

BUILDING AN EDUCATIONAL SEISMIC NETWORK IN ROMANIAN SCHOOLS

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ABSTRACT

Understanding the earthquake phenomena and their effects is an important step toward the education of population and aims to raise the awareness about the earthquake risk and possible mitigation actions. In this sense, The Romanian Educational Seismic Network project represents an efficient communication tool, allowing teaching and learning about the earthquakes and seismic wave impact through experimental practices and educational activities.

The seismic network consist of nine SEP seismometers installed in high-schools from the most important seismic areas (Vrancea, Banat, Fagaras, Dobrogea), vulnerable cities (Bucharest, Iasi) or high populated places (Cluj, Sibiu, Timisoara, Zalau) and is coordinated by the National Institute of Earth Physics from Bucharest.

Once installed, the seismic network is the starting point of activities for students through an e-learning platform. Some objectives are aimed:

- To train students and teachers how to make analysis and interpretation of seismological data;
- To make science more interesting for students;
- To improve the participation rates in physical sciences for students;
- To raise awareness of geoscience as a scientific discipline for pre-university students;
- To promote the installation and effective use of educational seismographs and seismic data;
- To reinforce and develop relationships between participating schools and research institutes;
- To create an earthquake database this will be used by students and teachers for educational purposes.

Different types of practical activities using educational seismometer, designed by researchers for students, are described in educational materials and in the web platform project. Also we encourage the teachers from the participating schools to share their experiences and produce new didactic tools for the classroom. This collaborative work could illustrate the conjugated efforts of researchers and teachers for a better education and awareness of the risk culture. Additionally, educating the children, as the future of any community at risk, can be considered as an effective strategy to communicate safety messages to the entire community.

ROEDUSEIS NETWORK



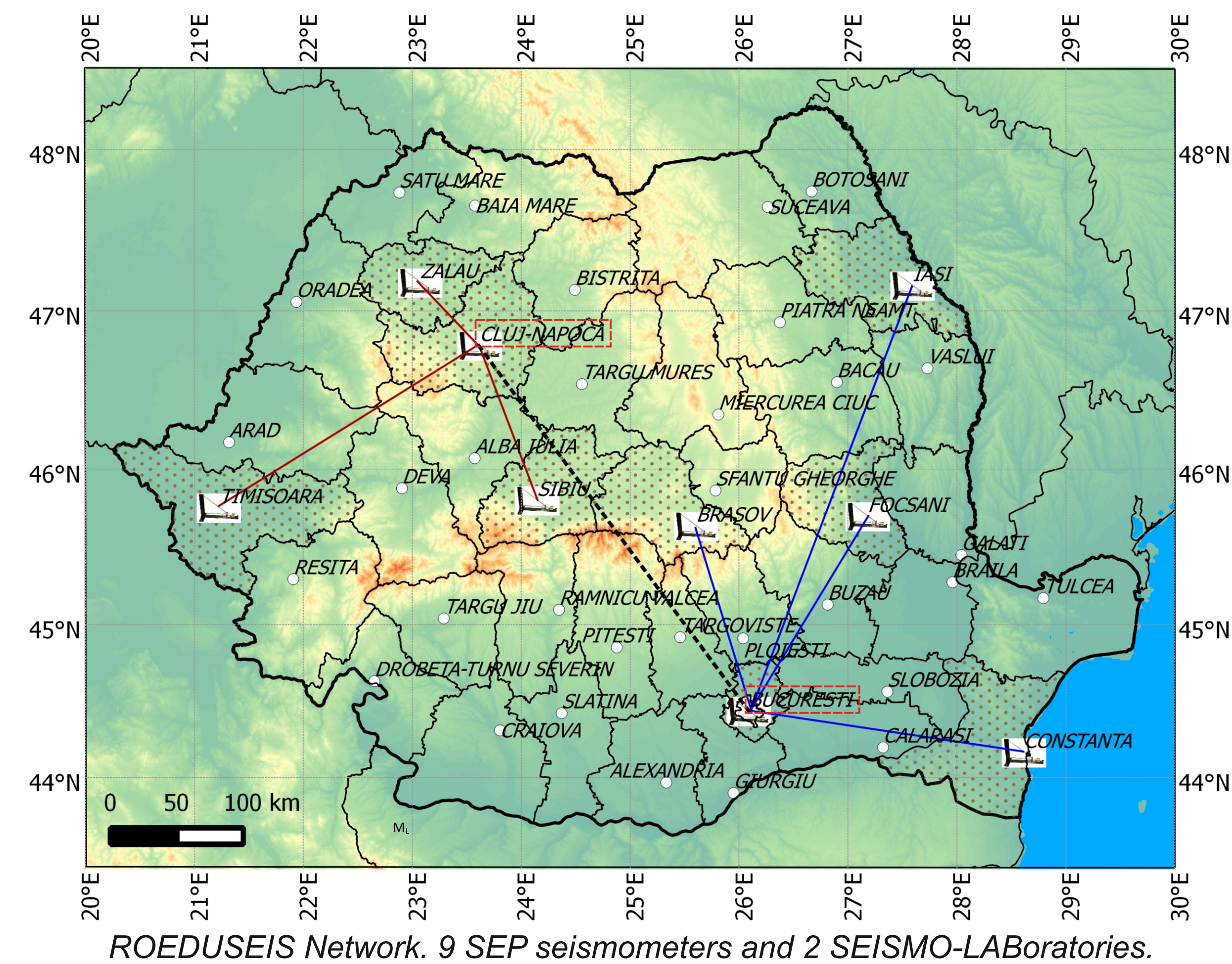
SEP seismometer installed in a high-school, Costache Negruzzi National College - Iasi, in particularly



