



Magyarországi földrengések évkönyve
Hungarian Earthquake Bulletin
2009

Tóth L., Mónus P., Zsíros T., Bus Z., Kiszely M., Czifra T.

GeoRisk
Földrengéskutató Intézet ♦ Earthquake Research Institute

Magyar Tudományos Akadémia
Geodéziai és Geofizikai Kutatóintézet
Szeizmológiai Főosztály



Hungarian Academy of Sciences
Geodetic and Geophysical Research Institute
Seismological Observatory

Budapest

MAGYARORSZÁGI FÖLDRENGÉSEK ÉVKÖNYVE

HUNGARIAN EARTHQUAKE BULLETIN

2009

TÓTH LÁSZLÓ, MÓNUS PÉTER, ZSÍROS TIBOR,
BUS ZOLTÁN, KISZELY MÁRTA, CZIFRA TIBOR

Hivatkozás

Tóth L., Mónus P., Zsíros T., Bus Z.,
Kiszely M., Czifra T.:
Magyarországi földrengések évkönyve 2009.
GeoRisk - MTA GGKI, Budapest, 2010.
HU ISSN 1589-8326

Bibliographic reference

Tóth, L., Mónus, P., Zsíros, T., Bus Z.,
Kiszely, M., Czifra, T.
Hungarian Earthquake Bulletin, 2009.
GeoRisk - MTA GGKI, Budapest, 2010.
HU ISSN 1219-963X

GEORISK
MTA GGKI

BUDAPEST 2010

© *GeoRisk*

Ringló u. 101/B, H-1221 Budapest, HUNGARY
www.georisk.hu
info@georisk.hu

MTA GGKI

Meredek u. 18, H-1112 Budapest, HUNGARY
www.seismology.hu
seismo@seismology.hu

Minden jog fenntartva.

Apart from any fair dealing for the purpose of study, research, criticism, or review, as permitted under the Copyright Act, no part may be reproduced by any process without written permission.

Készült a *Paksi Atomerőmű Rt.* támogatásával.

This work was supported by *Paks Nuclear Power Plant Ltd.*

HU ISSN 1589-8326 (magyar)

HU ISSN 1219-963X (English)

Felelős kiadó: *Dr. Tóth László*

Hátsó borító: Szeizmikus események a Móri-árok környékén 2009-ben
(rengés és robbantás)

Back cover page: Seismic events recorded in the area of Mór graben in 2009
(earthquakes and explosions)

TARTALOMJEGYZÉK

BEVEZETÉS	5
1. ÖSSZEFOGLALÁS	7
2. A MAGYARORSZÁGI FÖLDRENGÉS-MEGFIGYELŐ HÁLÓZAT.....	9
Szélessávú állomások.....	9
Rövidperiódusú állomások.....	9
Adatközpont	11
Virtuális szeizmológiai hálózat.....	11
3. ESEMÉNYLISTA ÉS FÖLDRENGÉS FÉSZEKPARAMÉTEREK.....	19
A földrengés fészekparaméterek meghatározása	19
Sebességmodell.....	19
Eseménylista	21
Fészekparaméterek és fázisadatok	29
4. JELENTŐS FÖLDRENGÉSEK 2009-BEN	63
2009. október 5. – Tiszabездéd	65
2009. november 25. – Berhida	69
HIVATKOZÁSOK.....	73
A MELLÉKLET: <i>Európai Makroszeizmikus Skála (EMS)</i>	75
B MELLÉKLET: <i>A világ jelentős földrengései 2009-ben</i>	77

CONTENTS

INTRODUCTION	6
1. SUMMARY.....	8
2. SEISMOGRAPH STATIONS IN HUNGARY	10
Broadband stations.....	10
Short period stations	10
Data centre	12
Virtual seismic network.....	12
3. LIST OF ORIGINS AND HYPOCENTER PARAMETERS	20
Method for hypocenter parameter determination	20
Crustal velocity model.....	20
List of events.....	21
Phase data	30
4. SIGNIFICANT EARTHQUAKES IN 2009	64
5 October 2009 – Tiszabezdéd	65
25 November 2009 – Berhida.....	69
REFERENCES.....	73
APPENDIX A: <i>European Macroseismic Scale (EMS)</i>	76
APPENDIX B: <i>Significant Earthquakes of the World, 2009</i>	78

BEVEZETÉS

A Pannon-medencében a földrengés aktivitás a lemezperemi területekhez képest mérsékelt, a rengések epicentrumainak eloszlása pedig első pillantásra rendszertelennek látszik. Nehéz eldönteni, hogy a földrengések izolált területeken, vagy szeizmikusan aktív vonalak mentén keletkeznek. Mindenesetre felismerhető néhány terület, ahol viszonylag gyakran fordult elő a múltban földrengés. Ilyenek pl. Eger és környéke, ahol 70 év alatt legalább 16 földrengés és több mint 50 nagyobb utórengés történt. Komárom és Mór környékén, Jászberény, Kecskemét és Dunaharaszti közelében szintén jelentős volt az aktivitás egy-egy bizonyos időszakban. Az alacsony szeizmicitás nem feltétlenül jelenti a földrengések méretének csekélységét: komoly épületkárokat okozó földrengésekről van szó, néhány esetben talajfolyósodást is okozó gyorsulásokkal (pl. 1763 Komárom, M 6.2; 1911 Kecskemét, M 5.6), esetleg a felszínen is megjelenő töréssel (pl. 1834 Érmellék, M 6.2). Ezek a példák azt mutatják, hogy 6.0-6.5 magnitúdójú rengések lehetségesek, de nem gyakoriak a Pannon-medencében (Tóth et al., 2002a).

A földtudományi kutatás fontos eleme a szeizmicitás vizsgálata, annak megismerése, hogy milyen gyakorisággal, hol és mekkora földrengések keletkeznek, továbbá melyek azok a szeizmotektonikai folyamatok, melyek a földrengéseket létrehozzák.

Az általános ismeretszerzésen túlmenően a földrengés elleni védekezéshez is fontos segítséget nyújt a szeizmicitás pontos ismerete. Egy terület földrengés kockázatát csak komplex szeizmológiai, geofizikai, geológiai ismeretek alapján lehet meghatározni. A legfontosabb információ, mely mennyiségileg meghatározza a földrengéskockázatot, a terület földrengés története, illetve a jelenkori rengések ismerete. Ehhez nyújt kardinális fontosságú segítséget a földrengés monitorozás, a földrengések megfigyelése, mérése és paramétereinek meghatározása.

Magyarországon a földrengésmérő állomások száma és minősége 1995-ben érte el azt a szintet, hogy a lakosság által érzékelt valamennyi rengést a hálózat nagy valószínűséggel detektálja. Ez nagyrészt annak a szeizmikus megfigyelő hálózatnak köszönhető, melyet a Nemzetközi Atomenergia Ügynökség javaslatára a Paksi Atomerőmű Rt. létesített az atomerőmű telephely tágabb környezetében.

Jelen kiadványunk célja és tartalma pontosan az, amit a címe is jelez: évkönyv, melyben megtalálható minden olyan adat és ismeret, melyet az év során a magyarországi földrengésekkel kapcsolatban összegyűjtöttünk. A célterület a 45.5-49.0É szélesség és 16.0-23.0K hosszúság által határolt földrajzi tartomány. A teljesség kedvéért azonban a világ jelentős földrengéseinek listája is megtalálható a mellékletben. Reméljük, hogy hasznát látják munkánknak mindazok, akik földtudományi kutatásaikban felhasználói a szeizmicitás adatoknak, de azok is, akik csupán egy-egy földrengéssel kapcsolatos kérdésükre keresnek választ kiadványunkban.

INTRODUCTION

Seismicity in the Pannonian basin is relatively low comparing to the peripherals and the distribution of earthquake epicenters shows a rather scattered pattern at the first glance. It is particularly difficult to decide whether the epicenters occur at isolated places or along elongated zones however, at several single places earthquakes occur repeatedly. For example, near to Eger (47.9N; 20.4E) at least sixteen earthquakes with more than fifty greater aftershocks occurred over a time interval of some 70 years. Komárom and Mór area (47.4-47.8N; 18.2E), Jászberény (47.5N; 20.0E), Kecskemét (46.9N; 19.7E) and Dunaharaszti (47.4; 19.0E) also produced significant activity over a certain but limited period of time. Moderate seismicity does not necessarily mean moderate size of earthquakes: reports of major earthquakes often refer to heavy building damage, liquefaction (e.g. 1763 Komárom earthquake, M 6.2; 1911 Kecskemét earthquake, M 5.6) and sometimes the possibility of surface fault rupture (e.g. 1834 Érmellék earthquake, M 6.2). These observations indicate that magnitude 6.0-6.5 earthquakes are possible but not frequent in the Pannonian basin (Tóth et al., 2002b).

The study of the recent seismicity is an important element of seismotectonic research. Earthquakes represent the sudden release of slowly accumulated strain energy and hence provide direct evidence of active tectonic processes. However, low and moderate seismicity at intraplate areas generally precludes reliable statistical correlation between epicenters and geological features.

Moreover, as one of the chief contributor to seismic hazard at a given area, detailed knowledge of seismicity also plays an important role in earthquake risk reduction. To be useful, accurately located earthquakes are required. While good information about larger historical earthquakes exists for about the past few hundred years, these are not well enough located. Only modern seismic monitoring networks, capable of locating small magnitude local earthquakes provide the necessary information to close this knowledge gap. The developing database of well-located earthquakes can be used, in one hand, to resolve the tectonic framework and required on the other hand to refine our understanding of the level of seismic risk.

1995 was a milestone in the history of Hungarian seismological observations. The Paks Nuclear Power Plant Ltd. installed a network of high quality digital seismographs, following the recommendations by the International Atomic Energy Agency (IAEA). For the first time, this network made it possible to detect and locate such small magnitude local seismic events that it is very unlikely so as to felt events go undetected in most parts of the country.

The present Earthquake Bulletin is a united annual summary report of all Hungarian earthquake monitoring projects. The information in the Bulletin is based on all available earthquake related data provided by different organizations. The geographic region covered is bounded by latitudes 45.5-49.0N and longitudes 16.0-23.0E.

1.

ÖSSZEFOGLALÁS

A 2009. év szeizmikus szempontból csendes időszaknak tekinthető Magyarországon. Az év folyamán 229 szeizmikus eseményről szereztünk tudomást a 45.5-49.0N szélességi és 16.0-23.0E hosszúsági koordináták által határolt területen, amelyek közül 104 volt természetes eredetű földrengés, 125 robbantás. Az események mérete a $0.0 \leq M_L \leq 3.6$ lokális magnitúdó tartományba esett.

Az évben mindössze 2 olyan földrengés volt, melyet a lakosság is érzett. A Tiszabezdéd és Berhida környékén keletkezett rengések mindegyike ismert forrászónához köthető.

A legnagyobb földrengés intenzitás, melyet Magyarország területéről jelentettek 4 EMS fokozatú volt. Épületkárokról az év folyamán nem kaptunk jelentést.

Időrendben az első érezhető rengés október 5-én este keletkezett Tiszabezdéd közelében. A 2.6 M_L magnitúdójú földrengés intenzitása 4 EMS fokra becsülhető.

November 25-én reggel 2.8 M_L magnitúdójú földrengést éreztek Berhida környékén. A rengés intenzitása 3-4 EMS fokra becsülhető, de csak viszonylag kis területen érezték.

1.

SUMMARY

2009 was a quiet year for Hungarian seismicity. Out of the 229 seismic events ($0.0 \leq M_L \leq 3.6$) located within the area bounded by latitudes 45.5-49.0N and longitudes 16.0-23.0E 104 were identified as natural earthquakes, 125 were known quarry blasts.

Only two earthquakes were reported as felt. The earthquakes of Tiszabezdéd and Berhida can be connected to known source zones.

The highest magnitude assigned to a shock was 3.6 M_L while the highest intensity reported during the year was 4 EMS. No building damage was reported during the year.

Reviewing the more notable events of the year in chronological order, the first felt earthquake was reported from Tiszabezdéd on 5th October. The shock was felt in a relatively small area produced reports of 4 EMS from Tiszabezdéd.

On November 25th morning, a small magnitude earthquake (2.8 M_L) was reported from Berhida area. The shock was felt (EMS 3-4) only at the epicenter area.

2.

A MAGYARORSZÁGI FÖLDRENGÉS-MEGFIGYELŐ HÁLÓZAT

2009-ben 16 szeizmográf állomást működtetett Magyarországon az MTA Geodéziai és Geofizikai Kutatóintézet és a GeoRisk Földrengekutató Intézet Kft. A két szervezet által kötött megállapodás értelmében az összes mért adatot korlátozás nélkül megosztják egymással. Az adatok együttes feldolgozásának köszönhetően a földrengések paraméterei jóval pontosabban, gyorsabban, megbízhatóbban határozhatók meg (2.1. Táblázat és 2.1. ábra).

Szélessávú állomások

Az év folyamán 6 szélessávú szeizmológiai állomás működött (BEHE, BUD, PKSM, PSZ, SOP, TRPA), melyek mindegyikén az érzékelő egy 3 komponenses szélessávú Streckeisen STS-2 szeizmométer. Az érzékelő jele a PKSM állomáson egy Quanterra Q380 berendezésen keresztül, a többi helyen pedig EarthData PS-6-24 digitalizáló egységen át jut a SeisComp szoftverrel felszerelt adatgyűjtő számítógépre. Mindegyik állomás internet összeköttetéssel rendelkezik, így az adatok közel valós időben, egy erre a célra kifejlesztett protokoll (SeedLink) felhasználásával jutnak el a budapesti adatközpontba, ahol a feldolgozás és archiválás történik. Az adatközpontban az adatok átlagos késése a valós időhöz képest 10 másodperc körüli. Az állomáson tárolt adatok bizonyos idő elteltével törlődnek.

Rövidperiódusú állomások

Kilenc rövidperiódusú állomáson Lennartz LE-3D 1 s sajátperiódusú 3 komponenses szeizmométer és Lennartz MARS88 digitalizáló és adatgyűjtő működik, folyamatos regisztrálással. Egy állomáson (CSKK) az érzékelő három Kinometrics SS-1 rövidperiódusú szeizmométer, szintén folyamatos regisztrálással.

Öt rövidperiódusú állomáson (PKS2, PKS6, PKS7, PKS9, PKSN) az adatok átmeneti tárolása a helyszínen, magneto-optikai lemezeken történik. A lemezek havi cseréjével az adatok legalább két nap, legfeljebb egy hónap késéssel kerülnek az adatközpontba.

Két állomás (PKSG, PKST) működése eltér a többi rövidperiódusú állomásétól. Az érzékelő és digitalizáló ugyanaz, de az adatok a helyszínen működő SeisComp rendszerű számítógépbe jutnak, ahol annak merevlemezén tárolódnak, és az interneten keresztül eljutnak a budapesti adatközpontba, hasonlóan a szélessávú állomásokhoz. Azonban itt az alkalmazott konfiguráció és a működés részben eltér a szélessávú állomásokétól, ebből adódóan az adatok késése valamivel nagyobb, 10-30 perces. Az állomáson tárolt adatok bizonyos idő elteltével itt is automatikusan törlődnek (2.2. ábra).

Az év folyamán telepített CSKK állomáson Kinometrics K2 adatgyűjtő és SeisComp PC biztosítja a helyszíni regisztrálást.

PENC és RHK3 állomásokat az év folyamán bezártuk, az előzőt a magas szeizmikus háttérzaj, az utóbbit a magas üzemeltetési költségek miatt.

2.

SEISMOGRAPH STATIONS IN HUNGARY

In 2009, there were 16 seismograph stations in Hungary operated by Geodetic and Geophysical Research Institute, Hungarian Academy of Sciences and GeoRisk Earthquake Research Institute Ltd. Based on an agreement, the two institutions shared all data recorded in all seismic stations without limitations and operated a common data centre (Table 2.1 and Fig. 2.1).

Broadband stations

Six broadband stations (BEHE, BUD, PKSM, PSZ, SOP, TRPA) were running during the year. All of these stations have Streckeisen STS-2 very broadband seismometers as sensors. Each station is equipped with EarthData PS-6-24 digitizer except PKSM where a Quanterra Q380 unit serves as a digitizer. Linux PC's with SeisComP software have been used as data acquisition systems. All stations are accessible via Internet in support of near real time data transfer. The average data latency at these stations is typically less than 10 s. SeedLink protocol is used for data collection and all continuous data is archived in the data centre.

Short period stations

Nine of the short period stations consist of a three component short period seismometer, a digital recorder and time signal receiver. The seismometers used are the LE-3D three directional compact size high sensitivity 1 Hz geophones. The digital acquisition system is the MARS88 recorder. Continuous data are recorded at each short period station. The new station CSKK has Kinometrics short period SS-1 sensors.

In case of five stations (PKS2, PKS6, PKS7, PKS9, PKSN) the data is recorded and temporarily stored on-site on rewritable magneto-optical disks, which are collected and transferred to the data center on a monthly basis.

The configuration at two stations (PKSG, PKST) is somewhat different from the rest of the short period stations. Having the same sensor and digitizer, continuous data is recorded on a SeisComP PC connected to the MARS88 data logger. The stations have near real-time data access via Internet using the SeedLink protocol. Data latency is between 10 and 30 minutes due to the operation schedule of the data converter (Fig. 2.2).

The newly installed station CSKK has local recording with Kinometrics K2 digitizer and SeisComP PC.

The operation of two short period stations has been discontinued: in case of PENC due to the high background noise and in case of RHK3 due to the high operational costs.

Adatközpont (www.foldrenges.hu)

Az összes mérőállomáson regisztrált adatot a budapesti adatközpontban gyűjtjük és dolgozzuk fel. Az adatközpont nem csak gyűjti a szeizmológiai adatokat, de több formában szolgáltatja is azokat, elsősorban elektronikusan az Interneten keresztül.

Minden állomás digitális adataiból napi szeizmogramok készülnek kép formátumban. A képi szeizmogramok egyrészt az érdeklődők tájékoztatását, másrészt a működés ellenőrzését szolgálják. A mérőállomással fennálló adatátviteli módtól függően ezek a szeizmogramok lehetnek közel valós idejűek, vagy a direkt kommunikációval nem rendelkező állomások esetében több napos késéssel készülők.

Az események fázisainak körültekintő manuális kimérése alapján állítjuk össze havonta a fázisadatokat (kimérési adatokat) tartalmazó jelentést. E jelentéseket elküldjük a szomszédos országok szeizmológiai intézményeinek, valamint a nemzetközi adatközpontoknak.

A fázisadatok felhasználásával – a saját adatokat kiegészítve a szomszédos országok szeizmológiai intézményeinek hasonló adataival – havonta eseménylista készül (Havi Jelentés), mely a helyi és regionális földrengések hipocentrum adatait tartalmazza.

Kétoldalú megállapodások alapján néhány szomszédos országgal, illetve nemzetközi adatközpontokkal (GEOFON, ORFEUS) zajlik valós idejű adatcsere. A valós idejű hullámforma adatok a budapesti adatközpont SeedLink szerverén keresztül érhetők el. Mód van azonban – bizonyos korlátokkal – múltbeli hullámforma adatok kiszolgáltatására is az adatközpontban működtetett AutoDRM rendszer segítségével (autodrm@seismology.hu).

A mérési adatok, szeizmogramok, a kiértékelés eredményei nagyrészt nyilvánosan elérhetők az interneten a www.foldrenges.hu oldalon.

Átlagos zaj- (talajnyugtalanosság) viszonyokat feltételezve a magyarországi szeizmológiai hálózat észlelési képessége $ML=1.0-2.0$ magnitúdó körül van (2.3. ábra). Ennek számítása azon feltételezésen alapul, hogy az eseményt legalább négy mérőállomás érzékeli, mely a helymeghatározáshoz szükséges minimális állomásszám. Az ország középső részén kissé alacsonyabb, a határok környékén kissé magasabb az érzékenység. Ez azt jelenti, hogy az ÉK-i területeket kivéve, a lakosság által érzékelt valamennyi rengést a hálózat nagy valószínűséggel detektálja.

Virtuális szeizmológiai hálózat (HUNRENG)

A kommunikáció fejlődése, a valós idejű adatátvitel és az azonos adatátviteli protokoll (SeedLink) Európa-szerte elterjedt használata lehetővé tette, hogy külföldi állomások adatait is fogadjuk közel valós időben ugyanúgy, mint a saját állomásainkét. A külföldi állomások mérési adatainak felhasználásával a földrengések paraméterei még pontosabban, megbízhatóbban számíthatók ki. Ezen kívül a nagyszámú állomás adatahoz való valós idejű hozzáférés lehetővé tette *automatikus földrengésjelző rendszerünk* elindítását. Ez a rendszer automatikusan képes felismerni a földrengéseket, és azok paramétereit néhány percen belül ki is számítja. A térképen és listán automatikusan megjelenített földrengés információ elsősorban gyors tájékoztatásul szolgál (2.4. ábra és 2.2. Táblázat).

Data Centre (www.foldrenges.hu)

All recorded data is transmitted to and processed at the *Data Centre* in Budapest. The data that are collected by the *Data Centre* are published in a variety of formats and publications are available electronically via the Internet.

Using digitally recorded data, analogue “live seismograms” are calculated for each station. The main purposes of the “live seismograms” are feeding public interests in one hand, and rapid visualization of the operational status and quality check of the stations on the other. The delay of the “live seismograms” varies from near real time to several days depending on the communication category of the station.

A careful manual offline analysis is used for event identification and picking the phases on each recorded seismogram. Seismogram readings (phase data) are disseminated by email to partner institutions and international data centers.

Merging the phase data of the Hungarian network and the same kind of available data sets from neighbor countries, preliminary event lists are calculated on monthly schedule. Based on technical and operational statistics of the stations, list of local and regional seismic events and their hypocenter information, *Monthly Reports* are compiled.

Real time data from broadband stations can be accessed through a SeedLink server operated at the data centre. Real time data are provided to international data centers (ORFEUS, GEOFON) and some other partner institutions. Waveform data is also available through an AutoDRM service (autodrm@seismology.hu).

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 1.0-2.0 M_L , 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, not including the NE territory, it is very unlikely that felt events go undetected.

Virtual network (HUNRENG)

Development in communication technology and standardized communication protocols, software packages made available to access near real time data of stations beyond the national network. SeedLink and SeisComP developed at GEOFON became a kind of standard all over Europe.

The larger pool of data provided by an extended, “virtual network” of seismic stations helps to have faster and more accurate earthquake locations and parameter determinations. In addition, near real time access to data from large number of stations makes possible to operate automatic rapid earthquake alarm systems. Automatically generated earthquake lists and epicenter maps are the main product of such systems.

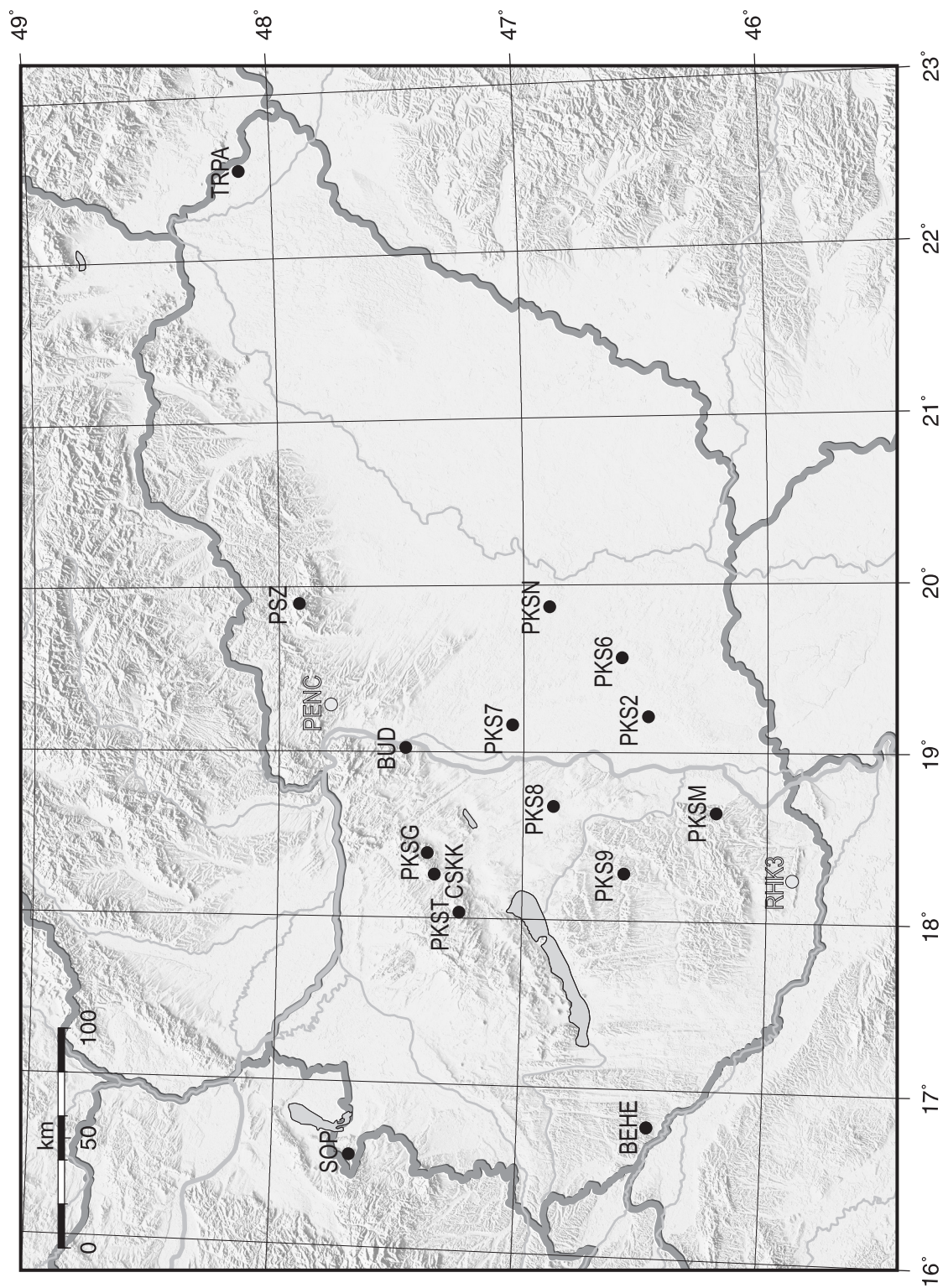
The present configuration of the experimental virtual network *HUNRENG* is shown in Fig. 2.4 and Table 2.2.

2.1. Táblázat Szeizmológiai állomások, műszerek és alapkőzet

Table 2.1. Seismic stations, instrumentation and lithology

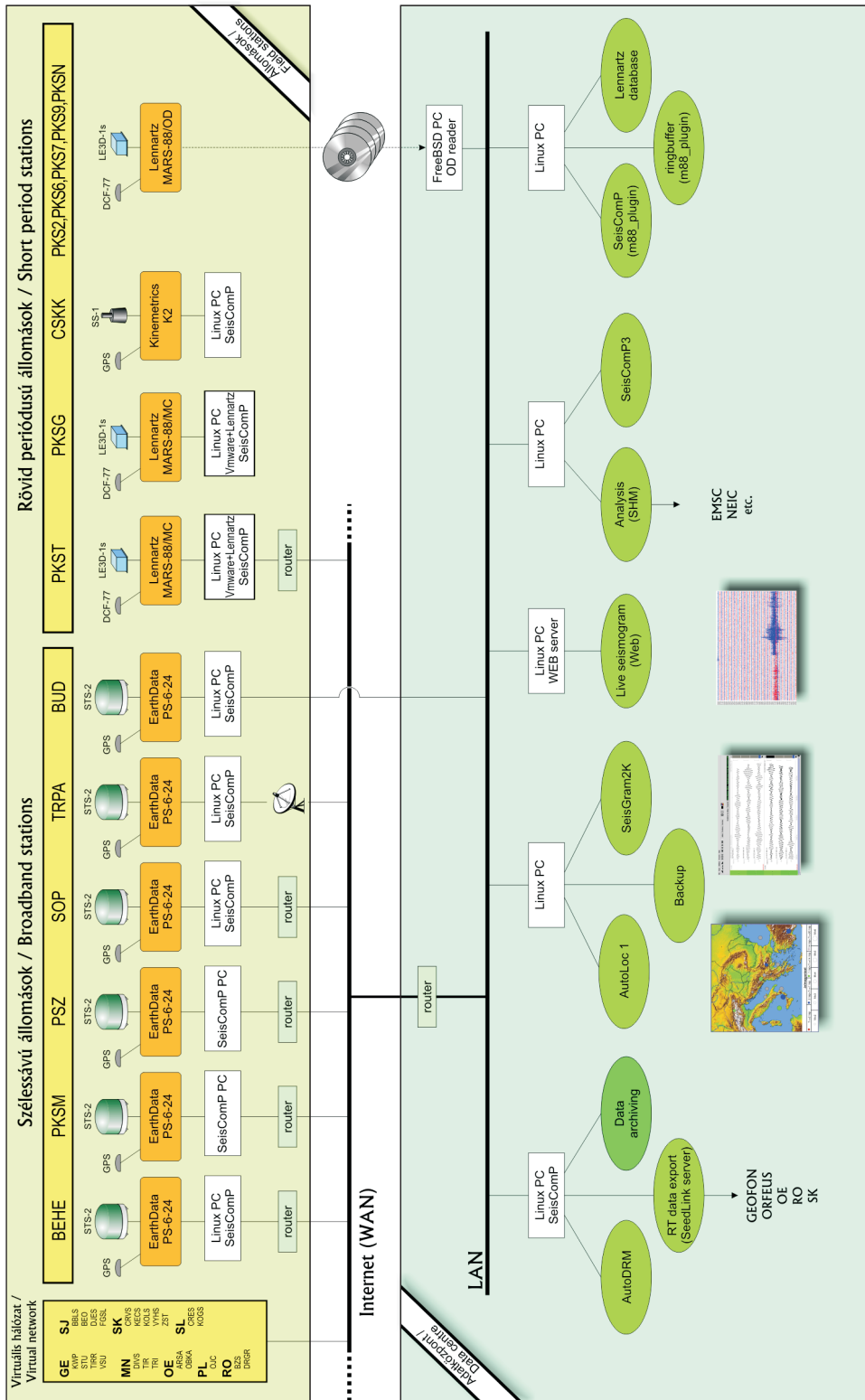
Kód Helység Code Location	Szélesség Latitude (N)	Hosszúság Longitude (E)	Magasság Elevation (m)	Alapkőzet Foundation	Állomás típusa Station type (1)	Érzékelő típusa Sensor type (2)	Regisztrálás Adatgyűjtő Recording mode Equipment (3)	Szerv. Org. (4)
BEHE Becsehely	46,4702	16,7755	298	üledék alluvium	3C BB	STS-2	D-C; PS-6-24+ SeisComp PC	GGKI
BUD Budapest	47,4836	19,0239	196	dolomit dolomite	3C BB	STS-2	D-C; PS-6-24+ SeisComp PC	GGKI
CSKK* Penc	47,3631	18,2606	319	dolomit dolomite	3C SP	SS-1	D-C; K2+ SeisComp PC	GGKI
PENC** Penc	47,7905	19,2817	250	üledék alluvium	3C SP	LE-3D	D-C; MARS-88MC+ SeisComp PC	GR
PKS2 Kecel	46,4920	19,2131	106	homok sand	3C SP	LE-3D	D-C; MARS-88OC	GR
PKS6 Bócsa	46,5998	19,5645	120	homok sand	3C SP	LE-3D	D-C; MARS-88OC	GR
PKS7 Kunszentmiklós	47,0473	19,1609	95	agyag mud	3C SP	LE-3D	D-C; MARS-88OC	GR
PKS9 Tamási	46,5870	18,2789	240	löss loess	3C SP	LE-3D	D-C; MARS-88OC	GR
PKSG Gánt	47,3918	18,3907	200	dolomit dolomite	3C SP	LE-3D	D-C; MARS-88MC+ SeisComp PC	GR
PKSM Mórággy	46,2119	18,6413	170	gránit granite	3C BB	STS-2	D-C; Q380+ SeisComp PC	GGKI/ GR
PKSN Nyárlőrinc	46,8972	19,8673	110	homok sand	3C SP	LE-3D	D-C; MARS-88OC	GR
PKST Tés	47,2590	18,0343	473	dolomit dolomite	3C SP	LE-3D	D-C; MARS-88MC+ SeisComp PC	GR
PSZ Piszkéstető	47,9184	19,8944	940	andezit andesite	3C BB	STS-2	D-C; PS-6-24+ SeisComp PC	GEO FON /GGKI
RHK3*** Tenkes	45,8885	18,2521	420	mész kő limestone	3C SP	LE-3D	D-C; MARS-88MC+ SeisComp PC	GR
SOP Sopron	47,6833	16,5583	260	gneisz gneiss	3C BB	STS-2	D-C; PS-6-24+ SeisComp PC	GGKI
TRPA Tarpa	48,1304	22,5391	113	andezit andesite	3C BB	STS-2	D-C; PS-6-24+ SeisComp PC	GGKI

- (1) 3C – 3 komponenses szeizmométer / three component seismometer
 SP – rövid periódusú szeizmométer / short period seismometer;
 BB – széles sávú szeizmométer / broad band seismometer
- (2) STS-2 – Streckeisen széles sávú szeizmométer / Streckeisen broad band seismometer
 LE-3D – Lennartz 3 komponenses 1Hz-es geofon / Lennartz three directional 1Hz geophone
 SS-1 – Kinematics SS-1 rövidperiódusú szeizmométer / Kinematics SS-1 short period seismometer
- (3) D – digitális / digital; C – folyamatos felvétel / continuous recording; PS-6-24 – Earth Data digitalizáló / Earth Data digitizer
 Q-380 – Quanterra adatgyűjtő rendszer / Quanterra data acquisition system;
 SeisComp – GEOFON Seismological Communication Processor
 MARS-88 – Lennartz adatgyűjtő / Lennartz data acquisition system
 K2 – Kinematics K2 adatgyűjtő / Kinematics K2 data acquisition system
- (4) GGKI – MTA Geodéziai és Geofizikai Kutatóintézet / Geodetic and Geophysical Research Institute, HAS
 GR – GeoRisk Földrengéskutató Intézet Kft. / GeoRisk Earthquake Research Institute Ltd.
- * Működés kezdete / Open date: 2009/05/08
 ** Működés vége / Off date: 2009/03/18
 *** Működés vége / Off date: 2009/03/24



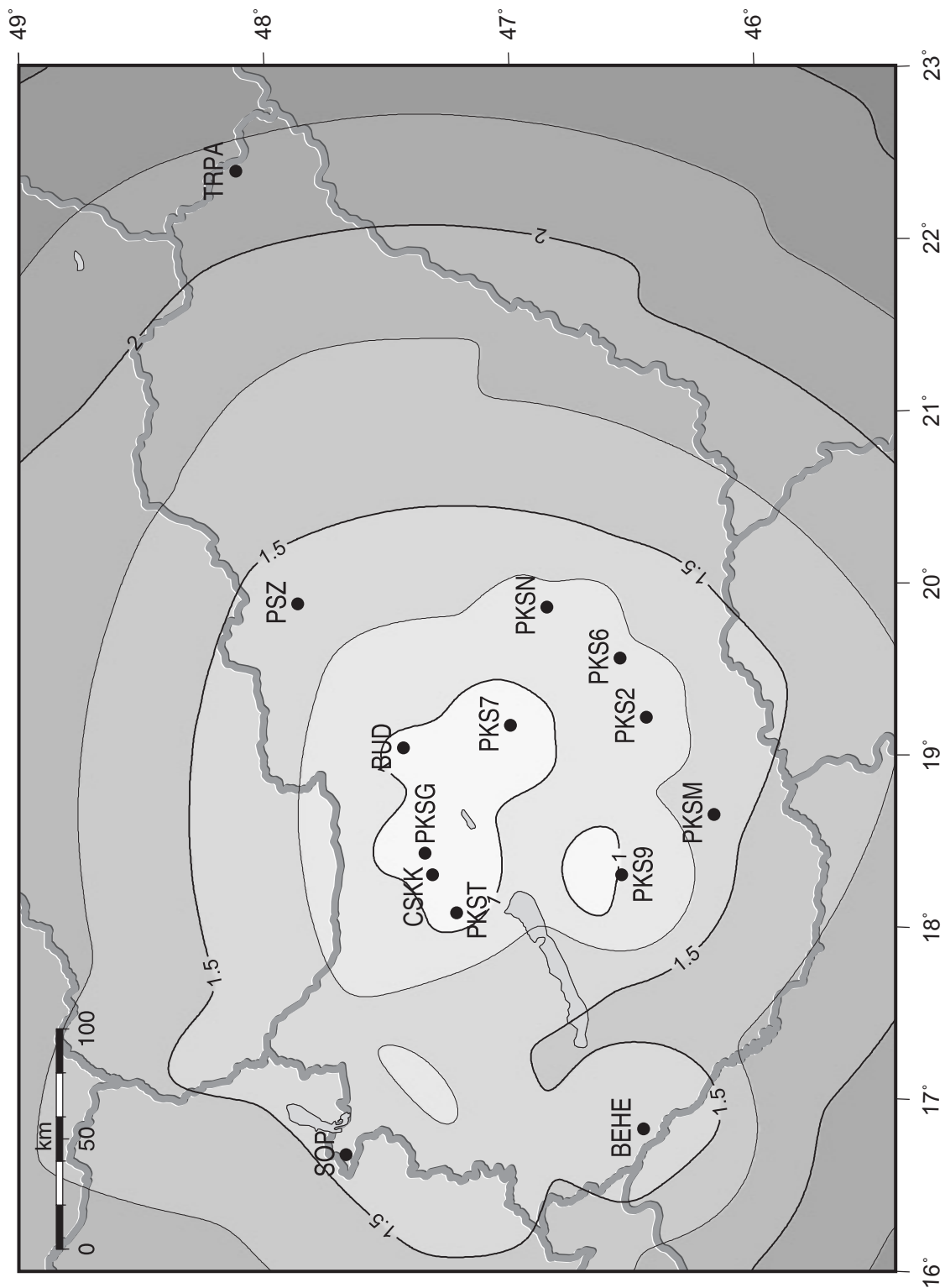
2.1. ábra A magyarországi szeizmológiai állomáshálózat 2009-ben (részletek: 2.1. Táblázat)

Figure 2.1. Seismograph station network in Hungary in 2009 (See Table 2.1. for details)



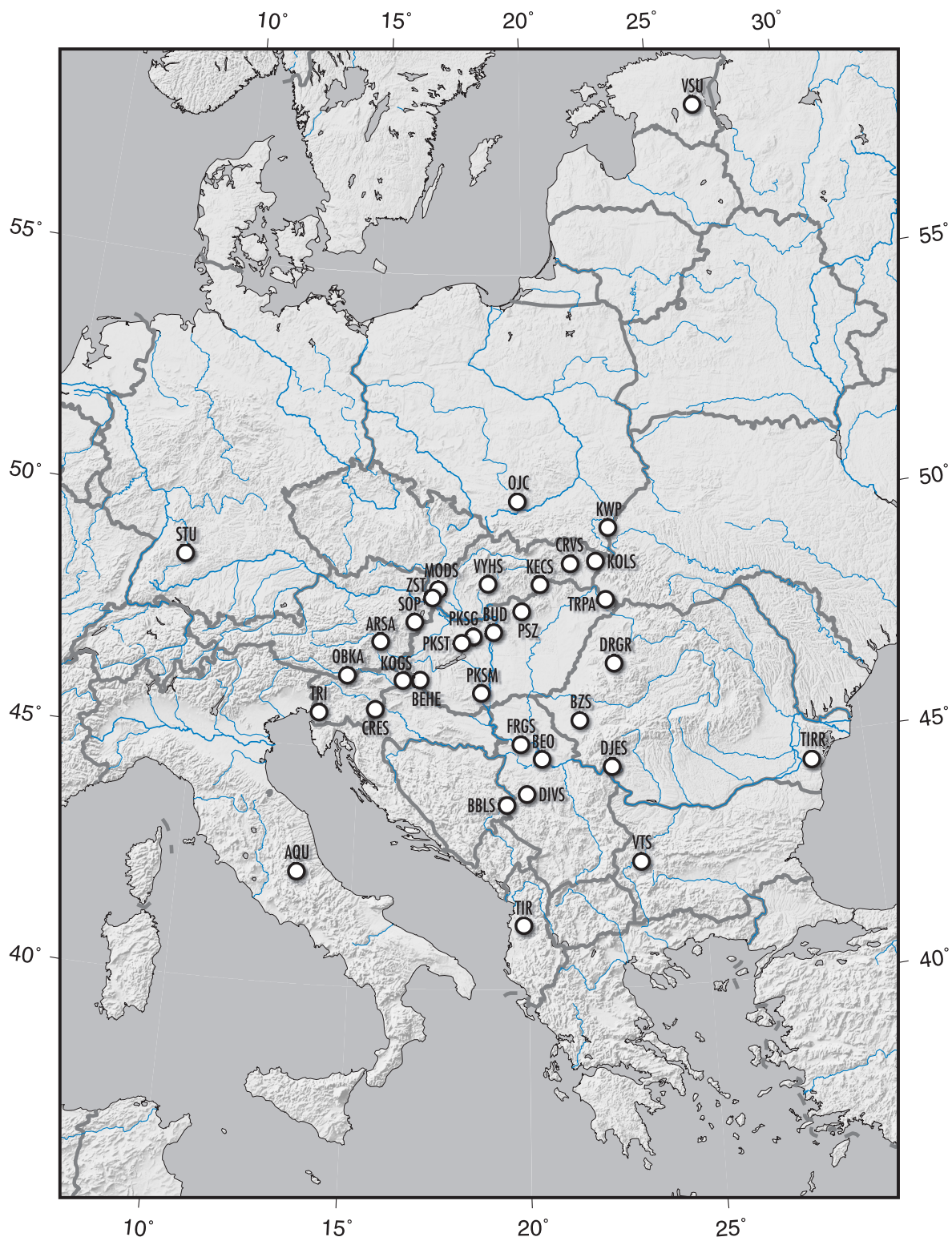
2.2. ábra A magyarországi szeizmológiai hálózat felépítése

Figure 2.2. Structure of the Hungarian seismograph network



2.3. ábra Érzékenységi küszöb átlagos zajviszonyokat feltételezve. Az izovonalak Richter-féle lokális magnitúdót (ML) mutatnak.

Figure 2.3. Detection capability at average noise conditions. Contour values are local Richter magnitudes (ML)



2.4. ábra HUNRENG virtuális szeizmológiai hálózat állomásai

Figure 2.4. Seismic stations used for HUNRENG virtual seismic network

2.2. Táblázat HUNRENG virtuális szeizmológiai hálózat külföldi állomásai
Table 2.2. Supplementary seismic stations used for HUNRENG virtual seismic network

Állomáskód Station code	Az üzemeltető hálózat / Operating network		Ország / Country
	Kódja / Code *	Neve / Name	
KWP	GE	GEOFON	Lengyelország / Poland
SANT			Görögország / Greece
STU			Németország / Germany
TIRR			Románia / Romania
VSU			Észtország / Estonia
AQU	MN	MEDNET	Olaszország / Italy
DIVS			Szerbia / Serbia
TIR			Albánia / Albania
TRI			Olaszország / Italy
VTS			Bulgária / Bulgaria
ARSA OBKA	OE	Osztrák Szeizmológiai Hálózat / Austrian Seismic Network	Ausztria / Austria
OJC	PL	Lengyel Szeizmológiai Hálózat / Polish Seismological Network	Lengyelország / Poland
BZS DRGR	RO	Román Szeizmológiai Hálózat / Romanian Seismic Network	Románia / Romania
BBLs BEO DJES FRGS	SJ	Szerb Szeizmológiai Hálózat / Serbian Seismological Network	Szerbia / Serbia
CRVS KECS KOLS MODS VYHS ZST	SK	Szlovák Nemzeti Szeizmológiai Hálózat / Slovak National Seismic Network	Szlovákia / Slovakia
CRES KOGS	SL	Szlovéniai Szeizmológiai Hálózat / Slovenia Seismic Network	Szlovénia / Slovenia

* FDSN (International Federation of Digital Seismograph Networks) kód

3.

