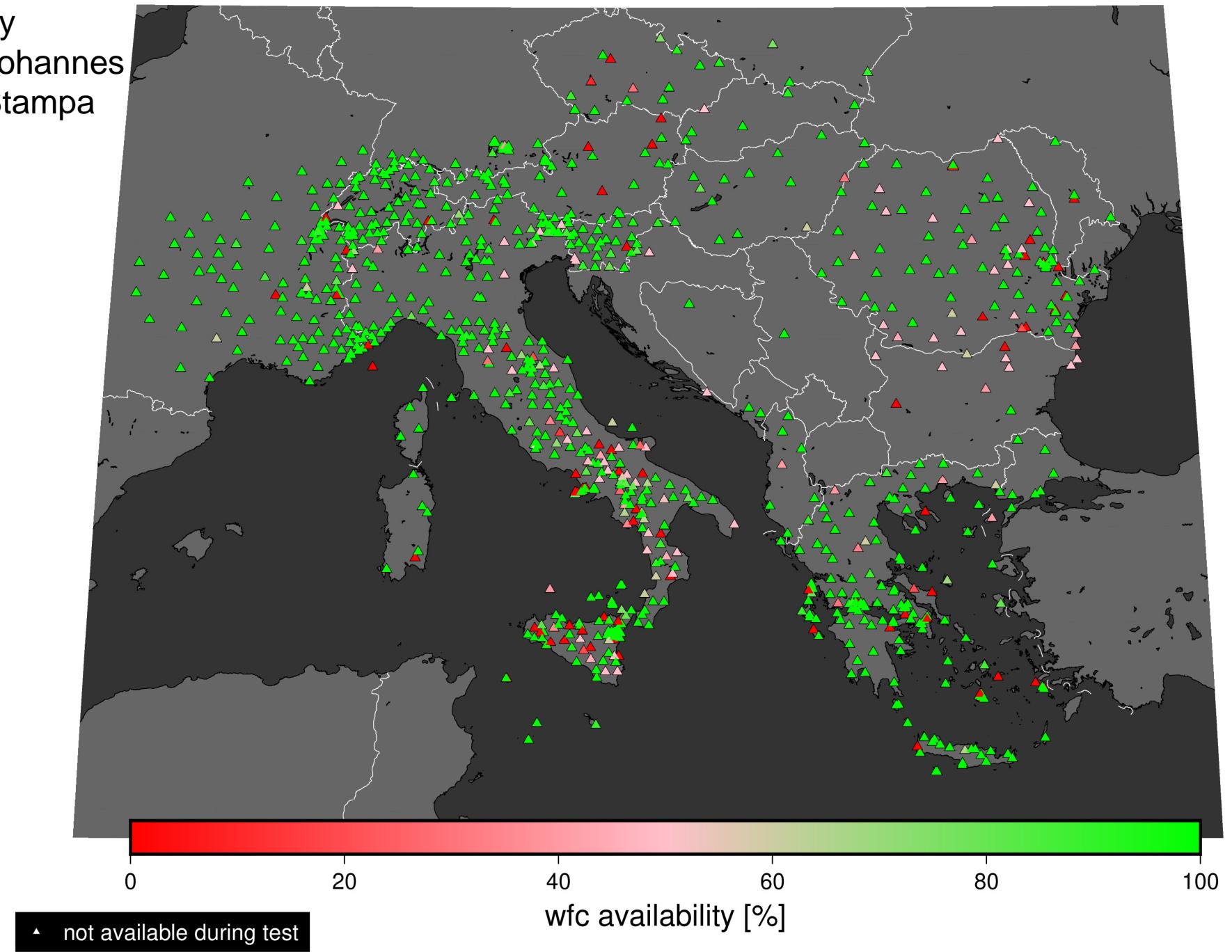
- guidelines for quality control and data management being developed



