Universiteti Politeknik i Tiranës
Instituti i Gjeoshkencave, Energjisë, Ujit dhe Mjedisit
Departamenti i Sizmologjisë
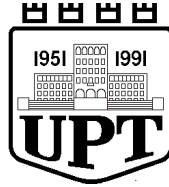
BULETINI SIZMOLOGJIK

BULETINI I TËRMETEVE TË RRJETIT SIZMOLOGJIK SHQIPTAR

Shkurt 2013

PARAMETRIC DATA
AND ALBANIAN'S EARTHQUAKE ANALYSIS
February 2013

UNIVERSITETI POLITEKNIK I TIRANËS
INSTITUTI I GJEOSHKENCAVE, ENERGJISË, UJIT DHE MJEDISIT
Departamenti i Sizmologjisë

BULETINI MUJOR I RRJETIT SIZMOLOGJIK

TË SHQIPERISË

SHKURT 2013

MONTHLY BULLETIN OF THE ALBANIAN

SEISMOLOGICAL NETWORK

February 2013

Përliluar nga: **Redaktor përgjegjës**
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Tiranë, 2013

INFORMACION I PERGJITSHEM

Prezantim

Buletini Sizmologjik i Shqiperise është një publikim periodik i parametrave valore, parametrave vatrore dhe madhësisë së tërmeteve brenda territorit të Shqiperisë dhe rrotull saj, përpiluar nga Departamenti i Sizmologjisë i Institutit te Gjeoshkencave, Energjisë, Ujit dhe Mjedisit pranë Universitetit Politeknik të Tiranës.

Parametrat e vlerësuar i referohen kuadrantit gjeografik të kufizuar nga koordinatat: 39.0^0-43.0^0 V dhe 18.5^0-21.5^0 L.

Buletini përmban pjesën spjeguese të përbërë nga informacioni i përgjithshëm, simbolet e përdorura për parametrat e vlerësuar, të dhënat fazore valore për seicilin nga tërmetet e regjistruar dhe përpunuar, katalogu mujor i termeteve, informacionin makrosimik, statistikor, mekanizmin vatror dhe hartën e shpërndarjes së epiqendrave. Në të përfshihen disa kategori tërmetesh, bazuar në informacionin e regjistruar dhe përpunuar për secilen prej tyre. Ato jane: **1**- tërmetet e lokalizuar; **2**- tërmetet e regjistruar nga më shumë se një stacion lokal, por jo të lokalizuar dhe **3**- termete te regjistruar të paktën nga një stacion lokal, por me më shumë se një fazë valore.

Të dhënat parametrike, si më siper, vlerësohen në mënyrë të pandërprerë nëpërmjet monitorimit sizmologjik dhe bazohen në analizën sasiore të regjistrimit instrumental valor. Llogaritja e vlerave të tyre është produkt i aplikimit të metodave analitike të njohura, në menyrë

GENERAL INFORMATION

Introduction

The *Albanian Seismological Bulletin* is a periodic publication of earthquake wave data, source parameters and their magnitudes, for every seismic event occurring inside the Albanian territory and its surroundings. This publication is compiled in the Department of Seismology of the Institute of Geosciences, Energy, Water and Environment under the Polytechnic University of Tirana. All the estimated values, of the parameters, refer to the geographic quadrant confined by the coordinates: 39^0- 43^0N and 18.5^0-21.5^0 E. Bulletin comprises a description section, containing the most general information, the section of the used symbols corresponding to all the evaluated parameters, phases data for each of the recorded and located earthquakes. It contains also the event catalogue, the macro- seismic information, the statistical information, the focal mechanism solutions and an aerial epicenter distribution map.

Different earthquake information categories are included, depending on their recorded and elaborated information, for each of them. They are: **1**- 1ocalized earthquakes; **2**- earthquakes recorded from more than one local station, but not located and **3**- earthquakes recorded at least by one station, but having more than one seismic phase.

The parametric data, as above, are permanently evaluated throughout the seismological monitoring routine, based upon quantitative analyze of instrumental waveform recordings. Their computed values are the direct application

iterative dhe interaktive, të aplikuara në programe llogarites të çertifikuar dhe të njohur globalisht. Kështu, për përcaktimin e të dhënave kohore valore hyrëse përdoret programi Atlas, ndërsa lokalizimi i tërmeteve kryhet nëpërmjet programit Hypoinverse.

Në këtë analizë merret në konsideratë modeli lokal për strukturën e shpejtësisë së përhapjes së valëve sizmike (Ormëni 2007) (kryesisht atyre volumore, primare dhe sekondare, P dhe S). Vlerësimi i magnitudës realizohet duke aplikuar modele të njohur parametrik si ai Richter & Gutenberg (1956) dhe Eaton (1992).

Analiza e të dhënave të publikuara realizohet nga grupi i punes i përbere nga punonjësit kërkues shkencor Rrapo Ormeni dhe Edmond Dushi si edhe ata ndihmës shkencor Ardian Minarolli dhe Ervin Kasa.

Informacioni instrumental valor përftohet nëpërmjet një rrjeti stacionesh lokal, ku përfshihen: stacioni sizmologjik qëndror i Tiranës (TIR), B. Currit (BCI), Pukës (PUK), Peshkopisë (PHP), Vlorës (VLO), Tepelenës (TPE), Sarandës (SRN) dhe Korçës (KBN), te cilët janë të paisur me sensor me bandë të gjerë regjistrimi. Gjithashtu, rrjeti lokal përmban edhe një numër stacionesh me regjistrim me period të shkurtër, ku përfshihen: Shkodra (SDA), Laçi (LACI) dhe Leskoviku (LSK).

Në analizë perfshihen edhe të dhënat valore të regjistruara e përcaktuara nga një numër stacionesh sizmologjik të rajonit dhe Mesdheut, të cilët i përkasin rrjetit sizmologjik të Universitetit "Aristotel" të Selanikut (AUTH), rrjetit sizmologjik Italian të menaxhuar nga Instituti Kombetar i Gjeofizikës dhe Vullkanologjisë (INGV), si edhe stacione të rrjetit sizmologjik të Observatorit Sizmologjik të Malit të Zi (MSO).

result of known analytical methods, iteratively and interactively, within certified and globally known computational programs.

Hence, for the onset time data determination, the Atlas program is used, whereas the earthquake location is done by mean of Hypoinverse program. For this analyze, a local velocity model accounting for the local and accurate seismic wave paths, is used (Ormeni, 2007). Mainly body seismic waves are concerned, primary P-phases and secondary S-phases, within computation and location process. Magnitude determination is achieved through known parametric models as the one of Richter (1956) and Eaton (1992).

Analyzes of the published data is undertaken from a dedicated working group, comprising by scientific staff RrapoOrmeni& Edmond Dushi and technical staff ArdianMinarolli& Ervin Kasa.

Instrumental information is achieved through a network of local seismological stations, as listed: Tirana central station (TIR), B. Curri (BCI), Puka (PUK), Peshkopia (PHP), Vlora (VLO), Tepelena (TPE), Saranda (SRN) and Korça (KBN), which are equipped with broad band seismic sensors.

Also, the local network enumerates some short period recording stations, situated at Shkodra (SDA), Laçi (LACI) and Leskoviku (LSK).

In this analyze, data from a number of regional stations, are included as well. They are distributed along the Mediterranean coast and belong to the AUTH network of the "Aristotle" university of Thessaloniki, Italian National Seismological Network managed from National Institute of Geophysics and Volcanoes (INGV) as well as seismological stations of the Seismological Observatory of Montenegro (MSO).