ESEMÉNYLISTA ÉS FÖLDRENGÉS FÉSZEKPARAMÉTEREK

A FÖLDRENGÉS FÉSZEKPARAMÉTEREK MEGHATÁROZÁSA

A fészekparaméterek rutinszerű kiszámításához a HYPO71PC programot használtuk (Lee and Lahr, 1975). A kimérés és magnitúdó meghatározás a K. Stammler által készített SeismicHandler program segítségével történt.

A fészekparaméterek meghatározásánál mind a magyarországi, mind a szomszédos országok állomásainak adatait felhasználtuk. A számításnál az egyes állomások kimérési adatait az epicentrumtól való távolsággal fordított arányban súlyoztuk. Néhány esetben, amikor elegendő P fázis adat állt rendelkezésre, az S fázis adatokat nem használtuk fel.

SEBESSÉGMODELL

A számításnál felhasznált 3 rétegű sebességmodell több száz helyi és közeli földrengés kéregfázis adatain alapul (Mónus, 1995).

<i>Sebesség (v_p) [km/s]</i>	<i>Mélység [km]</i>	<i>Vastagság [km]</i>	v_p/v_s
5,60	0,0	20,0	1,78
6,57	20,0	11,0	
8,02	31,0	∞	

3.

LIST OF ORIGINS AND HYPOCENTER PARAMETERS

METHOD FOR HYPOCENTER PARAMETER DETERMINATION

HYPO71PC (Lee and Lahr, 1975) was used for the routine calculation of hypocenter parameters. SeismicHandler software package by K. Stammler has been used for phase picking and magnitude determination.

The hypocenter parameters have been calculated using phase readings of seismological stations from Hungary and from the adjoining countries. However, a distance weighting has been applied, phase data from stations with epicenter distance greater than 450 km have been weighted out. In some cases, when sufficient number of 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 hypocenter calculations has been derived from crustal phase travel times of several hundreds of local earthquakes (Mónus, 1995).

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

ESEMÉNYLISTA / LIST OF EVENTS

Nap	Kipattanási idő UTC óó pp mp	Földrajzi koordináták Lat Long	Mélys. (km)	ML	I _{MAX} (EMS)	Helyszín
Day	Origin time UTC hr mn sec	Geographic coordinates Lat Long	Depth (km)	ML	I _{MAX} (EMS)	Locality or Region
JANUÁR / JANUARY, 2009						
13	21:32:32.5	45.996N 17.100E	10	2.3	-	Croatia
14	0:59:37.4	48.090N 16.566E	4	2.1	-	Austria
14	1:38:36.0	48.045N 16.604E	7	1.9	-	Austria
18	2:05:30.4	46.001N 17.240E	10	3.5	-	Croatia
18	16:53:44.5	48.041N 16.589E	5	2.3	-	Austria
22	9:17:35.0	47.004N 22.212E	0	2.2	-	Romania
23	13:33:47.0	48.609N 22.642E	9	1.5	-	Ukraine
25	14:04:34.3	47.748N 16.185E	10	2.0	-	Austria
25	16:39:31.2	47.743N 16.194E	10	2.0	-	Austria
26	9:18:16.5	47.413N 18.242E	8	0.7	-	Pusztavám
26	12:55:43.5	47.369N 18.673E	10	1.1	-	Vál
30	3:39:51.1	47.451N 18.040E	0	1.2	-	Aka
FEBRUÁR / FEBRUARY, 2009						
03	9:06:38.6	46.044N 16.041E	14	2.4	-	Croatia
03	23:16:55.7	48.451N 18.984E	17	0.4	-	Slovakia
06	8:38:36.3	45.876N 21.248E	5	2.3	-	Romania
07	12:25:34.8	47.836N 18.997E	4	2.0	-	Kismaros
27	10:09:24.9	48.189N 22.746E	8	1.8	-	Ukraine
MÁRCIUS / MARCH, 2009						
11	1:34:16.1	45.593N 17.421E	13	3.6	-	Croatia
19	8:18:43.7	46.027N 17.166E	13	2.4	-	Croatia
24	11:42:09.9	48.900N 20.496E	1	2.0	-	Slovakia
27	21:48:28.5	47.123N 18.226E	12	1.2	-	Jenő
28	21:03:35.0	46.420N 16.760E	0	2.3	-	Letenye
31	13:09:51.9	46.554N 21.252E	10	2.5	-	Elek
ÁPRILIS / APRIL, 2009						
07	15:03:34.8	48.840N 21.610E	0	2.1	-	Slovakia (expl.)
16	21:42:43.0	45.894N 21.159E	6	2.0	-	Romania
21	14:42:42.3	48.296N 19.795E	0	1.4	-	Slovakia (expl.)
30	6:58:29.0	47.001N 22.214E	0	2.1	-	Romania
MÁJUS / MAY, 2009						
08	19:11:53.9	46.486N 16.662E	13	3.3	-	Szentmargitfalva
08	19:12:13.4	46.384N 16.695E	9	3.6	-	Szentmargitfalva
09	2:25:44.5	46.499N 16.637E	15	2.6	-	Szentmargitfalva
09	5:47:03.5	47.286N 18.351E	0	0.2	-	Magyaralmás (expl.)
09	5:52:30.8	47.272N 18.349E	0	0.2	-	Sárkeresztes (expl.)
11	8:50:45.1	47.307N 18.459E	0	1.7	-	Pátka (expl.)
11	8:51:29.0	47.306N 18.464E	0	1.0	-	Pátka (expl.)
11	16:34:38.5	47.018N 18.057E	0	1.0	-	Balatonalmádi
13	5:31:26.9	47.302N 18.327E	0	0.3	-	Magyaralmás (expl.)
23	4:05:13.3	46.616N 21.279E	7	2.7	-	Gyula
26	5:38:29.3	47.286N 18.342E	0	0.2	-	Magyaralmás (expl.)
27	9:26:37.2	47.167N 18.305E	0	0.5	-	Sárkeszi
27	9:58:13.0	48.371N 19.899E	0	1.4	-	Slovakia (expl.)
28	5:13:27.7	47.323N 18.321E	10	0.2	-	Söréd
28	11:11:00.6	47.933N 19.449E	10	1.1	-	Szanda

Földrengés paraméterek
Hypocenter Parameters

28	11:25:28.2	48.224N	21.220E	2	2.0	-	Rátka
29	11:33:22.9	47.931N	20.499E	5	1.2	-	Noszvaj
30	13:27:06.5	47.398N	18.224E	1	0.2	-	Mór

JÚNIUS / JUNE, 2009

01	10:17:46.2	46.224N	19.418E	17	1.8	-	Mélykút
02	5:35:42.6	47.336N	18.323E	10	0.1	-	Csákberény
02	9:09:44.2	47.479N	18.431E	0	1.0	-	Várgesztes (expl.)
02	9:14:37.3	47.317N	18.446E	0	1.3	-	Zámoly (expl.)
02	10:14:44.4	48.789N	20.692E	0	2.0	-	Slovakia (expl.)
03	5:08:13.6	47.209N	18.347E	0	0.8	-	Székesfehérvár (exp.)
03	9:37:30.0	47.182N	18.303E	10	0.6	-	Sárkeszi
05	11:31:23.5	47.959N	20.044E	0	1.0	-	Mátraballa (expl.)
06	5:32:25.6	47.271N	18.348E	0	0.1	-	Sárkeresztes (expl.)
06	5:34:49.2	47.239N	18.400E	0	0.3	-	Sárkeresztes (expl.)
06	6:23:15.6	47.272N	18.335E	0	0.3	-	Sárkeresztes (expl.)
08	10:09:08.3	48.002N	19.497E	0	1.1	-	Nógrádsipek (expl.)
09	9:13:42.8	47.339N	18.458E	0	1.1	-	Lovasberény (expl.)
09	9:19:48.8	47.339N	18.539E	0	1.5	-	Lovasberény (expl.)
10	5:35:23.7	47.243N	18.385E	0	0.5	-	Sárkeresztes (expl.)
11	6:05:45.0	47.144N	18.231E	0	0.6	-	Nádasdladány (expl.)
17	11:42:08.6	47.132N	18.316E	0	0.7	-	Úrhida (expl.)
19	12:17:08.1	47.921N	20.565E	0	1.4	-	Cserépváralja (expl.)
22	5:09:46.2	45.633N	20.114E	10	2.7	-	Serbia
22	7:04:46.6	47.334N	18.267E	6	0.1	-	Söréd
22	7:56:39.6	47.312N	18.448E	0	1.0	-	Pátka (expl.)
22	7:57:17.8	47.479N	18.419E	0	1.2	-	Várgesztes (expl.)
25	9:09:32.8	48.597N	20.856E	0	1.7	-	Slovakia (expl.)
26	9:09:35.5	48.247N	20.190E	0	0.8	-	Szentsimon (expl.)
26	11:49:34.1	48.100N	20.218E	0	0.7	-	Bekölce (expl.)

JÚLIUS / JULY, 2009

01	5:42:29.3	47.413N	18.242E	4	0.3	-	Pusztavám
02	5:54:14.6	47.261N	18.365E	0	0.2	-	Sárkeresztes (expl.)
02	9:17:18.0	47.367N	18.638E	0	0.7	-	Vértessacsa (expl.)
02	9:22:48.9	47.178N	18.309E	0	0.5	-	Székesfehérvár (exp.)
03	6:10:12.0	47.284N	18.232E	6	0.4	-	Kincsesbánya
04	2:51:02.5	48.229N	22.618E	7	1.9	-	Beregdaróc
04	4:06:31.5	46.657N	20.898E	3	2.3	-	Telekgerendás
07	8:37:42.6	47.338N	18.510E	0	1.3	-	Lovasberény (expl.)
07	8:38:01.5	47.461N	18.389E	0	1.3	-	Várgesztes (expl.)
08	9:27:58.5	47.211N	18.292E	0	0.5	-	Iszkaasztgyörgy (exp.)
08	10:21:18.6	48.928N	20.701E	0	1.9	-	Slovakia (expl.)
13	8:16:32.2	47.133N	18.243E	0	0.6	-	Nádasdladány (expl.)
13	8:19:32.1	47.181N	18.254E	0	0.5	-	Csór (expl.)
13	8:50:08.5	47.497N	18.393E	0	1.4	-	Várgesztes (expl.)
13	8:50:26.7	47.487N	18.388E	0	1.3	-	Várgesztes (expl.)
13	14:07:53.7	47.333N	18.164E	10	0.6	-	Balinka
14	8:43:53.0	47.337N	18.452E	0	1.2	-	Zámoly (expl.)
14	10:03:26.9	47.953N	19.427E	10	1.3	-	Terény
20	10:28:51.8	47.971N	19.456E	0	1.1	-	Cserhátsurány (expl.)
26	3:34:33.5	47.520N	18.441E	6	0.3	-	Vértessomló
26	4:26:03.9	47.490N	18.444E	10	0.6	-	Várgesztes
27	9:53:11.1	47.925N	19.463E	0	0.9	-	Szanda (expl.)
27	22:19:23.9	45.994N	16.893E	13	2.1	-	Croatia
28	9:59:09.4	47.335N	18.445E	0	1.3	-	Zámoly (expl.)
28	10:41:57.2	48.590N	20.816E	0	1.5	-	Tornanádaska (expl.)
30	10:02:23.1	47.965N	19.432E	0	1.2	-	Terény (expl.)

AUGUSZTUS / AUGUST, 2009

03	6:04:00.9	47.339N	18.292E	10	0.2	-	Csákberény
04	16:10:59.7	47.084N	17.951E	10	0.7	-	Veszprém
05	8:08:41.2	47.354N	18.431E	6	1.4	-	Gánt
06	10:16:17.7	47.880N	19.402E	0	1.0	-	Bercel (expl.)

Hypocenter Parameters

Földrengés paraméterek

07	6:19:20.7	47.271N	18.358E	0	0.0	-	Sárkeresztes (expl.)
10	5:26:56.1	47.296N	18.324E	8	0.2	-	Magyaralmás
10	6:53:24.2	48.389N	19.823E	0	1.4	-	Slovakia (expl.)
10	10:31:15.2	48.579N	20.797E	0	1.7	-	Tornanádaska (expl.)
10	10:50:58.9	47.992N	19.479E	0	1.0	-	Herencsény (expl.)
11	7:40:01.0	47.342N	18.531E	0	1.4	-	Lovasberény (expl.)
12	5:40:01.3	47.341N	18.311E	10	0.1	-	Csákberény
12	9:25:34.7	47.288N	18.441E	0	1.2	-	Pátka (expl.)
12	9:25:46.5	47.183N	18.597E	0	1.2	-	Dinnyés (expl.)
12	16:46:21.9	47.116N	17.889E	2	0.9	-	Márkó
13	8:44:32.8	47.412N	18.268E	9	0.0	-	Pusztavám
13	10:44:47.7	47.464N	18.646E	10	0.6	-	Bicske
14	8:51:36.5	47.347N	18.486E	0	1.5	-	Lovasberény
15	6:31:27.9	47.309N	18.344E	8	0.1	-	Magyaralmás
16	3:44:15.1	47.323N	18.329E	10	0.1	-	Söréd
16	3:47:52.4	47.317N	18.335E	9	0.0	-	Magyaralmás
19	8:25:01.4	47.279N	18.373E	0	0.2	-	Magyaralmás (expl.)
19	9:54:15.5	47.981N	19.465E	0	1.2	-	Herencsény (expl.)
22	6:29:15.3	47.310N	18.320E	10	0.3	-	Söréd
24	23:24:56.3	47.028N	21.131E	10	2.0	-	Szeghalom
25	1:39:50.6	47.000N	20.876E	10	1.9	-	Dévaványa
25	9:04:56.0	47.469N	18.401E	0	1.2	-	Várgesztes (expl.)
25	9:13:38.3	47.337N	18.439E	0	1.3	-	Zámoly (expl.)
25	9:14:32.9	47.336N	18.432E	0	1.5	-	Zámoly (expl.)
27	5:02:37.0	47.272N	18.355E	6	0.2	-	Sárkeresztes

SZEPTEMBER / SEPTEMBER, 2009

02	10:52:46.0	48.307N	21.174E	14	1.8	-	Abaújkér
03	5:51:43.6	47.292N	18.337E	0	0.2	-	Magyaralmás (expl.)
03	7:00:06.3	47.277N	18.353E	0	0.4	-	Magyaralmás (expl.)
03	8:50:08.9	47.327N	18.435E	0	0.9	-	Zámoly (expl.)
03	14:27:37.9	47.279N	18.347E	0	0.0	-	Magyaralmás
04	10:46:04.6	48.017N	19.514E	0	1.2	-	Rimóc (expl.)
04	11:53:38.7	47.581N	18.420E	6	0.8	-	Tatabánya
04	13:27:24.6	48.303N	19.810E	0	1.3	-	Slovakia (expl.)
07	8:51:30.5	47.522N	18.397E	0	1.4	-	Vértessomló (expl.)
08	5:06:23.4	47.269N	18.337E	0	0.2	-	Sárkeresztes (expl.)
08	9:12:59.8	47.179N	18.360E	0	1.1	-	Székesfehérvár (exp.)
10	5:59:09.3	47.286N	18.342E	0	0.2	-	Magyaralmás (expl.)
10	6:02:35.6	47.283N	18.330E	0	0.1	-	Magyaralmás (expl.)
11	12:19:30.1	47.928N	19.424E	0	1.3	-	Szanda (expl.)
18	9:22:51.0	47.306N	18.326E	0	0.9	-	Magyaralmás (expl.)
18	10:59:51.6	47.263N	18.377E	0	0.5	-	Sárkeresztes (expl.)
18	11:23:50.5	47.262N	18.337E	0	0.5	-	Sárkeresztes (expl.)
21	7:54:57.3	45.543N	21.004E	14	2.5	-	Romania
22	9:01:09.4	47.919N	19.874E	5	1.6	-	Mátraszentimre
22	9:06:34.8	47.484N	18.368E	0	1.0	-	Várgesztes (expl.)
22	9:07:03.5	47.320N	18.482E	0	1.1	-	Lovasberény (expl.)
23	7:53:26.0	47.308N	18.333E	9	0.2	-	Magyaralmás
23	8:19:38.8	47.200N	18.288E	8	0.4	-	Csór
23	10:15:28.0	48.618N	20.367E	0	1.6	-	Slovakia (expl.)
29	8:34:18.4	47.315N	18.425E	0	1.4	-	Zámoly (expl.)
30	8:10:26.2	47.176N	18.233E	0	0.5	-	Csór (expl.)
30	9:20:38.5	47.191N	18.290E	0	0.5	-	Sárkeszi (expl.)

OKTÓBER / OCTOBER, 2009

02	5:44:42.2	47.313N	18.330E	10	0.3	-	Magyaralmás
02	9:44:31.6	47.882N	20.840E	0	1.7	-	Hejőpapi (expl.)
02	11:19:06.1	48.839N	20.622E	0	2.2	-	Slovakia (expl.)
03	6:10:10.9	47.250N	18.434E	10	0.5	-	Csala
05	9:15:14.8	47.284N	18.453E	0	1.3	-	Pátka (expl.)
05	9:19:43.8	47.455N	18.400E	0	1.0	-	Várgesztes (expl.)
05	9:19:57.8	47.450N	18.375E	0	1.3	-	Várgesztes (expl.)
05	19:06:05.0	48.391N	22.244E	13	2.6	4	Tiszabездéd

Földrengés paraméterek

Hypocenter Parameters

06	10:01:29.1	48.856N	20.913E	0	1.9	-	Slovakia (expl.)
09	6:25:46.8	47.334N	18.458E	0	1.4	-	Lovasberény (expl.)
09	6:26:03.0	47.336N	18.479E	0	1.3	-	Lovasberény (expl.)
20	8:26:32.8	47.315N	18.444E	0	1.3	-	Zámoly (expl.)
20	8:29:43.4	47.329N	18.425E	0	1.2	-	Zámoly (expl.)
20	9:36:12.7	47.454N	18.401E	0	1.3	-	Várgesztes (expl.)
20	18:16:06.7	47.704N	17.540E	9	1.9	-	Abda
21	7:54:07.9	47.335N	18.528E	0	1.3	-	Lovasberény (expl.)
21	7:58:08.4	47.335N	18.492E	0	1.3	-	Lovasberény (expl.)
22	6:11:07.3	47.287N	18.352E	9	0.4	-	Magyaralmás
26	9:48:00.2	47.340N	18.453E	0	2.0	-	Zámoly (expl.)
28	7:33:51.1	47.276N	18.334E	0	0.4	-	Magyaralmás (expl.)
29	9:29:14.4	47.268N	18.375E	0	1.1	-	Sárkeresztes (expl.)
31	1:47:28.8	48.788N	22.245E	10	2.0	-	Ukraine

NOVEMBER / NOVEMBER, 2009

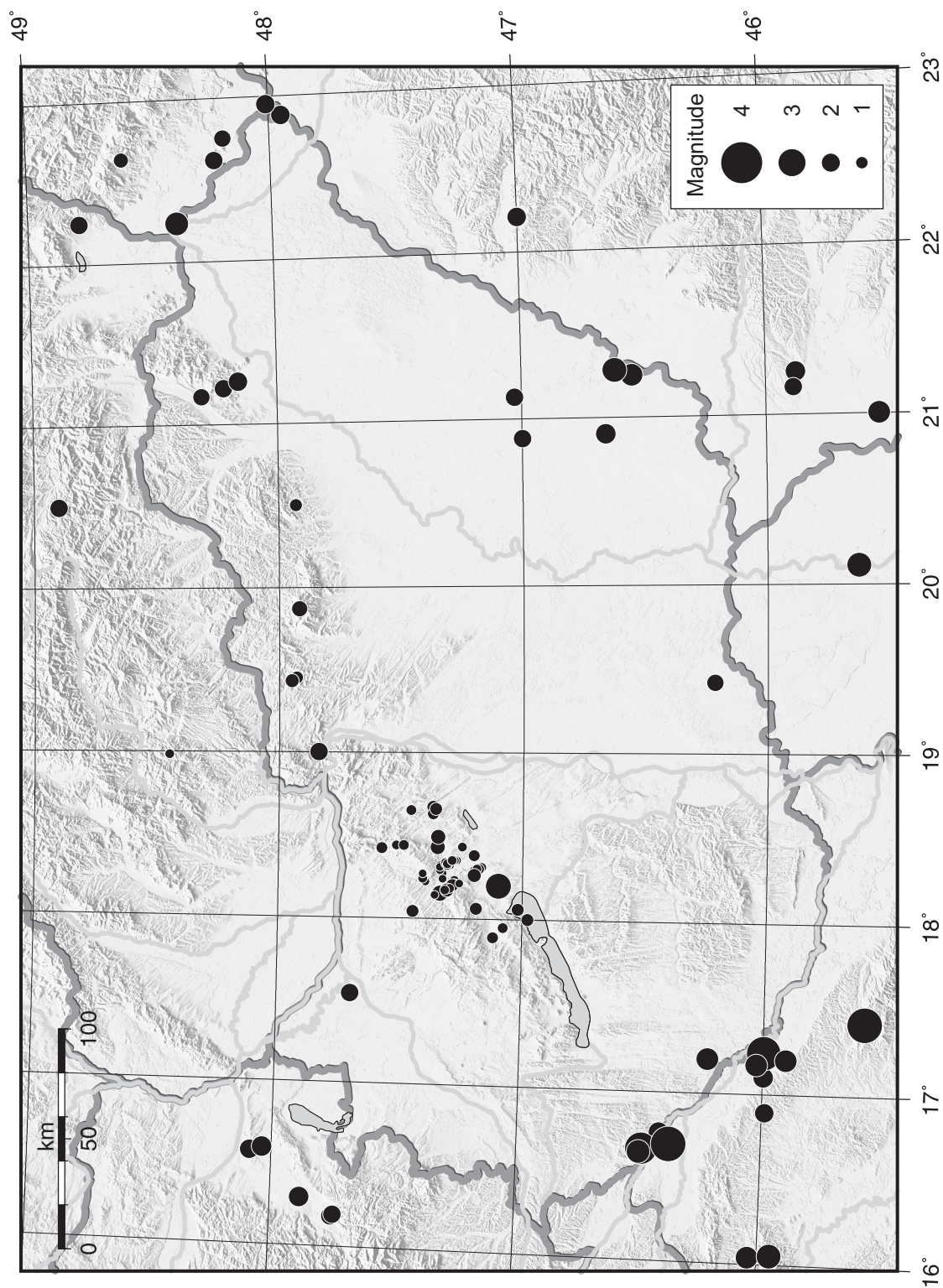
02	9:15:16.2	47.320N	18.304E	0	0.2	-	Söréd (expl.)
02	10:00:23.3	47.418N	18.351E	0	0.8	-	Gánt (expl.)
02	10:07:35.6	47.444N	18.364E	0	1.2	-	Oroszlány (expl.)
03	9:56:03.9	47.482N	18.400E	0	1.1	-	Várgesztes (expl.)
03	11:32:21.0	47.373N	18.628E	13	0.8	-	Vértessacska
03	11:44:52.6	47.191N	18.301E	10	0.4	-	Székesfehérvár
06	7:04:46.7	47.297N	18.333E	0	0.7	-	Magyaralmás (expl.)
06	14:14:03.5	47.363N	18.657E	10	1.0	-	Vál
08	22:39:52.2	47.334N	18.244E	5	0.0	-	Bodajk
09	10:31:19.4	47.442N	18.403E	0	1.1	-	Várgesztes (expl.)
09	10:31:30.5	47.338N	18.445E	0	1.3	-	Zámoly (expl.)
10	8:35:10.1	47.315N	18.493E	0	1.4	-	Lovasberény (expl.)
10	8:35:24.3	47.340N	18.465E	0	1.2	-	Lovasberény (expl.)
12	7:25:09.5	47.208N	18.354E	0	0.3	-	Székesfehérvár (exp.)
12	11:27:59.2	47.170N	18.299E	0	0.5	-	Sárkeszi (expl.)
16	9:59:12.6	48.354N	19.913E	0	1.7	-	Slovakia (expl.)
19	8:00:18.5	47.880N	16.290E	5	2.2	-	Austria
21	0:21:02.0	47.344N	18.154E	9	1.6	-	Nagyveleg
21	0:21:12.8	47.204N	18.256E	10	1.3	-	Csór
21	1:03:02.5	47.277N	18.206E	7	0.4	-	Isztimér
21	1:38:31.1	47.355N	18.139E	7	0.2	-	Nagyveleg
21	1:46:49.0	47.292N	18.195E	9	1.1	-	Balinka
21	4:20:54.2	47.309N	18.175E	10	1.3	-	Balinka
21	19:21:15.9	47.303N	18.177E	9	0.3	-	Balinka
22	13:42:08.0	47.317N	18.170E	10	0.4	-	Balinka
23	8:43:11.2	47.308N	18.332E	0	0.2	-	Magyaralmás (expl.)
23	10:57:00.5	47.462N	18.404E	0	1.1	-	Várgesztes (expl.)
23	10:57:37.2	47.427N	18.337E	0	0.8	-	Oroszlány (expl.)
23	11:01:31.8	47.442N	18.349E	0	0.8	-	Oroszlány (expl.)
24	10:59:57.5	47.179N	18.302E	0	0.5	-	Sárkeszi (expl.)
24	18:56:16.3	47.257N	18.211E	10	0.1	-	Kincsesbánya
25	7:25:23.0	47.290N	18.350E	10	0.4	-	Magyaralmás
25	9:34:37.6	47.954N	22.882E	10	2.1	-	Garbolc
25	10:07:35.7	47.100N	18.199E	10	2.8	3-4	Berhida
25	20:41:20.1	48.011N	22.948E	6	2.1	-	Garbolc
27	6:56:53.4	47.280N	18.349E	0	0.4	-	Magyaralmás (expl.)
28	1:36:53.8	47.194N	18.058E	0	1.0	-	Várpalota
28	9:39:53.5	45.951N	16.051E	10	2.7	-	Croatia
30	7:31:59.3	47.269N	18.367E	0	0.4	-	Sárkeresztes (expl.)
30	11:03:32.9	47.340N	18.454E	0	1.5	-	Zámoly (expl.)
30	11:03:50.9	47.468N	18.397E	0	1.4	-	Várgesztes (expl.)

DECEMBER / DECEMBER, 2009

04	7:19:57.3	47.336N	18.472E	0	1.0	-	Lovasberény (expl.)
04	12:10:46.3	47.256N	18.701E	0	0.9	-	Pettend (expl.)
07	10:26:24.7	47.335N	18.500E	0	1.3	-	Lovasberény (expl.)
07	10:36:19.4	47.290N	18.356E	0	1.1	-	Magyaralmás (expl.)
07	11:02:25.5	47.346N	18.458E	0	1.2	-	Lovasberény (expl.)

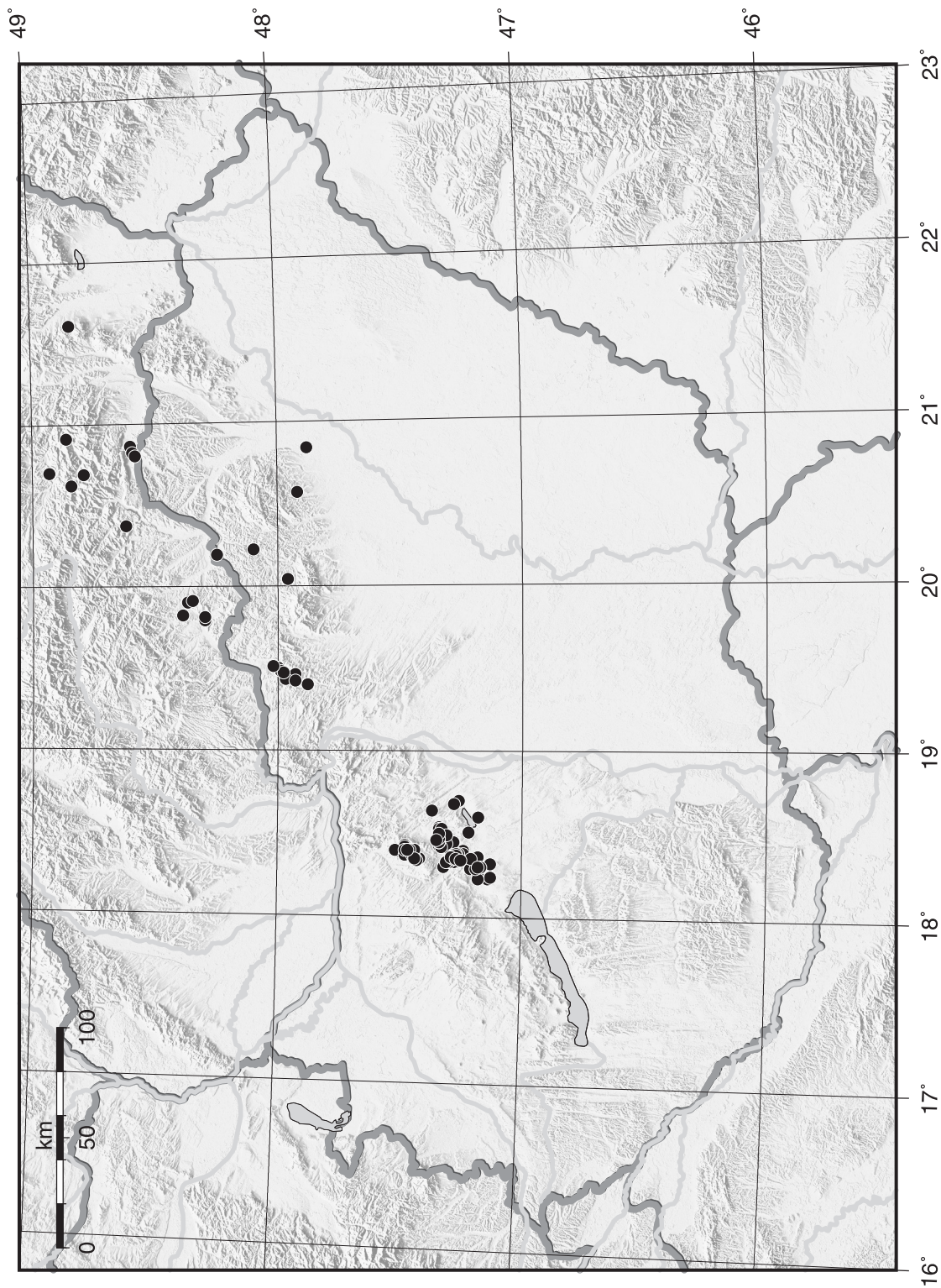
Hypocenter Parameters**Földrengés paraméterek**

07	12:34:18.0	47.272N	18.350E	0	0.2	-	Sárkeresztes (expl.)
09	8:43:19.3	47.246N	18.342E	0	0.3	-	Sárkeresztes (expl.)
10	11:17:29.3	47.276N	18.681E	0	0.8	-	Kápolnásnyék (expl.)
11	7:09:13.5	47.223N	18.507E	0	0.5	-	Pákozd (expl.)
14	10:53:31.9	46.979N	17.999E	0	1.0	-	Alsóörs
14	13:10:17.8	48.158N	21.258E	2	2.1	-	Mezőzombor
22	1:36:06.0	47.204N	18.375E	10	0.8	-	Székesfehérvár
26	3:39:13.2	46.228N	17.196E	10	2.4	-	Berzence
30	1:28:19.2	45.907N	17.197E	15	2.5	-	Croatia



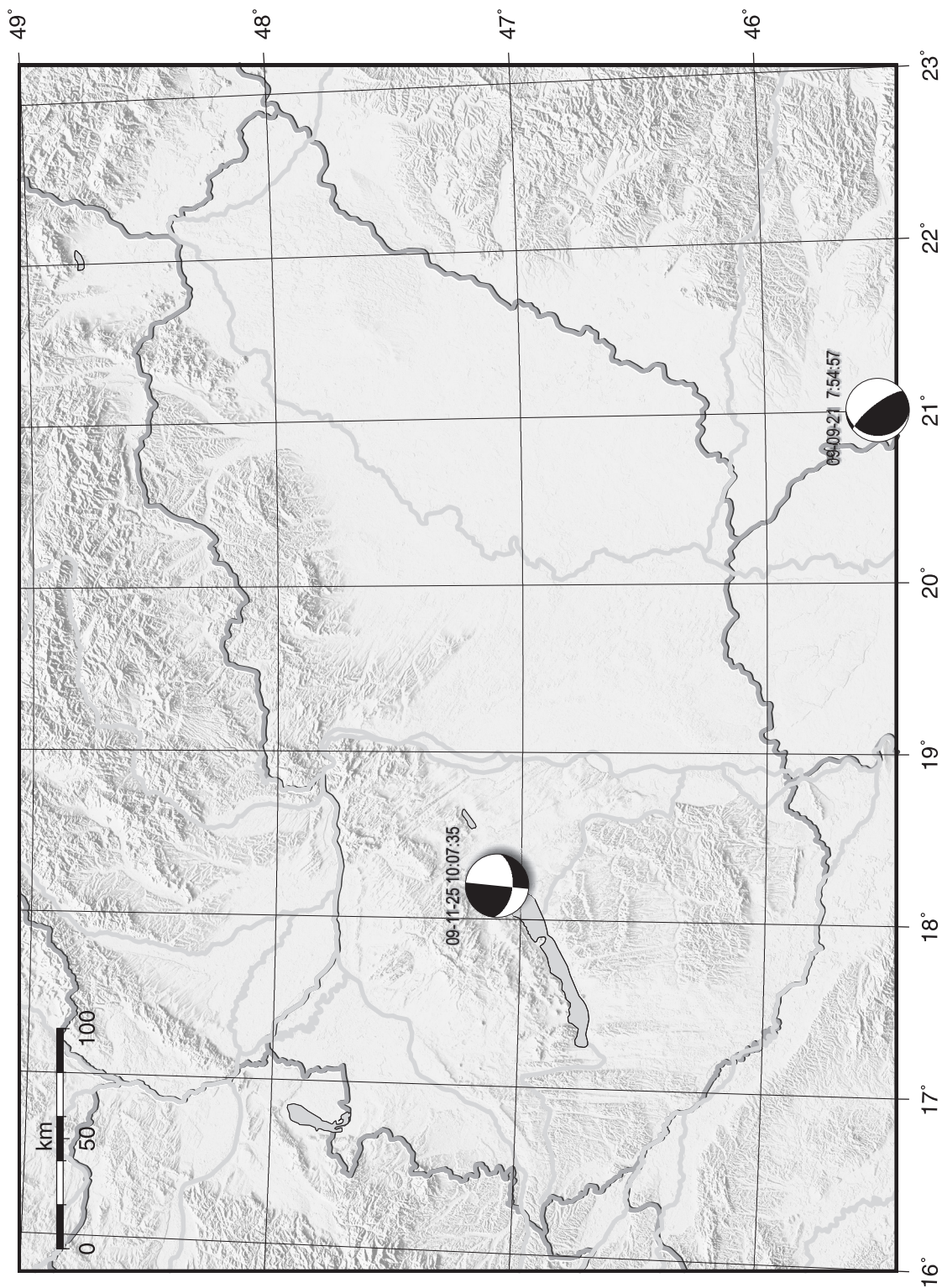
3.1. ábra A 2009-ben regisztrált földrengések epicentrumai

Figure 3.1. Epicenters of 2009 earthquakes



3.2. ábra A 2009-ben regisztrált robbantások epicentrumai

Figure 3.2. Epicenters of 2009 explosions



3.3. ábra A 2009-ben regisztrált földrengések fészekmechanizmusai

Figure 3.3. Fault plane solutions of 2009 earthquakes

FÉSZEKPARAMÉTEREK ÉS FÁZISADATOK

A listában alkalmazott jelek és rövidítések magyarázata:

time:	Az esemény kipattanásának ideje (óra:perc:másodperc; UTC).
ML:	A rengés Richter-féle lokális magnitúdója.
lat:	Az esemény földrajzi szélessége (fok).
lon:	Az esemény földrajzi hosszúsága (fok).
h:	A fészek mélysége (km).
erh:	Horizontális hiba km-ben. ($erh = \sqrt{SDX^2 + SDY^2}$, ahol SDX és SDY az epicentrum földrajzi szélességének és hosszúságának meghatározási hibái.) Ha $erh = ---$, a kevés rendelkezésre álló adat miatt erh nem volt meghatározható.
erz:	A fészekmélység meghatározásának hibája (km). $erz = ---$ azt jelzi, hogy erz nem volt meghatározható a kevés rendelkezésre álló adat miatt.
nr:	A számításnál felhasznált fázisadatok száma. Azonos állomásról származó P és S beérkezések 2 adatnak számítanak.
gap:	Az állomások közötti legnagyobb irányeltérés (fok).
rms:	A számított beérkezési idők átlagnégyzetes hibája (mp). ($rms = \sqrt{\sum R_i^2 / nr}$, ahol R_i az i -edik állomás időhibája (reziduál).)
Locality:	A rengés földrajzi helyének megnevezése, általában a legközelebbi település neve.
Comments:	Az eseménnyel kapcsolatos egyéb közlemény (pl. epicentrális intenzitás).
sta:	Az állomás neve. (L. 2. fejezet.)
dist:	Az állomás távolsága az epicentrumtól (km).
azm:	Az állomás irányszöge az epicentrumtól az északi iránytól számítva (fok).
phase:	Fázis azonosító; az első betű a kezdetet jellemzi: e = lassan emelkedő i = hirtelen kitérő; a második és harmadik betű a fázis megnevezése pl. Pn, Pg, Sn, Sg; a negyedik a kitérési irányt jelzi: C=kompRESSzió/fel, D=dilatáció/le.
hr mn sec:	A fázis beérkezési ideje (óra, perc, másodperc).
res:	Reziduál (másodperc). ($res = T_{obs} - T_{cal}$, ahol T_{obs} a mért, és T_{cal} a számított menetidő.)

Minden rengésnél, ahol elegendő számú első kitérési adat állt rendelkezésre, megkíséreltük a fészekmechanizmus meghatározását. Az ábrákon az alsó félteke sztereografikus képe látható, **P** a maximális, **T** a minimális feszültségtengely iránya. A fészekmechanizmusokat a 3.3. ábra foglalja össze.

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 hypocenter in km.
erh:	Standard error of the epicenter in km. ($erh = \sqrt{SDX^2 + SDY^2}$, where SDX and SDY are the standard errors in latitude and longitude respectively, of the epicenter.) 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 epicenter 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 epicenter to station in km.
azm:	Azimuthal angle between epicenter 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 fourth 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 were attempted for each event where any information for the stress field could be drawn. Stereographic projections of the lower focal hemisphere are shown, **P** and **T** are the main compression and tension axes respectively. Strike, dip and slip values of the nodal planes are also indicated. Calculations were carried out by computer program FPFIT (Reasenber and Oppenheimer, 1985). The results are summarized in Fig. 3.3.

Hypocenter Parameters

Földrengés paraméterek

1.

2009-01-13 time: 21:32:32.52 UTC ML= 2.3
 lat: 45.996N lon: 17.100E h= 10.0 km
 erh= 4.3km erz= 2.9km
 nr= 21 gap=164 rms=1.05
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	58.3	335	ePg	21:32:43.60	0.51
			eSg	32:51.60	0.27
KOGS	82.6	307	iPg	21:32:47.00	-0.37
			iSg	32:57.90	-1.06
RHK3	90.1	98	ePgC	21:32:48.50	-0.21
PKS9	112.1	54	ePnD	21:32:52.10	-0.15
			eSn	33:07.10	-0.54
GOLS	114.3	271	iPn	21:32:52.60	0.07
			iSn	33:06.50	-1.63
PKSM	121.6	79	ePnD	21:32:52.40	-1.03
			eSn	33:08.60	-1.14
CRES	128.9	262	iPn	21:32:55.00	0.66
			eSn	33:11.00	-0.37
GROS	133.7	293	iPn	21:32:56.70	1.76
			iSn	33:11.10	-1.33
LEGS	138.2	268	eSn	21:33:14.50	1.06
PKST	157.6	27	ePn	21:32:57.20	-0.72
			eSn	33:20.70	2.97
SOKA	176.3	295	Sn	21:33:22.60	0.71
ARSA	184.5	319	Pn	21:33:03.40	2.13
			Sn	33:25.20	1.50

2.

2009-01-14 time: 0:59:37.43 UTC ML= 2.1
 lat: 48.090N lon: 16.566E h= 4.4 km
 erh= 3.4km erz= 2.9km
 nr= 27 gap=106 rms=1.32
 Locality: Austria
 Comments:

sta	dist	azm	phase	hr mn sec	res
ZST	41.7	73	ePg	0:59:45.10	0.19
			eSg	59:49.70	-1.05
SOP	45.2	181	ePgD	0:59:45.20	-0.34
			eSg	59:50.10	-1.76
CONA	55.4	251	Pg	0:59:47.70	0.34
			Sg	59:54.20	-0.90
SMOL	79.5	54	ePg	0:59:51.80	0.15
ARSA	121.8	220	Pn	0:59:57.90	-1.19
			Sn	1:00:12.70	-3.28
KOLL	146.6	68	ePn	0:60:02.00	-0.18
TREC	155.8	329	ePn	0:60:03.70	0.38
			eSn	60:22.00	-1.52
MOA	173.8	261	Pn	0:60:06.20	0.63
			Sn	60:26.20	-1.32
VYHS	174.4	75	ePn	0:60:04.80	-0.84
			eSn	60:25.10	-2.55
KOGS	184.1	187	iPn	0:60:09.00	2.15
			iSn	60:30.40	0.60
PERS	195.2	214	iSn	0:60:32.90	0.63
GROS	198.2	204	iPn	0:60:11.10	2.49
			iSn	60:33.60	0.67
KHC	248.9	298	ePn	0:60:16.10	1.17
			eSn	60:46.10	1.91
DPC	252.0	356	ePn	0:60:19.90	4.58
			eSn	60:50.10	5.22
PRU	257.9	325	ePn	0:60:17.10	1.05
			eSn	60:50.70	4.52
PVCC	307.6	332	eSn	0:61:05.70	8.48
NKC	383.5	308	eSn	0:61:26.50	12.45

3.

2009-01-14 time: 1:38:36.03 UTC ML= 1.9
 lat: 48.045N lon: 16.604E h= 6.8 km
 erh= 2.9km erz= 2.6km
 nr= 19 gap=112 rms=0.96
 Locality: Austria
 Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	40.3	185	ePgD	1:38:43.80	0.46
			eSg	38:48.80	-0.24
ZST	40.8	66	ePg	1:38:42.90	-0.51
			eSg	38:48.30	-0.87
CONA	56.8	257	Pg	1:38:46.40	0.15
			Sg	38:54.00	-0.22
SMOL	80.4	50	ePg	1:38:50.50	0.05
			eSg	39:00.10	-1.59
ARSA	120.0	223	Pn	1:38:57.20	0.05
			Sn	39:11.90	-1.72
KOLL	146.0	66	ePn	1:39:00.00	-0.40
TREC	161.5	329	ePn	1:39:03.10	0.77
			eSn	39:20.90	-1.95
VYHS	173.1	73	ePn	1:39:05.60	1.83
			eSn	39:27.90	2.49
KHC	253.8	298	ePn	1:39:15.90	2.06
			eSn	39:44.90	1.57
DPC	257.2	355	eSn	1:39:48.50	4.41
PRU	263.6	325	ePn	1:39:18.60	3.54
			eSn	39:50.30	4.80

4.

2009-01-18 time: 2:05:30.36 UTC ML= 3.5
 lat: 46.001N lon: 17.240E h= 10.0 km
 erh=15.1km erz= 9.4km
 nr= 9 gap=227 rms=1.28
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	63.3	326	ePg	2:05:41.90	0.10
			eSg	05:48.50	-2.23
RHK3	79.5	99	ePgC	2:05:45.50	0.83
PKS9	103.3	51	eP*C	2:05:48.80	-0.08
			eS*	06:03.50	0.17
PKSM	110.9	78	ePn	2:05:49.00	-0.95
			eSn	06:04.70	-0.52
PKST	152.6	24	ePnC	2:05:56.10	0.96
SOP	194.1	344	eSn	2:06:33.10	9.40

5.