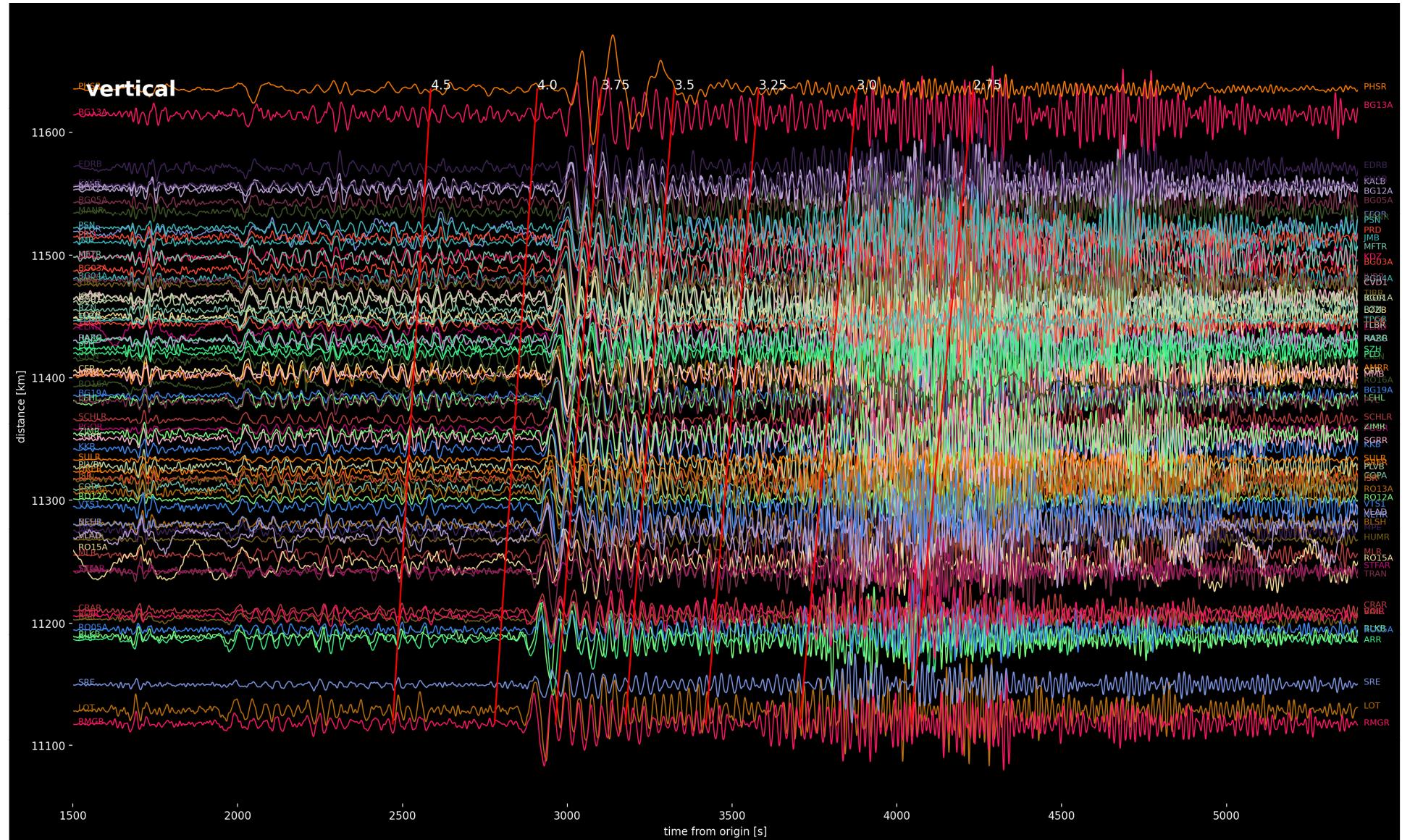
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