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1997

GeoRisk
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HUNGARIAN EARTHQUAKE BULLETIN

1997

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Special thanks due to the *Geodetic and Geophysical Research Institute (GGKI)* who is responsible for the national seismological network and whose cooperation was utmost important.

Other organisations supplying data for this Bulletin are:

Paks Nuclear Power Plant Ltd. (PA RT)
MOL Rt.
GeoRisk Ltd.
GEOS BT.

Data interchange with a number of seismic stations from the neighbouring countries contributed to the accuracy of event locations. Those are *Austria, Croatia, Czech Republic, Germany, Romania and Slovakia.*

INTRODUCTION

After substantial progress with development of the Hungarian earthquake monitoring network in 1995, there has been no significant changes in 1997. A network of eleven seismograph stations supplemented by the access to data from three national stations enabled us to detect local earthquakes with relatively low magnitude threshold and calculate their hypocentre parameters with high certainty.

In 1997, in the third year of the project some 150 earthquakes have been located by the monitoring network and 51 of them happened in the monitored geographic window given below. The developing database of these well located earthquakes can be used, in one hand, to resolve the tectonic framework in the Pannonian Basin and required on the other hand to refine our understanding of the level of seismic risk in Hungary. This helps in assessment of the level of precautionary measures which should be taken in respect of existing and new buildings and constructions, and installations which could prove hazardous in the event of damage or disruption.

This bulletin is based on all available earthquake related data provided by different organisations. The geographic region covered is bounded by latitudes 45.5-49.0N and longitudes 16.0-23.0E.

1.

SUMMARY OF 1997 SEISMICITY

1997 was a quiet year again for Hungarian seismicity. There were 51 earthquakes ($0.6 \leq ML \leq 3.4$) located within the area of interest. Five earthquakes were reported as felt, of those one in Slovenia, but none of them caused damage. The highest magnitudes (ML) assigned to a shock was 3.3 and 3.4 for earthquakes near to the Austrian-Hungarian and Slovak-Hungarian border.

The highest intensity reported during the year was 4 EMS. No earthquake damage was reported.

Reviewing the more notable earthquakes of the year in chronological order, a shock of magnitude 2.4 ML on the 3rd of March in Magyarpolány produced report of intensity 4 EMS. On June 17th, an earthquake with a magnitude of 3.1 ML was felt at Csorvás and Békés with a maximum intensity of 3-4 EMS. On July 16th an earthquake (2.8 ML) in Kóny gave rise to reports of intensity 4 EMS. The Lendva (Lendava, Slovenia) earthquake of 10th August had intensity 5 at the epicentral area and produced reports of intensity 3-4 EMS from the border region in Hungary. The area in which it was felt in Hungary was relatively small, just about 100-150 km^2. On November 27th, an earthquake with a magnitude of 2.5 ML was felt over a small area of 100-150 km^2 (Monor area) with a maximum intensity of 3-4 EMS.

2.

SEISMOGRAPH STATIONS IN HUNGARY

In 1997, there has been no substantial changes with the Hungarian earthquake monitoring network compared to the previous year.

The Microseismic Monitoring Network (MMN) established by the *Paks Nuclear Power Plant Ltd.* in 1995, has been operational throughout the year.

In addition to the information from the eleven station PAKS MMN, data is contributed by four stations operated by the *Seismological Observatory, Geodetic and Geophysical Research Institute (GGKI).* Of those, one belongs to the *Ministry of Foreign Affairs* and is operated in cooperation with the German GEOFON network.

Another station was partially available on *ad hoc* basis for origin determination, belonging to *Mecseki Ércbányászati Vállalat (MÉV)* and operated by *GEOS BT.*

Data interchange with stations from the neighbouring countries and international data centres was also important.

The estimated detection capabilities of the present network with average noise conditions, supposing that at least four stations is needed for origin determination, is typically around 1.5-2.0 ML, somewhat lower in the middle of the country and a little higher towards the border regions. (See Fig. 2.3) This means that in most parts of the country it is very unlikely that felt events go undetected.

During the reporting period we also had access to five strong motion accelerograph stations belonging to and operated by different organisations such as *Paks Nuclear Power Plant, GeoRisk, GGKI, Ministry of Environment* and *MOL RT.*

Seismograph Stations

Table 2.1. *Seismic stations, instrumentation and lithology*

Code	Latitude (N)	Longitude (E)	Elevation (m)	Foundation	Type of station (1)	Sensor type (2)	Recording (3)	Org. (4)
BUD	47.4836	19.0239	196	dolomite	3C LP	Kirnos	A - C	GGKI
BUDA	47.4836	19.0239	196	dolomite	3C SP	LE-3D	D - E	GR
GYL	46.5981	21.1718	92	sand	3C SP	SS-1	D - E	GGKI
MEV	46.1128	18.1123	400	limestone	3C SP	SS-1	D - E	GEOS
PKS0	46.5743	18.8449	100	sand	3C SP	LE-3D	D - E	GR
PKS2	46.4920	19.2131	106	sand	3C SP	LE-3D	D - E	GR
PKS4	46.2340	18.4635	220	limestone	3C SP	LE-3D	D - E	GR
PKS6	46.5998	19.5645	120	sand	3C SP	LE-3D	D - E	GR
PKS7	47.0473	19.1609	95	mud	3C SP	LE-3D	D - E	GR
PKS8	46.8787	18.6765	135	rhyolite tuff	3C SP	LE-3D	D - E	GR
PKS9	46.5870	18.2789	240	loess	3C SP	LE-3D	D - E	GR
PKSc	47.3806	18.4371	200	dolomite	3C SP	LE-3D	D - E	GR
PKSm	46.2119	18.6413	170	granite	3C SP	LE-3D	D - E	GR
PKSn	46.8972	19.8673	110	sand	3C SP	LE-3D	D - E	GR
PSZ	47.9184	19.8944	940	andesite	3C BB	STS-2	D - C	GGKI
SOP	47.6833	16.5583	260	gneiss	3C SP	SS-1	D - E	GGKI

(1) 1C - one component vertical seismometer, 3C - three component seismometer
SP - short period seismometer, BB - broad band seismometer, SM - strong motion accelerograph

(2) STS-2 - Streckeisen broad band seismometer, LE-3D - Lennartz three directional 1Hz geophone,
SS-1 - Kinemetrics 1Hz seismometer, Kirnos - 12 s long period seismometer

(3) A - analogue, D - digital, C - continuous recording, E - event recording

(4) GEOS - GEOS BT., GGKI - Geodetic and Geophysical Research Institute, GR - GeoRisk Ltd., PART - Paks Nuclear Power Plant Ltd.

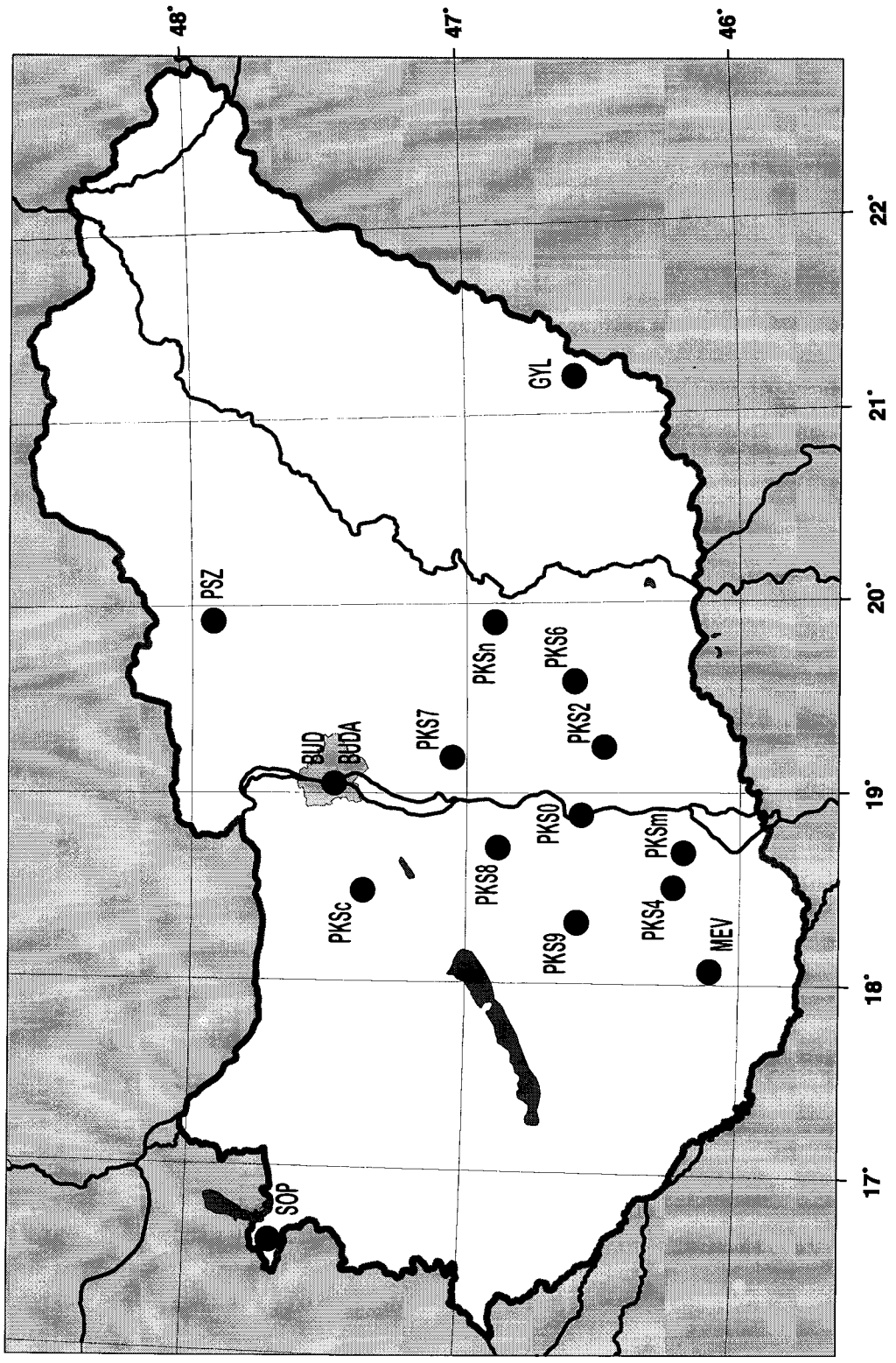


Figure 2.1. *Seismograph stations in Hungary*
(See Table 2.1. for details)

Seismograph Stations

Table 2.2. *Strong motion accelerograph stations*

Code	Latitude (N)	Longitude (E)	Elevation (m)	Foundation	Type of station (1)	Sensor type (2)	Recording (3)	Org. (4)
ALGY	46.3332	20.2092	90	loose sand	3C SM	AC-23	D - E	GR
BOD	47.322	18.241	250	limestone	3C SM	AC-23	D - E	GR
BPGY	47.4836	19.0239	196	dolomite	3C SM	AC-23	D - E	GGKI
PAKB	46.5743	18.8587	100	sand	3C SM	AC-23	D - E	PART
PAKK	46.5743	18.8449	100	loose sand	3C SM	AC-23	D - E	GGKI

(1) 1C - one component vertical seismometer, 3C - three component seismometer
SP - short period seismometer, BB - broad band seismometer, SM - strong motion accelerograph

(2) AC-23 - triaxial accelerometer package (full scale 0.5g)

(3) A - analogue, D - digital, C - continuous recording, E - event recording

(4) GGKI - Geodetic and Geophysical Research Institute, GR - GeoRisk Ltd., PART - Paks Nuclear Power Plant Ltd.

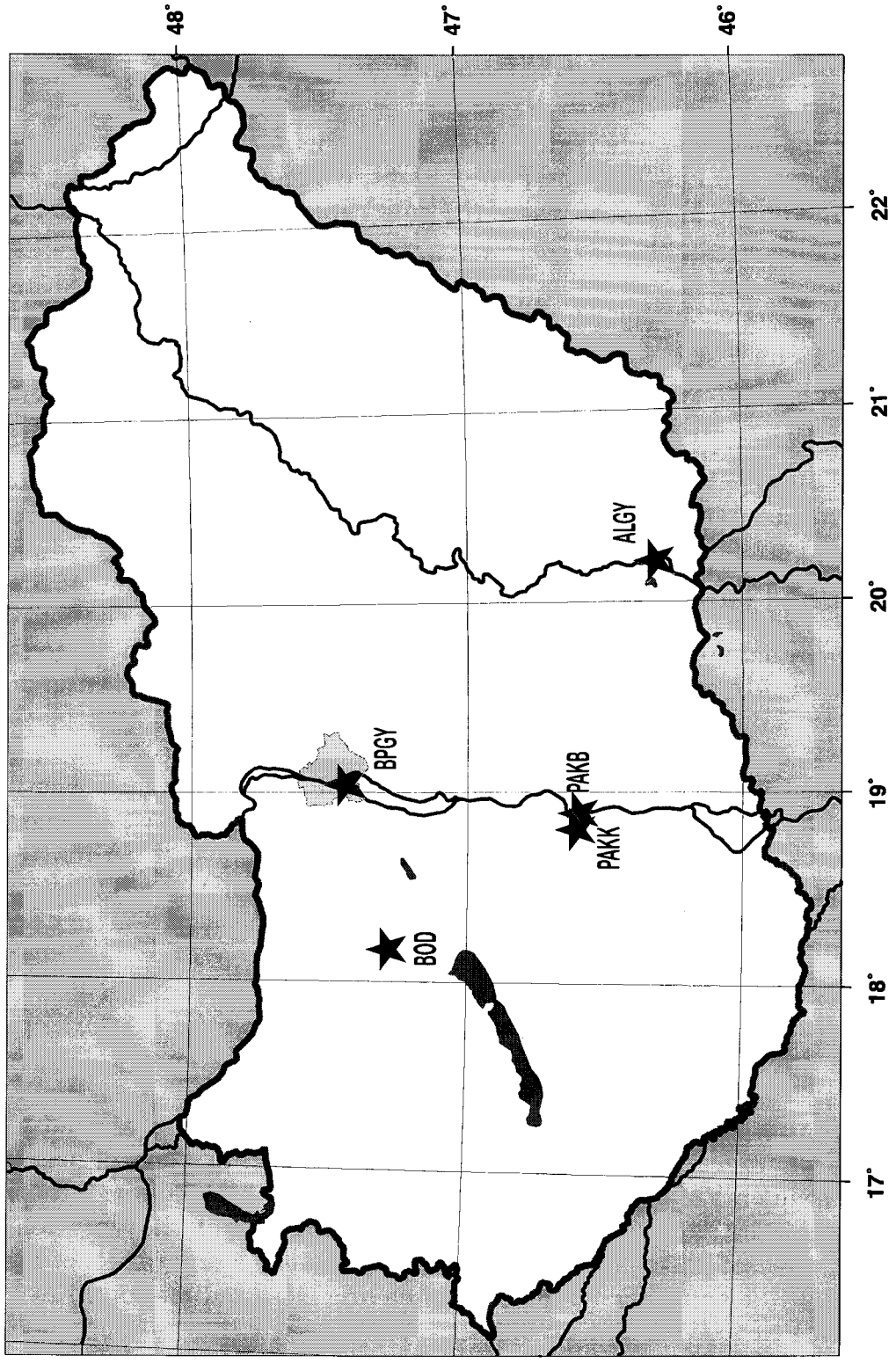


Figure 2.2. *Strong motion accelerograph stations in Hungary (See Table 2.2. for details)*

Seismograph Stations

PAKS MICROSEISMIC MONITORING NETWORK (MMN)

The system comprises of a network of ten seismometer stations, located within a radius of about 100 km from the Power Plant at Paks (situated in the centre of Hungary) and one in Budapest where the data centre is set up and collected data analysed (Tóth and Mónus, 1997).

The field stations each consist of a three component short period seismometer located in a pit, with a digital recorder and time signal receiver housed nearby in a heat insulated steel container building.

The seismometers used are the LE-3D three directional compact size high sensitivity 1 Hz geophones. The digital acquisition system is the MARS-88 recorder that uses 20 bit AD converters sampling the data 125 times per second. The recorder also performs signal detection by its internal STA/LTA algorithm. Three of the stations are accessible over commercial telephone lines (one of them is a mobile phone) while the others store event and continuous monitor channel data on rewritable magneto-optical disks, which are collected and transferred to the data centre on a weekly basis. Most of the stations are powered by solar panels, and absolute time is provided by DCF-77 time code receivers.

At the data centre a SUN SPARC workstation with 3GB on-line disk capacity serves as a powerful tool for the routine data processing and analysis. Lennartz M88 database software is used for the data management and XPITSA for advanced seismogram analysis. All continuous data are archived on CDs. Both waveform and bulletin data are available over the INTERNET for authorized remote users.

The MMN is currently operated and its data processed and analysed by *GeoRisk Ltd.* The *British Geological Survey* have been supervising the network operation through the European Community's PHARE research programme.

In the beginning of 1997, an extensive noise survey has been started at those station sites where magneto-optical disks storage allowed to store large amount of data. Noise segments of 3 minutes has been recorded with 11 hours shifts over the whole year. Figure 2.3. shows the vertical components of the very long term averaged (one year) noise power spectra. There is a clear separation of the rocky sites (PKSm, PKSc and PKS8) from those of having loose sediments (PKSn, PKS2, PKS6, PKS7, PKS9).

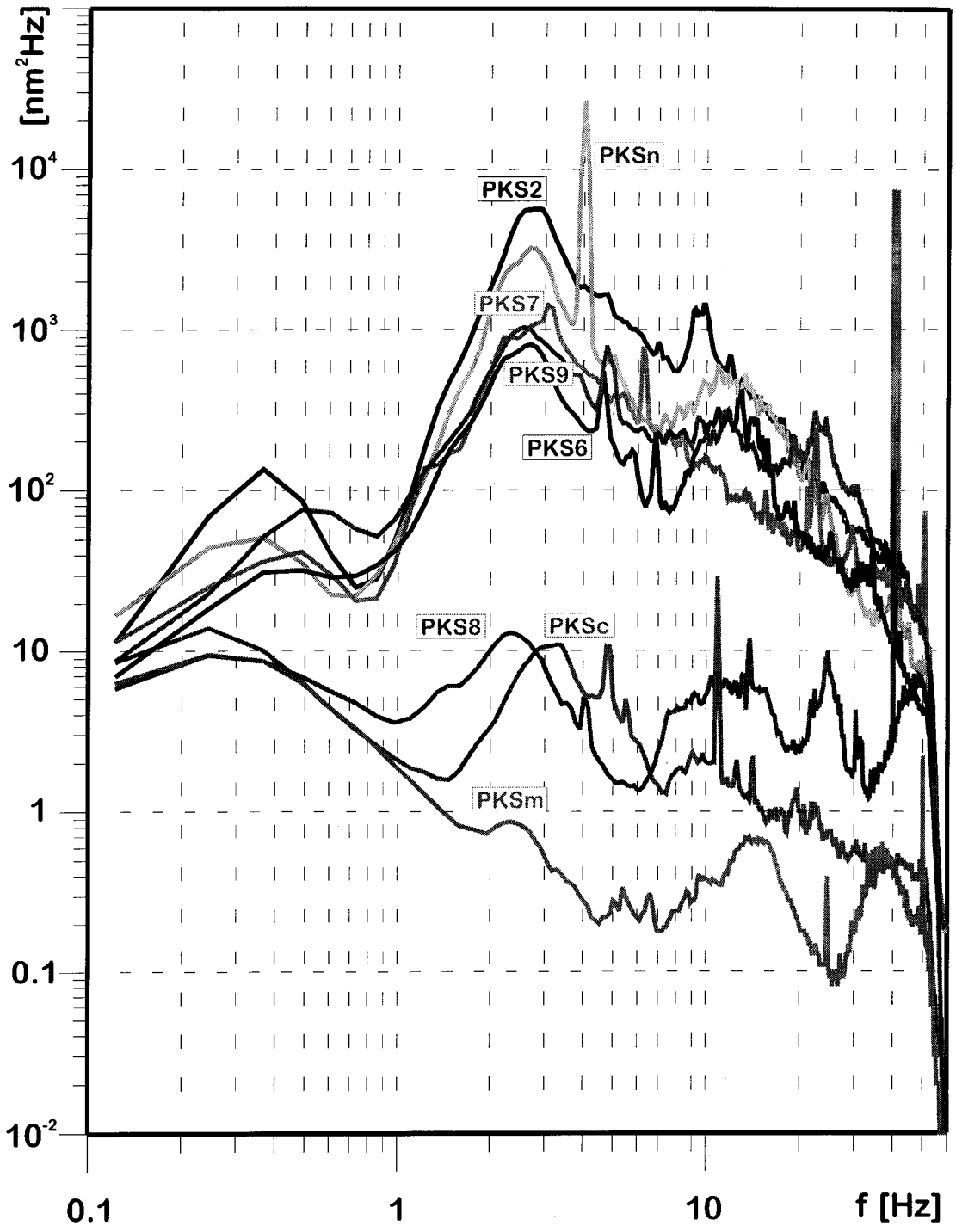


Figure 2.3. *Average noise power spectra for the MMN stations. (See text for details)*

Seismograph Stations

STATIONS OPERATED BY GGKI

During 1997 GGKI operated three digital and one analogue seismological stations.

Station *Piszkés (PSZ)* has been installed as an 'Open Station' under a cooperation between the Ministries for Foreign Affairs of Hungary and of Germany with the primary goal of nuclear test ban monitoring (Tóth, 1992). The station is equipped with a triaxial Streckeisen STS-2 broad-band seismometer and Quanterra's data acquisition system with a 24 bit, 80 Hz high resolution digitizer. Three component continuous data streams are recorded in circular buffers on magnetic disks and archived on EXABYTE cartridge. Continuous data is available on-line for more than a month. All data can be accessed directly and retrieved either in interactive or automatic mode, via the INTERNET. A menu driven software (DRM) serves a powerful and easy tool for data access, extraction of data segments at different sampling rates, filtering, communication, system control and station operation. In 1997 PSZ also contributed data to GEOFON Project.

GYL and SOP are three component short period stations installed in 1994 under a local project, "Soproni Regionális Műszerközpont (SROM)". Kinemetrics SSR-1 16bit digitizers and event recorders sample and record the output of three component SS-1 Ranger seismometers. Data of recorded events are collected via commercial telephone links.

A long period analogue recording seismograph is operated at the *Seismological Observatory* in Budapest mostly for demonstration purposes.

MÉV STATION

Six vertical short period seismometers are installed on different levels in a uranium ore mine near to Pécs (southern Hungary). Event data is recorded by Teledyne PDAS-100 recorder. There is no formal arrangement to access this station, we received data only on *ad hoc* informal basis.

STRONG MOTION STATIONS

Although the five strong motion accelerograph stations belong to five different organisations, they are all equipped with the same instrumentation: a AC-23 triaxial accelerometer package (full scale 0.5g) and an SM-2 digital event recorder (manufactured by SIG^{SA}, Switzerland).

During 1997 we had access to all of these stations.

