Magyarországi földrengések évkönyve
Hungarian Earthquake Bulletin
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GeoRisk

Földrengéskutató Intézet ◆ Earthquake Research Institute

Magyar Tudományos Akadémia
Geodéziai és Geofizikai Kutatóintézet
Szeizmológiai Főosztály

MTA GGKI

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,
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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

CONTENTS

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 Földrengéskutató 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 Kinemetrics 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 Kinemetrics 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 Kinemetrics 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 Kinemetrics 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 kiszolgálására 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- (talajnyugtalanság) 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 adatához 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	lösz 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 Mórágy	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	mészkő 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 – Kinemetrics SS-1 rövidperiódusú szeizmométer / Kinemetrics SS-1 short period seismometer

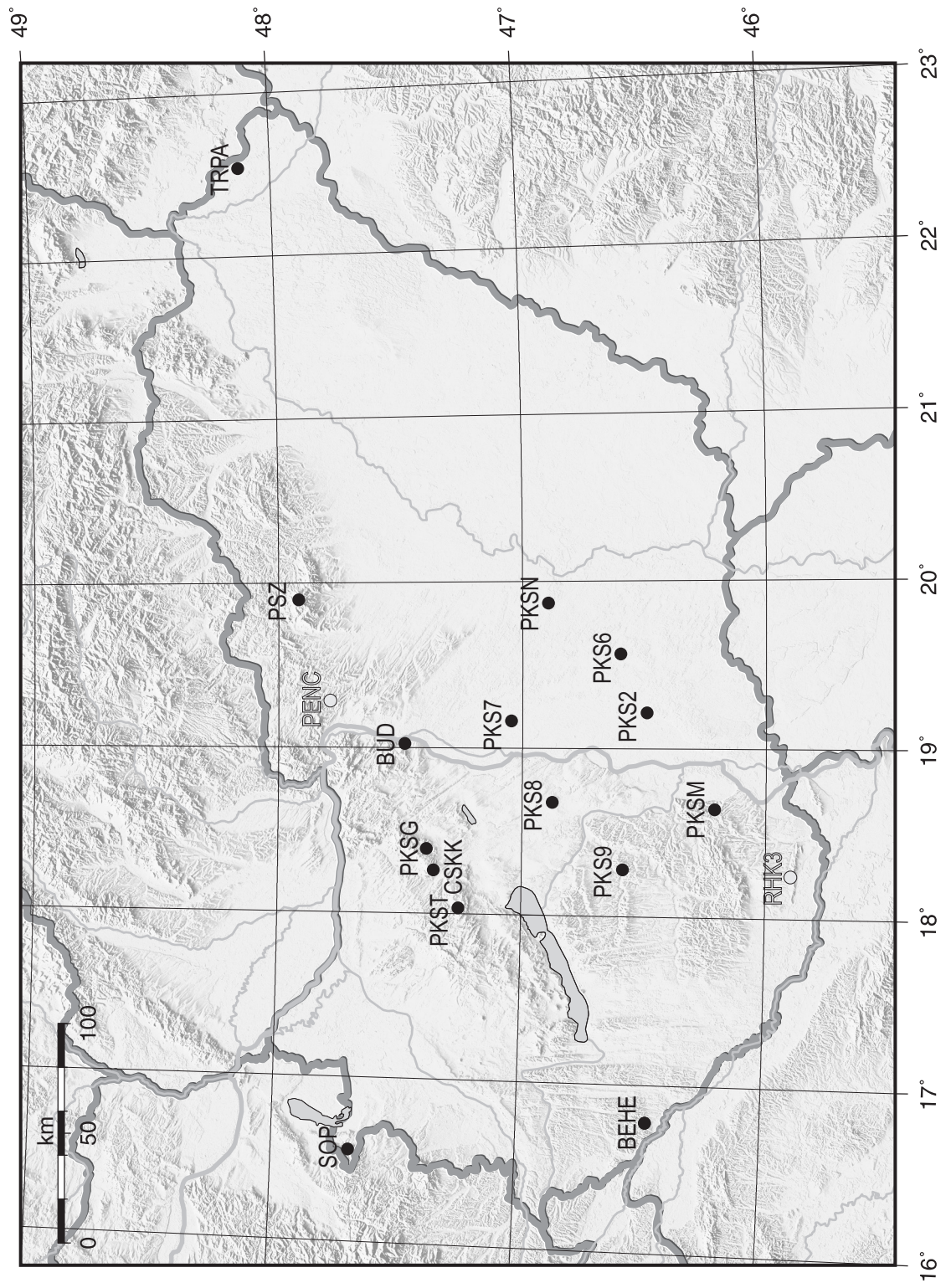
(3) D – digitális / digital; C – folyamatos felvétel / continuous recording; PS-6-24 – Earth Data digitalizáló / Earth Data digitizer
Q-380 – Quanterra adatgyűjtő rendszer / Quanterra data acquisition system;
SeisComP – GEOFON Seismological Communication Processor
MARS-88 – Lennartz adatgyűjtő / Lennartz data acquisition system
K2 – Kinemetrics K2 adatgyűjtő / Kinemetrics 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