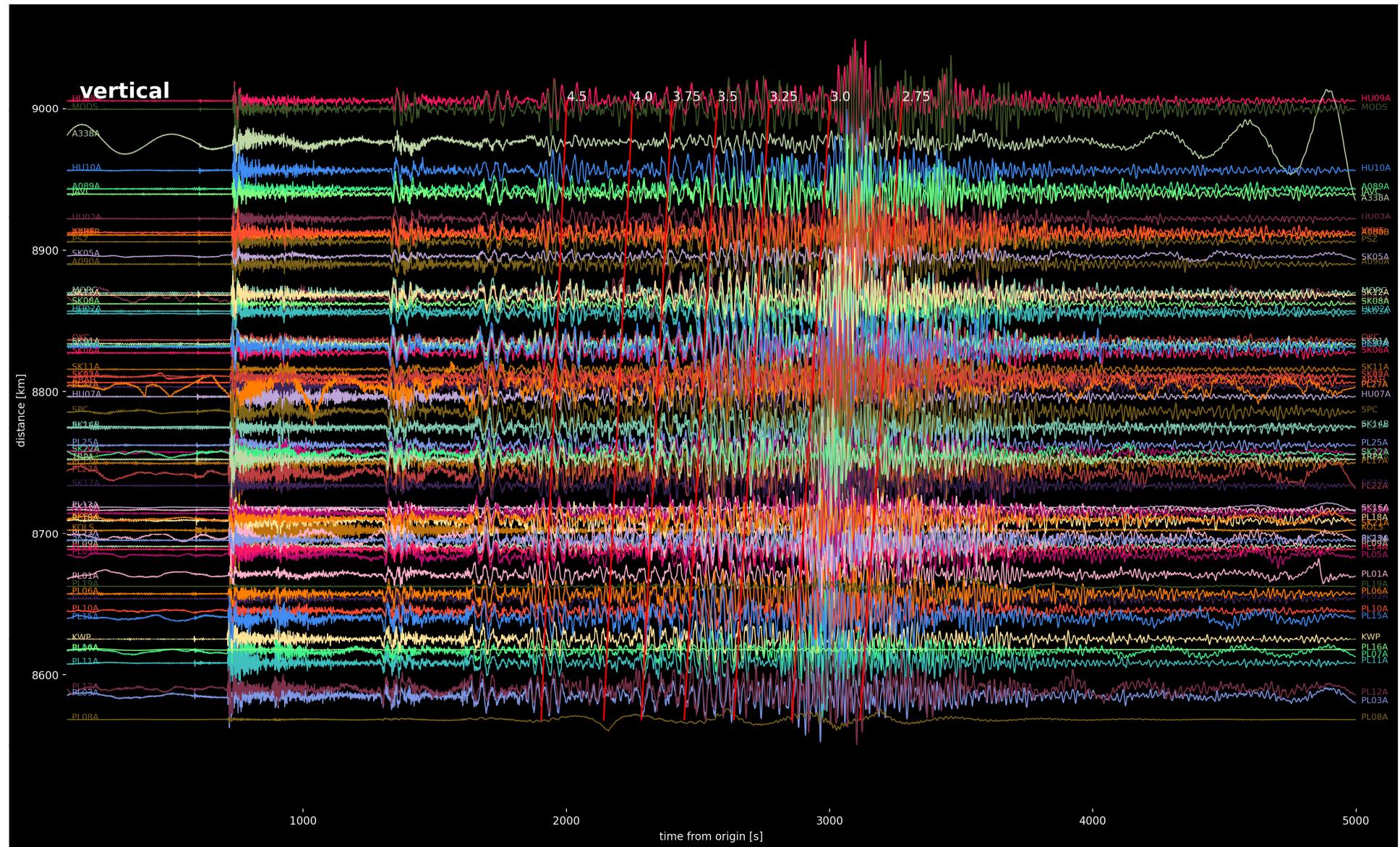
by  
Johannes  
Stampa