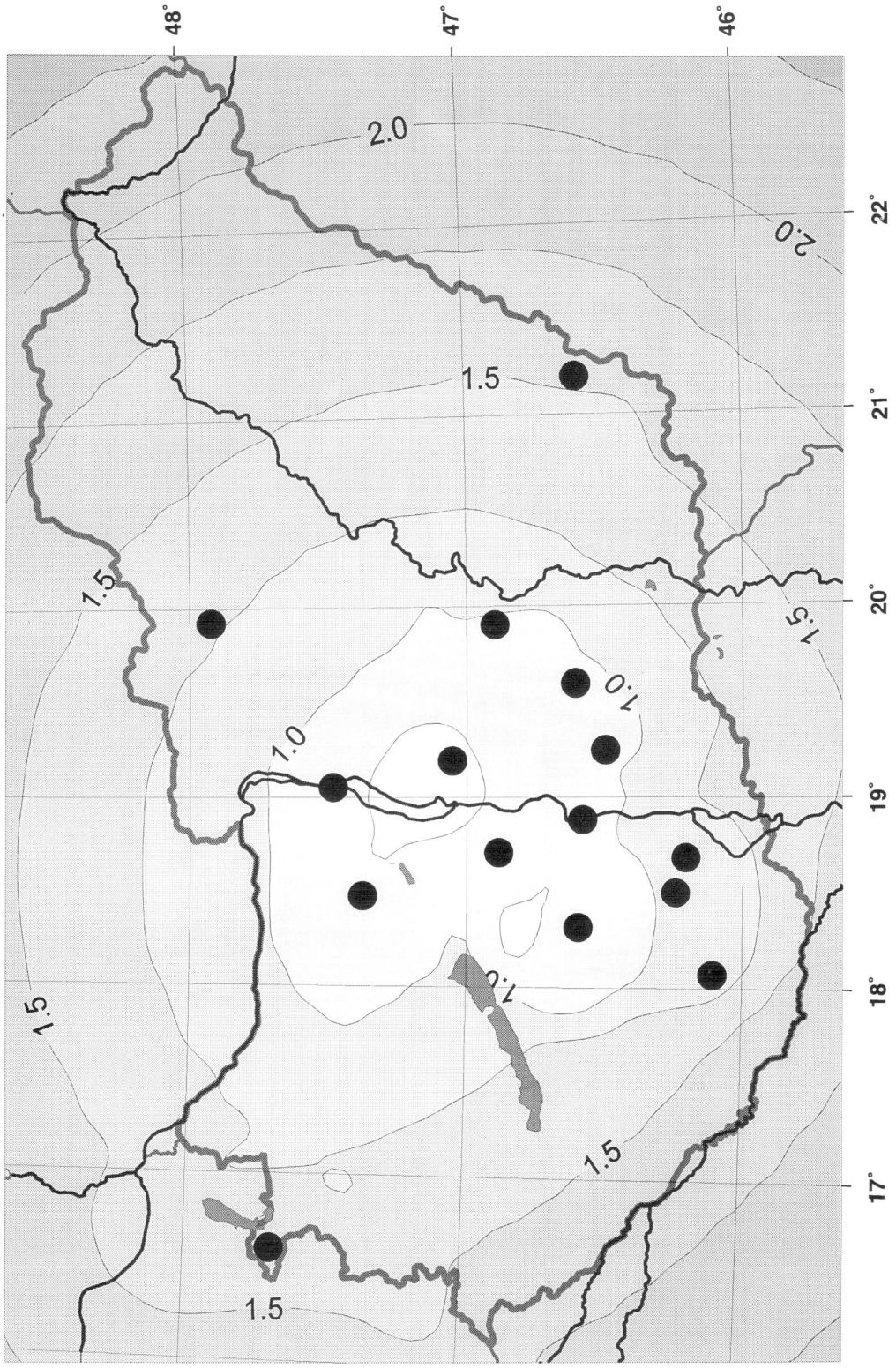


Figure 2.4. *Detection capability with average noise conditions. Contour values are Richter local magnitudes (ML).*

Seismograph Stations

3.

List of Origins / Hypocentre Parameters

Hypocentre Parameters

METHOD FOR HYPOCENTRE PARAMETER DETERMINATION

HYPO71PC (Lee and Lahr, 1975) was used for the routine calculation of hypocentre parameters. The original program has been slightly modified in order to implement a routine for Richter local magnitude calculation for the instruments used. For the magnitude calculations the method published by Bakun and Joyner (1984) was used.

The hypocentre parameters were calculated using phase readings of seismological stations from Hungary and from the neighbouring countries. However, a distance weighting was applied, phase data from stations with epicentral distance greater than 450 km have been assigned a weight of 0 in most cases. In some cases, when enough P readings were available, S phase readings were not used in the calculations.

CRUSTAL VELOCITY MODEL

The three layer crustal velocity model used in the hypocentre calculations has been derived from crustal phase travel times of several hundreds of local earthquakes (Mónus, 1995).

Velocity (v_P) [km/s]	*Depth [km]*	*Thickness [km]*	v_P/v_S
5.60	0.0	20.0	1.78
6.57	20.0	11.0	
8.02	31.0	∞	

Table 3.1. *List of events in 1997*

Day	Origin time UTC hr mn sec	Geographic coordinates Lat	Long	Depth (km)	ML	I_{MAX} (EMS)	Locality/Region
JANUARY, 1997							
23	5:57:40.2	46.010N	19.378E	6	0.6	-	NYugoslavia/Hungary
23	20:01:17.3	47.920N	20.725E	10	2.5	-	Sály
24	11:32:47.2	47.642N	18.557E	14	0.9	-	Bajna
FEBRUARY, 1997							
11	14:19:11.6	47.854N	18.533E	10	1.5	-	Slovakia
MARCH, 1997							
03	14:33:00.4	47.207N	17.590E	25	2.4	4.0	Magyarpolány
03	15:17:46.9	46.252N	18.904E	10	0.9	-	Pörböly
09	0:45:25.6	45.798N	18.506E	6	1.9	-	Magyarbóly
26	12:02:58.6	47.916N	19.081E	15	1.9	-	Diósjenő
30	4:18:04.6	47.755N	16.170E	15	2.0	-	E Austria
APRIL, 1997							
08	11:03:36.4	47.095N	18.312E	12	0.7	-	Polgárdi
08	16:10:45.1	46.431N	17.854E	15	1.1	-	Zimány
30	19:18:22.5	46.122N	16.105E	10		-	Croatia
MAY, 1997							
10	19:29:14.6	48.090N	16.706E	4	2.5	-	E Austria
19	3:21:35.3	47.809N	16.151E	10	2.8	-	E Austria
22	0:11:17.5	47.090N	21.425E	13	2.5	-	Vekerd
23	23:40:19.0	47.345N	18.475E	11	1.9	-	Zámoly
26	7:56:46.0	45.949N	16.320E	10	2.7	-	Croatia
30	19:28:20.8	47.721N	16.053E	10	3.3	-	E Austria
JUNE, 1997							
17	13:33:45.4	46.456N	20.728E	10	3.1	3.5	Csorvás
17	17:03:07.7	46.508N	20.718E	8	2.5	-	Csorvás
JULY, 1997							
08	0:48:25.1	47.516N	16.444E	22	0.6	-	E Austria

Hypocentre Parameters

16	10:52:54.3	47.764N	18.029E	7	1.4	-	Komárom
16	11:58:31.3	47.077N	18.208E	7	1.0	-	Csajág
16	20:43:32.0	47.783N	17.303E	10	2.8	4.0	Kóny
18	18:58:37.2	45.976N	18.979E	10	1.5	-	Hercegszántó
19	22:33:37.7	47.842N	16.372E	4	1.5	-	E Austria
29	14:24:58.0	47.310N	18.989E	10	1.4	-	Szigethalom
AUGUST, 1997							
06	11:45:26.9	47.940N	19.090E	10		-	Diósjenő
10	10:48:26.9	46.565N	16.331E	10	3.0	5.0	Slovenia
15	9:50:47.9	47.722N	18.319E	4	1.4	-	Dunaalmás
SEPTEMBER, 1997							
04	1:45:39.1	47.718N	16.164E	4	2.0	4.0	E Austria
05	9:21:38.6	47.408N	18.498E	19	1.3	-	Csákvár
05	18:16:59.6	46.140N	19.227E	13		-	Bácsbokod
12	14:46:15.0	47.092N	18.247E	10	0.9	-	Füle
18	10:10:24.9	47.580N	18.105E	10	1.0	-	Csép
23	15:03:44.0	47.058N	18.177E	10	1.3	-	Csajág
OCTOBER, 1997							
08	15:40:26.6	47.645N	18.817E	10	1.2	-	Piliscsaba
11	15:41:41.5	47.608N	18.658E	16	1.1	-	Szomor
16	12:14:43.3	47.103N	18.356E	10	0.8	-	Kőszárhegy
17	11:01:18.8	47.856N	19.104E	8	2.2	-	Szendehely
25	23:49:15.6	45.743N	17.351E	10	1.5	-	Croatia
27	23:26:05.3	45.999N	18.962E	10	1.9	-	Dávod
NOVEMBER, 1997							
03	21:44:53.7	47.758N	16.126E	10	1.6	4.0	E Austria
03	23:17:04.0	47.761N	16.113E	10	1.7	4.0	E Austria
04	2:22:19.7	47.755N	16.111E	10	1.5	-	E Austria
10	14:54:40.9	48.251N	17.170E	10	3.4	-	Slovakia
24	8:48:46.1	47.782N	16.171E	6	1.5	-	E Austria
27	10:40:56.9	47.260N	19.385E	16	2.5	3.5	Nyáregyháza
DECEMBER, 1997							
01	0:42:58.2	45.951N	16.208E	10	2.3	-	Croatia
19	11:34:17.6	47.604N	18.657E	7	1.4	-	Zsámbék
29	2:09:53.6	46.548N	17.896E	21	0.6	-	Igal

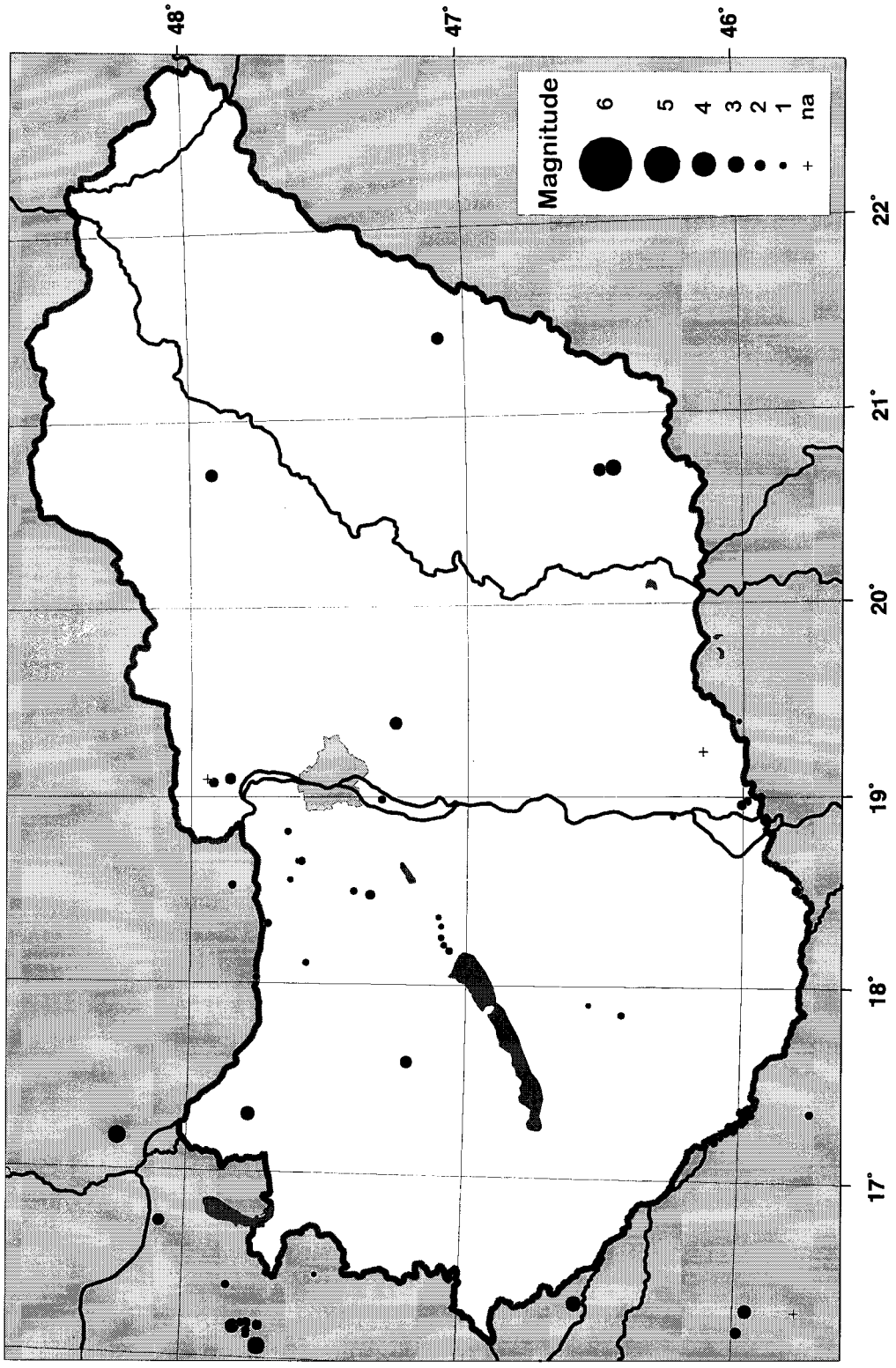


Figure 3.1. *Epicentres of Hungarian earthquakes in 1997.*

Hypocentre Parameters

PHASE DATA

Key to phase data encoding

time:	Time of occurrence of event in hours, mins and secs (UTC).
ML:	Richter local magnitude of the earthquake.
lat:	Latitude of the event in degrees.
lon:	Longitude of the event in degrees.
h:	Depth of the hypocentre in km.
erh:	Standard error of the epicentre in km. ($erh = \sqrt{SDX^2 + SDY^2}$, where SDX and SDY are the standard errors in latitude and longitude respectively, of the epicentre. If erh = ---, this means that erh could not be computed because of insufficient data.
erz:	Standard error of the focal depth in km. If erz = ---, this means that erz could not be computed either because focal depth is fixed in the solution or because of insufficient data.
nr:	Number of station readings used in locating the earthquake. P and S arrivals for the same stations are regarded as 2 readings.
gap:	Largest azimuthal separation in degrees between stations.
rms:	Root mean square error of time residuals in seconds. ($rms = \sqrt{\sum R_i^2/nr}$, where R_i is the time residual of the i^{th} station.
Locality:	A geographical indication of the epicentral area, usually the nearest settlement.
Comments:	Additional comments about the event, eg. maximum EMS intensity
sta:	Station name. (For details see Chapter 2.)
dist:	Distance from earthquake epicentre to station in km.
azm:	Azimuthal angle between epicentre to station measured from North in degrees.
phase:	Phase identifier; the first letter characterizes onset e = emergent i = impulsive, the second and third indicate the phase eg. Pn, Pg, Sn and Sg, the forth indicates the polarity C=compression/up D=dilatation/down.
hr mn sec:	Arrival time of the phase from input data.
res:	Residual of the phase in secs. ($res = T_{obs} - T_{cal}$, where T_{obs} is the observed and T_{cal} is the calculated travel time respectively.

Fault plane solutions was attempted for each events where any information for the stress field could be drawn even if due to incomplete station coverage no reliable single solution could be obtained. Stereographic projections of the lower focal hemisphere are shown, P and T are the possible main compression and tension axes.

Hypocentre Parameters

1997-01-23 time: 5:57:40.21 UTC ML= 0.6
lat: 46.010N lon: 19.378E h= 5.7 km
erh= ---km erz= ---km
nr= 4 gap=315 rms= .00
Locality: N Yugoslavia/Hungary
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	61.2	292	iPgC	5:57:51.18	.00
PKS4	74.9	289	eSg	5:58:04.10	.01
PKS8	110.6	331	iPgC	5:57:59.98	.00
PKSC	168.5	335	ePnD	5:58:07.53	.00

1997-01-23 time: 20:01:17.30 UTC ML= 2.5
lat: 47.920N lon: 20.725E h= 10.0 km
erh= 6.8km erz= 4.3km
nr= 6 gap=300 rms= .21
Locality: Sály
Comments:

sta	dist	azm	phase	hr mn sec	res
PSZ	62.1	270	ePgD	20:01:28.38	-.15
			eSg	01:37.39	.10
PKSN	130.8	210	ePn	20:01:39.40	.03
			eSn	01:56.31	-.28
PKS7	152.7	231	ePnD	20:01:42.46	.36
			eSn	02:01.49	.06

1997-01-24 time: 11:32:47.15 UTC ML= .9
lat: 47.642N lon: 18.557E h= 14.3 km
erh= 5.2km erz= 2.5km
nr= 5 gap=236 rms= .36
Locality: Bajna
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSC	30.4	197	ePgD	11:32:52.88	-.27
			eSg	32:58.34	.51
PKS8	85.3	174	eS*	11:33:14.18	-.36
PSZ	104.8	73	ePn	11:33:05.45	.02
			eSn	33:20.17	.48

1997-02-11 time: 14:19:11.57 UTC ML= 1.5
lat: 47.854N lon: 18.533E h= 10.0 km
erh=19.8km erz= 110km
nr= 6 gap=258 rms= .54
Locality: Slovakia
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSC	53.2	188	iPgD	14:19:21.73	.50
			iSg	19:27.99	-.77
BUD	55.3	138	ePgC	14:19:21.10	-.50
			iSg	19:30.10	.67
PSZ	102.1	86	ePgC	14:19:29.64	-.24
			iSg	19:44.28	.11

1997-03-03 time: 14:33:00.37 UTC ML= 2.4
lat: 47.207N lon: 17.590E h= 24.7 km
erh= 5.3km erz= 5.6km
nr= 10 gap=198 rms= .71
Locality: Magyarpolány
Comments: felt 4 EMS

sta	dist	azm	phase	hr mn sec	res
PKSC	67.0	73	iPgC	14:33:11.90	-.58
			iSg	33:22.40	.47
PKS9	86.7	143	ePnC	14:33:15.90	.66
			eSn	33:28.80	1.96
ZST	115.9	342	ePn	14:33:18.60	-.29
			iSn	33:33.10	-.23
PKSM	136.8	144	iPnC	14:33:21.60	.11
			eSn	33:37.60	-.37
PSZ	190.7	65	ePn	14:33:30.70	2.49
KHC	367.1	306	ePn	14:33:59.50	9.28
			eSn	34:42.00	12.91

1997-03-03 time: 15:17:46.90 UTC ML= 0.9
lat: 46.252N lon: 18.904E h= 10.0 km
erh= ---km erz= ---km
nr= 4 gap=272 rms= .49
Locality: Pörböly
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	20.7	258	ePgC	15:17:51.20	.19
			iSg	17:54.40	.18
PKS9	60.8	308	iPgC	15:17:57.30	-.60
PKS8	71.8	346	ePgD	15:18:00.60	.75

1997-03-09 time: 0:45:25.63 UTC ML= 1.9
lat: 45.798N lon: 18.506E h= 6.0 km
erh= 3.4km erz= 2.4km
nr= 11 gap=306 rms= .38
Locality: Magyarbóly
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	47.1	13	iPgD	0:45:34.00	-.11
			iSg	45:40.60	-.13
PKS4	48.5	356	ePg	0:45:34.30	-.06
			eSg	45:41.20	.03
PKS9	89.4	349	ePgC	0:45:42.20	.57
			eSg	45:54.10	.00
PKS2	94.5	35	iPgD	0:45:42.60	.07
			eSg	45:56.00	.28
PKS8	120.8	6	ePn	0:45:45.90	-1.06
			eSn	46:00.10	-3.50
PKS6	120.9	43	ePn	0:45:47.40	.43
			eSn	46:04.00	.38

1997-03-26 time: 12:02:58.64 UTC ML= 1.9
lat: 47.916N lon: 19.081E h= 15.0 km
erh= 8.5km erz= 5.2km
nr= 7 gap=231 rms= .72
Locality: Diósjenő
Comments:

sta	dist	azm	phase	hr mn sec	res
PSZ	60.8	90	ePgC	12:03:09.70	-.12
			eSg	03:18.40	-.13
PKSC	76.7	219	ePgD	12:03:12.00	-.60
			eSg	03:25.10	1.61
PKS8	119.3	195	ePnC	12:03:19.80	1.17
			eSn	03:33.50	-.73

1997-03-30 time: 4:18:04.57 UTC ML= 2.0
lat: 47.755N lon: 16.170E h= 15.0 km
erh= 4.3km erz= 4.9km
nr= 11 gap=129 rms= .60
Locality: Austria
Comments:

sta	dist	azm	phase	hr mn sec	res
VKA	57.8	11	iPgD	4:18:14.90	-.33
			iSg	18:24.70	1.15

Hypocentre Parameters

PKSC	175.6	104	ePnD	4:18:31.80	.22
			eSn	18:54.50	1.84
PKS9	206.0	129	ePn	4:18:36.80	1.43
PKS8	213.1	117	iPnC	4:18:36.10	-.16
			iSn	19:00.40	-.57
KHC	245.3	309	ePn	4:18:41.00	.73
			eSn	19:06.40	-1.72
PKSM	254.6	132	iPnC	4:18:40.80	-.62
PRU	275.6	334	Pn	4:18:45.30	1.26
			Sn	19:20.20	5.36
WTTA	345.8	261	iPnD	4:18:52.80	.00
			iSn	19:40.90	10.47
WATA	348.9	262	iPnC	4:18:52.80	-.39
			iSn	19:40.70	9.59
SQTA	378.6	261	iPnC	4:18:56.70	-.18
			iSn	19:48.20	10.51
MOTA	384.0	263	iPnD	4:18:56.80	-.77
			iSn	19:48.70	9.79

1997-04-08 time: 11:03:36.36 UTC ML= 0.7

lat: 47.095N lon: 18.312E h= 12.0 km
erh= ---km erz= ---km
nr= 4 gap=246 rms= .16
Locality: Polgárdi
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSC	33.1	17	iPgC	11:03:42.50	-.15
			iSg	03:47.70	.15
PKS8	36.7	131	iPgC	11:03:43.40	.15
			eSg	03:48.40	-.23
PSZ	150.3	52	Pn	11:04:19.20	18.60

1997-04-08 time: 16:10:45.10 UTC ML= 1.1

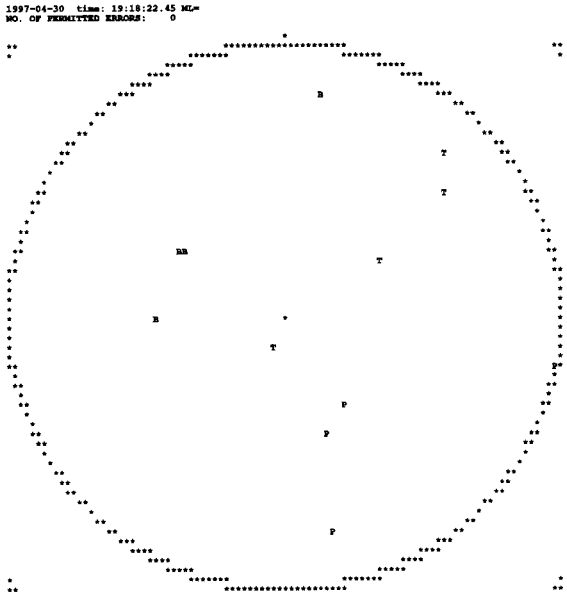
lat: 46.431N lon: 17.854E h= 15.0 km
erh= 5.4km erz= 2.9km
nr= 6 gap=300 rms= .30
Locality: Zimány
Comments:

sta	dist	azm	phase	hr mn sec	res
PKS9	36.9	62	iPgC	16:10:52.60	.39
			iSg	10:57.50	-.26
PKSM	65.3	112	iPgD	16:10:56.80	-.27
			eSg	11:07.20	.79
PKS8	80.2	52	iP*D	16:10:59.60	-.04
			eS*	11:11.00	.02