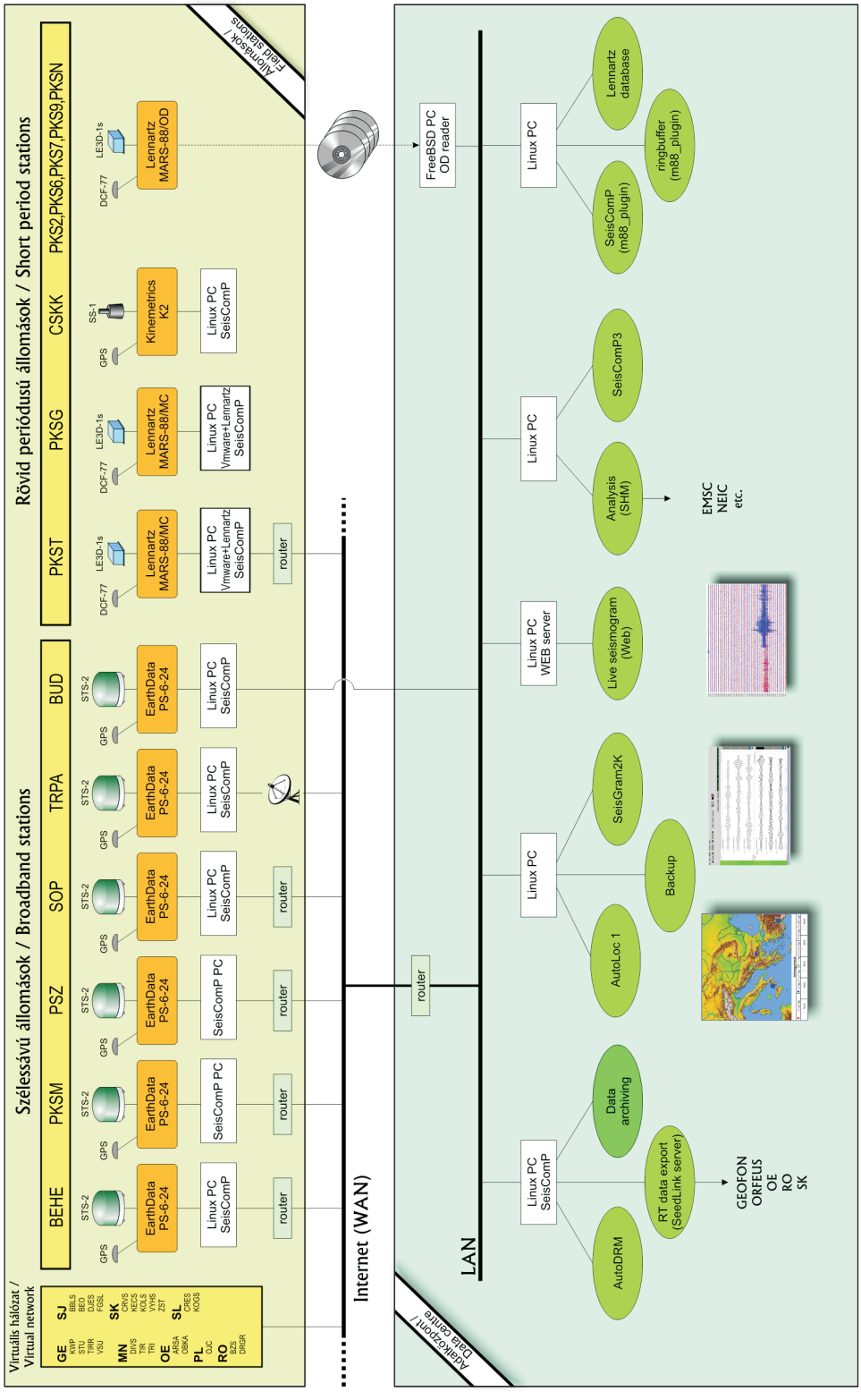
** Működés vége / Off date: 2009/03/18

*** Működés vége / Off date: 2009/03/24



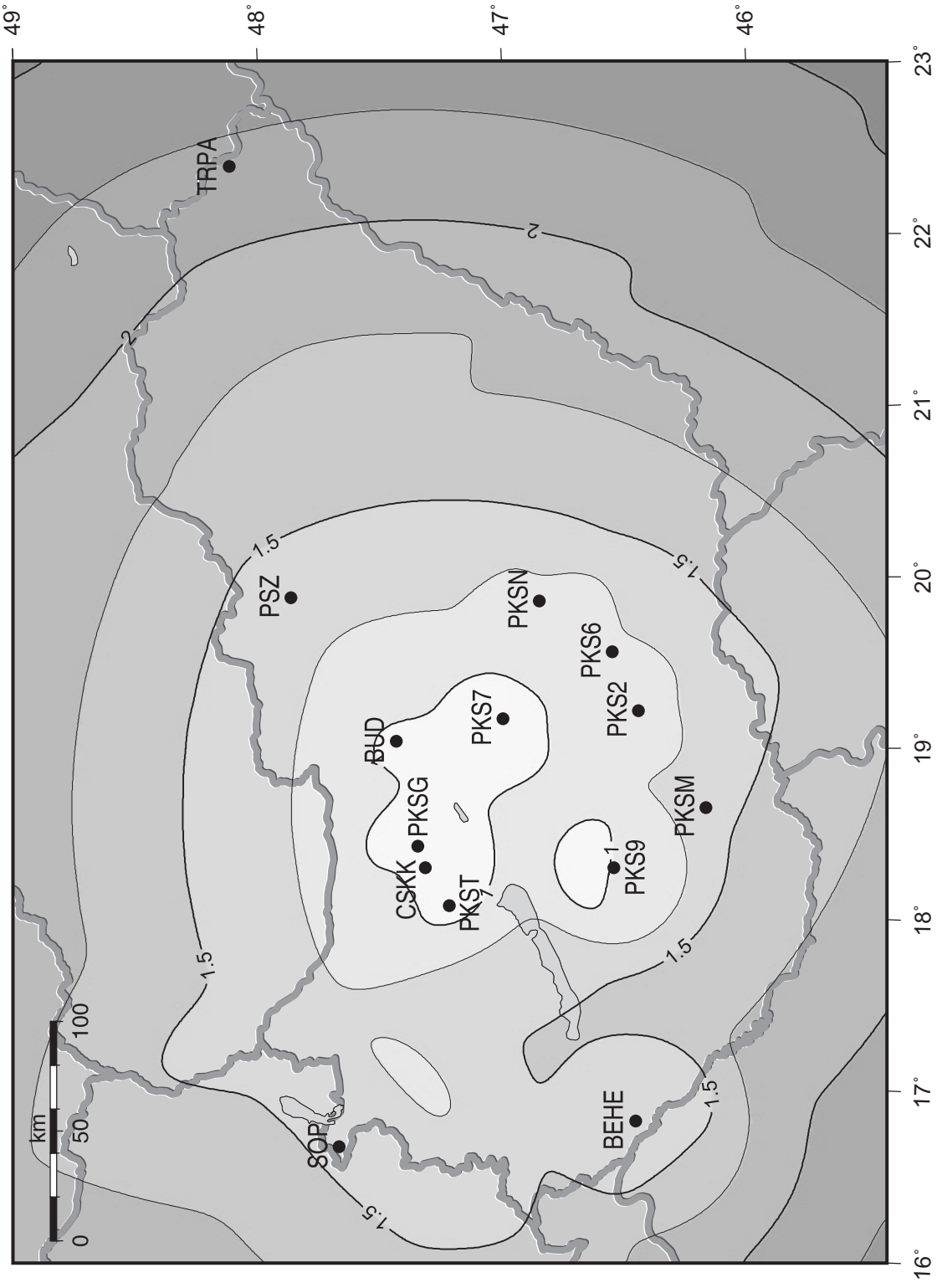
2.1. ábra A magyarországi szeizmológiai állomáshálózat 2009-ben (részletek: 2.1. Táblázat)

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



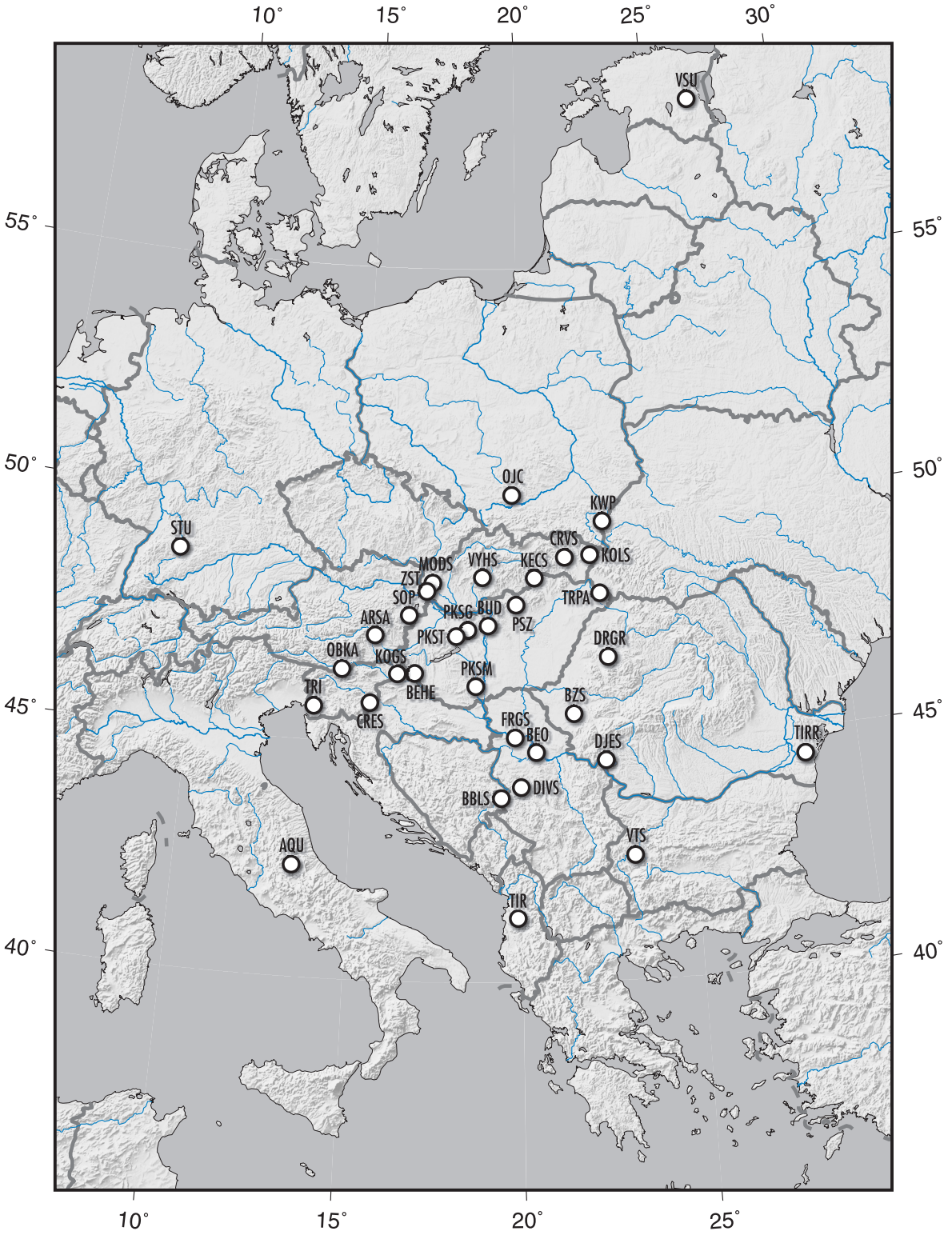
2.2. ábra A magyarországi szeizmológiai hálózat felépítése

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 üzembentartó 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	OE	Osztrák Szeizmológiai Hálózat / Austrian Seismic Network	Ausztria / Austria
OBKA			
OJC	PL	Lengyel Szeizmológiai Hálózat / Polish Seismological Network	Lengyelország / Poland
BZS	RO	Román Szeizmológiai Hálózat / Romanian Seismic Network	Románia / Romania
DRGR			
BBLS	SJ	Szerb Szeizmológiai Hálózat / Serbian Seismological Network	Szerbia / Serbia
BEO			
DJES			
FRGS			
CRVS	SK	Szlovák Nemzeti Szeizmológiai Hálózat / Slovak National Seismic Network	Szlovákia / Slovakia
KECS			
KOLS			
MODS			
VYHS			
ZST			
CRES	SL	Szlovéniai Szeizmológiai Hálózat / Slovenia Seismic Network	Szlovénia / Slovenia
KOGS			

* 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).