STACIONET E RRJETIT SIZMOLOGJIK(SEISMOLOGICAL NETWORK STATION)

Kodi Stacionit (Stn. Code)	Regjistrimi (po/jo) (Registered)	Koordinatat (Coordinates)		Lartesia (Elevation)	Tipi Stacionit (Stn. Type)	Sizmometri (Sensor Type)	Sistemi regjistrimit Recording system	Sistemi i komunikimit Comunication system	Perioda natyrore e sensorit (Natural Sensor period
		V-J (N-S)	L-P (E-W)						
TIR	Po (y)	41.3477	19.8650	198	3C-VBB	STS-2	Quantera	VSAT	120 s
BCI	Po	42.3666	20.0675	500	3C-BB	CMG-40T	Trident	VSAT	40 s
KKS	Po	42.0756	20.4113	300	3C-BB	SM-4 (B)	GBD-x16	Dial Up	0.2 s
PHP	Po	41.6847	20.4408	670	3C-BB	Trillium-40	Trident	VSAT	40 s
PUK	Po	42.0426	19.8926	900	3C-BB	Trillium-40	Trident	VSAT	40 s
SDA	Po	42.0519	19.4986	80	3C-SP	SM-4 (B)	GBD-x16	Dial Up	0.2 s
LACI	Po	41.6363	19.7094	40	3C-SP	SM-4 (B)	GBD-x16	Dial Up	0.2 s
KBN	Po	40.6236	20.7874	800	3C-BB	Trillium-40	Trident	VSAT	40 s
LSK	Po	40.1500	20.6000	920	3C-SP	SM-4 (B)	GBD-x16	Dial Up	0.2 s
TPE	Po	40.2952	20.0109	240	3C-BB	CMG-40T	Trident	VSAT	40 s
VLO	Po	40.4686	19.4955	80	3C-BB	Trillium-40	Trident	VSAT	40 s
SRN	Po	39.8800	20.0005	20	3C-BB	Trillium-40	Trident	VSAT	40 s

SIMBOLIKA E PERDORUR NE PERMBAJTJEN E BULETINIT SIZMOLOGJIK
SYMBOLIC USED IN SEISMOLOGICAL BULLETIN CONTAIN

Simboli (Symbol)	Parametri korrespondues (Corresponding parameter)	Pershkrimi (Description)
Y	Viti (year)	Viti ndodhjes se ngjarjes (year of occurence)
M	Muaji (month)	Muaji i ndodhjes së ngjarjes (month of occurence
D	Dita (day)	Data e ndodhjes së ngjarjes (date of occurence)
H	Ora (hour)	Ora ne origjine (UTC) (origine time universal)
M	Minuta (minute)	Minuta (origine time minute)
Sec	Sekonda (second)	Sekonda (origine time second)
Lat	Gjerësiagjeografike (latitude)	Gjeresia gjeografike e epiqendrës Veri-Jug(^{0}) Geographical latitude N-S direction
Lon	Gjatësiagjeografike (longitude)	Gjatesia gjeografike e epiqendrës Lindje-Perendim(^{0}) Geographical longitude E-W direction
Dep	Thellësia (depth)	Thellësiavatrore (focal depth)-km
Hor. err	Gabimi horizontal (horizontal error)	Gabimi ibërë në vlerësimin eepiqendres (km) Estimation error of epicentre
Ver. err	Gabimi vertikal (vertical error)	Gabimi i bërë në vlerësimin e thellësisë (km) Depth estimation error
Gap	Mosmbulimi me stacione minitorimi (azimutal gap)	Zona e sferës fokale (imagjinare),e pa mbuluar me stacione regjistrues Azimutal station gap
Rms	Gabimi mesatar kuadratik (Root mean squarre)	Gabimi i pergjitshem (Total estimation error-sec)
Mag	Magnituda (magnitude)	Madhesia e termetit sipas shkalles lokale te kalibruar (local calibrated measure of the earthquake size)
Net	Emërtimi i rrjetit sizmologjik (network code)	Kodi nderkombetar i identifikimit te rrjetit ne FDSN (Federation of Digital seismologies network) eshte AC

		(International code of Network identification on FDSN is AC)
Nr	Numuri i stacioneve (station's number)	Nr. Stacioneve te perdorur ne lokalizim (No. Of used stations)
STAT	Kodi i stacionit (station code)	Kodi nderkombetar që përdoret për të identifikuar stacionin përkatës sizmologjik (tre karaktere) (international stn code)
SP	Komponentja e regjistrimit (recording component)	Kodimi i komponenteve te regjistrimit ne perputhje e orientimin gjeografik 3D (Z, N ose E) Component code acording to recording direction
IPHASW	Faza valore sizmike (seismic wave phase)	tipi i valës P (P_g / P_n) ose S (S_g / S_n) (wave phase type)
D	Polariteti i hyrjes së parë në komponenten vertikale (first vertical honsent polarity)	Polariteti i vales renese ne statcion, ne komponenten Z (first onset polarity on Z)
HRMM SECON	Ora, minuta dhe sekonda (time onsets for each phase)	Te dhenat kohore per mbrritjen e seciles faze ne regjistrim Time data for each phases on recording
AZIMU	Kendi azimutal (station-source azimuth angle)	Azimuti stacion- vater termeti Station-focus azimuthal angle
RES	Diferenca kohore (time residual)	Ndryshimi ndërmjet kohës teorike të llogaritur nga modeli dhe kohës faktike, nga regjistrimi Time residuals between calculated and observed times
DIS	Largesia epiqendrore (epicentral distance)	Largesia hoeizontale epiqender-stacion Distance from epicenter to the station
DUR	Zgjatshmeria e sinjalit sizmik (signal time duration)	Shpreh zgjatshmerinë e plotë të sinjalit sizmik ne sizmogram Total Signal Duration

INFORMACIONI PARAMETRIK FAZOR DHE LOKALIZIMI (PARAMETRIC PHASES INFORMATION AND LOCATION)

TËRMETE TËAFËRTA (NEAR EARTHQUAKE)

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***
Y   M   D   HM    Sec     Lat      Long     Dep   Net   Nr  Rms  Mag     Epicenter

2013 2  2   1859  27.49   41.90    20.19    23    ASN   5   0.2  3.5     KLOS, KUKES
GAP=138                   hor.err=0km            ver.err=1KM

STAT SP  IPHASW  D  HRMM  SECON      AZIMU      RES       DIS      DUR      Md
PUK   SZ  IPG       1859  33.84      302        0.1       29       65       3.5
Puk   SE  ISG       1859  38.55      302        0.1       29
PHP   SZ  IPG       1859  33.95      140        0.1       31       50       3.4
```

```
PHP   SE ISG        1859 39.23        140          0.1        31
TIR   SZ IPG        1859 39.75        205          0.0        67        50        3.4
TIR   SE ISG        1859 49.11        205          0.0        67
TPE   SZ IPN        1859 57.58        186         -0.1        178
TPE   SE ISN        1900 19.99        186          0.1        178
SRN   SZ IPN        1900 03.15        185          0.1        225
SRN   SE ISN        1900 30.77        185          0.1        225
```

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	3	0208	19.37	43.01	18.01	32	ASN	3	0.4	3.5	BOSNJE

GAP=345   hor.err=11km   ver.err=7KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PUK	SZ	IPN		0209	00.18	129	0.4	188	34	3.3
PUK	SE	ISN		0209	23.02	129	0.2	188		
TIR	SZ	IPN		0209	08.37	139	-0.1	240	48	3.6
TIR	SE	ISN		0209	35.41	139	0.5	240		
PHP	SZ	IPN		0209	07.91	125	0.4	248		
PHP	SE	ISN		0209	37.01	125	0.3	248		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	3	0337	22.84	43.22	18.86	10	ASN	3	0.3	3.6	MONTENEGRO

GAP=316   hor.err=16km   ver.err=22KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPN		0337	52.96	268	0.2	152	70	3.6
PHP	SE	ISN		0338	18.23	268	0.3	152		
TIR	SZ	IPN		0337	51.85	258	0.1	205	69	3.6
TIR	SE	ISN		0338	17.31	258	-0.3	205		
SRN	SZ	IPN		0338	10.60	224	0.2	283		
SRN	SE	ISN		0338	47.41	224	-0.4	283		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	3	1200	58.00	43.13	18.54	3	ASN	3	0.4	4.0	BOSNJE

GAP=333   hor.err=3km   ver.err=2KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
BCI	SZ	IPN		1201	24.00	123	0.2	151	91	3.8
BCI	SE	ISN		1201	45.60	123	-0.3	151		
PHP	SZ	IPN		1201	37.20	135	0.3	224	121	4.1
PHP	SE	ISN		1202	05.90	135	-0.1	224		
TIR	SZ	IPN		1201	37.20	150	0.4	150		
TIR	SE	ISN		1202	06.90	150	0.2	150		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	4	0429	53.00	42.26	16.89	7	ASN	4	0.4	4.2	KROACI

GAP=355   hor.err=1km   ver.err=3KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PUK	SZ	IPN		0429	40.06	94	0.2	249	154	4.2
PUK	SE	ISN		0430	11.20	94	0.3	249		
BCI	SZ	IPN		0430	42.10	86	0.1	262	155	4.2
BCI	SE	ISN		0431	15.20	86	0.2	262		
TIR	SZ	IPN		0430	47.20	111	0.3	267	160	4.3
TIR	SE	ISN		0431	16.10	111	-0.3	267		
PHP	SZ	IPN		0430	48.10	101	-0.3	301		
PHP	SE	ISN		0431	23.40	101	-0.4	301		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	4	2141	26.86								PHP

GAP=   hor.err=km   ver.err=KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPG		2141	26.86					
PHP	SE	ISG		2141	28.59					

***

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	5	0905	26.58	40.70	19.86	3	ASN	6	0.2	3.4	BERAT

GAP=147   hor.err=1km   ver.err=1KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
TPE	SZ	IPG		0905	34.66	176	0.0	45	85	3.5
TPE	SE	ISG		0905	41.30	176	-0.1	45		
VLO	SZ	IPG		0905	35.05	238	0.0	46	80	3.4
VLO	SE	ISG		0905	42.02	238	0.0	46		
TIR	SZ	IPG		0905	39.72	355	0.1	72	78	3.5
TIR	SE	ISG		0905	49.02	355	0.1	72		
SRN	SZ	IPG		0905	42.24	176	0.0	90	82	3.4
SRN	SE	ISG		0905	55.24	176	0.1	90		
PHP	SZ	IPG		0905	46.10	19	0.1	116	81	3.4
PHP	SE	ISG		0906	02.69	19	0.1	116		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	7	0417	53.29								

GAP=   hor.err=km   ver.err=KM