1997-04-30 time: 19:18:22.45 UTC ML=

lat: 46.122N lon: 16.105E h= 10.0 km
erh=15.7km erz=****km
nr= 15 gap=201 rms=1.90
Locality: Croatia
Comments:

sta	dist	azm	phase	hr mn sec	res
PKS9	175.1	73	ePnC	19:18:47.80	-2.24
PKSM	196.1	87	ePn	19:18:48.30	-4.36
			eSn	19:13.00	-3.23
PKS8	214.6	67	ePn	19:18:55.90	.94
			eSn	19:20.30	-.02
PKSC	226.6	52	ePnC	19:18:54.40	-2.06
			eSn	19:24.60	1.62
VKA	238.8	4	iPn	19:18:59.70	1.72
			iSn	19:38.80	13.10
ZST	242.7	18	ePn	19:18:58.00	-.47
PKS2	242.9	80	ePn	19:19:02.50	4.00
			eSn	19:29.00	2.38
PKS6	271.5	79	ePn	19:19:05.30	3.24
			eSn	19:44.40	11.45
PSZ	350.6	55	ePn	19:19:09.10	-2.82
WTTA	364.6	290	iPnD	19:19:13.50	-.18
			iSn	19:54.00	.37
WATA	371.6	291	iPnC	19:19:14.50	-.04
			iSn	19:57.50	2.34
KHC	384.7	330	PnC	19:19:16.60	.42
			Sn	20:15.00	16.92
SQTA	394.1	288	iPnC	19:19:17.20	-.15
			iSn	20:01.50	1.33
MOTA	405.7	290	iPnD	19:19:18.70	-.10
			iSn	20:00.20	-2.55
PRU	445.4	345	iPn	19:19:24.30	.55
			eSn	20:25.20	13.64



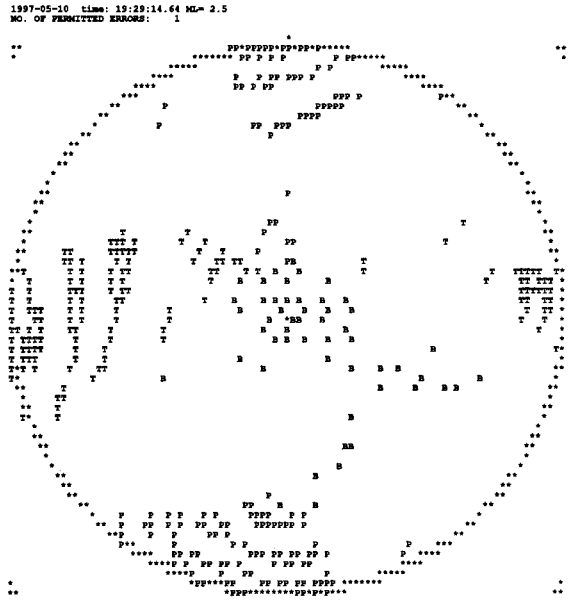
1997-05-10 time: 19:29:14.64 UTC ML= 2.5

lat: 48.090N lon: 16.706E h= 4.3 km
erh= 1.5km erz= 1.5km
nr= 12 gap=105 rms= .31
Locality: Austria
Comments:

sta	dist	azm	phase	hr mn sec	res
ZST	31.8	68	iPg	19:29:20.50	.13
			eSg	29:24.80	-.03
VKA	34.8	304	iPgC	19:29:20.80	-.09
			iSg	29:25.20	-.57
SOP	46.6	194	iPgD	19:29:22.80	-.19
			iSg	29:28.80	-.71
PKSC	152.0	121	ePnC	19:29:39.60	-.47
			eSn	29:57.60	-2.31
MOA	184.2	262	iPnD	19:29:44.50	.41
			iSn	30:07.30	.24
PKS8	200.5	132	iPnD	19:29:46.20	.07
			eSn	30:08.30	-2.39
PKS9	205.1	145	iPnD	19:29:46.90	.20
			eSn	30:12.70	1.00
PSZ	238.7	95	ePn	19:29:51.40	.51
KHC	258.1	297	ePn	19:29:52.80	-.50
			eSn	30:27.50	4.04
PKS2	259.9	133	iPnD	19:29:53.30	-.23
			iSn	30:22.30	-1.57
PRU	263.8	323	Pn	19:29:53.30	-.72
			eSn	30:22.70	-2.03
KBA	276.8	246	iPnC	19:29:56.60	.97
			iSn	30:33.90	6.29

Hypocentre Parameters

WTTA	391.6	256	iPnC	19:30:11.10	1.14
			iSn	31:06.60	13.50
WATA	394.0	258	iPnC	19:30:11.90	1.65
			iSn	31:07.60	13.98
SQTA	424.1	257	iPnD	19:30:15.50	1.49
			iSn	31:17.40	17.08
MOTA	428.5	259	iPnC	19:30:15.50	.95
			iSn	31:17.60	16.32



1997-05-19 time: 3:21:35.32 UTC ML= 2.8
lat: 47.809N lon: 16.151E h= 10.0 km
erh= 3.0km erz= 3.7km
nr= 12 gap=157 rms= .90
Locality: Austria
Comments:

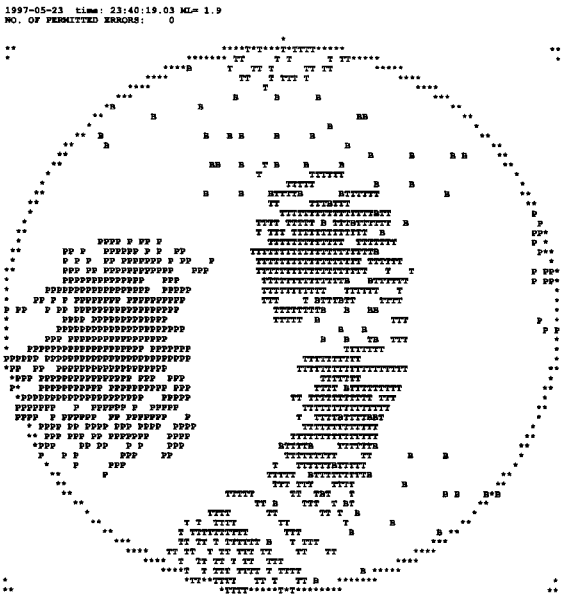
sta	dist	azm	phase	hr mn sec	res
SOP	33.6	115	iPgC	3:21:41.00	-.58
			iSg	21:47.00	.53
VKA	52.2	14	iPgD	3:21:44.00	-.81
			iSg	21:51.70	-.52
ZST	83.0	59	ePg	3:21:50.10	-.16
			eSg	22:04.50	2.59
MOA	141.2	272	iPnC	3:21:58.40	-.28
			iSn	22:16.50	-.40
KHC	240.4	308	ePn	3:22:12.60	1.55
			eSn	22:40.00	1.08
PRU	269.5	334	Pn	3:22:15.60	.92
			Sn	22:47.70	2.31
WTTA	345.3	260	iPnC	3:22:32.00	7.87
			iSn	23:13.40	11.20

1997-05-22 time: 0:11:17.46 UTC ML= 2.5
lat: 47.090N lon: 21.425E h= 13.0 km
erh=29.9km erz=20.1km
nr= 12 gap=251 rms=1.35
Locality: Vekerd
Comments:

sta	dist	azm	phase	hr mn sec	res
GYL	58.0	199	iPgD	0:11:28.20	.12
			iSg	11:35.60	-.77
PSZ	147.6	309	ePn	0:11:41.50	.26
			iSn	11:58.90	-.88
PKS6	152.1	249	iPnD	0:11:40.80	-.99
			eSn	12:00.30	-.47
PKS7	172.1	268	ePnC	0:11:46.10	1.81
			eSn	12:06.20	.98
PKS2	181.5	249	ePnC	0:11:44.00	-1.47
			eSn	12:06.20	-1.12
PKS8	210.5	264	iPnD	0:11:52.30	3.22
			eSn	12:18.40	4.67

1997-05-23 time: 23:40:19.03 UTC ML= 1.9
lat: 47.345N lon: 18.475E h= 10.9 km
erh= 2.5km erz= 1.2km
nr= 13 gap=150 rms= .45
Locality: Zámoly
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSC	4.9	325	iPgC	23:40:21.20	.03
			iSg	40:22.60	-.23
PKS8	54.0	164	iPgC	23:40:28.90	.03
			eSg	40:35.90	-.64
PKS7	61.6	122	iPgD	23:40:30.80	.60
			iSg	40:38.50	-.41
PKS2	110.2	149	ePn	23:40:38.90	.49
			eSn	40:53.30	-.23
PKS6	117.2	135	iPnC	23:40:39.90	.62
			eSn	40:55.10	.03
PSZ	124.3	59	iPnC	23:40:39.80	-.37
			eSn	40:55.00	-1.66
PKSM	126.6	174	eSn	23:40:56.30	-.86



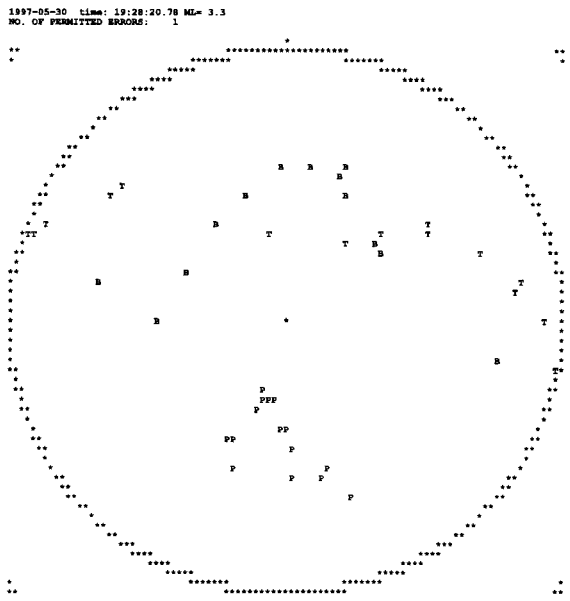
Hypocentre Parameters

1997-05-26 time: 7:56:46.04 UTC ML= 2.7
lat: 45.949N lon: 16.320E h= 10.0 km
erh= 6.8km erz= 531km
nr= 8 gap=209 rms= .39
Locality: Croatia
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	181.9	81	ePn	7:57:14.80	.32
			eSn	57:41.40	4.74
PKS8	208.6	60	ePn	7:57:17.60	-.20
MOA	262.9	323	iPnD	7:57:24.50	-.08
			iSn	58:03.70	9.05
WTTA	387.5	292	iPnD	7:57:40.10	-.01
			iSn	57:48.30	-33.98
WATA	394.6	293	iPnD	7:57:41.70	.70
			iSn	57:50.00	-33.86
KHC	409.6	330	Pn	7:57:42.70	-.17
			eSn	58:39.50	12.30
SQTA	416.5	290	iPnD	7:57:42.90	-.83
			iSn	57:52.50	-36.22
PRU	468.4	344	Pn	7:57:50.70	.50

1997-05-30 time: 19:28:20.78 UTC ML= 3.3
lat: 47.721N lon: 16.053E h= 10.0 km
erh= 4.5km erz= 4.2km
nr= 17 gap=131 rms= .85
Locality: Austria
Comments:

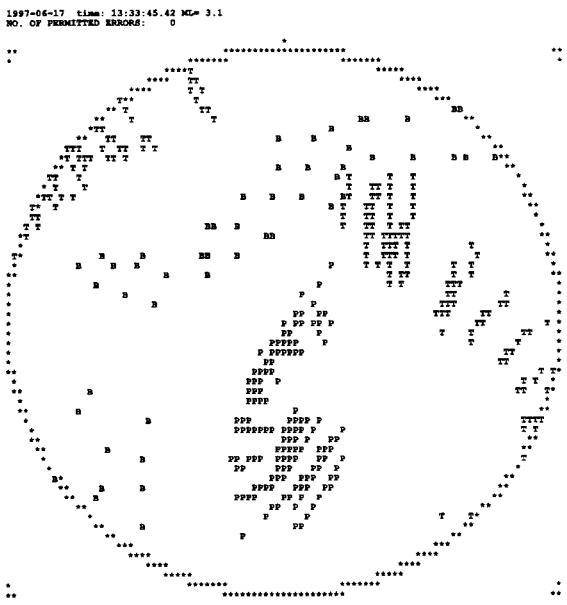
sta	dist	azm	phase	hr mn sec	res
SOP	38.2	96	iPgC	19:28:27.40	-.42
			Sg	28:32.50	-.82
VKA	63.7	18	iPgD	19:28:32.40	.11
			iSg	28:41.60	.33
ZST	94.6	56	ePg	19:28:36.70	-1.06
			eSg	28:49.40	-1.60
MOA	134.7	276	iPnC	19:28:42.00	-1.32
			iSn	28:58.30	-2.61
SRO	169.8	87	iPn	19:28:49.50	1.80
			iSn	29:13.40	4.70
PKSC	183.4	102	ePn	19:28:49.70	.30
			eSn	29:14.70	2.97
PKS9	210.7	127	ePnD	19:28:52.90	.10
			eSn	29:22.30	4.52
PKS8	219.4	115	ePnD	19:28:53.50	-.39
			eSn	29:17.30	-2.42
KHC	241.1	311	Pn	19:28:57.50	.90
			eSn	29:24.00	-.54
PKS7	246.4	108	ePnC	19:29:03.30	6.05
PKSM	258.7	130	iPnC	19:28:58.00	-.79
			iSn	29:25.10	-3.35
PRU	275.5	336	ePn	19:29:01.10	.22
			eSn	29:33.20	1.04
PKS2	276.1	120	iPnD	19:29:00.70	-.25
			eSn	29:40.90	8.61
PSZ	288.5	86	iPn	19:29:02.50	-.01
			iSn	29:33.60	-1.46
WTTA	336.7	261	iPnD	19:29:09.10	.59
			iSn	29:55.70	9.96
WATA	339.8	263	iPnC	19:29:09.60	.70
			iSn	29:55.20	8.76
SQTA	369.4	261	iPnD	19:29:13.60	1.01
			iSn	30:05.00	11.99
MOTA	375.0	264	iPnD	19:29:13.50	.21
			iSn	30:05.20	10.95



1997-06-17 time: 13:33:45.42 UTC ML= 3.1
lat: 46.456N lon: 20.728E h= 10.0 km
erh= 5.2km erz= 2.2km
nr= 19 gap=195 rms= .78
Locality: Csorvás
Comments: felt 3.5 EMS

sta	dist	azm	phase	hr mn sec	res
GYL	37.6	65	ePgC	13:33:51.90	-.46
			iSg	33:58.00	.22
PKS6	90.7	280	iPgC	13:34:01.40	-.31
			iSg	34:14.40	-.02
PKS2	116.4	272	ePnD	13:34:05.60	-.09
			iSn	34:21.70	.20
PKS7	136.6	299	iPnC	13:34:08.30	.09
			iSn	34:24.80	-1.18
PKSM	162.9	260	iPnD	13:34:10.70	-.79
			eSn	34:34.20	2.38
PKS8	163.9	287	ePn	13:34:12.60	.99
			iSn	34:31.60	-.44
BUD	172.9	311	ePn	13:34:12.40	-.33
			iSn	34:34.00	-.03
PKS9	188.5	274	iPnD	13:34:17.30	2.62
			eSn	34:40.90	3.40
PKSC	202.5	301	iPnC	13:34:19.10	2.67
			eSn	34:42.50	1.88
SRO	237.4	309	iPn	13:34:21.40	.63
KHC	612.7	299	ePn	13:35:08.50	.92

Hypocentre Parameters



1997-06-17 time: 17:03:07.65 UTC ML= 2.5
lat: 46.508N lon: 20.718E h= 8.0 km
erh= 8.3km erz= 3.8km
nr= 16 gap=184 rms=1.09
Locality: Csorvás
Comments:

sta	dist	azm	phase	hr mn sec	res
GYL	36.2	74	iPgC	17:03:13.95	-.32
			iSg	03:19.95	.51
PKS6	89.1	277	iPgC	17:03:23.20	-.42
			eSg	03:35.40	-.67
PKS2	115.5	269	ePnC	17:03:27.50	-.56
			eSn	03:43.20	-.79
PKS7	133.2	297	ePn	17:03:30.30	.04
			iSn	03:46.20	-1.70
PKS8	161.5	285	ePn	17:03:34.80	1.01
			iSn	03:53.70	-.49
PKSM	163.2	258	iPnC	17:03:32.70	-1.31
			iSn	03:55.70	1.14
PKS9	187.3	273	iPnC	17:03:39.10	2.09
			eSn	04:02.40	2.49
PKSC	198.9	299	ePn	17:03:40.10	1.64
			eSn	04:04.10	1.61

1997-07-08 time: 0:48:25.12 UTC ML= .6
lat: 47.516N lon: 16.444E h= 21.6 km
erh= 8.9km erz= 4.1km
nr= 11 gap=214 rms= .91
Locality: Austria
Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	20.5	25	iPgC	0:48:31.10	.73
			iSg	48:34.10	-.37
ARSA	75.6	247	iPgC	0:48:38.70	.20
			iSg	48:48.30	-.63
ZST	90.2	33	ePn	0:48:39.00	-1.71
			eSn	48:49.70	-3.16
MOA	167.7	283	iPnD	0:48:51.30	.93
			iSn	49:09.80	-.26
KHC	278.2	310	ePn	0:49:07.00	2.85
			eSn	49:36.00	1.41

1997-07-16 time: 10:52:54.33 UTC ML= 1.4
lat: 47.764N lon: 18.029E h= 7.0 km
erh= 3.2km erz= 3.1km
nr= 7 gap=160 rms= .44
Locality: Komárom
Comments:

sta	dist	azm	phase	hr mn sec	res
SRO	22.0	76	iPg	10:52:58.00	-.44
PKSC	52.5	144	iPgD	10:53:03.70	-.09
			iSg	53:11.30	.12
BUD	81.0	113	Sg	10:53:26.40	6.23
ZST	84.2	305	iPg	10:53:09.80	.38
			iSg	53:21.10	-.10
PSZ	140.7	83	Pn	10:53:18.80	.79
			Sn	53:35.60	-.88

1997-07-16 time: 11:58:31.27 UTC ML= 1.0
lat: 47.077N lon: 18.208E h= 6.9 km
erh= 1.9km erz= .7km
nr= 6 gap=265 rms= .09
Locality: Csajág
Comments:

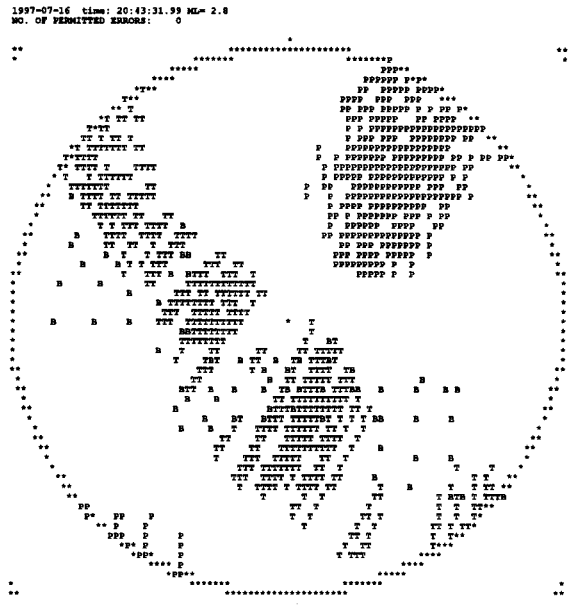
sta	dist	azm	phase	hr mn sec	res
PKSC	37.9	27	iPgD	11:58:38.20	.04
			iSg	58:43.50	-.03
PKS8	41.9	122	iPgC	11:58:38.90	.04
			eSg	58:44.10	-.67
PSZ	157.8	54	ePn	11:58:56.90	-.20
			Sn	59:17.30	.06

1997-07-16 time: 20:43:31.99 UTC ML= 2.8
lat: 47.783N lon: 17.303E h= 10.0 km
erh= 4.6km erz= 4.0km
nr= 16 gap= 95 rms=1.15
Locality: Kóny
Comments: felt 4 EMS

sta	dist	azm	phase	hr mn sec	res
ZST	48.3	342	iPg	20:43:40.60	-.21
			iSg	43:46.60	-1.08
SOP	56.9	259	iPgD	20:43:41.20	-1.12
			iSg	43:47.60	-2.77
SRO	75.8	87	iPg	20:43:45.00	-.64
			iSg	43:56.50	.22
VKA	90.9	306	iPgC	20:43:48.30	-.03
			iSg	44:01.40	.33
PKSC	96.3	118	iPgC	20:43:48.30	-.98
			iSg	44:07.80	5.03
BUD	133.5	104	Pn	20:43:54.90	.50
			Sn	44:14.10	2.23
PKS8	144.5	134	iPn	20:43:55.00	-.77
			iSn	44:18.90	4.59
ARSA	146.5	246	iPnC	20:43:55.40	-.62
			iSn	44:12.40	-2.36
PKS9	152.1	151	iPn	20:43:57.90	1.18
PKS7	162.3	120	iPn	20:44:00.20	2.22
			eSn	44:21.60	3.34
PSZ	194.5	86	Pn	20:44:03.80	1.80
			Sn	44:29.40	3.99
PKS2	203.9	135	iPnC	20:44:02.50	-.68
			iSn	44:37.90	10.40
MOA	227.6	272	iPnC	20:44:09.40	3.27
			iSn	44:36.00	3.25
SPC	267.9	54	e	20:44:16.30	5.15

Hypocentre Parameters

			eSn	44:53.90	12.21
KHC	313.7	299	Pn	20:44:16.50	-.36
			eSn	45:02.50	10.65
PRU	318.1	320	Pn	20:44:17.20	-.21
			Sn	45:02.00	9.16

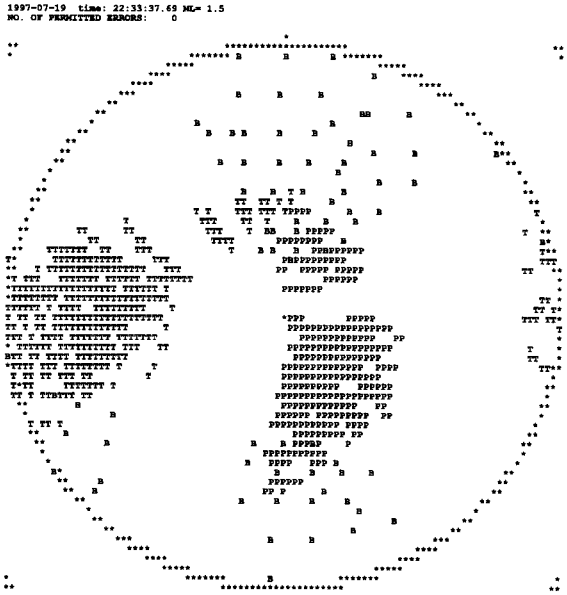


1997-07-18 time: 18:58:37.21 UTC ML= 1.5
lat: 45.976N lon: 18.979E h= 10.0 km
erh= 6.5km erz=23.9km
nr= 5 gap=282 rms= .07
Locality: Hercegszántó
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSM	37.0	315	iPgC	18:58:44.10		.04
			eSg	58:49.20		-.20
PKS2	60.2	17	ePg	18:58:48.10		.00

1997-07-19 time: 22:33:37.69 UTC ML= 1.5
lat: 47.842N lon: 16.372E h= 4.1 km
erh= 4.1km erz= 4.5km
nr= 10 gap= 82 rms= .77
Locality: Austria
Comments:

sta	dist	azm	phase	hr mn	sec	res
SOP	22.6	142	ePgC	22:33:43.00		1.21
			iSg	33:46.20		1.22
VKA	47.1	355	iPgD	22:33:46.20		.06
			iSg	33:52.70		-.03
ZST	67.2	54	iPg	22:33:49.50		-.22
			iSg	33:58.40		-.70
ARSA	91.7	224	iPgC	22:33:53.40		-.68
			iSg	34:05.10		-1.77
SRO	145.4	91	e	22:34:02.00		-.33
MOA	157.6	270	iPnC	22:34:02.90		-.95
			iSn	34:21.80		-2.46
PKSC	163.6	108	ePn	22:34:04.80		.20
KHC	251.3	305	Pn	22:34:16.70		1.16
			Sn	34:42.30		-2.76
PRU	273.7	331	ePn	22:34:18.60		.27
			eSn	34:47.70		-2.33
WTTA	362.2	260	iPnC	22:34:31.30		1.94