Sebesség (v_P) [km/s]	*Mélység [km]*	*Vastagság [km]*	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).

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

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

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	-	Vértesacsa (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	-	Iszkasztgyörgy (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.)

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.)

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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	Tiszabezdéd

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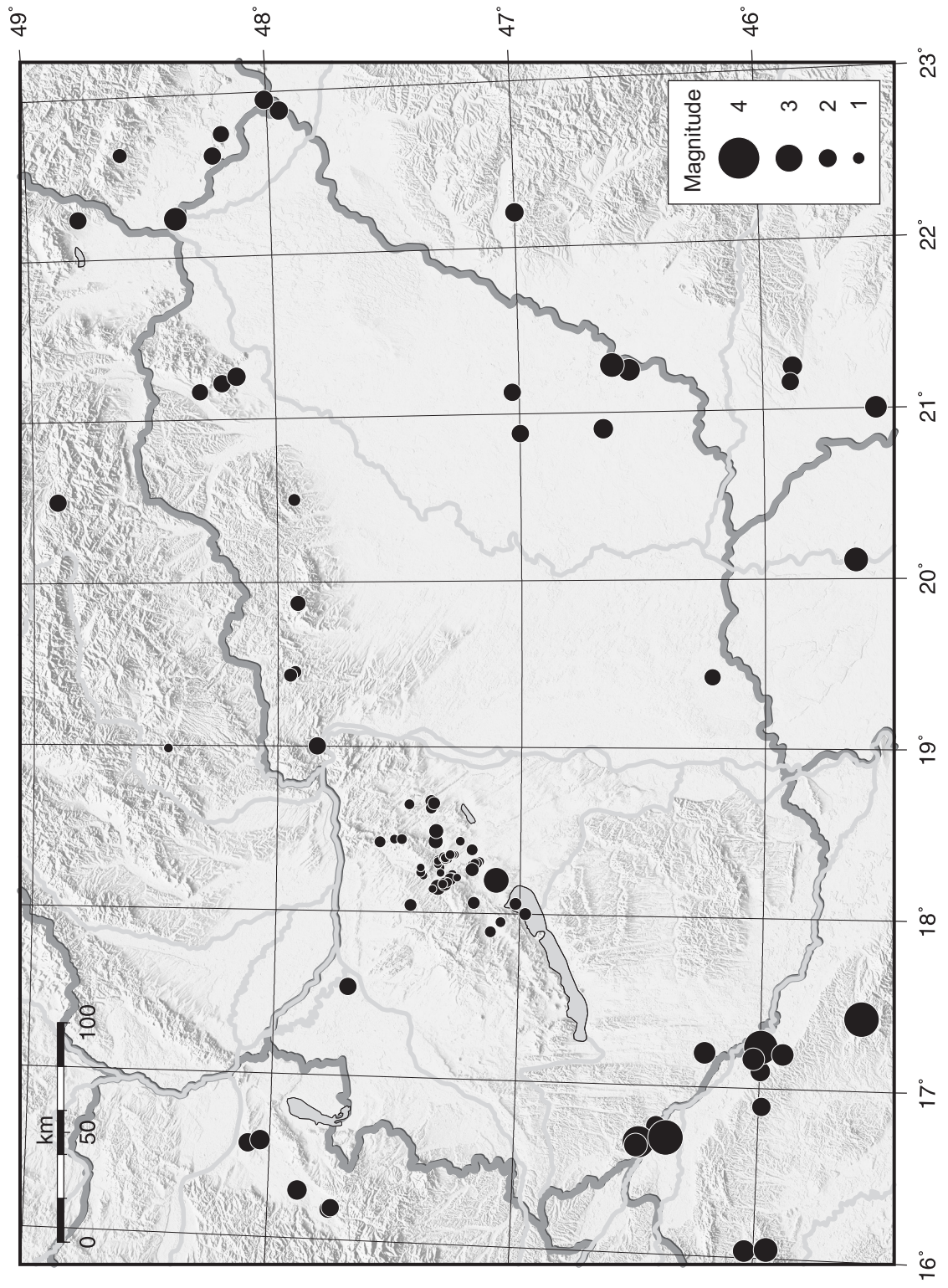
04	7:19:57.3	47.336N	18.472E	0	1.0	-	Lovasberény (expl.)
04	12:10:46.3	47.256N	18.701E	0	0.9	-	Pettend (expl.)
07	10:26:24.7	47.335N	18.500E	0	1.3	-	Lovasberény (expl.)
07	10:36:19.4	47.290N	18.356E	0	1.1	-	Magyaralmás (expl.)
07	11:02:25.5	47.346N	18.458E	0	1.2	-	Lovasberény (expl.)

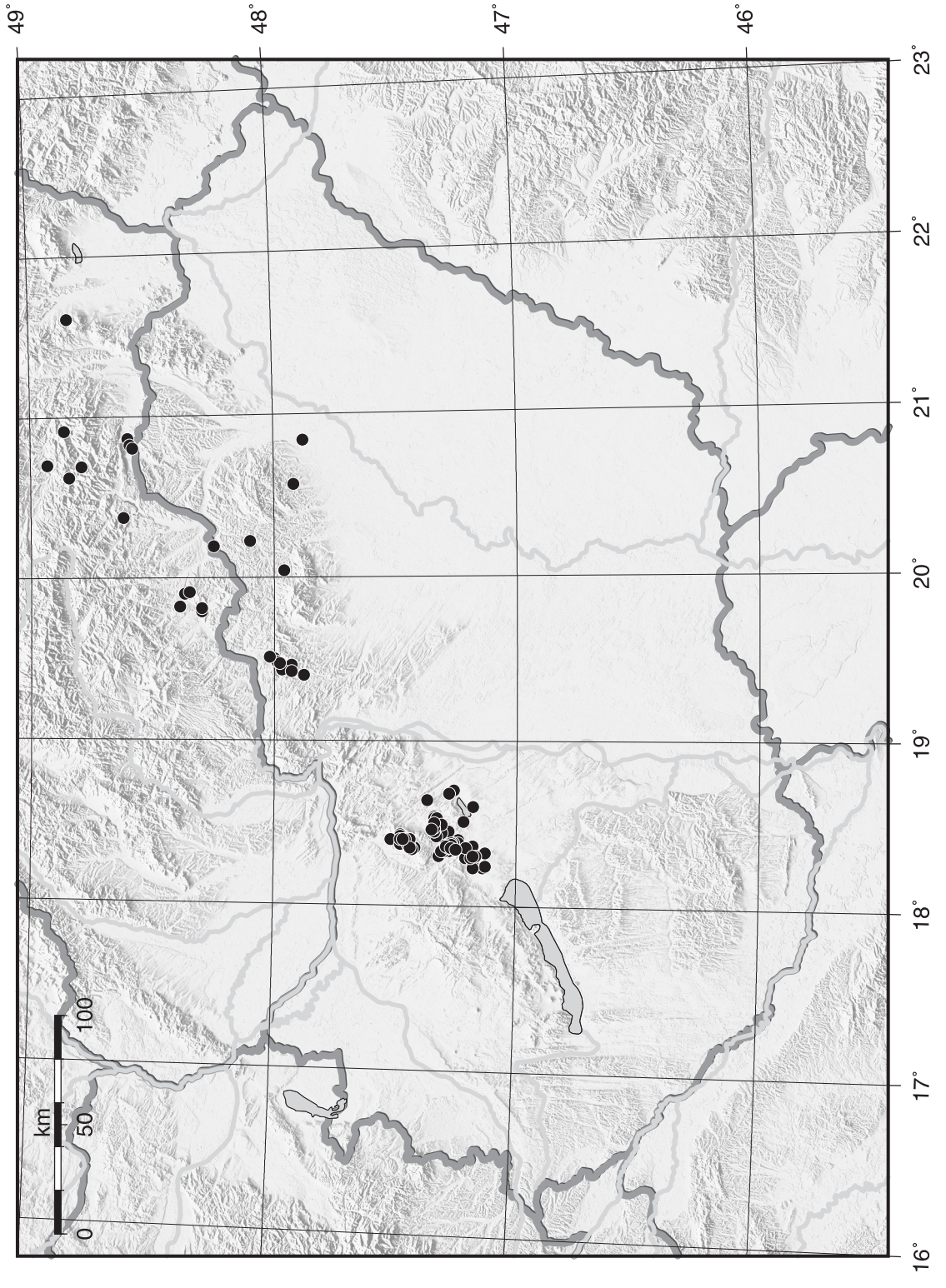
Hypocenter Parameters **Földrengés paraméterek**