```
  STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS       DUR     Md
TIR   SZ IPG        0417 53.29
TIR   SE ISG        0417 56.17
```

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 ***
 Y    M    D   HM    Sec     Lat      Long    Dep  Net Nr Rms Mag      Epicenter

 2013 2  9  1237   00.82   41.47    19.64   12    ASN 6  0.3 3.5  11KM V-P VORE
 GAP=192                      hor.err=3km         ver.err=4KM
```

```
  STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS       DUR     Md
TIR   SZ IPG        1237 05.54   126        0.0        23        89      3.6
TIR   SE ISG        1237 09.40   126       -0.1        23
PHP   SZ IPG        1237 12.90   70         0.0        70        85      3.7
PHP   SE ISG        1237 23.52   70        -0.1        70
BCI   SZ IPG        1337 20.05   19         0.0        105       54      3.3
BCI   SE ISG        1337 35.56   19         0.0        105
VLO   SZ IPG        1337 21.07   187        0.0        112       44      3.2
VLO   SE ISG        1337 37.19   187        0.1        112
TPE   SZ IPN        1337 22.57   166        0.1        134       58      3.5
TPE   SE ISN        1337 50.32   166        0.1        134
SRN   SZ IPN        1337 30.32   170       -0.1        179       45      3.3
SRN   SE ISN        1337 52.23   170        0.1        179
```

```
 Y    M    D   HM    Sec     Lat      Long    Dep  Net Nr Rms Mag      Epicenter

 2013 2  9  1313   48.93   40.45    21.01   5     ASN 7  0.4 3.0     BILISHT
 GAP=229                      hor.err=8km         ver.err=3KM
```

```
  STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS       DUR     Md
TPE   SZ IPG        1314 03.26   259        0.2        87        45      3.1
TPE   SE ISG        1314 16.01   259       -0.1        87
SRN   SZ IPG        1314 07.08   234        0.1        107       37      3.0
SRN   SE ISG        1314 21.56   234        0.1        107
IGT   SZ IPG        1314 10.60   210        0.1        118
IGT   SE ISG        1314 26.66   210        0.1        118
VLO   SZ IPN        1314 12.00   272       -0.1        128       29      2.8
VLO   SE ISN        1314 30.88   272        0.1        128
TIR   SZ IPN        1314 14.58   317        0.1        138       36      3.0
TIR   SE ISN        1314 33.30   317        0.1        138
PHP   SZ IPN        1314 13.85   341       -0.1        144       56      3.2
PHP   SE ISN        1314 32.72   341        0.3        144
BCI   SZ IPN        1314 28.78   348        0.8        179
```

```
 Y    M    D   HM    Sec     Lat      Long    Dep  Net Nr Rms Mag      Epicenter
```

```
2013 2  9  2356  58.70  41.15    20.16  10   ASN 6  0.4 2.8    ELBASAN
GAP=165                       hor.err=6km        ver.err=2KM

 STAT SP IPHASW D HRMM SECON     AZIMU      RES        DIS      DUR    Md
TIR   SZ IPG       2357 03.71    312        0.1        33       34     2.8
TIR   SE ISG       2357 10.44    312       -0.1        33
PHP   SZ IPG       2357 09.51    21         0.1        63       30     2.7
PHP   SE ISG       2357 19.78    21         0.5        63
TPE   SZ IPG       2357 15.54    188        0.1        96       30     2.8
TPE   SE ISG       2357 29.85    188       -0.1        96
PUK   SZ IPG       2357 15.85    348        0.1        101      30     2.8
PUK   SE ISG       2357 31.70    348        0.1        101
BCI   SZ IPN       2357 21.14    357        0.1        135      55     3.3
BCI   SE ISN       2357 41.05    357        0.1        135
SRN   SZ IPN       2357 23.43    186        0.2        142


 ***
 Y    M    D    HM   Sec      Lat     Long    Dep  Net Nr Rms Mag    Epicenter

2013 2  12 1106  37.74  40.94    20.77  6    ASN 5  0.2 3.5   OHRI LAKE
GAP=201                       hor.err=1km        ver.err=2KM

 STAT SP IPHASW D HRMM SECON     AZIMU      RES        DIS      DUR    Md
PHP   SZ IPG       1106 53.28    340        0.0        88       71     3.6
PHP   SE ISG       1107 04.44    240        0.0        88
TIR   SZ IPG       1106 54.21    302        0.0        89       70     3.6
TIR   SE ISG       1107 05.36    302       -0.1        89
TPE   SZ IPG       1106 54.98    233        0.0        95       61     3.4
TPE   SE ISG       1107 07.18    233       -0.1        95
SRN   SZ IPN       1107 02.04    280        0.1        133      72     3.6
SRN   SE ISN       1107 20.19    280        0.0        133
BCI   SZ IPN       1107 07.32    341        0.1        170      72     3.6
BCI   SE ISN       1107 29.67    341        0.1        170


 ***
 Y    M    D    HM   Sec      Lat     Long    Dep  Net Nr Rms Mag    Epicenter

2013 2  13 0207  15.03  42.38    19.84  6    ASN 4  0.1 3.4 THETH,B.CURRI
GAP=275                       hor.err=1km        ver.err=1KM

 STAT SP IPHASW D HRMM SECON     AZIMU      RES        DIS      DUR    Md
BCI   SZ IPG       0207 26.17    94         0.0        18       28     3.4
BCI   SE ISG       0207 34.48    94         0.1        18
PUK   SZ IPG       0207 27.01    173        0.0        38       29     3.4
PUK   SE ISG       0207 36.36    173        0.1        38
PHP   SZ IPG       0207 33.18    147        0.0        92       29     3.4
PHP   SE ISG       0207 45.17    147        0.0        92
TIR   SZ IPG       0207 35.66    179        0.1        115      34     3.6
```

```
TIR   SE ISG        0207 50.07       179         0.1      115
```

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	13	0626	41.05	40.95	20.68	5	ASN	6	0.1	2.7	V-P POGRADEC

```
 GAP=201                       hor.err=3km          ver.err=2KM
```

