

Division II – Seismic observation network



***October 27th, 2004
Earthquake Report***

by

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1. General elements

Date & time	October 27 th , 2004; 20:34:32.00 UTC
Seismic source	Vrancea subcrustal
Magnitude	Mw=6.0 (moment magnitude)
Location	45.83 °N; 26.77 °E
Depth	98.6 km

Seismic event characteristics were compiled from *EMSC* (www.emsc-csem.org), *USGS* (<http://earthquake.usgs.gov/eqcenter/>) and *NIEP* (<http://www.infp.ro/>) websites.



Figure 1. Location of the epicenter of Oct. 27th, 2004 earthquake (*EMSC*)

The earthquake was felt on a large area in South-eastern Europe and did not induce any significant damage or casualties, as reported by news agencies. Disturbance of telephone communications was reported.

The earthquake was recorded by 16 *NCSR* seismic stations: 6 borehole stations and 4 building stations in Bucharest, and 6 free-field stations outside Bucharest.

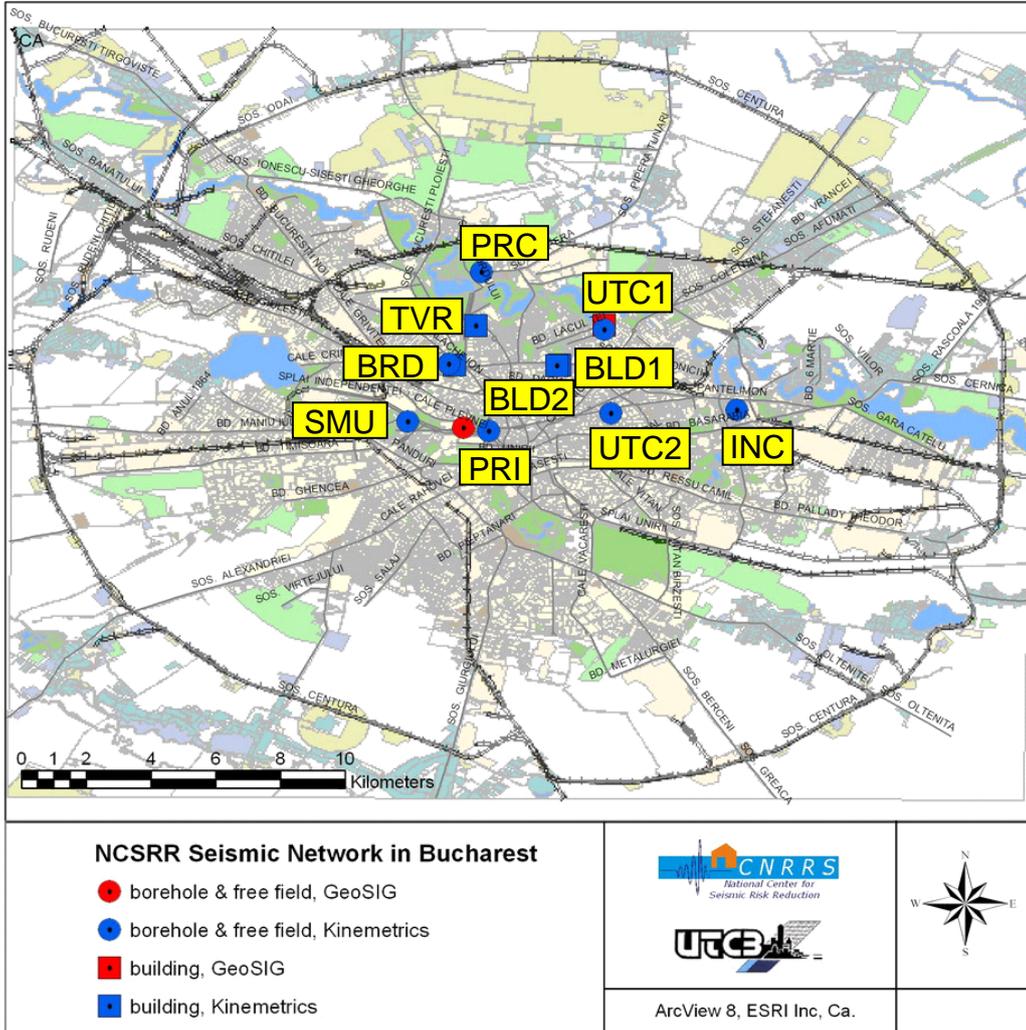


Figure 2. Bucharest - location of NCSRR stations with records during October 27th, 2004 Vrancea subcrustal earthquake