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



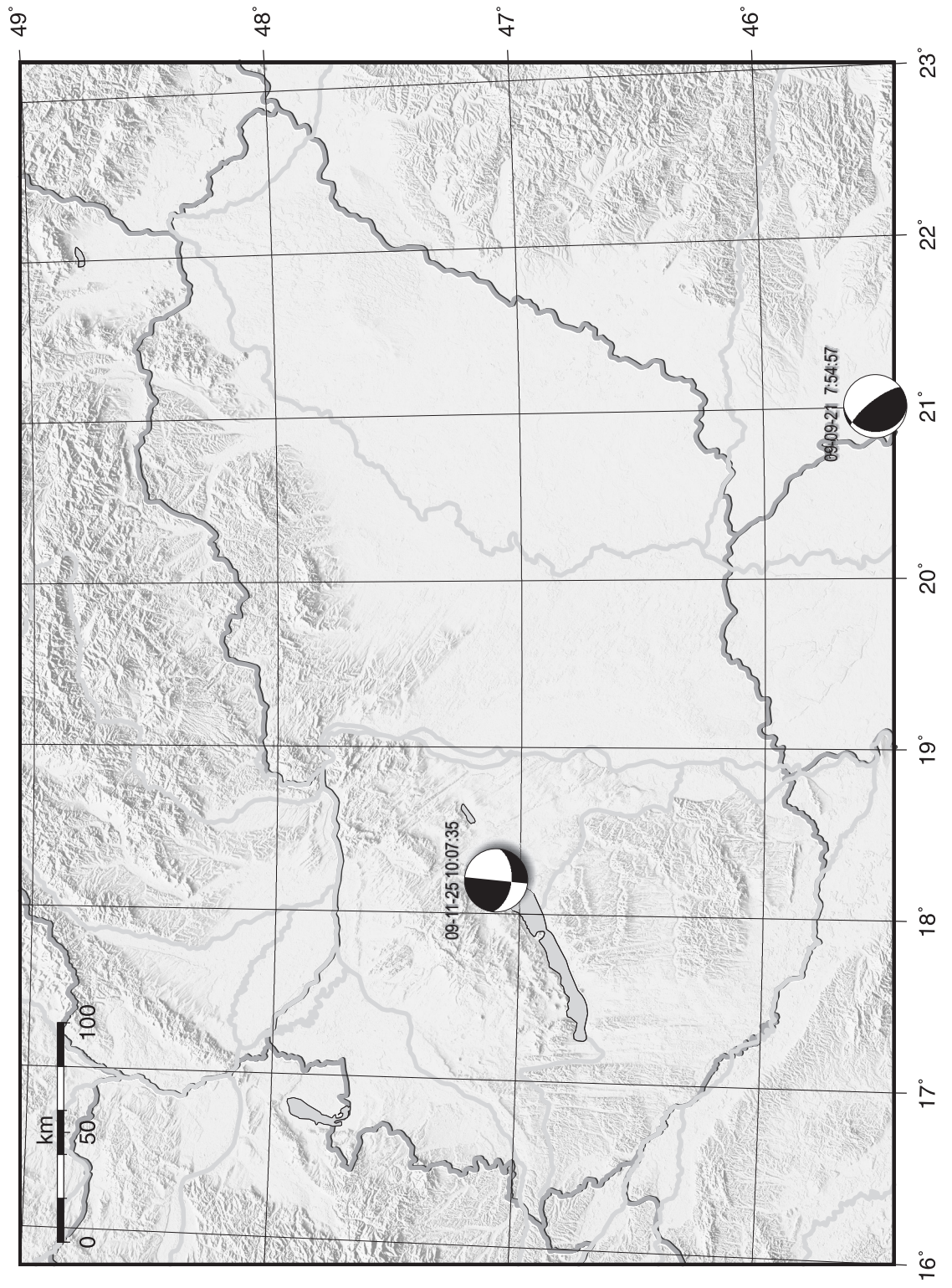
3.1. ábra A 2009-ben regisztrált földrengések epicentrumai

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 epicentrumból 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 (Reasenberg and Oppenheimer, 1985). The results are summarized in Fig. 3.3.

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

```
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
```

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

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
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

```
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:

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
```

		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

```
                 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
```

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: Csákberény
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

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: Sárkeresztes
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: Sárkeresztes
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: Sárkeresztes
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: Sárkeresztes
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

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	ePgD	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

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: Sárkeresztes
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: Vértesacsa
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
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

```
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
```

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
```

```
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
```

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
```

```
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: Csákberény
   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
```

```
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: Csákberény
   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
                 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:
```

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

```
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: Sárkeresztes
   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: Abaújkér
   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:
```

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: Sárkeresztes
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

		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: Sárkeresztes
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.

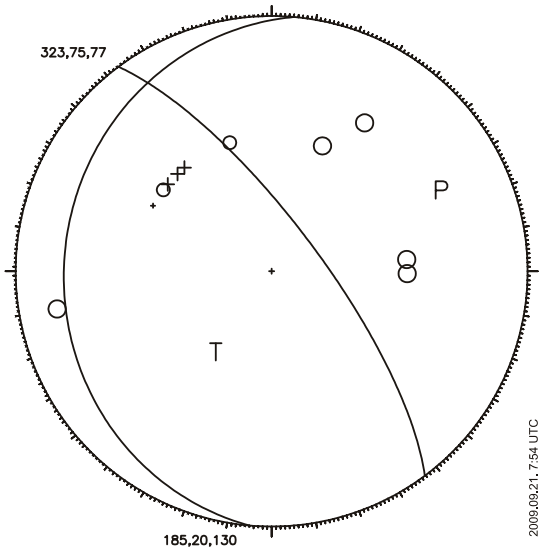
2009-09-18 time: 11:23:50.54 UTC ML= 0.5
lat: 47.262N lon: 18.337E h= 0.0 km
erh= 2.2km erz= 227km
nr= 5 gap=254 rms=0.11
Locality: Sárkeresztes
Comments: probably explosion

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
			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: Mátraszentimre
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

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

```
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
```

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: Tiszabezdéd
   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
```

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

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: Sárkeresztes
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: Vértesacsa
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