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
TIR	SZ	IPG		0626	56.05	303	0.0	81	18	2.4
TIR	SE	ISG		0627	06.96	303	-0.1	81		
PHP	SZ	IPG		0626	55.50	347	0.0	83	24	2.7
PHP	SE	ISG		0627	07.59	347	0.1	83		
TPE	SZ	IPG		0626	56.64	219	0.1	92	24	2.7
TPE	SE	ISG		0627	10.97	219	-0.1	91		
SRN	SZ	IPN		0627	05.87	207	-0.1	132	24	2.7
SRN	SE	ISN		0627	22.65	207	0.0	132		
PUK	SZ	IPN		0627	04.84	322	0.0	137		
PUK	SE	ISN		0627	25.44	322	-0.1	137		
BCI	SZ	IPN		0627	11.30	343	-0.1	165		
BCI	SE	ISN		0627	35.56	343	-0.1	165		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	13	2153	57.68								

```
 GAP=                       hor.err=km           ver.err=KM
```

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PUK	SZ	IPG		2153	57.63					
PUK	SE	ISG		2154	02.30					

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	14	0051	49.59								

```
 GAP=                       hor.err=km           ver.err=KM
```

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPG		0051	49.59					
PHP	SE	ISG		0051	50.70					

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	14	0202	35.95								

```
 GAP=                       hor.err=km           ver.err=KM
```

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
TIR	SZ	IPG		0202	35.95					

```
TIR   SE ISG      0202 39.09


 Y    M    D    HM   Sec      Lat      Long    Dep  Net Nr Rms Mag     Epicenter

 2013 2  14 0239  17.07   40.05    20.56   25   ASN 7  0.1 3.0    LESKOVIKU
 GAP=203                     hor.err=5km        ver.err=2KM

 STAT SP IPHASW D HRMM SECON    AZIMU    RES      DIS     DUR    Md
SRN   SZ IPG      0239 26.00     250      -0.1     51      22     2.7
SRN   SE ISG      0239 33.20     250       0.0     51
TPE   SZ IPG      0239 26.45     301       0.0     54      33     3
TPE   SE ISG      0239 34.74     301      -0.1     54
IGT   SZ IPG      0239 28.64     200       0.0     60
IGT   SE ISG      0239 37.28     200       0.1     60
VLO   SZ IPG      0239 35.49     298       0.0     102
VLO   SE ISG      0239 49.75     298      -0.1     102
TIR   SZ IPN      0239 43.96     338       0.0     156     44     3.4
TIR   SE ISN      0240 04.04     338      -0.1     156
PHP   SZ IPN      0239 47.92     357       0.1     182     33     3.3
PHP   SE ISN      0240 08.43     357       0.1     182
PUK   SZ IPN      0239 53.18     346       0.1     228
PUK   SE ISN      0240 21.12     346      -0.1     228


 Y    M    D    HM   Sec      Lat      Long    Dep  Net Nr Rms Mag     Epicenter

 2013 2 14   0355  45.90
 GAP=                        hor.err=km         ver.err=KM

 STAT SP IPHASW D HRMM SECON    AZIMU    RES      DIS     DUR    Md
PUK   SZ IPG      0355 45.90
PUK   SE ISG      0355 47.10


 Y    M    D    HM   Sec      Lat      Long    Dep  Net Nr Rms Mag     Epicenter

 2013 2 14   0400  21.56
 GAP=                        hor.err=km         ver.err=KM

 STAT SP IPHASW D HRMM SECON    AZIMU    RES      DIS     DUR    Md
SRN   SZ IPG      0400 21.65
SRN   SE ISG      0400 25.34


 Y    M    D    HM   Sec      Lat      Long    Dep  Net Nr Rms Mag     Epicenter

 2013 2  14 0930  08.65   41.19    20.05   22   ASN 3  0.1 2.6    ELBASAN
 GAP=287                     hor.err=0km        ver.err=0KM
```

```
  STAT SP IPHASW D HRMM SECON     AZIMU     RES       DIS      DUR    Md
TIR  SZ IPG        0930 13.93     317       0.0       23       11     2.6
TIR  SE ISG        0930 17.99     317       0.1       23
PHP  SZ IPG        0930 20.28     30        0.0       63       19     2.6
PHP  SE ISG        0930 29.01     30        0.0       63
PUK  SZ IPG        0930 25.33     352       0.0       95       23     2.8
PUK  SE ISG        0930 37.83     352       0.1       95
```

```
  Y    M    D    HM    Sec     Lat     Long    Dep  Net  Nr Rms Mag    Epicenter

 2013 2 15   0324   47.91
  GAP=                          hor.err=km         ver.err=KM
```

```
  STAT SP IPHASW D HRMM SECON     AZIMU     RES       DIS      DUR    Md
PHP  SZ IPG        0324 47.91
PHP  SE ISG        0324 49.93
```

```
  ***
  Y    M    D    HM    Sec     Lat     Long    Dep  Net  Nr Rms Mag    Epicenter

 2013 2  15 1144  0322    41.91    20.32   20   ASN 4  0.1 3.4  VRRIN,KUKES
  GAP=287                        hor.err=1km        ver.err=1KM
```

```
  STAT SP IPHASW D HRMM SECON     AZIMU     RES       DIS      DUR    Md
PHP  SZ IPG        1144 08.84     158       0.0       27       59     3.4
PHP  SE ISG        1144 13.77     158       0.0       27
BCI  SZ IPG        1144 12.44     358       0.1       54       72     3.7
BCI  SE ISG        1144 21.35     358       0.0       54
TIR  SZ IPG        1144 16.31     338       0.0       73       59     3.4
TIR  SE ISG        1144 26.49     338       0.1       73
TPE  SZ IPN        1144 34.87     212       0.0       181
TPE  SE ISN        1144 57.06     212       0.1       181
```

```
  ***
  Y    M    D    HM    Sec     Lat     Long    Dep  Net  Nr Rms Mag    Epicenter

 2013 2  16 1046  49.88   40.59    19.77   12   ASN 6  0.2 3.3    BALLSH
  GAP=143                        hor.err=1km        ver.err=8KM
```

```
  STAT SP IPHASW D HRMM SECON     AZIMU     RES       DIS      DUR    Md
VLO  SZ IPG        1046 54.70     240       0.0       27       34     2.8
VLO  SE ISG        1046 59.99     240      -0.1       27
TPE  SZ IPG        1046 56.05     148       0.1       38       42     3.1
TPE  SE ISG        1047 03.32     148       0.1       38
SRN  SZ IPG        1047 04.92     166       0.0       81       40     3.1
SRN  SE ISG        1047 15.92     166      -0.1       81
TIR  SZ IPG        1047 04.66     5         0.1       84       53     3.4
```

```
TIR   SE  ISG        1047 16.95      5           0.1      84
PHP   SZ  IPN        1047 11.45      24          0.1      133       47      3.3
PHP   SE  ISN        1047 32.04      24         -0.1      133
BCI   SZ  IPN        1047 22.01      7           0.1      198       48      3.3
BCI   SE  ISN        1047 47.00      7           0.1      198
```

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	16	1158	32.91								

GAP=   hor.err=km   ver.err=KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPG		1158	32.91					
PHP	SE	ISG		1158	36.62					

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	16	1732	07.09								

GAP=   hor.err=km   ver.err=KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPG		1732	07.09					
PHP	SE	ISG		1732	11.60					

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	16	2116	04.41	42.00	13.39	21	ASN	7	0.4	5.1	ITALI