Mexico, 2022-09-19, M=7.6, 10 – 200 s, stations in Romania + Bulgaria



Japan, 2022-03-16, M=7.3, stations in Slovakia, Poland, Hungary, CZ, Austria



candidates: permanent networks

invited as initiators, but did not submit the Application in May, but later:

Geological Survey of Kosovo

represented by Shemsi Mustafa

Croatian Seismological Survey

represented by Ines Ivančić

Republic Hydrometeorological Service, Republika Srpska, Bosnia and Herzegovina

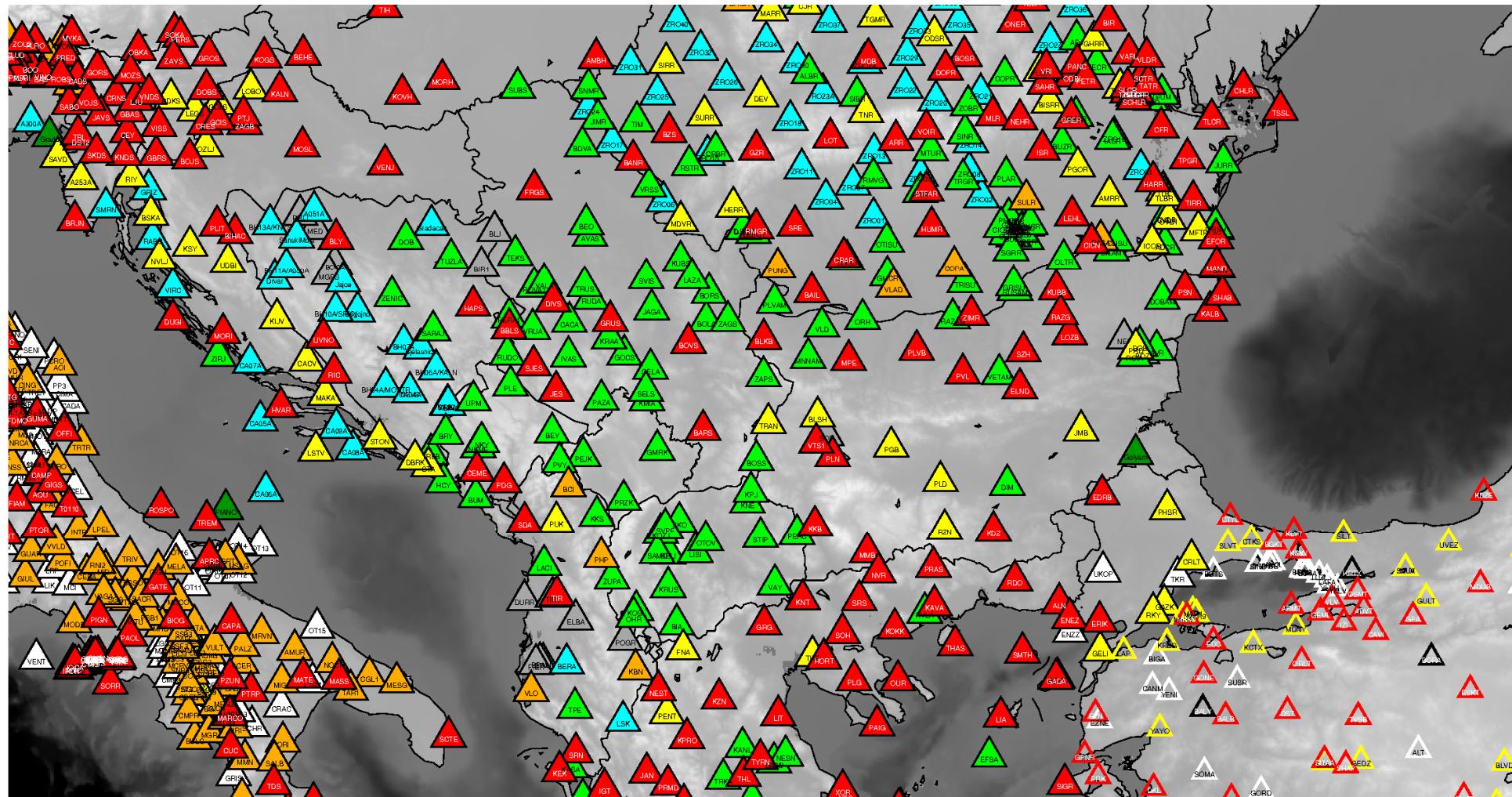
represented by Snježana Cvijić Amulić

Hydrometeorological Institute of Federation of Bosnia and Herzegovina

represented by Almir Bijedić

Kandilli Observatory And Earthquake Research Institute

represented by Musavver Didem Cambaz



candidates: temporary networks

Uni Bochum

represented by Wolfgang Friederich  
operating temporary stations in Greece and planning to operate stations  
in Northern Macedonia, 51 stations in total

Norwegian Broadband Pool

represented by Stéphane Rondenay  
operating 12 temporary stations in Croatia

Technische Universität Bergakademie Freiberg

represented by Thorsten Nagel  
operating 19 temporary stations in Bulgaria and Romania