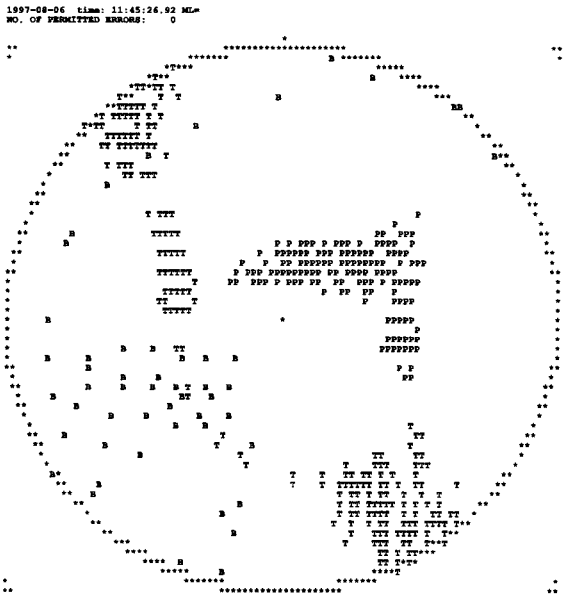
1997-07-29 time: 14:24:57.96 UTC ML= 1.4
lat: 47.310N lon: 18.989E h= 10.0 km
erh= 5.3km erz= 7.8km
nr= 5 gap=236 rms= .15
Locality: Szigethalom
Comments:

sta	dist	azm	phase	hr mn	sec	res
BUD	19.5	8	iPgD	14:25:02.18		.31
			eSg	25:04.90		-.03
PKSC	42.4	281	iPgC	14:25:05.80		.06
			eSg	25:11.70		-.11
PSZ	96.0	45	iPgD	14:25:15.00		-.20

1997-08-06 time: 11:45:26.92 UTC ML=
lat: 47.940N lon: 19.090E h= 10.0 km
erh=22.8km erz= 8.4km
nr= 8 gap=234 rms=1.68
Locality: Diósjenõ
Comments:

sta	dist	azm	phase	hr mn	sec	res
BUD	51.0	186	iPgC	11:45:40.50		4.29
			iSg	45:52.80		9.35
PSZ	60.1	92	iPgC	11:45:37.70		-.11
			iSg	45:45.90		-.40
PKSC	79.3	218	iPgD	11:45:40.70		-.49
			iSg	45:51.40		-.91
PKS8	122.1	195	iPnC	11:45:47.70		-.20
			iSn	46:02.50		-1.77

Hypocentre Parameters



1997-08-10 time: 10:48:26.86 UTC ML= 3.0
lat: 46.565N lon: 16.331E h= 10.0 km
erh= 4.2km erz= 4.7km
nr= 26 gap=109 rms=1.90
Locality: Slovenia
Comments: felt 5 EMS

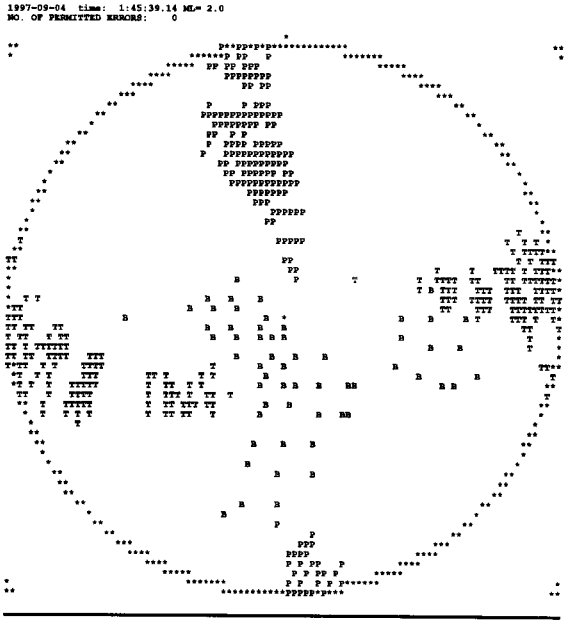
sta	dist	azm	phase	hr mn sec	res
PTJ	78.0	201	iPg	10:48:40.60	-.30
			iSg	48:51.50	-.35
ZAG	85.9	198	iPg	10:48:42.00	-.30
			iSg	48:53.80	-.54
ARSA	98.0	321	iPgC	10:48:42.20	-2.25
			iSg	48:55.20	-2.96
PKS9	149.3	89	iPnC	10:48:51.20	-.04
			iSn	49:12.10	1.85
PKS8	182.7	79	iPnC	10:48:52.60	-2.80
			iSn	49:19.00	1.35
VKA	189.0	360	iPnC	10:48:59.20	3.01
			iSn	49:21.80	2.74
RIY	202.9	228	iPn	10:49:01.60	3.68
			iSn	49:21.00	-1.14
SRO	204.5	47	ePn	10:48:56.00	-2.12
MOA	211.8	312	iPnC	10:48:59.40	.37
			iSn	49:23.70	-.43
PSZ	308.9	61	iPnC	10:49:10.00	-1.14
			iSn	49:42.20	-3.47
KHC	351.9	324	Pn	10:49:17.30	.80
			eSn	50:07.00	11.78
WTTA	366.0	282	iPnC	10:49:19.50	1.25
			iSn	50:19.80	21.46
WATA	372.0	283	iPnD	10:49:20.00	1.00
			iSn	50:18.60	18.93
SQTA	397.1	281	iPnC	10:49:23.30	1.16
			iSn	50:26.20	20.95
PRU	403.2	341	ePn	10:49:22.50	-.39
			Sn	50:19.00	12.41

1997-08-15 time: 9:50:47.92 UTC ML= 1.4
lat: 47.722N lon: 18.319E h= 4.3 km
erh=17.4km erz= 9.7km
nr= 5 gap=191 rms= .14
Locality: Dunaalmás
Comments:

sta	dist	azm	phase	hr mn sec	res
SRO	10.2	358	iPg	9:50:49.90	.00
PKSC	38.9	167	iPgC	9:50:54.80	-.12
			iSg	51:00.40	.03
PKS8	97.5	164	iPgC	9:51:05.60	.24
			iSg	51:18.80	-.16

1997-09-04 time: 1:45:39.14 UTC ML= 2.0
lat: 47.718N lon: 16.164E h= 4.3 km
erh= 2.1km erz= 2.4km
nr= 17 gap= 91 rms= .73
Locality: Austria
Comments: felt 4 EMS

sta	dist	azm	phase	hr mn sec	res
SOP	29.9	97	iPgC	1:45:44.80	.27
			iSg	45:48.70	-.03
VKA	61.9	11	iPgD	1:45:50.20	-.03
			iSg	45:58.40	-.47
ARSA	71.0	223	iPgC	1:45:52.20	.36
			iSg	46:01.00	-.74
MOA	143.0	276	iPnC	1:46:03.90	.45
			iSn	46:21.90	-.51
PKSC	175.2	102	ePn	1:46:08.20	.73
PKS8	211.7	116	iPnC	1:46:11.60	-.42
KHC	247.6	309	ePn	1:46:16.50	.00
			eSn	46:44.00	-1.63
PKSM	252.2	132	iPnC	1:46:16.60	-.46
PRU	279.1	335	Pn	1:46:21.20	.77
			Sn	46:52.90	.27
WTTA	344.9	262	iPnC	1:46:35.50	6.87
			iSn	47:15.00	7.77



Hypocentre Parameters

1997-09-05 time: 9:21:38.57 UTC ML= 1.3
lat: 47.408N lon: 18.498E h= 19.0 km
erh=11.5km erz= 2.3km
nr= 6 gap=290 rms= .35
Locality: Csákvár
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSC	5.5	237	iPgC	9:21:41.90		-.21
			iSg	21:44.90		.04
PKS8	60.3	167	iP*C	9:21:50.00		.28
			iS*	21:58.70		.29
PKSM	133.4	175	iPnC	9:21:59.90		.09
			iSn	22:15.40		-.97

1997-09-05 time: 18:16:59.59 UTC ML=
lat: 46.140N lon: 19.227E h= 12.9 km
erh= ---km erz= ---km
nr= 4 gap=253 rms= .09
Locality: Bácsbokod
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSM	45.9	280	iPgD	18:17:08.10		-.01
PKS6	57.4	27	iPgD	18:17:10.10		.01
PKS8	92.4	333	iP*D	18:17:16.30		.12
PKSC	150.6	336	iPnC	18:17:23.60		-.15

1997-09-12 time: 14:46:15.03 UTC ML= 0.9
lat: 47.092N lon: 18.247E h= 10.0 km
erh= .1km erz= .3km
nr= 5 gap=221 rms= .06
Locality: Füle
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSC	35.2	24	iPgD	14:46:21.60		.04
			iSg	46:26.60		-.06
PKS8	40.4	126	iPgC	14:46:22.40		-.05
PKS7	69.6	94	ePg	14:46:27.70		.12
PKSM	102.4	163	iPgC	14:46:33.40		.00
			iSg	46:45.80		-1.92

1997-09-18 time: 10:10:24.85 UTC ML= 1.0
lat: 47.580N lon: 18.105E h= 10.0 km
erh= 7.5km erz= 7.0km
nr= 9 gap=226 rms= .77
Locality: Csép
Comments:

sta	dist	azm	phase	hr mn	sec	res
SRO	30.3	31	ePg	10:10:26.80		-3.74
PKSC	33.4	132	iPgD	10:10:30.40		-.68
			eSg	10:35.00		-.94
BUD	70.0	99	ePg	10:10:38.70		1.23
			eSg	10:45.70		-1.62
PKS8	89.2	151	iPgC	10:10:41.40		.53
			iSg	10:53.80		.43
PKSM	157.5	165	iPnC	10:10:50.00		-.24

1997-09-23 time: 15:03:44.04 UTC ML= 1.3
lat: 47.058N lon: 18.177E h= 10.0 km
erh= 2.2km erz= 7.9km
nr= 7 gap=230 rms= .55
Locality: Csajág
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSC	40.9	29	ePgC	15:03:51.80		.23
			iSg	03:56.80		-.64
PKS8	43.0	118	ePgC	15:03:52.50		.58
			iSg	03:57.60		-.46
PKS7	74.8	91	ePg	15:03:58.20		.68
			eSg	04:09.00		.97
PKSM	100.6	159	eSg	15:04:15.90		-.27

1997-10-08 time: 15:40:26.57 UTC ML= 1.2
lat: 47.645N lon: 18.817E h= 10.0 km
erh= 5.1km erz=11.0km
nr= 7 gap=205 rms= .47
Locality: Piliscsaba
Comments:

sta	dist	azm	phase	hr mn	sec	res
BUD	23.8	139	iPgC	15:40:31.80		.63
			eSg	40:33.20		-1.56
PKSC	41.0	224	ePgC	15:40:33.70		-.42
			iSg	40:39.80		-.20
PKS8	85.9	187	iPgD	15:40:42.10		.09
PSZ	86.3	69	ePg	15:40:42.10		.02
			eSg	40:53.30		-.88

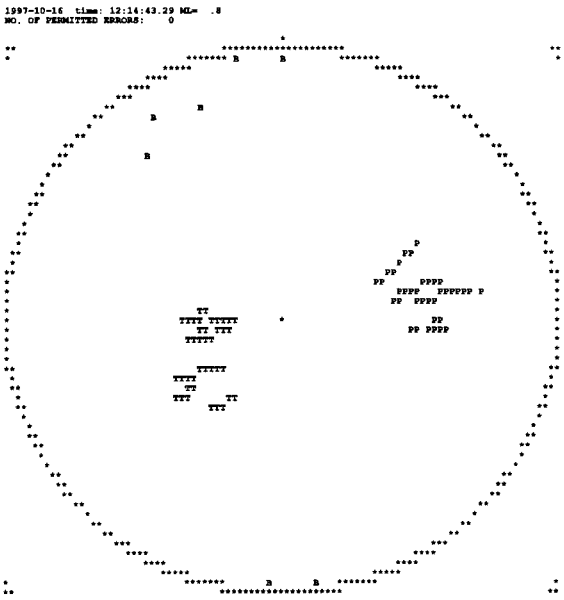
1997-10-11 time: 15:41:41.53 UTC ML= 1.1
lat: 47.608N lon: 18.658E h= 15.9 km
erh= 4.5km erz= 2.0km
nr= 5 gap=263 rms= .17
Locality: Szomor
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSC	30.2	213	iPgC	15:41:47.50		-.13
			eSg	41:53.90		1.51
BUD	30.8	117	PgC	15:41:47.80		.07
PKS8	81.1	179	iP*D	15:41:56.10		-.03
			eS*	42:07.80		.29

1997-10-16 time: 12:14:43.29 UTC ML= 0.8
lat: 47.103N lon: 18.356E h= 10.0 km
erh= 5.6km erz= 6.6km
nr= 8 gap=185 rms= .55
Locality: Kőszárhegy
Comments:

sta	dist	azm	phase	hr mn	sec	res
PKSC	31.5	11	iPgC	12:14:49.00		-.20
			Sg	14:54.10		.30
PKS8	34.8	136	iPgC	12:14:49.80		.03
			Sg	14:54.90		.09
PKS9	57.6	186	ePgD	12:14:55.00		1.26
PKS2	94.3	136	iPgD	12:15:00.80		.58
PKSM	101.4	168	iPgC	12:15:00.70		-.79
PKS6	107.8	121	ePn	12:15:02.70		.21

Hypocentre Parameters



1997-10-17 time: 11:01:18.81 UTC ML= 2.2
lat: 47.856N lon: 19.104E h= 8.4 km
erh= 4.1km erz= 2.8km
nr= 8 gap=220 rms= .49
Locality: Szendehely
Comments:

sta	dist	azm	phase	hr mn sec	res
BUD	41.8	188	Sg	11:01:32.10	-.26
PSZ	59.5	83	iPgD	11:01:29.60	.06
			Sg	01:37.70	-.21
PKSC	72.8	224	iPgD	11:01:31.70	-.21
			eSg	01:41.90	-.22
PKS7	90.0	177	Sg	11:01:49.00	1.47
PKS8	113.3	197	iPnD	11:01:39.60	.70
			Sn	01:53.70	-.87

1997-10-25 time: 23:49:15.61 UTC ML= 1.5
lat: 45.743N lon: 17.351E h= 10.0 km
erh= 149km erz= 139km
nr= 8 gap=322 rms=1.20
Locality: Croatia
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	112.8	62	ePnC	23:49:35.50	.07
			eSn	49:49.90	-.98
PKS9	118.1	37	iPnC	23:49:36.60	.51
			eSn	49:49.70	-2.36
PKS2	166.3	60	Sn	23:50:06.60	3.84
PKSC	200.2	25	iPnC	23:49:45.20	-1.13
			eSn	50:10.50	.21
PKS7	201.0	44	Sn	23:50:12.80	2.33

1997-10-27 time: 23:26:05.34 UTC ML= 1.9
lat: 45.999N lon: 18.962E h= 10.0 km
erh= 5.7km erz= 2.6km
nr= 11 gap=279 rms= .89
Locality: Dávod
Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	34.3	314	Sg	23:26:15.60	-1.08
PKS2	58.2	20	iPgD	23:26:15.60	-.28
			eSg	26:24.60	.51
PKS6	81.4	35	iPgC	23:26:19.30	-.68
			Sg	26:32.00	.60
PKS9	83.9	321	ePgC	23:26:19.90	-.53
			eSg	26:31.10	-1.10
PKS7	117.6	7	ePnD	23:26:26.40	.65
			Sn	26:41.40	-.27
PKSC	158.8	345	Pn	23:26:32.70	1.81
			Sn	26:52.60	1.78

1997-11-03 time: 21:44:53.71 UTC ML= 1.6
lat: 47.758N lon: 16.126E h= 10.0 km
erh= 2.2km erz= 2.7km
nr= 13 gap=114 rms= .77
Locality: Austria
Comments: felt 4 EMS

sta	dist	azm	phase	hr mn sec	res
SOP	33.5	104	iPgC	21:45:00.60	.64
			iSg	45:05.20	.37
VKA	58.1	14	iPgC	21:45:03.90	-.35
			iSg	45:11.40	-1.06
ARSA	72.5	219	iPgD	21:45:06.60	-.18
			iSg	45:16.00	-.97
ZST	87.7	56	ePg	21:45:08.80	-.67
			eSg	45:23.00	1.24
MOA	139.7	274	iPnC	21:45:17.60	.71
			iSn	45:34.60	-.37
KHC	242.5	309	ePn	21:45:31.70	1.99
			eSn	45:58.50	.71
PRU	273.9	335	ePn	21:45:41.70	8.08
			Sn	46:06.70	1.96

1997-11-03 time: 23:17:03.96 UTC ML= 1.7
lat: 47.761N lon: 16.113E h= 10.0 km
erh= 2.1km erz= 2.7km
nr= 13 gap=114 rms= .78
Locality: Austria
Comments: felt 4 EMS

sta	dist	azm	phase	hr mn sec	res
SOP	34.5	105	iPgC	23:17:10.80	.42
			iSg	17:15.50	.12
VKA	58.1	15	iPgD	23:17:14.10	-.39
			iSg	17:21.60	-1.09
ARSA	72.1	218	iPgD	23:17:16.80	-.16
			iSg	17:26.10	-1.00
ZST	88.3	57	ePg	23:17:19.00	-.83
			eSg	17:33.10	.89
MOA	138.7	274	iPnC	23:17:28.00	.99
			iSn	17:45.20	.20
KHC	241.6	309	ePn	23:17:42.00	2.16
			eSn	18:08.50	.67
PRU	273.2	335	Pn	23:17:45.70	1.92
			Sn	18:19.20	4.36

1997-11-04 time: 2:22:19.68 UTC ML= 1.5
lat: 47.755N lon: 16.111E h= 10.0 km
erh= 3.0km erz= 3.7km
nr= 13 gap=115 rms= .93
Locality: Austria
Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	34.5	103	iPgD	2:22:26.80	.71
			iSg	22:31.30	.20
VKA	58.8	15	iPgD	2:22:29.90	-.43

Hypocentre Parameters

			iSg	22:37.40	-1.24
ARSA	71.4	218	iPgD	2:22:32.60	.05
			iSg	22:41.80	-.80
ZST	88.9	56	ePg	2:22:34.40	-1.24
			eSg	22:48.80	.70
MOA	138.6	274	iPnC	2:22:43.60	.89
			iSn	23:00.30	-.38
KHC	241.9	309	ePn	2:22:58.00	2.40
			eSn	23:24.50	.89
PRU	273.8	335	ePn	2:23:09.50	9.93
			Sn	23:35.00	4.32

1997-11-10 time: 14:54:40.90 UTC ML= 3.4
lat: 48.251N lon: 17.170E h= 10.0 km
erh= 5.7km erz= 3.1km
nr= 11 gap=261 rms=1.09
Locality: Slovakia
Comments:

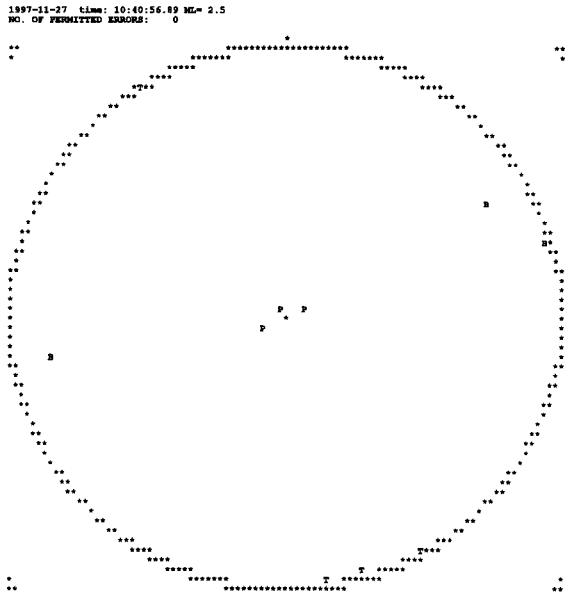
sta	dist	azm	phase	hr mn	sec	res
VKA	63.3	271	iPgC	14:54:51.80		-.54
			iSg	55:01.10		-.16
SOP	77.9	216	iPgC	14:54:54.40		-.53
			iSg	55:05.00		-.87
ARSA	166.2	228	iPnC	14:55:08.20		.82
			iSn	55:30.30		2.27
MOA	221.1	258	iPn	14:55:12.90		-1.32
			iSn	55:41.40		1.19
PRU	272.3	315	Pn	14:55:23.00		2.39
			Sn	55:52.70		1.12
KHC	282.0	290	ePn	14:55:20.00		-1.82
			eSn	55:48.50		-5.23

1997-11-24 time: 8:48:46.14 UTC ML= 1.5
lat: 47.782N lon: 16.171E h= 6.3 km
erh= 2.2km erz= 3.3km
nr= 8 gap=109 rms= .44
Locality: Austria
Comments:

sta	dist	azm	phase	hr mn	sec	res
SOP	31.0	111	iPg	8:48:52.20		.41
			iSg	48:55.80		-.40
VKA	54.9	12	iPgC	8:48:56.00		.00
			iSg	49:03.10		-.59
ARSA	76.6	220	iPgC	8:49:00.30		.44
			iSg	49:10.20		-.37
MOA	142.9	273	iPnD	8:49:10.80		.62
			iSn	49:28.40		-.54

1997-11-27 time: 10:40:56.89 UTC ML= 2.5
lat: 47.260N lon: 19.385E h= 16.4 km
erh= 1.1km erz= 1.0km
nr= 13 gap=110 rms= .30
Locality: Nyáregyháza
Comments: felt 3.5 EMS

sta	dist	azm	phase	hr mn	sec	res
PKS7	29.1	216	iPgD	10:41:02.90		.04
			iSg	41:07.60		.09
BUD	37.0	312	iSg	10:41:09.80		.05
PKSN	54.4	138	iPgC	10:41:07.00		-.05
			iSg	41:15.10		.13
PKS8	68.5	232	iPgC	10:41:09.10		-.37
			eSg	41:18.70		-.58
PKSC	72.9	281	iP*D	10:41:10.70		.51
			eS*	41:20.30		-.27
PSZ	82.7	28	eP*C	10:41:11.60		-.07
			eS*	41:22.50		-.70
PKSM	129.6	206	iPnD	10:41:17.90		-.09
			eSn	41:35.30		.86
ZST	200.4	301	ePn	10:41:28.60		1.79



1997-12-01 time: 0:42:58.18 UTC ML= 2.3
lat: 45.951N lon: 16.208E h= 10.0 km
erh= 5.1km erz= 465km
nr= 9 gap=218 rms= .35
Locality: Croatia
Comments:

sta	dist	azm	phase	hr mn	sec	res
ARSA	153.7	340	iPnC	0:43:22.40		-.70
			iSn	43:42.00		-.54
PKSM	190.5	81	iPnD	0:43:27.60		-.09
			iSn	43:57.10		6.40
SOP	194.5	8	iPnC	0:43:28.30		.12
			iSn	43:49.60		-1.98
PKSC	233.2	47	ePnD	0:43:33.30		.29
PKS2	239.6	75	ePn	0:43:43.70		9.89
			iSn	44:11.90		10.30
KBA	253.0	300	iPnC	0:43:35.50		.02
			iSn	44:04.80		.23
PKS7	257.4	62	eSn	0:44:16.10		10.55
MOA	257.8	325	iPnC	0:43:36.30		.22
			iSn	44:05.50		-.14
ZST	258.7	15	ePn	0:43:36.40		.20
			eSn	44:03.50		-2.35
PKS6	268.6	74	eSn	0:44:18.70		10.66
KHC	405.2	331	ePn	0:43:54.50		.04
			eSn	44:54.00		15.63
PRU	465.9	345	ePn	0:44:03.00		.98
			eSn	45:14.30		22.48

1997-12-19 time: 11:34:17.56 UTC ML= 1.4
lat: 47.604N lon: 18.657E h= 7.2 km
erh= ---km erz= ---km
nr= 4 gap=262 rms= .10
Locality: Zsámbék
Comments:

sta	dist	azm	phase	hr mn	sec	res

Hypocentre Parameters

PKSC	29.9	214	iPgD	11:34:22.96	-.09
			iSg	34:27.40	.06
BUD	30.7	116	iPgD	11:34:23.34	.15
			iSg	34:27.49	-.09