GAP=330   hor.err=11km   ver.err=7KM

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PUK	SZ	IPN		2117	21.38	87	0.2	538	207	5.2
PUK	SE	ISN		2118	16.12	87	-0.3	538		
VLO	SZ	IPN		2117	20.30	106	0.4	539	225	5.3
VLO	SE	ISN		2118	21.71	106	0.3	539		
TIR	SZ	IPN		2117	21.38	15	0.2	544	222	5.3
TIR	SE	ISN		2118	17.99	15	-0.1	544		
BCI	SZ	IPN		2117	23.90	83	0.6	553	161	5.0
BCI	SE	ISN		2118	22.25	83	0.3	553		
PHP	SZ	IPN		2117	27.86	91	0.2	587	206	5.2
PHP	SE	ISN		2118	29.53	91	0.3	587		
TPE	SZ	IPN		2117	25.70	106	0.4	586	216	5.3
TPE	SE	ISN		2118	28.65	106	0.3	586		
SRN	SZ	IPN		2117	28.58	110	0.2	605	220	5.3
SRN	SE	ISN		2118	35.57	110	0.6	605		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter

```
2013 2  17 0312  56.83  37.87    21.42  15   ASN 7  0.4 4.9     GREECE
GAP=341                      hor.err=10km        ver.err=8KM

STAT SP IPHASW D HRMM SECON     AZIMU      RES      DIS     DUR    Md
SRN  SZ IPN       0313 38.89    332        0.2      254     227    4.7
SRN  SE ISN       0314 10.70    332        0.3      254
TPE  SZ IPN       0313 43.86    337        0.4      295     262    4.8
TPE  SE ISN       0314 19.17    337       -0.2      295
VLO  SZ IPN       0313 49.65    338        0.2      332     248    4.8
VLO  SE ISN       0314 29.98    338        0.2      332
TIR  SZ IPN       0313 59.17    342        0.2      408     265    4.9
TIR  SE ISN       0314 45.02    342       -0.3      408
PHP  SZ IPN       0314 02.89    350        0.4      431     246    4.9
PHP  SE ISN       0314 51.59    350        0.2      431
PUK  SZ IPN       0314 07.44    345        0.4      481     265    5.0
BCI  SZ IPN       0314 11.16    348        0.2      512     180    4.8
BCI  SE ISN       0315 13.34    348        0.3      512


Y    M    D    HM    Sec     Lat      Long    Dep  Net Nr Rms Mag     Epicenter

2013 2  17 0542  13.73  37.63    21.66  17   ASN 6  0.6 4.9     GREECE
GAP=342                      hor.err=3km         ver.err=8KM

STAT SP IPHASW D HRMM SECON     AZIMU      RES      DIS     DUR    Md
SRN  SZ IPN       0543 00.40    331        0.2      288     271    4.8
SRN  SE ISN       0543 35.61    331        0.2      288
TPE  SZ IPN       0543 05.37    335        0.4      328     224    4.7
TPE  SE ISN       0543 45.31    335        0.3      328
VLO  SZ IPN       0543 10.25    330        0.4      366     232    4.8
VLO  SE ISN       0543 52.36    330       -0.3      366
TIR  SZ IPN       0543 19.44    341        0.5      440     248    4.9
TIR  SE ISN       0544 10.04    341        0.2      440
PHP  SZ IPN       0543 23.22    348       -0.4      461     250    4.9
PHP  SE ISN       0544 15.27    348        0.5      461
PUK  SZ IPN       0543 28.18    344        0.4      512     233    4.9
PUK  SE ISN       0544 27.77    344        0.4      512
BCI  SZ IPN       0543 33.15    347       -0.5      542     161    4.6
BCI  SE ISN       0544 32.47    347        0.3      542


Y    M    D    HM    Sec     Lat      Long    Dep  Net Nr Rms Mag     Epicenter

2013 2  17 1206  47.20  40.82    21.32  2    ASN 5  0.6 3.7     GREECE
GAP=345                      hor.err=2km         ver.err=8KM

STAT SP IPHASW D HRMM SECON     AZIMU      RES      DIS     DUR    Md
PHP  SZ IPG       1207 08.37    323        0.1      120     75     3.8
PHP  SE ISG       1207 25.89    323        0.1      120
```

```
TIR   SZ IPN       1207 11.45      296          0.1      135      81      3.8
TIR   SE ISN       1207 30.12      296          0.1      135
THE   SZ IPN       1207 12.49      98           0.1      140
THE   SE ISN       1207 32.16      98           0.2      140
SRN   SZ IPN       1207 14.42      228          0.2      153      81      3.8
SRN   SE ISN       1207 35.65      228          0.3      153
IGT   SZ IPN       1207 16.66      211          0.3      166
IGT   SE ISN       1207 39.47      211          0.2      166
```

```
 Y    M   D   HM    Sec     Lat      Long    Dep  Net Nr Rms Mag      Epicenter

 2013 2  17 1648  45.46   40.81    21.56  10    ASN 7  0.5 4.4      GREECE
 GAP=136                  hor.err=1km        ver.err=6KM
```

```
 STAT SP IPHASW D HRMM SECON     AZIMU      RES        DIS      DUR     Md
PHP   SZ IPN       1649 09.25      317          0.1      135      166     4.3
PHP   SE ISN       1649 28.12      317          0.1      135
TPE   SZ IPN       1649 09.78      248          0.1      143      166     4.3
TPE   SE ISN       1649 31.12      248         -0.1      143
TIR   SZ IPN       1649 12.87      294         -0.1      155      158     4.3
TIR   SE ISN       1649 34.16      294         -0.1      155
SRN   SZ IPN       1649 15.64      233          0.2      168
SRN   SE ISN       1649 37.16      233         -0.3      168
IGT   SZ IPN       1649 18.20      218         -0.3      176
IGT   SE ISN       1649 40.23      218          0.2      176
VLO   SZ IPN       1649 14.82      259          0.2      179
VLO   SE ISN       1649 40.59      259         -0.3      179
BCI   SZ IPN       1649 22.52      325         -0.4      213
BCI   SE ISN       1649 51.05      325         -0.2      213
```

```
 Y    M   D   HM    Sec     Lat      Long    Dep  Net Nr Rms Mag      Epicenter

 2013 2  18 0359  41.92   41.61    20.29  2     ASN 4  0.1 2.6   SELISHTE
 GAP=175                  hor.err=1Km        ver.err=1Km       PESHKOPI
```

```
 STAT SP IPHASW D HRMM SECON     AZIMU      RES        DIS      DUR     Md
PHP   SZ IPG       0359 44.99      56           0.0      15       27      2.6
PHP   SE ISG       0359 47.16      56           0.0      15
TIR   SZ IPG       0359 50.26      231          0.0      44       29      2.8
TIR   SE ISG       0359 58.19      231         -0.1      44
PUK   SZ IPG       0359 52.15      326          0.0      58       29      2.8
PUK   SE ISG       0400 00.73      326         -0.1      58
BCI   SZ IPG       0359 57.78      348         -0.1      86
BCI   SE ISG       0400 10.15      348          0.1      86
```

```
 Y    M   D   HM    Sec     Lat      Long    Dep  Net Nr Rms Mag      Epicenter
```

```
2013 2  18 0401  07.10
GAP=                          hor.err=km          ver.err=KM

 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS      DUR    Md
PHP  SZ IPG       0401 07.10
PHP  SE ISG       0401 09.35



 Y   M   D   HM   Sec     Lat     Long   Dep  Net Nr Rms Mag    Epicenter

2013 2  19 1818  09.18
GAP=                          hor.err=km          ver.err=KM

 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS      DUR    Md
PUK  SZ IPG       1818 09.18
PUK  SE ISG       1818 14.61



 Y   M   D   HM   Sec     Lat     Long   Dep  Net Nr Rms Mag    Epicenter

2013 2  20 0132  19.93  39.58    20.68  2    ASN 7  0.5 3.2     GREECE
GAP=297                       hor.err=2km        ver.err=4KM

 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS      DUR    Md
SRN  SZ IPN       0132 27.89    299      0.1       66       46     3.1
SRN  SE ISN       0132 28.59    299     -0.1       66
TPE  SZ IPN       0132 33.90    324      0.1       97       39     3
TPE  SE ISN       0132 47.73    324     -0.1       97
VLO  SZ IPN       0132 42.43    315      0.2       140      44     3.2
VLO  SE ISN       0133 01.73    315     -0.3       140
TIR  SZ IPN       0132 51.91    341     -0.2       206      48     3.3
TIR  SE ISN       0133 18.59    341     -0.2       206
PHP  SZ IPN       0132 56.84    356      0.2       233      58     3.5
PHP  SE ISN       0133 27.20    356      0.3       233
PUK  SZ IPN       0133 01.48    347     -0.3       280      58     3.5
PUK  SE ISN       0133 38.69    347     -0.2       280
BCI  SZ IPN       0133 01.89    352     -0.2       312



 Y   M   D   HM   Sec     Lat     Long   Dep  Net Nr Rms Mag    Epicenter

2013 2  21 0646  12.30  41.46    20.97  7    ASN 4  0.1 2.7     MACEDONI
GAP=191                       hor.err=4Km        ver.err=3Km

 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS      DUR    Md
PHP  SZ IPG       0646 22.72    300      0.1       50       23     2.6
PHP  SE ISG       0646 28.96    300      0.1       50
FNA  SZ IPG       0646 27.57    255     -0.1       83
FNA  SE ISG       0646 36.28    255     -0.1       83
PUK  SZ IPG       0646 31.56    307      0.1       120      31     2.9
```

```
PUK   SE ISG        0646 45.84       307          -0.1       120
BCI   SZ IPG        0646 37.90       324          -0.1       125        35       3.1
BCI   SE ISG        0646 53.48       324          -0.1       125
```

```
    Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr  Rms  Mag      Epicenter

  2013 2   21  2251 08.14    41.47    20.43   6      ASN  4   0.1  2.6      LUBALESH
    GAP=164                     hor.err=1Km         ver.err=2Km          DIBER

   STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS       DUR    Md
PHP   SZ IPG        2251 14.12       359          0.0        31        32       2.9
PHP   SE ISG        2251 19.36       359          0.1        31
TIR   SZ IPG        2251 18.97       264          0.1        49        35       3
TIR   SE ISG        2251 25.48       264          0.1        49
PUK   SZ IPG        2251 23.35       327          0.0        85        35       3
PUK   SE ISG        2251 34.69       327          0.1        85
BCI   SZ IPG        2251 28.69       344          0.1        112
BCI   SE ISG        2251 43.15       344          0.1        112
```

```
    Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr  Rms  Mag      Epicenter

  2013 2   22  1903  32.05    40.09    19.77   9      ASN  3   0.1  2.3      QEPARO
    GAP=215                     hor.err=1Km         ver.err=4Km          SARANDE

   STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS       DUR    Md
TPE   SZ IPG        1903 38.25       40           -0.1       30        17       2.2
TPE   SE ISG        1903 41.90       40           0.1        30
SRN   SZ IPG        1903 37.78       140          0.1        31        19       2.3
SRN   SE ISG        1903 42.71       140          0.1        31
IGT   SZ IPG        1903 45.71       142          0.1        77
IGT   SE ISG        1903 56.27       142          0.1        77
```

```
    Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr  Rms  Mag      Epicenter

  2013 2   23  2152  48.15    40.16    19.73   7      ASN  3   0.1  2.6      HIMARE
    GAP=274                     hor.err=1Km         ver.err=2Km

   STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS       DUR    Md
TPE   SZ IPG        2152 54.50       58           0.1        27        24       2.6
TPE   SE ISG        2152 57.87       58           0.0        27
SRN   SZ IPG        2152 55.96       144          0.1        39        24       2.6
SRN   SE ISG        2153 01.62       144          0.0        39
IGT   SZ IPG        2153 04.11       143          0.1        87
IGT   SE ISG        2153 16.81       143          0.0        87
```

```
    Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr  Rms  Mag      Epicenter
```

```
 2013 2  24 0017  33.68    40.06    19.71  7    ASN 3  0.1 2.5      HIMARE
 GAP=276                    hor.err=1Km         ver.err=1Km
```

```
 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS     DUR    Md
TPE  SZ IPG      0017 39.18    59       -0.1      28      19     2.4
TPE  SE ISG      0017 43.40    59       -0.1      28
SRN  SZ IPG      0017 41.19    142       0.0      40      26     2.7
SRN  SE ISG      0017 46.68    142      -0.1      40
IGT  SZ IPG      0017 49.52    143       0.0      88
IGT  SE ISG      0018 00.92    143       0.0      88
```

```
 Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr Rms Mag     Epicenter
```

```
 2013 2  24 0312  58.16    39.53    20.49  9    ASN 4  0.2 3      GREECE
 GAP=295                    hor.err=1Km         ver.err=2Km
```

```
 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS     DUR    Md
IGT  SZ IPG      0313 07.81    279       0.1      6
IGT  SE ISG      0313 15.02    279      -0.1      6
SRN  SZ IPG      0313 11.11    319      -0.1      52      32     3
SRN  SE ISG      0313 20.28    319       0.1      52
TPE  SZ IPG      0313 19.35    339       0.1      92      32     3
TPE  SE ISG      0313 28.55    339      -0.1      92
FNA  SZ IPN      0313 22.35    32        0.1      162
FNA  SE ISN      0313 40.29    32       -0.1      162
```

```
 Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr Rms Mag     Epicenter
```

```
 2013 2  26 0108 24.01    41.50    19.52  11   ASN 3  0.1 2.3  GJIRI LALEZ
 GAP=266                    hor.err=2Km         ver.err=2Km
```

```
 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS     DUR    Md
TIR  SZ IPG      0108 30.35    120       0.0      33      15     2.1
TIR  SE ISG      0108 35.53    120       0.0      33
PUK  SZ IPG      0108 36.14    26        0.0      67      19     2.4
PUK  SE ISG      0108 45.98    26        0.1      67
PHP  SZ IPG      0108 37.76    74        0.1      79      19     2.4
PHP  SE ISG      0108 48.67    74        0.1      79
```

```
 ***
 Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr Rms Mag     Epicenter
```

```
 2013 2  25 0809  27.12    41.14    19.50  25   ASN 6  0.1 3.3   HAJDARAJ
 GAP=171                    hor.err=1Km         ver.err=1Km          KAVAJE
```

```
 STAT SP IPHASW D HRMM SECON    AZIMU    RES       DIS     DUR    Md
```

```
TIR   SZ IPG        0809 34.92     52           0.0      37       30      3
TIR   SE ISG        0809 41.35     52          -0.1      37
VLO   SZ IPG        0809 40.61     181          0.0      75       40      3.3
VLO   SE ISG        0809 51.71     181          0.0      75
PHP   SZ IPG        0809 44.78     54           0.0      98       35      3.2
PHP   SE ISG        0809 58.37     54           0.1      98
TPE   SZ IPG        0809 46.64     155          0.0      103      41      3.4
TPE   SE ISG        0810 00.02     155         -0.1      103
BCI   SZ IPG        0809 51.65     18           0.0      143
BCI   SE ISG        0810 11.13     18           0.1      143
SRN   SZ IPG        0809 52.89     163          0.1      143
SRN   SE ISG        0810 12.79     163         -0.2      146
```