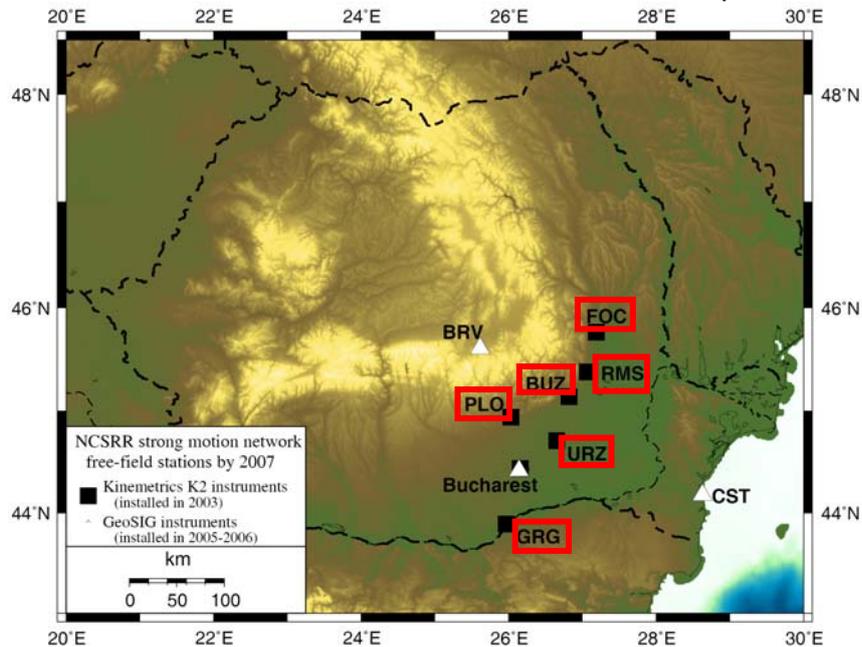


Figure 3. Location of free-field NCSRR stations with records during October 27th, 2004 Vrancea subcrustal earthquake (highlighted with red)

2. Earthquake records in NCSRR network

Table 1. Peak ground acceleration at NCSRR borehole seismic stations during October 27th, 2004 Vrancea subcrustal earthquake

Station	PGA (cm/s ²)											
	UTC1			UTC2			INC			PRC		
Comp.	EW	NS	V	EW	NS	V	EW	NS	V	EW	NS	V
S	58.4	34.9	34.4	41	42	25	30	30	25	49.2	29	34
B1	14.6	28.5	11.1	16.8	21.6	11.5	12.5	13.9	8.3	13.1	20.3	11.2
B2	23.1	16.5	9.8	23.5	15.6	7	11.4	11.3	6.7	19.4	12.7	8.8

S – ground surface; B1 – shallow borehole; B2 – deep borehole

Station	PGA (cm/s ²)					
	PRI			UTC2		
Comp.	EW	NS	V	EW	NS	V
S	79	29.8	33.1	44.7	54.6	50.8
B1	37.7	16.6	11.8	18.5	11.6	8.2
B2	22.2	13.2	9.6	18.1	12.6	8.9

S – ground surface; B1 – shallow borehole; B2 – deep borehole

Table 2. Peak ground acceleration at NCSRR free-field seismic stations during October 27th, 2004 Vrancea subcrustal earthquake

Station/ Comp.	PGA (cm/s ²)					
	FOC	RMS	BUZ	PLO	URZ	GRG
EW	64.6	49.0	86.0	49.2	44.3	30.6
NS	62.9	41.4	67.9	64.5	33.7	22.9
V	82.2	219.6	80.8	34.8	38.9	15.3

Table 3. Peak acceleration at NCSRR building seismic stations during October 27th, 2004 Vrancea subcrustal earthquake
(L - longitudinal building direction, T - transversal building direction)