Aarhus University

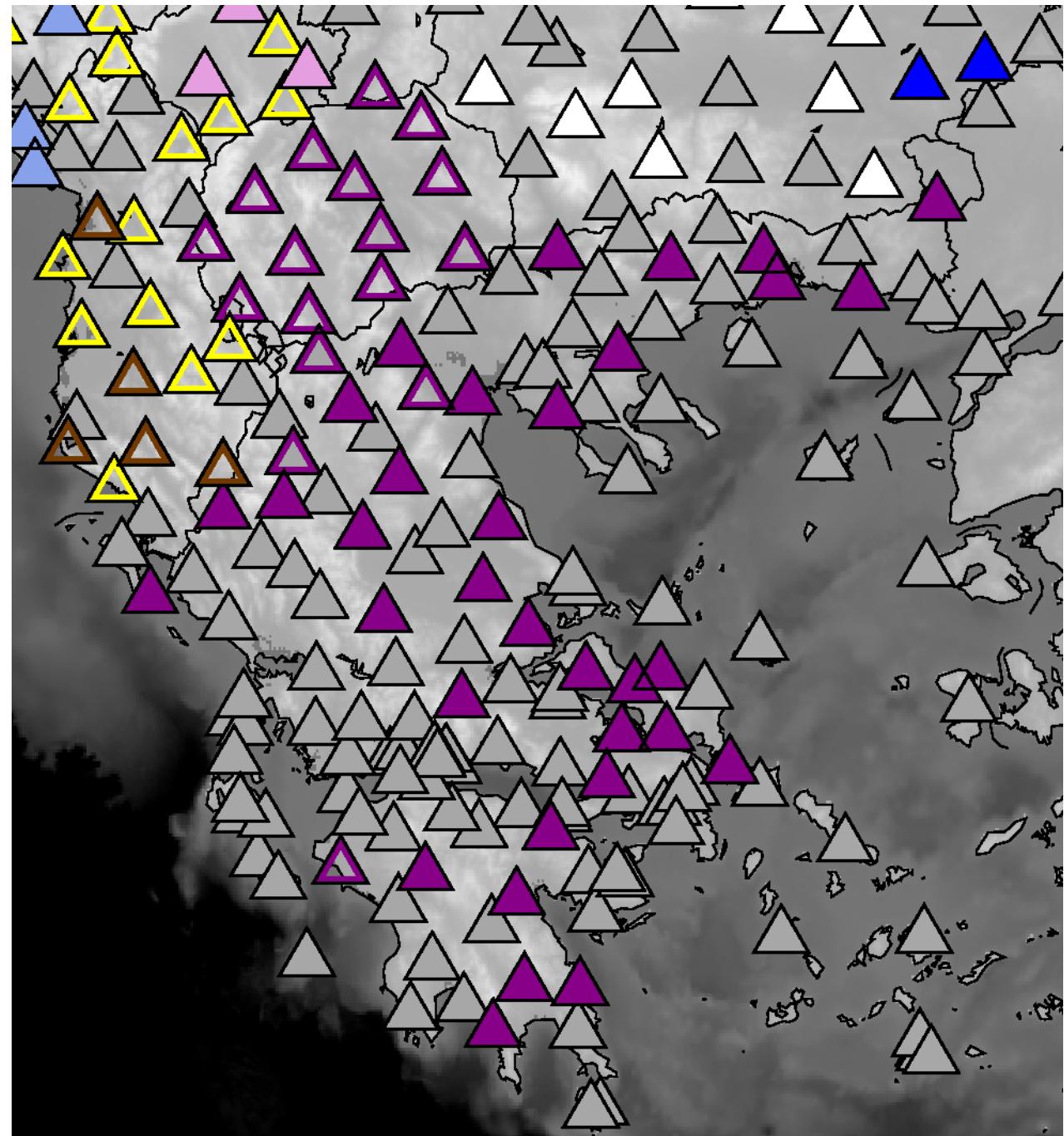
represented by Søren Bom Nielsen  
providing 19 temporary stations for Bulgaria and Romania