2009-01-18 time: 16:53:44.52 UTC ML= 2.3
 lat: 48.041N lon: 16.589E h= 5.3 km
 erh= 3.1km erz= 2.7km
 nr= 18 gap=110 rms=0.95
 Locality: Austria
 Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	39.9	183	ePgD	16:53:52.10	0.40
			eSg	53:56.90	-0.41
ZST	41.9	66	ePg	16:53:51.80	-0.27
			eSg	53:56.80	-1.16
CONA	55.6	257	Pg	16:53:54.70	0.20
			Sg	54:02.20	-0.09
SMOL	81.5	50	ePg	16:53:58.70	-0.41
			eSg	54:09.30	-1.19
ARSA	118.9	222	Pn	16:54:05.10	-0.60
			Sn	54:20.00	-2.22
VYHS	174.3	73	ePn	16:54:14.70	2.10
			eSn	54:36.00	1.50
MOA	174.9	263	Pn	16:54:13.30	0.62
			Sn	54:35.20	0.56
KHC	253.1	299	ePn	16:54:24.40	1.97
			eSn	54:53.00	1.01

Földrengés paraméterek

Hypocenter Parameters

PRU 263.3 325 ePn 16:54:26.40 2.70
 eSn 54:57.70 3.44
 UPC 277.5 351 eSn 16:55:02.40 4.99
 PVCC 313.2 332 eSn 16:55:12.00 6.66
 NKC 388.3 309 eSn 16:55:32.50 10.50

6.

2009-01-22 time: 9:17:35.01 UTC ML= 2.2
 lat: 47.004N lon: 22.212E h= 0.0 km
 erh= 1.2km erz= 1.5km
 nr= 7 gap=175 rms=0.24
 Locality: Romania
 Comments:

sta	dist	azm	phase	hr mn sec	res
DRGR	44.8	122	iPg	9:17:42.70	-0.31
BMR	122.3	53	iPg	9:17:57.00	0.14
TRPA	127.6	11	iPgD	9:17:57.60	-0.20
BZS	160.9	197	iPn	9:18:02.20	0.10
GZR	184.3	166	iPn	9:18:05.20	0.18
LOT	210.7	145	iPn	9:18:08.50	0.19
BURB	237.2	73	iPn	9:18:12.50	0.88

7.

2009-01-23 time: 13:33:47.03 UTC ML= 1.5
 lat: 48.609N lon: 22.642E h= 8.8 km
 erh= 2.2km erz= 1.8km
 nr= 6 gap=216 rms=0.15
 Locality: Ukraine
 Comments:

sta	dist	azm	phase	hr mn sec	res
KOLS	45.1	323	ePg	13:33:55.00	-0.24
			eSg	34:02.10	0.45
TRPA	53.8	188	iPg	13:33:56.80	0.03
CRVS	92.8	291	ePg	13:34:03.60	-0.08
			eSg	34:16.80	0.15
DRGR	202.1	179	iPn	13:34:18.20	0.05

8.

2009-01-25 time: 14:04:34.32 UTC ML= 2.0
 lat: 47.748N lon: 16.185E h= 10.0 km
 erh= 2.2km erz= 2.0km
 nr= 16 gap=118 rms=0.76
 Locality: Austria
 Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	28.9	104	ePgc	14:04:40.80	1.02
			eSg	04:44.60	0.55
CONA	31.4	310	Pg	14:04:40.30	0.10
			Sg	04:44.30	-0.49
ARSA	74.4	222	Pg	14:04:47.80	0.08
			Sg	04:56.80	-1.38
ZST	84.8	54	ePg	14:04:49.10	-0.46
			eSg	04:59.80	-1.64
MOA	144.2	275	Pn	14:04:58.70	0.65
			Sn	05:16.70	0.14
TREC	179.6	343	eSn	14:05:24.20	-0.22
KOLL	189.1	61	ePn	14:05:04.10	0.45
			eSn	05:26.10	-0.43
VYHS	214.2	67	ePn	14:05:07.00	0.23
			eSn	05:30.10	-1.99
KHC	246.7	309	eSn	14:05:42.10	2.79
PRU	276.8	334	eSn	14:05:50.40	4.40
DPC	289.6	2	eSn	14:05:54.10	5.26

9.

2009-01-25 time: 16:39:31.24 UTC ML= 2.0
 lat: 47.743N lon: 16.194E h= 10.0 km
 erh= 2.0km erz= 1.6km
 nr= 19 gap=112 rms=0.75
 Locality: Austria
 Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	28.1	104	ePgD	16:39:37.90	1.33
			eSg	39:41.60	0.87
CONA	32.3	310	Pg	16:39:37.20	-0.07
			Sg	39:41.40	-0.58
ARSA	74.5	223	Pg	16:39:44.80	0.14
			Sg	39:54.00	-1.13
ZST	84.5	53	ePg	16:39:46.20	-0.24
			eSg	39:56.80	-1.49
SMOL	125.7	47	ePn	16:39:53.40	0.73
			eSn	40:09.40	0.02
MOA	144.9	275	Pn	16:39:55.90	0.83
			Sn	40:13.70	0.05
PKST	148.7	111	eSn	16:40:14.40	-0.10
PKSG	169.9	103	eSn	16:40:18.60	-0.58
KOLL	188.8	61	eSn	16:40:22.30	-1.08
VYHS	213.7	67	ePn	16:40:04.00	0.36
			eSn	40:27.70	-1.22
KHC	247.6	309	ePn	16:40:11.60	3.74
			eSn	40:38.30	1.87
PRU	277.6	334	eSn	16:40:47.10	4.01
DPC	290.1	2	eSn	16:40:51.10	5.23
NKC	389.7	315	eSn	16:41:21.30	13.32

10.

2009-01-26 time: 9:18:16.48 UTC ML= 0.7
 lat: 47.413N lon: 18.242E h= 7.7 km
 erh= 1.0km erz= 1.6km
 nr= 6 gap=239 rms=0.08
 Locality: Pusztavám
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	11.5	102	ePgc	9:18:18.90	-0.05
			eSg	18:21.00	0.13
PKST	23.2	223	ePgD	9:18:20.90	0.05
			eSg	18:24.10	-0.16
PKS9	91.9	178	ePg	9:18:32.90	-0.04
			eSg	18:45.90	0.11

11.

2009-01-26 time: 12:55:43.49 UTC ML= 1.1
 lat: 47.369N lon: 18.673E h= 10.0 km
 erh= 1.6km erz= 3.1km
 nr= 5 gap=282 rms=0.07
 Locality: Vál
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	21.5	277	ePgc	12:55:47.80	0.08
			eSg	55:50.90	-0.12
PKST	49.8	256	ePgD	12:55:52.50	-0.07
			eSg	55:59.70	0.06
PKS9	92.0	199	eSg	12:56:12.90	0.01

12.

2009-01-30 time: 3:39:51.06 UTC ML= 1.2
 lat: 47.451N lon: 18.040E h= 0.3 km
 erh=19.7km erz= 966km
 nr= 5 gap=283 rms=0.87
 Locality: Aka
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKST	21.3	181	ePgc	3:39:53.80	-1.07
			eSg	39:58.10	0.26
PKSG	27.2	104	ePgc	3:39:56.40	0.48
			eSg	39:59.20	-0.52
PKS9	97.7	169	ePg	3:40:10.10	1.59

Hypocenter Parameters

Földrengés paraméterek

13.

2009-02-03 time: 9:06:38.63 UTC ML= 2.4
 lat: 46.044N lon: 16.041E h= 13.6 km
 erh= 1.8km erz= 1.4km
 nr= 29 gap=141 rms=0.62
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
GOLS	32.4	264	iPg	9:06:45.30			0.39
GCIS	37.6	238	iPgC	9:06:45.70			-0.07
			iSg	06:51.50			0.17
CESS	45.4	260	iPg	9:06:47.60			0.50
			iSg	06:54.30			0.60
DOBS	45.7	285	iPg	9:06:47.70			0.55
			iSg	06:54.60			0.81
KOGS	47.8	20	iPg	9:06:47.30			-0.20
			iSg	06:54.00			-0.42
CRES	51.3	242	iPg	9:06:47.90			-0.22
			iSg	06:55.20			-0.31
LEGS	57.0	259	iPg	9:06:49.40			0.30
GROS	62.3	318	iPg	9:06:50.20			0.19
			iSg	06:58.50			-0.39
BEHE	73.9	50	ePgC	9:06:51.80			-0.25
PDKS	80.8	273	iPgC	9:06:53.40			0.14
			iSg	07:04.40			-0.28
BOJS	85.8	226	iPg	9:06:53.20			-0.94
			iSg	07:04.60			-1.64
PERS	96.9	313	iS*	9:07:08.30			-0.98
VISS	96.9	254	iP*	9:06:55.60			-0.26
			iS*	07:09.50			0.21
SOKA	104.8	312	Pn	9:06:57.10			0.10
			Sn	07:09.90			-1.43
OBKA	126.1	294	Pn	9:07:00.50			0.85
			Sn	07:15.50			-0.55
ARSA	139.9	344	Pn	9:07:02.60			1.23
VOY	166.2	270	ePn	9:07:06.60			1.94
			eSn	07:30.80			5.84
PKSM	201.9	85	ePn	9:07:12.40			3.30

14.

2009-02-03 time: 23:16:55.65 UTC ML= 0.4
 lat: 48.451N lon: 18.984E h= 16.6 km
 erh= 3.4km erz= 1.0km
 nr= 7 gap=142 rms=0.27
 Locality: Slovakia
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
VYHS	11.9	294	ePg	23:16:59.00			-0.29
			eSg	17:02.60			0.46
PSZ	90.0	131	eP*C	23:17:11.60			0.07
			eS*	17:23.70			-0.22
SMOL	115.2	273	eSn	23:17:29.90			-0.06
CRVS	189.2	75	ePn	23:17:24.50			0.34
			eSn	17:43.70			-2.70

15.

2009-02-06 time: 8:38:36.35 UTC ML= 2.3
 lat: 45.876N lon: 21.248E h= 5.1 km
 erh= 7.5km erz= 5.6km
 nr= 5 gap=145 rms=0.21
 Locality: Romania
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
BZS	40.7	135	iPg	8:38:43.70			0.03
DEV	128.5	90	iPnD	8:38:58.90			0.14
GZR	130.7	114	iPnD	8:38:58.80			-0.23
PKSM	205.2	280	iPn	8:39:08.60			0.28
PSZ	249.4	336	iPnD	8:39:13.30			-0.53
VOIR	300.3	99	iPn	8:39:21.60			1.42
BURB	359.6	57	iPnD	8:39:27.10			-0.48
MLR	368.4	97	iPnD	8:39:30.20			1.53

16.

2009-02-07 time: 12:25:34.84 UTC ML= 2.0
 lat: 47.836N lon: 18.997E h= 4.2 km
 erh= 1.7km erz= 1.7km
 nr= 22 gap= 80 rms=0.69
 Locality: Kismaros
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
BUD	39.2	177	ePgD	12:25:42.75			0.87
			eSg	25:47.00			-0.38
PKSG	67.2	223	ePgD	12:25:47.00			0.14
			eSg	25:57.10			0.86
PSZ	67.7	82	ePgD	12:25:46.80			-0.16
			eSg	25:55.10			-1.31
VYHS	74.1	351	ePg	12:25:48.90			0.80
			eSg	25:57.40			-1.04
PKS7	88.5	172	eSg	12:26:02.30			-0.71
PKST	96.8	228	ePgD	12:25:51.80			-0.34
			eSg	26:04.80			-0.83
SMOL	138.9	303	ePn	12:25:58.60			-0.06
			eSn	26:17.20			-0.04
PKS6	144.0	163	eSn	12:26:18.50			0.13
ZST	146.9	286	ePn	12:25:59.60			-0.06
			eSn	26:16.60			-2.42
PKS9	149.1	201	ePn	12:26:00.30			0.37
			eSn	26:19.40			-0.11
PKS2	150.3	174	eSn	12:26:19.70			-0.07
SOP	183.6	265	eSn	12:26:29.90			2.73
CRVS	217.7	57	ePn	12:26:11.60			3.12
			eSn	26:38.00			3.27

17.

2009-02-27 time: 10:09:24.90 UTC ML= 1.8
 lat: 48.189N lon: 22.746E h= 7.9 km
 erh= ---km erz= ---km
 nr= 4 gap=207 rms=0.00
 Locality: Ukraine
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
TRPA	16.7	247	iPgD	10:09:28.20			0.00
DRGR	155.4	181	iPnD	10:09:50.30			0.00
BURB	195.5	109	iPn	10:09:55.30			0.00
PSZ	214.7	262	iPn	10:09:57.70			0.01

18.

2009-03-11 time: 1:34:16.14 UTC ML= 3.6
 lat: 45.593N lon: 17.421E h= 13.5 km
 erh= 2.7km erz= 2.1km
 nr= 19 gap=204 rms=0.31
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
RHK3	72.5	63	ePgD	1:34:29.30			-0.01
			eSg	34:40.40			0.81
BEHE	109.5	333	ePnC	1:34:35.80			0.69
			eSn	34:49.90			0.00
PKSM	117.0	54	iPnD	1:34:35.80			-0.24
PKSM	117.0	54	ePnD	1:34:36.50			0.46
			eSn	34:51.40			-0.17
PKS9	128.8	31	ePnC	1:34:37.60			0.08
KOGS	131.3	316	iPn	1:34:37.70			-0.13
			iSn	34:54.60			-0.14
BOJS	169.7	267	iPn	1:34:42.60			-0.01
			iSn	35:04.20			0.94
PKS2	170.9	54	ePnD	1:34:45.70			2.93
			eSn	35:09.60			6.07
PKS6	200.0	56	ePnD	1:34:46.30			-0.09
			eSn	35:17.20			7.22
PKS7	209.9	40	ePnC	1:34:47.50			-0.13
			eSn	35:19.00			6.81
PERS	212.5	303	iPn	1:34:47.60			-0.35
PKSG	213.3	20	ePnD	1:34:48.20			0.15
			eSn	35:10.00			-2.94

Földrengés paraméterek

SOKA	220.5	303	Pn	1:34:48.60	-0.34
			Sn	35:13.20	-1.32
ARSA	235.0	322	Pn	1:34:51.00	0.25
			Sn	35:15.50	-2.25
SOP	241.5	344	ePnD	1:34:51.80	0.23
			eSn	35:13.90	-5.30
BUD	243.5	30	ePn	1:34:50.90	-0.91
			eSn	35:27.40	7.77
OBKA	244.5	295	Pn	1:34:51.80	-0.14
			Sn	35:25.20	5.34
JAVS	263.4	277	iPn	1:34:54.60	0.31
			iSn	35:30.00	5.96
VOY	278.5	280	ePn	1:34:56.30	0.13
			eSn	35:33.80	6.40
CONA	285.6	335	Pn	1:34:57.50	0.44
			Sn	35:26.90	-2.09
MYKA	314.1	292	Pn	1:35:00.90	0.29
			Sn	35:34.30	-1.00
PSZ	320.2	36	ePnC	1:35:00.70	-0.67
			eSn	35:34.60	-2.06
PSZ	320.2	36	iPn	1:35:00.60	-0.77
SMOL	324.7	0	ePn	1:35:02.10	0.17
			eSn	35:33.90	-3.76
BZS	327.3	90	iPn	1:35:02.80	0.53
VYHS	339.9	18	ePn	1:35:04.10	0.26
			eSn	35:38.50	-2.54
MOA	348.0	316	Pn	1:35:05.70	0.86
			Sn	35:40.50	-2.33
KBA	354.6	298	Pn	1:35:05.60	-0.07
			Sn	35:58.10	13.80
ABTA	400.2	289	Pn	1:35:11.30	-0.05
			Sn	36:11.80	17.38
VRAC	417.7	351	iPn	1:35:13.90	0.36
DRGR	429.6	72	iPnD	1:35:15.50	0.49
MORC	465.2	1	iPnD	1:35:19.90	0.44
CRVS	478.4	40	ePn	1:35:23.20	2.10
TRPA	481.5	54	iPnD	1:35:39.80	18.31
WTTA	481.9	293	Pn	1:35:22.00	0.47
AQU	483.3	222	iPnD	1:35:24.80	3.09
KHC	488.9	324	ePn	1:35:23.50	1.10
			eSn	36:11.40	-2.69
KOLS	522.2	45	ePn	1:35:48.00	21.43
DPC	535.2	351	ePn	1:35:28.80	0.61
			eSn	36:19.60	-4.79
FETA	539.4	287	Pn	1:35:30.00	1.29
			Sn	36:24.30	-1.01
VOIR	596.4	92	iPnD	1:35:36.30	0.49

19.

2009-03-19 time: 8:18:43.67 UTC ML= 2.4
 lat: 46.027N lon: 17.166E h= 12.7 km
 erh= 5.4km erz= 2.1km
 nr= 8 gap=228 rms=0.34
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	57.7	329	ePgD	8:18:54.30	0.08
			eSg	19:02.40	-0.05
RHK3	85.6	100	ePg	8:18:59.40	0.28
			eSg	19:10.80	-0.37
PKS9	105.9	54	ePnD	8:19:02.50	0.21
			eSn	19:16.30	-0.51
PKSM	115.8	80	ePnD	8:19:03.10	-0.43
			eSn	19:19.70	0.68

20.

2009-03-24 time: 11:42:09.86 UTC ML= 2.0
 lat: 48.900N lon: 20.496E h= 1.0 km
 erh= 2.8km erz= 2.1km
 nr= 8 gap=199 rms=0.27
 Locality: Slovakia
 Comments:

sta	dist	azm	phase	hr mn sec	res
CRVS	70.8	90	ePg	11:42:22.60	0.10
			eSg	42:31.70	-0.66

Hypocenter Parameters

PSZ	117.9	202	ePgD	11:42:31.00	0.09
			eSg	42:47.10	-0.24
VYHS	130.3	250	ePn	11:42:33.00	0.00
			eSn	42:48.10	-2.95
KOLS	130.3	88	ePn	11:42:33.20	0.19
			eSn	42:51.20	0.13

21.

2009-03-27 time: 21:48:28.46 UTC ML= 1.2
 lat: 47.123N lon: 18.226E h= 12.1 km
 erh= 1.9km erz= 1.6km
 nr= 13 gap=140 rms=0.49
 Locality: Jenő
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKST	21.0	316	ePgC	21:48:32.60	-0.19
			eSg	48:35.70	-0.47
PKSG	32.4	23	ePgD	21:48:34.70	0.06
			eSg	48:39.50	0.04
PKS9	59.7	176	ePg	21:48:39.60	0.27
			eSg	48:50.60	2.79
PKS7	71.4	97	eSg	21:48:51.20	-0.29
PKS2	102.9	133	eS*	21:49:01.30	0.33
PKSM	106.1	163	ePn	21:48:47.00	-0.18
			eSn	48:59.90	-1.88
PKS6	117.4	120	eSn	21:49:04.00	-0.29
PSZ	153.7	55	ePn	21:48:53.90	0.79
			eSn	49:13.30	0.97

22.

2009-03-28 time: 21:03:35.05 UTC ML= 2.3
 lat: 46.420N lon: 16.760E h= 0.2 km
 erh= 4.8km erz= 4.5km
 nr= 11 gap=138 rms=0.87
 Locality: Letenye
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	5.7	12	iPg	21:03:35.08	-0.99
			eSg	03:37.00	0.14
KOGS	39.3	275	iPg	21:03:41.77	-0.30
			eSg	03:53.50	5.96
PKS9	118.0	81	ePg	21:03:56.80	0.67
			eSg	04:12.10	-0.47
CRES	120.4	237	ePg	21:03:55.82	-0.74
			eSg	04:14.40	1.07
ARSA	132.0	314	Pn	21:04:00.00	1.48
			Sn	04:17.10	0.27
PKST	134.7	46	ePnD	21:03:58.50	-0.35
			eSn	04:14.00	-3.42
SOKA	135.6	282	Pn	21:04:01.20	2.24
			Sn	04:17.70	0.09
SOP	141.3	354	ePn	21:04:00.34	0.67
			eSn	04:17.40	-1.48
PKSM	146.7	99	ePn	21:03:59.90	-0.45
			eSn	04:20.20	0.11
PKSG	164.6	49	ePnD	21:04:03.30	0.71
			eSn	04:25.40	1.33
OBKA	170.1	273	Sn	21:04:29.80	4.51
PKS2	188.6	88	eSn	21:04:31.70	2.31
PKS7	196.3	69	ePn	21:04:09.00	2.47
PKS6	216.2	85	eSn	21:04:40.90	5.40

23.

2009-03-31 time: 13:09:51.93 UTC ML= 2.5
 lat: 46.554N lon: 21.252E h= 10.0 km
 erh= 4.8km erz= 6.0km
 nr= 18 gap= 78 rms=1.12
 Locality: Elek
 Comments:

sta	dist	azm	phase	hr mn sec	res
TIM	90.9	182	iPg	13:10:08.60	0.34
BZS	107.9	165	iPn	13:10:09.90	-1.24
DRGR	114.7	77	iPnD	13:10:10.80	-1.19

Hypocenter Parameters

Station	Dist	Azm	Phase	hr mn sec	res
PKS6	129.5	272	ePn	13:10:13.10	-0.73
			eSn	10:30.30	-0.62
DEV	147.6	120	iPn	13:10:16.40	0.31
PKS2	156.6	267	eSn	13:10:37.10	0.16
PSZ	183.3	326	ePnC	13:10:20.70	0.16
			eSn	10:39.40	-3.45
TRPA	200.4	29	iPn	13:10:23.90	1.22
PKSM	204.4	259	ePnD	13:10:24.20	1.02
			eSn	10:48.60	1.05
BMR	211.0	54	iPnD	13:10:25.90	1.91
PKS9	228.0	271	ePn	13:10:29.20	3.08
			eSn	10:57.10	4.32
PKST	257.4	288	iPn	13:10:28.00	-1.78
KOLS	275.4	16	iPn	13:10:33.10	1.07
ARR	293.4	117	iPn	13:10:35.30	1.02
BURB	323.3	69	iPnD	13:10:39.50	1.49

24.

2009-04-07 time: 15:03:34.79 UTC ML= 2.1
 lat: 48.840N lon: 21.610E h= 0.0 km
 erh= 2.8km erz= 3.5km
 nr= 8 gap=135 rms=0.45
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CRVS	12.9	303	ePg	15:03:36.80	-0.30
			eSg	03:39.70	0.80
KOLS	49.7	78	ePg	15:03:43.60	-0.07
			eSg	03:50.70	0.11
TRPA	104.6	139	ePgC	15:03:53.10	-0.36
			eSg	04:08.70	0.67
PSZ	163.2	231	eSn	15:04:24.00	0.47
VYHS	207.9	259	eSn	15:04:32.70	-0.75

25.

2009-04-16 time: 21:42:42.96 UTC ML= 2.0
 lat: 45.894N lon: 21.159E h= 6.5 km
 erh= 2.5km erz= 2.3km
 nr= 5 gap=130 rms=0.09
 Locality: Romania
 Comments:

sta	dist	azm	phase	hr mn sec	res
TIM	18.1	165	iPg	21:42:46.50	0.11
BZS	47.1	131	iPg	21:42:51.30	-0.14
GZR	137.8	114	iPnD	21:43:06.40	0.05
DRGR	155.7	50	iPn	21:43:08.60	0.03
PKSM	198.0	280	iPn	21:43:13.80	-0.05

26.

2009-04-21 time: 14:42:42.32 UTC ML= 1.4
 lat: 48.296N lon: 19.795E h= 0.0 km
 erh=14.8km erz=19.4km
 nr= 6 gap=134 rms=0.37
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	42.6	170	ePgC	14:42:50.10	-0.04
			eSg	42:56.40	0.17
VYHS	74.3	287	ePg	14:42:56.10	0.38
			eSg	43:05.60	-0.56
CRVS	140.2	61	ePn	14:43:05.10	-0.46
			eSn	43:24.20	0.52

27.

2009-04-30 time: 6:58:28.98 UTC ML= 2.1
 lat: 47.001N lon: 22.214E h= 0.5 km
 erh= ---km erz= ---km
 nr= 4 gap=174 rms=0.09
 Locality: Romania
 Comments:

Földrengés paraméterek

sta	dist	azm	phase	hr mn sec	res
DRGR	44.5	122	iPg	6:58:36.90	-0.03
TRPA	127.9	11	iPg	6:58:51.80	-0.02
BZS	160.6	197	iPn	6:58:56.00	0.01
BURB	237.1	73	iPn	6:59:06.00	0.48

28.

2009-05-08 time: 19:11:53.93 UTC ML= 3.3
 lat: 46.486N lon: 16.662E h= 12.7 km
 erh= 3.9km erz= 2.0km
 nr= 19 gap=170 rms=0.82
 Locality: Szentmargitfalva
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	8.9	101	ePgC	19:11:56.80	0.09
			eSg	11:59.00	0.13
ARSA	121.5	314	Pn	19:12:14.30	-0.19
			Sn	12:29.50	-1.02
PKS9	124.6	85	ePn	19:12:15.20	0.34
			eSn	12:31.00	-0.19
SOKA	126.7	280	Pn	19:12:15.00	-0.13
			Sn	12:31.50	-0.17
SOP	133.4	357	ePnC	19:12:16.00	0.03
			eSn	12:31.60	-1.55
PKST	135.4	51	ePnD	19:12:15.70	-0.52
			eSn	12:35.00	1.39
PKSM	155.4	101	ePnD	19:12:17.30	-1.41
			eSn	12:38.40	0.36
OBKA	162.2	271	Pn	19:12:19.60	0.04
			Sn	12:42.80	3.24
CONA	171.5	339	Pn	19:12:21.10	0.38
			Sn	12:42.40	0.79
ZST	193.1	10	ePn	19:12:29.20	5.79
VYHS	277.0	36	ePn	19:12:32.70	-1.17
KHC	374.0	322	ePn	19:12:49.00	3.03

29.

2009-05-08 time: 19:12:13.35 UTC ML= 3.6
 lat: 46.384N lon: 16.695E h= 8.8 km
 erh= 3.1km erz= 2.7km
 nr= 7 gap=157 rms=0.27
 Locality: Szentmargitfalva
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	11.4	33	eSg	19:12:18.00	0.08
KOGS	34.9	282	ePg	19:12:19.70	-0.08
			eSg	12:25.10	0.31
GOLS	92.5	243	eSg	19:12:43.10	0.22
DOBS	98.0	255	eSg	19:12:44.20	-0.44
PKS2	193.9	86	ePnC	19:12:43.60	0.16
			eSn	13:10.80	3.89
PSZ	296.6	55	ePnC	19:12:57.10	0.85
			eSn	13:25.40	-4.31
KHC	384.6	323	ePn	19:13:06.50	-0.71
			eSn	13:40.70	-8.53

30.

2009-05-09 time: 2:25:44.51 UTC ML= 2.6
 lat: 46.499N lon: 16.637E h= 15.4 km
 erh= 2.0km erz= 1.2km
 nr= 35 gap=121 rms=0.71
 Locality: Szentmargitfalva
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	11.1	107	ePgC	2:25:47.00	-0.90
			eSg	25:49.20	-1.34
KOGS	30.2	259	iPg	2:25:50.80	0.23
			iSg	25:56.00	0.71
GROS	87.3	267	iP*	2:25:59.80	-0.29
			iS*	26:11.30	-0.95
GOLS	95.1	235	iP*	2:26:01.60	0.32
			iS*	26:13.80	-0.56
DOBS	98.0	247	iP*C	2:26:01.90	0.18

Földrengés paraméterek

Hypocenter Parameters

	iS*	26:15.30	0.15
GCIS 104.9 228	iPn	2:26:02.90	0.24
	iSn	26:16.20	-0.62
CESS 107.8 237	iPn	2:26:03.40	0.38
	iSn	26:18.20	0.75
ARSA 119.1 315	Pn	2:26:03.60	-0.83
	Sn	26:18.60	-1.37
SOKA 124.5 279	Pn	2:26:05.30	0.19
	Sn	26:21.00	-0.18
PKS9 126.3 86	ePnC	2:26:05.80	0.47
	eSn	26:21.80	0.23
SOP 131.8 357	ePnC	2:26:06.30	0.29
	eSn	26:21.80	-0.99
PKST 136.0 52	ePnC	2:26:05.80	-0.73
	eSn	26:23.50	-0.21
CSKK 156.6 52	ePnC	2:26:09.80	0.70
	eSn	26:30.40	2.11
PKSM 157.6 102	ePnD	2:26:07.50	-1.73
	eSn	26:24.70	-3.80
OBKA 160.3 270	Pn	2:26:09.90	0.33
	Sn	26:32.80	3.69
PKSG 166.4 53	ePnC	2:26:11.50	1.17
	eSn	26:36.40	5.94
CONA 169.4 340	Pn	2:26:10.90	0.19
	Sn	26:31.30	0.16
PKS2 197.8 90	ePnC	2:26:16.50	2.26
	eSn	26:41.90	4.47
VOJS 218.2 256	ePn	2:26:17.10	0.31
KHC 371.6 322	ePn	2:26:37.80	1.88
	eSn	27:16.70	0.68

31.

2009-05-09 time: 5:47:03.54 UTC ML= 0.2
 lat: 47.286N lon: 18.351E h= 0.0 km
 erh= 2.2km erz= 332km
 nr= 6 gap=248 rms=0.19
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	10.9	321	ePgC	5:47:05.50			0.00
			eSg	47:06.90			-0.13
PKSG	12.1	14	ePgC	5:47:05.80			0.09
			eSg	47:07.50			0.11
PKST	24.2	263	ePgC	5:47:07.60			-0.26
			eSg	47:11.70			0.47

32.

2009-05-09 time: 5:52:30.77 UTC ML= 0.2
 lat: 47.272N lon: 18.349E h= 0.0 km
 erh= 2.6km erz= 376km
 nr= 6 gap=253 rms=0.22
 Locality: Sárkeresztes
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	12.2	327	ePgC	5:52:33.30			0.35
			eSg	52:34.40			-0.25
PKSG	13.7	13	ePgC	5:52:33.00			-0.22
			eSg	52:35.20			0.07
PKST	23.9	267	ePgC	5:52:35.10			0.06
			eSg	52:38.20			-0.16

33.

2009-05-11 time: 8:50:45.13 UTC ML= 1.7
 lat: 47.307N lon: 18.459E h= 0.0 km
 erh= 3.1km erz= 397km
 nr= 6 gap=289 rms=0.24
 Locality: Pátka
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	10.8	331	ePgC	8:50:47.00			-0.05
			eSg	50:47.90			-0.64
CSKK	16.2	293	ePgC	8:50:48.30			0.27
			eSg	50:50.50			0.21
PKST	32.5	261	ePgC	8:50:50.90			-0.04

eSg 50:55.30 -0.17

34.

2009-05-11 time: 8:51:28.99 UTC ML= 1.0
 lat: 47.306N lon: 18.464E h= 0.0 km
 erh= 4.7km erz= 605km
 nr= 6 gap=291 rms=0.36
 Locality: Pátka
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	11.0	330	ePgC	8:51:30.70			-0.25
			eSg	51:32.30			-0.18
CSKK	16.6	292	ePgC	8:51:32.10			0.15
			eSg	51:34.60			0.33
PKST	32.9	261	ePgC	8:51:35.20			0.34
			eSg	51:38.50			-0.95

35.

2009-05-11 time: 16:34:38.48 UTC ML= 1.0
 lat: 47.018N lon: 18.057E h= 0.0 km
 erh= ***km erz= ***km
 nr= 5 gap=325 rms=0.67
 Locality: Balatonalmádi
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
PKST	26.8	356	ePgD	16:34:43.30			0.03
			eSg	34:46.40			-0.60
CSKK	41.3	22	ePg	16:34:46.70			0.84
			eSg	34:52.20			0.58
PKSG	48.6	31	ePg	16:34:46.30			-0.86

36.

2009-05-13 time: 5:31:26.93 UTC ML= 0.3
 lat: 47.302N lon: 18.327E h= 0.0 km
 erh= 1.3km erz= 227km
 nr= 6 gap=232 rms=0.13
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	8.5	324	ePgC	5:31:28.40			-0.04
			eSg	31:29.50			-0.12
PKSG	11.1	26	ePgC	5:31:28.90			-0.02
			eSg	31:30.90			0.43
PKST	22.6	258	ePgD	5:31:30.90			-0.07
			eSg	31:34.30			0.17

37.

2009-05-23 time: 4:05:13.32 UTC ML= 2.7
 lat: 46.616N lon: 21.279E h= 6.9 km
 erh= 4.1km erz= 4.7km
 nr= 25 gap= 75 rms=1.18
 Locality: Gyula
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
TIM	97.8	183	iPg	4:05:30.80			-0.03
DRGR	111.2	80	iPg	4:05:33.50			0.28
BZS	114.0	167	iPnD	4:05:32.20			-1.49
PKS6	131.4	269	ePnC	4:05:36.40			0.54
			eSn	05:52.50			-0.94
DEV	149.3	123	iPn	4:05:38.90			0.80
PKS2	159.1	265	ePnC	4:05:40.30			0.99
			eSn	06:00.00			0.42
PSZ	178.8	324	ePnC	4:05:41.40			-0.37
			eSn	06:01.70			-2.26
TRPA	193.4	29	ePnD	4:05:43.70			0.11
			eSn	06:12.50			5.29
BUD	196.7	299	ePnD	4:05:43.30			-0.70
			eSn	06:13.00			5.07
PKSM	207.7	258	ePnD	4:05:43.90			-1.48
			eSn	06:12.00			1.62
PKS9	229.9	269	ePnD	4:05:52.40			4.25

Hypocenter Parameters

Földrengés paraméterek

	eSn	06:19.30	3.99
LOT 232.4 124	iPn	4:05:48.60	0.15
PKSG 236.1 291	ePnD	4:05:47.90	-1.01
CRVS 254.6 3	ePn	4:05:50.10	-1.12
	eSn	06:29.10	8.32
PKST 257.3 286	ePnD	4:05:50.70	-0.85
	eSn	06:27.90	6.53
KOLS 268.2 16	ePn	4:05:53.00	0.08
	eSn	06:16.00	-7.81
VYHS 278.3 319	ePn	4:05:54.30	0.13
	eSn	06:40.60	14.56
BURB 318.8 70	iPn	4:06:01.50	2.27
VOIR 320.0 114	iPn	4:06:00.80	1.43
BEHE 345.9 267	eSn	4:06:53.90	12.87
SMOL 358.5 306	ePn	4:06:02.00	-2.18
	eSn	06:38.70	-5.14
ZST 361.0 299	ePn	4:06:02.80	-1.68
	eSn	06:38.30	-6.09
SOP 377.3 288	ePnD	4:06:05.70	-0.81
MLR 382.1 109	iPn	4:06:07.40	0.28
MORC 448.1 322	iPn	4:06:15.30	-0.04
VRAC 460.6 311	iPn	4:06:16.20	-0.70
TREC 525.3 305	ePn	4:06:23.90	-1.07
UPC 581.8 318	ePn	4:06:31.00	-1.02
PRU 624.9 307	ePn	4:06:36.50	-0.90
	eSn	07:38.50	-4.48
KHC 640.5 296	ePn	4:06:38.80	-0.53
	eSn	07:40.60	-5.82

38.

2009-05-26 time: 5:38:29.28 UTC ML= 0.2
 lat: 47.286N lon: 18.342E h= 0.0 km
 erh= 1.1km erz= 162km
 nr= 6 gap=245 rms=0.10
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	10.6	324	ePgD	5:38:31.10	-0.06
			eSg	38:32.60	-0.03
PKSG	12.3	17	ePgC	5:38:31.60	0.12
			eSg	38:33.10	-0.10
PKST	23.5	263	ePgD	5:38:33.40	-0.07
			eSg	38:36.90	0.16

39.

2009-05-27 time: 9:26:37.18 UTC ML= 0.5
 lat: 47.167N lon: 18.305E h= 0.0 km
 erh= 1.5km erz= 188km
 nr= 6 gap=282 rms=0.11
 Locality: Sárkeszi
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	22.1	351	ePgC	9:26:41.20	0.07
			eSg	26:44.40	0.19
PKST	22.9	297	ePgC	9:26:41.30	0.02
			eSg	26:44.30	-0.17
PKSG	25.9	14	ePgD	9:26:41.80	0.00
			eSg	26:45.20	-0.21

40.

2009-05-27 time: 9:58:13.00 UTC ML= 1.4
 lat: 48.371N lon: 19.899E h= 0.0 km
 erh= ***km erz= ***km
 nr= 8 gap=143 rms=0.89
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	45.1	74	ePg	9:58:21.80	0.75
			eSg	58:28.30	0.96
PSZ	50.4	180	ePgC	9:58:21.90	-0.09
			eSg	58:28.50	-0.51
VYHS	79.9	280	ePg	9:58:28.10	0.84
			eSg	58:36.40	-1.98

CRVS 129.4 63	ePg	9:58:35.70	-0.40
	eSg	58:52.50	-1.61

41.

2009-05-28 time: 5:13:27.69 UTC ML= 0.2
 lat: 47.323N lon: 18.321E h= 10.0 km
 erh=10.1km erz= 7.0km
 nr= 6 gap=217 rms=0.19
 Locality: Söréd
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	6.4	315	ePgD	5:13:29.60	-0.21
			eSg	13:31.60	0.13
PKSG	9.3	34	ePgD	5:13:30.40	0.27
			eSg	13:31.80	-0.24
PKST	22.8	252	ePgD	5:13:32.10	-0.04
			eSg	13:35.70	0.09

42.

2009-05-28 time: 11:11:00.63 UTC ML= 1.1
 lat: 47.933N lon: 19.449E h= 10.0 km
 erh= 6.4km erz=20.1km
 nr= 6 gap=231 rms=0.50
 Locality: Szanda
 Comments:

sta	dist	azm	phase	hr mn sec	res
PSZ	33.3	93	ePgD	11:11:06.50	-0.35
			eSg	11:12.00	0.31
VYHS	77.2	324	ePg	11:11:14.20	-0.33
			eSg	11:25.80	0.42
KECS	98.4	52	ePg	11:11:19.00	0.71
			eSg	11:31.30	-0.76

43.

2009-05-28 time: 11:25:28.17 UTC ML= 2.0
 lat: 48.224N lon: 21.220E h= 1.8 km
 erh= 6.9km erz= 6.9km
 nr= 11 gap=155 rms=1.53
 Locality: Rátka
 Comments:

sta	dist	azm	phase	hr mn sec	res
KECS	61.6	298	ePg	11:25:40.30	1.14
			eSg	25:47.90	0.16
CRVS	77.5	13	ePg	11:25:42.60	0.60
			eSg	25:50.50	-2.30
TRPA	98.7	96	ePg	11:25:45.60	-0.19
PSZ	104.5	251	ePg	11:25:42.90	-3.92
KOLS	110.7	45	ePg	11:25:48.50	0.56
			eSg	26:02.70	-0.66
STHS	132.6	1	ePn	11:25:53.10	1.59
			eSn	26:09.00	-0.71
VYHS	179.2	280	eSn	11:26:21.50	1.46

44.

2009-05-29 time: 11:33:22.88 UTC ML= 1.2
 lat: 47.931N lon: 20.499E h= 5.5 km
 erh=16.1km erz=14.7km
 nr= 6 gap=235 rms=1.07
 Locality: Noszvaj
 Comments:

sta	dist	azm	phase	hr mn sec	res
PSZ	45.2	268	ePgC	11:33:30.30	-0.71
			eSg	33:37.10	-0.25
KECS	61.3	359	ePg	11:33:34.60	0.72
			eSg	33:42.20	-0.26
CRVS	129.3	33	ePn	11:33:46.50	1.16
			eSn	33:59.50	-3.36

Földrengés paraméterek

Hypocenter Parameters

45.

2009-05-30 time: 13:27:06.53 UTC ML= 0.2
 lat: 47.398N lon: 18.224E h= 1.4 km
 erh= 4.4km erz=13.2km
 nr= 6 gap=230 rms=0.15
 Locality: Mór
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	4.7	144	ePgD	13:27:07.30	-0.11
			eSg	27:08.00	-0.09
PKSG	12.6	93	ePgD	13:27:08.80	0.01
			eSg	27:10.80	0.24
PKST	21.0	223	ePgD	13:27:10.20	-0.09
			eSg	27:13.60	0.37

46.

2009-06-01 time: 10:17:46.23 UTC ML= 1.8
 lat: 46.224N lon: 19.418E h= 16.7 km
 erh=12.1km erz= 9.0km
 nr= 5 gap=281 rms=0.36
 Locality: Mélykút
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSM	59.9	269	ePgD	10:17:57.20	-0.14
PKS7	93.6	348	eP*C	10:18:03.10	0.45
			eSn	18:14.90	-0.56
PKS9	96.4	295	eP*C	10:18:02.90	-0.18
			eSn	18:16.60	0.37

47.

2009-06-02 time: 5:35:42.56 UTC ML= 0.1
 lat: 47.336N lon: 18.323E h= 10.0 km
 erh= 3.7km erz= 2.1km
 nr= 6 gap=209 rms=0.20
 Locality: Csákbéreny
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	5.6	302	ePgD	5:35:44.80	0.20
			eSg	35:46.10	-0.10
PKSG	8.0	40	ePgC	5:35:45.00	0.16
			eSg	35:46.20	-0.42
PKST	23.5	248	ePgD	5:35:47.10	-0.01
			eSg	35:50.40	-0.27

48.

2009-06-02 time: 9:09:44.22 UTC ML= 1.0
 lat: 47.479N lon: 18.431E h= 0.0 km
 erh= 2.3km erz= 208km
 nr= 5 gap=327 rms=0.09
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	10.1	197	ePgC	9:09:46.10	0.08
			eSg	09:47.30	-0.13
CSKK	18.1	225	ePgC	9:09:47.40	-0.06
			eSg	09:49.80	-0.19
PKST	38.6	231	eSg	9:09:56.60	0.10

49.

2009-06-02 time: 9:14:37.26 UTC ML= 1.3
 lat: 47.317N lon: 18.446E h= 0.0 km
 erh= 3.8km erz= 413km
 nr= 6 gap=285 rms=0.25
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	9.3	333	ePgC	9:14:38.80	-0.12
			eSg	14:39.60	-0.61

CSKK	14.9	290	ePgC	9:14:40.10	0.18
			eSg	14:42.40	0.40
PKST	31.8	258	ePgC	9:14:43.00	0.06
			eSg	14:46.70	-0.67

50.

2009-06-02 time: 10:14:44.38 UTC ML= 2.0
 lat: 48.789N lon: 20.692E h= 0.0 km
 erh= 4.5km erz= 752km
 nr= 9 gap=179 rms=0.57
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	37.2	204	ePg	10:14:51.10	0.07
			eSg	14:56.60	0.39
CRVS	57.8	77	ePg	10:14:54.00	-0.70
			eSg	15:02.40	-0.36
STHS	80.6	30	ePg	10:14:59.10	0.33
PSZ	113.4	211	ePgC	10:15:04.30	-0.33
			eSg	15:20.20	-0.23
KOLS	117.1	82	ePg	10:15:06.50	1.21
			eSg	15:22.70	1.10

51.

2009-06-03 time: 5:08:13.56 UTC ML= 0.8
 lat: 47.209N lon: 18.347E h= 0.0 km
 erh= ***km erz= ***km
 nr= 5 gap=175 rms=0.65
 Locality: Székesfehérvár
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	18.3	339	ePgC	5:08:17.60	0.76
			eSg	08:18.70	-0.69
PKSG	20.6	9	ePgC	5:08:17.70	0.46
			eSg	08:19.20	-0.90
PKS9	69.4	184	eSg	5:08:35.30	-0.31

52.

2009-06-03 time: 9:37:30.02 UTC ML= 0.6
 lat: 47.182N lon: 18.303E h= 10.0 km
 erh=10.7km erz=20.1km
 nr= 6 gap=277 rms=0.15
 Locality: Sárkeszi
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	20.4	351	ePgD	9:37:34.00	-0.07
			eSg	37:37.50	0.27
PKST	22.1	293	ePgD	9:37:34.40	0.05
			eSg	37:37.40	-0.33
PKSG	24.2	16	ePgD	9:37:34.80	0.10
			eSg	37:38.20	-0.15

53.

2009-06-05 time: 11:31:23.47 UTC ML= 1.0
 lat: 47.959N lon: 20.044E h= 0.0 km
 erh= 4.9km erz= 5.9km
 nr= 6 gap=203 rms=0.98
 Locality: Mátraballa
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	12.1	248	ePgC	11:31:25.30	-0.32
			eSg	31:28.00	0.70
KECS	66.9	29	ePg	11:31:36.50	1.09
			eSg	31:45.50	0.78
VYHS	107.7	304	eSg	11:31:56.10	-1.59
CRVS	148.3	45	eSn	11:32:07.40	-1.50

Hypocenter Parameters

Földrengés paraméterek

54.