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	27	0152	00.24	40.80	21.66	7	ASN	3	0.2	2.8	GREECE

GAP=142   hor.err=2Km   ver.err=4Km

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPN		0152	24.47	314	0.1	142	32	2.9
PHP	SE	ISN		0152	43.22	314	0.1	142		
PUK	SZ	IPN		0152	31.44	235	0.1	175	29	2.8
PUK	SE	ISN		0152	52.78	235	-0.2	175		
PUK	SZ	IPN		0152	34.97	315	-0.2	202	39	3.1
PUK	SE	ISN		0153	02.06	315	-0.2	202		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	27	0214	42.03	41.41	20.34	6	ASN	3	0.1	2.5	OKSHTUNI

GAP=245   hor.err=0Km   ver.err=1Km   DIBER

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
PHP	SZ	IPG		0214	48.04	15	0.0	31	19	2.4
PHP	SE	ISG		0214	52.01	15	0.1	31		
TIR	SZ	IPG		0214	49.56	280	0.0	40	20	2.5
TIR	SE	ISG		0214	55.32	280	0.1	40		
PUK	SZ	IPG		0214	55.49	332	0.0	79	28	2.8
PUK	SE	ISG		0215	07.11	332	0.0	79		

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	27	1156	01.25	42.03	19.73	15	ASN	4	0.1	2.7	PUKE