```
                  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
```

```
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
                 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
```

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

Földrengés paraméterek

207.

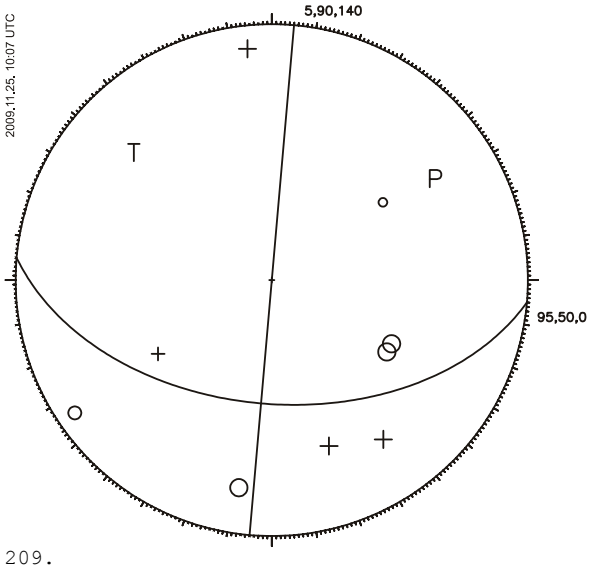
2009-11-25 time: 9:34:37.60 UTC ML= 2.1
lat: 47.954N lon: 22.882E h= 10.0 km
erh= 4.8km erz= 2.4km
nr= 12 gap=125 rms=0.75
Locality: Garbolc
Comments:

sta	dist	azm	phase	hr mn	sec	res
TRPA	32.3	307	ePgD	9:34:	43.40	-0.24
			eSg		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



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

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: Sárkeresztes
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

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: Sárkeresztes
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: Sárkeresztes
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: Alsóörs
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:

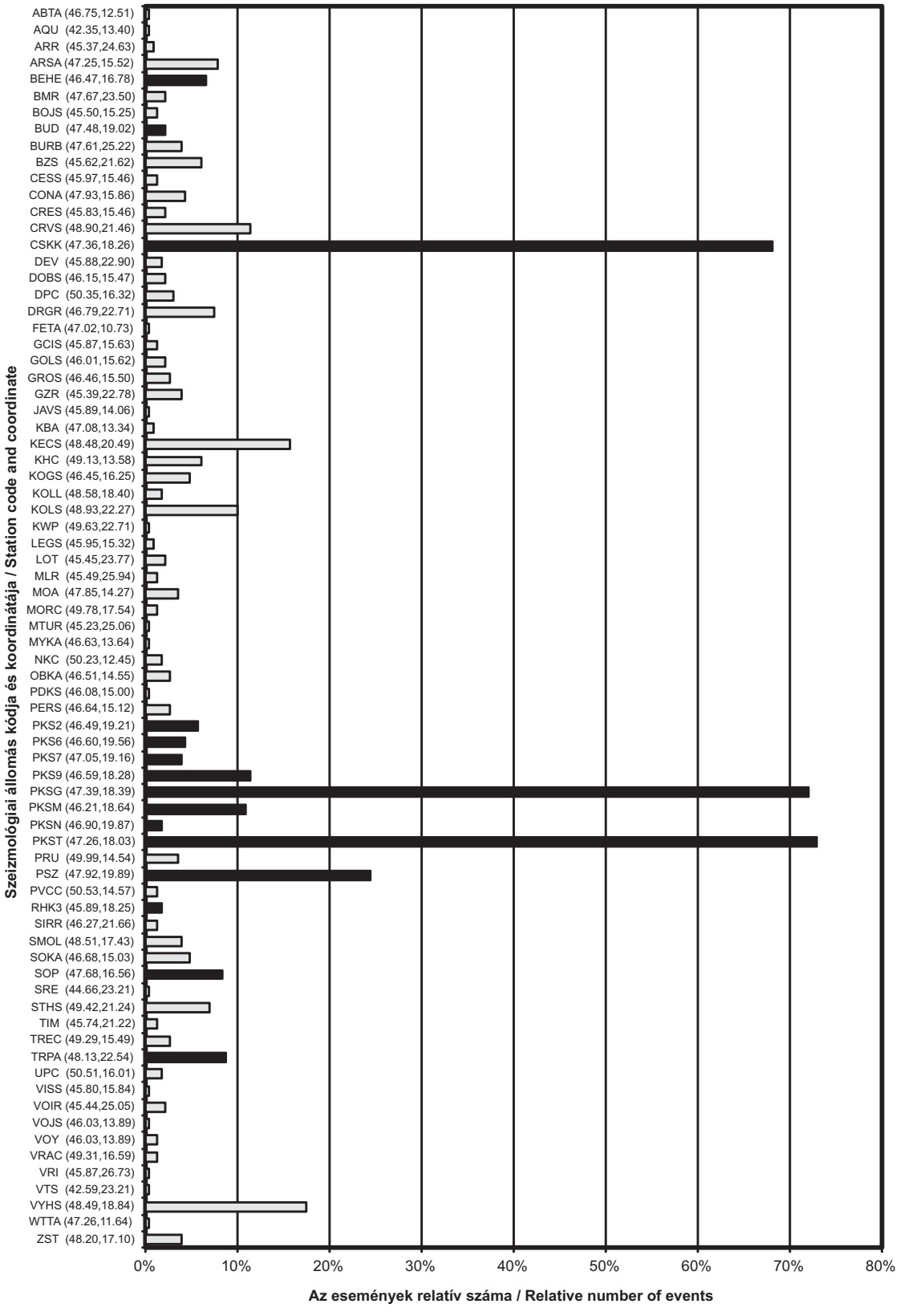
sta	dist	azm	phase	hr mn	sec	res
BEHE	42.2	310	ePgC	3:39:21.60		0.71
			eSg	39:27.20		0.27
KOGS	76.9	289	iPg	3:39:26.80		-0.20
			iSg	39:38.80		1.01
PKS9	92.3	64	ePgC	3:39:29.20		-0.54
			eSg	39:42.30		-0.38
PKSM	111.5	91	ePnC	3:39:33.50		0.68
			eSn	39:47.20		-0.95
PKST	131.3	29	ePn	3:39:35.20		-0.09

```
                 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. - Tiszabezdéd / 5 October 2009 - Tiszabezdéd

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 Tiszabezdéden. A rengés intenzitása 4 EMS fokra becsülhető. A rengés csak nagyon kis területen volt érezhető.

Az esemény szeizmogramja a 4.1. ábrán látható.

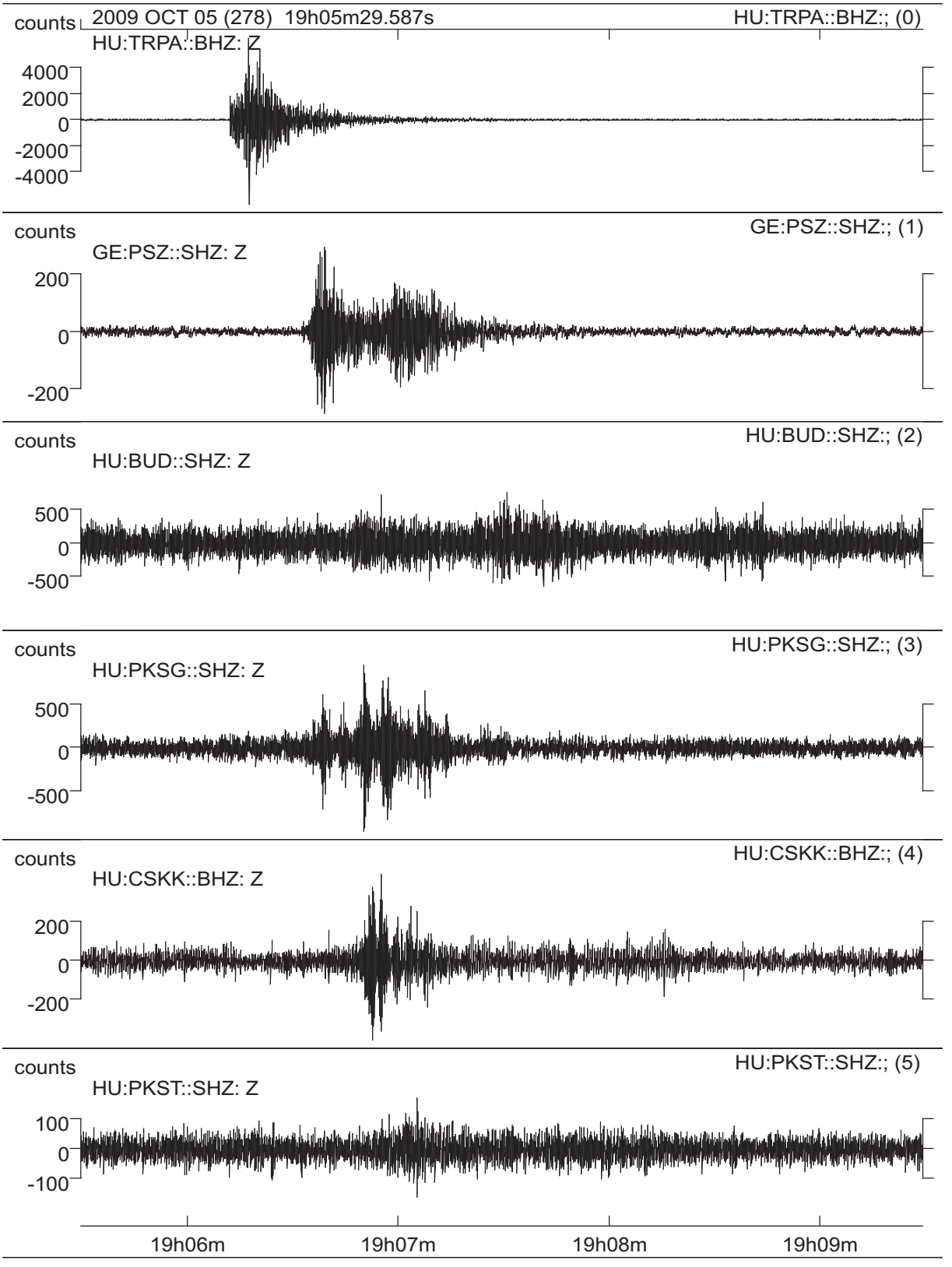
A rengés intenzitás eloszlását a 4.1. táblázat tartalmazza és a 4.2. ábra mutatja.