 2009-06-06 time: 5:32:25.62 UTC ML= 0.1
 lat: 47.271N lon: 18.348E h= 0.0 km
 erh= 2.1km erz= 300km
 nr= 6 gap=253 rms=0.18
 Locality: Sárkeresztés
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	12.1	327	ePgC	5:32:27.80	0.01
			eSg	32:29.20	-0.28
PKSG	13.8	14	ePgC	5:32:28.20	0.12
			eSg	32:30.00	0.00
PKST	23.7	267	ePgC	5:32:29.70	-0.16
			eSg	32:33.60	0.43

55.

 2009-06-06 time: 5:34:49.24 UTC ML= 0.3
 lat: 47.239N lon: 18.400E h= 0.0 km
 erh= 3.2km erz= 422km
 nr= 6 gap=277 rms=0.25
 Locality: Sárkeresztés
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	17.0	358	ePgC	5:34:52.60	0.32
			eSg	34:54.50	-0.14
CSKK	17.4	323	ePgC	5:34:52.20	-0.14
			eSg	34:54.60	-0.16
PKST	27.8	275	ePgC	5:34:54.00	-0.20
			eSg	34:58.50	0.43

56.

 2009-06-06 time: 6:23:15.56 UTC ML= 0.3
 lat: 47.272N lon: 18.335E h= 0.0 km
 erh= 2.0km erz= 318km
 nr= 6 gap=249 rms=0.19
 Locality: Sárkeresztés
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	11.6	331	ePgC	6:23:17.50	-0.13
			eSg	23:19.10	-0.15
PKSG	14.0	18	ePgC	6:23:17.90	-0.16
			eSg	23:20.40	0.39
PKST	22.8	266	ePgC	6:23:19.80	0.17
			eSg	23:22.80	0.00

57.

 2009-06-08 time: 10:09:08.28 UTC ML= 1.1
 lat: 48.002N lon: 19.497E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=211 rms=0.88
 Locality: Nógrádsipek
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	31.1	107	ePgC	10:09:12.70	-1.14
			eSg	09:18.50	0.32
VYHS	73.5	318	ePg	10:09:22.10	0.70
			eSg	09:29.80	-1.83
KECS	90.8	54	ePg	10:09:25.30	0.80
			eSg	09:37.70	0.54

58.

 2009-06-09 time: 9:13:42.82 UTC ML= 1.1
 lat: 47.339N lon: 18.458E h= 0.0 km
 erh= 4.3km erz= 529km
 nr= 6 gap=295 rms=0.32
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
-----	------	-----	-------	-----------	-----

PKSG	7.8	319	ePgC	9:13:44.30	0.09
			eSg	13:45.60	0.30
CSKK	15.2	280	ePgC	9:13:45.60	0.07
			eSg	13:46.70	-0.94
PKST	33.3	255	ePg	9:13:48.50	-0.26
			eSg	13:53.70	0.31

59.

 2009-06-09 time: 9:19:48.84 UTC ML= 1.5
 lat: 47.339N lon: 18.539E h= 0.0 km
 erh= 7.8km erz= 862km
 nr= 6 gap=319 rms=0.51
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	12.7	298	ePgC	9:19:51.50	0.40
			eSg	19:52.60	-0.27
CSKK	21.2	277	ePgC	9:19:52.80	0.17
			eSg	19:54.70	-0.89
PKST	39.2	257	ePgC	9:19:55.40	-0.44
			eSg	20:02.20	0.90

60.

 2009-06-10 time: 5:35:23.71 UTC ML= 0.5
 lat: 47.243N lon: 18.385E h= 0.0 km
 erh= 3.4km erz= 460km
 nr= 6 gap=272 rms=0.27
 Locality: Sárkeresztés
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	16.3	325	ePgC	5:35:26.40	-0.22
			eSg	35:28.40	-0.49
PKSG	16.5	2	ePgC	5:35:26.60	-0.06
			eSg	35:29.50	0.54
PKST	26.6	274	ePgC	5:35:28.60	0.14
			eSg	35:32.40	0.24

61.

 2009-06-11 time: 6:05:44.98 UTC ML= 0.6
 lat: 47.144N lon: 18.231E h= 0.0 km
 erh= 4.5km erz= 515km
 nr= 5 gap=287 rms=0.23
 Locality: Nádasdladány
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKST	19.6	311	ePgC	6:05:48.70	0.22
			eSg	05:51.00	-0.22
CSKK	24.5	5	ePgC	6:05:49.00	-0.35
			eSg	05:52.90	0.14
PKSG	30.1	24	ePgC	6:05:50.50	0.15

62.

 2009-06-17 time: 11:42:08.56 UTC ML= 0.7
 lat: 47.132N lon: 18.316E h= 0.0 km
 erh= 7.6km erz= 867km
 nr= 6 gap=292 rms=0.53
 Locality: Úrhida
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKST	25.6	303	ePgC	11:42:12.50	-0.63
			eSg	42:16.90	0.21
CSKK	26.0	351	ePgC	11:42:13.60	0.39
			eSg	42:15.10	-1.73
PKSG	29.4	11	ePgC	11:42:14.30	0.49
			eSg	42:17.50	-0.41

Földrengés paraméterek

Hypocenter Parameters

63.

 2009-06-19 time: 12:17:08.12 UTC ML= 1.4
 lat: 47.921N lon: 20.565E h= 0.0 km
 erh= ***km erz= ***km
 nr= 5 gap=238 rms=0.75
 Locality: Cserépváralja
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	50.1	270	ePgC	12:17:17.60	0.53
			eSg	17:22.90	-1.16
KECS	62.8	355	ePg	12:17:20.30	0.96
			eSg	17:28.40	0.31
CRVS	127.7	31	ePg	12:17:30.40	-0.53

64.

 2009-06-22 time: 5:09:46.21 UTC ML= 2.7
 lat: 45.633N lon: 20.114E h= 10.0 km
 erh= 8.2km erz=10.7km
 nr= 24 gap=202 rms=1.21
 Locality: Serbia
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKS6	115.5	338	ePnD	5:10:06.10	-0.27
			eSn	10:20.90	-1.19
BZS	117.2	91	iPnD	5:10:06.10	-0.48
PKS2	118.2	324	ePnD	5:10:07.70	1.00
			eSn	10:22.50	-0.18
PKSM	131.1	299	ePnC	5:10:06.80	-1.51
			eSn	10:20.80	-4.74
PKSN	141.8	352	ePn	5:10:12.30	2.66
			eSn	10:29.40	1.49
PKS7	173.4	335	eSn	5:10:36.80	1.85
PKS9	177.1	307	ePnD	5:10:15.00	0.96
			eSn	10:38.10	2.34
GZR	209.8	97	iPnD	5:10:18.00	-0.12
PKSG	236.0	326	ePn	5:10:20.90	-0.49
DRGR	238.2	57	iPn	5:10:21.10	-0.57
PKST	241.2	319	ePnD	5:10:21.50	-0.54
PSZ	254.6	356	ePnC	5:10:23.40	-0.30
			eSn	10:49.30	-3.65
LOT	286.3	94	iPnD	5:10:28.20	0.54
KECS	318.1	5	ePn	5:10:33.40	1.78
			eSn	11:04.40	-2.65
VYHS	332.5	343	ePn	5:10:35.20	1.78
			eSn	11:07.40	-2.85
ZST	365.8	321	ePn	5:10:36.90	-0.67

65.

 2009-06-22 time: 7:04:46.56 UTC ML= 0.1
 lat: 47.334N lon: 18.267E h= 6.5 km
 erh=19.4km erz=12.1km
 nr= 6 gap=189 rms=0.33
 Locality: Söréd
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	3.3	352	ePgC	7:04:47.70	-0.16
			eSg	04:49.20	0.33
PKSG	11.4	56	ePgC	7:04:49.30	0.40
			eSg	04:49.90	-0.82
PKST	19.4	245	ePnD	7:04:50.10	-0.12
			eSg	04:53.10	0.02

66.

 2009-06-22 time: 7:56:39.64 UTC ML= 1.0
 lat: 47.312N lon: 18.448E h= 0.0 km
 erh= 2.5km erz= 333km
 nr= 6 gap=286 rms=0.20
 Locality: Pátka
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
-----	------	-----	-------	-----------	-----

PKSG	9.9	334	ePgC	7:56:41.30	-0.10
			eSg	56:42.40	-0.38
CSKK	15.3	292	ePgC	7:56:42.60	0.23
			eSg	56:44.70	0.20
PKST	31.9	259	ePgC	7:56:45.40	0.07
			eSg	56:49.50	-0.27

67.

 2009-06-22 time: 7:57:17.76 UTC ML= 1.2
 lat: 47.479N lon: 18.419E h= 0.0 km
 erh= 1.5km erz= 171km
 nr= 6 gap=322 rms=0.10
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	10.0	192	ePgC	7:57:19.60	0.06
			eSg	57:20.80	-0.13
CSKK	17.6	223	ePgC	7:57:21.00	0.09
			eSg	57:23.40	0.04
PKST	38.0	230	ePgC	7:57:24.40	-0.15
			eSg	57:29.90	0.06

68.

 2009-06-25 time: 9:09:32.83 UTC ML= 1.7
 lat: 48.597N lon: 20.856E h= 0.0 km
 erh= 6.3km erz= 4.7km
 nr= 8 gap=171 rms=0.41
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	30.2	245	ePg	9:09:38.30	0.08
			eSg	09:42.30	-0.12
CRVS	55.9	53	ePg	9:09:42.60	-0.22
			eSg	09:50.50	-0.11
PSZ	103.9	223	ePg	9:09:51.90	0.51
			eSg	10:05.20	-0.66
VYHS	149.6	266	ePn	9:09:58.90	0.38
			eSn	10:17.30	-1.25

69.

 2009-06-26 time: 9:09:35.48 UTC ML= 0.8
 lat: 48.247N lon: 20.190E h= 0.0 km
 erh= 4.1km erz= 928km
 nr= 5 gap=171 rms=0.42
 Locality: Szentsimon
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	34.2	40	ePg	9:09:40.90	-0.69
			eSg	09:47.80	1.44
PSZ	42.6	211	ePgC	9:09:43.20	0.10
			eSg	09:49.10	0.06
VYHS	104.0	285	eSg	9:10:08.60	0.06

70.

 2009-06-26 time: 11:49:34.08 UTC ML= 0.7
 lat: 48.100N lon: 20.218E h= 0.0 km
 erh= ***km erz= ***km
 nr= 5 gap=205 rms=0.61
 Locality: Bekölce
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	31.5	230	ePgC	11:49:39.50	-0.20
			eSg	49:44.90	0.81
KECS	47.0	25	ePg	11:49:41.80	-0.66
			eSg	49:50.00	0.99
VYHS	111.5	293	eSg	11:50:09.20	-0.31

Hypocenter Parameters

71.
 2009-07-01 time: 5:42:29.31 UTC ML= 0.3
 lat: 47.413N lon: 18.242E h= 3.8 km
 erh= 7.1km erz= 9.4km
 nr= 6 gap=239 rms=0.13
 Locality: Pusztavám
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
CSKK	5.7	166	ePgC	5:42:30.70			0.17
			eSg	42:31.30			-0.18
PKSG	11.5	102	ePgD	5:42:31.50			0.04
			eSg	42:33.00			-0.15
PKST	23.2	222	ePgD	5:42:33.40			-0.11
			eSg	42:36.90			0.12

72.
 2009-07-02 time: 5:54:14.56 UTC ML= 0.2
 lat: 47.261N lon: 18.365E h= 0.0 km
 erh= 2.9km erz= 400km
 nr= 6 gap=262 rms=0.24
 Locality: Sárkeresztos
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	13.8	325	ePgC	5:54:16.90			-0.13
			eSg	54:18.50			-0.46
PKSG	14.6	8	ePgC	5:54:17.10			-0.08
			eSg	54:19.70			0.48
PKST	25.1	269	ePgC	5:54:19.10			0.07
			eSg	54:22.80			0.28

73.
 2009-07-02 time: 9:17:17.95 UTC ML= 0.7
 lat: 47.367N lon: 18.638E h= 0.0 km
 erh= 5.7km erz= 461km
 nr= 6 gap=337 rms=0.27
 Locality: Vértesacska
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	18.9	278	ePgC	9:17:21.30			-0.02
			eSg	17:24.30			0.36
CSKK	28.5	269	ePgC	9:17:22.80			-0.24
			eSg	17:26.40			-0.61
PKST	47.2	255	ePgC	9:17:26.60			0.23
			eSg	17:33.10			0.16

74.
 2009-07-02 time: 9:22:48.86 UTC ML= 0.5
 lat: 47.178N lon: 18.309E h= 0.0 km
 erh= 1.9km erz= 242km
 nr= 6 gap=279 rms=0.14
 Locality: Székesfehérvár
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	21.0	350	ePgC	9:22:52.70			0.09
			eSg	22:55.70			0.18
PKST	22.7	293	ePgD	9:22:52.90			-0.02
			eSg	22:55.90			-0.18
PKSG	24.6	15	ePgC	9:22:53.30			0.04
			eSg	22:56.30			-0.38

75.
 2009-07-03 time: 6:10:12.04 UTC ML= 0.4
 lat: 47.284N lon: 18.232E h= 6.5 km
 erh= 7.2km erz= 8.3km
 nr= 6 gap=215 rms=0.15
 Locality: Kincsesbánya
 Comments:

sta	dist	azm	phase	hr	mn	sec	res

Földrengés paraméterek

CSKK 9.1 14 ePgC 6:10:14.30 0.26
 eSg 10:15.40 -0.19
 PKST 15.2 260 ePgD 6:10:14.90 -0.09
 eSg 10:17.30 0.01
 PKSG 17.0 45 ePg 6:10:15.30 0.01
 eSg 10:17.70 -0.12

76.
 2009-07-04 time: 2:51:02.49 UTC ML= 1.9
 lat: 48.229N lon: 22.618E h= 6.7 km
 erh= 5.9km erz= 4.1km
 nr= 11 gap=107 rms=1.03
 Locality: Beregdaróc
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
TRPA	12.4	208	ePgD	2:51:04.70			-0.31
			eSg	51:06.90			-0.08
KOLS	82.3	342	ePg	2:51:17.10			-0.14
			eSg	51:28.30			-0.45
KWP	156.1	2	iPnD	2:51:27.30			-0.83
KECS	160.5	280	ePn	2:51:29.50			0.82
			eSn	51:46.10			-3.01
STHS	166.2	323	ePn	2:51:30.80			1.41
			eSn	51:48.50			-1.87
PSZ	205.9	260	iPn	2:51:36.70			2.36
BURB	205.9	109	iPnD	2:51:34.40			0.06

77.
 2009-07-04 time: 4:06:31.50 UTC ML= 2.3
 lat: 46.657N lon: 20.898E h= 2.6 km
 erh= 8.0km erz= 7.8km
 nr= 21 gap=100 rms=1.98
 Locality: Telekgerendás
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
PKS6	102.3	266	ePgC	4:06:50.50			0.72
			eSg	07:03.30			-0.73
BZS	128.3	154	iPn	4:06:54.90			0.70
PKS2	130.5	262	ePnC	4:06:53.50			-0.96
			eSn	07:10.50			-1.87
PKS7	139.4	288	ePnC	4:06:55.40			-0.18
			eSn	07:12.40			-1.96
DRGR	139.4	84	iPnD	4:06:54.10			-1.48
PSZ	159.4	332	ePnC	4:06:55.20			-2.87
			eSn	07:13.70			-5.10
PKSM	180.4	254	ePnC	4:07:01.20			0.52
			eSn	08:24.10			60.65
PKS9	200.8	268	ePnC	4:07:05.30			2.07
			eSn	07:30.30			2.32
GZR	202.2	134	iPnD	4:07:02.50			-0.91
TRPA	205.4	37	ePnC	4:07:09.70			5.90
			eSn	07:33.00			4.00
PKSG	207.4	293	ePnC	4:07:05.90			1.85
			eSn	07:31.00			1.56
CSKK	215.4	291	eSn	4:07:34.70			3.48
PKST	228.0	287	eSn	4:07:37.40			3.38
LOT	259.7	121	iPn	4:07:10.80			0.22
ARR	322.9	116	iPn	4:07:18.70			0.24
SOP	348.2	289	eSn	4:07:29.70			-31.01
VOIR	348.8	113	iPnD	4:07:21.60			-0.09

78.
 2009-07-07 time: 8:37:42.64 UTC ML= 1.3
 lat: 47.338N lon: 18.510E h= 0.0 km
 erh= 3.8km erz= 450km
 nr= 6 gap=313 rms=0.27
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	10.8	303	ePgC	8:37:44.80			0.23
			eSg	37:45.80			-0.27
CSKK	19.1	278	ePgD	8:37:46.20			0.16
			eSg	37:48.30			-0.40

Földrengés paraméterek

PKST 37.0 256 ePgc 8:37:49.00 -0.25
eSg 37:54.80 0.39

79.

2009-07-07 time: 8:38:01.52 UTC ML= 1.3
lat: 47.461N lon: 18.389E h= 0.0 km
erh= 1.6km erz= 191km
nr= 6 gap=309 rms=0.11
Locality: Várgesztes
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	7.7	179	ePgc	8:38:02.90			0.01
			eSg	38:03.90			-0.05
CSKK	14.5	222	ePgc	8:38:04.20			0.09
			eSg	38:06.30			0.16
PKST	34.9	230	ePgc	8:38:07.70			-0.06
			eSg	38:12.30			-0.32

80.

2009-07-08 time: 9:27:58.47 UTC ML= 0.5
lat: 47.211N lon: 18.292E h= 0.0 km
erh= 1.0km erz= 132km
nr= 6 gap=265 rms=0.08
Locality: Iszkaszentgyörgy
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	17.1	352	ePgc	9:28:01.50			-0.02
			eSg	28:03.90			0.00
PKST	20.3	285	ePgc	9:28:02.00			-0.08
			eSg	28:05.00			0.10
PKSG	21.5	20	ePgc	9:28:02.40			0.10
			eSg	28:05.20			-0.09

81.

2009-07-08 time: 10:21:18.58 UTC ML= 1.9
lat: 48.928N lon: 20.701E h= 0.0 km
erh= 5.5km erz= 7.3km
nr= 9 gap=145 rms=0.84
Locality: Slovakia
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
KECS	51.9	198	ePg	10:21:28.00			0.15
			eSg	21:34.20			-0.87
STHS	67.3	36	eSg	10:21:38.90			-1.06
KOLS	115.2	90	ePg	10:21:40.70			1.55
			eSg	21:54.90			-0.30
PSZ	127.1	208	ePgd	10:21:41.70			0.42
			eSg	21:57.70			-1.28
VYHS	145.5	251	ePn	10:21:44.10			0.35
			eSn	22:03.60			0.22

82.

2009-07-13 time: 8:16:32.24 UTC ML= 0.6
lat: 47.133N lon: 18.243E h= 0.0 km
erh= 2.0km erz= 222km
nr= 6 gap=290 rms=0.13
Locality: Nádasdladány
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKST	21.2	312	ePgc	8:16:36.00			-0.02
			eSg	16:39.10			0.14
CSKK	25.6	3	ePgc	8:16:36.70			-0.12
			eSg	16:40.00			-0.39
PKSG	30.9	21	ePgc	8:16:37.90			0.15
			eSg	16:42.10			0.04

Hypocenter Parameters

83.

2009-07-13 time: 8:19:32.12 UTC ML= 0.5
lat: 47.181N lon: 18.254E h= 0.0 km
erh= 3.9km erz= 463km
nr= 6 gap=274 rms=0.27
Locality: Csór
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKST	18.8	297	ePgc	8:19:35.50			0.03
			eSg	19:37.90			-0.18
CSKK	20.2	1	ePgc	8:19:36.10			0.37
			eSg	19:38.20			-0.35
PKSG	25.6	24	ePgc	8:19:36.40			-0.29
			eSg	19:40.50			0.24

84.

2009-07-13 time: 8:50:08.54 UTC ML= 1.4
lat: 47.497N lon: 18.393E h= 0.0 km
erh= 3.7km erz= 408km
nr= 6 gap=315 rms=0.24
Locality: Várgesztes
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	11.7	181	ePgc	8:50:10.70			0.07
			eSg	50:12.00			-0.26
CSKK	17.9	214	ePgc	8:50:12.00			0.26
			eSg	50:14.10			-0.14
PKST	37.9	226	ePgc	8:50:15.00			-0.30
			eSg	50:20.90			0.32

85.

2009-07-13 time: 8:50:26.74 UTC ML= 1.3
lat: 47.487N lon: 18.388E h= 0.0 km
erh= 1.7km erz= 192km
nr= 6 gap=312 rms=0.12
Locality: Várgesztes
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	10.6	179	ePgc	8:50:28.60			-0.03
			eSg	50:30.00			-0.11
CSKK	16.8	215	ePgc	8:50:29.90			0.16
			eSg	50:32.00			-0.08
PKST	36.8	226	ePgc	8:50:33.20			-0.11
			eSg	50:38.60			0.16

86.

2009-07-13 time: 14:07:53.72 UTC ML= 0.6
lat: 47.333N lon: 18.164E h= 10.0 km
erh=19.0km erz= 4.2km
nr= 6 gap=196 rms=0.41
Locality: Balinka
Comments:

sta	dist	azm	phase	hr	mn	sec	res
CSKK	8.0	66	ePgc	14:07:56.70			0.69
			eSg	07:57.30			-0.50
PKST	12.8	230	ePgd	14:07:56.60			-0.03
			eSg	07:58.80			-0.10
PKSG	18.3	69	ePgc	14:07:57.20			-0.25
			eSg	07:59.90			-0.46

87.

2009-07-14 time: 8:43:53.00 UTC ML= 1.2
lat: 47.337N lon: 18.452E h= 0.0 km
erh= 3.0km erz= 343km
nr= 6 gap=292 rms=0.20
Locality: Zámoly
Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
-----	------	-----	-------	----	----	-----	-----

Hypocenter Parameters

PKSG 7.6 323 ePgC 8:43:54.30 -0.06
 eSg 43:55.40 -0.02
 CSKK 14.7 281 ePgC 8:43:55.60 -0.03
 eSg 43:58.00 0.32
 PKST 32.7 255 ePgC 8:43:58.90 0.05
 eSg 44:01.70 -1.71

88.

2009-07-14 time: 10:03:26.93 UTC ML= 1.3
 lat: 47.953N lon: 19.427E h= 10.0 km
 erh= 4.5km erz=16.3km
 nr= 6 gap=228 rms=0.38
 Locality: Terény
 Comments:

sta	dist	azm	phase	hr mn sec	res
PSZ	35.2	96	ePgD	10:03:33.10	-0.36
			eSg	03:38.80	0.25
VYHS	74.4	324	ePg	10:03:40.90	0.56
			eSg	03:50.20	-0.60
KECS	98.3	53	ePg	10:03:44.60	0.03
			eSg	03:58.60	0.26

89.

2009-07-20 time: 10:28:51.76 UTC ML= 1.1
 lat: 47.971N lon: 19.456E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=222 rms=0.83
 Locality: Cserhátsurány
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	33.3	100	ePgD	10:28:57.00	-0.70
			eSg	29:02.60	0.26
VYHS	74.2	322	ePg	10:29:06.10	1.09
			eSg	29:13.70	-1.65
KECS	95.4	53	ePg	10:29:09.40	0.60
			eSg	29:22.00	-0.09

90.

2009-07-26 time: 3:34:33.49 UTC ML= 0.3
 lat: 47.520N lon: 18.441E h= 5.7 km
 erh= 2.8km erz= 5.1km
 nr= 6 gap=328 rms=0.08
 Locality: Vértessomló
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	14.8	195	ePgC	3:34:36.30	-0.02
			eSg	34:38.60	0.07
CSKK	22.1	218	ePgD	3:34:37.50	-0.07
			eSg	34:40.60	-0.16
PKST	42.2	227	ePgC	3:34:41.20	0.10
			eSg	34:47.10	0.06

91.

2009-07-26 time: 4:26:03.87 UTC ML= 0.6
 lat: 47.490N lon: 18.444E h= 9.5 km
 erh= 3.8km erz= 3.0km
 nr= 6 gap=330 rms=0.05
 Locality: Várgesztes
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	11.6	200	ePgC	4:26:06.60	0.04
			eSg	26:08.60	-0.06
CSKK	19.8	224	ePgC	4:26:07.80	0.01
			eSg	26:10.80	-0.04
PKST	40.2	230	ePgC	4:26:11.20	-0.05
			eSg	26:17.10	0.09

Földrengés paraméterek

92.

2009-07-27 time: 9:53:11.05 UTC ML= 0.9
 lat: 47.925N lon: 19.463E h= 0.0 km
 erh= 5.0km erz= 734km
 nr= 6 gap=232 rms=0.46
 Locality: Szanda
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	32.3	91	ePgD	9:53:16.30	-0.51
			eSg	53:21.90	0.59
VYHS	78.5	324	ePg	9:53:25.60	0.53
			eSg	53:35.60	-0.41
KECS	98.1	51	ePg	9:53:28.50	-0.07
			eSg	53:42.70	0.46

93.

2009-07-27 time: 22:19:23.89 UTC ML= 2.1
 lat: 45.994N lon: 16.893E h= 13.2 km
 erh= 7.6km erz= 4.9km
 nr= 19 gap=218 rms=1.53
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr mn sec	res
BEHE	53.7	350	ePgD	22:19:34.50	0.74
			eSg	19:40.70	-0.76
PKS9	125.4	58	ePnD	22:19:43.50	-1.38
			eSn	19:59.00	-2.26
PKSM	137.3	80	ePnC	22:19:45.70	-0.66
			eSn	20:02.80	-1.08
SOKA	162.2	298	Pn	22:19:50.60	1.14
			Sn	20:10.70	1.29
PKST	165.5	32	ePnD	22:19:51.10	1.22
			eSn	20:06.70	-3.45
ARSA	174.7	323	Pn	22:19:50.00	-1.02
			Sn	20:10.50	-1.68
CSKK	184.7	35	ePn	22:19:50.30	-1.96
			eSn	20:15.00	0.60
PKS2	187.3	73	ePn	22:19:56.30	3.71
			eSn	20:17.60	2.62
PKSG	193.0	36	eSn	22:20:17.40	1.15
PKS7	209.7	56	eSn	22:20:21.60	1.64
PKS6	216.5	72	eSn	22:20:25.70	4.23

94.

2009-07-28 time: 9:59:09.41 UTC ML= 1.3
 lat: 47.335N lon: 18.445E h= 0.0 km
 erh= 2.5km erz= 292km
 nr= 6 gap=288 rms=0.17
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.6	327	ePgD	9:59:10.70	-0.07
			eSg	59:11.50	-0.32
CSKK	14.3	283	ePgD	9:59:12.10	0.13
			eSg	59:14.30	0.33
PKST	32.2	255	ePgC	9:59:15.20	0.03
			eSg	59:19.30	-0.35

95.

2009-07-28 time: 10:41:57.19 UTC ML= 1.5
 lat: 48.590N lon: 20.816E h= 0.0 km
 erh= 5.7km erz= 3.6km
 nr= 8 gap=204 rms=0.42
 Locality: Tornanádaska
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	27.1	244	ePg	10:42:01.70	-0.33
			eSg	42:06.00	0.19
STHS	97.1	19	ePg	10:42:15.20	0.67
			eSg	42:27.10	-0.96

Földrengés paraméterek

Hypocenter Parameters

PSZ 101.3 222 ePg 10:42:15.10 -0.17
 eSg 42:29.30 -0.08
 VYHS 146.6 266 ePn 10:42:22.70 0.20
 eSn 42:42.30 0.06

96.

2009-07-30 time: 10:02:23.15 UTC ML= 1.2
 lat: 47.965N lon: 19.432E h= 0.0 km
 erh= 6.2km erz= 969km
 nr= 6 gap=224 rms=0.60
 Locality: Terény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	34.9	99	ePgD	10:02:28.90	-0.49
			eSg	02:34.50	0.24
VYHS	73.6	323	ePg	10:02:37.30	1.00
			eSg	02:45.90	-0.65
KECS	97.2	54	ePg	10:02:40.80	0.29
			eSg	02:53.50	-0.55

97.

2009-08-03 time: 6:04:00.92 UTC ML= 0.2
 lat: 47.339N lon: 18.292E h= 10.0 km
 erh= 4.3km erz= 2.0km
 nr= 6 gap=194 rms=0.09
 Locality: Csákerény
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	3.6	319	ePgD	6:04:02.80	-0.02
			eSg	04:04.20	-0.10
PKSG	9.5	52	ePgD	6:04:03.30	-0.08
			eSg	04:05.50	0.20
PKST	21.4	246	ePgD	6:04:05.20	0.06
			eSg	04:08.40	-0.03

98.

2009-08-04 time: 16:10:59.65 UTC ML= 0.7
 lat: 47.084N lon: 17.951E h= 10.0 km
 erh=37.1km erz=51.1km
 nr= 6 gap=334 rms=0.28
 Locality: Veszprém
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKST	20.4	18	ePgC	16:11:03.80	0.09
			eSg	11:06.10	-0.77
CSKK	38.8	37	ePgC	16:11:06.50	-0.31
			eSg	11:12.70	0.30
PKSG	47.7	44	ePgC	16:11:08.60	0.25
			eSg	11:15.20	0.06

99.

2009-08-05 time: 8:08:41.16 UTC ML= 1.4
 lat: 47.354N lon: 18.431E h= 5.8 km
 erh=12.7km erz=12.6km
 nr= 6 gap=287 rms=0.23
 Locality: Gánt
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	5.1	324	ePgC	8:08:42.40	-0.15
			eSg	08:43.60	-0.04
CSKK	12.9	274	ePgC	8:08:43.80	0.10
			eSg	08:45.90	0.23
PKST	31.8	251	ePgC	8:08:47.00	0.06
			eSg	08:49.60	-1.85

100.

2009-08-06 time: 10:16:17.71 UTC ML= 1.0
 lat: 47.880N lon: 19.402E h= 0.0 km
 erh=12.5km erz= 894km
 nr= 5 gap=245 rms=0.40
 Locality: Bercel
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	37.1	83	ePgC	10:16:24.20	-0.14
			eSg	16:29.80	0.29
VYHS	80.2	328	ePg	10:16:32.40	0.36
			eSg	16:41.30	-1.91
KECS	104.9	50	ePg	10:16:36.50	0.06

101.

2009-08-07 time: 6:19:20.66 UTC ML= 0.0
 lat: 47.271N lon: 18.358E h= 0.0 km
 erh= 1.0km erz= 134km
 nr= 6 gap=257 rms=0.08
 Locality: Sárkeresztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	12.7	324	ePgC	6:19:23.00	0.08
			eSg	19:24.50	-0.19
PKSG	13.7	10	ePgC	6:19:23.10	-0.01
			eSg	19:25.00	-0.02
PKST	24.6	267	ePgC	6:19:25.00	-0.05
			eSg	19:28.60	0.13

102.

2009-08-10 time: 5:26:56.09 UTC ML= 0.2
 lat: 47.296N lon: 18.324E h= 7.9 km
 erh= 7.9km erz= 9.7km
 nr= 6 gap=234 rms=0.15
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	8.9	327	ePgC	5:26:58.00	-0.22
			eSg	27:00.00	0.12
PKSG	11.8	25	ePgD	5:26:58.80	0.16
			eSg	27:00.50	-0.12
PKST	22.3	259	ePgD	5:27:00.30	-0.02
			eSg	27:03.80	0.19

103.

2009-08-10 time: 6:53:24.22 UTC ML= 1.4
 lat: 48.389N lon: 19.823E h= 0.0 km
 erh= 2.0km erz= 484km
 nr= 5 gap=159 rms=0.22
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	50.2	78	ePg	6:53:33.30	0.12
			eSg	53:39.80	-0.37
PSZ	52.7	174	ePgC	6:53:33.80	0.17
			eSg	53:40.50	-0.46
VYHS	73.9	279	eSg	6:53:47.60	-0.12

104.

2009-08-10 time: 10:31:15.17 UTC ML= 1.7
 lat: 48.579N lon: 20.797E h= 0.0 km
 erh= 2.7km erz= 4.6km
 nr= 12 gap=152 rms=0.49
 Locality: Tornanádaska
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	25.3	245	ePg	10:31:19.30	-0.40
			eSg	31:23.30	0.07

Hypocenter Parameters

CRVS	60.7	54	ePg	10:31:26.30	0.29
			eSg	31:33.60	-0.86
STHS	98.8	19	ePg	10:31:33.30	0.49
			eSg	31:46.10	-0.47
PSZ	99.4	222	ePg	10:31:33.10	0.17
			eSg	31:46.60	-0.17
KOLS	115.5	70	ePg	10:31:36.60	0.80
			eSg	31:51.10	-0.78
VYHS	145.1	266	ePn	10:31:40.00	-0.30
			eSn	31:57.40	-2.50

105.

2009-08-10 time: 10:50:58.88 UTC ML= 1.0
 lat: 47.992N lon: 19.479E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=215 rms=0.79
 Locality: Herencsény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	32.1	105	ePgD	10:51:04.10	-0.51
			eSg	51:09.90	0.82
VYHS	73.5	319	ePg	10:51:13.00	1.00
			eSg	51:21.30	-0.93
KECS	92.6	54	ePg	10:51:16.10	0.68
			eSg	51:27.10	-1.22

106.

2009-08-11 time: 7:40:01.04 UTC ML= 1.4
 lat: 47.342N lon: 18.531E h= 0.0 km
 erh= 2.9km erz= 288km
 nr= 6 gap=319 rms=0.17
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	11.9	298	ePgC	7:40:03.30	0.13
			eSg	40:04.80	-0.03
CSKK	20.5	277	ePgC	7:40:04.60	-0.11
			eSg	40:06.70	-0.87
PKST	38.6	256	ePgC	7:40:07.90	-0.04
			eSg	40:13.60	0.27

107.

2009-08-12 time: 5:40:01.29 UTC ML= 0.1
 lat: 47.341N lon: 18.311E h= 10.0 km
 erh=10.1km erz= 5.0km
 nr= 6 gap=199 rms=0.15
 Locality: Csákkerény
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	4.5	302	ePg	5:40:03.20	-0.05
			eSg	40:04.80	0.02
PKSG	8.2	47	ePgC	5:40:03.50	-0.10
			eSg	40:05.50	0.10
PKST	22.9	246	ePgC	5:40:05.90	0.16
			eSg	40:08.60	-0.62

108.

2009-08-12 time: 9:25:34.71 UTC ML= 1.2
 lat: 47.288N lon: 18.441E h= 0.0 km
 erh= 7.3km erz= 969km
 nr= 6 gap=282 rms=0.68
 Locality: Pátka
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	12.2	342	ePgC	9:25:36.70	-0.19
			eSg	25:37.50	-1.09
CSKK	16.0	302	ePgC	9:25:38.00	0.43
			eSg	25:39.90	0.09
PKST	30.9	264	ePgC	9:25:41.00	0.76

Földrengés paraméterek

eSg	25:43.30	-1.25
-----	----------	-------

109.

2009-08-12 time: 9:25:46.54 UTC ML= 1.2
 lat: 47.183N lon: 18.597E h= 0.0 km
 erh= 1.3km erz= 119km
 nr= 5 gap=315 rms=0.90
 Locality: Dinnyés
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	28.0	326	ePgC	9:25:51.70	0.17
			eSg	25:53.00	-2.43
CSKK	32.4	308	ePgC	9:25:53.00	0.68
			eSg	25:55.20	-1.64
PKST	43.5	281	eSg	9:26:00.60	0.25

110.

2009-08-12 time: 16:46:21.91 UTC ML= 0.9
 lat: 47.116N lon: 17.889E h= 2.1 km
 erh=19.4km erz=77.9km
 nr= 6 gap=344 rms=0.19
 Locality: Márkó
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKST	19.4	35	ePgC	16:46:25.30	-0.09
			eSg	46:28.00	-0.11
CSKK	39.4	46	ePgC	16:46:29.30	0.35
			eSg	46:34.40	-0.04
PKSG	48.9	51	ePgC	16:46:30.50	-0.14
			eSg	46:37.40	-0.06

111.

2009-08-13 time: 8:44:32.79 UTC ML= 0.0
 lat: 47.412N lon: 18.268E h= 8.5 km
 erh= 1.8km erz= 0.9km
 nr= 6 gap=237 rms=0.03
 Locality: Pusztavám
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	5.4	186	ePgD	8:44:34.60	0.00
			eSg	44:36.00	-0.01
PKSG	9.5	103	ePgC	8:44:35.10	0.03
			eSg	44:36.80	-0.05
PKST	24.5	226	ePgC	8:44:37.40	-0.03
			eSg	44:41.10	0.05

112.

2009-08-13 time: 10:44:47.66 UTC ML= 0.6
 lat: 47.464N lon: 18.646E h= 10.0 km
 erh=18.6km erz= 6.1km
 nr= 6 gap=355 rms=0.55
 Locality: Bicske
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	20.8	247	ePgC	10:44:52.40	0.61
			eSg	44:55.30	0.29
CSKK	31.2	249	ePgC	10:44:52.80	-0.70
			eSg	44:57.10	-0.96
PKST	51.5	244	ePg	10:44:57.20	0.17
			eSg	45:04.60	0.27

113.

2009-08-14 time: 8:51:36.53 UTC ML= 1.5
 lat: 47.347N lon: 18.486E h= 0.1 km
 erh= ***km erz= ***km
 nr= 6 gap=309 rms=0.13
 Locality: Lovasberény
 Comments:

Földrengés paraméterek

Hypocenter Parameters

sta	dist	azm	phase	hr mn sec	res
PKSG	8.8	305	ePgC	8:51:38.20	0.11
			eSg	51:39.10	-0.21
CSKK	17.1	276	ePgC	8:51:39.60	0.02
			eSg	51:41.80	-0.17
PKST	35.5	254	ePgC	8:51:42.80	-0.07
			eSg	51:48.20	0.38

114.

2009-08-15 time: 6:31:27.93 UTC ML= 0.1
 lat: 47.309N lon: 18.344E h= 8.4 km
 erh= 6.4km erz= 6.9km
 nr= 6 gap=236 rms=0.16
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	8.7	313	ePgD	6:31:30.00	-0.09
			eSg	31:31.50	-0.28
PKSG	9.8	21	ePgD	6:31:30.40	0.16
			eSg	31:32.10	0.06
PKST	24.1	257	ePgD	6:31:32.40	-0.09
			eSg	31:36.40	0.35

115.

2009-08-16 time: 3:44:15.11 UTC ML= 0.1
 lat: 47.323N lon: 18.329E h= 10.0 km
 erh= 4.9km erz= 3.5km
 nr= 6 gap=221 rms=0.09
 Locality: Söréd
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	6.9	311	ePg	3:44:17.30	0.02
			eSg	44:18.90	-0.07
PKSG	9.0	31	ePgC	3:44:17.60	0.09
			eSg	44:19.20	-0.18
PKST	23.4	252	ePgD	3:44:19.60	-0.06
			eSg	44:23.30	0.10

116.

2009-08-16 time: 3:47:52.38 UTC ML= 0.0
 lat: 47.317N lon: 18.335E h= 8.7 km
 erh= 5.7km erz= 5.2km
 nr= 6 gap=228 rms=0.14
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	7.7	313	ePg	3:47:54.30	-0.15
			eSg	47:55.90	-0.16
PKSG	9.4	27	ePgD	3:47:54.80	0.14
			eSg	47:56.50	0.06
PKST	23.6	254	ePgD	3:47:56.80	-0.08
			eSg	48:00.70	0.31

117.

2009-08-19 time: 8:25:01.42 UTC ML= 0.2
 lat: 47.279N lon: 18.373E h= 0.0 km
 erh= 3.6km erz= 412km
 nr= 5 gap=259 rms=0.21
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	12.7	6	ePgC	8:25:03.70	0.02
			eSg	25:05.70	0.26
CSKK	12.7	318	ePg	8:25:03.50	-0.18
			eSg	25:05.00	-0.45
PKST	25.7	265	eSg	8:25:09.80	0.20

118.

2009-08-19 time: 9:54:15.51 UTC ML= 1.2
 lat: 47.981N lon: 19.465E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=218 rms=0.71
 Locality: Herencsény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	32.8	102	ePgD	9:54:20.90	-0.47
			eSg	54:26.50	0.56
VYHS	73.8	321	ePg	9:54:29.60	0.92
			eSg	54:38.20	-0.75
KECS	94.2	54	ePg	9:54:33.00	0.67
			eSg	54:44.30	-1.14

119.

2009-08-22 time: 6:29:15.26 UTC ML= 0.3
 lat: 47.310N lon: 18.320E h= 10.0 km
 erh= 4.5km erz= 3.7km
 nr= 6 gap=225 rms=0.14
 Locality: Söréd
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	7.4	323	ePg	6:29:17.30	-0.18
			eSg	29:19.10	-0.11
PKSG	10.5	31	ePgD	6:29:17.80	-0.05
			eSg	29:20.30	0.43
PKST	22.3	255	ePgC	6:29:19.70	0.07
			eSg	29:23.20	0.16

120.

2009-08-24 time: 23:24:56.30 UTC ML= 2.0
 lat: 47.028N lon: 21.131E h= 10.0 km
 erh= 4.2km erz= 4.8km
 nr= 18 gap= 78 rms=1.08
 Locality: Szeghalom
 Comments:

sta	dist	azm	phase	hr mn sec	res
SIRR	93.7	154	iPg	23:25:12.70	-0.42
PKSN	97.3	261	ePg	23:25:14.40	0.64
			eSg	25:26.60	-0.78
DRGR	123.2	102	iPn	23:25:17.10	-0.31
PSZ	136.0	317	ePnD	23:25:17.40	-1.61
			eSn	25:33.30	-3.43
PKS2	158.2	248	ePn	23:25:22.70	0.93
			eSn	25:43.90	2.25
BZS	161.2	167	iPnD	23:25:22.10	-0.05
TRPA	162.0	41	iPnD	23:25:22.10	-0.15
KECS	168.9	343	ePn	23:25:24.20	1.09
			eSn	25:43.00	-1.03
CRVS	209.9	7	ePn	23:25:30.60	2.38
			eSn	25:55.10	1.98
PKSM	211.2	245	iPn	23:25:28.70	0.32
			eSn	25:57.90	4.49
GZR	221.6	145	iPnD	23:25:30.40	0.71
KOLS	228.4	22	ePn	23:25:34.00	3.47

121.

2009-08-25 time: 1:39:50.60 UTC ML= 1.9
 lat: 47.000N lon: 20.876E h= 10.0 km
 erh= 5.9km erz= 7.0km
 nr= 12 gap= 83 rms=0.92
 Locality: Dévaványa
 Comments:

sta	dist	azm	phase	hr mn sec	res
SIRR	101.2	144	iPgD	1:40:08.50	-0.25
PSZ	126.1	324	iPn	1:40:12.40	0.32
			eSn	40:29.00	0.17
DRGR	141.8	99	iPnD	1:40:13.10	-0.93
BZS	164.0	160	iPn	1:40:17.60	0.79

Hypocenter Parameters

Földrengés paraméterek

KECS 167.5 350 ePn 1:40:19.60 2.36
 eSn 40:38.30 0.28
 TRPA 177.4 45 iPnD 1:40:17.90 -0.57
 PKSM 192.3 243 iPn 1:40:18.90 -1.43
 CRVS 216.0 12 eSn 1:40:50.70 1.92
 GZR 231.1 141 iPnD 1:40:26.30 1.12
 KOLS 238.9 26 eSn 1:40:56.40 2.52

122.

2009-08-25 time: 9:04:56.01 UTC ML= 1.2
 lat: 47.469N lon: 18.401E h= 0.0 km
 erh= 2.4km erz= 199km
 nr= 5 gap=315 rms=0.09
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	8.6	185	ePgC	9:04:57.60	0.05
			eSg	04:58.40	-0.35
CSKK	15.8	222	ePgC	9:04:58.90	0.06
			eSg	05:01.10	0.05
PKST	36.2	230	ePg	9:05:02.40	-0.08

123.

2009-08-25 time: 9:13:38.25 UTC ML= 1.3
 lat: 47.337N lon: 18.439E h= 0.0 km
 erh= 1.1km erz= 111km
 nr= 5 gap=285 rms=0.05
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.1	329	ePgC	9:13:39.50	-0.02
			eSg	13:40.50	-0.01
CSKK	13.8	282	ePgC	9:13:40.80	0.08
			eSg	13:42.60	-0.05
PKST	31.8	254	ePgC	9:13:43.90	-0.04

124.