Uppsala University

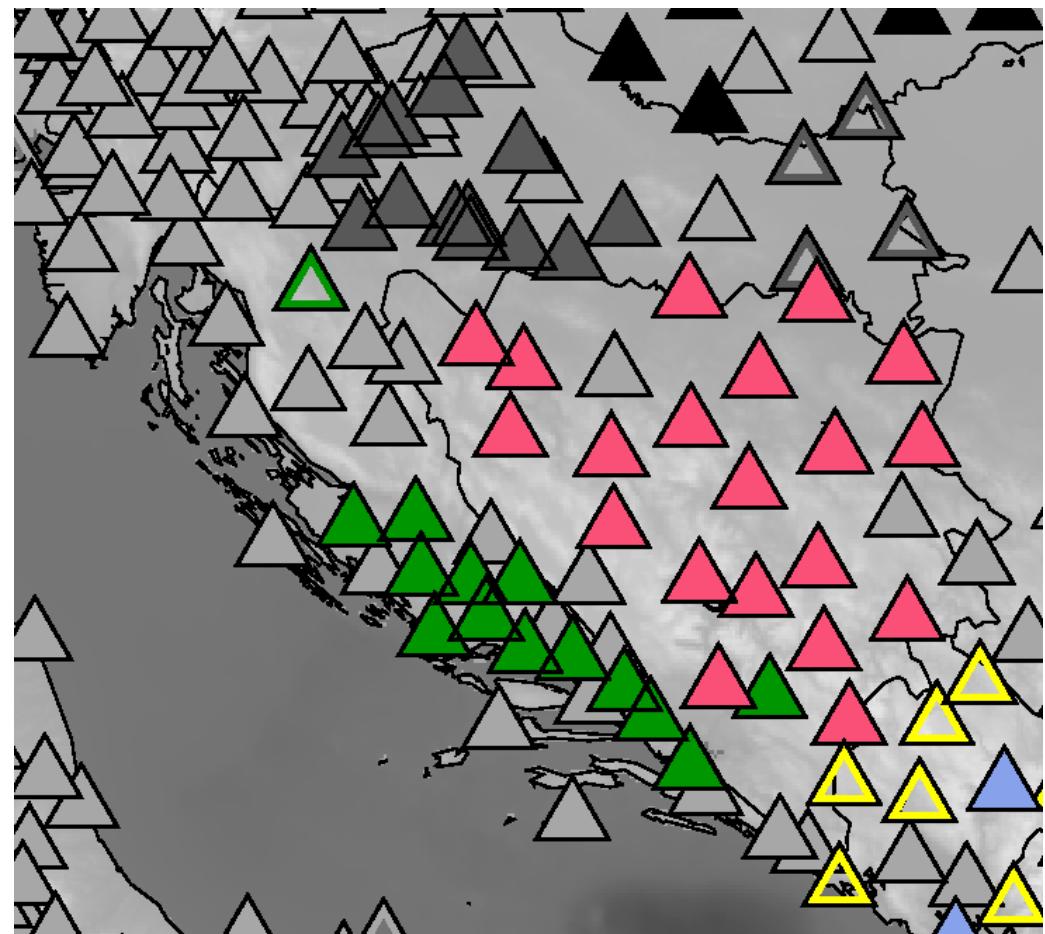
represented by Christian Schiffer  
supporting the installation and operation of 19 temporary stations  
in Bulgaria and Romania

Uni Bochum

- stations come from Germany
- colleagues from Uni Bochum took part in the fieldwork



Norwegian Broadband Pool  
- stations come from Norway  
- colleagues from Norway  
took part in the fieldwork