GAP=164   hor.err=0Km   ver.err=1Km

STAT	SP	IPHASW	D	HRMM	SECON	AZIMU	RES	DIS	DUR	Md
BCI	SZ	IPG		1156	10.05	36	0.0	46	25	2.7
BCI	SE	ISG		1156	16.14	36	-0.1	46		

```
PHP   SZ IPG        1156 14.30      123           0.0      70        26      2.7
PHP   SE ISG        1156 23.51      123           0.1      70
TIR   SZ IPG        1156 14.84      171           0.0      77        26      2.7
TIR   SE ISG        1156 25.60      171          -0.1      77
FNA   SZ IPN        1156 34.25      134           0.1     196
FNA   SE ISN        1156 59.15      134          -0.1     196
```

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	27	2207	16.54	36.58	20.48	10	ASN	3	0.6	4.3	GREECE

GAP=265   hor.err=3Km   ver.err=25Km

```
 STAT SP IPHASW D HRMM SECON     AZIMU       RES         DIS      DUR    Md
SRN   SZ IPN        1156 10.05    36           0.0      46        25      2.7
SRN   SE ISN        1156 16.14    36          -0.1      46
IGT   SZ IPN        1156 14.30    123          0.0      70        26      2.7
IGT   SE ISN        1156 23.51    123          0.1      70
FNA   SZ IPN        1156 14.84    171          0.0      77        26      2.7
FNA   SE ISN        1156 25.60    171         -0.1      77
```

Y	M	D	HM	Sec	Lat	Long	Dep	Net	Nr	Rms	Mag	Epicenter
2013	2	28	2040	23.96	40.70	19.61	2	ASN	6	0.1	3.0	FIER

GAP=141   hor.err=0Km   ver.err=2Km

```
 STAT SP IPHASW D HRMM SECON     AZIMU       RES         DIS      DUR    Md
VLO   SZ IPG        2040 29.82    203          0.0      28        41      3
VLO   SE ISG        2040 33.87    203          0.0      28
TPE   SZ IPG        2040 32.14    143          0.1      56        43      3.1
TPE   SE ISG        2040 43.26    143         -0.1      56
TIR   SZ IPG        2040 37.45    16           0.0      74        60      3.3
TIR   SE ISG        2040 48.95    16           0.1      74
SRN   SZ IPG        2040 40.01    160          0.0      96        44      3.1
SRN   SE ISG        2040 55.83    160         -0.1      96
PHP   SZ IPN        2040 46.07    32           0.1     129        36      3
PHP   SE ISN        2041 05.48    32           0.1     129
BCI   SZ IPN        2041 20.60    11           0.1     188
BCI   SE ISN        2041 55.75    11           0.1     188
```

TERMETE TE LARGETA (LONG DISTANT EARTHQUAKE)

```
   Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr Rms  Mag      Epicenter

  2013  2    2   1429   12.41   42.80     14.27           5        6.8    HOKAIDO
 JAPONI
  GAP=                              hor.err=km          ver.err=KM

  STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS      DUR     Md
 PHP   SZ IP        1429 42.21
 TIR   SZ IP        1429 40.88
 PHP   SZ IP        1429 44.56
 SRN   SZ IP        1429 50.23
 VLO   SZ IP        1429 50.10


   Y    M    D    HM    Sec      Lat      Long    Dep   Net  Nr Rms  Mag      Epicenter

  2013  2    6   0131   47.26                            7        8.0   SANTA CRUIZ
  GAP=                              hor.err=km          ver.err=KM

  STAT SP IPHASW D HRMM SECON      AZIMU      RES        DIS      DUR     Md
 VLO   SZ IP        0131 53.95
 TPE   SZ IP        0131 55.20
 SRN   SZ IP        0132 07.20
 TIR   SZ IP        0132 17.35
 PHP   SZ IP        0132 01.11
 PUK   SZ IP        0132 12.03
 BCI   SZ IP        0132 16.01
```

PËRSHKRIM MAKROSIZMIK I TËRMETEVE TË NDJESHME NË VENDIN TONË

MACROSEISMIC DESCRIPTION OF EARTHQUAKES FELT IN OUR COUNTR

Intensiteti i tërmetitnëepiqendër I_0ështëpërcaktuarme formulën$I_0=\frac{M-1}{6}$.Intensiteti I nëqyteteështë

përcaktuarngainformacioni i marrëmbindjeshmerinë e tërmetitngaemergjencatcivilesidheburimetëtjera.

The epicentral Intensity of earthquake I_0 is determined by the formula $I_0= \frac{M-1}{6}$. The felt

informacion of earthquakes in inhebitance zones provide by civil emergencies and other source is used to determine the Intensity I.

Nr	D a t a (D a t e)	Kohëndodhja (Origin time)	Epiqendradhe të dhënamakrosizmike EMS-98 (Epicenter and macroseismic data EMS-98)
1	2.02.2013	18:59:27.4	Epiqendra: 41.90V; 20.19L nëfshatinKlos24 km nëJ-PtëqytetitKukesit. Intensiteti i tërmetitnëepiqendër I_0=IVballe Ndjerë: III-IVballë ne qytetin e BurrelitdheIIIballë nëqytetin e Pukes, Kukesit (Epicentre: 41.90N; 20.19P in Klos village, S-W of Kukesi town. Epicentral Intensity I_0=IV Felt: III-IV at Burreli city and III at Puka, Kukesi town)
2	5.02.2013	09:05:26.8	Epiqendra: 40.70V; 19.95L nëqytetin e Beratit. Intensiteti i tërmetitnëepiqender I_0=IVballë Ndjerë: IV nëqytetin e Beratit, Kucovesdhe III nëqytetin e Rroskovecit (Epicentre: 40.70N; 19.95E in Beratitown. Epicentral Intensity I_0= IV Felt: IV at Berati, Kucovatowns and IV at Rroskoveci town)
3	09.02.2013	12:37:15.10	Epiqendra: 41.47V; 19.64L,ne fshatin MazheVore. Tirane. Intensiteti i tërmetit në epiqender I_0=IV ballë Ndjerë: IVVore dhe III-IV ne qytetin e Tiranes.

			(Epicentre: 41.47N; 19.64Ein Mazhe village, Vore, Tirane. Epicentral Intensity I_0= IV Felt: IV at villages near Vora town and III-IV Tirana town)
4	12.02.2013	11:06:19.70	Epiqendra: 40.94V; 20.77L, ne perendim te qytetit te Pogradecitfshatin. Intensiteti i tërmetit në epiqender I_0=IV ballë Ndjerë: III-IVne qytetin e Pogradecit. (Epicentre: 40. 94N; 20.77E in Pogradeci town. Epicentral Intensity I_0= IV Felt: III-IV at Pogradeci town)
5	25.02.2013	08:09:15.40	Epiqendra: 41.14V; 19.50L, ne fshatin Hajdaraj 7 km ne J-P tëqytetit Kavajes. Intensiteti i tërmetit në epiqender I_0=IV ballë Ndjerë: III-IV ballene qytetin e Kavajes. (Epicentre: : 41.14N; 19.50E in Hajdaraj village, 7 km in S-W of Kavaja town. Epicentral Intensity I_0=I V Felt:III- IV at Kavajatown)

KATALOGU I TËRMETEVE MUJORE (THE MONTHLY EARTHQUAKE CATALOG)

Data		KohaGjer.	Gjat	Thell.	Nr. St.	Gab	Mag.	Vendndodhja
Date		Time	Lat	Long.Depth	N0.St	Rms		Location
vvvv/mm/dd		*hh:mm:ss*		*(km)*			*(MD)*	
2013 2	2	1859	27. 49	41. 90	20. 19	23	5	0.4 3.5	KLOS BURREL-ALBANIA
2013 2	3	0337	22. 84	43. 22	18. 86	10	3	0.3 3.6	MONTENEGRO
2013 2	3	1200	58. 00	43. 13	18. 54	3	3	0.4 4.0	BOSNJE
2013 2	4	0429	53. 00	42. 26	16. 89	7	4	0.4 4.2	KROACIA
2013 2	5	0905	26. 58	40. 70	19. 86	3	6	0.2 3.4	BERAT-ALBANIA
2013 2	9	1237	00. 82	41. 47	19. 64	12	6	0.3 3.5	VORE-ALBANIA
2013 2	9	1313	48. 93	40. 45	21. 01	5	7	0.4 3.0	GREECE
2013 2	9	2356	58. 70	41. 15	20. 16	10	6	0.4 2.8	ELBASAN-ALBANIA
2013 2	12	1106	37. 74	40. 94	20. 77	6	5	0.2 3.5	POGRADEC-ALBANIA
2013 2	13	0207	15. 03	42. 38	19. 84	6	4	0.1 3.4	THETH, B. CURRI-ALBANIA
2013 2	13	0626	41. 05	40. 95	20. 68	5	6	0.1 2.7	POGRADECIT-ALBANIA
2013 2	14	0239	17. 07	40. 05	20. 56	25	7	0.1 3.0	LESKOVIKUT-ALBANIA
2013 2	14	0930	08. 65	41. 19	20. 05	22	3	0.1 2.6	ELBASAN-ALBANIA
2013 2	15	1144	0322	41. 91	20. 32	20	4	0.1 3.4	VRRIN, KUKES-ALBANIA