2009-08-25 time: 9:14:32.87 UTC ML= 1.5
 lat: 47.336N lon: 18.432E h= 0.0 km
 erh= 1.9km erz= 225km
 nr= 6 gap=281 rms=0.14
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	6.9	333	ePgC	9:14:34.00	-0.10
			eSg	14:35.10	0.03
CSKK	13.3	283	ePgC	9:14:35.30	0.05
			eSg	14:37.20	0.10
PKST	31.3	254	ePg	9:14:38.50	0.04
			eSg	14:41.50	-1.32

125.

2009-08-27 time: 5:02:36.99 UTC ML= 0.2
 lat: 47.272N lon: 18.355E h= 5.8 km
 erh= 8.5km erz=19.3km
 nr= 6 gap=255 rms=0.16
 Locality: Sárkeresztos
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	12.4	325	ePgC	5:02:39.40	-0.03
			eSg	02:41.60	0.27
PKSG	13.6	12	ePgD	5:02:39.70	0.07
			eSg	02:41.40	-0.28
PKST	24.3	267	ePgD	5:02:41.50	0.05
			eSg	02:44.40	-0.53

126.

2009-09-02 time: 10:52:46.02 UTC ML= 1.8
 lat: 48.307N lon: 21.174E h= 13.6 km
 erh= 8.2km erz= 4.7km
 nr= 8 gap=242 rms=0.83
 Locality: Abaujkér
 Comments:

sta	dist	azm	phase	hr mn sec	res
KECS	54.6	291	ePg	10:52:55.40	-0.67
			eSg	53:03.50	-0.42
CRVS	69.5	18	ePg	10:53:00.00	1.34
			eSg	53:08.00	-0.52
KOLS	106.8	49	ePn	10:53:04.10	-0.53
			eSn	53:18.10	-1.04
STHS	123.5	2	ePn	10:53:07.70	0.99
			eSn	53:23.00	0.15

127.

2009-09-03 time: 5:51:43.58 UTC ML= 0.2
 lat: 47.292N lon: 18.337E h= 0.0 km
 erh= 0.5km erz=64.6km
 nr= 6 gap=241 rms=0.04
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	9.8	324	ePgC	5:51:45.30	-0.02
			eSg	51:46.70	0.01
PKSG	11.8	20	ePgC	5:51:45.70	0.01
			eSg	51:48.10	0.76
PKST	23.2	261	ePgD	5:51:47.70	-0.01
			eSg	51:51.00	0.06

128.

2009-09-03 time: 7:00:06.27 UTC ML= 0.4
 lat: 47.277N lon: 18.353E h= 0.0 km
 erh= 2.7km erz= 347km
 nr= 6 gap=253 rms=0.22
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	11.9	324	ePgD	7:00:08.20	-0.20
			eSg	00:09.70	-0.35
PKSG	13.1	12	ePgD	7:00:08.70	0.09
			eSg	00:10.90	0.46
PKST	24.2	265	ePgD	7:00:10.60	0.01
			eSg	00:14.60	0.64

129.

2009-09-03 time: 8:50:08.88 UTC ML= 0.9
 lat: 47.327N lon: 18.435E h= 0.0 km
 erh= 2.8km erz= 318km
 nr= 6 gap=281 rms=0.19
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.9	335	ePgC	8:50:10.20	-0.09
			eSg	50:11.20	-0.20
CSKK	13.8	287	ePgC	8:50:11.60	0.25
			eSg	50:13.40	0.13
PKST	31.3	256	ePgC	8:50:14.40	-0.07
			eSg	50:18.30	-0.52

130.

2009-09-03 time: 14:27:37.94 UTC ML= 0.0
 lat: 47.279N lon: 18.347E h= 0.0 km
 erh= 0.8km erz= 103km
 nr= 6 gap=250 rms=0.07
 Locality: Magyaralmás
 Comments:

Földrengés paraméterek

Hypocenter Parameters

sta	dist	azm	phase	hr mn sec	res
CSKK	11.4	325	ePgd	14:27:39.90	-0.08
			eSg	27:41.50	-0.07
PKSG	13.0	15	ePgc	14:27:40.30	0.04
			eSg	27:42.50	0.43
PKST	23.7	265	ePgc	14:27:42.20	0.02
			eSg	27:45.60	0.11

131.

2009-09-04 time: 10:46:04.63 UTC ML= 1.2
 lat: 48.017N lon: 19.514E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=205 rms=0.92
 Locality: Rimóc
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	30.4	111	ePgd	10:46:09.10	-0.97
			eSg	46:14.70	0.39
VYHS	73.1	316	ePg	10:46:18.40	0.71
			eSg	46:26.40	-1.48
KECS	88.8	54	ePg	10:46:21.60	1.10
			eSg	46:33.10	0.23

132.

2009-09-04 time: 11:53:38.70 UTC ML= 0.8
 lat: 47.581N lon: 18.420E h= 6.4 km
 erh=14.3km erz=37.6km
 nr= 6 gap=171 rms=0.50
 Locality: Tatabánya
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	21.2	186	ePg	11:53:42.30	-0.35
			eSg	53:46.10	0.37
CSKK	27.1	206	ePgd	11:53:43.40	-0.26
			eSg	53:48.40	0.86
VYHS	106.1	17	ePg	11:53:58.30	0.61
			eSg	54:11.60	-0.90

133.

2009-09-04 time: 13:27:24.65 UTC ML= 1.3
 lat: 48.303N lon: 19.810E h= 0.0 km
 erh= ***km erz= ***km
 nr= 5 gap=142 rms=0.51
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	43.2	172	ePgc	13:27:32.40	0.03
			eSg	27:38.70	0.30
KECS	53.9	68	ePg	13:27:33.40	-0.88
			eSg	27:42.90	1.11
VYHS	75.2	286	eSg	13:27:48.70	0.16

134.

2009-09-07 time: 8:51:30.49 UTC ML= 1.4
 lat: 47.522N lon: 18.397E h= 0.0 km
 erh= 4.2km erz= 353km
 nr= 6 gap=319 rms=0.21
 Locality: Vértessomló
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	14.5	182	ePgc	8:51:33.10	0.02
			eSg	51:34.10	-1.00
CSKK	20.5	210	ePgc	8:51:34.30	0.16
			eSg	51:36.60	-0.39
PKST	40.1	223	ePgc	8:51:37.50	-0.14
			eSg	51:43.60	0.38

135.

2009-09-08 time: 5:06:23.37 UTC ML= 0.2
 lat: 47.269N lon: 18.337E h= 0.0 km
 erh= 4.8km erz= 630km
 nr= 6 gap=250 rms=0.36
 Locality: Sárkeresztés
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	11.9	331	ePgc	5:06:26.10	0.60
			eSg	06:26.70	-0.46
PKSG	14.2	17	ePgc	5:06:25.70	-0.21
			eSg	06:27.70	-0.19
PKST	22.9	267	ePgc	5:06:27.40	-0.06
			eSg	06:30.20	-0.45

136.

2009-09-08 time: 9:12:59.77 UTC ML= 1.1
 lat: 47.179N lon: 18.360E h= 0.0 km
 erh= 6.9km erz= 879km
 nr= 6 gap=284 rms=0.51
 Locality: Székesfehérvár
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	21.8	340	ePgc	9:13:04.40	0.73
			eSg	13:06.60	-0.12
PKSG	23.8	6	ePgc	9:13:03.50	-0.53
			eSg	13:04.60	-2.74
PKST	26.2	290	ePgc	9:13:04.60	0.14
			eSg	13:07.70	-0.41

137.

2009-09-10 time: 5:59:09.34 UTC ML= 0.2
 lat: 47.286N lon: 18.342E h= 0.0 km
 erh= 0.7km erz= 103km
 nr= 6 gap=245 rms=0.07
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	10.6	324	ePgc	5:59:11.20	-0.03
			eSg	59:12.60	-0.10
PKSG	12.3	17	ePgc	5:59:11.60	0.05
			eSg	59:14.10	0.83
PKST	23.4	263	ePgc	5:59:13.50	-0.03
			eSg	59:16.90	0.10

138.

2009-09-10 time: 6:02:35.56 UTC ML= 0.1
 lat: 47.283N lon: 18.330E h= 0.0 km
 erh= 1.3km erz= 163km
 nr= 5 gap=242 rms=0.07
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	10.3	330	ePgd	6:02:37.40	0.00
			eSg	02:38.80	-0.04
PKSG	12.9	21	ePgd	6:02:37.80	-0.07
			eSg	02:39.90	0.23
PKST	22.5	263	ePgc	6:02:39.60	0.02

139.

2009-09-11 time: 12:19:30.14 UTC ML= 1.3
 lat: 47.928N lon: 19.424E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=234 rms=0.75
 Locality: Szanda
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	35.2	92	ePgd	12:19:36.00	-0.43

Hypocenter Parameters

		eSg	19:41.70	0.37
VYHS	76.6 325	ePg	12:19:45.20	1.37
		eSg	19:52.80	-1.70
KECS	100.2 52	ePg	12:19:48.20	0.16
		eSg	20:01.70	-0.30

140.

2009-09-18 time: 9:22:51.02 UTC ML= 0.9
 lat: 47.306N lon: 18.326E h= 0.0 km
 erh= 2.0km erz= 309km
 nr= 6 gap=229 rms=0.19
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	8.0	322	ePgC	9:22:52.30	-0.15
			eSg	22:53.50	-0.07
PKSG	10.7	27	ePgC	9:22:52.90	-0.02
			eSg	22:55.10	0.69
PKST	22.7	257	ePgD	9:22:55.10	0.03
			eSg	22:58.80	0.57

141.

2009-09-18 time: 10:59:51.59 UTC ML= 0.5
 lat: 47.263N lon: 18.377E h= 0.0 km
 erh= 3.0km erz= 391km
 nr= 6 gap=265 rms=0.23
 Locality: Sárkereszttes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	14.2	322	ePg	10:59:53.80	-0.32
			eSg	59:56.00	-0.10
PKSG	14.4	4	ePg	10:59:54.30	0.15
			eSg	59:56.40	0.25
PKST	25.9	269	ePg	10:59:56.20	-0.02
			eSg	11:00:00.30	0.47

142.

2009-09-18 time: 11:23:50.54 UTC ML= 0.5
 lat: 47.262N lon: 18.337E h= 0.0 km
 erh= 2.2km erz= 227km
 nr= 5 gap=254 rms=0.11
 Locality: Sárkereszttes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	12.7	333	ePgC	11:23:52.80	-0.01
			eSg	23:54.30	-0.27
PKSG	15.1	16	ePgC	11:23:53.20	-0.03
			eSg	23:55.70	0.37
PKST	22.9	269	eSg	11:23:57.90	0.09

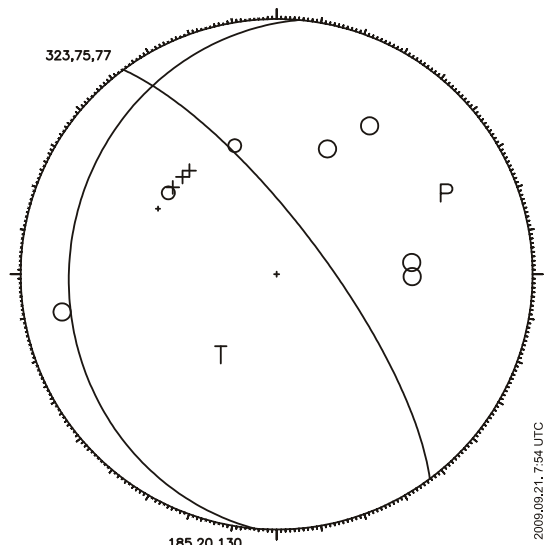
143.

2009-09-21 time: 7:54:57.34 UTC ML= 2.5
 lat: 45.543N lon: 21.004E h= 13.7 km
 erh= 8.2km erz= 7.2km
 nr= 21 gap=179 rms=1.36
 Locality: Romania
 Comments:

sta	dist	azm	phase	hr mn sec	res
BZS	48.5	80	iPgD	7:55:05.80	-0.55
SIRR	95.2	32	iP*D	7:55:15.00	0.71
DEV	152.7	76	iPn	7:55:21.60	-0.06
PKS2	174.2	307	ePnD	7:55:26.60	2.26
			eSn	55:54.50	9.09
DRGR	191.4	44	iPn	7:55:27.20	0.71
SRE	199.0	119	iPn	7:55:25.70	-1.74
LOT	216.5	93	iPn	7:55:29.50	-0.11
PKS7	219.3	320	ePnC	7:55:29.50	-0.47
PKS9	240.6	299	ePnC	7:55:37.50	4.87
			eSn	56:09.60	9.45
PSZ	277.3	342	ePnD	7:55:37.40	0.20

Földrengés paraméterek

		eSn	56:07.70	-0.59
PSZ	277.3 342	iPn	7:55:35.10	-2.10
PKSG	287.2 316	ePnC	7:55:35.60	-2.84
PKST	297.5 310	ePnC	7:55:38.40	-1.32
TRPA	310.5 22	iPnD	7:55:42.30	0.96
MTUR	319.9 96	iPn	7:55:43.80	1.29
KECS	329.2 353	ePn	7:55:44.70	1.03
VYHS	367.1 333	ePn	7:55:48.30	-0.10
CRVS	375.0 5	ePn	7:55:50.50	1.12
MLR	386.2 91	iPnD	7:55:51.50	0.73
VRI	447.2 85	iPnD	7:56:00.20	1.81



144.

2009-09-22 time: 9:01:09.45 UTC ML= 1.6
 lat: 47.919N lon: 19.874E h= 5.4 km
 erh= 9.6km erz= 8.7km
 nr= 6 gap=215 rms=0.61
 Locality: Mátrászentimre
 Comments:

sta	dist	azm	phase	hr mn sec	res
PSZ	1.5	95	ePgC	9:01:10.00	-0.46
			eSg	01:12.30	1.05
KECS	77.4	36	ePg	9:01:23.90	0.59
			eSg	01:33.60	-0.52
VYHS	100.2	310	ePg	9:01:27.90	0.53
			eSg	01:40.50	-0.84

145.

2009-09-22 time: 9:06:34.82 UTC ML= 1.0
 lat: 47.484N lon: 18.368E h= 0.0 km
 erh= 4.3km erz= 431km
 nr= 6 gap=306 rms=0.26
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	10.4	171	ePgC	9:06:36.70	0.03
			eSg	06:37.60	-0.52
CSKK	15.7	211	ePgC	9:06:37.90	0.28
			eSg	06:40.00	0.19
PKST	35.5	225	ePgC	9:06:41.00	-0.16
			eSg	06:45.10	-1.01

146.

2009-09-22 time: 9:07:03.52 UTC ML= 1.1
 lat: 47.320N lon: 18.482E h= 0.0 km
 erh= 1.2km erz= 120km
 nr= 6 gap=299 rms=0.08
 Locality: Lovasberény
 Comments: probably explosion

Földrengés paraméterek

Hypocenter Parameters

sta	dist	azm	phase	hr mn sec	res
PKSG	10.5	319	ePgC	9:07:05.40	-0.01
			eSg	07:06.30	-0.58
CSKK	17.4	286	ePgC	9:07:06.70	0.07
			eSg	07:09.10	0.05
PKST	34.5	259	ePgC	9:07:09.60	-0.09
			eSg	07:14.60	0.10

147.

2009-09-23 time: 7:53:26.02 UTC ML= 0.2
 lat: 47.308N lon: 18.333E h= 8.8 km
 erh= 1.3km erz= 1.3km
 nr= 6 gap=231 rms=0.12
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	8.2	319	ePgD	7:53:28.00	-0.18
			eSg	53:29.80	-0.06
PKSG	10.3	25	ePgD	7:53:28.50	0.05
			eSg	53:30.60	0.26
PKST	23.2	257	ePgD	7:53:30.50	0.04
			eSg	53:34.10	0.18

148.

2009-09-23 time: 8:19:38.75 UTC ML= 0.4
 lat: 47.200N lon: 18.288E h= 8.4 km
 erh= 6.1km erz=12.3km
 nr= 6 gap=269 rms=0.08
 Locality: Csór
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	18.3	354	ePgD	8:19:42.40	0.06
			eSg	19:45.00	-0.14
PKST	20.3	289	ePg	8:19:42.70	0.03
			eSg	19:45.70	-0.03
PKSG	22.7	20	ePgD	8:19:43.00	-0.08
			eSg	19:46.60	0.15

149.

2009-09-23 time: 10:15:28.01 UTC ML= 1.6
 lat: 48.618N lon: 20.367E h= 0.0 km
 erh= 3.2km erz= 759km
 nr= 7 gap=165 rms=0.50
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
KECS	17.3	150	ePg	10:15:30.90	-0.21
PSZ	85.3	204	ePgD	10:15:43.50	0.26
			eSg	15:55.00	-0.12
CRVS	86.5	69	ePg	10:15:44.20	0.75
			eSg	15:54.50	-1.00
VYHS	113.8	263	ePg	10:15:48.40	0.07
			eSg	16:03.40	-0.79

150.

2009-09-29 time: 8:34:18.38 UTC ML= 1.4
 lat: 47.315N lon: 18.425E h= 0.0 km
 erh= 4.7km erz= 656km
 nr= 5 gap=275 rms=0.31
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	8.9	343	ePgC	8:34:19.90	-0.06
			eSg	34:20.70	-0.50
CSKK	13.5	293	eSg	8:34:23.10	0.44
PKST	30.2	258	ePg	8:34:23.90	0.13
			eSg	34:27.30	-0.67

151.

2009-09-30 time: 8:10:26.16 UTC ML= 0.5
 lat: 47.176N lon: 18.233E h= 0.0 km
 erh= 1.3km erz= 137km
 nr= 6 gap=275 rms=0.08
 Locality: Csór
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKST	17.6	301	ePgC	8:10:29.30	-0.01
			eSg	10:31.70	-0.06
CSKK	20.9	6	ePgC	8:10:29.90	0.01
			eSg	10:32.90	0.10
PKSG	26.8	27	ePgC	8:10:31.00	0.06
			eSg	10:34.40	-0.27

152.

2009-09-30 time: 9:20:38.48 UTC ML= 0.5
 lat: 47.191N lon: 18.290E h= 0.0 km
 erh= 2.8km erz= 314km
 nr= 6 gap=272 rms=0.18
 Locality: Sárkeszi
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	19.3	353	ePgC	9:20:42.20	0.28
			eSg	20:44.30	-0.30
PKST	20.8	291	ePg	9:20:42.10	-0.09
			eSg	20:45.10	0.02
PKSG	23.6	19	ePgC	9:20:42.60	-0.09
			eSg	20:45.80	-0.17

153.

2009-10-02 time: 5:44:42.20 UTC ML= 0.3
 lat: 47.313N lon: 18.330E h= 10.0 km
 erh= 2.9km erz= 2.4km
 nr= 6 gap=227 rms=0.10
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	7.6	317	ePgD	5:44:44.30	-0.15
			eSg	44:46.10	-0.10
PKSG	9.9	28	ePgC	5:44:44.80	0.09
			eSg	44:46.70	0.03
PKST	23.1	255	ePgD	5:44:46.70	0.00
			eSg	44:50.40	0.18

154.

2009-10-02 time: 9:44:31.65 UTC ML= 1.7
 lat: 47.882N lon: 20.840E h= 0.0 km
 erh= 2.0km erz= 2.4km
 nr= 6 gap=263 rms=0.15
 Locality: Hejőpapi
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PSZ	70.8	273	ePgD	9:44:44.40	0.11
			eSg	44:53.90	-0.25
KECS	71.8	338	ePg	9:44:44.40	-0.07
			eSg	44:54.50	0.03
STHS	173.2	10	ePn	9:45:00.30	0.02
			eSn	45:23.30	0.69

155.

2009-10-02 time: 11:19:06.12 UTC ML= 2.2
 lat: 48.839N lon: 20.622E h= 0.0 km
 erh= 3.1km erz= 556km
 nr= 8 gap=187 rms=0.40
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
-----	------	-----	-------	-----------	-----

Hypocenter Parameters

KECS 40.8 194 ePg 11:19:13.20 -0.21
 eSg 19:19.10 0.00
 STHS 78.7 35 ePg 11:19:20.00 -0.17
 eSg 19:31.20 0.08
 PSZ 115.7 208 ePgC 11:19:27.10 0.32
 eSg 19:42.00 -0.90
 KOLS 121.6 85 ePg 11:19:29.10 1.27
 eSg 19:44.40 -0.36

156.

2009-10-03 time: 6:10:10.90 UTC ML= 0.5
 lat: 47.250N lon: 18.434E h= 10.0 km
 erh=13.1km erz=21.8km
 nr= 6 gap=284 rms=0.83
 Locality: Csala
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	16.1	348	ePgD	6:10:14.80	0.52
			eSg	10:17.90	0.98
CSKK	18.2	314	ePg	6:10:13.80	-0.81
			eSg	10:15.80	-1.70
PKST	30.3	272	ePg	6:10:16.50	-0.10
			eSg	10:21.80	0.75

157.

2009-10-05 time: 9:15:14.78 UTC ML= 1.3
 lat: 47.284N lon: 18.453E h= 0.0 km
 erh= 6.9km erz= 849km
 nr= 6 gap=286 rms=0.49
 Locality: Pátka
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	12.9	339	ePgC	9:15:17.10	0.01
			eSg	15:18.00	-0.89
CSKK	17.0	301	ePgC	9:15:18.50	0.68
			eSg	15:20.60	0.41
PKST	31.8	265	ePgC	9:15:20.10	-0.35
			eSg	15:24.30	-0.58

158.

2009-10-05 time: 9:19:43.85 UTC ML= 1.0
 lat: 47.455N lon: 18.400E h= 0.0 km
 erh= 1.1km erz= 108km
 nr= 5 gap=314 rms=0.05
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.0	186	ePgC	9:19:45.10	-0.01
			eSg	19:46.10	0.02
CSKK	14.6	226	ePgC	9:19:46.40	-0.07
			eSg	19:48.50	-0.01
PKST	35.2	232	ePgC	9:19:50.20	0.07

159.

2009-10-05 time: 9:19:57.84 UTC ML= 1.3
 lat: 47.450N lon: 18.375E h= 0.0 km
 erh= 3.5km erz= 426km
 nr= 6 gap=299 rms=0.25
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	6.6	170	ePgC	9:19:58.80	-0.22
			eSg	20:00.10	0.16
CSKK	13.0	222	ePgC	9:20:00.20	0.04
			eSg	20:02.20	0.23
PKST	33.4	230	ePgC	9:20:04.00	0.20
			eSg	20:07.80	-0.66

Földrengés paraméterek

160.

2009-10-05 time: 19:06:05.01 UTC ML= 2.6
 lat: 48.391N lon: 22.244E h= 13.3 km
 erh= 2.1km erz= 1.4km
 nr= 11 gap=129 rms=0.37
 Locality: Tiszabездéd
 Comments: felt 4 EMS

sta	dist	azm	phase	hr mn sec	res
TRPA	36.3	143	iPg	19:06:12.06	0.15
			iSg	06:16.70	-0.60
KOLS	60.3	2	ePg	19:06:16.10	0.06
			eSg	06:25.00	0.36
BMR	122.9	131	iPn	19:06:25.58	-0.08
			iSn	06:41.70	-0.07
STHS	135.6	327	ePn	19:06:27.10	-0.15
			eSn	06:43.80	-0.80
DRGR	181.3	169	iPn	19:06:33.80	0.86
			iSn	06:56.80	2.07
PSZ	182.6	253	iPn	19:06:32.90	-0.21
			iSn	06:55.00	-0.02
VOIR	391.8	147	iPn	19:07:00.30	1.11

161.

2009-10-06 time: 10:01:29.08 UTC ML= 1.9
 lat: 48.856N lon: 20.913E h= 0.0 km
 erh= 3.6km erz= 808km
 nr= 6 gap=165 rms=0.48
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
STHS	66.8	21	ePg	10:01:41.00	-0.01
			eSg	01:49.70	-0.62
KOLS	100.1	85	ePg	10:01:47.40	0.45
			eSg	02:00.60	-0.29
PSZ	128.7	216	ePgC	10:01:52.50	0.43
			eSg	02:08.90	-1.11

162.

2009-10-09 time: 6:25:46.83 UTC ML= 1.4
 lat: 47.334N lon: 18.458E h= 0.0 km
 erh= 9.8km erz= 9.6km
 nr= 5 gap=294 rms=0.21
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	8.2	322	ePgC	6:25:49.10	-0.04
			eSg	25:49.90	-1.04
CSKK	15.2	282	ePgC	6:25:50.30	0.21
			eSg	25:52.70	0.07
PKST	33.1	255	ePgD	6:25:52.90	-0.11

163.

2009-10-09 time: 6:26:03.03 UTC ML= 1.3
 lat: 47.336N lon: 18.479E h= 0.0 km
 erh= 1.4km erz= 129km
 nr= 5 gap=303 rms=0.08
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	9.1	313	ePgC	6:26:04.70	0.04
			eSg	26:05.70	-0.23
CSKK	16.8	280	ePgC	6:26:06.00	-0.03
			eSg	26:08.40	0.03
PKST	34.7	256	ePgD	6:26:09.30	0.06

Földrengés paraméterek

Hypocenter Parameters

164.

 2009-10-20 time: 8:26:32.77 UTC ML= 1.3
 lat: 47.315N lon: 18.444E h= 0.0 km
 erh= 4.2km erz= 503km
 nr= 6 gap=284 rms=0.30
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	9.5	335	ePgC	8:26:34.40	-0.06
			eSg	26:35.00	-0.78
CSKK	14.9	291	ePgC	8:26:35.80	0.37
			eSg	26:37.60	0.10
PKST	31.6	259	ePgC	8:26:38.40	-0.01
			eSg	26:42.30	-0.51

165.

 2009-10-20 time: 8:29:43.38 UTC ML= 1.2
 lat: 47.329N lon: 18.425E h= 0.0 km
 erh= 3.9km erz= 471km
 nr= 6 gap=276 rms=0.28
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.4	340	ePgC	8:29:44.60	-0.11
			eSg	29:45.20	-0.54
CSKK	13.0	287	ePgC	8:29:45.90	0.20
			eSg	29:48.00	0.50
PKST	30.5	255	ePgC	8:29:48.90	0.07
			eSg	29:52.50	-0.59

166.

 2009-10-20 time: 9:36:12.72 UTC ML= 1.3
 lat: 47.454N lon: 18.401E h= 0.0 km
 erh= 3.0km erz= 317km
 nr= 6 gap=314 rms=0.18
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.0	186	ePgC	9:36:13.90	-0.07
			eSg	36:15.10	0.16
CSKK	14.7	226	ePgC	9:36:15.20	-0.13
			eSg	36:17.50	0.12
PKST	35.2	232	ePgC	9:36:19.20	0.20
			eSg	36:23.30	-0.60

167.

 2009-10-20 time: 18:16:06.67 UTC ML= 1.9
 lat: 47.704N lon: 17.540E h= 8.9 km
 erh= 3.0km erz= 1.7km
 nr= 17 gap=161 rms=0.61
 Locality: Abda
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKST	61.9	143	ePgD	18:16:17.70	-0.14
			eSg	16:25.30	-1.26
CSKK	66.2	125	ePgD	18:16:18.90	0.31
			eSg	16:27.10	-0.79
PKSG	72.8	118	ePgD	18:16:19.60	-0.17
			eSg	16:30.50	0.51
SOP	73.7	268	ePgD	18:16:20.20	0.27
			eSg	16:30.90	0.62
CONA	128.1	281	Pn	18:16:28.40	-0.13
			Sn	16:43.60	-1.98
PKS9	136.2	156	eSn	18:16:47.60	0.20
ARSA	160.2	252	Pn	18:16:32.40	-0.13
			Sn	16:54.10	1.39
PSZ	177.9	82	ePnD	18:16:35.20	0.45
			eSn	16:57.00	0.35
MOA	245.9	274	Pn	18:16:43.00	-0.23
			Sn	17:11.60	-0.14

KHC 333.5 298 ePn 18:16:54.70 0.56
 eSn 17:39.30 8.13

168.

 2009-10-21 time: 7:54:07.93 UTC ML= 1.3
 lat: 47.335N lon: 18.528E h= 0.0 km
 erh= 5.6km erz= 576km
 nr= 6 gap=316 rms=0.34
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	12.2	302	ePgC	7:54:10.30	0.20
			eSg	54:10.90	-0.89
CSKK	20.5	279	ePgC	7:54:11.70	0.12
			eSg	54:14.20	-0.23
PKST	38.3	257	ePgC	7:54:14.50	-0.26
			eSg	54:20.80	0.71

169.

 2009-10-21 time: 7:58:08.45 UTC ML= 1.3
 lat: 47.335N lon: 18.492E h= 0.0 km
 erh= 3.8km erz= 423km
 nr= 6 gap=307 rms=0.25
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	9.9	309	ePgC	7:58:10.40	0.19
			eSg	58:11.30	-0.28
CSKK	17.7	280	ePgC	7:58:11.70	0.09
			eSg	58:13.70	-0.38
PKST	35.6	256	ePgC	7:58:14.60	-0.20
			eSg	58:20.40	0.64

170.

 2009-10-22 time: 6:11:07.25 UTC ML= 0.4
 lat: 47.287N lon: 18.352E h= 8.9 km
 erh= 4.7km erz= 5.8km
 nr= 6 gap=248 rms=0.10
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	10.9	321	ePgD	6:11:09.60	-0.16
			eSg	11:11.80	0.07
PKSG	12.0	14	ePgD	6:11:10.00	0.08
			eSg	11:12.00	0.00
PKST	24.2	262	ePgD	6:11:11.90	0.04
			eSg	11:15.50	0.04

171.

 2009-10-26 time: 9:48:00.24 UTC ML= 2.0
 lat: 47.340N lon: 18.453E h= 0.0 km
 erh= 2.4km erz= 243km
 nr= 5 gap=293 rms=0.11
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.5	321	ePgC	9:48:01.60	0.03
			eSg	48:02.40	-0.21
CSKK	14.8	280	ePgC	9:48:03.00	0.12
			eSg	48:05.00	0.06
PKST	32.9	254	ePg	9:48:06.00	-0.12

172.

 2009-10-28 time: 7:33:51.10 UTC ML= 0.4
 lat: 47.276N lon: 18.334E h= 0.0 km
 erh= 2.1km erz= 267km
 nr= 6 gap=247 rms=0.16
 Locality: Magyaralmás
 Comments: probably explosion

Hypocenter Parameters

Földrengés paraméterek

sta	dist	azm	phase	hr mn sec	res
CSKK	11.2	330	ePgC	7:33:53.10	0.01
			eSg	33:54.20	-0.45
PKSG	13.5	18	ePgC	7:33:53.40	-0.12
			eSg	33:55.70	0.30
PKST	22.8	265	ePgD	7:33:55.20	0.03
			eSg	33:58.60	0.25

173.

2009-10-29 time: 9:29:14.40 UTC ML= 1.1
 lat: 47.268N lon: 18.375E h= 0.0 km
 erh= 5.3km erz= 639km
 nr= 6 gap=263 rms=0.42
 Locality: Sárkereszttes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	13.7	321	ePgC	9:29:16.40	-0.44
			eSg	29:17.70	-1.05
PKSG	13.8	5	ePgC	9:29:17.00	0.14
			eSg	29:19.20	0.42
PKST	25.8	268	ePgC	9:29:19.20	0.19
			eSg	29:23.30	0.69

174.

2009-10-31 time: 1:47:28.80 UTC ML= 2.0
 lat: 48.788N lon: 22.245E h= 10.0 km
 erh= 8.8km erz=15.1km
 nr= 6 gap=156 rms=0.66
 Locality: Ukraine
 Comments:

sta	dist	azm	phase	hr mn sec	res
KOLS	16.2	7	ePg	1:47:31.10	-1.11
			eSg	47:35.80	0.94
TRPA	76.3	163	ePgD	1:47:42.60	0.05
			eSg	47:54.00	0.72
STHS	101.1	314	ePg	1:47:46.60	-0.35
			eSg	48:02.10	1.00

175.

2009-11-02 time: 9:15:16.20 UTC ML= 0.2
 lat: 47.320N lon: 18.304E h= 0.0 km
 erh= 5.6km erz= 3.8km
 nr= 6 gap=212 rms=0.33
 Locality: Söréd
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	5.8	326	ePg	9:15:17.70	-0.57
			eSg	15:19.70	-0.18
PKSG	10.4	39	ePgD	9:15:18.80	0.02
			eSg	15:21.50	0.72
PKST	21.5	252	ePgC	9:15:20.50	0.07
			eSg	15:24.10	0.37

176.

2009-11-02 time: 10:00:23.29 UTC ML= 0.8
 lat: 47.418N lon: 18.351E h= 0.0 km
 erh= 4.2km erz= 408km
 nr= 6 gap=260 rms=0.24
 Locality: Gánt
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	4.2	133	ePgC	10:00:23.90	-0.14
			eSg	00:24.70	0.08
CSKK	9.1	228	ePg	10:00:24.80	-0.12
			eSg	00:26.30	0.11
PKST	29.7	234	ePgC	10:00:28.90	0.30
			eSg	00:32.10	-0.64

177.

2009-11-02 time: 10:07:35.60 UTC ML= 1.2
 lat: 47.444N lon: 18.364E h= 0.0 km
 erh= 6.2km erz= 615km
 nr= 5 gap=290 rms=0.28
 Locality: Oroszlány
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	6.1	161	ePgC	10:07:36.70	0.01
			eSg	07:37.40	-0.14
CSKK	11.9	221	ePgC	10:07:38.10	0.37
			eSg	07:39.50	0.11
PKST	32.3	231	ePgC	10:07:41.00	-0.37

178.

2009-11-03 time: 9:56:03.93 UTC ML= 1.1
 lat: 47.482N lon: 18.400E h= 0.0 km
 erh= 3.1km erz= 278km
 nr= 6 gap=316 rms=0.17
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	10.0	184	ePgC	9:56:05.70	-0.02
			eSg	56:06.40	-0.72
CSKK	16.9	219	ePgC	9:56:07.10	0.15
			eSg	56:09.20	-0.10
PKST	37.1	228	ePg	9:56:10.40	-0.16
			eSg	56:16.00	0.27

179.

2009-11-03 time: 11:32:21.05 UTC ML= 0.8
 lat: 47.373N lon: 18.628E h= 12.9 km
 erh=16.3km erz=13.2km
 nr= 6 gap=338 rms=0.22
 Locality: Vértesacsca
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	18.1	277	ePgD	11:32:25.20	0.19
			eSg	32:28.00	-0.10
CSKK	27.8	268	ePgC	11:32:26.30	-0.22
			eSg	32:29.80	-0.98
PKST	46.6	254	ePgD	11:32:29.70	0.01
			eSg	32:36.80	0.37

180.

2009-11-03 time: 11:44:52.56 UTC ML= 0.4
 lat: 47.191N lon: 18.301E h= 10.0 km
 erh= 7.4km erz=13.2km
 nr= 6 gap=274 rms=0.09
 Locality: Székesfehérvár
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	19.4	351	ePgC	11:44:56.40	-0.05
			eSg	44:59.60	0.11
PKST	21.6	290	ePgC	11:44:56.80	0.00
			eSg	45:00.10	-0.01
PKSG	23.3	17	ePg	11:44:57.20	0.11
			eSg	45:00.40	-0.22

181.

2009-11-06 time: 7:04:46.70 UTC ML= 0.7
 lat: 47.297N lon: 18.333E h= 0.0 km
 erh= 4.9km erz= 4.6km
 nr= 6 gap=237 rms=0.14
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	9.2	323	ePg	7:04:49.00	-0.12

Földrengés paraméterek

Hypocenter Parameters

eSg 04:50.40 -0.61
 PKSG 11.4 22 ePgD 7:04:49.40 0.00
 eSg 04:51.70 0.18
 PKST 23.0 259 ePgC 7:04:51.20 0.02
 eSg 04:55.00 0.33

182.

2009-11-06 time: 14:14:03.46 UTC ML= 1.0
 lat: 47.363N lon: 18.657E h= 10.0 km
 erh= 7.8km erz= 9.8km
 nr= 6 gap=337 rms=0.21
 Locality: Vál
 Comments:

sta	dist	azm	phase	hr mn sec	res
PKSG	20.4	279	ePgD	14:14:07.70	0.18
			eSg	14:10.90	0.22
CSKK	30.0	270	ePgC	14:14:08.90	-0.21
			eSg	14:13.00	-0.51
PKST	48.5	256	ePg	14:14:12.30	-0.01
			eSg	14:19.50	0.29

183.

2009-11-08 time: 22:39:52.18 UTC ML= 0.0
 lat: 47.334N lon: 18.244E h= 5.5 km
 erh= 4.5km erz= 2.7km
 nr= 6 gap=183 rms=0.09
 Locality: Bodajk
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	3.5	21	ePgC	22:39:53.40	0.06
			eSg	39:54.20	-0.04
PKSG	12.8	60	ePgD	22:39:54.60	-0.07
			eSg	39:56.60	0.00
PKST	17.9	242	ePgD	22:39:55.60	0.07
			eSg	39:57.90	-0.24

184.

2009-11-09 time: 10:31:19.35 UTC ML= 1.1
 lat: 47.442N lon: 18.403E h= 0.0 km
 erh= 0.9km erz=90.6km
 nr= 6 gap=316 rms=0.06
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	5.6	190	ePgC	10:31:20.40	0.04
			eSg	31:21.10	-0.04
CSKK	13.9	231	ePg	10:31:21.80	-0.03
			eSg	31:23.80	0.04
PKST	34.5	234	ePg	10:31:25.50	-0.01
			eSg	31:29.70	-0.62

185.

2009-11-09 time: 10:31:30.51 UTC ML= 1.3
 lat: 47.338N lon: 18.445E h= 0.0 km
 erh= 2.5km erz= 281km
 nr= 6 gap=289 rms=0.17
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.3	326	ePgC	10:31:31.70	-0.11
			eSg	31:32.80	-0.02
CSKK	14.2	281	ePg	10:31:33.20	0.15
			eSg	31:35.10	0.07
PKST	32.3	254	ePg	10:31:36.30	0.02
			eSg	31:38.90	-1.87

186.

2009-11-10 time: 8:35:10.11 UTC ML= 1.4
 lat: 47.315N lon: 18.493E h= 0.0 km
 erh= 3.5km erz= 437km
 nr= 6 gap=302 rms=0.26
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	11.5	318	ePgC	8:35:12.30	0.14
			eSg	35:13.30	-0.46
CSKK	18.3	287	ePgC	8:35:13.60	0.22
			eSg	35:15.90	-0.03
PKST	35.2	260	ePgC	8:35:16.10	-0.29
			eSg	35:21.60	0.30

187.

2009-11-10 time: 8:35:24.27 UTC ML= 1.2
 lat: 47.340N lon: 18.465E h= 0.0 km
 erh= 1.8km erz= 226km
 nr= 6 gap=299 rms=0.13
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	8.0	316	ePgC	8:35:25.80	0.10
			eSg	35:26.80	-0.01
CSKK	15.6	279	ePgC	8:35:27.10	0.04
			eSg	35:28.90	-0.34
PKST	33.8	254	ePgC	8:35:30.20	-0.10
			eSg	35:35.20	0.19

188.

2009-11-12 time: 7:25:09.46 UTC ML= 0.3
 lat: 47.208N lon: 18.354E h= 0.0 km
 erh= 8.6km erz= 932km
 nr= 6 gap=276 rms=0.56
 Locality: Székesfehérvár
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	18.6	338	ePgC	7:25:13.10	0.31
			eSg	25:14.40	-0.99
PKSG	20.6	8	ePgC	7:25:13.50	0.36
			eSg	25:15.40	-0.61
PKST	24.9	283	ePgC	7:25:13.40	-0.51
			eSg	25:19.00	1.62

189.

2009-11-12 time: 11:27:59.22 UTC ML= 0.5
 lat: 47.170N lon: 18.299E h= 0.0 km
 erh= 0.9km erz=74.5km
 nr= 6 gap=281 rms=0.04
 Locality: Sárkeszi
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	21.7	352	ePgC	11:28:03.10	0.00
			eSg	28:05.10	-1.02
PKST	22.4	296	ePgC	11:28:03.20	-0.02
			eSg	28:06.40	0.06
PKSG	25.6	16	ePgC	11:28:03.80	0.00
			eSg	28:07.40	0.03

190.

2009-11-16 time: 9:59:12.61 UTC ML= 1.7
 lat: 48.354N lon: 19.913E h= 0.0 km
 erh= 3.9km erz= 2.0km
 nr= 7 gap=240 rms=0.31
 Locality: Slovakia
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
-----	------	-----	-------	-----------	-----

Hypocenter Parameters

KECS 44.7 71 ePg 9:59:20.50 -0.10
 eSg 59:27.10 0.27
 PSZ 48.5 182 ePgD 9:59:21.10 -0.16
 eSg 59:27.90 -0.11
 CRVS 129.4 62 ePg 9:59:35.90 0.19
 eSg 59:52.40 -1.33
 KOLS 185.5 70 eSn 9:60:06.90 0.61

191.

2009-11-19 time: 8:00:18.47 UTC ML= 2.2
 lat: 47.880N lon: 16.290E h= 5.0 km
 erh= 2.9km erz= 2.3km
 nr= 26 gap=130 rms=1.03
 Locality: Austria
 Comments:

sta	dist	azm	phase	hr mn sec	res
SOP	29.7	137	ePgD	8:00:24.10	0.26
			eSg	00:27.60	-0.44
CONA	32.4	280	Pg	8:00:23.90	-0.42
			Sg	00:29.10	0.21
ARSA	90.7	220	Pg	8:00:33.80	-0.88
			Sg	00:45.00	-2.33
MOA	151.5	269	Pn	8:00:43.70	-0.04
			Sn	01:03.20	-0.26
CSKK	158.9	111	ePnC	8:00:44.40	-0.27
			eSn	01:03.90	-1.20
KOGS	159.2	181	iPn	8:00:46.50	1.80
			iSn	01:06.50	1.33
SOKA	164.0	215	Pn	8:00:46.40	1.09
PERS	164.3	213	iPn	8:00:46.50	1.15
			iSn	01:05.00	-1.31
PKSG	166.9	109	ePnC	8:00:44.90	-0.77
			eSn	01:04.20	-2.69
TREC	168.2	339	ePn	8:00:45.90	0.07
			eSn	01:05.60	-1.56
GROS	168.6	201	iPn	8:00:47.00	1.11
			iSn	01:06.20	-1.07
KBA	239.2	248	Pn	8:00:56.20	1.52
KHC	244.0	305	ePn	8:00:55.60	0.32
			eSn	01:23.30	-0.69
PRU	267.2	331	ePn	8:00:58.90	0.72
			eSn	01:32.70	3.55

192.

2009-11-21 time: 0:21:01.99 UTC ML= 1.6
 lat: 47.344N lon: 18.154E h= 8.5 km
 erh= 2.9km erz= 1.7km
 nr= 10 gap=209 rms=0.35
 Locality: Nagyveleg
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	8.3	75	ePgD	0:21:04.30	0.18
			eSg	21:05.80	0.02
PKST	13.0	224	ePgD	0:21:04.70	-0.07
			eSg	21:06.30	-0.64
PKSG	18.7	73	ePgD	0:21:05.70	0.05
			eSg	21:07.90	-0.61
PKS9	84.7	174	ePgC	0:21:19.30	2.12
			eSg	21:29.30	0.27
PKSM	131.2	164	ePnD	0:21:24.80	0.50
			eSn	21:40.70	-1.00

193.

2009-11-21 time: 0:21:12.80 UTC ML= 1.3
 lat: 47.204N lon: 18.256E h= 10.0 km
 erh= 4.1km erz= 2.8km
 nr= 8 gap=228 rms=0.40
 Locality: Csór
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	17.6	1	ePgD	0:21:16.30	-0.12
			eSg	21:18.40	-0.85
PKST	17.9	290	ePgD	0:21:16.70	0.24

Földregés paraméterek

eSg 21:18.90 -0.41
 PKSG 23.2 26 ePgD 0:21:17.80 0.49
 eSg 21:20.80 -0.03
 BUD 65.8 62 ePg 0:21:24.10 -0.59
 SOP 138.7 293 ePn 0:21:39.90 4.05
 eSn 21:53.80 -0.03

194.