DISCUSSION

On the evening of October 5th, a 2.6 M_L magnitude earthquake was felt at Tiszabezdéd 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.



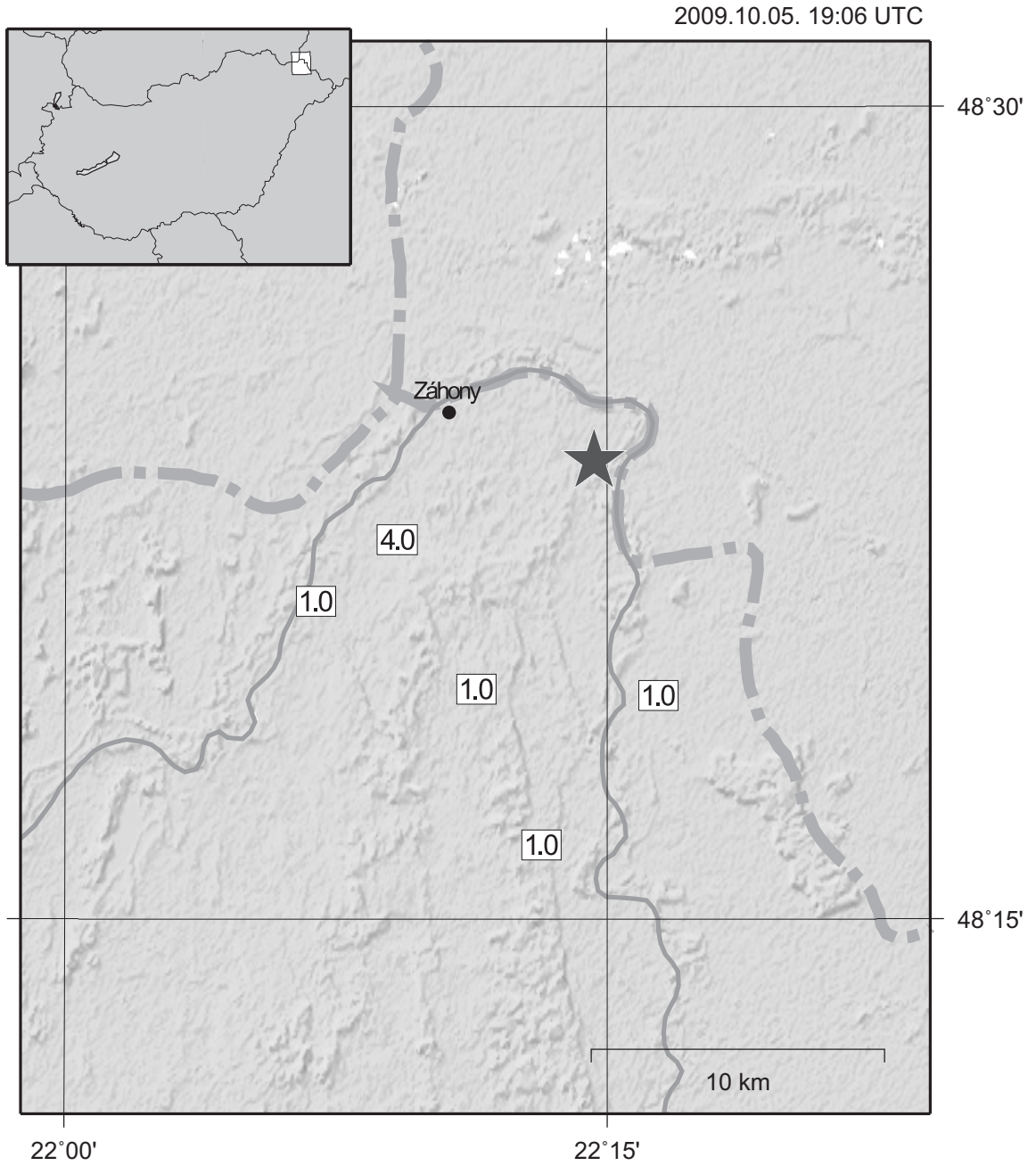
4.1. ábra A 2009. október 5-i, tiszabezdédi földrengés (19:06 UTC) szeizmogramjai

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	R	N
		Szélesség Latitude (N)	Hosszúság Longitude (E)	Intenzitás Intensity	Rel. megbízhatóság Rel. reliability	Jelentések száma No. of reports
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, tiszabezdédi földrengés (19:06 UTC) intenzitás eloszlása (a csillag a műszeresen meghatározott epicentrumot jelöli)

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

2009. november 25. - Berhida / 25 November 2009 - Berhida

FÉSZEKPARAMÉTEREK / 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 ML
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 km^2 területen érezték.

Az esemény szeizmogramja a 4.3. ábrán látható.

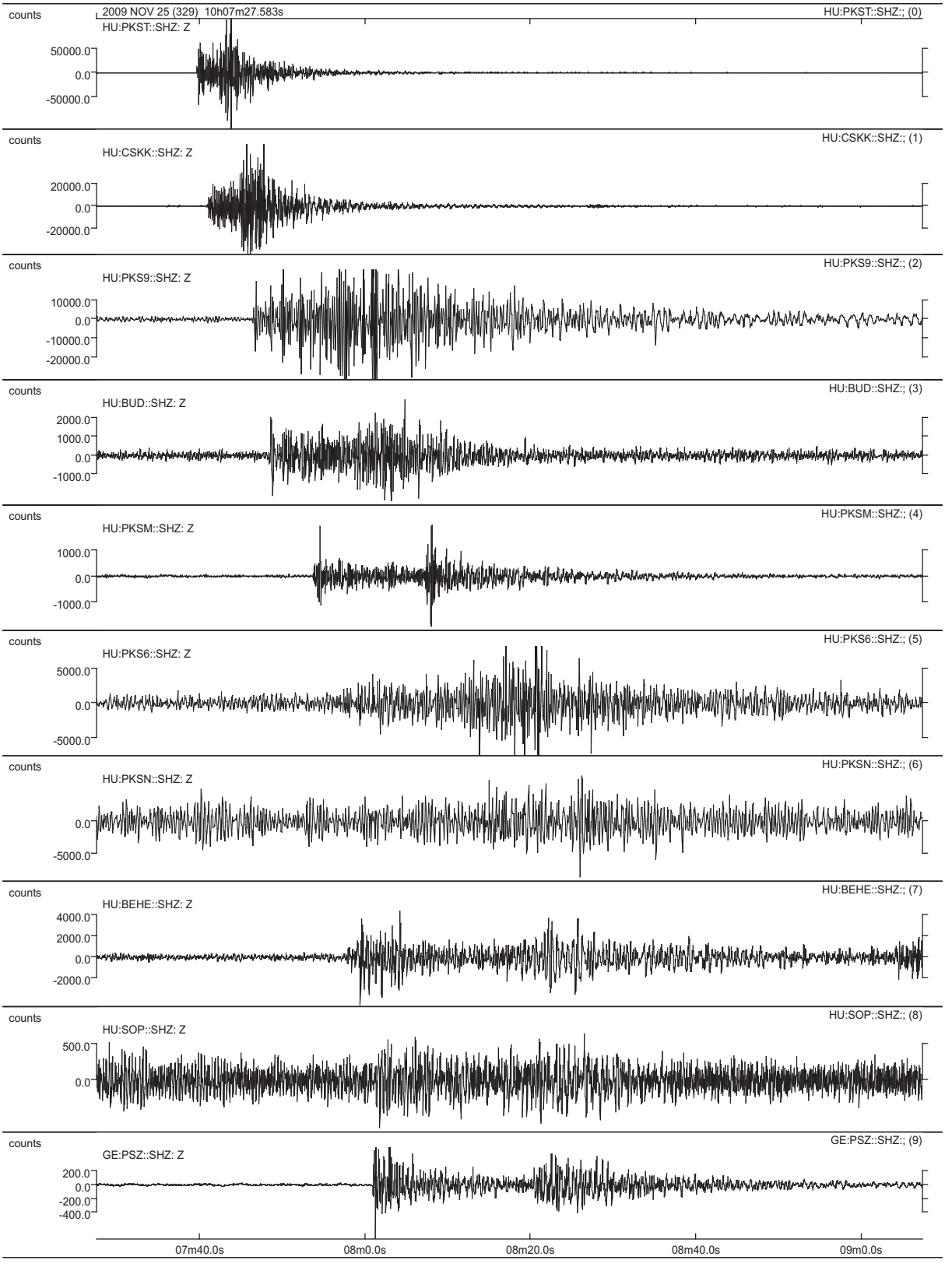
A rengés intenzitás eloszlását a 4.2. táblázat tartalmazza és a 4.4. ábra mutatja.