Technische Universität Bergakademie Freiberg

+

Aarhus University

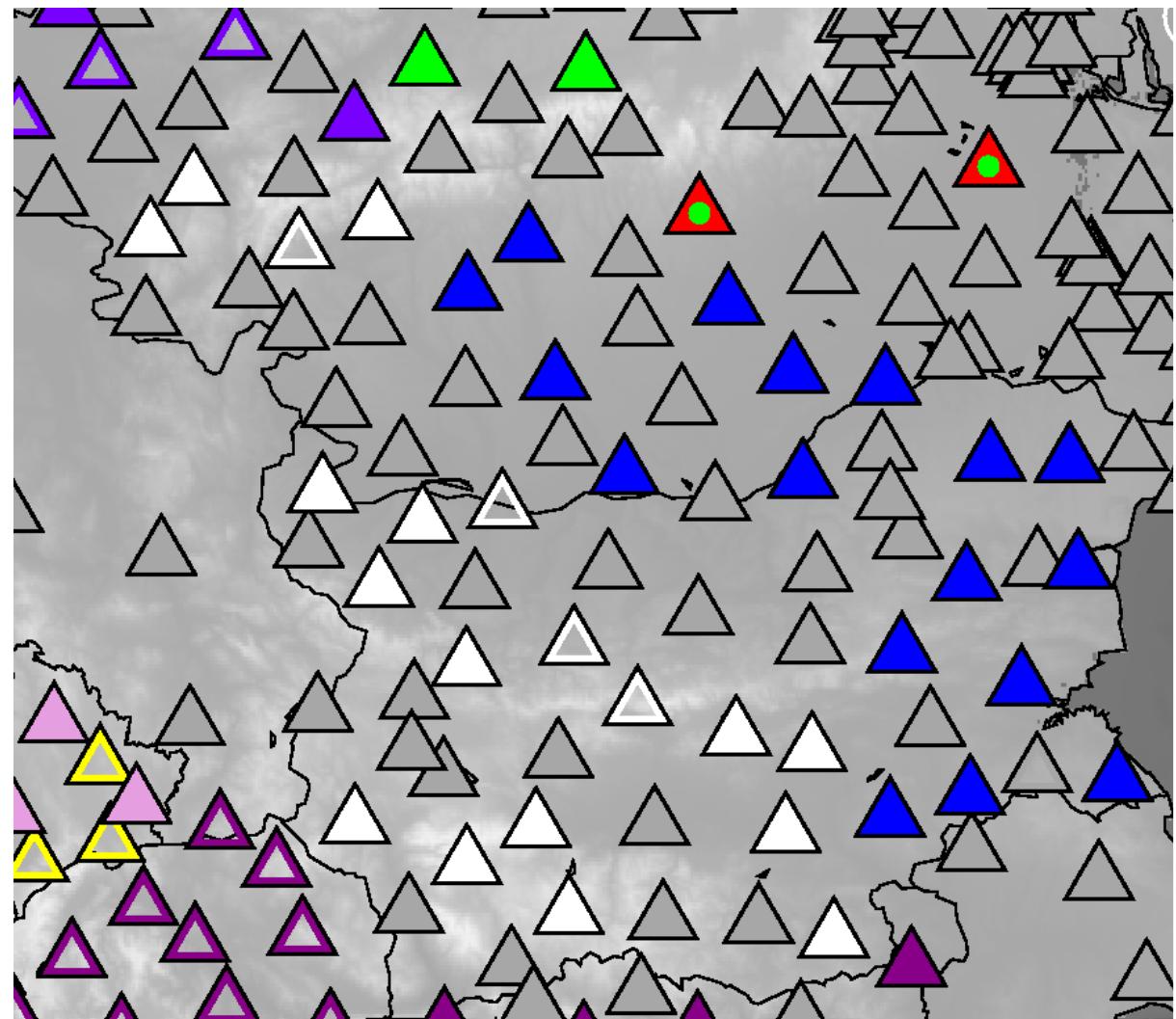
+

Uppsala University

Thorsten Nagel from Freiberg  
got funded the deployment  
and took part in the fieldwork

Christian Schiffer from  
Uppsala got funded the  
deployment and took part  
in the fieldwork

Aarhus University  
provides the stations



candidates: fieldwork, operating the stations

Institute of Rock Structure and Mechanics  
of the Czech Academy of Sciences

represented by Renata Lukešová

+ installing 7 temporary stations provided  
by the Uni Helsinki pool in Romania

(Uni Helsinki did not send any personnel  
for deployment) (green and red triangles)