2009-11-21 time: 1:03:02.53 UTC ML= 0.4
 lat: 47.277N lon: 18.206E h= 6.6 km
 erh= 5.8km erz= 6.2km
 nr= 6 gap=213 rms=0.08
 Locality: Isztimér
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	10.4	23	ePg	1:03:04.70	-0.03
			eSg	03:06.50	0.06
PKST	13.1	261	ePgD	1:03:05.10	-0.06
			eSg	03:07.30	0.10
PKSG	18.9	48	ePgC	1:03:06.20	0.09
			eSg	03:08.70	-0.20

195.

2009-11-21 time: 1:38:31.15 UTC ML= 0.2
 lat: 47.355N lon: 18.139E h= 6.6 km
 erh= 1.3km erz= 0.7km
 nr= 6 gap=221 rms=0.03
 Locality: Nagyveleg
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	9.2	85	ePgC	1:38:33.20	0.03
			eSg	38:34.70	-0.04
PKST	13.4	217	ePgD	1:38:33.80	-0.01
			eSg	38:35.90	0.02
PKSG	19.4	78	ePgC	1:38:34.80	-0.01
			eSg	38:37.60	-0.06

196.

2009-11-21 time: 1:46:48.99 UTC ML= 1.1
 lat: 47.292N lon: 18.195E h= 8.5 km
 erh= 3.1km erz= 2.0km
 nr= 6 gap=200 rms=0.05
 Locality: Balinka
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	9.3	32	ePgD	1:46:51.30	0.05
			eSg	46:52.90	-0.11
PKST	12.7	253	ePgD	1:46:51.70	-0.02
			eSg	46:53.90	0.04
PKSG	18.5	53	ePgD	1:46:52.60	-0.02
			eSg	46:55.50	0.04

197.

2009-11-21 time: 4:20:54.19 UTC ML= 1.3
 lat: 47.309N lon: 18.175E h= 10.2 km
 erh= 1.0km erz= 0.3km
 nr= 6 gap=182 rms=0.02
 Locality: Balinka
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	8.8	47	ePg	4:20:56.60	0.00
			eSg	20:58.50	0.03
PKST	12.0	242	ePgD	4:20:57.00	0.00
			eSg	20:59.20	0.00
PKSG	18.7	61	ePgD	4:20:58.00	0.01
			eSg	21:00.90	-0.06

Földrengés paraméterek

Hypocenter Parameters

198.

2009-11-21 time: 19:21:15.94 UTC ML= 0.3
 lat: 47.303N lon: 18.177E h= 9.3 km
 erh= 2.7km erz= 1.1km
 nr= 6 gap=187 rms=0.04
 Locality: Balinka
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	9.2	43	ePg	19:21:18.30	0.03
			eSg	21:20.00	-0.10
PKST	11.8	246	ePgD	19:21:18.60	-0.02
			eSg	21:20.80	0.08
PKSG	18.9	59	ePgc	19:21:19.70	-0.01
			eSg	21:22.70	0.06

199.

2009-11-22 time: 13:42:08.03 UTC ML= 0.4
 lat: 47.317N lon: 18.170E h= 10.0 km
 erh= 2.8km erz= 0.8km
 nr= 6 gap=175 rms=0.07
 Locality: Balinka
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	8.5	53	ePgD	13:42:10.30	-0.08
			eSg	42:12.20	-0.01
PKST	12.1	238	ePgD	13:42:10.80	-0.04
			eSg	42:13.10	0.07
PKSG	18.6	63	ePgc	13:42:11.90	0.09
			eSg	42:14.80	0.05

200.

2009-11-23 time: 8:43:11.21 UTC ML= 0.2
 lat: 47.308N lon: 18.332E h= 0.0 km
 erh= 2.6km erz= 2.3km
 nr= 6 gap=231 rms=0.06
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	8.2	318	ePg	8:43:13.50	-0.02
			eSg	43:15.20	-0.12
PKSG	10.3	25	ePg	8:43:13.80	0.03
			eSg	43:15.80	0.03
PKST	23.2	256	ePgc	8:43:15.70	-0.02
			eSg	43:19.40	0.16

201.

2009-11-23 time: 10:57:00.50 UTC ML= 1.1
 lat: 47.462N lon: 18.404E h= 0.0 km
 erh= 2.4km erz= 221km
 nr= 6 gap=317 rms=0.13
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.9	188	ePgc	10:57:01.90	-0.01
			eSg	57:02.90	-0.11
CSKK	15.5	225	ePgc	10:57:03.40	0.14
			eSg	57:05.60	0.18
PKST	36.0	231	ePgc	10:57:06.80	-0.12
			eSg	57:11.10	-0.83

202.

2009-11-23 time: 10:57:37.18 UTC ML= 0.8
 lat: 47.427N lon: 18.337E h= 0.0 km
 erh= 7.2km erz= 679km
 nr= 6 gap=263 rms=0.42
 Locality: Oroszlány
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
-----	------	-----	-------	-----------	-----

PKSG	5.6	134	ePgc	10:57:37.90	-0.28
			eSg	57:38.70	-0.26
CSKK	9.1	219	ePgc	10:57:39.40	0.59
			eSg	57:40.20	0.12
PKST	29.5	231	ePgc	10:57:42.30	-0.15
			eSg	57:44.90	-1.66

203.

2009-11-23 time: 11:01:31.75 UTC ML= 0.8
 lat: 47.442N lon: 18.349E h= 0.0 km
 erh= 6.0km erz= 625km
 nr= 6 gap=281 rms=0.36
 Locality: Oroszlány
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	6.4	150	ePgc	11:01:32.80	-0.10
			eSg	01:33.50	-0.29
CSKK	11.0	217	ePgc	11:01:34.20	0.48
			eSg	01:35.60	0.35
PKST	31.3	229	ePgc	11:01:37.10	-0.23
			eSg	01:40.70	-0.99

204.

2009-11-24 time: 10:59:57.47 UTC ML= 0.5
 lat: 47.179N lon: 18.302E h= 0.0 km
 erh= 1.0km erz= 111km
 nr= 6 gap=278 rms=0.07
 Locality: Sárkeszi
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	20.8	351	ePgc	11:00:01.20	0.02
			eSg	00:03.90	-0.18
PKST	22.2	294	ePgc	11:00:01.40	-0.03
			eSg	00:04.60	0.08
PKSG	24.7	16	ePgc	11:00:01.90	0.03
			eSg	00:06.10	0.79

205.

2009-11-24 time: 18:56:16.32 UTC ML= 0.1
 lat: 47.257N lon: 18.211E h= 10.0 km
 erh= 5.0km erz= 4.2km
 nr= 6 gap=229 rms=0.12
 Locality: Kincsesbánya
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	12.3	18	ePgc	18:56:19.30	0.14
			eSg	56:20.60	-0.77
PKST	13.4	271	ePgD	18:56:19.30	0.00
			eSg	56:21.50	-0.13
PKSG	20.2	42	ePgc	18:56:20.30	-0.04
			eSg	56:23.30	-0.18

206.

2009-11-25 time: 7:25:23.02 UTC ML= 0.4
 lat: 47.290N lon: 18.350E h= 10.0 km
 erh= 4.5km erz= 5.0km
 nr= 6 gap=247 rms=0.14
 Locality: Magyaralmás
 Comments:

sta	dist	azm	phase	hr mn sec	res
CSKK	10.6	320	ePgD	7:25:25.40	-0.22
			eSg	25:27.60	-0.05
PKSG	11.7	15	ePgD	7:25:25.80	0.03
			eSg	25:28.20	0.29
PKST	24.2	262	ePgD	7:25:27.80	0.11
			eSg	25:31.40	0.07

Hypocenter Parameters

207.

2009-11-25 time: 9:34:37.60 UTC ML= 2.1
 lat: 47.954N lon: 22.882E h= 10.0 km
 erh= 4.8km erz= 2.4km
 nr= 12 gap=125 rms=0.75
 Locality: Garbolc
 Comments:

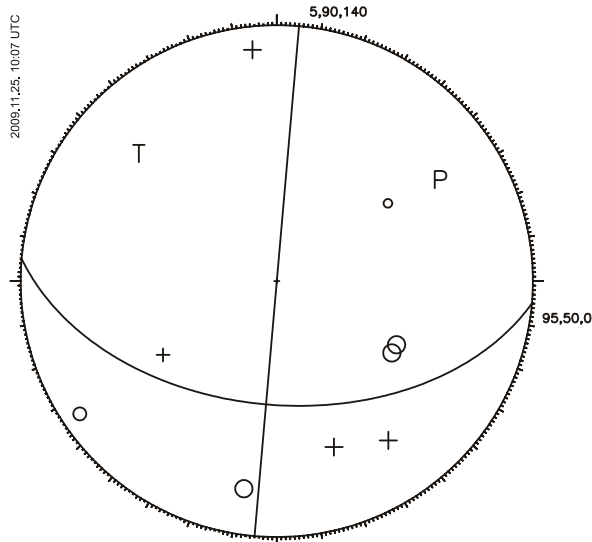
sta	dist	azm	phase	hr	mn	sec	res
TRPA	32.3	307	ePgD	9:34:43.40			-0.24
			eSg		34:48.90		0.56
BMR	55.6	124	iPg	9:34:46.80			-0.90
KOLS	117.9	338	ePn	9:34:58.40			0.34
			eSn		35:13.10		-0.91
DRGR	129.8	186	iPnD	9:34:59.60			0.05
CRVS	149.0	315	ePn	9:35:02.60			0.67
			eSn		35:20.00		-0.91
BURB	178.9	102	iPn	9:35:06.80			1.13
STHS	202.6	323	eSn	9:35:37.20			4.39
PSZ	223.3	269	ePn	9:35:12.50			1.30
			eSn		35:44.00		6.59
GZR	284.7	182	iPn	9:35:21.10			2.24

208.

2009-11-25 time: 10:07:35.66 UTC ML= 2.8
 lat: 47.100N lon: 18.199E h= 10.0 km
 erh= 2.4km erz= 2.0km
 nr= 30 gap= 62 rms=1.03
 Locality: Berhida
 Comments: felt 3-4 EMS

sta	dist	azm	phase	hr	mn	sec	res
PKST	21.7	325	ePgC	10:07:39.70			-0.22
			eSg		07:42.90		-0.34
CSKK	29.7	9	ePgD	10:07:41.10			-0.15
			eSg		07:45.10		-0.50
PKS9	57.3	174	ePgC	10:07:46.40			0.35
BUD	75.6	56	ePgD	10:07:48.40			-0.87
			eSg		07:59.00		-0.89
PKSM	104.3	161	eP*C	10:07:53.70			-0.64
			eSn		08:05.90		-3.01
PKS6	118.0	118	ePn	10:07:58.90			2.77
			eSn		08:11.90		-0.20
PKSN	128.9	100	ePn	10:07:58.70			1.22
			eSn		08:15.10		0.60
BEHE	129.3	237	ePnC	10:07:57.70			0.17
			eSn		08:13.80		-0.80
SOP	139.8	298	ePn	10:08:01.20			2.35
			eSn		08:15.50		-1.44
PSZ	156.8	55	ePnD	10:08:00.90			-0.07
			eSn		08:20.00		-0.71
KOGS	165.5	244	ePn	10:08:03.60			1.55
SMOL	167.5	340	ePn	10:08:03.70			1.40
			eSn		08:24.30		1.23
ARSA	203.6	275	Pn	10:08:03.30			-3.49
			Sn		08:30.40		-0.68
GROS	217.9	251	iPn	10:08:08.60			0.02
			eSn		08:33.20		-1.06
PERS	240.6	258	ePn	10:08:11.60			0.19
CRES	253.8	236	ePn	10:08:12.40			-0.66
			eSn		08:41.40		-0.83
VRAC	273.1	334	iPn	10:08:16.30			0.84
MORC	301.6	351	iPn	10:08:19.30			0.28
BZS	310.4	122	iPnD	10:08:20.40			0.28
CRVS	315.3	51	ePn	10:08:21.50			0.77
STHS	342.8	41	ePn	10:08:26.10			1.95
DRGR	345.2	96	iPn	10:08:24.60			0.14
KOLS	366.0	56	ePn	10:08:27.50			0.45
DPC	386.9	339	ePn	10:08:29.50			-0.16
GZR	400.8	118	iPnD	10:08:31.70			0.32
KHC	411.6	303	ePn	10:08:33.90			1.17
			eSn		09:28.40		11.15
UPC	411.6	337	ePn	10:08:32.70			-0.03

Földrengés paraméterek



209.

2009-11-25 time: 20:41:20.11 UTC ML= 2.1
 lat: 48.011N lon: 22.948E h= 5.8 km
 erh= 5.1km erz= 3.0km
 nr= 9 gap=130 rms=0.55
 Locality: Garbolc
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
TRPA	33.2	293	iPgD	20:41:26.30			0.16
BMR	55.7	132	iPg	20:41:29.50			-0.62
KOLS	114.0	334	ePg	20:41:41.20			0.70
			eSg		41:55.80		-0.60
CRVS	148.0	312	ePn	20:41:44.70			-0.16
			eSn		42:02.90		-1.25
BURB	175.6	105	iPnD	20:41:48.90			0.61
STHS	200.4	321	eSn	20:42:15.50			-0.28
BZS	284.9	201	iPnD	20:42:04.00			2.07

210.

2009-11-27 time: 6:56:53.40 UTC ML= 0.4
 lat: 47.280N lon: 18.349E h= 0.0 km
 erh= 1.7km erz= 221km
 nr= 6 gap=250 rms=0.14
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	11.4	324	ePg	6:56:55.30			-0.14
			eSg		56:56.80		-0.23
PKSG	12.9	14	ePgD	6:56:55.70			0.01
			eSg		56:57.80		0.32
PKST	23.9	264	ePgD	6:56:57.70			0.03
			eSg		57:01.30		0.30

211.

2009-11-28 time: 1:36:53.85 UTC ML= 1.0
 lat: 47.194N lon: 18.058E h= 0.5 km
 erh=12.0km erz= 190km
 nr= 6 gap=297 rms=0.14
 Locality: Várpalota
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
PKST	7.4	346	ePgC	1:36:55.20			0.02
			eSg		36:56.20		-0.02
CSKK	24.2	39	ePg	1:36:57.90			-0.28
			eSg		37:01.60		0.05
PKSG	33.4	49	ePgC	1:37:00.00			0.19
			eSg		38:04.40		-0.06

Földrengés paraméterek

Hypocenter Parameters

212.

2009-11-28 time: 9:39:53.47 UTC ML= 2.7
 lat: 45.951N lon: 16.051E h= 10.0 km
 erh= 2.7km erz= 2.1km
 nr= 23 gap=150 rms=0.81
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr mn sec	res
GOLS	33.7	281	iPg	9:40:00.30	0.55
			iSg	40:05.60	0.95
GCIS	34.2	254	iPgD	9:39:59.90	0.07
			iSg	40:05.00	0.21
CRES	48.2	253	iPg	9:40:02.20	-0.06
			iSg	40:08.40	-0.71
DOBS	50.2	296	iPg	9:40:03.10	0.49
			iSg	40:09.90	0.17
KOGS	57.4	16	iPg	9:40:03.70	-0.17
			iSg	40:11.40	-0.58
BOJS	79.6	231	iPg	9:40:06.70	-1.10
BEHE	80.3	44	ePgc	9:40:07.10	-0.83
			eSg	40:20.10	0.90
SOKA	112.6	316	Pn	9:40:13.10	-0.17
			Sn	40:26.30	-2.41
OBKA	131.5	298	Pn	9:40:16.20	0.58
			Sn	40:31.70	-1.19
ARSA	150.0	344	Pn	9:40:19.00	1.07
VOY	167.4	273	ePn	9:40:21.80	1.70
PKS9	185.7	68	eSn	9:40:45.40	0.47
PKSM	202.4	82	ePn	9:40:21.90	-2.57
			eSn	40:49.70	1.06
PKST	210.3	46	ePnD	9:40:27.90	2.45
TRPA	549.4	64	iPn	9:41:09.50	1.77

213.

2009-11-30 time: 7:31:59.35 UTC ML= 0.4
 lat: 47.269N lon: 18.367E h= 0.0 km
 erh= 1.3km erz= 159km
 nr= 6 gap=260 rms=0.09
 Locality: Sárkereszttes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	13.2	323	ePgc	7:32:01.80	0.08
			eSg	32:03.30	-0.26
PKSG	13.8	8	ePgc	7:32:01.80	-0.02
			eSg	32:03.80	0.05
PKST	25.2	268	ePgD	7:32:03.80	-0.05
			eSg	32:07.50	0.14

214.

2009-11-30 time: 11:03:32.87 UTC ML= 1.5
 lat: 47.340N lon: 18.454E h= 0.0 km
 erh= 1.8km erz= 188km
 nr= 6 gap=294 rms=0.11
 Locality: Zámoly
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	7.5	320	ePgc	11:03:34.20	-0.01
			eSg	03:35.10	-0.16
CSKK	14.9	280	ePgc	11:03:35.60	0.07
			eSg	03:37.80	0.20
PKST	33.0	254	ePgc	11:03:38.70	-0.07
			eSg	03:41.50	-1.86

215.

2009-11-30 time: 11:03:50.90 UTC ML= 1.4
 lat: 47.468N lon: 18.397E h= 0.0 km
 erh= 1.1km erz= 105km
 nr= 6 gap=313 rms=0.06
 Locality: Várgesztes
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	8.5	183	ePgc	11:03:52.40	-0.03
			eSg	03:53.70	0.09
CSKK	15.6	221	ePgc	11:03:53.70	0.02
			eSg	03:55.90	0.05
PKST	35.9	230	ePg	11:03:57.30	-0.02
			eSg	04:01.20	-1.13

216.

2009-12-04 time: 7:19:57.30 UTC ML= 1.0
 lat: 47.336N lon: 18.472E h= 0.0 km
 erh= 2.8km erz= 279km
 nr= 6 gap=300 rms=0.16
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	8.7	316	ePgc	7:19:58.90	0.05
			eSg	19:59.70	-0.36
CSKK	16.2	281	ePgc	7:20:00.30	0.11
			eSg	20:02.60	0.15
PKST	34.1	255	ePgc	7:20:03.30	-0.09
			eSg	20:05.70	-2.45

217.

2009-12-04 time: 12:10:46.34 UTC ML= 0.9
 lat: 47.256N lon: 18.701E h= 0.0 km
 erh= 7.6km erz= 713km
 nr= 6 gap=328 rms=0.43
 Locality: Pettend
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	27.9	303	ePgD	12:10:51.50	0.17
			eSg	10:55.30	0.08
CSKK	35.4	290	ePg	12:10:52.00	-0.67
			eSg	10:57.20	-0.40
PKST	50.5	270	ePg	12:10:55.90	0.54
			eSg	11:02.30	-0.10

218.

2009-12-07 time: 10:26:24.74 UTC ML= 1.3
 lat: 47.335N lon: 18.500E h= 0.0 km
 erh= 3.2km erz= 310km
 nr= 6 gap=309 rms=0.19
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
PKSG	10.4	307	ePgc	10:26:26.70	0.10
			eSg	26:27.70	-0.34
CSKK	18.4	280	ePgc	10:26:28.10	0.08
			eSg	26:30.10	-0.48
PKST	36.3	256	ePgc	10:26:31.10	-0.11
			eSg	26:36.70	0.44

219.

2009-12-07 time: 10:36:19.37 UTC ML= 1.1
 lat: 47.290N lon: 18.356E h= 0.0 km
 erh= 3.1km erz= 349km
 nr= 6 gap=249 rms=0.23
 Locality: Magyaralmás
 Comments: probably explosion

sta	dist	azm	phase	hr mn sec	res
CSKK	10.9	318	ePgc	10:36:21.10	-0.21
			eSg	36:22.10	-0.72
PKSG	11.6	13	ePgc	10:36:21.50	0.06
			eSg	36:23.40	0.34
PKST	24.6	262	ePgD	10:36:23.80	0.04
			eSg	36:27.70	0.52

Hypocenter Parameters

Földrengés paraméterek

220.

2009-12-07 time: 11:02:25.48 UTC ML= 1.2
 lat: 47.346N lon: 18.458E h= 0.0 km
 erh= 1.2km erz= 122km
 nr= 6 gap=298 rms=0.07
 Locality: Lovasberény
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	7.2	315	ePgC	11:02:26.80			0.04
			eSg	02:27.60			-0.16
CSKK	15.0	277	ePgC	11:02:28.20			0.04
			eSg	02:30.30			0.05
PKST	33.4	253	ePgC	11:02:31.40			-0.05
			eSg	02:36.90			0.79

221.

2009-12-07 time: 12:34:18.03 UTC ML= 0.2
 lat: 47.272N lon: 18.350E h= 0.0 km
 erh= 1.3km erz= 161km
 nr= 6 gap=254 rms=0.10
 Locality: Sárkereszttes
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	12.2	326	ePgC	12:34:20.20			-0.01
			eSg	34:21.80			-0.11
PKSG	13.7	13	ePgC	12:34:20.40			-0.07
			eSg	34:22.60			0.22
PKST	23.9	267	ePgC	12:34:22.40			0.09
			eSg	34:25.50			-0.14

222.

2009-12-09 time: 8:43:19.29 UTC ML= 0.3
 lat: 47.246N lon: 18.342E h= 0.0 km
 erh= 7.3km erz= 780km
 nr= 5 gap=261 rms=0.35
 Locality: Sárkereszttes
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
CSKK	14.4	335	ePgC	8:43:22.30			0.44
			eSg	43:23.50			-0.36
PKSG	16.6	13	ePgC	8:43:22.30			0.05
			eSg	43:23.60			-0.96
PKST	23.3	273	ePgC	8:43:23.20			-0.26

223.

2009-12-10 time: 11:17:29.25 UTC ML= 0.8
 lat: 47.276N lon: 18.681E h= 0.0 km
 erh= 2.4km erz= 193km
 nr= 5 gap=327 rms=0.09
 Locality: Kápolnásnyék
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	25.5	300	ePgC	11:17:33.70			-0.10
			eSg	17:37.40			0.05
CSKK	33.3	287	ePgC	11:17:35.30			0.11
			eSg	17:39.80			-0.03
PKST	49.0	268	eSg	11:17:44.80			-0.03

224.

2009-12-11 time: 7:09:13.51 UTC ML= 0.5
 lat: 47.223N lon: 18.507E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=302 rms=0.65
 Locality: Pákozd
 Comments: probably explosion

sta	dist	azm	phase	hr	mn	sec	res
PKSG	20.7	335	ePgC	7:09:16.60			-0.61
			eSg	09:21.10			1.00

CSKK	24.3	310	ePgC	7:09:18.50			0.65
			eSg	09:19.80			-1.44
PKST	36.0	276	ePgC	7:09:20.10			0.16
			eSg	09:24.30			-0.66

225.

2009-12-14 time: 10:53:31.90 UTC ML= 1.0
 lat: 46.979N lon: 17.999E h= 0.0 km
 erh= ***km erz= ***km
 nr= 6 gap=332 rms=0.58
 Locality: Alsóórs
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
PKST	31.3	5	ePgD	10:53:37.60			0.11
			eSg	53:41.70			-0.14
CSKK	47.1	25	ePg	10:53:39.60			-0.72
			eSg	53:47.10			0.22
PKSG	54.7	33	ePg	10:53:42.80			1.13
			eSg	53:48.90			-0.39

226.

2009-12-14 time: 13:10:17.76 UTC ML= 2.1
 lat: 48.158N lon: 21.258E h= 1.5 km
 erh= 2.0km erz= 2.6km
 nr= 9 gap=111 rms=0.44
 Locality: Mezőzombor
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
CRVS	84.2	10	ePg	13:10:32.80			0.01
			eSg	10:44.90			0.38
TRPA	95.4	92	iPg	13:10:34.80			0.00
PSZ	105.1	255	iPgD	13:10:36.20			-0.34
KOLS	114.3	41	ePg	13:10:37.70			-0.47
			eSg	10:51.30			-2.78
STHS	140.0	360	ePn	13:10:43.10			1.04
			eSn	11:00.50			-0.51
DRGR	187.2	144	iPnD	13:10:48.30			0.35

227.

2009-12-22 time: 1:36:05.96 UTC ML= 0.8
 lat: 47.204N lon: 18.375E h= 10.0 km
 erh= 9.3km erz= 18.1km
 nr= 6 gap=280 rms=0.12
 Locality: Székesfehérvár
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
CSKK	19.7	334	ePgC	1:36:10.10			0.19
			eSg	36:12.80			-0.19
PKSG	21.0	3	ePgD	1:36:10.00			-0.11
			eSg	36:13.40			0.06
PKST	26.5	283	ePgC	1:36:11.00			-0.02
			eSg	36:14.90			-0.07

228.

2009-12-26 time: 3:39:13.16 UTC ML= 2.4
 lat: 46.228N lon: 17.196E h= 10.0 km
 erh= 5.6km erz= 3.5km
 nr= 13 gap=167 rms=0.68
 Locality: Berzence
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
BEHE	42.2	310	ePgC	3:39:21.60			0.71
			eSg	39:27.20			0.27
KOGS	76.9	289	iPg	3:39:26.80			-0.20
			iSg	39:38.80			1.01
PKS9	92.3	64	ePgC	3:39:29.20			-0.54
			eSg	39:42.30			-0.38
PKSM	111.5	91	ePnC	3:39:33.50			0.68
			eSn	39:47.20			-0.95
PKST	131.3	29	ePn	3:39:35.20			-0.09

Földrengés paraméterek

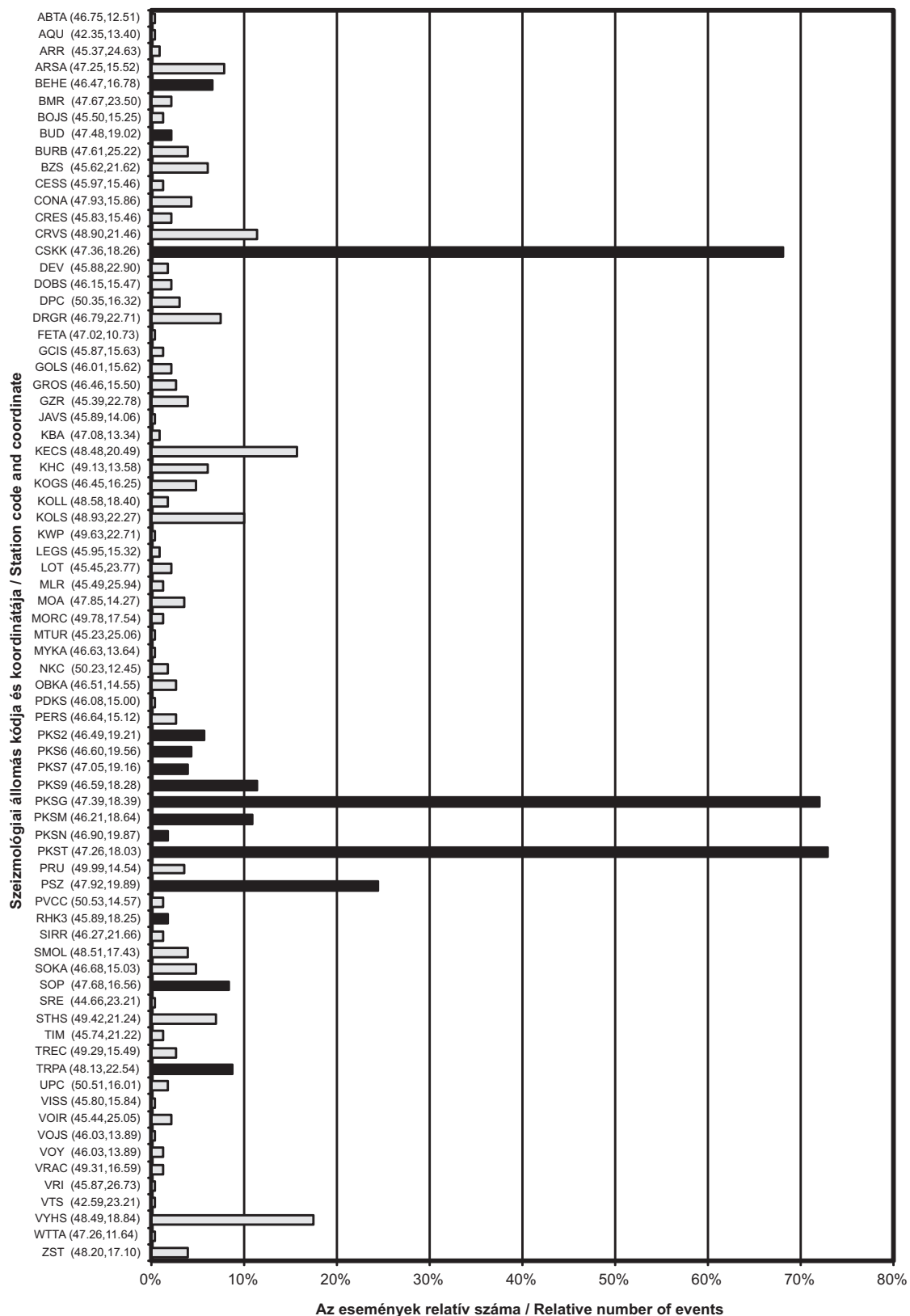
Hypocenter Parameters

		eSn	39:51.70	-0.85
DOBS	133.6 266	iPn	3:39:34.80	-0.78
CESS	137.0 258	iPn	3:39:37.30	1.31
		iSn	39:55.40	1.60
PKSG	158.3 35	ePnC	3:39:39.00	0.35
		eSn	39:56.30	-2.24
PERS	166.2 286	iPn	3:39:38.90	-0.73
SOP	169.0 343	ePn	3:39:39.60	-0.38
		eSn	40:02.00	1.10
ARSA	171.1 312	Pn	3:39:40.00	-0.25
		Sn	40:01.00	-0.38
SOKA	173.6 287	Pn	3:39:39.50	-1.06
		Sn	40:01.70	-0.24
PKSN	217.9 70	eSn	3:40:19.60	7.83
MOA	286.6 309	Pn	3:39:54.50	-0.14
		Sn	40:25.70	-1.30

229.

2009-12-30 time: 1:28:19.20 UTC ML= 2.5
 lat: 45.907N lon: 17.197E h= 14.8 km
 erh= 5.9km erz= 3.1km
 nr= 16 gap=224 rms=0.91
 Locality: Croatia
 Comments:

sta	dist	azm	phase	hr	mn	sec	res
BEHE	70.6	333	ePgD	1:28:31.70			-0.38
			eSg	28:42.60			0.47
PKS9	112.6	48	ePnC	1:28:38.30			-0.08
			eSn	28:52.20			-1.15
PKSM	116.8	73	ePnC	1:28:39.10			0.19
			eSn	28:52.90			-1.38
PKST	163.5	23	ePnD	1:28:45.70			0.97
			eSn	29:00.80			-3.84
SOKA	187.5	297	Pn	1:28:48.50			0.78
			Sn	29:10.70			0.73
PKSG	188.7	29	ePnD	1:28:48.40			0.53
			eSn	29:11.80			1.56
ARSA	196.9	319	Pn	1:28:47.40			-1.50
			Sn	29:10.60			-1.46
SOP	203.5	346	ePnD	1:28:50.80			1.09
			eSn	29:15.00			1.49



3.4. ábra Az egyes állomások részvétele a hipocentrum meghatározásban
 Figure 3.4. Contribution of individual stations to the hypocenter determination

4.

JELENTŐS FÖLDRENGÉSEK 2009-BEN (Magyarországon érezhető földrengések)

2009. október 5. – Tiszabezdéd

2009. november 25. – Berhida

A MAKROSZEIZMIKUS INTENZITÁS MEGHATÁROZÁSA

A földrengés érezhető és az épített környezetben okozott hatásainak felmérése kérdőívek segítségével történt. Az összegyűjtött válaszok alapján került meghatározásra az intenzitás értéke (Zsíros et al, 1990 és Zsíros, 1994).

Az intenzitás leírása az *Európai Makroszeizmikus Skála (EMS)* szerint történik, mely részletesen megtalálható Grünthal (1998) munkájában. (*A Melléklet*)

4.

SIGNIFICANT EARTHQUAKES IN 2009 (Earthquakes that were felt in Hungary)

5 October 2009 – Tiszabezdéd

25 November 2009 – Berhida

METHOD USED FOR ESTIMATION OF INTENSITY

The earthquake effects (macroseismic observations) were evaluated by 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 1998 (EMS)* edited by Grünthal (1998). (APPENDIX A)

2009. október 5. - Tiszabездéd / 5 October 2009 - Tiszabездéd**FÉSZEKPARAMÉTEREK / HYPOCENTER PARAMETERS**

Dátum / Date:	2009/10/05
Kipattanási idő / Origin Time:	19:06:05.0 UTC
Szélesség és hosszúság / Latitude and Longitude:	48.391 N 22.244 E (S.D. 2.1 km)
Mélység / Depth:	13.3 km (S.D. 1.4 km)
Magnitúdó / Magnitude:	2.6 ML
Maximális intenzitás / Maximum Intensity:	4 EMS

LEÍRÁS

Október 5-én este 2.6 M_L magnitúdójú földrengés keletkezett az ukrán határ közelében fekvő Tiszabездéden. A rengés intenzitása 4 EMS fokra becsülhető. A rengés csak nagyon kis területen volt érezhető.

Az esemény szeizmogramja a 4.1. ábrán látható.

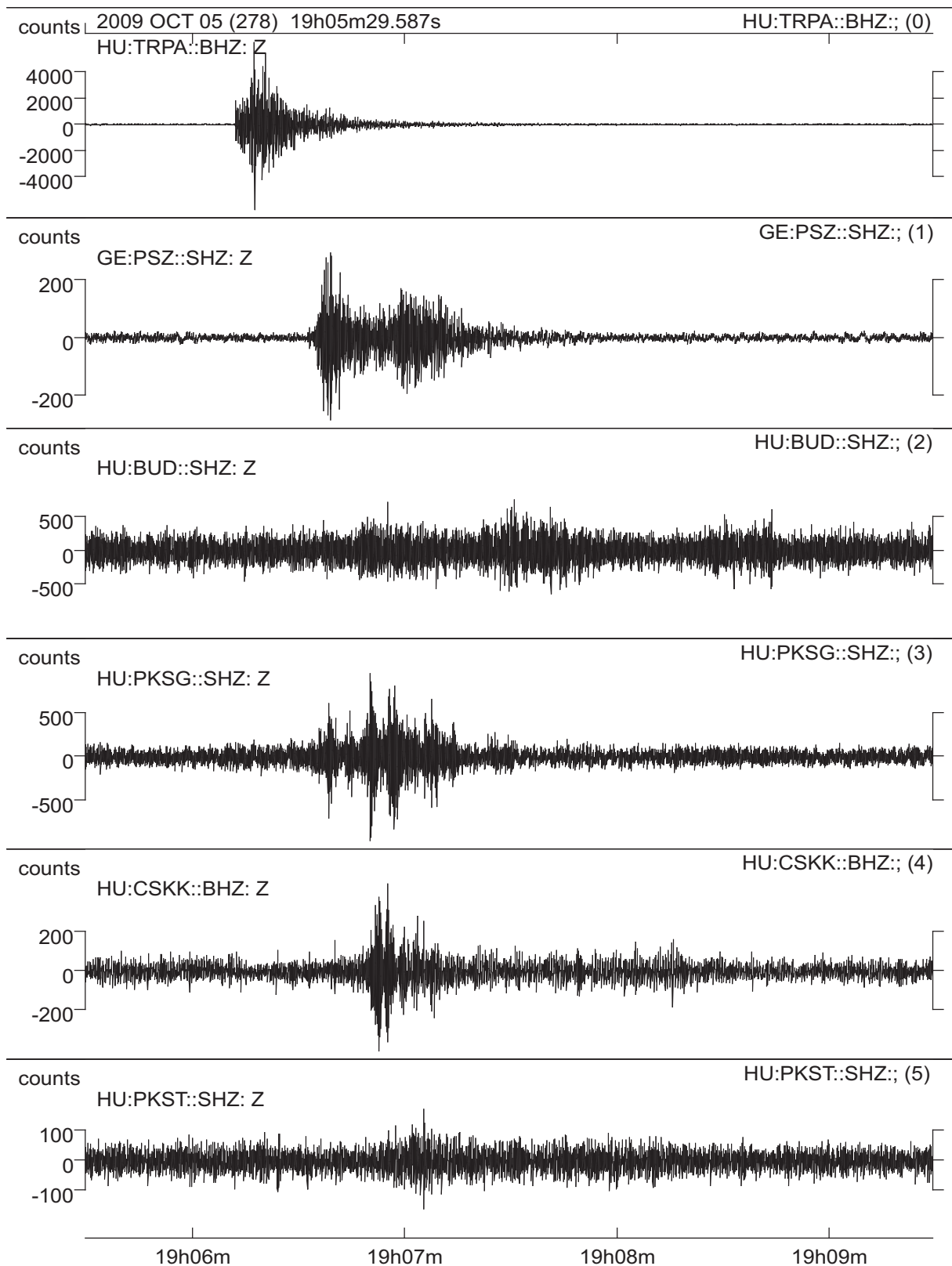
A rengés intenzitás eloszlását a 4.1. táblázat tartalmazza és a 4.2. ábra mutatja.

DISCUSSION

On the evening of October 5th, a 2.6 M_L magnitude earthquake was felt at Tiszabездéd near the Hungarian-Ukraine border. The shock was felt in a very small area and produced reports of 4 EMS.

Seismograms of the event are shown in Figure 4.1.

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



4.1. ábra A 2009. október 5-i, tiszabezdédi földrengés (19:06 UTC) szeizmogramjai

Figure 4.1. Seismograms of the Tiszabezdéd earthquake 5th October 2009 (19:06 UTC)

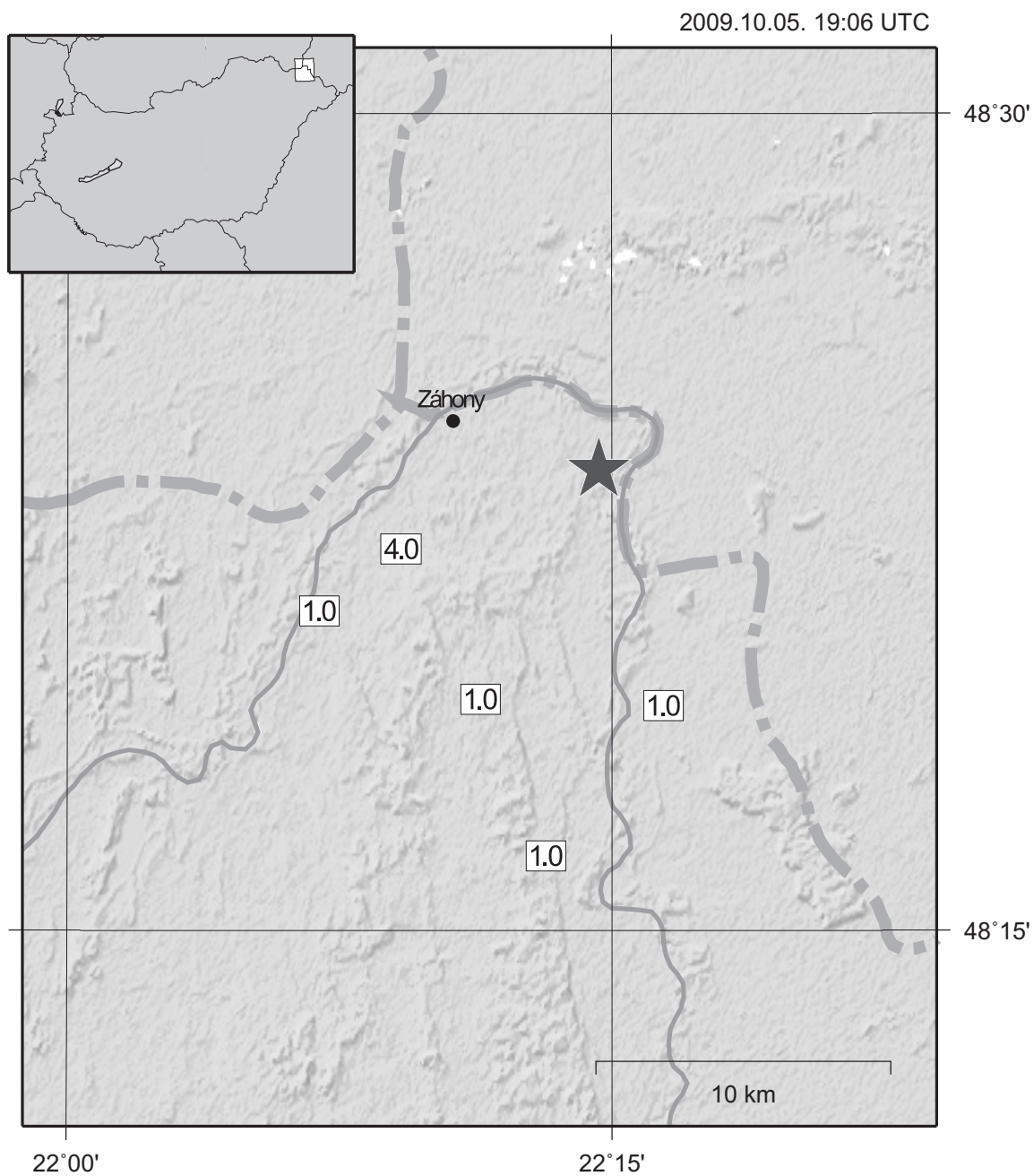
4.1. Táblázat

A 2009. október 5-i, tiszabezdédi földrengés (19:06 UTC) intenzitás eloszlása

Table 4.1.

Intensity distribution of the Tiszabezdéd earthquake 5th October 2009 (19:06 UTC)

Helység / Location		Koordináta Coordinates		I Intenzitás Intensity	R Rel. megbízhatóság Rel. reliability	N Jelentések száma No. of reports
		Szélesség Latitude (N)	Hosszúság Longitude (E)			
1	Lónya	48.319	22.273	1.0	0%	1
2	Mándok	48.321	22.189	1.0	0%	1
3	Mezőladány	48.273	22.219	1.0	0%	2
4	Tiszabezdéd	48.367	22.153	4.0	36%	2
5	Tuzsér	48.348	22.115	1.0	0%	1



4.2. ábra A 2009. október 5-i, tiszabzdédi földrengés (19:06 UTC) intenzitás eloszlása (a csillag a műszeresen meghatározott epicentrumot jelöli)

Figure 4.2. Intensity distribution of the Tiszabzdéd earthquake 5th October 2009 (19:06 UTC) (star - instrumental epicentre)

2009. november 25. - Berhida / 25 November 2009 - Berhida**FÉSZKEPARAMÉTEREK / HYPOCENTER PARAMETERS**

Dátum / Date:	2009/11/25
Kipattanási idő / Origin Time:	10:07:35.7 UTC
Szélesség és hosszúság / Latitude and Longitude:	47.100 N 18.199 E (S.D. 2.4 km)
Mélység / Depth:	10.0 km (S.D. 2.0 km)
Magnitúdó / Magnitude:	2.8 M _L
Maximális intenzitás / Maximum Intensity:	3-4 EMS

LEÍRÁS

November 25-én reggel kisebb, 2.8 M_L magnitúdójú földrengést pattant ki Berhida környékén. A rengés intenzitása 3-4 EMS fokra becsülhető, de csak kisebb, kb. 100 km² területen érezték.

Az esemény szeizmogramja a 4.3. ábrán látható.