1997-12-29 time: 2:09:53.64 UTC ML= 0.6
lat: 46.548N lon: 17.896E h= 20.8 km
erh= 9.7km erz= 8.1km
nr= 6 gap=261 rms= .56
Locality: Igal
Comments:

sta	dist	azm	phase	hr mn sec	res
PKS9	29.7	82	iSg	2:10:04.10	-.99
PKSM	68.5	123	ePg	2:10:05.50	-.44
			iSg	10:15.90	.37
PKS8	70.1	58	ePg	2:10:06.60	.41
			eSg	10:16.90	.92
PKSC	101.3	24	eSn	2:10:23.90	-.08

Hypocentre Parameters

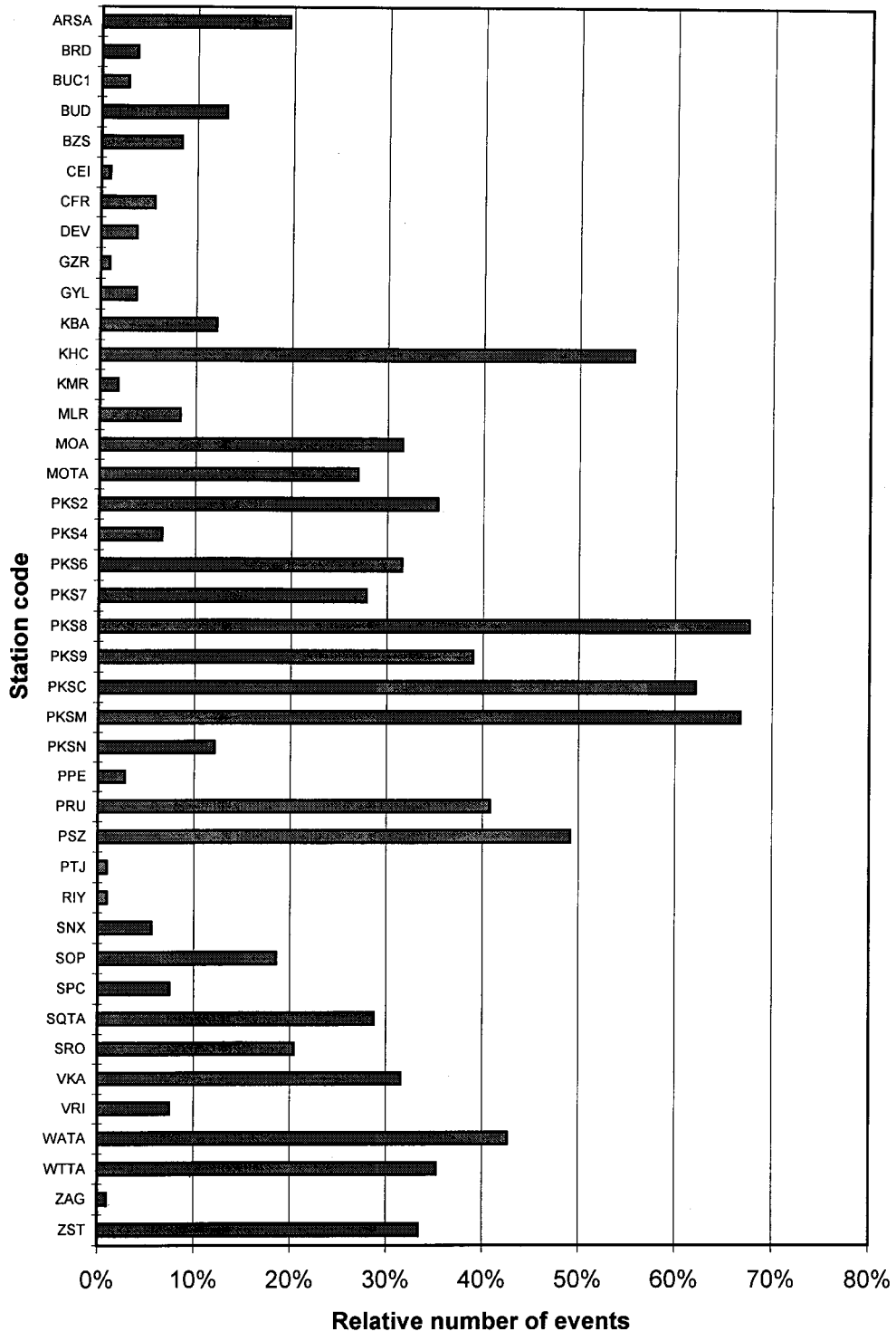


Figure 3.2. *Station contribution to the hypocentre determination.*

4.

SIGNIFICANT EARTHQUAKES IN 1997

(Earthquakes that was felt in Hungary)

3 March 1997	- Magyarpolány
17 June 1997	- Csorvás
16 July 1997	- Kóny
10 August 1997	- Lendva (Lendava, Slovenia)
27 November 1997	- Nyáregyháza

METHOD USED FOR ESTIMATION OF INTENSITY

The earthquake effects (macroseismic observations) are usually gathered on questionnaires. Based on these reports the intensity values were estimated by a computer algorithm (Zsíros et al, 1990 and Zsíros 1994).

The assigned intensities correspond to the *European Macroseismic Scale 1992 (EMS)* edited by Grünthal (1993). (APPENDIX A)

3 March 1997 - Magyarpolány

HYPOCENTRE PARAMETERS

Date:	1997/03/03
Origin Time:	14:33:00.4 UTC
Latitude and Longitude:	47.207N 17.590E (S.D. 5.3km)
Depth:	24.7 km (S.D. 5.6km)
Magnitude:	2.4 ML
Maximum Intensity:	4

DISCUSSION

On March 3rd, an earthquake with a magnitude of 2.4 ML was felt slightly at Magyarpolány, Ajka area, with a maximum intensity of 4 EMS.

The intensity distribution of the event is shown in Table 4.1. and Figure 4.2.

3 March 1997 - Magyarpolány

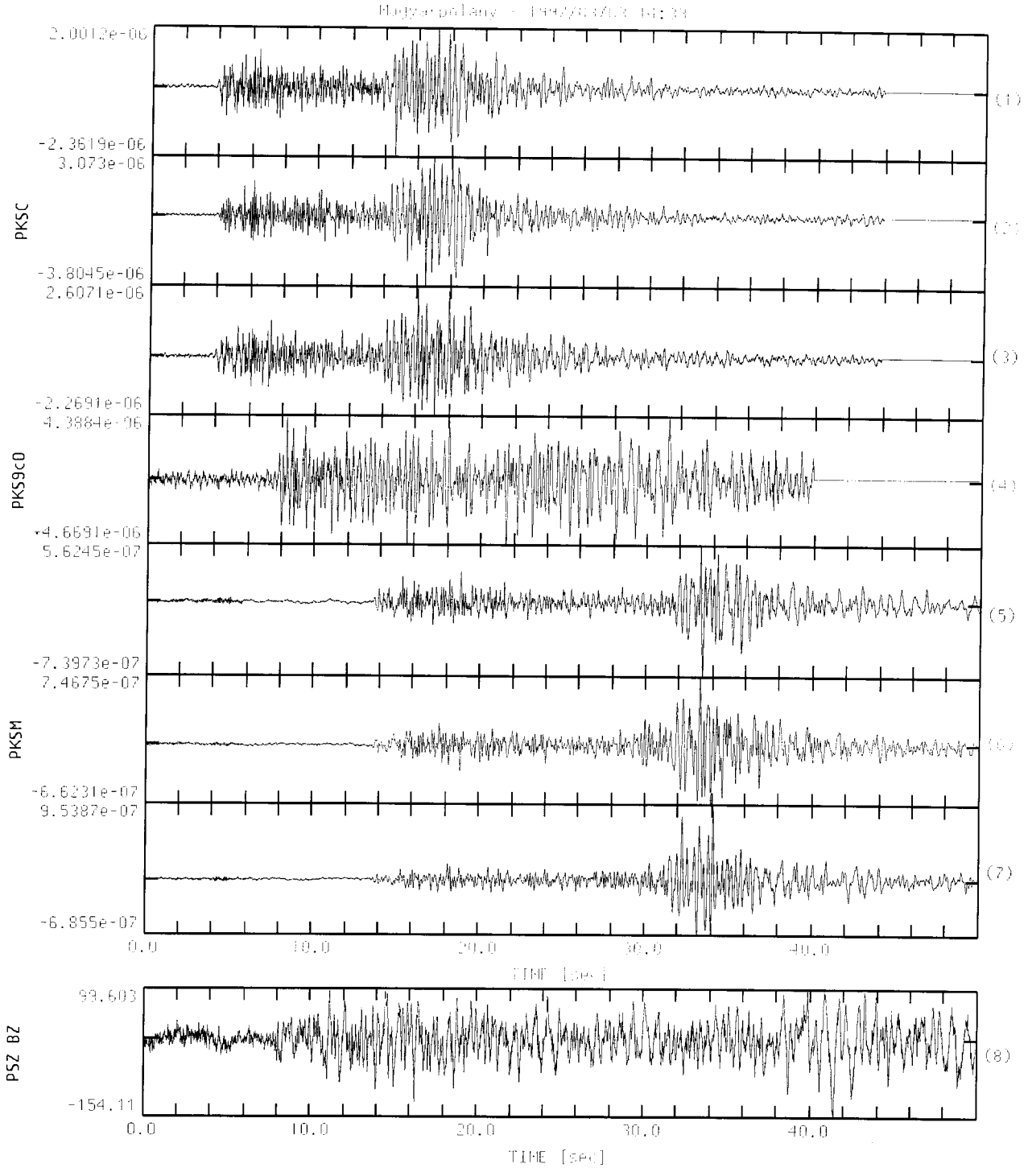


Figure 4.1. Seismograms of the Magyarpolány Earthquake 3rd March 1997, 14:33:00 UTC. (PKS9 vertical component, PKSc and PKSm three components, PSZ vertical component)
The vertical axis is ground velocity in m/s.

3 March 1997 - Magyarpolány

Table 4.1. *Intensity distribution of the Magyarpolány Earthquake 3rd March 1997, 14:33:00 UTC*

	Location	Coordinates	I	R	N
1	Ajka	47.099 N 17.553 E	.0	0.%	2
2	Devecser	47.104 N 17.437 E	.0	0.%	1
3	Halimba	47.036 N 17.539 E	.0	0.%	1
4	Herend	47.131 N 17.748 E	.0	0.%	2
5	Magyarpolány	47.167 N 17.550 E	4.0	47.%	1
6	Nyirád	47.008 N 17.457 E	.0	0.%	2
7	Padragkút	47.061 N 17.553 E	.0	0.%	1
8	Szentgál	47.113 N 17.738 E	.0	0.%	2
9	Városlőd	47.144 N 17.655 E	.0	0.%	2

I - intensity
R - relative reliability
N - number of reports

3 March 1997 - Magyarpolány

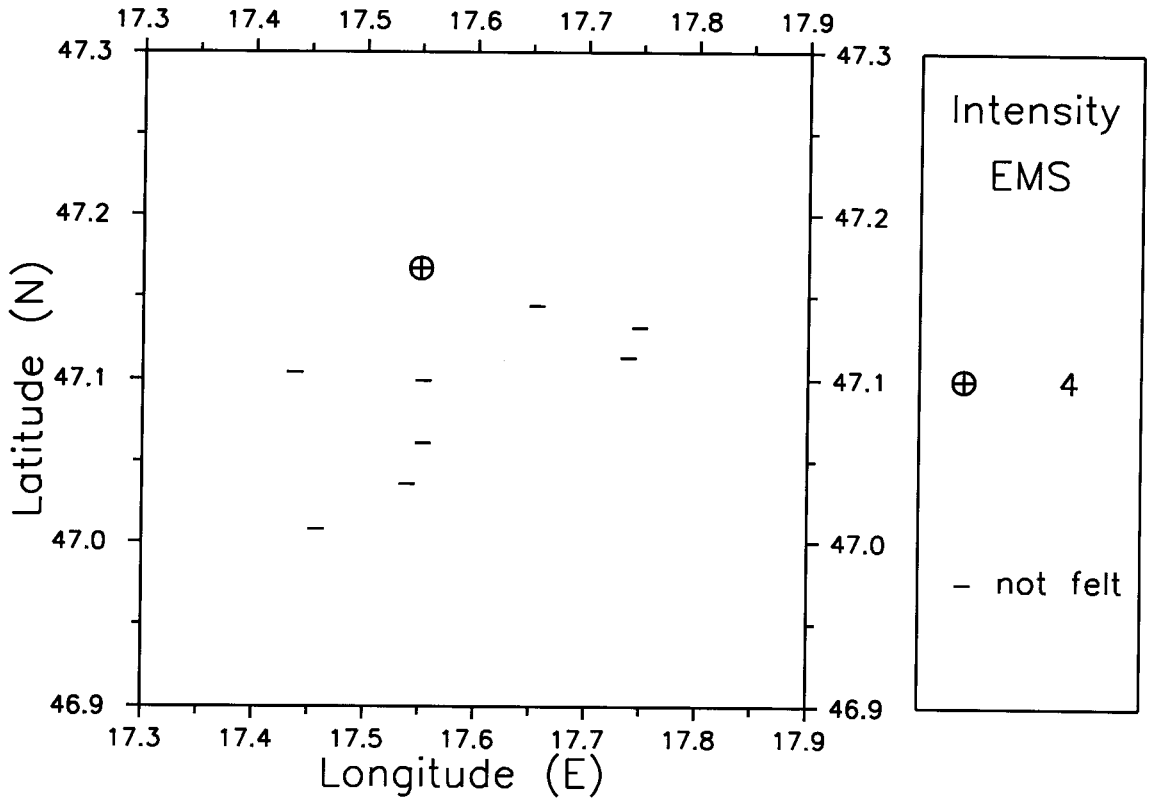


Figure 4.2. Intensity distribution of the Magyarpolány Earthquake 3rd March 1997, 14:33:00 UTC

17 June 1997 - Csorvás

HYPOCENTRE PARAMETERS

Date:	1997/06/17
Origin Time:	13:33:45.4 UTC
Latitude and Longitude:	46.456N 20.728E (S.D. 5.2km)
Depth:	10.0 km (S.D. 2.2km)
Magnitude:	3.1 ML
Maximum Intensity:	3-4

DISCUSSION

On June 17th, an earthquake with a magnitude of 3.1 ML, followed by a magnitude 2.5 aftershock some four hours later, was felt at Békés and Csorvás with a maximum intensity of 3-4 EMS.

The intensity distribution of the event is shown in Table 4.2. and Figure 4.4.

17 June 1997 - Csorvás

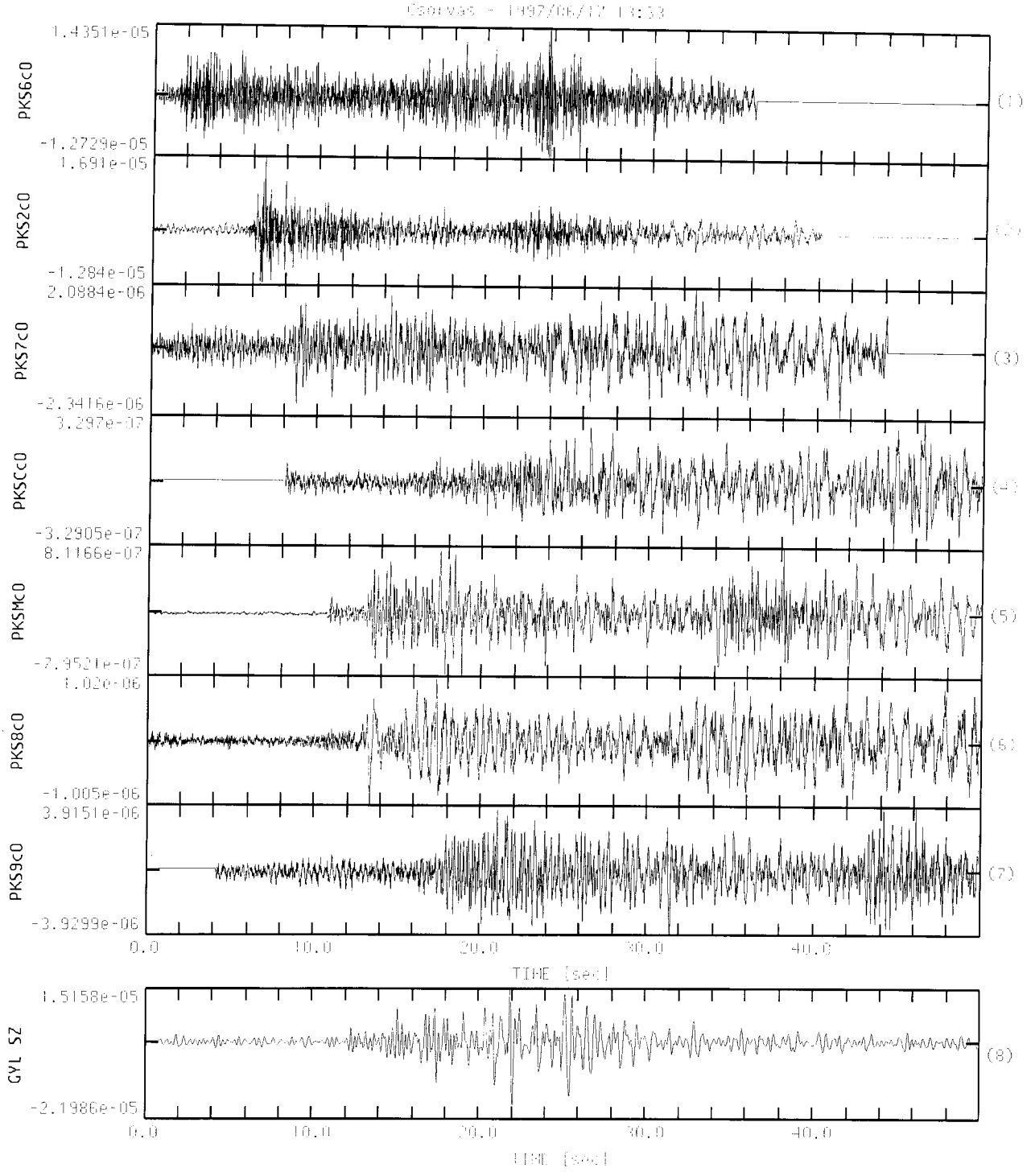


Figure 4.3. Seismograms of the Csorvás Earthquake 17th June 1997, 13:33:45 UTC (PKS6, PKS2, PKS7, PKSc, PKSm, PKS8, PKS9 and GYL vertical components)
The vertical axis is ground velocity in m/s.

Table 4.2. *Intensity distribution of the Csorvás Earthquake 17th June 1997, 13:33:45 UTC*

	Location	Coordinates	I	R	N
1	Békés	46.774 N 21.128 E	3.5	38.%	3
2	Békéscsaba	46.675 N 21.081 E	.0	0.%	2
3	Doboz	46.735 N 21.241 E	.0	0.%	1
4	Csorvás	46.631 N 20.824 E	3.5	35.%	2
5	Gádoros	46.665 N 20.593 E	.0	0.%	2
6	Gerendás	46.599 N 20.854 E	3.0	38.%	1
7	Gyula	46.644 N 21.275 E	.0	0.%	1
8	Kamut	46.762 N 20.974 E	.0	0.%	2
9	Kétegyháza	46.546 N 21.182 E	.0	0.%	1
10	Kétsoprony	46.718 N 20.882 E	.0	0.%	3
11	Kondoros	46.753 N 20.797 E	.0	0.%	2
12	Medgyesbodzás	46.520 N 20.953 E	.0	0.%	1
13	Medgyesegyháza	46.501 N 21.024 E	.0	0.%	2
14	Mezőberény	46.820 N 21.016 E	.0	0.%	2
15	Murony	46.762 N 21.029 E	.0	0.%	4
16	Nagyszénás	46.672 N 20.671 E	.0	0.%	1
17	Orosháza	46.562 N 20.668 E	2.5	44.%	2
18	Újkígyós	46.589 N 21.017 E	.0	0.%	2
19	Szabadkígyós	46.604 N 21.068 E	.0	0.%	1
20	Telekgerendás	46.666 N 20.952 E	.0	0.%	2

I - intensity
R - relative reliability
N - number of reports

17 June 1997 - Csorvás

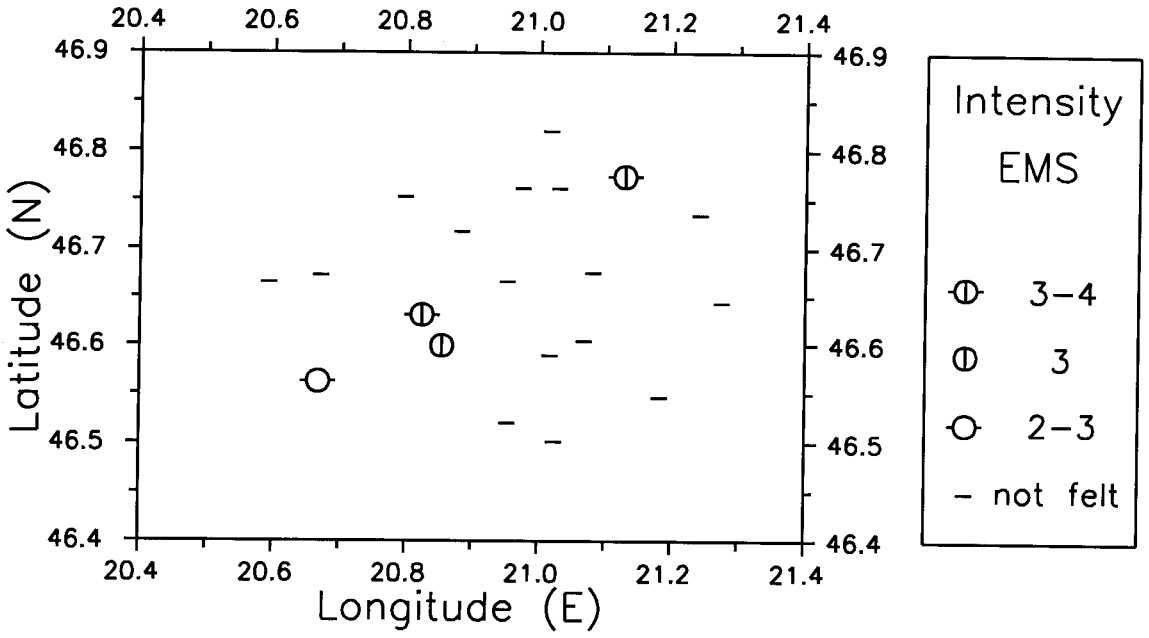


Figure 4.4. Intensity distribution of the Csorvás Earthquake 17th June 1997, 13:33:45 UTC

16 July 1997 - Kóny

HYPOCENTRE PARAMETERS

Date:	1997/07/16
Origin Time:	20:43:32.0 UTC
Latitude and Longitude:	47.783N 17.303E (S.D. 4.6km)
Depth:	10.0 km (S.D. 4.0km)
Magnitude:	2.8 ML
Maximum Intensity:	4

DISCUSSION

The Kóny earthquake of 16 July with a magnitude of 2.8 ML, preceeded by two smaller shocks with 1.4 and 1.0 ML, was felt over a small area of about 100 km^2. The macroseismic survey carried out at the time of the event resulted a maximum intensity of 4 at the epicentre.

The intensity distribution is shown in Table 4.3. and Figure 4.6.