Station	Peak Acceleration (cm/s ²)		
	BLD1		
Location / Comp.	T	L	V
11 th floor (top)	59	93.8	42.7
K2 (11 th floor down)	43.7	85	40.3
4 th floor	38.2	67.6	26.3
S (Basement)	22.3	26.1	21.7

Station	Peak Acceleration (cm/s ²)		
	BLD2		
Location / Comp.	T	L	V
6 th floor	67.3	78.3	30.2
3 rd floor	41.3	46.4	30
S (Basement)	27.6	27.8	17.5

Station	Peak Acceleration (cm/s ²)		
	TVR		
Location / Comp.	L	T	V
T (13 th floor top)	30.7	55	31.3
K2 (13 th floor down)	22	35.2	30.5
D (Basement)	25.6	29.1	22.6

Station	Peak Acceleration (cm/s ²)		
	BRD		
Location / Comp.	L	T	V
K2 (20 th floor)	62.7	69.4	36
D (3 rd basement)	27.1	36.9	7.1

3. Examples of *NCSRR* network recorded accelerograms

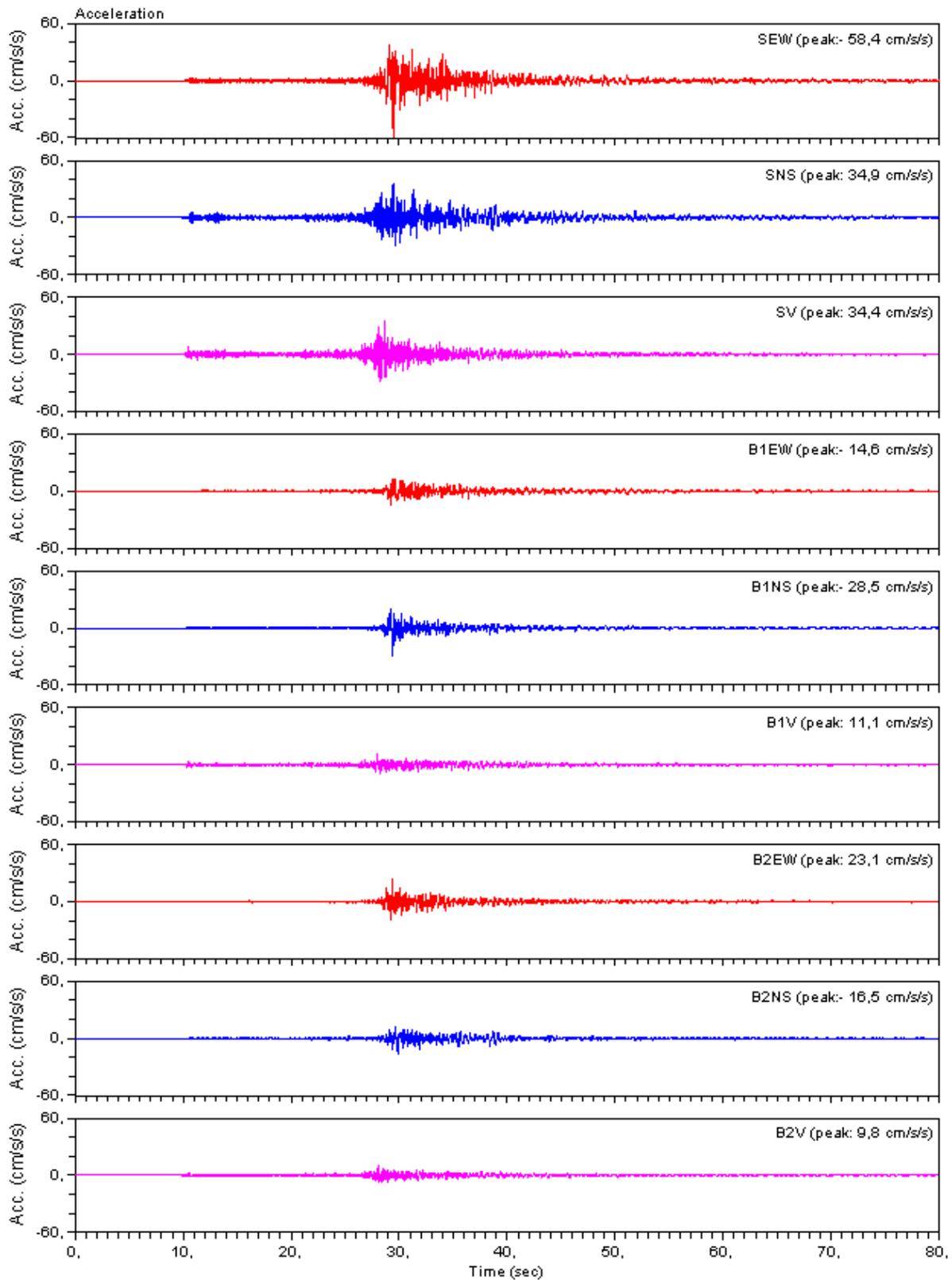


Figure 4. Accelerograms recorded at UTC1 borehole seismic station during October 27th, 2004 Vrancea subcrustal earthquake ($M_w=6.0$)