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 km^2.

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.



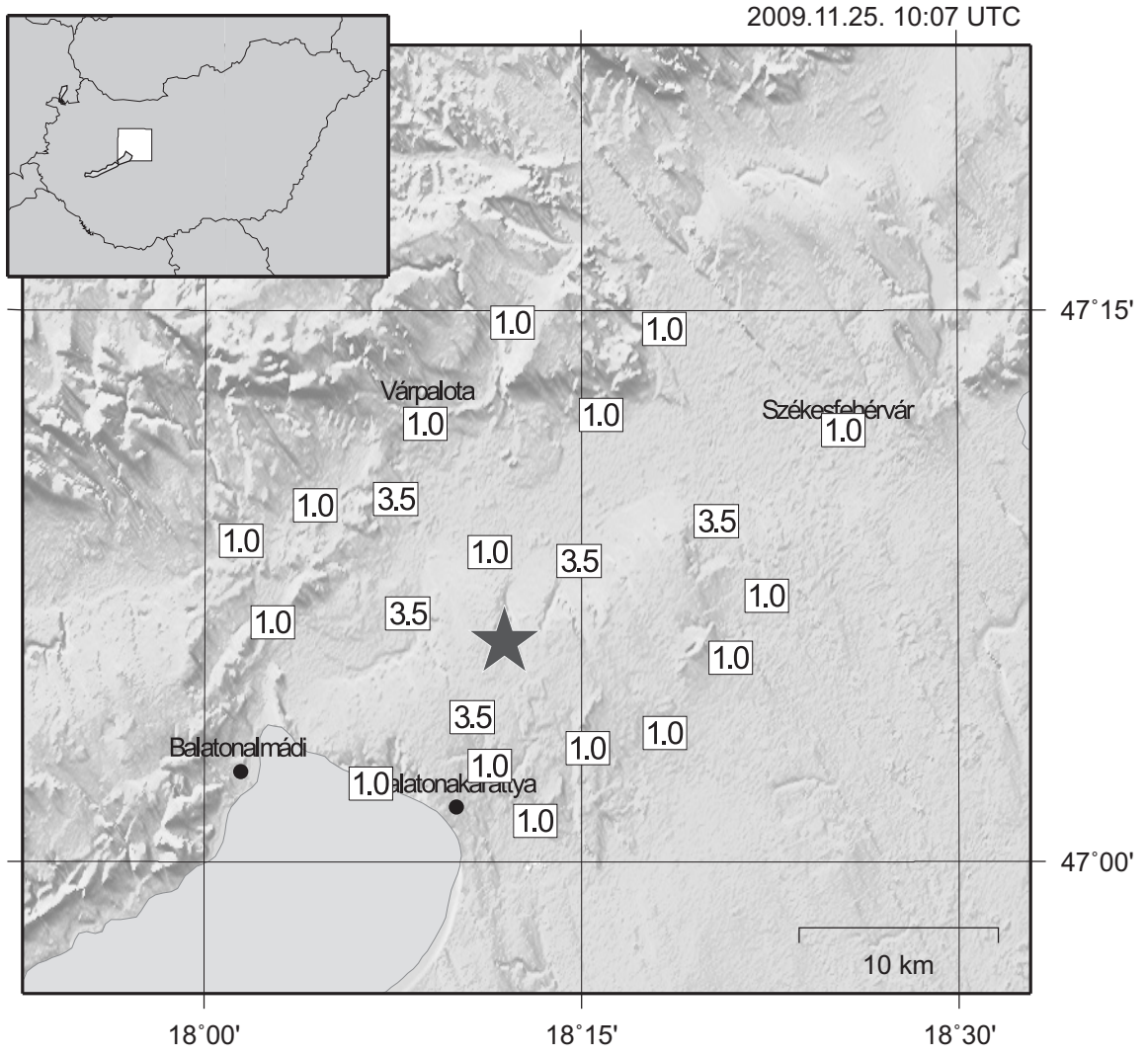
4.3. ábra A 2009. november 25-i, berhidai földrengés (10:07 UTC) szeizmogramjai

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	R	N
		Szélesség Latitude (N)	Hosszúság Longitude (E)	Intenzitás Intensity	Rel. megbízhatóság Rel. reliability	Jelentések száma No. of reports
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	Csaják	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



4.4. ábra A 2009. november 25-i, berhidai földrengés (10:07 UTC) intenzitás eloszlása (a csillag a műszeresen meghatározott epicentrumot jelöli)

Figure 4.4. Intensity distribution of the Berhida earthquake 25th November 2009 (10:07 UTC) (star - instrumental epicentre)

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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 rengést 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 rengést 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 kinyílanak vagy bezáródnak.

6 ☞ **Kisebb károkat okozó**

Épületen belül szinte mindenki, szabadban sokan érzik. Épületben tartózkodók közül sokan megijednek, és a szabadba menekülnek. Kisebb 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 ☞ **Elsöprő**

A legtöbb épület összedől.