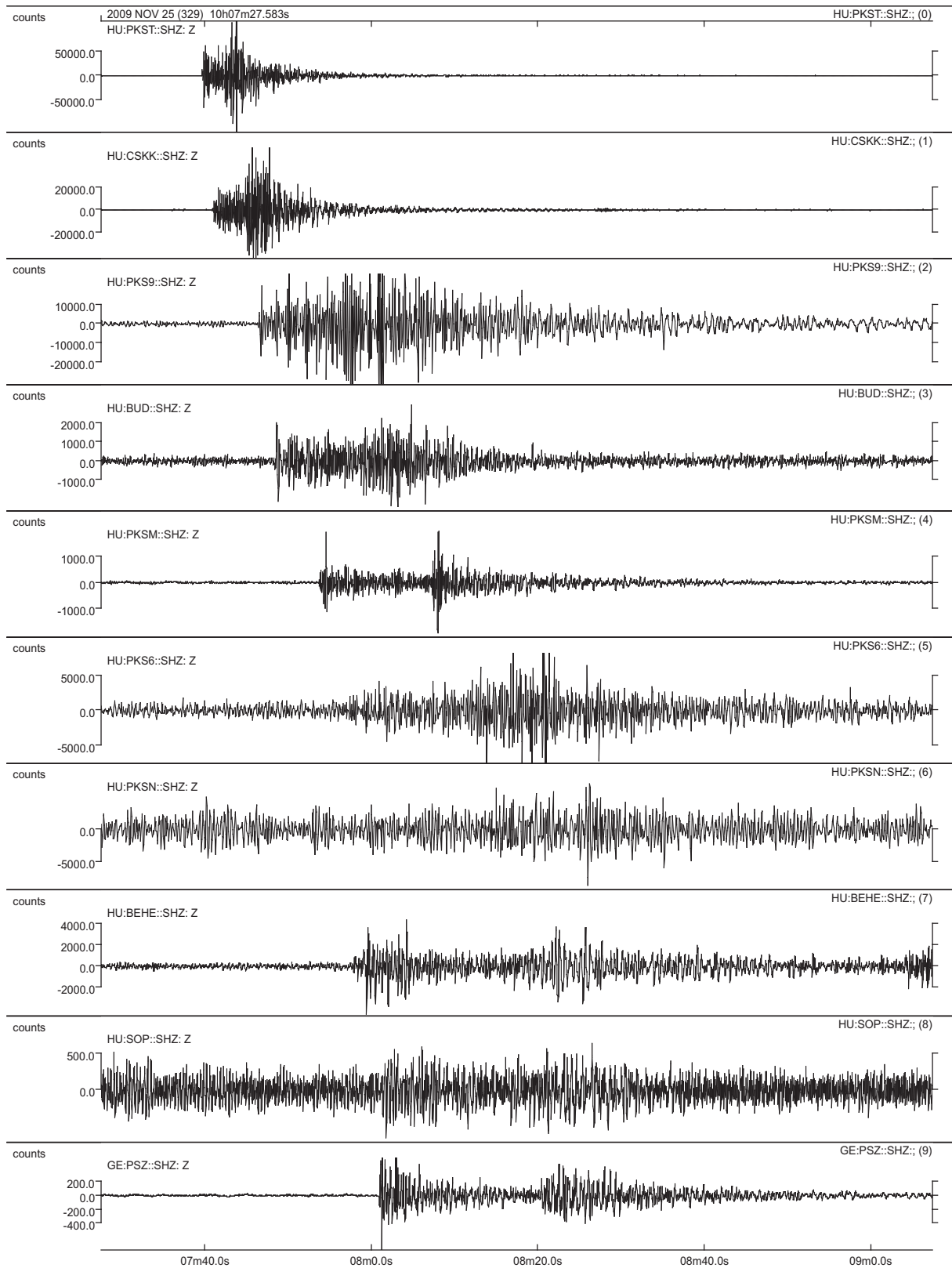
A rengés intenzitás eloszlását a 4.2. táblázat tartalmazza és a 4.4. ábra mutatja.

DISCUSSION

On November 25th morning, a small magnitude earthquake (2.8 M_L) was reported from Berhida. The shock was felt (EMS 3-4) only at a small area of about 100 km².

Seismograms of the event are shown in Figure 4.3.

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



4.3. ábra A 2009. november 25-i, berhidai földrengés (10:07 UTC) szeizmogramjai

Figure 4.3. Seismograms of the Berhida earthquake 25th November 2009 (10:07 UTC)

4.2. Táblázat

A 2009. november 25-i, berhidai földrengés (10:07 UTC) intenzitás eloszlása

Table 4.2.

Intensity distribution of the Berhida earthquake 25th November 2009 (10:07 UTC)

Helység / Location		Koordináta Coordinates		I Intenzitás Intensity	R Rel. megbízhatóság Rel. reliability	N Jelentések száma No. of reports
		Szélesség Latitude (N)	Hosszúság Longitude (E)			
1	Bakonykúti	47.245	18.203	1.0	0%	1
2	Balatonfőkajár	47.019	18.218	1.0	0%	2
3	Balatonkenese	47.036	18.109	1.0	0%	1
4	Berhida	47.113	18.134	3.5	38%	1
5	Csajág	47.044	18.188	1.0	0%	1
6	Csór	47.203	18.262	1.0	0%	2
7	Füle	47.052	18.253	1.0	0%	2
8	Hajmáskér	47.146	18.023	1.0	0%	1
9	Iszkaszentgyörgy	47.242	18.304	1.0	0%	2
10	Királyszentistván	47.109	18.044	1.0	0%	1
11	Kőszárhegy	47.093	18.348	1.0	0%	1
12	Küngös	47.066	18.177	3.5	38%	1
13	Nádasladány	47.137	18.248	3.5	40%	1
14	Ősi	47.141	18.188	1.0	0%	1
15	Öskü	47.162	18.072	1.0	0%	2
16	Pétfürdő	47.165	18.126	3.5	42%	1
17	Polgárdi	47.059	18.304	1.0	0%	3
18	Sárszentmihály	47.155	18.339	3.5	36%	2
19	Szabadbattyán	47.121	18.372	1.0	0%	1
20	Székesfehérvár	47.196	18.423	1.0	0%	1
21	Várpalota	47.199	18.145	1.0	0%	1

HIVATKOZÁSOK / REFERENCES

- Grünthal, G. (editor), 1998. European Macroseismic Scale 1998. Conseil de L'Europe, Luxembourg, 1998. pp. 99.
- Lee, W.H.K. and J.C. Lahr, 1975. HYPO71 (Revised): A computer program for determining hypocenter, magnitude, and first motion pattern of local earthquakes. U. S. Geological Survey Open-file report 75-311.
- Mónus, P., 1995. Travel time curves and crustal velocity model for the Pannonian basin. MTA GGKI Technical report
- Reasenber, P.A. and D. Oppenheimer, 1985. FPFIT, FPLOT and FPPAGE: Fortan computer programs for calculating and displaying earthquake fault-plane solutions, USGS Open File Report No. 85-739.
- Tóth, L. and P. Mónus, 1997. The micro-seismic monitoring network of the Paks NPP, in: Seismic Safety of the Paks Nuclear Power Plant, Akadémiai Kiadó, Budapest, 1997, pp. 113-121.
- Tóth, L., P. Mónus, T. Zsíros and M. Kiszely, 2002a. A Pannon-medence szeizmicitása, Földtani Közlöny 132/különszám, 327-337
- Tóth, L., P. Mónus, T. Zsíros and M. Kiszely, 2002b. Seismicity in the Pannonian Region - earthquake data, EGU Stephan Mueller Special Publication Series, 3, 9-28
- Tóth L., Mónus P., Bus Z., Győri E., 2008. Seismicity of the Pannonian Basin, In: E.S. Husebye (ed.), Earthquake Monitoring and Seismic Hazard Mitigation in Balkan Countries, Springer Verlag, NATO ARW Series, Vol. 81, p. 97-108.
- Zsíros, T., P. Mónus and L. Tóth, 1990. Computer estimation of intensities; the 1985 Berhida, Hungary, earthquake, PAGEOPH, 132, 533-543.
- Zsíros, T., 1994. Macroseismic observations in Hungary (1989-1993), Seismological Observatory, Geodetic and Geophysical Research Institute, Budapest, 1994. pp. 44.

A MELLÉKLET

EURÓPAI MAKROSZEIZMIKUS SKÁLA (EMS)

1 ☞ **Nem érezhető**

Nem érezhető, még a legkedvezőbb körülmények között sem.

2 ☞ **Alig érezhető**

A rezgést csak egy-egy, elsősorban fekvő ember érzi, különösen magas épületek felsőbb emeletein.

3 ☞ **Gyenge**

A rezgés gyenge, néhány ember érzi, főleg épületen belül. A fekvő emberek lengést vagy gyenge remegést éreznek.

4 ☞ **Széles körben érezhető**

A rezgést épületen belül sokan érzik, a szabadban kevesen. Néhány ember felébred. A rezgés mértéke nem ijesztő. Ablakok, ajtók, edények megcsörrennek, felfüggesztett tárgyak lengenek.

5 ☞ **Erős**

A rezgést épületen belül a legtöbben érzik, a szabadban csak néhányan. Sok alvó ember felébred, néhányan a szabadba menekülnek. Az egész épület remeg, a felfüggesztett tárgyak nagyon lengenek. Tányérok, poharak összekoccannak. A rezgés erős. Felül nehéz tárgyak felborulnak. Ajtók, ablakok kinyílnak vagy bezáródnak.

6 ☞ **Kiseb károkat okozó**

Épületen belül szinte mindenki, szabadban sokan érzik. Épületben tartózkodók közül sokan megijednek, és a szabadba menekülnek. Kiseb tárgyak leesnek. Hagyományos épületek közül sokban keletkezik kisebb kár, hajszálrepedés a vakolatban, kisebb vakolatdarabok lehullanak.

7 ☞ **Károkat okozó**

A legtöbb ember megrémül, és a szabadba menekül. Bútorok elmozdulnak, a polcokról sok tárgy leesik. Sok hagyományos épület szenved mérsékelt sérülést: kisebb repedések keletkeznek a falakban, kémények ledőlnek.

8 ☞ **Súlyos károkat okozó**

Bútorok felborulnak. Sok hagyományos épület megsérül: kémények ledőlnek, a falakban nagy repedések keletkeznek, néhány épület részlegesen összedől.

9 ☞ **Pusztító**

Oszlopok, műemlékek ledőlnek vagy elferdülnek. Sok hagyományos épület részlegesen, néhány teljesen rombadől.

10 ☞ **Nagyon pusztító**

Sok hagyományos épület összedől.

11 ☞ **Elsőpró**

A legtöbb épület összedől.

12 ☞ **Teljesen elsőpró**

Gyakorlatilag minden építmény megsemmisül.

(Részletesen lásd: Grünthal, 1998)

APPENDIX A

EUROPEAN MACROSEISMIC SCALE (EMS)

- 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, 1998)

B MELLÉKLET

A VILÁG JELENTŐS FÖLDRENGÉSEI

2009

Forrás:

*U.S. Geological Survey
National Earthquake Information Center
(USGS - NEIC)*

APPENDIX B

SIGNIFICANT EARTHQUAKES OF THE WORLD

2009

Source:

*U.S. Geological Survey
National Earthquake Information Center
(USGS - NEIC)*

Halálos áldozatot követelő földrengések a világon 2009-ben

Deaths from Earthquakes in 2009

Dátum Date	Ország, terület Region	Magnitúdó Magnitude	Áldozatok száma Number killed
2009 01 03	North Coast of Papua, Indonesia	7.7	5
2009 01 03	North Coast of Papua, Indonesia	7.7	5
2009 01 04	Southern Greece	4.3	1
2009 01 04	Southern Greece	4.3	1
2009 01 08	Costa Rica	6.1	40
2009 01 08	Costa Rica	6.1	40
2009 04 06	Central Italy	6.3	295
2009 04 06	Central Italy	6.3	295
2009 04 07	Central Italy	5.5	1
2009 04 07	Central Italy	5.5	1
2009 04 16	Hindu Kush region, Afghanistan	5.4	19
2009 04 16	Hindu Kush region, Afghanistan	5.4	19
2009 05 28	Offshore Honduras	7.3	7
2009 06 13	Eastern Kazakhstan	5.4	1
2009 07 09	Yunnan, China	5.7	1
2009 08 08	Sichuan-Chongqing border region, China	3.7	2
2009 08 10	Near the south coast of Honshu, Japan	6.1	1
2009 09 02	Java, Indonesia	7.0	81
2009 09 21	Bhutan	6.1	11
2009 09 29	Samoa Islands region	8.1	192
2009 09 30	Southern Sumatra, Indonesia	7.5	1117
2009 10 22	Hindu Kush region, Afghanistan	6.2	5
2009 11 08	Sumbawa region, Indonesia	6.6	2
2009 12 06	South Africa	3.5	2
2009 12 08	Malawi	5.9	1
2009 12 19	Malawi	6.0	3
Összesen / Total			1.787

A 7.0 vagy annál nagyobb magnitúdójú földrengések a világon 2009-ben

Earthquakes of magnitude 7.0 and greater in 2009

	Év Year	Hónap Month	Nap Day	Idő Time (UTC)	Szélesség Latitude	Hosszúság Longitude	Mélység Depth (km)	Magnitúdó Magnitude	Ország, terület Region
1.	2009	01	03	19:43:50.6	-0.414	132.885	17	7.7	Indonesia
2.	2009	01	03	22:33:40.2	-0.691	133.305	23	7.4	Indonesia
3.	2009	01	15	17:49:39.0	46.857	155.154	36	7.4	Kuril Islands
4.	2009	02	11	17:34:50.8	3.884	126.397	22	7.2	Indonesia
5.	2009	02	18	21:53:45.1	-27.424	-176.330	25	7.0	Kermadec Islands region
6.	2009	03	19	18:17:40.9	-23.046	-174.659	34	7.6	Tonga Region
7.	2009	05	28	08:24:45.0	16.720	-86.233	10	7.3	Honduras
8.	2009	07	15	09:22:29.0	-45.762	166.562	12	7.8	Off West Coast of N.Z.
9.	2009	08	09	10:55:55.6	33.167	137.941	297	7.1	Japan
10.	2009	08	10	19:55:35.6	14.099	92.888	5	7.5	Andaman Islands, India region
11.	2009	09	02	07:55:01.1	-7.782	107.297	46	7.0	Java, Indonesia
12.	2009	09	29	17:48:10.9	-15.489	-172.095	18	8.1	Samoa Islands region
13.	2009	09	30	10:16:09.2	-0.720	99.867	81	7.5	Southern Sumatra, Indonesia
14.	2009	10	07	22:03:15.9	-13.057	166.341	45	7.7	Vanuatu
15.	2009	10	07	22:18:53.5	-12.528	166.367	55	7.8	Santa Cruz Islands
16.	2009	10	07	23:13:48.0	-13.071	166.472	29	7.4	Vanuatu
17.	2009	11	09	10:44:54.4	-17.211	178.411	585	7.3	Fiji

**A 6.5 vagy annál nagyobb magnitúdójú,
és a jelentősebb károkat okozó földrengések a világon 2009-ben**

**Earthquakes of magnitude 6.5 or greater
or ones that caused fatalities, injuries or substantial damage in 2009**

DÁTUM	IDŐ ÓÓ MM SEC	KOORDINÁTA SZÉL LONG	MÉLYS. MAG	ÁLL. SZÁM	RÉGIÓ, TOVÁBBI MAGNITÚDÓK, MEGJEGYZÉSEK
DATE UTC	ORIGIN TIME UTC HR MN SEC	GEOGRAPHIC COORDINATES LAT LONG	DEPTH MAG SD	NO. STA USED	REGION, ADDITIONAL MAGNITUDES AND COMMENTS
JAN 03	19 43 50.6	0.414 S 132.885 E	17 G 7.7	1.3 288	NEAR THE NORTH COAST OF PAPUA, INDONESIA. MW 7.7 (GCMT), 7.6 (UCMT), 7.4 (GS). mb 6.6 (GS). MS 7.5 (GS). ME 7.7 (GS). Mo $3.9 \cdot 10^{20}$ Nm (GCMT), $2.8 \cdot 10^{20}$ Nm (UCMT), $1.4 \cdot 10^{20}$ Nm (GS), $1.2 \cdot 10^{20}$ Nm (PPT). Es $7.2 \cdot 10^{15}$ Nm (GS). At least four people killed at Manokwari and one killed at Sorong. At least 250 people injured, 840 buildings damaged and power outages in western Papua. Felt (VI) at Manokwari and Sorong and (IV) at Nabire and Ransiki. Also felt on Ambon. A tsunami was recorded with the following wave heights (peak-to-trough): 78 cm at Manokwari, 38 cm on Biak and 20 cm at Jayapura, Indonesia; 13.0 cm at Ishigakijima, 10.2 cm at Naha, 30.7 cm at Omaezeki and 30.8 cm at Tosashimizu, Japan; 0.8 cm on Yap, Federated States of Micronesia; 20.0 cm on Saipan, Northern Mariana Islands; 3.7 cm at Malakal, Palau; 5.2 cm on Wake Island.
JAN 03	20 23 20.1	36.419 N 70.743 E	205 D 6.6	0.9 344	HINDU KUSH REGION, AFGHANISTAN. MW 6.6 (GCMT). mb 5.8 (GS). Mo $9.2 \cdot 10^{18}$ Nm (GCMT). Felt (IV) at Baghlan, Charikar and Jabal os Saraj; (III) at Bagrami, Jalalabad, Kabul and Mazar-e Sharif; (II) at Khowst. Also felt at Asadabad, Asmar, Eshkashem, Konduz, Mehtar Lam and Sarowbi. Felt (IV) at Peshawar and (III) at Islamabad and Lahore, Pakistan. Felt (III) at Dushanbe, Tajikistan. Also felt at Khorugh and Uroteppa. Felt (II) at Tashkent, Uzbekistan. Also felt at Termez. Felt at Delhi, Gurgaon and Pathankot, India; Srinagar, Kashmir; Osh, Kyrgyzstan.
JAN 03	22 33 40.2	0.691 S 133.305 E	23 G 7.4	1.0 314	NEAR THE NORTH COAST OF PAPUA, INDONESIA. MW 7.4 (GCMT), 7.3 (UCMT), 7.2 (GS). mb 6.7 (GS). MS 7.4 (GS). ME 7.5 (GS). Mo $9.2 \cdot 10^{19}$ Nm (GS), $1.4 \cdot 10^{20}$ Nm (GCMT), $1.2 \cdot 10^{20}$ Nm (UCMT), $6.0 \cdot 10^{19}$ Nm (PPT). Es $3.5 \cdot 10^{15}$ Nm (GS). Casualties and damage are included with the event at 19:33 UTC. Felt (VII) at Manokwari, (VI) at Sorong, (IV) at Nabire and (III) at Biak.
JAN 04	05 10 33.5	36.729 N 22.281 E	10 G 4.3	0.9 65	SOUTHERN GREECE. MW 3.9 (ATH). mb 4.3 (GS). ML 4.1 (THE). One person killed and one injured by a falling wall at Khora Gaitson. Felt at Kalamata and Sparta.
JAN 08	19 21 35.6	10.165 N 84.197 W	14 G 6.1	0.9 289	COSTA RICA. MW 6.1 (GS), 6.1 (UCMT), 6.1 (GCMT), 6.0 (WCMT). mb 5.7 (GS). MS 6.0 (GS). ME 6.0 (GS). Mo $1.9 \cdot 10^{18}$ Nm (GS), $1.8 \cdot 10^{18}$ Nm (GCMT), $1.5 \cdot 10^{18}$ Nm (UCMT), $1.3 \cdot 10^{18}$ Nm (WCMT), $2.0 \cdot 10^{18}$ Nm (PPT). Es $2.3 \cdot 10^{13}$ Nm (GS). At least 23 people killed, 100 injured and 17 missing in central Costa Rica. Many of the casualties were caused by landslides. A total of 518 houses destroyed or damaged at Barrio Fatima de Heredia, Barrio Santa Cecilia de Aserri, Cinchona, Dulce Nombre de Alajuela, Infiernillo, Leon XIII, Los Guido, Poasito, Rio Cuarto, Sabana Redonda, Santa Rosa de Poas and Vara Blanca. Roads were damaged in the Cinchona and Vara Blanca areas and bridges were destroyed or damaged at Los Angeles, Rio Cuarto de Grecia and Bajos del Toro. Electricity was disrupted in parts of San Jose. Felt (VII) at Naranjo and (VI) at Alajuela, Asuncion, Cinco Esquinas, Escazu, Grecia, Heredia, Llorente, Mercedes, Sabanilla, San Francisco, San Jose, San Josecito, San Juan, San Pablo, San Rafael, San Vicente and Santa Ana. Felt throughout Costa Rica and in southern and central Nicaragua.

- JAN 15 07 27 20.2 22.352 S 170.635 E 27 G 6.7 1.0 253 SOUTHEAST OF THE LOYALTY ISLANDS. MW 6.7 (UCMT), 6.6 (GCMT), 6.4 (GS). mb 5.8 (GS). MS 6.5 (GS). ME 5.9 (GS). Mo 9.6×10^{18} Nm (GCMT), 4.5×10^{18} Nm (GS), 1.4×10^{19} Nm (UCMT), 7.3×10^{18} Nm (PPT). Es 1.7×10^{13} Nm (GS). Felt at Noumea, New Caledonia.
- JAN 15 17 49 39.0 46.857 N 155.154 E 36 G 7.4 0.9 522 EAST OF THE KURIL ISLANDS. MW 7.4 (UCMT), 7.4 (GCMT), 7.3 (GS), 7.4 (WCMT). mb 6.9 (GS). MS 7.5 (GS). ME 7.3 (GS). Mo 1.6×10^{20} Nm (UCMT), 1.5×10^{20} Nm (GCMT), 1.1×10^{20} Nm (GS), 1.6×10^{20} Nm (WCMT), 1.8×10^{20} Nm (PPT). Es 1.8×10^{15} Nm (GS). Felt at Petropavlovsk-Kamchatskiy. Recorded (2 JMA) in eastern and southern Hokkaido. Also recorded (2 JMA) in Aomori, Iwate and Miyagi; (1 JMA) in Akita, Honshu.
- JAN 19 03 35 18.8 22.596 S 170.911 E 12 G 6.6 1.2 182 SOUTHEAST OF THE LOYALTY ISLANDS. MW 6.6 (GCMT), 6.5 (UCMT), 6.4 (GS). mb 5.7 (GS). MS 6.4 (GS). ME 6.2 (GS). Mo 8.6×10^{18} Nm (GCMT), 8.3×10^{18} Nm (UCMT), 4.8×10^{18} Nm (GS). Es 4.3×10^{13} Nm (GS).
- FEB 11 17 34 50.4 3.886 N 126.387 E 20 G 7.2 1.1 432 KEPULAUAN TALAUD, INDONESIA. MW 7.2 (UCMT), 7.1 (GS), 7.1 (GCMT), 7.1 (WCMT). mb 6.6 (GS). MS 7.3 (GS). ME 7.2 (GS). Mo 6.7×10^{19} Nm (UCMT), 5.9×10^{19} Nm (GCMT), 5.4×10^{19} Nm (GS), 5.0×10^{19} Nm (WCMT), 9.1×10^{19} Nm (PPT). Es 1.3×10^{15} Nm (GS). At least 64 people injured and 597 buildings damaged or destroyed in the Kepulauan Talaud. Felt (VI) at Lirung. Felt (V) on Pulau Sangihe and (IV) at Manado, Sulawesi. Felt (III PIVS) at Davao and (II PIVS) at General Santos, Philippines. Also felt at Mati.
- FEB 18 21 53 45.1 27.424 S 176.330 W 25 G 7.0 0.9 353 KERMADEC ISLANDS REGION. MW 7.0 (GCMT), 6.9 (GS), 6.9 (UCMT), 6.9 (WCMT). mb 6.8 (GS). MS 7.2 (GS). ME 7.5 (GS). Mo 3.5×10^{19} Nm (GCMT), 2.8×10^{19} Nm (GS), 2.7×10^{19} Nm (UCMT), 2.5×10^{19} Nm (WCMT), 5.0×10^{19} Nm (PPT). Es 4.3×10^{15} Nm (GS). Felt at Wellington, New Zealand.
- FEB 20 03 48 48.5 34.203 N 73.900 E 12 G 5.5 1.0 220 PAKISTAN. MW 5.5 (GCMT), 5.4 (GS). mb 5.5 (GS). ME 5.2 (GS). Mo 2.4×10^{17} Nm (GCMT), 1.4×10^{17} Nm (GS). Es 1.4×10^{12} Nm (GS). At least 44 people injured and landslides in Kashmir. Some buildings damaged at Balgran, Hattian, Islamabad, Jhelum, Jura, Lahore, Malial, Masarm, Muzaffarabad, Rawalpindi and Uri, Pakistan. Some buildings damaged at Baramulla and Marsar, India. Felt strongly in the Chandigarh-Srinagar area, India.
- MAR 06 10 50 29.4 80.324 N 1.853 W 9 G 6.5 0.9 341 NORTH OF SVALBARD. MW 6.5 (GCMT), 6.4 (GS), 6.4 (UCMT), 6.4 (WCMT). mb 6.6 (GS). MS 6.5 (GS). ME 7.2 (GS). Mo 6.3×10^{18} Nm (GCMT), 5.4×10^{18} Nm (UCMT), 4.8×10^{18} Nm (GS), 5.2×10^{18} Nm (WCMT). Es 1.4×10^{15} Nm (GS).
- MAR 19 18 17 40.4 23.043 S 174.660 W 31 G 7.6 1.0 504 TONGA REGION. MW 7.6 (UCMT), 7.6 (GCMT), 7.6 (WCMT). mb 7.0 (GS). MS 7.6 (GS). ME 7.8 (GS). Mo 3.5×10^{20} Nm (UCMT), 3.4×10^{20} Nm (GCMT), 3.4×10^{20} Nm (WCMT), 3.3×10^{20} Nm (PPT). Es 1.1×10^{16} Nm (GS). Felt (VI) at Nuku'alofa. Felt at Havelu, Neiafu, Pangai and Vaini. Also felt at Suva, Fiji; Auckland, Lower Hutt, Taradale and Wellington, New Zealand; Apia, Samoa. A small tsunami was generated with wave heights (peak-to-trough, in cm.) at the following selected tide stations: 10.4 at Iquique, Chile; 17.3 at Rarotonga, Cook Islands; 5.7 at Suva, Fiji; 27.0 at Santa Cruz, Galapagos Islands; 10.0 at Honolulu, 18.6 at Kahului and 9.4 at Nawiliwili, Hawaii; 20.3 at Nuku Hiva and 14.5 at Hiva Oa, Marquesas Islands; 10.0 at Napier, New Zealand; 8.7 at Niue; 22.8 at Callao, Peru; 10.7 at Port-Vila, Vanuatu.
- MAR 26 04 44 11.6* 22.399 N 85.903 E 10 G 4.1 1.1 17 JHARKHAND, INDIA. mb 4.1 (GS). Five people injured and buildings damaged at Chaibasa. Felt at Bahalda, Itwari, Jamshedpur, Kharsawan, Rajnagar and Saraikela.
- APR 06 01 32 39.0& 42.334 N 13.334 E 9 6.3 488 CENTRAL ITALY. <ROM>. MW 6.3 (UCMT), 6.3 (GCMT), 6.2 (GS), 6.2 (WCMT), 6.2 (RMT), 6.3 (ROM). mb 5.9 (GS). MS 6.2 (GS). ME 5.8 (GS). ML 6.3 (STR), 6.2 (PDG). Mo 3.4×10^{18} Nm (UCMT),

- 3.4*10**18 Nm (GCMT), 2.8*10**18 Nm (GS), 2.9*10**18 Nm (WCMT), 2.3*10**18 Nm (RMT), 3.7*10**18 Nm (ROM). Es 1.3*10**13 Nm (GS). At least 295 people killed, 1,000 injured, 55,000 homeless, 15,000 buildings damaged or destroyed and landslides in the L'Aquila area. Felt (VII) at L'Aquila; (VI) at Corfinio and San Demetrio ne' Vestini; (V) at Avezzano, Chieti, Pescara, Rieti, San Benedetto del Tronto, Sulmona and Teramo; (IV) at Amelia, Ancona, Ascoli Piceno, Castelfrentano, Fiumicino, Fondi, Francavilla al Mare, Frosinone, Guidonia, Isernia, Lanciano, Latina, Macerata, Montesilvano, Naples, Osimo, Pesaro, Rome and Terni. Felt throughout central Italy and as far north as Florence, Milan and Venice and as far south as Bari and Salerno. Also felt in San Marino and at Vienna, Austria; Tirana, Albania; Knin, Croatia; Nuremberg, Germany; San Gwann, Malta; Celje, Slovenia; Zurich, Switzerland and Podgorica, Montenegro.
- APR 07 04 23 33.1 46.049 N 151.548 E 31 G 6.9 0.9 493 KURIL ISLANDS. MW 6.9 (UCMT), 6.9 (GCMT), 6.8 (GS), 6.9 (WCMT). mb 6.5 (GS). MS 6.8 (GS). ME 6.5 (GS). Mo 3.1*10**19 Nm (UCMT), 2.6*10**19 Nm (GCMT), 1.8*10**19 Nm (GS), 2.9*10**19 Nm (WCMT), 3.2*10**19 Nm (PPT). Es 1.4*10**14 Nm (GS). Felt (IV) at Kuril'sk and (II) at Severo-Kuril'sk and Yuzhno-Kuril'sk. Felt at Sapporo, Hokkaido. Recorded (3 JMA) in southeastern Hokkaido. Also recorded (1 JMA) in Aomori, Iwate and Miyagi, Honshu.
- APR 07 17 47 37.0& 42.275 N 13.464 E 15 5.5 376 CENTRAL ITALY. <ROM>. MW 5.5 (GS), 5.5 (UCMT), 5.5 (GCMT), 5.6 (ROM). mb 5.4 (GS). MS 5.4 (GS). ML 5.7 (STR), 5.6 (PDG), 5.3 (LDG). Mo 2.5*10**17 Nm (UCMT), 2.5*10**17 Nm (GCMT), 1.9*10**17 Nm (GS), 2.9*10**17 Nm (ROM). One person was killed and additional damage to buildings in L'Aquila. Felt (VI) at L'Aquila and Manoppello; (V) at Alatri, Camerino, Celano, Penne, Pratola Peligna, Roseto degli Abruzzi, Sambuceto, Sulmona and Teramo; (IV) at Ancona, Ascoli Piceno, Avezzano, Cassino, Chieti, Collevero, Falconara Maritima, Fermo, Francavilla al Mare, Frosinone, Guidonia, Lanciano, Lariano, Latina, Macerata, Mentana, Monterotondo, Montesilvano, Pesaro, Pescara, Rieti, Rome, San Benedetto del Tronto, Sora, Termoli and Terni. Felt throughout central Italy; as far north and northwest as Belluno and Parma and as far southeast as Bari and Lamezia Terme. Also felt along the northern coast of Sicily.
- APR 09 01 46 58.2 27.143 N 70.749 E 44 D 5.2 0.9 202 INDIA-PAKISTAN BORDER REGION. mb 5.2 (GS). At least 6 people injured and many buildings damaged at Jaisalmer, India. Felt at Bhuj, Bikaner, Jaipur, Jodhpur and by people in high-rise buildings at Delhi. Also felt at Kabul, Afghanistan and at Hyderabad and Sukkur, Pakistan.
- APR 16 14 57 06.2 60.203 S 26.858 W 20 G 6.7 1.0 214 SOUTH SANDWICH ISLANDS REGION. MW 6.7 (UCMT), 6.7 (GCMT), 6.6 (GS), 6.7 (WCMT). mb 6.2 (GS). MS 6.8 (GS). ME 6.8 (GS). Mo 8.9*10**18 Nm (GS), 1.2*10**19 Nm (GCMT), 1.6*10**19 Nm (WCMT), 1.3*10**19 Nm (UCMT), 4.6*10**18 Nm (PPT). Es 3.7*10**14 Nm (GS).
- APR 16 21 27 51.3 34.185 N 70.076 E 6 5.4 1.0 237 HINDU KUSH REGION, AFGHANISTAN. mb 5.4 (GS). At least 19 people killed, 51 injured, more than 200 homes destroyed and some livestock killed in Nangarhar. Felt (V) at Jalalabad and (III) at Kabul. Also felt at Fayzabad, Nurestan, Panjab and Zarghun Shahr. Felt at Bhakkar, Chitral, Islamabad and Rawalpindi, Pakistan.
- APR 16 23 42 51.9 34.106 N 70.056 E 4 5.1 0.9 155 HINDU KUSH REGION, AFGHANISTAN. mb 5.1 (GS). Casualties and damage are included with the event at 21:27 UTC. Felt (V) at Jalalabad. Also felt at Kabul and Mazar-e Sharif. Felt at Islamabad and Kohat, Pakistan.
- APR 18 19 17 58.9 46.015 N 151.427 E 35 G 6.6 0.9 459 KURIL ISLANDS. MW 6.6 (GCMT), 6.4 (GS), 6.7 (WCMT), 6.6 (UCMT). mb 6.3 (GS). MS 6.3 (GS). ME 6.3 (GS). Mo 5.9*10**18 Nm (GS), 1.0*10**19 Nm (GCMT), 1.4*10**19 Nm (WCMT), 1.1*10**19 Nm (UCMT), 1.1*10**19 Nm (PPT). Es 5.6*10**13 Nm (GS). Recorded (3 JMA) in southeastern Hokkaido. Also recorded (1 JMA) in Aomori,

Iwate and Miyagi, Honshu.

- MAY 02 01 11 13.7& 34.069 N 118.882 W 14 4.3 162 GREATER LOS ANGELES AREA, CALIFORNIA. <PAS>. mb 4.3 (GS). ML 4.4 (PAS). One person injured in the Los Angeles area. Felt (IV) at Westlake Village; (III) at Agoura Hills, Avalon, Bell, Burbank, Calabasas, Camarillo, Chino Hills, Compton, Culver City, Encino, Garden Grove, Gardena, Hermosa Beach, Inglewood, Malibu, Marina del Rey, Moorpark, Newbury Park, Oak Park, Pacific Palisades, Panorama City, Paramount, Playa del Rey, Reseda, Santa Monica, Sherman Oaks, Simi Valley, Tarzana, Thousand Oaks, Valley Village and Van Nuys; (II) throughout Los Angeles and Orange Counties, in much of Ventura County and in western Riverside and San Bernardino Counties. Felt as far as Lompoc, Palm Springs and San Diego.
- MAY 16 00 53 52.7 31.519 S 178.792 W 55 6.5 0.9 468 KERMADEC ISLANDS REGION. MW 6.5 (GCMT), 6.3 (GS), 6.6 (WCMT), 6.5 (UCMT). mb 6.1 (GS). Mo $7.4 \cdot 10^{18}$ Nm (GCMT), $4.0 \cdot 10^{18}$ Nm (GS), $8.6 \cdot 10^{18}$ Nm (WCMT), $8.3 \cdot 10^{18}$ Nm (UCMT), $1.1 \cdot 10^{19}$ Nm (PPT). Felt at Gisborne, Rotorua and Wellington, New Zealand.
- MAY 19 17 35 00.6 25.292 N 37.744 E 2 G 5.7 0.9 254 WESTERN SAUDI ARABIA. MW 5.7 (GS), 5.7 (GCMT), 5.6 (UCMT). mb 5.7 (GS). MS 5.3 (GS). Mo $4.0 \cdot 10^{17}$ Nm (GS), $3.8 \cdot 10^{17}$ Nm (GCMT), $3.4 \cdot 10^{17}$ Nm (UCMT). At least seven people injured in Al Madinah. Felt at Al `Ula, Al Wajh, Medina, Umm Lajj, Yanbu` al Bahr and in other parts of Al Madinah. Several large ground cracks and landslides were observed in Al Madinah.
- MAY 28 08 24 45.0 16.720 N 86.233 W 10 G 7.3 1.1 468 OFFSHORE HONDURAS. MW 7.3 (GCMT), 7.3 (WCMT), 7.2 (UCMT). mb 6.7 (GS). MS 7.2 (GS). MD 7.2 (SNET). Mo $9.0 \cdot 10^{19}$ Nm (UCMT), $1.2 \cdot 10^{20}$ Nm (GCMT), $1.1 \cdot 10^{20}$ Nm (WCMT), $8.0 \cdot 10^{19}$ Nm (PPT). At least 7 people killed, 40 injured and more than 130 buildings damaged or destroyed in northern Honduras, including the Islas de la Bahia. The central span of a major bridge at El Progreso was destroyed. Felt (VII) at El Progreso, Jose Santos Guardiola, La Lima, Omoa, Puerto Cortes and Utila; (VI) at French Harbor, La Ceiba, Roatan, Sambo Creek, San Pedro Sula, Sandy Bay and Tela; (V) at Arizona, Guanaja, Mateo, Santa Rosa de Copan, Siguatepeque, Tocoa and Villanueva. At least 5 buildings destroyed and 25 damaged in Belize. Felt (VI) at Dangriga; (V) at Belize City, Benque Viejo and Punta Gorda; (IV) at Belmopan, San Ignacio and San Pedro. Felt (V) at Colon and (IV) at Antigua Cuscatlan, Mejicanos, San Miguel and San Salvador, El Salvador. Felt (VI) at Livingston and Puerto Barrios; (V) at Villa Canales; (IV) at Antigua Guatemala, Chichicastenango, Chimaltenango, Chiquimula, Coban, Fraijanes, Guatemala, Mixco and Villa Nueva, Guatemala. Felt (III) at Carmen, Chetumal, Merida and Villahermosa; (II) at Cancun and Mexico, Mexico and (II) at Havana, Cuba. Felt throughout Belize, El Salvador and Guatemala and in much of Honduras. Also felt in The Bahamas, Cayman Islands and the Virgin Islands and in parts of Colombia, Costa Rica, Cuba, Jamaica, Mexico, Nicaragua and Panama. Seiches were reported in swimming pools at La Ceiba and Roatan, Honduras and ground cracks and possible liquefaction were observed at Monkey River, Belize.
- MAY 29 06 20 14.6 17.026 S 168.329 E 13 G 5.7 1.1 145 VANUATU. MW 5.7 (GCMT), 5.6 (GS). mb 5.5 (GS). MS 5.5 (GS). Mo $4.4 \cdot 10^{17}$ Nm (GCMT), $3.2 \cdot 10^{17}$ Nm (GS). Ten people injured, several buildings damaged or destroyed, several roads damaged, water utilities disrupted and landslides occurred on Tongoa.
- JUN 02 02 17 03.5 17.757 S 167.949 E 15 G 6.3 0.9 257 VANUATU. MW 6.3 (UCMT), 6.3 (GCMT). mb 5.7 (GS). MS 6.2 (GS). ME 5.7 (GS). Mo $4.1 \cdot 10^{18}$ Nm (UCMT), $4.1 \cdot 10^{18}$ Nm (GCMT), $6.5 \cdot 10^{18}$ Nm (PPT). Es $9.3 \cdot 10^{12}$ Nm (GS). Four people injured, some buildings damaged, utilities disrupted and landslides occurred on Tongoa. Felt (III) at Port-Vila. Also felt at Lakatoro, Luganville and Norsup.
- JUN 13 17 17 38.2 44.724 N 78.864 E 15 5.4 0.7 399 EASTERN KAZAKHSTAN. MW 5.4 (UCMT), 5.4 (GCMT), 5.3 (GS). mb 5.8

- (GS). MS 5.1 (GS). Mo $1.8 \cdot 10^{17}$ Nm (GCMT), $1.7 \cdot 10^{17}$ Nm (UCMT), $1.3 \cdot 10^{17}$ Nm (GS). One person died of a heart attack and several buildings damaged (VII) at Tekeli. Felt (III) at Almaty. Also felt at Druzhba and Ushtobe. Felt at Yining, China.
- JUN 23 14 19 22.3 5.157 S 153.782 E 64 G 6.7 1.2 269 NEW IRELAND REGION, PAPUA NEW GUINEA. MW 6.7 (GS), 6.7 (UCMT), 6.7 (GCMT), 6.7 (WCMT). mb 6.3 (GS). ME 6.4 (GS). Mo $1.4 \cdot 10^{19}$ Nm (GS), $1.4 \cdot 10^{19}$ Nm (GCMT), $1.6 \cdot 10^{19}$ Nm (WCMT), $1.5 \cdot 10^{19}$ Nm (UCMT). Es $9.0 \cdot 10^{13}$ Nm (GS). Felt (V) at Kokopo, New Britain. Also felt at Arawa, Bougainville.
- JUL 04 06 49 35.5 9.590 N 78.966 W 38 G 6.0 0.9 358 PANAMA. MW 6.0 (GS), 6.0 (UCMT), 6.0 (GCMT). mb 6.0 (GS). MS 5.5 (GS). ME 6.3 (GS). Mo $1.3 \cdot 10^{18}$ Nm (GCMT), $1.2 \cdot 10^{18}$ Nm (UCMT), $1.1 \cdot 10^{18}$ Nm (GS). Es $7.0 \cdot 10^{13}$ Nm (GS). At least 32 people injured and 10 buildings damaged (V) in the Panama City area. Felt (V) at Alcalediaz, Balboa, Cativa, Cerro Azul, Chame, La Cabima, Las Guías, Margarita, Tocumen and Veracruz; (IV) at Ancon, Anton, Arraijan, Colon, La Chorrera, Las Cumbres, Penonome, Sabanitas and San Miguelito; (III) at Bejuco, Chilibre, Nueva Gorgona, Paraiso, Puerto Pilon, Taboga and Vista Alegre. Also felt at Almirante, Boquete, Caimitillo, Cerro Cama, Chepo, Chitre, Cocle, El Espino, El Porvenir, Gatun, La Herradura, Las Tablas, Maria Chiquita, Nargena, Nuevo Arraijan, Pacora, Portobelo, Puerto Caimito, Remedios, Rio Hato, Rio Rita, Sajalices, San Carlos, Santa Clara, Santiago and Santo Domingo. Felt (II) at Barranquilla, Colombia. Also felt at Cartagena and Santa Marta.
- JUL 09 11 19 16.2 25.632 N 101.095 E 7 G 5.7 1.0 151 YUNNAN, CHINA. MW 5.7 (UCMT), 5.7 (GCMT), 5.6 (GS). mb 5.5 (GS). MS 5.6 (GS). Mo $5.0 \cdot 10^{17}$ Nm (GCMT), $4.0 \cdot 10^{17}$ Nm (UCMT), $3.2 \cdot 10^{17}$ Nm (GS). One person killed, 336 people injured and severe damage in the Yao'an area. Felt (III) at Dali and Kunming. Also felt at Xichang. Felt at Bangkok, Thailand.
- JUL 15 09 22 29.0& 45.762 S 166.562 E 12 G 7.8 434 OFF WEST COAST OF THE SOUTH ISLAND, N.Z. <WEL>. MW 7.8 (GCMT), 7.7 (WCMT), 7.6 (UCMT). mb 6.5 (GS). MS 7.7 (GS). ME 7.3 (GS). ML 7.3 (WEL). Mo $6.0 \cdot 10^{20}$ Nm (GCMT), $4.5 \cdot 10^{20}$ Nm (WCMT), $3.1 \cdot 10^{20}$ Nm (UCMT), $6.0 \cdot 10^{20}$ Nm (PPT). Es $1.7 \cdot 10^{15}$ Nm (GS). A water main was broken at Winton, walls of buildings were cracked at Invercargill and items fell from shelves throughout Southland. Power outages occurred in several parts of the South Island. Several small landslides were also reported. Geodetic measurements indicate the southern tip of the South Island shifted as much as 35 cm to the west-southwest. Felt (VI) at Te Anau and Tuatapere; (V) at Arrowtown, Edendale, Lumsden and Winton; (IV) at Bluff, Gore, Invercargill, Outram, Queenstown and Wanaka. Felt throughout the South Island, the southern part of the North Island and as far away as southeast Australia. A tsunami with wave heights in centimeters (peak-to-trough) was recorded at the following stations: 100 at Jackson Bay; 25 at Charleston; 12 at Dog Island, New Zealand; 14 at Port Kembla and 6 at Spring Bay, Australia.
- AUG 03 17 59 56.1 29.039 N 112.903 W 10 G 6.9 1.3 243 GULF OF CALIFORNIA. MW 6.9 (GCMT), 6.8 (GS), 6.9 (WCMT), 6.8 (UCMT). mb 6.2 (GS). Mo $2.5 \cdot 10^{19}$ Nm (GCMT), $1.8 \cdot 10^{19}$ Nm (GS), $2.6 \cdot 10^{19}$ Nm (WCMT), $2.3 \cdot 10^{19}$ Nm (UCMT), $1.0 \cdot 10^{19}$ Nm (PPT). Felt (IV) at Bahia de Kino and Caborca; (III) at Puerto Penasco; (II) at Hermosillo, San Felipe and Tijuana, Mexico. Also felt at Guerrero Negro, Insurgentes, Maneadero, Puerto Vallarta, Sonoyta, Tijuana and Vicente Guerrero. Felt (III) at Mesa, Phoenix and Tucson; (II) at Chandler, Gilbert, Maricopa, Nogales, Peoria, Scottsdale and Tempe, Arizona. Felt (III) at Carlsbad, Los Angeles and San Diego; (II) at Chula Vista, Costa Mesa, El Centro, El Segundo, Fallbrook, Fontana, Irvine, La Jolla, Long Beach, Manhattan Beach, Newport Beach, Orange, San Clemente, San Jose, Santa Ana, Santa Monica, Santee, and Woodland Hills, California.