SEISMO - LAB from "Babes-Bolyai" University, Faculty of Environment

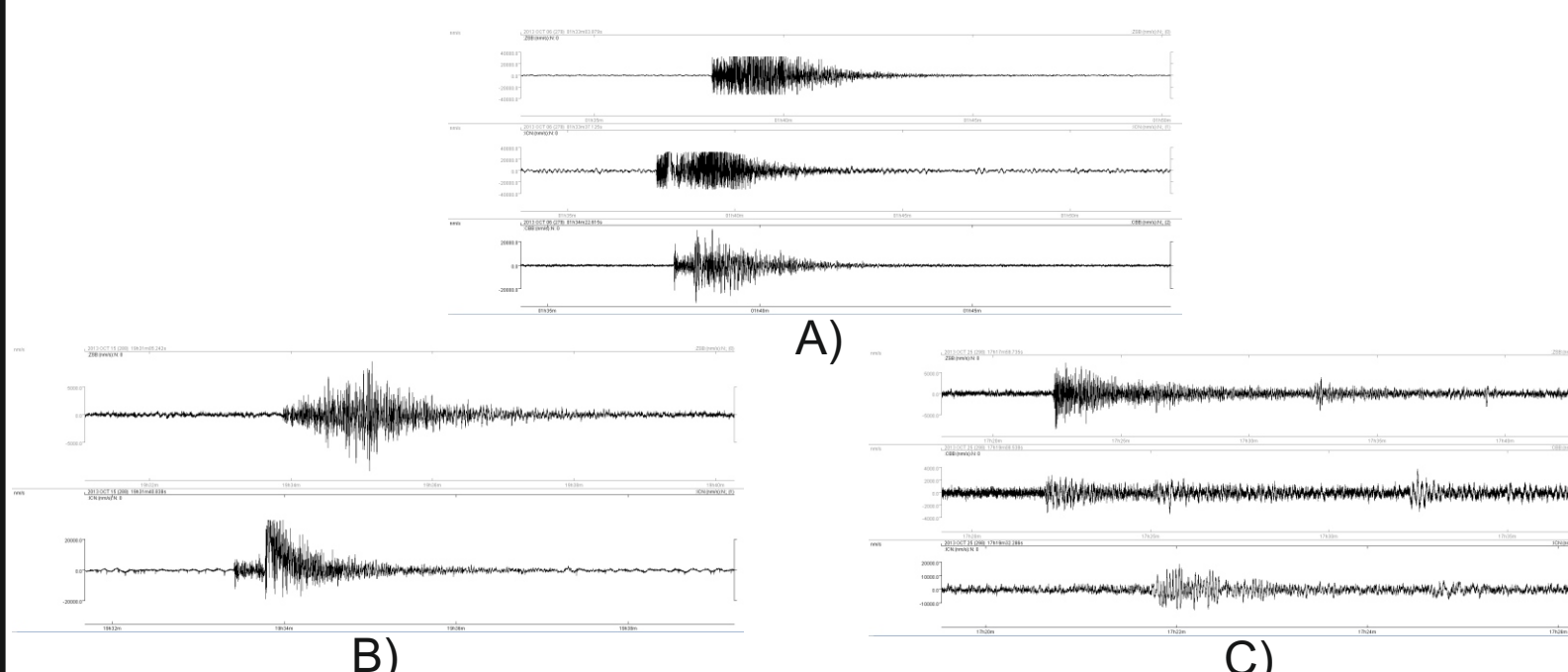
- 9 seismic stations with SEP seismometers installed in high-schools from the most important seismic areas (Vrancea, Banat, Fagaras, Dobrogea), vulnerable cities (Bucharest, Iasi) or high populated places (Cluj, Sibiu, Timisoara, Zalau).