12 ☞ **Teljesen elsöprő**

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*10**20 Nm (GCMT), 2.8*10**20 Nm (UCMT), 1.4*10**20 Nm (GS), 1.2*10**20 Nm (PPT). Es 7.2*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*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 Termiz. 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*10**19 Nm (GS), 1.4*10**20 Nm (GCMT), 1.2*10**20 Nm (UCMT), 6.0*10**19 Nm (PPT). Es 3.5*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*10**18 Nm (GS), 1.8*10**18 Nm (GCMT), 1.5*10**18 Nm (UCMT), 1.3*10**18 Nm (WCMT), 2.0*10**18 Nm (PPT). Es 2.3*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, Muzzaffarabad, 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, Colleferro, 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*10**18 Nm (GCMT), 4.0*10**18 Nm (GS), 8.6*10**18 Nm (WCMT), 8.3*10**18 Nm (UCMT), 1.1*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*10**17 Nm (GS), 3.8*10**17 Nm (GCMT), 3.4*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*10**19 Nm (UCMT), 1.2*10**20 Nm (GCMT), 1.1*10**20 Nm (WCMT), 8.0*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 Antiguo 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*10**17 Nm (GCMT), 3.2*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*10**18 Nm (UCMT), 4.1*10**18 Nm (GCMT), 6.5*10**18 Nm (PPT). Es 9.3*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*10**17 Nm (GCMT), 1.7*10**17 Nm (UCMT), 1.3*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*10**19 Nm (GS), 1.4*10**19 Nm (GCMT), 1.6*10**19 Nm (WCMT), 1.5*10**19 Nm (UCMT). Es 9.0*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*10**18 Nm (GCMT), 1.2*10**18 Nm (UCMT), 1.1*10**18 Nm (GS). Es 7.0*10**13 Nm (GS). At least 32 people injured and 10 buildings damaged (V) in the Panama City area. Felt (V) at Alcaldediaz, Balboa, Cativa, Cerro Azul, Chame, La Cabima, Las Guias, 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*10**17 Nm (GCMT), 4.0*10**17 Nm (UCMT), 3.2*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*10**20 Nm (GCMT), 4.5*10**20 Nm (WCMT), 3.1*10**20 Nm (UCMT), 6.0*10**20 Nm (PPT). Es 1.7*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*10**19 Nm (GCMT), 1.8*10**19 Nm (GS), 2.6*10**19 Nm (WCMT), 2.3*10**19 Nm (UCMT), 1.0*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*10**19 Nm (GCMT), 4.9*10**19 Nm (GS), 4.8*10**19 Nm (UCMT), 5.3*10**19 Nm (PPT). Es 2.8*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*10**18 Nm (UCMT), 8.6*10**18 Nm (GS), 7.5*10**18 Nm (GCMT), 1.2*10**19 Nm (PPT). Es 8.9*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*10**20 Nm (GCMT), 2.5*10**20 Nm (WCMT), 2.1*10**20 Nm (UCMT), 2.6*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; Qiongshan, 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 (6L 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*10**18 Nm (GCMT), 9.1*10**18 Nm (GS), 1.1*10**19 Nm (WCMT), 1.0*10**19 Nm (UCMT), 1.4*10**19 Nm (PPT). Es 3.8*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*10**18 Nm (GS), 1.2*10**19 Nm (GCMT), 1.2*10**19 Nm (WCMT), 1.1*10**19 Nm (UCMT). Es 2.1*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*10**19 Nm (GCMT), 1.1*10**19 Nm (GS), 1.3*10**19 Nm (WCMT), 1.1*10**19 Nm (UCMT), 1.3*10**19 Nm (PPT). Es 1.1*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*10**19 Nm (GCMT), 2.4*10**19 Nm (GS), 2.5*10**19 Nm (WCMT), 2.4*10**19 Nm (UCMT), 8.3*10**18 Nm (PPT). Felt (III) at Karangkates, 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*10**18 Nm (GCMT), 6.3*10**18 Nm (GS), 1.1*10**19 Nm (UCMT), 8.1*10**18 Nm (PPT). Es 8.4*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*10**19 Nm (GS), 3.9*10**19 Nm (UCMT), 3.6*10**19 Nm (GCMT), 3.1*10**19 Nm (WCMT), 3.4*10**19 Nm (PPT). Es 7.7*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 Karangkates, 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*10**17 Nm (GS), 1.3*10**18 Nm (GCMT), 9.9*10**17 Nm (WCMT), 8.6*10**17 Nm (UCMT). Es 6.9*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*10**18 Nm (GCMT), 3.7*10**18 Nm (UCMT), 2.8*10**18 Nm (GS), 3.5*10**18 Nm (WCMT), 5.1*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*10**17 Nm (GCMT), 4.1*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*10**17 Nm (GS), 5.2*10**17 Nm (UCMT), 5.2*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*10**18 Nm (GCMT), 1.6*10**18 Nm (GS), 2.7*10**18 Nm (WCMT), 1.9*10**18 Nm (UCMT). Es 1.7*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*10**21 Nm (GCMT), 1.2*10**21 Nm (UCMT), 3.5*10**21 Nm (PPT). Es 2.8*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 Niuatoputapu, Tonga. Widespread damage to infrastructure occurred at Pago Pago, American Samoa, in many parts of Samoa and on Niuatoputapu, 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 Niuatoputapu. 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*10**20 Nm (GCMT), 2.3*10**20 Nm (GS), 3.1*10**20 Nm (WCMT), 2.6*10**20 Nm (UCMT), 1.7*10**20 Nm (PPT). Es 2.0*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*10**18 Nm (GS), 1.0*10**19 Nm (GCMT), 9.0*10**18 Nm (WCMT), 1.0*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*10**19 Nm (GS), 1.0*10**19 Nm (UCMT), 1.0*10**19 Nm (GCMT), 1.0*10**19 Nm (WCMT). Es 1.2*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*10**19 Nm (UCMT), 1.7*10**19 Nm (GCMT), 1.6*10**19 Nm (GS), 1.5*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*10**20 Nm (GCMT), 4.3*10**20 Nm (WCMT), 3.3*10**20 Nm (UCMT), 4.5*10**20 Nm (PPT). Es 2.1*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*10**20 Nm (GCMT), 6.4*10**20 Nm (UCMT), 1.3*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 Abottabad, 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 Nguiu; (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 Io-jima, 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, Miao-li, P'ing-tung, Pu-li, San-ch'ung, San-hsia, Sha-lu, Shu-lin, Ta-lin, 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 Yun-lin; (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, Miao-li 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.

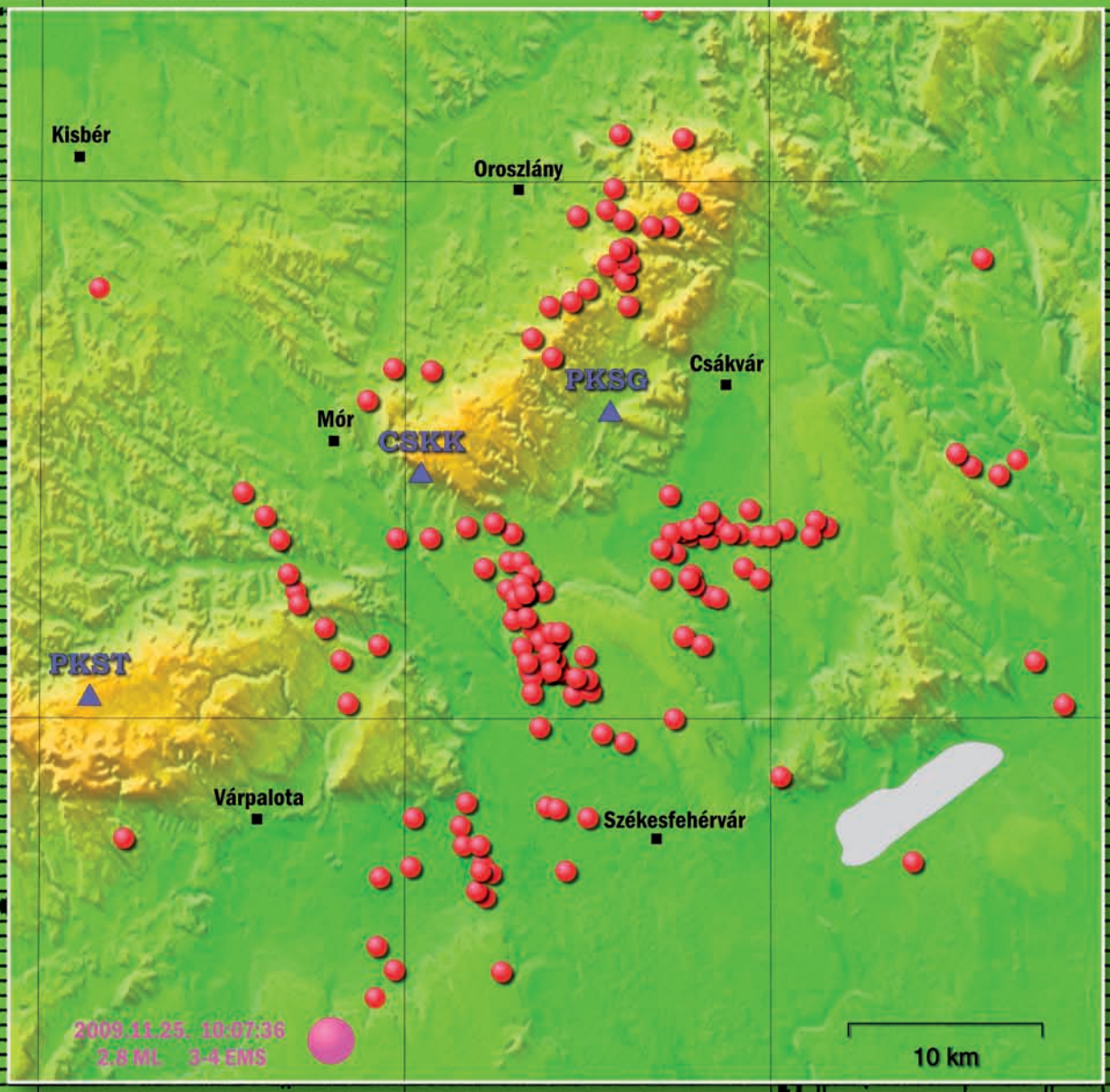
DEC 06 21 51 59.8& 26.414 S 27.494 E 2 G 3.5 28 SOUTH AFRICA. <PRE>. ML 3.5 (PRE). Two people killed and 3 injured in a mine near Carletonville.

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)