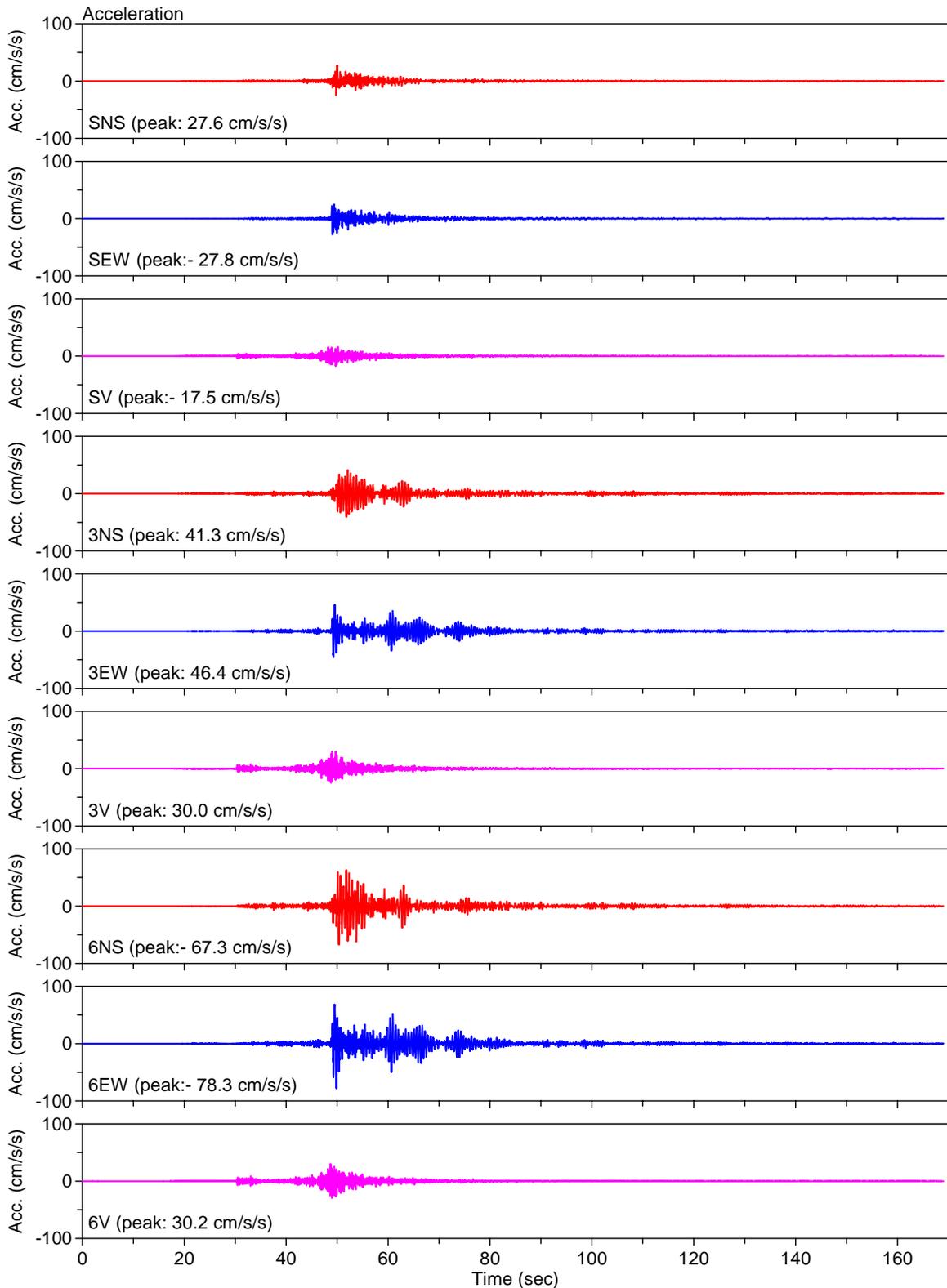


Figure 5. Accelerograms recorded at BLD2 building seismic station during October 27th, 2004 Vrancea subcrustal earthquake ($M_w=6.0$) (NS = Transversal, EW = Longitudinal)

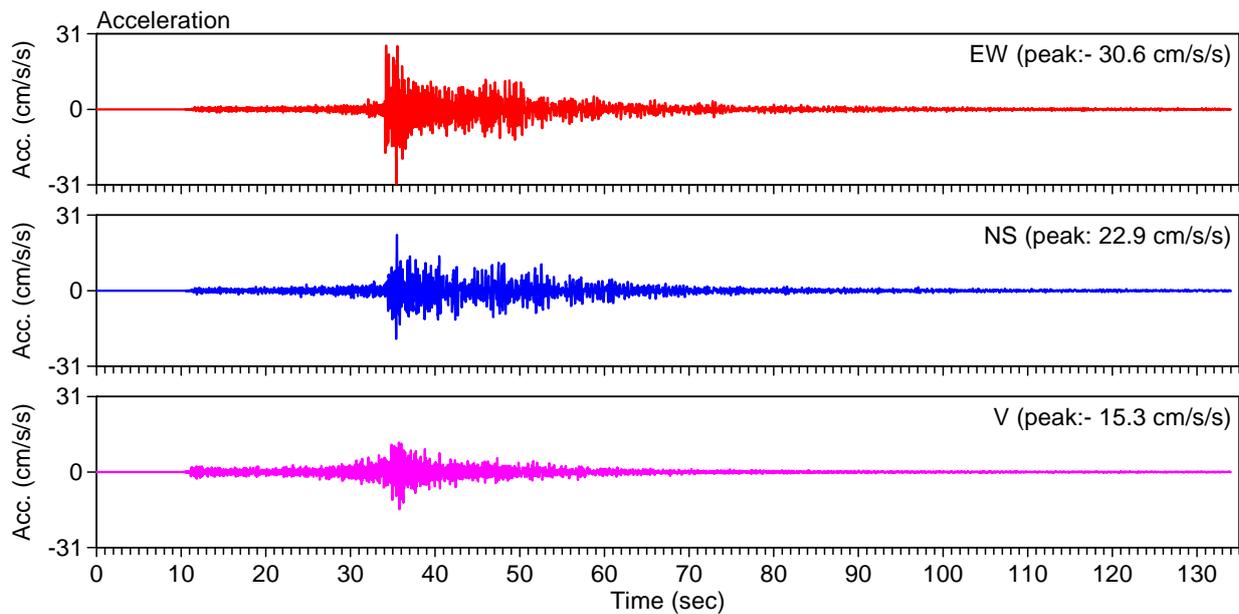


Figure 6. Accelerogram recorded at GRG free-field seismic station during October 27th, 2004 Vrancea subcrustal earthquake ($M_w=6.0$)

4. Acknowledgements

Acknowledgements to *Japan International Cooperation Agency JICA* for donation of seismic instrumentation, to *Ministry of Regional Development and Housing MDRL* for the budget for developing the seismic network and for maintenance, to all institutions that are kindly hosting *NCSRR* seismic stations, to all persons that supported the installation of the network, and to former *NCSRR* Division's II staff involved in earthquake records retrieval and processing. Thanks to the staff of *Building Research Institute, Tsukuba*, for their support related to *NCSRR* network.