16 July 1997 - Kóny

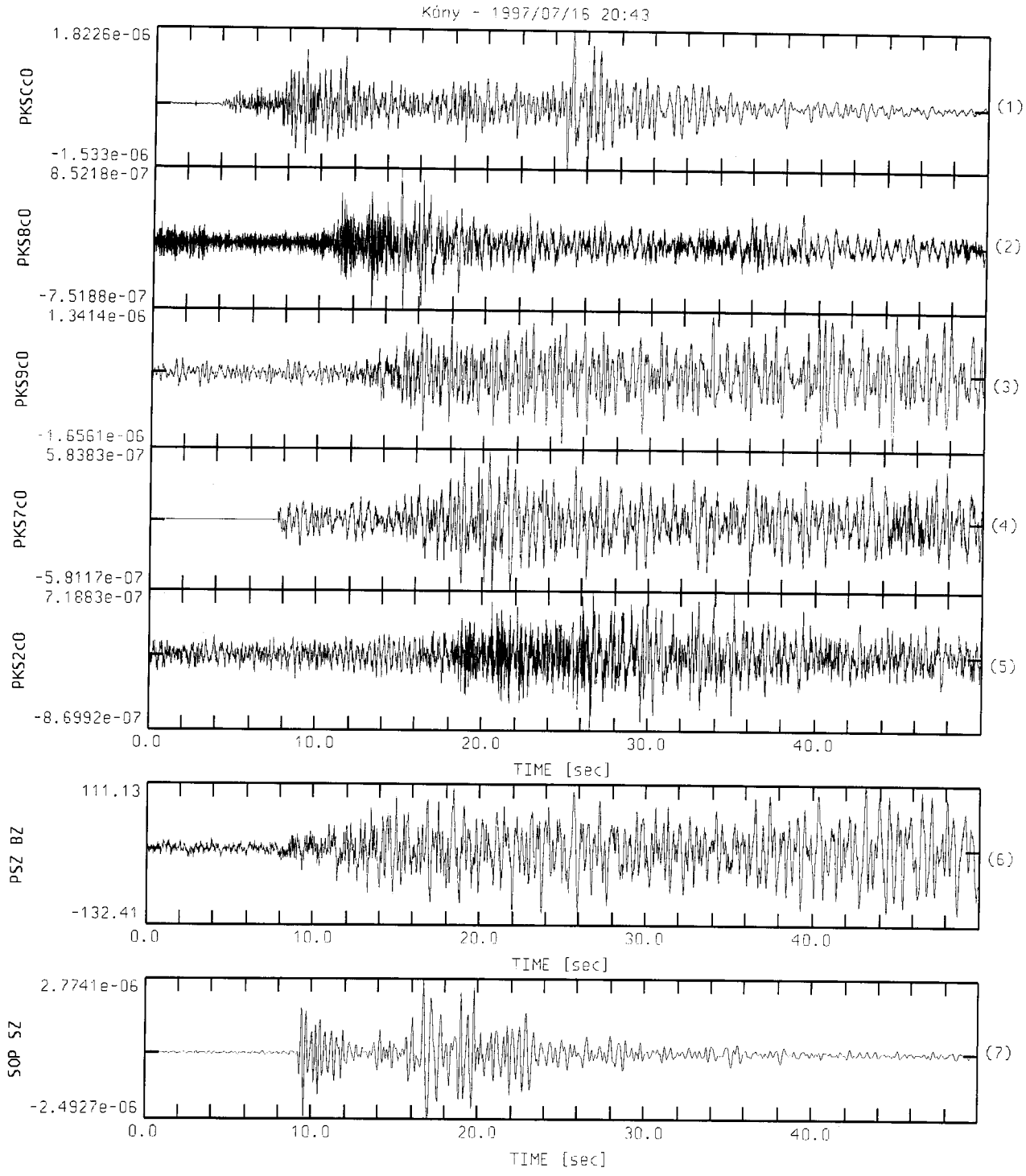


Figure 4.5. Seismograms of the Kóny Earthquake 16th July 1997, 20:43:32 UTC (PKSc, PKS8, PKS9, PKS7, PKS2, PSZ, SOP vertical components). The vertical axis is ground velocity in m/s.

Table 4.3. *Intensity distribution of the Kóny Earthquake 16th July 1997, 20:43:32 UTC*

	Location	Coordinates	I	R	N
1	Abda	47.698 N 17.549 E	.0	0.%	1
2	Acsalag	47.674 N 17.207 E	.0	0.%	1
3	Barbacs	47.647 N 17.303 E	.0	0.%	1
4	Bágyogszovát	47.584 N 17.372 E	.0	0.%	1
5	Bezi	47.673 N 17.396 E	.0	0.%	1
6	Bősárkány	47.688 N 17.256 E	3.0	38.%	2
7	Csorna	47.615 N 17.255 E	.0	0.%	1
8	Enese	47.645 N 17.429 E	.0	0.%	1
9	Győrsövényház	47.689 N 17.381 E	.0	0.%	1
10	Jánossomorja	47.782 N 17.138 E	.0	0.%	2
11	Kóny	47.631 N 17.366 E	4.0	48.%	1
12	Lébény	47.736 N 17.384 E	.0	0.%	1
13	Maglóca	47.662 N 17.283 E	.0	0.%	1
14	Mosonszentmiklós	47.731 N 17.431 E	.0	0.%	2
15	Osli	47.639 N 17.083 E	.0	0.%	1
16	Rábacsécsény	47.583 N 17.435 E	.0	0.%	2
17	Rábatamási	47.590 N 17.177 E	.0	0.%	1

I - intensity
R - relative reliability
N - number of reports

16 July 1997 - Kóny

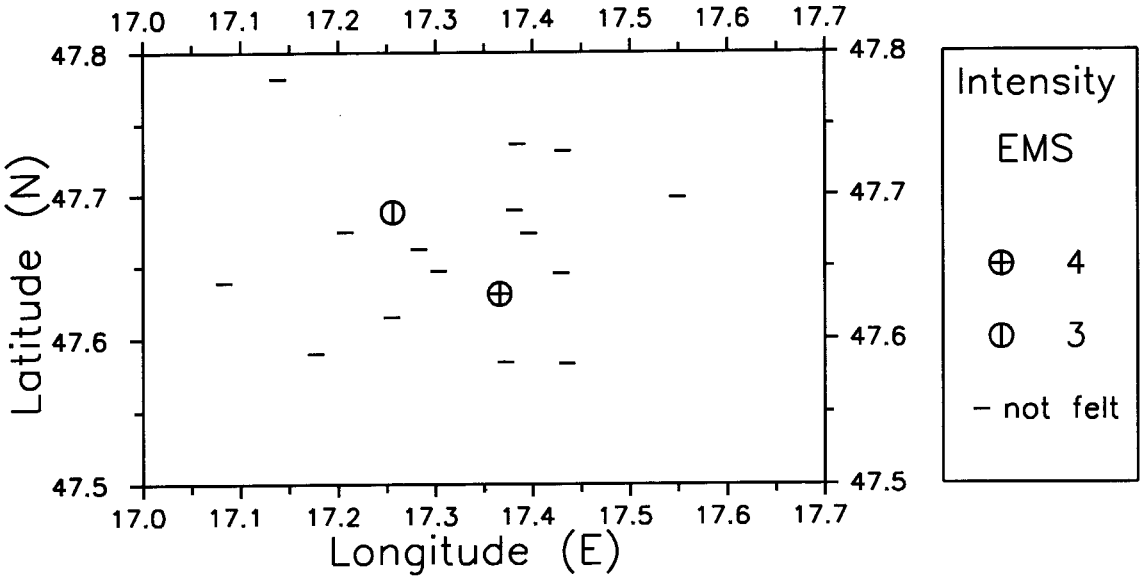


Figure 4.6. Intensity distribution of the Kóny Earthquake 16th July 1997, 20:43:32 UTC

10 August 1997 - Lendva (Lendava, Slovenia)

HYPOCENTRE PARAMETERS

Date:	1997/08/10
Origin Time:	10:48:26.9 UTC
Latitude and Longitude:	46.565N 16.331E (S.D. 4.2km)
Depth:	10.0 km (S.D. 4.7km)
Magnitude:	3.0 ML
Maximum Intensity:	5 (4 in Hungary)

DISCUSSION

The Lendva (Lendava, Slovenia) earthquake of 10 August had intensity 5 at the epicentral area and produced reports of intensity 3-4 EMS from the border region in Hungary. The area in which it was felt in Hungary was relatively small, just about 100-150 km^2.

The intensity distribution of the event (only in Hungary) is shown in Table 4.4. and Figure 4.8.

10 August 1997 - Lendva (Lendava, Slovenia)

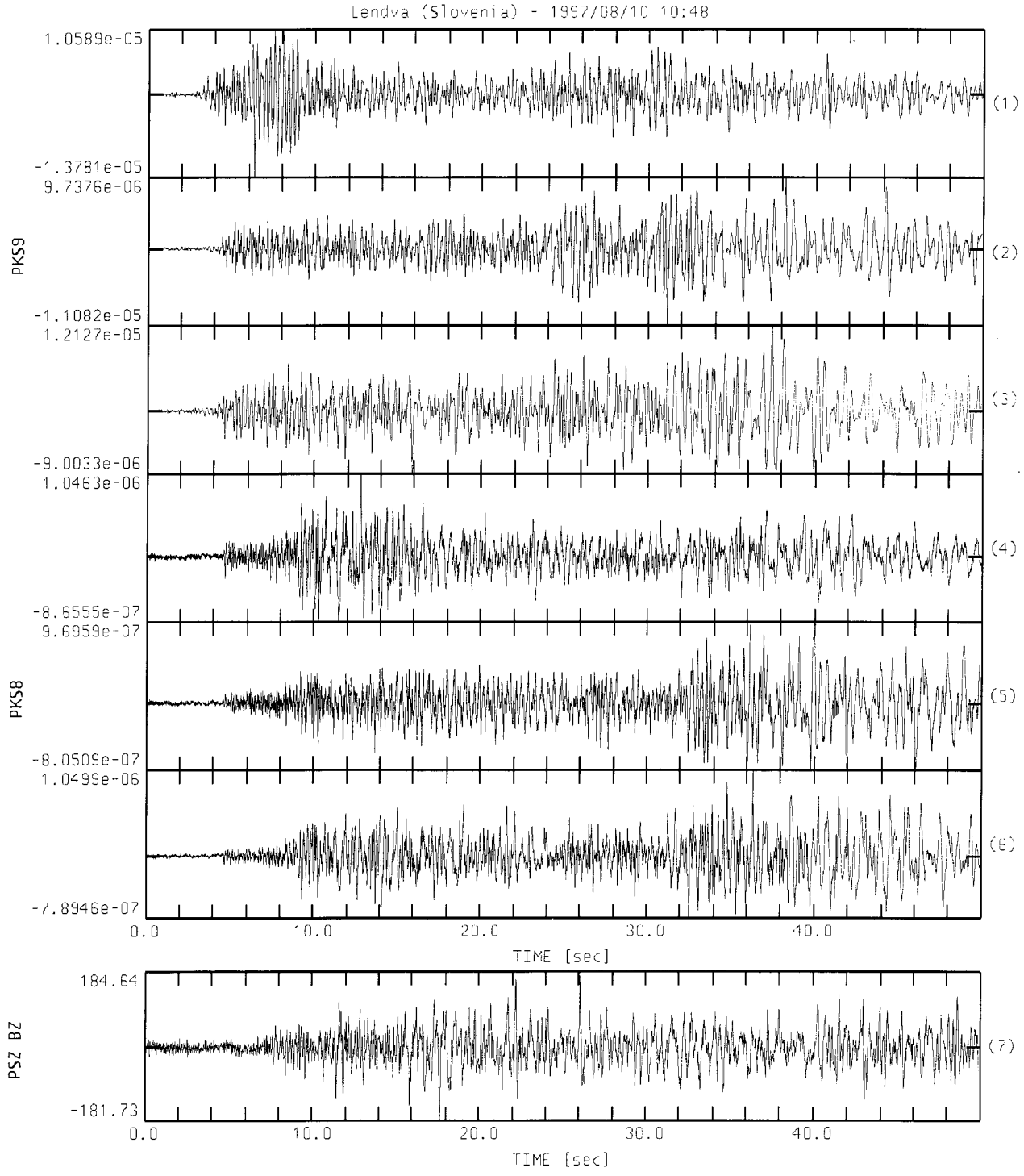


Figure 4.7. Seismograms of the Lendva (Lendava, Slovenia) Earthquake 10th August 1997, 10:48:27 UTC (PKS9 and PKS8 three components and PSZ vertical components).
The vertical axis is ground velocity in m/s.

10 August 1997 - Lendva (Lendava, Slovenia)

Table 4.4. *Intensity distribution of the Lendva (Lendava, Slovenia) Earthquake 10th August 1997, 10:48:27 UTC*

	Location	Coordinates	I	R	N
1	Bázakerettye	46.528 N 16.729 E	.0	0.%	1
2	Becsvölgye	46.764 N 16.687 E	.0	0.%	2
3	Csesztreg	46.719 N 16.517 E	.0	0.%	2
4	Dobri	46.513 N 16.581 E	.0	0.%	1
5	Gosztola	46.592 N 16.527 E	3.5	37.%	1
6	Gutorfölde	46.644 N 16.739 E	.0	0.%	2
7	Lendvadédes	46.585 N 16.510 E	.0	0.%	1
8	Letenye	46.433 N 16.724 E	.0	0.%	2
9	Lovászi	46.543 N 16.563 E	.0	0.%	2
10	Maróc	46.552 N 16.664 E	.0	0.%	1
11	Páka	46.595 N 16.646 E	.0	0.%	2
12	Resznek	46.667 N 16.474 E	.0	0.%	1
13	Rédics	46.622 N 16.472 E	4.0	26.%	2
14	Szentgyörgyvölgy	46.731 N 16.417 E	.0	0.%	1
15	Szécsisziget	46.574 N 16.589 E	3.5	45.%	2
16	Tornyiszentmiklós	46.514 N 16.555 E	3.5	42.%	2
17	Zalabaksa	46.707 N 16.553 E	.0	0.%	1
18	Zalatárnok	46.703 N 16.758 E	.0	0.%	2

I - intensity
R - relative reliability
N - number of reports

10 August 1997 - Lendva (Lendava, Slovenia)

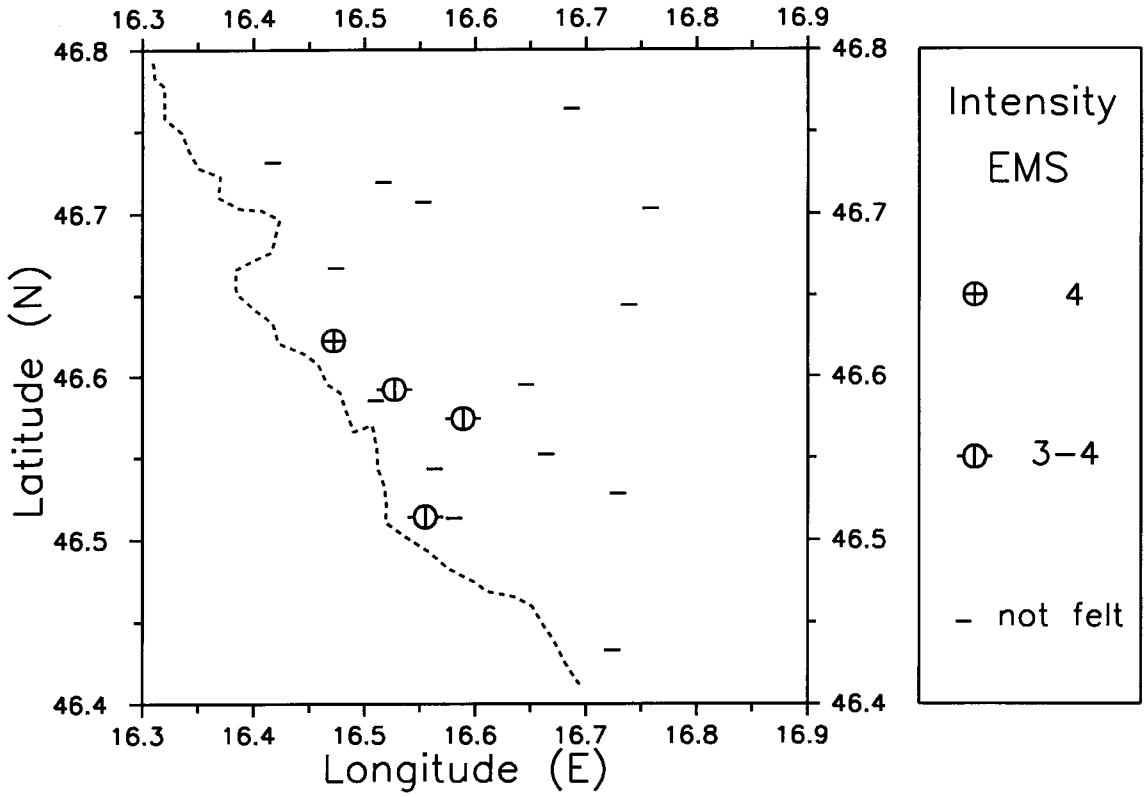


Figure 4.8. Intensity distribution of the Lendva (Lendava, Slovenia) Earthquake 10th August 1997, 10:48:27 UTC

27 November 1997 - Nyáregyháza

HYPOCENTRE PARAMETERS

Date:	1997/11/27
Origin Time:	10:40:56.9 UTC
Latitude and Longitude:	47.260N 19.385E (S.D. 1.1km)
Depth:	16.4 km (S.D. 1.0km)
Magnitude:	2.5 ML
Maximum Intensity:	3-4

DISCUSSION

On November 27th, an earthquake with a magnitude of 2.5 ML was felt over a small area of 100-150 km^2 (Monor area) with a maximum intensity of 3-4 EMS.

The intensity distribution of the event is shown in Table 4.5. and Figure 4.10.

27 November 1997 - Nyáregyháza

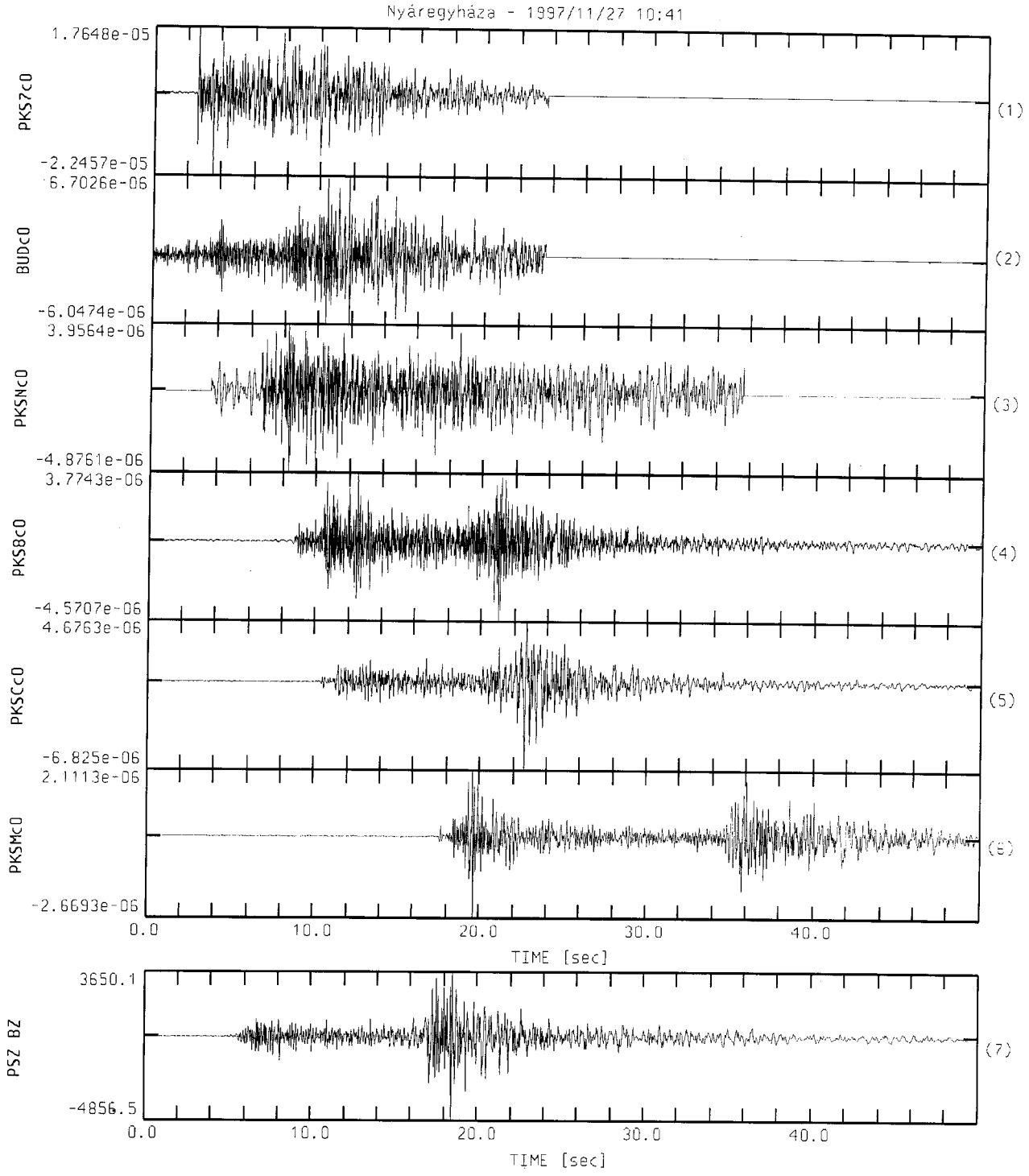


Figure 4.9. Seismograms of the Nyáregyháza Earthquake 27th November 1997, 10:40:57 UTC (PKS7, BUD, PKSn, PKS8, PKSc, PKSm and PSZ vertical components).
The vertical axis is ground velocity in m/s.