- 2 SEISMO - Laboratories (National Institute of Earth Physics and "Babes-Bolyai" University, Faculty of Environment Science and Engineering, Cluj-Napoca, Romania)



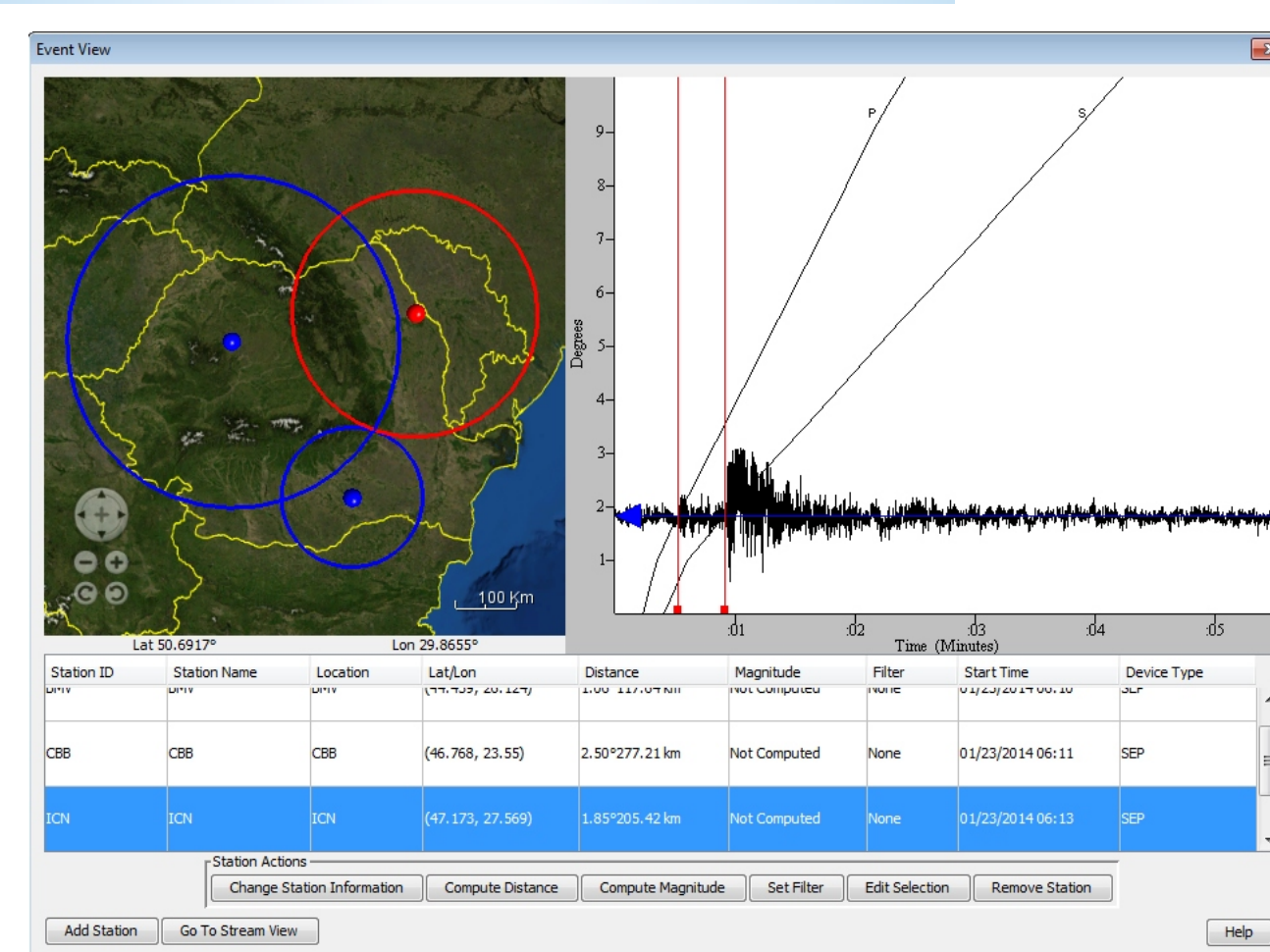
FIRST EARTHQUAKES RECORDED BY ROEDUSEIS-NET