- AUG 08 13 26 17.5 29.358 N 105.438 E 10 G 3.7 1.2 24 SICHUAN-CHONGQING BORDER REGION, CHINA. mb 3.7 (GS). At least two people killed, one person slightly injured and 440 houses damaged or destroyed in Rongchang.
- AUG 09 10 55 55.6 33.167 N 137.941 E 297 G 7.1 0.9 447 NEAR THE SOUTH COAST OF HONSHU, JAPAN. MW 7.1 (GS), 7.1 (UCMT), 7.1 (GCMT). mb 6.5 (GS). ME 6.7 (GS). Mo $5.0 \cdot 10^{19}$ Nm (GCMT), $4.9 \cdot 10^{19}$ Nm (GS), $4.8 \cdot 10^{19}$ Nm (UCMT), $5.3 \cdot 10^{19}$ Nm (PPT). Es $2.8 \cdot 10^{14}$ Nm (GS). Felt (V) at Narita; (IV) at Akiruno, Atsugi, Ayase, Chiba, Ebina, Fussa, Hamura, Sagamihara, Tokyo, Yokohama, Yokosuka and Zushi; (III) at Fuchu, Fujisawa, Hachioji, Kawasaki, Musashimurayama, Musashino, Nagoya, Osaka, Tachikawa, Tsukuba, Yamato and Zama; (II) at Misawa. Widely felt throughout central and southern Honshu. Recorded (4 JMA) in Chiba, Fukushima, Ibaraki, Miyagi, Saitama, Tochigi and Tokyo; (3 JMA) in Gumma, Iwate, Kanagawa, Nagano, Niigata, Shizuoka, Yamagata and Yamanashi; (2 JMA) in Aichi, Akita, Aomori, Fukui, Gifu, Hyogo, Ishikawa, Mie, Nara, Osaka, Shiga, Toyama and Wakayama; (1 JMA) in Hiroshima, Kyoto, Okayama, Tottori and Yamaguchi. Recorded (2 JMA) in eastern Hokkaido and (1 JMA) in southern Hokkaido. Recorded (2 JMA) in Kagawa and (1 JMA) in Kochi and Tokushima, Shikoku. Recorded (3 JMA) on Hachijo-jima and (2 JMA) on Aogo-shima, Kozu-shima, Mikura-jima, Miyake-jima, Nii-jima, O-shima, Shikine-jima and To-shima. Recorded (2 JMA) in the Chichijima-retto and Hahajima-retto.
- AUG 10 04 06 31.0 11.612 S 166.090 E 35 G 6.6 1.3 251 SANTA CRUZ ISLANDS. MW 6.6 (GS), 6.6 (UCMT), 6.5 (GCMT). mb 5.8 (GS). MS 6.3 (GS). ME 5.7 (GS). Mo $9.4 \cdot 10^{18}$ Nm (UCMT), $8.6 \cdot 10^{18}$ Nm (GS), $7.5 \cdot 10^{18}$ Nm (GCMT), $1.2 \cdot 10^{19}$ Nm (PPT). Es $8.9 \cdot 10^{12}$ Nm (GS).
- AUG 10 19 55 35.6 14.099 N 92.888 E 5 7.5 1.0 303 ANDAMAN ISLANDS, INDIA REGION. MW 7.5 (UCMT), 7.5 (GCMT), 7.5 (WCMT). mb 6.9 (GS). MS 7.6 (GS). Mo $2.1 \cdot 10^{20}$ Nm (GCMT), $2.5 \cdot 10^{20}$ Nm (WCMT), $2.1 \cdot 10^{20}$ Nm (UCMT), $2.6 \cdot 10^{20}$ Nm (PPT). Felt (V) at Porur; (IV) at Contai, Port Blair and Raurkela; (III) at Alandur, Ambattur, Bhubaneswar, Calcutta, Chengalpattu, Perungudi and Vishakhapatnam; (II) at Chetpet, Jamshedpur, Kharagpur, Punducherry and Singanallur. Felt (III) at Dhaka, Bangladesh; (III) at Kuala Lumpur, Malaysia; (III) at Rangoon, Myanmar; (II) at Chiang Mai, Thailand; (II) at Kathmandu, Nepal; (II) in the Maldives. Felt throughout eastern and southern India. Also felt at Phnom Penh, Cambodia; Qiongsan, China; Ho Chi Minh City, Vietnam; Colombo, Sri Lanka.
- AUG 10 20 07 09.1 34.743 N 138.264 E 40 6.1 0.9 163 NEAR THE SOUTH COAST OF HONSHU, JAPAN. mb 6.1 (GS). One person killed, 123 people injured and 5,192 buildings damaged in the Shizuoka area. One road damaged at Tokyo. Felt (VI) at Shizuoka; (V) at Akiruno and Namazu; (IV) at Ayase, Gotemba, Machida, Matsumoto, Okazaki, Tachikawa, Tokyo, Yamato, Yokohama, Zama and Zushi; (III) at Atsugi, Hachioji, Hamura, Kawasaki, Kyoto, Nagoya, Osaka, Sagamihara and Yokosuka. A tsunami with a wave height of 60 cm was recorded at Yaizu. Recorded (6 JMA) in Shizuoka; (5L JMA) in Nagano; (4 JMA) in Aichi, Chiba, Gifu, Kanagawa, Tokyo and Yamanashi; (3 JMA) in Fukui, Gumma, Hyogo, Ibaraki, Ishikawa, Kyoto, Mie, Nara, Niigata, Osaka, Saitama, Shiga, Tochigi, Tottori and Toyama; (2 JMA) in Fukushima, Miyagi, Okayama and Shimane; (1 JMA) in Hiroshima, Wakayama and Yamagata. Recorded (4 JMA) on Nii-jima; (3 JMA) on Kozu-shima, O-shima and To-shima; (2 JMA) on Mikura-jima and Miyake-jima. Also recorded (1 JMA) in Kagawa, Kochi and Tokushima, Shikoku.
- AUG 12 22 48 51.4 32.821 N 140.395 E 53 G 6.6 0.8 336 IZU ISLANDS, JAPAN REGION. MW 6.6 (GS), 6.6 (UCMT), 6.6 (GCMT), 6.6 (WCMT). mb 6.2 (GS). ME 6.2 (GS). Mo $9.3 \cdot 10^{18}$ Nm (GCMT), $9.1 \cdot 10^{18}$ Nm (GS), $1.1 \cdot 10^{19}$ Nm (WCMT), $1.0 \cdot 10^{19}$ Nm (UCMT), $1.4 \cdot 10^{19}$ Nm (PPT). Es $3.8 \cdot 10^{13}$ Nm (GS). Felt (III) at Tachikawa, Tokyo, Yokosuka, Zama and Zushi. Also felt at Atsugi, Fujisawa, Hamamatsu, Hamura, Ichinoseki, Maebashi, Matsudo, Mitaka, Moriguchi, Musashimurayama, Musashino, Sagamihara, Sendai, Suwa, Uenohara, Urayasu and Yamato. Recorded (5L JMA) on

Hachijo-jima; (4 JMA) on Aogo-shima; (3 JMA) on Kozu-shima, Mikura-jima, Miyake-jima and Nii-jima; (2 JMA) on O-shima and To-shima. Also recorded (3 JMA) in Chiba, Fukushima, Kanagawa and Shizuoka; (2 JMA) in Gumma, Ibaraki, Iwate, Miyagi, Nagano, Saitama, Tochigi and Yamanashi; (1 JMA) in Aomori, Gifu, Hyogo, Niigata, Wakayama and Yamagata, Honshu.

- AUG 16 07 38 21.7 1.479 S 99.490 E 20 G 6.7 1.1 369 KEPULAUAN MENTAWAI REGION, INDONESIA. MW 6.7 (GCMT), 6.5 (GS), 6.7 (WCMT), 6.6 (UCMT). mb 6.5 (GS). MS 6.7 (GS). ME 6.6 (GS). Mo $8.0 \cdot 10^{18}$ Nm (GS), $1.2 \cdot 10^{19}$ Nm (GCMT), $1.2 \cdot 10^{19}$ Nm (WCMT), $1.1 \cdot 10^{19}$ Nm (UCMT). Es $2.1 \cdot 10^{14}$ Nm (GS). Nine people injured in the Padang area. Felt (V) at Padang; (IV) at Pekanbaru and Sibolga; (III) at Padangpanjang and Painan, Sumatra. Also felt at Payakumbuh and at Gunungsitoli, Nias. Felt (III) at Petaling Jaya and (II) at Kuala Lumpur and Johor Bahru, Malaysia. Also felt at Keluang, Melaka, Shah Alam and Sungai Chua. Felt (II) in Singapore. A tsunami with a wave height (peak-to-trough) of 36 cm was recorded at Padang.
- AUG 17 00 05 49.0 23.501 N 123.499 E 20 G 6.7 1.0 345 SOUTHWESTERN RYUKYU ISLANDS, JAPAN. MW 6.7 (GCMT), 6.6 (GS), 6.7 (WCMT), 6.6 (UCMT). mb 6.2 (GS). MS 6.6 (GS). ME 7.1 (GS). Mo $1.3 \cdot 10^{19}$ Nm (GCMT), $1.1 \cdot 10^{19}$ Nm (GS), $1.3 \cdot 10^{19}$ Nm (WCMT), $1.1 \cdot 10^{19}$ Nm (UCMT), $1.3 \cdot 10^{19}$ Nm (PPT). Es $1.1 \cdot 10^{15}$ Nm (GS). Felt at Gushikawa and Ishigaki. Felt (III) at Taipei and (II) at T'ao-yuan, Taiwan. Also felt at Chu-pei, Hsia-yuan-lin, Hsin-chuang, Kang-shan, P'ing-tung, T'ai-nan and Yung-ho. Also felt at Xiamen, China. Recorded (3 JMA) on Iriomote-jima, Ishigaki-jima, Tarama-shima and Yonaguni-jima and (2 JMA) on Miyako-jima. Recorded (4 TAP) in T'ai-tung; (3 TAP) in Chang-hua, Hua-lien, I-lan, Nan-t'ou, T'ai-chung and Yun-lin; (2 TAP) in Chia-i, Hsin-cho, Kao-hsiung, Miao-li, P'eng-hu, P'ing-tung and T'ao-yuan.
- AUG 28 01 51 20.4 7.146 S 123.427 E 642 D 6.9 0.8 350 BANDA SEA. MW 6.9 (GS), 6.9 (UCMT), 6.9 (GCMT), 6.9 (WCMT). mb 6.3 (GS). Mo $2.6 \cdot 10^{19}$ Nm (GCMT), $2.4 \cdot 10^{19}$ Nm (GS), $2.5 \cdot 10^{19}$ Nm (WCMT), $2.4 \cdot 10^{19}$ Nm (UCMT), $8.3 \cdot 10^{18}$ Nm (PPT). Felt (III) at Karangates, Kupang, Makasar and Namlea and (II) on Bali, Indonesia. Also felt at Mataram. Felt at Dili, Timor-Leste.
- AUG 30 14 51 32.8 15.223 S 172.571 W 11 G 6.6 1.0 431 SAMOA ISLANDS REGION. MW 6.6 (UCMT), 6.6 (GCMT), 6.5 (GS). mb 6.4 (GS). MS 6.3 (GS). ME 6.4 (GS). Mo $8.5 \cdot 10^{18}$ Nm (GCMT), $6.3 \cdot 10^{18}$ Nm (GS), $1.1 \cdot 10^{19}$ Nm (UCMT), $8.1 \cdot 10^{18}$ Nm (PPT). Es $8.4 \cdot 10^{13}$ Nm (GS). Felt (III) at Pago Pago, American Samoa. Also felt at Aoloau, Aua, Fagatogo, Leone, Mapusagafou, Tafuna, Vailoatai and Vatia. Felt (III) at Apia, Samoa. Also felt at Lalovi and Vailoa.
- SEP 02 07 55 01.0 7.782 S 107.297 E 46 G 7.0 0.9 312 JAVA, INDONESIA. MW 7.0 (GS), 7.0 (UCMT), 7.0 (GCMT), 6.9 (WCMT). mb 6.8 (GS). MS 7.0 (GS). ME 7.0 (GS). Mo $4.2 \cdot 10^{19}$ Nm (GS), $3.9 \cdot 10^{19}$ Nm (UCMT), $3.6 \cdot 10^{19}$ Nm (GCMT), $3.1 \cdot 10^{19}$ Nm (WCMT), $3.4 \cdot 10^{19}$ Nm (PPT). Es $7.7 \cdot 10^{14}$ Nm (GS). At least 81 people killed, more than 1,297 injured, 25,000 displaced and severe damage in western Java, including at least 30 people killed and 27 missing due to a landslide at Cikangkareng. Felt (VII) at Tasikmalaya; (VI) at Cianjur and Sukabumi; (V) at Bandung, Bekasi, Bogor and Purwakarta; (IV) at Cibinong, Cikarang, Ciputat, Cirebon, Depok, Jakarta, Pekalongan, Serpong, Tangerang and Yogyakarta; (III) at Karangates, Klaten, Semarang, Sleman, Tretes and Wonosari. Felt widely on Java. Felt (IV) at Denpasar and (II) at Kuta, Bali. Also felt at Ubud. Felt at Jambi and Metro, Sumatra and on Sumbawa. Felt (V) in Singapore.
- SEP 07 22 41 37.3 42.660 N 43.443 E 15 G 6.0 0.8 309 GEORGIA (SAK'ART'VELO). MW 6.0 (GCMT), 5.9 (UCMT), 5.8 (GS), 5.9 (WCMT). mb 5.7 (GS). MS 5.8 (GS). ME 5.7 (GS). Mo $7.3 \cdot 10^{17}$ Nm (GS), $1.3 \cdot 10^{18}$ Nm (GCMT), $9.9 \cdot 10^{17}$ Nm (WCMT), $8.6 \cdot 10^{17}$ Nm (UCMT). Es $6.9 \cdot 10^{12}$ Nm (GS). One person injured at Oni. At

least 1,000 houses damaged or destroyed in northwestern Georgia. Felt (IV) at Tbilisi and (III) at Rustavi. Also felt at Bat'umi, Borjomi, K'ut'aisi, Lagodekhi, Marneuli, P'ot'i, Sach'khere, Sokhumi, T'elavi and Zugdidi. Felt (II) at Rostov, Russia. Also felt at Alagirka, Babayurt, Derbent, Il'inka, Makhachkala, Maykop, Nal'chik, Pavlodol'skaya, Pokrovskoye, Sochi, Stavropol' and Vladikavkaz. Felt at Ach'ajur, Dilijan, Gyumri, Noyemberyan, Spitak, Step'anavan and Yerevan, Armenia. Also felt at Ardahan, Kars, Rize and Trabzon, Turkey.

- SEP 12 20 06 24.6 10.705 N 67.920 W 10 G 6.3 1.1 480 OFFSHORE CARABOBO, VENEZUELA. MW 6.3 (UCMT), 6.3 (GCMT), 6.2 (GS), 6.3 (WCMT), 6.2 (CAR). mb 6.3 (GS). MS 6.4 (GS). Mo $4.2 \cdot 10^{18}$ Nm (GCMT), $3.7 \cdot 10^{18}$ Nm (UCMT), $2.8 \cdot 10^{18}$ Nm (GS), $3.5 \cdot 10^{18}$ Nm (WCMT), $5.1 \cdot 10^{18}$ Nm (PPT). At least 18 people injured and 17 buildings damaged north of Moron. Felt (VI) in parts of Carabobo; (V) at Baruta, Caracas, El Limon, Guarenas, La Victoria, Los Dos Caminos, Maiquetia, Maracay, Puerto Cabello, San Antonio de los Altos and Valencia; (IV) at Barquisimeto, Cagua, Chacao, El Cafetal, El Hatillo, Guatire, Los Teques and Petare. Felt in much of northern and central Venezuela. Felt (III) at Willemstad and (II) at Kralendijk, Netherlands Antilles. Also felt at Antriol, Groot Piscadera, Hato, Montana Abou, Ronde Klip and Tera Kora. Felt at Oranjestad, Aruba and at Bogota, Bucaramanga, Cartagena, Medellin and Santa Marta, Colombia.
- SEP 18 11 53 48.0 6.513 N 124.715 E 10 G 5.7 1.1 88 MINDANAO, PHILIPPINES. MW 5.7 (UCMT), 5.7 (GCMT). mb 5.4 (GS). MS 5.2 (GS). Mo $4.2 \cdot 10^{17}$ Nm (GCMT), $4.1 \cdot 10^{17}$ Nm (UCMT). At least 91 people injured and 76 buildings damaged in South Cotabato and Sultan Kudarat. Felt (IV PIVS) at Isulan, Koronadal, Polomolok and Tacurong; (III PIVS) at Cotabato, Davao, Digos, General Santos and Kabacan; (II PIVS) at Kidapawan and Matan-ao. Also felt at Banga.
- SEP 18 23 06 57.7 9.138 S 115.593 E 79 5.7 1.1 375 SOUTH OF BALI, INDONESIA. MW 5.7 (GS), 5.7 (UCMT), 5.7 (GCMT). mb 6.0 (GS). Mo $5.3 \cdot 10^{17}$ Nm (GS), $5.2 \cdot 10^{17}$ Nm (UCMT), $5.2 \cdot 10^{17}$ Nm (GCMT). At least seven people injured and several buildings damaged in the Denpasar area. Felt (VI) at Denpasar; (V) at Klungkung; (IV) at Kuta and Ubud; (III) at Tabanan; (II) at Singaraja. Also felt at Karangasem. Felt (IV) at Ampenan and Mataram, Lombok. Felt (III) at Banyuwangi and (II) at Tretes, Java. Felt at Sumbawa, Sumbawa.
- SEP 21 08 53 05.9 27.332 N 91.437 E 14 G 6.1 1.0 259 BHUTAN. MW 6.1 (GS), 6.1 (GCMT), 6.2 (WCMT), 6.1 (UCMT). mb 6.1 (GS). MS 6.1 (GS). ME 5.9 (GS). Mo $2.0 \cdot 10^{18}$ Nm (GCMT), $1.6 \cdot 10^{18}$ Nm (GS), $2.7 \cdot 10^{18}$ Nm (WCMT), $1.9 \cdot 10^{18}$ Nm (UCMT). Es $1.7 \cdot 10^{13}$ Nm (GS). At least eleven people killed and dozens injured in Mongar and Tashigang. Many buildings destroyed and many roads damaged throughout Bhutan. Cracks appeared in buildings at Guwahati, India. Felt (VI) at Tashigang and (IV) at Thimphu, Bhutan. Also felt at Tshongdue. Felt (II) at Calcutta, India. Also felt at Barpeta, Bidhannagar, Dispur, Guwahati, Kalimpong, Mussoorie, Nagaon, Nalbari, North Dum Dum, Patna, Shillong, Silchar, Tezpur and Tura. Felt in northern Bangladesh, at Lhasa, China and at Kathmandu, Nepal.
- SEP 29 17 48 10.9 15.489 S 172.095 W 18 G 8.1 1.0 520 SAMOA ISLANDS REGION. MW 8.1 (GCMT), 8.0 (UCMT). mb 7.1 (GS). MS 8.1 (GS). ME 8.1 (GS). Mo $1.8 \cdot 10^{21}$ Nm (GCMT), $1.2 \cdot 10^{21}$ Nm (UCMT), $3.5 \cdot 10^{21}$ Nm (PPT). Es $2.8 \cdot 10^{16}$ Nm (GS). At least 149 people killed in Samoa, 34 killed in American Samoa and 9 killed, 7 injured and 500 displaced on Niuaotupapu, Tonga. Widespread damage to infrastructure occurred at Pago Pago, American Samoa, in many parts of Samoa and on Niuaotupapu, Tonga. Nearly all of the casualties and damage was caused by large tsunamis, with run up heights of 12 m at Poloa, 7 m at Pago Pago and Tula, American Samoa and 3 m on Niuaotupapu. Felt (V) at Apia, Samoa and (IV) at Ili'ili and Tafuna, American Samoa. Felt in much of American Samoa, Samoa and northern Tonga

and as far away as Wallis and Futuna Islands. The tsunami was recorded with the following wave heights (peak-to-trough) on these selected tide stations: 411 cm at Pago Pago, American Samoa; 140 cm at Apia, Samoa; 111 cm at Rarotonga, Cook Islands; 64 cm in the Chatham Islands, 37 cm at Raoul, 21 cm at Tauranga, 14 cm at Gisborne, 11 cm at Wellington, New Zealand; 28 cm at Nuku'alofa, Tonga; 29 cm at Papeete, French Polynesia; 25 cm at Luganville, Vanuatu; 36 cm at Honolulu, Hawaii; 22 cm at Point Kemblao, Australia; 66 cm at Crescent City and 26 cm at Los Angeles, California; 42 cm at Cabo San Lucas, Mexico; 11 cm at Old Harbor and 4 cm at Seward, Alaska; 36 cm at Ofunato, Japan; 27 cm on Baltra, Ecuador; 73 cm at Antofagasta and 40 cm at Valparaiso, Chile.

- SEP 30 10 16 09.2 0.720 S 99.867 E 81 G 7.5 0.9 498 SOUTHERN SUMATRA, INDONESIA. MW 7.5 (GS), 7.5 (GCMT), 7.6 (WCMT), 7.5 (UCMT). mb 7.1 (GS). ME 7.3 (GS). Mo $2.6 \cdot 10^{20}$ Nm (GCMT), $2.3 \cdot 10^{20}$ Nm (GS), $3.1 \cdot 10^{20}$ Nm (WCMT), $2.6 \cdot 10^{20}$ Nm (UCMT), $1.7 \cdot 10^{20}$ Nm (PPT). Es $2.0 \cdot 10^{15}$ Nm (GS). At least 1,117 people killed, 1,214 injured, 181,665 buildings destroyed or damaged and about 451,000 people displaced in the Padang-Pariaman area. Landslides disrupted power and communications in the area. Felt (VII) at Padang; (VI) at Bukittinggi; (IV) at Bengkulu, Duri, Mukomuko and Sibolga; (III) at Pekanbaru. Also felt (IV) at Gunungsitoli, Nias and (II) at Jakarta, Java. Felt throughout Sumatra and in much of Java. Felt (III) in Singapore and at George Town, Johor Bahru, Kuala Lumpur, Petaling Jaya, Shah Alam and Sungai Chua, Malaysia. Felt in much of Peninsular Malaysia and as far away as Chiang Mai, Thailand. A 27-cm (center-to-peak) local tsunami was recorded at Padang, Sumatra.
- OCT 01 01 52 27.3 2.515 S 101.501 E 10 6.6 1.1 402 SOUTHERN SUMATRA, INDONESIA. MW 6.6 (UCMT), 6.6 (GCMT), 6.5 (GS), 6.6 (WCMT). mb 5.9 (GS). MS 6.7 (GS). Mo $6.4 \cdot 10^{18}$ Nm (GS), $1.0 \cdot 10^{19}$ Nm (GCMT), $9.0 \cdot 10^{18}$ Nm (WCMT), $1.0 \cdot 10^{19}$ Nm (UCMT). Three people killed and dozens of houses collapsed in Kerinci. Damage estimated at 10 million U.S. dollars. Felt (IV) at Jambi, Kapahiang and Padangpanjang and (III) at Bengkulu and Pekanbaru. Also felt at Duri. Felt (II) at Jakarta, Java and in Singapore. Also felt at Kuala Lumpur, Malaysia.
- OCT 04 10 58 00.1 6.740 N 123.378 E 620 G 6.6 1.0 419 MORO GULF, MINDANAO, PHILIPPINES. MW 6.6 (GS), 6.6 (UCMT), 6.6 (GCMT), 6.6 (WCMT). mb 6.4 (GS). ME 6.5 (GS). Mo $1.1 \cdot 10^{19}$ Nm (GS), $1.0 \cdot 10^{19}$ Nm (UCMT), $1.0 \cdot 10^{19}$ Nm (GCMT), $1.0 \cdot 10^{19}$ Nm (WCMT). Es $1.2 \cdot 10^{14}$ Nm (GS). Felt (II PIVS) at General Santos and Padada and (I PIVS) at Davao and Tarragona. Also felt at Zamboanga.
- OCT 07 21 41 13.2 4.079 N 122.371 E 574 D 6.8 1.1 326 CELEBES SEA. MW 6.8 (UCMT), 6.8 (GCMT), 6.7 (GS), 6.7 (WCMT). mb 6.3 (GS). Mo $1.8 \cdot 10^{19}$ Nm (UCMT), $1.7 \cdot 10^{19}$ Nm (GCMT), $1.6 \cdot 10^{19}$ Nm (GS), $1.5 \cdot 10^{19}$ Nm (WCMT).
- OCT 07 22 03 14.4 13.006 S 166.510 E 45 G 7.7 1.3 283 VANUATU. MW 7.6 (GCMT), 7.7 (WCMT), 7.6 (UCMT). mb 6.4 (GS). MS 7.3 (GS). ME 7.3 (GS). Mo $3.2 \cdot 10^{20}$ Nm (GCMT), $4.3 \cdot 10^{20}$ Nm (WCMT), $3.3 \cdot 10^{20}$ Nm (UCMT), $4.5 \cdot 10^{20}$ Nm (PPT). Es $2.1 \cdot 10^{15}$ Nm (GS). Felt at Lakatoro, Luganville, Port-Olry, Port-Vila and Sola. Also felt at Honiara, Solomon Islands. Tsunami information is included with the larger event at 22:18 UTC.
- OCT 07 22 18 51.2 12.517 S 166.382 E 35 G 7.8 1.0 195 SANTA CRUZ ISLANDS. MW 7.8 (UCMT), 7.8 (GCMT). mb 6.4 (GS). MS 7.9 (GS). Mo $6.5 \cdot 10^{20}$ Nm (GCMT), $6.4 \cdot 10^{20}$ Nm (UCMT), $1.3 \cdot 10^{21}$ Nm (PPT). A tsunami with maximum wave heights (peak-to-trough) was recorded at the following selected tide stations: 62 cm at Port-Vila and 20 cm at Luganville, Vanuatu; 14 cm at Honiara, Solomon Islands; 24 cm at Rosslyn Bay, Australia; 6 cm at Suva, Fiji; 8 cm at Apia, Samoa; 14 cm at Pago Pago, American Samoa; 6 cm at Papeete, French Polynesia; 14 cm at Hilo, 10 cm at Honolulu, 38 cm at Kahului, 40 cm at Kawaihae and 16 cm at Nawiliwili, Hawaii; 12 cm in the Midway Islands; 6 cm on Wake Island; 18 cm at Coquimbo and 10 cm at Iquique, Chile; 8 cm at

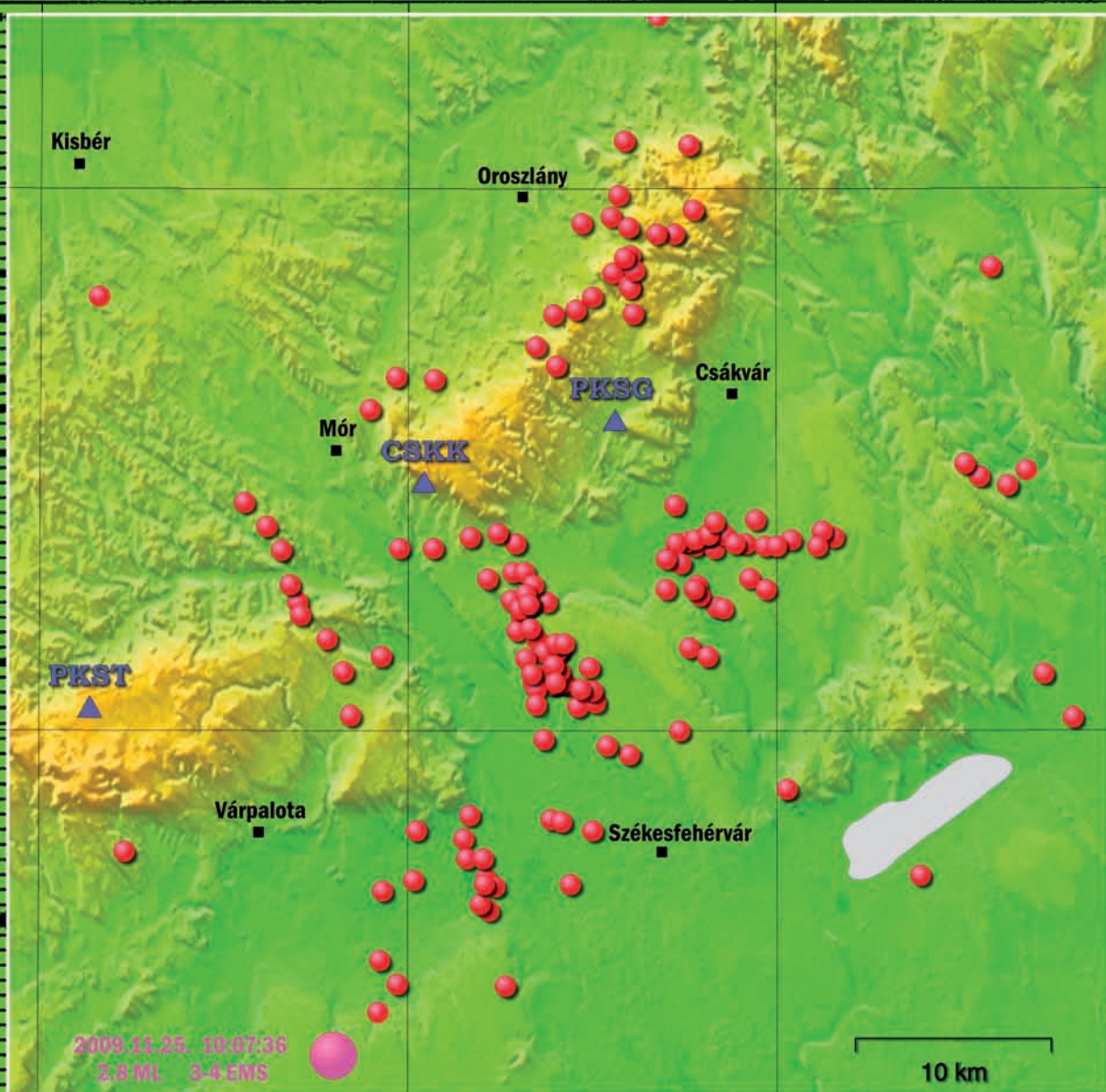
Cabo San Lucas, Mexico; 12 cm at Point Reyes, 30 cm at Santa Barbara and 10 cm at Santa Monica, California; 6 cm at Neah Bay, Washington; 8 cm at Tofino, Canada; 16 cm on Adak and 12 cm on Atka, Alaska.

- OCT 07 23 13 48.1 13.093 S 166.497 E 31 7.4 1.0 314 VANUATU. MW 7.4 (GCMT), 7.4 (WCMT), 7.3 (UCMT). mb 6.4 (GS). MS 7.2 (GS). Mo 1.5×10^{20} Nm (GCMT), 1.5×10^{20} Nm (WCMT), 1.2×10^{20} Nm (UCMT).
- OCT 08 02 12 39.0 11.660 S 166.177 E 35 G 6.6 0.8 218 SANTA CRUZ ISLANDS. MW 6.6 (UCMT). mb 5.8 (GS). Mo 1.0×10^{19} Nm (UCMT).
- OCT 08 08 28 47.9 13.298 S 165.910 E 35 G 6.8 1.5 174 VANUATU. MW 6.8 (UCMT), 6.7 (GCMT). mb 5.7 (GS). Mo 1.7×10^{19} Nm (UCMT), 1.5×10^{19} Nm (GCMT).
- OCT 13 05 37 23.6 52.754 N 166.997 W 24 G 6.5 0.9 485 FOX ISLANDS, ALEUTIAN ISLANDS, ALASKA. MW 6.5 (UCMT), 6.5 (GCMT), 6.2 (GS). mb 6.0 (GS). MS 6.1 (GS). ME 6.3 (GS). Mo 6.8×10^{18} Nm (UCMT), 6.4×10^{18} Nm (GCMT), 2.7×10^{18} Nm (GS), 8.2×10^{18} Nm (PPT). Es 6.7×10^{13} Nm (GS). Felt at Akutan and Unalaska.
- OCT 22 19 51 27.5 36.517 N 70.950 E 186 D 6.2 0.8 395 HINDU KUSH REGION, AFGHANISTAN. MW 6.2 (GS), 6.1 (UCMT), 6.1 (GCMT). mb 6.1 (GS). Mo 2.2×10^{18} Nm (GS), 2.0×10^{18} Nm (GCMT), 1.7×10^{18} Nm (UCMT). Felt (V) at Faizabad; (IV) at Charikar, Jalalabad, Konduz and Kabul; (III) at Baghlan, Bagrami, Eshkashem and Jabal os Saraj. Also felt at Khowst and Mazar-e Sharif. Three people killed by landslides and 2 others died of heart attacks in Mirpur, Pakistan. Felt (IV) at Islamabad, Peshawar and Rawalpindi; (III) at Lahore and Quetta. Also felt at Abbottabad, Chitral and Multan. Felt (IV) at Amritsar, Mohali and Srinagar; (III) at Chadigarh; (II) at Delhi and Gurgaon, India. Felt (III) at Dushanbe, Tajikistan and Tashkent, Uzbekistan. Felt at Shymkent and Taraz, Kazakhstan.
- OCT 24 14 40 43.7 6.133 S 130.385 E 130 G 6.9 0.8 397 BANDA SEA. MW 6.9 (GS), 6.9 (UCMT), 6.9 (GCMT). mb 6.7 (GS). ME 6.8 (GS). Mo 3.0×10^{19} Nm (GS), 2.9×10^{19} Nm (GCMT), 2.8×10^{19} Nm (UCMT), 3.8×10^{19} Nm (PPT). Es 4.0×10^{14} Nm (GS). Felt (V) at Saumlaki; (IV) in the Kepulauan Aru and at Ambon, Fakfak, Sorong and Tual; (III) at Bintuni, Kaimana, Manokwari, Merauke and Nabire; (II) at Serui, Indonesia. Felt (IV) at Nguui; (III) at Darwin, Howard Springs, Humpty Doo-MacMinns Lagoon, Katherine, Kununurra and Palmerston; (II) at Jabiru and Nhulunbuy, Australia. Also felt at Alyangula, Coonawarra, Manangrida, Milingimbi and as far as Alice Springs. Felt (III) at Dili, Timor-Leste.
- OCT 30 07 03 39.1 29.218 N 129.782 E 34 G 6.8 1.0 424 RYUKYU ISLANDS, JAPAN. MW 6.8 (UCMT), 6.8 (GCMT), 6.7 (GS), 6.8 (WCMT). mb 6.3 (GS). MS 6.8 (GS). ME 6.2 (GS). Mo 1.9×10^{19} Nm (GCMT), 1.3×10^{19} Nm (GS), 2.1×10^{19} Nm (WCMT), 2.0×10^{19} Nm (UCMT), 2.2×10^{19} Nm (PPT). Es 4.3×10^{13} Nm (GS). Felt on Okinawa. Recorded (4 JMA) on Akuseki-jima, Amami-oshima and Kikaiga-shima; (3 JMA) on Kuchinoerabu-jima, Nakano-shima, Suwanose-jima, Tanega-shima and Tokuno-shima; (2 JMA) on Iojima, Kuchino-shima, Okinawa, Okino-erabu-shima and Yaku-shima; (1 JMA) on Takara-jima and Yoron-jima. Also recorded (2 JMA) in Kagoshima and Miyazaki and (1 JMA) in Kumamoto and Oita, Kyushu.
- NOV 01 21 07 20.6 25.962 N 100.825 E 25 5.0 0.7 110 YUNNAN, CHINA. mb 5.0 (GS). Twenty-eight people injured and at least 30,000 homes damaged in Binchuan and Xiangyun.
- NOV 03 23 26 52.0& 27.334 N 56.202 E 14 5.1 134 SOUTHERN IRAN. <THR>. mb 5.1 (GS). mbLg 4.9 (TEH). ML 4.9 (THR). At least 269 people injured and several houses damaged at Bandar `Abbas.
- NOV 05 09 32 56.5 23.731 N 120.744 E 18 G 5.6 0.9 217 TAIWAN. MW 5.6 (GS), 5.6 (GCMT). mb 5.6 (GS). MS 5.4 (GS). ML 6.0 (TAP). Mo 2.9×10^{17} Nm (GS), 2.8×10^{17} Nm (GCMT). One person injured at T'ai-ping and minor damage at Nan-t'ou. Felt (V) at T'ai-chung, (IV) at Hsin-chu and T'ao-yuan, (III) at Taipei and (II) at T'ai-nan. Also felt at Chia-i, Chung-ho, Chung-li, Chu-

- pei, Hsin-tien, Hua-lien, Kang-shan, Kao-hsiung, Lu-chou, Miaoli, P'ing-tung, Pu-li, San-ch'ung, San-hsia, Sha-lu, Shu-lin, Tain, Tan-shui, Tou-nan, Yung-ho and Yung-k'ang. Felt at Quanzhou and Xiamen, China. Recorded (7 TAP) in Nan-t'ou; (6 TAP) in Yunlin; (5 TAP) in Chang-hua; (4 TAP) in Hua-lien, P'eng-hu, T'ai-chung and T'ai-nan; (3 TAP) in Chia-i, I-lan, Kao-hsiung, Miaoli and T'ai-tung; (2 TAP) in Hsin-chu, P'ing-tung, T'ai-pei and T'ao-yuan.
- NOV 08 19 41 43.3 8.207 S 118.631 E 18 G 6.6 1.0 305 SUMBAWA REGION, INDONESIA. MW 6.6 (GCMT), 6.5 (GS), 6.7 (WCMT), 6.6 (UCMT). mb 6.3 (GS). MS 6.5 (GS). ME 6.6 (GS). Mo 9.0×10^{18} Nm (UCMT), 7.5×10^{18} Nm (GS), 1.1×10^{19} Nm (GCMT), 1.6×10^{19} Nm (WCMT). Es 1.5×10^{14} Nm (GS). Two people killed at Kolo and hundreds injured in the Bima area. Damage estimated at approximately 2.43 million U.S. dollars. Felt (V) at Bima and Dompu and (IV) at Sumbawa Besar. Felt (III) at Denpasar, Bali. Also felt at Kuta and Ubud. Felt at Labuhanbajo, Flores; Mataram, Lombok; Makassar, Sulawesi.
- NOV 09 10 44 54.7 17.236 S 178.335 E 591 7.3 0.9 431 FIJI. MW 7.3 (GCMT), 7.2 (GS), 7.2 (UCMT), 7.2 (WCMT). mb 6.6 (GS). Mo 9.3×10^{19} Nm (UCMT), 8.8×10^{19} Nm (GS), 1.0×10^{20} Nm (GCMT), 7.4×10^{19} Nm (WCMT). Felt at Nambouwalu.
- NOV 13 03 05 57.2 19.394 S 70.321 W 27 G 6.5 0.8 390 OFFSHORE TARAPACA, CHILE. MW 6.5 (UCMT), 6.5 (GCMT), 6.4 (GS), 6.5 (WCMT). mb 6.2 (GS). MS 6.4 (GS). ME 6.2 (GS). ML 6.4 (GUC). Mo 7.6×10^{18} Nm (GCMT), 5.8×10^{18} Nm (GS), 7.2×10^{18} Nm (WCMT), 7.1×10^{18} Nm (UCMT). Es 4.6×10^{13} Nm (GS). Power outages occurred at Iquique. Felt (V) at Alto Hospicio, Arica, Camina, Huara, Iquique and Pozo Almonte; (IV) at Pica; (III) at Calama and Colchane; (II) at Tocopilla. Felt (V) at Tacna, (III) at Arequipa and (II) at Juliaca, Peru. Also felt at Acari, Ilo, Mollendo, Moquegua, Puno and Tarata. Felt (III) at La Paz and (II) at Cochabamba, Bolivia. Also felt at Oruro and Potosi.
- NOV 17 15 30 45.4 52.131 N 131.397 W 3 6.6 1.1 386 QUEEN CHARLOTTE ISLANDS REGION. MW 6.6 (UCMT), 6.6 (GCMT), 6.4 (GS), 6.6 (WCMT), 6.4 (PGC). mb 6.0 (GS). MS 6.5 (GS). Mo 9.4×10^{18} Nm (GCMT), 8.9×10^{18} Nm (UCMT), 5.7×10^{18} Nm (GS), 1.0×10^{19} Nm (WCMT), 5.9×10^{18} Nm (PGC), 1.2×10^{19} Nm (PPT). Felt throughout the Queen Charlotte Islands, (III) at Kitimat and (II) at Prince Rupert, Smithers and Terrace, British Columbia. Also felt at Abbotsford, Burns Lake, Campbell River, Courtenay, Duncan, Port Hardy, Prince George, Sooke, Vancouver, Vanderhoof, White Rock and Williams Lake. Felt at Chugiak, Hyder, Ketchikan, Metlakatla and Petersburg, Alaska; Lewiston, Idaho; Brookings and Oregon City, Oregon; Bellingham, Maple Valley and Seattle, Washington.
- NOV 24 12 47 15.6 20.708 S 174.035 W 18 G 6.8 0.9 459 TONGA. MW 6.8 (UCMT), 6.7 (GCMT), 6.7 (WCMT). mb 6.4 (GS). MS 6.8 (GS). ME 6.7 (GS). Mo 1.9×10^{19} Nm (UCMT), 1.4×10^{19} Nm (GCMT), 1.4×10^{19} Nm (WCMT), 2.3×10^{19} Nm (PPT). Es 2.8×10^{14} Nm (GS). Felt (III) at Nuku'alofa. Also felt at Pangai and Vaini. Felt at Alofi, Niue.
- DEC 06 21 51 59.8& 26.414 S 27.494 E 2 G 3.5 28 SOUTH AFRICA. <PRE>. ML 3.5 (PRE). Two people killed and 3 injured in a mine near Carletonville.
- DEC 08 03 08 57.2 9.948 S 33.878 E 8 G 5.9 1.0 305 MALAWI. MW 5.9 (GS), 5.9 (UCMT), 5.9 (GCMT), 5.9 (WCMT). mb 5.9 (GS). MS 5.9 (GS). ME 5.3 (GS). Mo 9.8×10^{17} Nm (GCMT), 9.3×10^{17} Nm (UCMT), 7.7×10^{17} Nm (GS), 8.4×10^{17} Nm (WCMT). Es 2.0×10^{12} Nm (GS). One person killed, 15 people injured and about 3,000 buildings damaged or destroyed in the Karonga area. Also felt at Chitipa and Mzuzu. Felt (IV) at Njombe, Tanzania. Also felt at Mbeya.
- DEC 19 13 02 16.5 23.783 N 121.636 E 49 6.4 1.0 230 TAIWAN. MW 6.4 (GS), 6.4 (UCMT), 6.4 (GCMT), 6.4 (GS). Mo 5.9×10^{18} Nm (GS), 5.9×10^{18} Nm (GCMT), 4.8×10^{18} Nm (UCMT), 7.8×10^{18} Nm (PPT). Fourteen people injured in Hualien. Felt throughout Taiwan and on the east coast of China.

DEC 19 23 19 15.6 10.086 S 33.830 E 6 G 6.0 1.0 292 MALAWI. MW 6.0 (GS), 6.0 (UCMT), 6.0 (GCMT). mb 6.0 (GS). MS 6.0 (GS). ME 5.3 (GS). Mo 1.3×10^{18} Nm (GS), 1.1×10^{18} Nm (UCMT), 1.1×10^{18} Nm (GCMT). Es 1.8×10^{12} Nm (GS). Three people killed and at least 200 injured in Karonga. About 1,000 houses destroyed and 2,800 damaged in the series of quakes which began on December 6. Felt at Mzuzu. Also felt at Njombe, Tanzania and Mpika, Zambia.

Compiled by Pamela J. Benfield and NEIC Operations Staff.



Szeizmikus események a Móri-árok környékén 2009-ben
(rengés és robbantás)

Seismic events recorded in the area of Mór graben in 2009
(earthquakes and explosions)