27 November 1997 - Nyáregyháza

Table 4.5. *Intensity distribution of the Nyáregyháza Earthquake 27th November 1997, 10:40:57 UTC*

	Location	Coordinates	I	R	N
1	Albertirsa	47.238 N 19.620 E	.0	0.%	2
2	Bénye	47.354 N 19.541 E	.0	0.%	1
3	Csévharaszt	47.292 N 19.422 E	3.5	38.%	1
4	Dabas	47.188 N 19.312 E	.0	0.%	2
5	Felsőpakony	47.343 N 19.238 E	.0	0.%	1
6	Gyömrő	47.429 N 19.393 E	.0	0.%	1
7	Inárcs	47.260 N 19.329 E	.0	0.%	1
8	Kakucs	47.246 N 19.358 E	3.0	32.%	2
9	Monor	47.349 N 19.440 E	.0	0.%	1
10	Nyáregyháza	47.263 N 19.497 E	3.5	40.%	2
11	Ócsa	47.300 N 19.229 E	.0	0.%	2
12	Pilis	47.286 N 19.545 E	.0	0.%	1
13	Tápiómság	47.404 N 19.615 E	.0	0.%	1
14	Újhartyán	47.222 N 19.384 E	3.0	33.%	2
15	Újlengyel	47.234 N 19.444 E	3.5	36.%	1
16	Úri	47.416 N 19.520 E	.0	0.%	2
17	Üllő	47.386 N 19.343 E	.0	0.%	2
18	Vecsés	47.408 N 19.264 E	.0	0.%	2

I - intensity
R - relative reliability
N - number of reports

27 November 1997 - Nyáregyháza

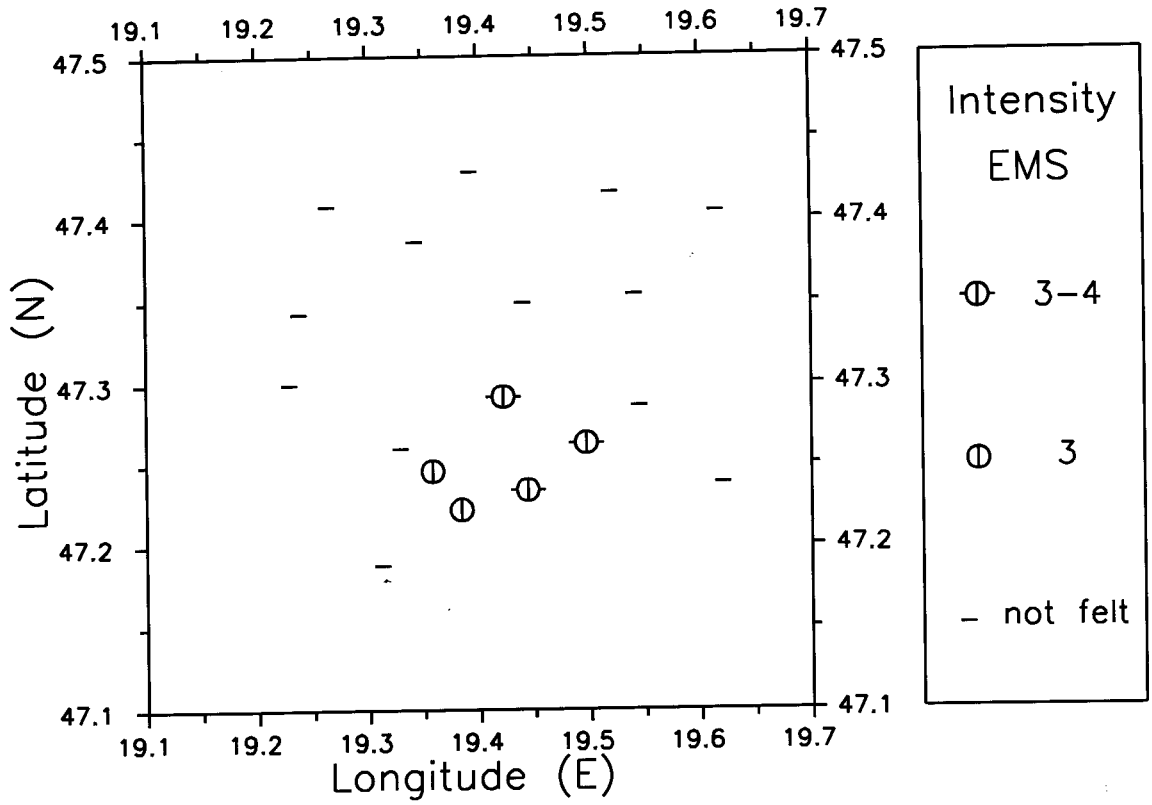


Figure 4.10. Intensity distribution of the Nyáregyháza Earthquake 27th November 1997, 10:40:57 UTC

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APPENDIX A

EUROPEAN MACROSEISMIC SCALE (EMS)

EMS INTENSITY SCALE

1 ☛ Not felt
Not felt, even the most favourable circumstances.

2 ☛ Scarcely felt
Vibration is felt only by individual people at rest in houses, especially on upper floors of buildings.

3 ☛ Weak
The vibration is weak and is felt indoors by a few people. People at rest feel a swaying or light trembling.

4 ☛ Largely observed
The earthquake is felt indoors by many people, outdoors by very few. A few people are awakened. The level of vibration is not frightening. Windows, doors and dishes rattle. Hanging objects swing.

5 ☛ Strong
The earthquake is felt indoors by most, outdoors by few. Many sleeping people awake. A few run outdoors. Buildings tremble throughout. Hanging objects swing considerably. China and glasses clatter together. The vibration is strong. Top heavy objects topple over. Doors and windows swing open or shut.

6 ☛ Slightly damaging
Felt by most indoors and many outdoors. Many people in buildings are frightened and run outdoors. Small objects fall. Slight damage to many ordinary buildings eg. fine cracks in plaster and small pieces of plaster fall.

7 ☛ Damaging
Most people are frightened and run outdoors. Furniture is shifted and objects fall from shelves in large numbers. Many ordinary buildings suffer moderate damage: small cracks in walls, partial collapse of chimneys.

8 ☛ Heavily damaging
Furniture may be overturned. Many ordinary buildings suffer damage: chimneys fall, large cracks appear in walls and few buildings may partially collapse.

9 ☛ Destructive
Monuments and columns fall or are twisted. Many ordinary buildings partially collapse and few collapse completely.

10 ☛ Very destructive
Many ordinary buildings collapse.

11 ☛ Devastating
Most ordinary buildings collapse.

12 ☛ Completely devastating
Practically all structures above and below ground are heavily damaged or destroyed.

(For details see Grünthal, 1993)

APPENDIX B

SIGNIFICANT EARTHQUAKES OF THE WORLD

1997

Earthquakes of magnitude 6.5 or greater or ones that caused fatalities, injuries or substantial damage.

Source: U.S. Geological Survey
National Earthquake Information Center
(http://**wwwneic.cr.usgs.gov/neis/eqlists/eqlists.html**)

Significant Earthquakes of the World, 1997

January 22, 1998

DATE	ORIGIN TIME UTC HR MN SEC	GEOGRAPHIC COORDINATES LAT	LONG	DEPTH	MAGNITUDES GS MB	Msz	SD	NO. STA USED	REGION, CONTRIBUTED MAGNITUDES AND COMMENTS
JAN 05	08 47 25.4	29.845 N	80.532 E	33 N	5.6	5.3	0.9	232	NEPAL-INDIA BORDER REGION. Mw 5.4 (GS), 5.6 (HRV). Mo=1.3*10**17 Nm (GS). Mo=2.8*10**17 Nm (HRV). Many houses damaged in western Nepal. Felt at Baitadi and Dandeldhura.
JAN 09	13 43 31.5	41.026 N	74.284 E	22 D	5.7	5.8	1.0	376	KYRGYZSTAN. Mw 5.7 (GS), 5.7 (HRV). Mo=4.5*10**17 Nm (GS). Mo=4.5*10**17 Nm (HRV). At least 10 houses destroyed and 400 others damaged in the Dzhergetal area. Felt (V) at Uzgen, (IV) at Osh and (III) at Bishkek. Also felt (III) at Almaty, Kazakhstan.
JAN 11	20 28 26.0	18.219 N	102.756 W	33 N	6.5	6.9	1.1	354	MICHOACAN, MEXICO. Mw 7.1 (GS), 7.1 (HRV). Me 7.0 (GS). Es=7.5*10**14 Nm (GS). Mo=5.5*10**19 Nm (GS). Mo=5.3*10**19 Nm (HRV). Mo=7.5*10**19 Nm (PPT). One person killed and extensive damage in the Arteaga area, Michoacan. Felt strongly in much of Michoacan and at Mexico City. Also felt in the states of Colima, Guerrero and Jalisco.
JAN 12	12 10 51.3	40.956 N	19.672 E	10 G	4.8	4.7	1.3	195	ALBANIA. ML 4.6 (ROM), 4.4 (THE). More than 70 houses damaged in the Berat District. Damage at Ura Vajgurore. Felt (VI) at Berat and Gramsh; (V) at Cerrik and Elbasan; (IV) at Kavaje, Tepelene and Vlore.
JAN 21	01 48 30.1*	39.474 N	76.998 E	33 N	5.3	5.8	1.3	42	SOUTHERN XINJIANG, CHINA. Mw 5.9 (HRV). Mo=7.7*10**17 Nm (HRV). At least 12 people killed, 40 injured, and 2,500 families homeless; about 14,000 homes destroyed, 17,000 additional homes damaged and 3,360 head of livestock killed in the Jiashi area. Felt at Aksu, Akto, Artux, Kashgar, Kashi and Wuqia.
JAN 23	02 15 23.3	21.954 S	65.579 W	275 D	6.3		1.1	255	SOUTHERN BOLIVIA. Mw 7.1 (GS), 7.1 (HRV). Mo=4.3*10**19 Nm (GS). Mo=5.7*10**19 Nm (HRV). Mo=1.6*10**20 Nm (PPT). Felt (V) at Antofagasta, Calama and Tocopilla; (III) at Arica, Chile.
FEB 04	10 37 47.1	37.661 N	57.291 E	10 G	5.9	6.8	1.1	338	TURKMENISTAN-IRAN BORDER REGION. Mw 6.4 (GS), 6.5 (HRV). Mo=5.3*10**18 Nm (GS). Mo=6.4*10**18 Nm (HRV). At least 88 people killed, nearly 2,000 injured, about 5,500 houses destroyed and 11,000 houses damaged in the Bojnurd-Shirvan area, Iran. Damage estimated at more than 30 million U.S. dollars. Felt in many parts of northeastern Iran, including Esfarayen, Mashhad, Neyshabur, Quchan, and Sabzevar.
FEB 27	21 08 02.3	29.976 N	68.208 E	33 N	6.3	7.3	1.2	362	PAKISTAN. Mw 6.9 (GS), 7.1 (HRV). Me 6.6 (GS). Es=1.8*10**14 Nm (GS). Mo=2.8*10**19 Nm (GS). Mo=4.3*10**19 Nm (HRV). Mo=3.2*10**19 Nm (PPT). At least 57 people killed, hundreds injured, more than 500 houses damaged or destroyed, thousands homeless and hundreds of livestock killed in the Harnai-Sibi area. Roads and railroads blocked by landslides in the Harnai-Sibi area. Three people killed and several injured in the Quetta area. Felt throughout much of central Baluchistan.
FEB 28	12 57 18.6	38.075 N	48.050 E	10 G	5.5	6.1	1.1	315	ARMENIA-AZERBAIJAN-IRAN BORD REG. Mw 6.0 (GS), 6.1 (HRV). Mo=1.3*10**18 Nm (GS). Mo=1.6*10**18 Nm (HRV). At least 965 people killed, 2,600 injured, 36,000 homeless, 12,000 houses damaged or destroyed and 160,000 livestock killed in the Ardabil area of northwestern Iran. Severe damage to roads, electrical power lines, communications and water distribution systems in the Ardabil area.
MAR 01	06 04 14.1	39.422 N	76.839 E	22 D	5.2	5.5	1.1	246	SOUTHERN XINJIANG, CHINA. Two people killed, six injured, 4,000 houses destroyed and 738 cattle killed in Jiashi County. Also felt at Kashi.
MAR 04	03 51 25.8	34.892 N	139.038 E	10 G	5.3	5.3	1.2	196	NEAR S. COAST OF HONSHU, JAPAN. Three people injured at Ito. Felt (IV JMA) at Ito, (III JMA) at Yokohama and Yokosuka, (II JMA) at Tokyo and (I JMA) at Kofu and Urawa.
MAR 04	13 03 47.8	29.422 N	68.790 E	33 N	5.4	5.8	1.1	275	PAKISTAN. Mw 5.7 (GS), 5.7 (HRV). Mo=4.6*10**17 Nm (GS). Mo=4.5*10**17 Nm (HRV). At least one person injured and additional damage at Sibi. Felt at Quetta.
MAR 06	15 16 32.0	5.518 N	0.313 W	10 G	4.4		0.7	46	NORTHWEST AFRICA. Seven people injured in the Accra area, Ghana.
MAR 11	19 22 00.1	7.742 N	127.647 E	10 G	6.3	6.7	1.2	210	PHILIPPINE ISLANDS REGION. Mw 6.8 (GS), 6.9 (HRV). Mo=1.5*10**19 Nm (GS). Mo=2.9*10**19 Nm (HRV). Mo=6.7*10**19 Nm (PPT). Some damage to buildings in the Cagayan de Oro area. Felt (V RF) at Bislig; (IV RF) at Cagayan de Oro and Davao; (III RF) at Surigao; (II RF) at General Santos.
MAR 16	05 51 37.0	34.851 N	137.445 E	36 D	5.7	5.1	0.8	339	NEAR S. COAST OF HONSHU, JAPAN. Mw 5.7 (HRV). Mo=4.2*10**17 Nm (HRV). At least 4 people injured at Toyohashi. Felt (V JMA) at Toyohashi and (IV JMA) Hikone,

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									Mino-kamo, Nagoya, Omi-Hachiman and Shimada. Also felt slightly at Tokyo.
MAR 19	19 57 11.9	34.872 N	71.620 E	50 G	4.9	0.8	88		PAKISTAN. Fifteen people killed, several others injured and damage to houses in the Bajaur region. Felt at Chitral.
MAR 20	08 50 40.3	30.136 N	68.022 E	33 N	5.5 5.8	1.0	264		PAKISTAN. Mw 5.7 (GS), 5.9 (HRV). Mo=4.1*10**17 Nm (GS). Mo=8.1*10**17 Nm (HRV). At least three people injured and additional damage to houses in the Harnai area.
MAR 26	02 08 57.2	51.277 N	179.533 E	33 N	6.0 6.5	1.0	434		RAT ISLANDS, ALEUTIAN ISLANDS. Mw 6.6 (GS), 6.7 (HRV). Me 6.1 (GS). ML 6.3 (PMR). Es=2.8*10**13 Nm (GS). Mo=7.7*10**18 Nm (GS). Mo=1.2*10**19 Nm (HRV). Mo=2.0*10**19 Nm (PPT).
MAR 26	08 31 47.1	31.920 N	130.429 E	10 G	5.6 5.9	1.3	275		KYUSHU, JAPAN. Mw 6.1 (GS), 6.1 (HRV). Mo=1.7*10**18 Nm (GS). Mo=1.6*10**18 Nm (HRV). At least 22 people injured, damage to many houses and landslides in Kagoshima Prefecture. Railway services interrupted in Kagoshima Prefecture and airports temporarily closed at Kagoshima Kumamoto and Miyazaki. Felt (VI JMA) at Akune, Togomachi and Tsuruda; (V JMA) at Miyanojo and Sendai; (IV JMA) at Hitoyoshi, Miyakonojo, Okuchi and Yatsushiro; (III JMA) at Kurume, Makurazaki, Miyazaki, Oita and Saga. Felt (IV JMA) at Ushibuka, Amakusa-Shimo-jima. Also felt in much of Shikoku and parts of western Honshu. several buildings damaged, landslides and roads damaged in the Kagoshima Prefecture. Felt (VI JMA) at Sendai; (V JMA) at Akune and Miyanojo. Also felt at Kumamoto and Miyazaki.
APR 02	19 33 22.2	31.824 N	130.089 E	10 G	5.1 5.0	1.4	120		KYUSHU, JAPAN. At least four people injured, five buldings damaged, landslides and road damage in Kagoshima Prefecture. Felt (V JMA) at Akune, Miyanojo and Sendai. Felt in parts of Kumamoto and Miyazaki Prefectures.
APR 05	12 23 30.5	6.485 S	147.408 E	69 D	6.1	0.9	365		EASTERN NEW GUINEA REG., P.N.G. Mw 6.4 (GS), 6.5 (HRV). Mo=5.3*10**18 Nm (GS). Mo=5.5*10**18 Nm (HRV).
APR 05	23 46 19.5	39.513 N	76.865 E	33 N	5.4 5.9	1.1	335		SOUTHERN XINJIANG, CHINA. Mw 5.9 (GS), 5.9 (HRV). Mo=8.9*10**17 Nm (GS). Mo=7.1*10**17 Nm (HRV). At least 23 people injured, 3,000 buildings damaged or destroyed and 100 head of livestock killed in Jiashi County by this earthquake and the event on April 6, 1997 at 04:36:35 UTC.
APR 06	04 36 35.2	39.537 N	76.998 E	33 N	5.6 5.8	1.0	374		SOUTHERN XINJIANG, CHINA. Mw 5.9 (GS), 5.9 (HRV). Mo=7.7*10**17 Nm (GS). Mo=8.1*10**17 Nm (HRV). At least 23 people injured, 3,000 buildings damaged or destroyed and 100 head of livestock killed in Jiashi County by this earthquake and the event on April 5, 1997 at 23:46:19 UTC.
APR 08	18 07 09.5	18.315 N	120.953 E	71 D	6.0	1.0	335		LUZON, PHILIPPINE ISLANDS. Mw 5.9 (GS), 5.9 (HRV). Mo=6.9*10**17 Nm (GS). Mo=7.4*10**17 Nm (HRV>). Felt in the Laoag area.
APR 11	05 34 42.7	39.527 N	76.941 E	15 G	5.8 6.1	1.0	433		SOUTHERN XINJIANG, CHINA. Mw 6.1 (GS), 6.1 (HRV). Me 5.8 (GS). Es=9.7*10**12 Nm (GS). Mo=1.4*10**18 Nm (GS). Mo=1.6*10**18 Nm (HRV). At least 9 people killed, 89 injured, 11,000 livestock killed, thousands of buildings destroyed and 100,000 people homeless in Jiashi County. Felt in Bachu, Shule, Yingjisha and Yuehpuhu Counties. This is the largest earthquake to date in a swarm of large strike-slip and normal faulting events which began on January 21, 1997.
APR 15	18 19 10.1	39.634 N	76.992 E	23 D	5.4 5.8	1.1	339		SOUTHERN XINJIANG, CHINA. Mw 5.7 (GS), 5.9 (HRV). Mo=3.8*10**17 Nm (GS). Mo=8.3*10**17 Nm (HRV). One person injured and some buildings destroyed in Jiashi County.
APR 21	12 02 26.4	12.584 S	166.676 E	33 N	6.4 7.9	0.9	299		SANTA CRUZ ISLANDS. Mw 7.5 (GS), 7.8 (HRV). Me 7.4 (GS). Ms 7.9 (BRK). Es=3.2*10**15 Nm (GS). Mo=2.3*10**20 Nm (GS). Mo=5.7*10**20 Nm (HRV). Mo=7.0*10**20 Nm (PPT). Local tsunami generated with wave heights up to 3 meters along the coasts of the Solomon and Vanuatu Islands causing damage to some houses.
APR 22	09 31 23.2	11.112 N	60.892 W	5 G	6.0 6.5	0.9	330		WINDWARD ISLANDS. Mw 6.7 (GS), 6.7 (HRV). Me 6.1 (GS). Ms 6.5 (BRK). Es=2.7*10**13 Nm (GS). Mo=1.1*10**19 Nm (GS). Mo=1.2*10**19 Nm (HRV). Mo=1.1*10**19 Nm (PPT). Two people injured, three houses destroyed and extensive damage in the western part of Tobago. Damage estimated at more than 150 million TT dollars. One of the largest known earthquakes to occur in or near Trinidad and Tobago. Seismicity at this triple junction zone is the result of highly oblique, right-lateral collision between the Caribbean and South American plates and subduction of the North American plate beneath the Caribbean plate.
APR 23	19 44 28.4	13.986 N	144.901 E	101 D	6.2	1.0	309		MARIANA ISLANDS. Mw 6.5 (GS), 6.5 (HRV). Mo=7.0*10**18 Nm (GS). Mo=6.5*10**18 Nm (HRV). Four people injured and some damage to buildings on Guam. Felt (VII) at Inarajan, Merizo and Yona; (IV) at Dededo and Yigo, Guam. Felt

										strongly on Rota, Saipan and Tinian.
APR 28	12 07 37.8	42.504 S	42.686 E	10 G	5.7	6.3	1.1	163	PRINCE EDWARD ISLANDS REGION. Mw 6.5 (GS), 6.8 (HRV). Mo=7.1*10**18 Nm (GS). Mo=1.5*10**19 Nm (HRV). Mo=3.5*10**19 Nm (PPT).
MAY 01	11 37 36.1	18.993 N	107.350 W	33 N	6.1	6.8	1.2	344	OFF COAST OF JALISCO, MEXICO. Mw 7.1 (GS), 6.9 (HRV). Me 7.1 (GS). Es=8.6*10**14 Nm (GS). Mo=4.5*10**19 Nm (GS). Mo=2.8*10**19 Nm (HRV). Felt along the coast of Jalisco.
MAY 03	16 46 02.0	31.971 S	179.382 W	108 D	6.6		1.1	465	KERMADEC ISLANDS REGION. Mw 6.9 (GS), 6.9 (HRV). Me 6.8 (GS). Es=3.0*10**14 Nm (GS). Mo=2.5*10**19 Nm (GS). Mo=2.7*10**19 Nm (HRV).
MAY 08	02 53 14.7	24.894 N	92.250 E	35 D	5.6	5.6	1.0	297	INDIA-BANGLADESH BORDER REGION. Mw 6.0 (GS), 5.9 (HRV). Mo=1.2*10**18 Nm (GS). Mo=8.9*10**17 Nm (HRV). Several people injured and some damage to older buildings at Sylhet, Bangladesh. Felt in much of Bangladesh. Also felt in parts of Assam, Meghalaya and Tripura, India.
MAY 10	07 57 29.7	33.825 N	59.809 E	10 G	6.4	7.3	1.1	381	NORTHERN IRAN. Mw 7.1 (GS), 7.2 (HRV). Me 7.5 (GS). Ms 7.2 (BRK). Es=3.7*10**15 Nm (GS). Mo=5.4*10**19 Nm (GS). Mo=7.7*10**19 Nm (HRV). At least 1,567 people killed, 2,300 injured, 50,000 homeless, 10,533 houses destroyed, 5,474 houses damaged and landslides in the Birjand-Qayen area. Five people killed and some damage in the Herat area, Afghanistan. Felt in the Kerman, Khorasan, Semnan, Sistan va Baluchestan and Yazd regions of Iran. This earthquake occurred on the Abiz fault, as confirmed by field work of Manuel Berberian. This fault is north of the collision zone between the Arabian and Eurasian plates. The region of the Abiz fault is comprised of several microplates and is tectonically very active. The most notable regional earthquake was the Dasht-e-Bayez earthquake (magnitude 7.3) of 1968, which resulted in 12,000-20,000 deaths. Both the Abiz and Dasht-e-Bayez earthquakes showed left-laterial, strike-slip faulting.
MAY 11	22 16 13.9	36.383 S	97.703 W	10 G	5.6	5.8	1.3	99	WEST CHILE RISE. Mw 6.4 (GS), 6.5 (HRV). Mo=4.2*10**18 Nm (GS). Mo=5.4*10**18 Nm (HRV).
MAY 13	05 38 30.2	31.824 N	130.281 E	33 N	5.6	5.8	1.3	241	KYUSHU, JAPAN. Mw 6.1 (GS), 6.1 (HRV). Mo=1.6*10**18 Nm (GS). Mo=1.4*10**18 Nm (HRV). Thirty-four people injured and five houses damaged (VI JMA) in the Sendai area. Felt as far as Fukuoka. Landslides occurred in Kagoshima Prefecture.
MAY 13	11 42 21.4	33.465 N	59.894 E	10 G	4.5	4.0	1.2	47	NORTHERN IRAN. One person killed and ten houses destroyed at Khunik Sar. Also felt at Birjand and Qaen.
MAY 13	14 13 45.7	36.411 N	70.945 E	196 D	6.1		1.0	460	HINDU KUSH REGION, AFGHANISTAN. Mw 6.5 (GS), 6.4 (HRV). Mo=5.5*10**18 Nm (GS). Mo=4.8*10**18 Nm (HRV). One person killed and eleven injured in the Malakand-Peshawar area, Pakistan. One person injured at northern Pakistan and at Srinagar, Kashmir. Felt strongly throughout northeastern Afghanistan, northern Pakistan and Tajikistan. Felt as far as Himachal Pradesh and Delhi, India.
MAY 17	03 58 23.7	39.525 N	76.974 E	33 N	4.9	4.9	0.9	194	SOUTHERN XINJIANG, CHINA. One person injured at Jiashi.
MAY 21	14 10 26.2	20.438 S	169.287 E	57 G	5.9	6.5	1.2	255	VANUATU ISLANDS. Mw 6.7 (GS), 6.7 (HRV). Me 6.1 (GS). Es=3.1*10**13 Nm (GS). Mo=1.2*10**19 Nm (GS). Mo=1.1*10**19 Nm (HRV). Mo=2.3*10**19 Nm. (PPT).
MAY 21	22 51 28.7	23.083 N	80.041 E	36 G	6.0	5.6	1.0	242	SOUTHERN INDIA. Mw 5.8 (GS), 5.8 (HRV). Me 5.6 (GS). Es=5.1*10**12 Nm (GS). Mo=5.2*10**17 Nm (GS). Mo=5.4*10**17 Nm (HRV). At least 38 people killed, more than 1,000 injured and extensive damage in the Jabalpur area.
MAY 21	23 50 43.5	42.881 N	7.193 W	19 D	5.3	4.9	1.1	172	SPAIN. ML 5.6 (LDG). mbLg 5.3 (MDD). One person died from a heart attack; some minor damage in the Galicia region. Also felt in northern Portugal.
MAY 22	07 50 53.5	18.684 N	101.604 W	70 G	5.9	6.0	1.0	259	GUERRERO, MEXICO. Mw 6.6 (HRV), 6.5 (GS). Mo=6.4*10**18 Nm (GS). Mo=9.1*10**18 Nm (HRV). Mo=4.9*10**18 Nm (PPT). Many houses damaged at Arteaga and a church damaged at Patzcuaro, Michoacan. Felt strongly at Lazaro Cardenas, Michoacan. Also felt at Mexico City.
MAY 25	23 22 33.1	32.115 S	179.791 E	333 D	6.2		1.2	256	SOUTH OF KERMADEC ISLANDS. Mw 7.1 (HRV), 7.0 (GS). Mo=3.8*10**19 Nm (GS). Mo=4.7*10**19 Nm (HRV). Mo=1.1*10**20 Nm (PPT). Felt strongly on Raoul Island. Felt throughout the North Island and as far south as Christchurch on the South Island, New Zealand.
MAY 29	17 02 38.7	35.964 S	102.511 W	10 G	5.6	6.1	1.0	148	SOUTHERN PACIFIC OCEAN. Mw 6.5 (HRV), 6.4 (GS). Mo=5.0*10**18 Nm (GS). Mo=6.2*10**18 Nm (HRV). Mo=6.4*10**18 Nm (PPT).
JUN 06	09 54 02.7	29.996 S	71.672 W	33 N	5.7	6.5	1.0	90	NEAR COAST OF CENTRAL CHILE. Mw 6.8 (HRV), 6.7 (GS). Me 6.4 (GS). Es=8.7*10**13 Nm (GS). Mo=1.1*10**19 Nm (GS). Mo=1.8*10**19 Nm (HRV). Mo=4.0*10**19 Nm (PPT). Felt (III) at Coquimbo, La Serena, Ovalle and Vicunia.
JUN 10	21 53 55.0	35.815 S	108.135 W	10 G	5.8	6.1	1.0	225	SOUTHERN EAST PACIFIC RISE. Mw 6.5 (GS), 6.5 (HRV), Ms 5.8 (BRK). Mo=6.4*10**18 Nm (GS). Mo=6.9*10**18 Nm (HRV). Mo=1.3*10**19 Nm (PPT).