Starting with Amaseis



Earthquake waveforms recorded by ROEDUSEIS-NET using Amaseis acquisition software and displayed with Seisgram. A). Vrancea earthquake, $M_L=5.5$; B). Vrancea earthquake, $M_L=4.7$; C) Teleseism, Japan earthquake, $M_0=7.1$

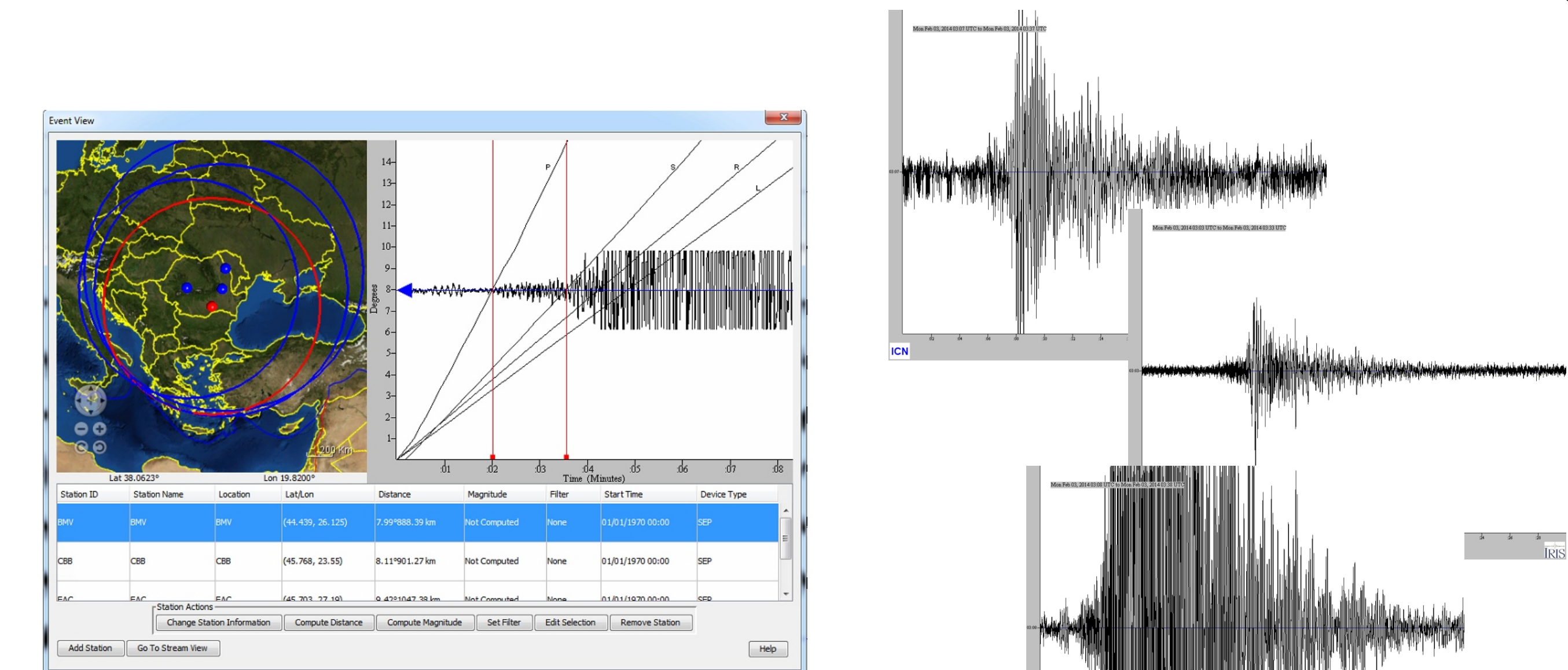
Updating to jAmaseis



Locating a local earthquake from Vrancea seismic area using jAmaseis. 2014-01-23 06:15:04.9, 45.42 N 26.26 E, 127 km depth, $M_L=4.7$, according to European Mediterranean Seismological Centre

Nr. crt.	Origin time	Epicenter coordinates	Magnitude	Depth (km)	Region
1.	03.04.2014 12:38:57	45.47 N; 26.40 E	4.6	124	Vrancea, Romania
2.	29.03.2014 19:18:05	45.61 N; 26.48 E	5.0	134	Vrancea, Romania
3.	03.02.2014 03:08:45	38.26 N; 20.32 E	6.0	2	Greece
4.	03.02.2014 00:26:31	45.67 N; 26.47 E	4.3	134	Vrancea, Romania
5.	26.01.2014 13:55:43	38.19 N; 20.41 E	6.1	18	Greece
6.	23.01.2014 08:15:05	45.42 N; 26.26 E	4.7	126	Vrancea, Romania
7.	25.10.2013 17:10:17	37.22 N; 144.69 E	7.1	10	Off East Coast of Honshu, Japan
8.	15.10.2013 19:33:12	45.64 N; 26.59 E	4.7	136	Vrancea, Romania
9.	06.10.2013 01:37:21	45.64 N; 26.69 E	5.5	134	Vrancea, Romania

Parameters of the earthquakes recorded by ROEDUSEIS network



Locating a regional earthquake from Greece using jAmaseis. 2014-02-03 03:08:45.1, 38.26 N 20.32 E, 2 km depth, $M_w=6.0$, according to European Mediterranean Seismological Centre.



Scientists, teachers and students through different actions: visits, open lessons, facebook, e-learning

CONCLUSIONS

- the visits in schools and the workshops for teachers give us certitude that the use of scientific equipment like seismometer and practical activities from the educational materials will stimulate the interest of students for earth science topics and knowledge in general;
- jAmaseis is not setted to compute magnitude with SEP seismometer and is necessarily to implement a magnitude formula into e-learning platform;
- earthquake locations can be done in jAmaseis but the locations module will be implemented into e-learning platform;
- the program provides opportunities to introduce earthquake, seismology, plate tectonics topics, earthquake effects on surrounding environment and buildings into school curriculum;
- the program and associated educational materials represent a wide range of information related to seismology.

ACKNOWLEDGEMENTS

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References

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jAmaseis: http://www.iris.edu/hq/programs/education_and_outreach/software/jamaseis