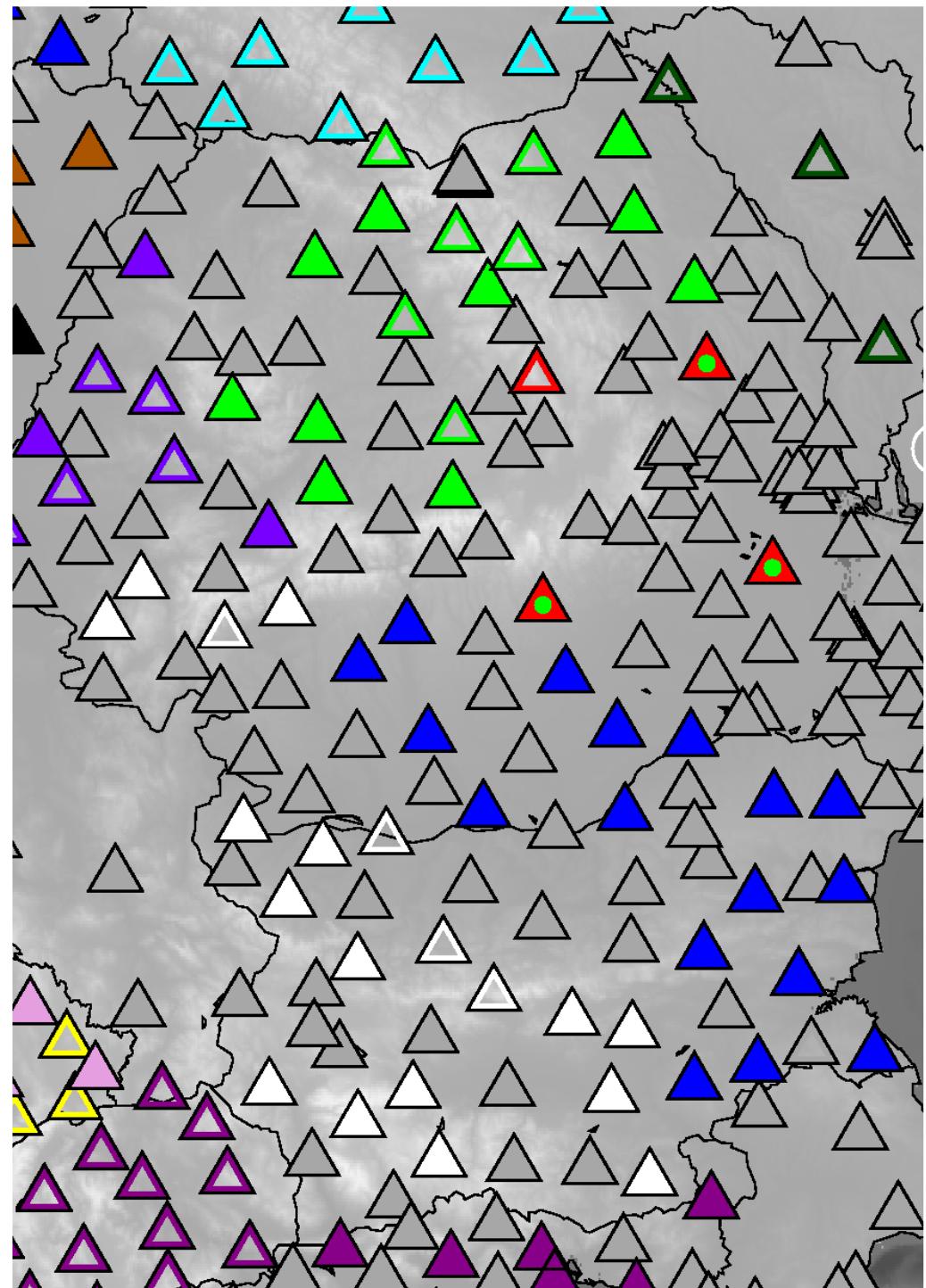
+ operating 4 stations in Romania  
(providing modems, batteries,  
paying transmission costs) (red triangles)

Uni Sofia

represented by Gergana Georgieva

+ supporting the installation of 15 temporary  
stations by the Uni Aarhus mobile pool  
in Bulgaria, scouting, deployment,  
maintenance (white triangles)

+ maintenance of the IG CAS CZ stations  
in Bulgaria (blue triangles)



## acknowledgements

Maps plotted using GMT by Wessel, P., Smith, W. H. F., Scharroo, R., Luis, J. F. and Wobbe, F., 2013: Generic Mapping Tools: Improved version released, EOS Trans. AGU, 94, 409-410.

AlpArray stations by the AlpArray Working Group [www.alparray.ethz.ch](http://www.alparray.ethz.ch).

Permanent stations by national seismological services and ORFEUS-EIDA.

Big thanks to all the network operators for supplying the permanent station information.

PACASE station information thanks to György, Jarka and Antje.

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