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JUN 17	21	03	40.2	51.347 N	179.332 W	33 N	6.4	6.3	0.9	405	ANDREANOF ISLANDS, ALEUTIAN IS. Mw 6.4 (HRV), 6.3 (GS), 6.3 (CSEM). Me 5.9 (GS). ML 6.6 (PMR). Es=1.7*10**13 Nm (GS). Mo=3.2*10**18 Nm (GS). Mo=5.2*10**18 Nm (HRV). Mo=3.1*10**18 Nm (PPT). Felt (IV) on Adak. Also felt on Amchitka.
JUN 20	12	57	32.3	32.334 N	59.957 E	10 G	5.0	5.4	1.4	108	NORTHERN IRAN. Mw 5.5 (HRV). Mo=2.2*10**17 Nm (HRV). Sixty houses destroyed in Khorasan Province.
JUN 25	19	38	40.6	33.938 N	59.475 E	10 G	5.5	5.8	0.9	269	NORTHERN IRAN. Mw 6.0 (HRV), 5.9 (GS). Mo=8.0*10**17 Nm (GS). Mo=9.9*10**17 Nm (HRV). About 100 houses destroyed, 5,000 others damaged and some livestock killed in the Birjand-Qayen area.
JUL 06	09	54	00.7	30.058 S	71.872 W	19 G	5.8	6.5	1.2	189	NEAR COAST OF CENTRAL CHILE. Mw 6.8 (HRV), 6.7 (GS). Me 6.4 (GS). Ms 6.3 (BRK). Es=8.7*10**13 Nm (GS). Mo=1.1*10**19 Nm (GS). Mo=1.8*10**19 Nm (HRV). Mo=4.0*10**19 Nm (PPT). Felt (III) at Coquimbo, La Serena, Ovalle and Vicuna.
JUL 09	19	24	13.1	10.598 N	63.486 W	20	6.2	6.8	1.3	350	NEAR COAST OF VENEZUELA. Mw 7.0 (HRV), 6.8 (GS). Me 6.6 (GS). Es=1.5*10**14 Nm (GS). Mo=1.7*10**19 Nm (GS). Mo=3.2*10**19 Nm (HRV). Mo=6.0*10**19 Nm (PPT) .At least 81 people killed, 522 injured, extensive damage and landslides in the Cariaco-Cumana area. At least 3,000 people were left homeless. Several people injured in the Barcelona-Puerto La Cruz area. Some damage on Isla de Margarita. Power, telephone and water services disrupted on Isla Coche and Isla de Margarita. Felt in much of northeastern Venezuela and as far west as Maracaibo. Felt (V) on Trinidad. Also felt on Tobago.
JUL 19	14	22	08.7	16.333 N	98.216 W	33 N	5.7	6.3	1.2	217	OFF COAST OF GUERRERO, MEXICO. Mw 6.8 (GS), 6.7 (HRV). Me 6.0 (GS). Es=2.2*10**13 Nm (GS). Mo=2.0*10**19 Nm (GS). Mo=1.3*10**19 Nm (HRV). Mo=1.5*10**19 Nm (PPT). Felt in Guerrero and Oaxaca. Also felt at Mexico City.
JUL 21	08	45	49.1	26.857 S	26.619 E	5 G	5.0		1.1	36	REPUBLIC OF SOUTH AFRICA. At least 15 people killed and 46 injured at Avgold's Hartebeesfontein mine near Stilfontein. Felt as far as Pretoria.
JUL 30	14	06	38.0	10.698 N	63.424 W	24	4.3		1.2	26	NEAR COAST OF VENEZUELA. Seven buildings destroyed at Carupano. Felt at Cariaco, Casanay, Chiguana, El Pilar, Rio Caribe and Yaguaraparo.
AUG 08	02	39	01.9	39.746 N	41.869 E	10 G	4.5	3.3	1.4	66	TURKEY. One person injured and seven houses destroyed in the Koprukoy area.
AUG 08	22	27	19.8	15.477 S	179.140 W	10 G	5.7	6.6	1.1	224	FIJI ISLANDS REGION. Mw 6.6 (HRV), 6.4 (GS). Mo=5.0*10**18 Nm (GS). Mo=9.0*10**18 Nm (HRV).
AUG 20	07	15	15.9	4.358 N	96.494 E	33 N	5.9	6.0	1.2	292	NORTHERN SUMATERA, INDONESIA. Mw 6.1 (GS), 6.0 (HRV). Mo=1.6*10**18 Nm (GS). Mo=1.2*10**18 Nm (HRV). Several hundred houses destroyed in Aceh. Felt at Banda Aceh, Medan and other parts of northern Sumatera. Felt at Alor Setar, Petaling Jaya, Pinang and Shah Alam, Malaysia. Also felt at Hat Yai and Songkhla, Thailand.
AUG 20	13	51	16.6	41.715 S	80.134 E	10 G	5.6	6.4	1.3	93	MID-INDIAN RIDGE. Mw 6.5 (HRV), 6.4 (GS). Mo=4.2*10**18 Nm (GS). Mo=5.4*10**18 Nm (HRV).
AUG 24	21	11	24.7	28.795 N	52.593 E	33 N	5.0	4.1	0.9	151	SOUTHERN IRAN. Sixty-seven people injured in the Firuzabad area.
AUG 29	06	54	00.2	15.235 S	175.576 W	33 N	5.6	6.4	1.3	187	TONGA ISLANDS. Mw 6.5 (HRV), 6.4 (GS). Mo=4.1*10**18 Nm (GS). Mo=5.4*10**18 Nm (HRV). Mo=4.1*10**18 Nm (PPT).
AUG 29	08	14	09.9	3.562 S	144.362 E	23	5.8	6.8	1.1	191	NEAR N COAST OF NEW GUINEA, PNG. Mw 6.6 (HRV), 6.5 (GS). Mo=5.8*10**18 Nm (GS). Mo=7.6*10**18 Nm (HRV).
SEP 02	12	13	22.9	3.849 N	75.749 W	199	6.5		0.9	420	COLOMBIA. Mw 6.8 (HRV), 6.7 (GS). Me 6.4 (GS). Es=1.0*10**14 (GS). Mo=1.4*10**19 Nm (GS). Mo=1.6*10**19 Nm (HRV). Mo=8.0*10**18 Nm (PPT). Felt at Armenia, Bogota, Cali, Manizales, Medellin, Pereira and many other parts of central and western Colombia. Also felt (II) at Panama City and Penonome, Panama.
SEP 04	04	23	37.0	26.569 S	178.336 E	625 D	6.3		1.0	435	SOUTH OF FIJI ISLANDS. Mw 6.8 (GS), 6.8 (HRV). Me 6.5 (GS). Es=1.3*10**14 Nm (GS). Mo=2.1*10**19 Nm (GS). Mo=2.0*10**19 Nm (HRV). Mo=2.2*10**19 Nm (PPT).
SEP 20	16	11	32.1	28.683 S	177.624 W	30 G	6.1	7.0	1.0	359	KERMADEC ISLANDS REGION. Mw 7.2 (GS), 7.0 (HRV). Me 6.7 (GS). Es=2.2*10**14 Nm . Mo=6.6*10**19 Nm (GS). Mo=3.6*10**19 Nm (HRV). Mo=4.4*10**19 Nm (PPT).
SEP 25	00	05	23.2	26.367 S	27.406 E	5 G	4.7		0.8	71	REPUBLIC OF SOUTH AFRICA. mbLg 4.5 (BUL). At least three people injured at the East Dreifontein gold mine.
SEP 26	00	33	12.2	43.048 N	12.879 E	10 G	5.5	5.6	1.2	341	CENTRAL ITALY. Mw 5.7 (HRV), 5.6 (GS). Me 5.2 (GS). ML 5.9 (VIE), 5.7 (STR), 5.6 (FUR), 5.2 (LDG). Es=1.6*10**12 Nm (GS). Mo=3.3*10**17 Nm (GS). Mo=4.4*10**17 Nm (HRV). As a result of this earthquake and the event at 09:40:26 UTC on September 26, a total of eleven people killed, more than 100 injured and about 80,000 homes destroyed or damaged in the Marche and Umbria regions. Maximum intensity (VIII) in the epicentral area. Damage to the

											Basilica of St. Francis at Assisi.
SEP	26	09 40 26.3	43.084 N	12.812 E	10 G	5.7	6.0	1.3	348	CENTRAL ITALY. Mw 6.0 (GS), 6.0 (HRV). Me 5.8 (GS). ML 6.4 (VIE), 6.2 (FUR), 6.0 (STR), 5.8 (ROM), 5.6 (LDG). Es=9.7*10**12 Nm (GS). Mo=1.0*10**18 Nm (GS). Mo=1.2*10**18 Nm (HRV). As a result of this earthquake and the event at 00:33:12 UTC on September 26, a total of eleven people killed, more than 100 injured and about 80,000 homes destroyed or damaged in the Marche and Umbria regions. Maximum intensity (X) at Serravalle di Chienti and (IX) at Valtopina. Extensive damage to the Basilica of St. Francis at Assisi. Felt in many parts of central and northern Italy from Bologna and Modena to Rome. Felt (IV) in western and central Slovenia and (III) in southern Karnten Province, Austria.
SEP	28	01 38 28.6	3.776 S	119.727 E	33 N	5.6	5.5	1.3	145	SULAWESI, INDONESIA. Mw 5.9 (GS), 5.9 (HRV). Mo=9.2*10**17 Nm GS). Mo=8.7*10**17 Nm (HRV). At least 17 people killed, over 300 injured and 425 buildings destroyed in the Parepare area.
SEP	30	06 27 24.7	31.959 N	141.878 E	10 G	5.5	6.5	1.1	245	SOUTH OF HONSHU, JAPAN. Mw 6.1 (HRV), 6.0 (GS). Mo=1.3*10**18 Nm (GS). Mo=1.6*10**18 Nm (HRV).
OCT	03	08 55 21.5	43.075 N	12.794 E	10 G	5.1	4.9	1.1	314	CENTRAL ITALY. ML 5.5 (VIE), 5.4 (FUR), 5.2 (STR), 4.9 (LDG). MD 4.8 (ROM). About 20 people injured and additional damage (VII) in the Marche and Umbria regions. Additional damage to the Basilica of St. Francis at Assisi. Felt at Rome.
OCT	03	11 28 40.5	27.813 N	54.731 E	33 N	5.2	4.8	1.1	203	SOUTHERN IRAN. Six people injured and several houses damaged in the epicentral area.
OCT	06	12 30 05.8	9.790 N	125.779 E	106 D	5.9		1.0	237	MINDANAO, PHILIPPINE ISLANDS. Mw 6.5 (HRV), 6.4 (GS). Mo=4.8*10**18 Nm (GS). Mo=5.6*10**18 Nm (HRV). Mo=9.6*10**18 Nm (PPT). Felt (III RF) in eastern Cebu.
OCT	06	23 24 52.5	43.045 N	12.835 E	10 G	5.3	5.2	1.2	263	CENTRAL ITALY. ML 5.7 (VIE), 5.5 (FUR), 5.1 (LDG). Four people injured and additional damage (VIII) in the Assisi, Foligno, Gualdo Tadino and Nocera Umbra areas. Felt from Arezzo to parts of Lazio.
OCT	13	13 39 37.4	36.379 N	22.071 E	24 G	6.2	6.6	1.2	484	SOUTHERN GREECE. Mw 6.5 (HRV), 6.5 (CSEM), 6.4 (GS). Me 6.2 (GS). Ms 6.7 (BRK). Es=4.5*10**13 Nm (GS). Mo=4.6*10**18 Nm (GS). Mo=5.5*10**18 Nm (HRV). Minor damage in southern Peloponnisos. Felt strongly at Athens. Felt throughout Greece and on Crete.
OCT	14	09 53 18.1	22.101 S	176.772 W	167 D	6.7		0.9	537	SOUTH OF FIJI ISLANDS. Mw 7.7 (GS), 7.7 (HRV). Me 7.4 (GS). mb 7.0 (BRK). Es=3.2*10**15 Nm (GS). Mo=3.4*10**20 Nm (GS). Mo=4.6*10**20 Nm (HRV). Mo=5.3*10**20 Nm (PPT). Felt at Wellington, New Zealand.
OCT	14	15 23 10.2	42.962 N	12.892 E	10 G	5.4	5.5	1.2	316	CENTRAL ITALY. ML 5.7 (VIE), 5.6 (FUR), 5.5 (STR), 5.4 (ROM), 5.3 (LDG). One person injured and additional damage (VIII) in the Assisi-Perugia-Foligno area. Slight damage at Rome. Felt as far south as Naples.
OCT	15	01 03 33.4	30.933 S	71.220 W	58 G	6.8	6.8	1.0	429	NEAR COAST OF CENTRAL CHILE. Mw 7.1 (GS), 7.1 (HRV). Me 7.3 (GS). mb 7.0 (BRK). Es+2.2*10**15 Nm (GS). Mo=5.2*10**19 Nm (GS). Mo=4.3*10**19 Nm (HRV). Mo=6.6*10**19 Nm (PPT). Five people killed at Pueblo Nuevo, one person killed at Coquimbo, one person killed at La Chimba and another died of a heart attack at Punitaqui. More than 300 people injured, 5,000 houses destroyed, 5,700 houses severely damaged, another 10,000 houses slightly damaged, numerous power and telephone outages, landslides and rockslides in the epicentral region. Some damage (VII) at La Serena and (VI) at Ovalle. Felt (VI) at Alto del Carmen and Illapel; (V) at Copiapo, Huasco, San Antonio, Santiago and Vallenar; (IV) at Caldera, Chanaral, Rancagua and Tierra Amarilla; (III) at Talca; (II) at Concepcion and Taltal. Felt as far south as Valdivia. Felt (V) in Mendoza and San Juan Provinces, Argentina. Felt in Buenos Aires, Catamarca, Cordoba, Distrito Federal and La Rioja Provinces, Argentina. Also felt in parts of Bolivia and Peru.
OCT	28	06 15 17.3	4.368 S	76.681 W	112 G	6.6	6.3	0.9	537	NORTHERN PERU. Mw 7.2 (GS), 7.2 (HRV). Me 6.6 (GS). Es=2.1*10**14 Nm. Mo=6.7*10**19 Nm (GS). Mo=7.8*10**19 Nm (HRV). Mo=6.0*10**19 Nm (PPT). Slight damage at Chachapoyas.
NOV	03	08 07 59.9	38.806 N	42.408 E	33 N	4.8		0.9	96	TURKEY. Two people injured and seven houses destroyed at Bitlis.
NOV	03	19 17 33.8	30.744 S	71.224 W	45 G	6.2	5.6	0.9	295	NEAR COAST OF CENTRAL CHILE. Mw 6.3 (GS), 6.2 (HRV). Me 6.2 (GS). MD 5.8 (SAN). Es=4.2*10**13 Nm (GS). Mo=2.9*10**18 Nm (GS). Mo=2.0*10**18 Nm (HRV). Additional damage (VII) at Punitaqui. Felt (VI) at Hurtado, Illapel, La Serena, Monte Patria, Ovalle and Vicuna; (V) at Copiapo and Coquimbo; (IV) at Petorca; (III) at San Antonio, Santiago and Valparaiso. Power and telephone outages occurred in Coquimbo, La Serena and Ovalle. Landslides occurred along Route 5 North in the epicentral area. Also felt (III) at Mendoza, Argentina.
NOV	06	02 34 33.0&	46.800 N	71.410 W	23 G	4.8	4.0		134	SOUTHERN QUEBEC, CANADA. <OTT-P>. mbLg 5.1 (OTT), 4.8 (GS). One person died of a heart attack. Felt in many parts of

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											southern Quebec. Felt as far south as Ottawa, Ontario and as far east as Edmundston, New Brunswick. Felt (V) at Adamstown; (IV) at Clayton Lake, Farmington, Saint Francis, Saint John and Shirley Mills, Maine. Felt (V) at East Haven and Newport; (IV) at Barton, Beebe Plain, Sheldon Springs and West Glover, Vermont. Also felt (IV) at Groveton, New Hampshire. Felt in western Maine, northern New Hampshire, northern Vermont and parts of northeastern New York in the United States.
NOV	08	10 02 52.6	35.069 N	87.325 E	33 N	6.2	7.9	1.4	344	XIZANG. Mw 7.6 (HRV), 7.4 (GS). Me 7.7 (GS). Es=7.7*10**15 Nm (GS). Mo=1.5*10**20 Nm (GS). Mo=2.8*10**20 Nm (HRV). Mo=1.5*10**20 Nm (PPT).
NOV	14	04 29 53.4	24.156 N	121.861 E	33 N	5.2	4.8	1.1	89	TAIWAN. One person injured by a landslide on the coastal highway between Hua-lien and Su-ao. Felt (V JMA) at Hua-lien. Felt in much of Taiwan.
NOV	15	18 59 24.3	15.145 S	167.375 E	123 D	6.4		1.1	357	VANUATU ISLANDS. Mw 7.0 (GS), 7.0 (HRV). Me 6.8 (GS). mb 6.3 (BRK). Es=3.3*10**14 Nm (GS). Mo=4.2*10**19 Nm (GS). Mo=4.1*10**19 Nm (HRV).
NOV	18	13 07 41.7	37.570 N	20.656 E	33 N	5.9	6.4	1.4	402	IONIAN SEA. Mw 6.7 (HRV), 6.5 (GS), 6.3 (CSEM). Me 6.3 (GS). ML 6.1 (THE). Es= 6.4*10**13 Nm (GS). Mo=7.1*10**18 Nm (GS). Mo=1.2*10**19 Nm (HRV). Mo=3.1*10**18 Nm (CSEM). Several people injured and considerable damage to buildings at Amalias, Gargalianoi, Kalamai, Kiparissia, Meligalas, Pirgos and other parts of western Peloponnisos. One house destroyed on Zakinthos. Felt in much of Greece and as far as Crete and Sicily.
NOV	21	11 23 06.3	22.212 N	92.702 E	54 D	5.9		1.0	362	INDIA-BANGLADESH BORDER REGION. Mw 6.1 (GS), 6.1 (HRV). Mo=1.6*10**18 Nm (GS). Mo=1.6*10**18 Nm (HRV). Twenty-three people killed, 200 injured, and a five-story building collapsed at Chittagong, Bangladesh. Houses damaged and old trees uprooted at Alikadam, Bandarban, Lama and Nakhyaungcharipara. Felt in much of Bangladesh as far north as Rangpur and Rajshahi.
NOV	25	12 14 33.6	1.241 N	122.536 E	24 G	6.1	6.8	1.2	296	MINAHASSA PENINSULA, SULAWESI. Mw 7.1 (GS), 7.0 (HRV). Me 6.7 (GS). Es=2.5*10**14 Nm (GS). Mo=5.0*10**19 Nm (GS). Mo=3.6*10**19 Nm (GS). Mo=2.4*10**19 Nm (PPT). At least 90 buildings damaged in the Gorontalo area. Felt at Manado.
NOV	28	22 53 41.5	13.740 S	68.788 W	586 D	6.4		0.9	488	PERU-BOLIVIA BORDER REGION. Mw 6.6 (GS), 6.6 (HRV). Mo=1.0*10**19 Nm (GS). Mo=1.0*10**19 Nm (HRV).
DEC	05	11 26 55.0	54.8985 N	162.111 E	33 N	6.3	7.6	1.1	303	NEAR EAST COAST OF KAMCHATKA. Mw 7.9 (HRV), 7.7 (GS). Me 7.3 (GS). Es=1.8*10**15 Nm (GS). Mo=3.9*10**20 Nm (GS). Mo=6.8*10**20 Nm (HRV). Felt (VI) at Ust-Kamchatsk and (V) at Petropavlovsk-Kamchatskiy. Felt (IV) at Severo-Kurilsk, Paramushir. Also felt aboard the cargo ship Stepan Krasheninnikov in the epicentral area.
DEC	05	18 48 23.0	53.719 N	161.831 E	33 N	6.3	6.5	1.1	270	OFF EAST COAST OF KAMCHATKA. Mw 6.7 (GS). Mo=1.2*10**19 Nm (GS).
DEC	17	04 38 53.3	51.188 N	178.891 E	33 N	5.8	6.5	1.1	259	RAT ISLANDS, ALEUTIAN ISLANDS. Mw 6.7 (GS), 6.6 (HRV). Me 6.1 (GS). ML 6.4 (PMR). Es=3.0*10**13 Nm (GS). Mo=1.1*10**19 Nm (GS). Mo=1.0*10**19 Nm (HRV). Mo=1.2*10**19 Nm (PPT). Felt (IV) on Adak.
DEC	22	02 05 50.1	5.544 S	147.898 E	179 D	6.3		1.0	328	EASTERN NEW GUINEA REG., P.N.G. Mw 7.1 (GS), 7.1 (HRV). Me 7.0 (GS). Es = 6.0*10**14 (GS). Mo=4.5*10**19 Nm (GS). Mo=5.5*10**19 Nm (HRV). Mo=5.6*10**19 Nm (PPT). Some minor damage at Lae, Madang, Morobe and Port Moresby. Also felt on New Britain.

Compiled by Waverly J. Person

Radó Kövesligethy (1862–1934)

founded the Budapest Seismological Observatory in 1905 and organized the Hungarian Seismological Service with nine seismograph stations in the Carpathian Basin. He was the first "Secretary General" of the "Association Internationale de Sismologie" between 1906 and 1916. His intensity attenuation model (Kövesligethy, 1906) has been used for estimation of macroseismic focal depth of earthquakes since then.