2013	2	16	1046	49.88	40.59	19.77	12	6	0.2	3.3	BALLESH–ALBANIA
2013	2	17	0312	56.83	37.87	21.42	15	7	0.4	4.9	GREECE
2013	2	17	0542	13.73	37.63	21.66	17	6	0.6	4.9	GREECE
2013	2	17	1206	47.20	40.82	21.32	2	5	0.6	3.7	GREECE
2013	2	17	1648	45.46	40.81	21.56	10	7	0.5	4.4	GREECE
2013	2	18	0359	41.92	41.61	20.29	2	4	0.1	2.6	SELISHTE, PESHKOPI–ALBANIA
2013	2	17	1693	19.93	39.58	20.68	2	7	0.5	3.2	GREECE
2013	2	21	0646	12.30	41.46	20.97	7	4	0.1	2.7	MACEDONI
2013	2	21	2251	08.14	41.47	20.43	6	4	0.1	2.6	LUBALESH, DIBER–ALBANIA
2013	2	22	1903	32.05	40.09	19.77	9	3	0.1	2.3	QEPARO, SARANDE–ALBANIA
2013	2	22	1903	32.05	40.09	19.77	9	3	0.1	2.3	QEPARO, SARANDE–ALBANIA
2013	2	23	2152	48.15	40.16	19.73	7	3	0.1	2.6	HIMARE–ALBANIA
2013	2	24	0017	33.68	40.06	19.71	7	3	0.1	2.5	HIMARE–ALBANIA
2013	2	24	0312	58.16	39.53	20.49	9	4	0.2	3	GREECE
2013	2	25	0108	24.01	41.50	19.52	11	3	0.1	2.3	DURRES–ALBANIA
2013	2	25	0809	27.12	41.14	19.50	25	6	0.1	3.3	HAJDARAJ, KAVAJE–ALBANIA
2013	2	27	0152	00.24	40.80	21.66	7	3	0.2	2.8	GREECE
2013	2	27	0214	42.03	41.41	20.34	6	3	0.1	2.5	OKSHTUNI, DIBER–ALBANIA
2013	2	27	1156	01.25	42.03	19.73	15	4	0.1	2.7	PUKE–ALBANIA
2013	2	27	2207	16.54	36.58	20.48	10	3	0.6	4.3	GREECE
2013	2	28	2040	23.96	40.70	19.61	2	6	0.1	2.0	FIER–ALBANIA

STATISTIKA E NGJARJEVE SIZMIKE (STATISTICS OF SEISMIC EVENTS)

Karakteristikat e pergjithshme (General Characteristics)	Vlerat (Data values)
➤ *Ngjarje sizmike të ndodhura në kuadratin (39-43 V; 18.5-21.5 L)* **Events occured within quandrant**	27
➤ *Ngjarje sizmike të ndodhura brenda kufijve shtetërore* **Events occured inside state boundaries**	21
➤ *Thellësia mesatare e ngjarjeve sizmike* **Mean hypocenter depth**	10
➤ *Thellësia maksimale* **Maximum hypocenter depth**	25
➤ *Magnituda lokale minimale e regjistruar* **Minimum recorded local magnitude**	2.0
➤ *Magnituda lokale maksimale e regjistruar* **Maximum recorded local magnitude**	3.7
➤ *Intensiteti sizmik maksimal ne epiqendër* **Maximum seismic intensity**	IV-V
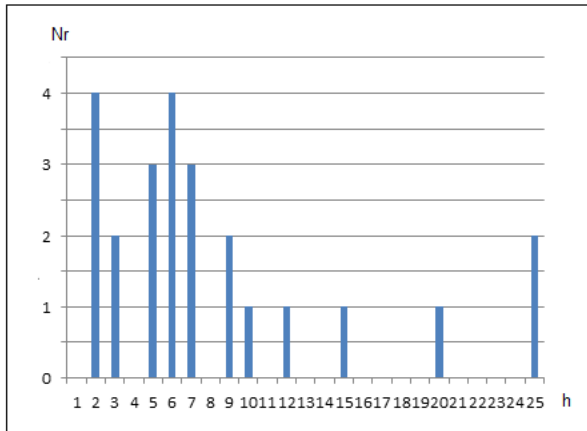
Grafiku i shpërndarjes së numurit të ngjarjeve sizmike mujore në vartesi të thellësisë (djathtas) magnitudës (majtas)
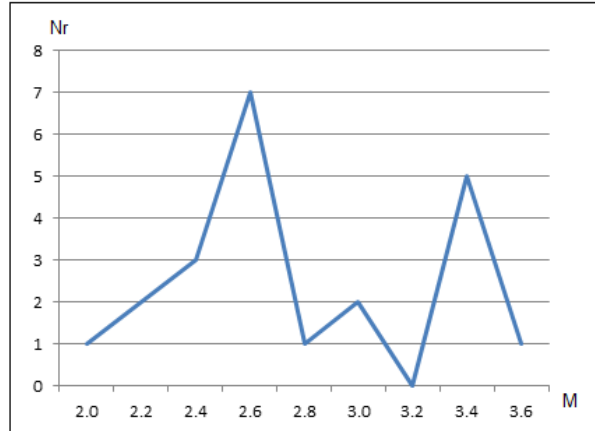
Distribution graphic of monthly seismic event number according to depth (right) magnitude (left)

Zgjidhja e mekanizmit vatror (ZMV)

Për zgjidhjen e mekanizmit të vatres janë përdorur polaritetet e hyrjeve të para P (Pg/Pn), të përcaktuara mbi format valore që shprehin funksionin kohor të burimit sizmik perkatës, në fushën e shpejtësisë. Janë përdorur regjistrimet në bandë të gjere frekuenciale (0.2 – 30 Hz), të cilat janë modeluar nëpermjet filtrave band-pass: 1.0-5.0 Hz, 2.0-10 Hz dhe 0.1-3.0 Hz. Për të arritur zgjidhjen optimale janë përdorur edhe raporti i amplitudave të valëve volumore AMPSg/AMPPg, (AMPSn/AMPPn), të cilat janë lexuar mbi komponentet e transformuara nga sistemi koordinativ gjeografik në atë sferik (vertikal, radial dhe transversal).

Eshtë realizuar një kerkim në rrjetin koordinativ me interval 5.0 – 10 grad, duke vendosur kriteret për gabimin në polaritetet e përdorura.
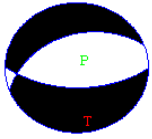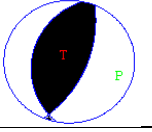
Focal Mechanism Solution (FMS)

For focal mechanism solution, the first onset polarity of P (Pg/Pn) are used, picked on the source time function respective waveforms. This is done for the velocity field recordings. Broadband recordings are used within the frequency range 0.2-30 Hz, witch are modeled by band-pass filtering in the ranges: 1.0-5.0 Hz, used. These amplitudes are red on rotated and corrected components, from the geographic system to the spherical one2.0-10 Hz and 0.1-3.0Hz. To achieve the optimum solution also the amplitude ratio of the type AMPSg/AMPPg, (AMPSn/AMPPn), are used.These amplitudes are red on rotated and corrected components, from the geographic system to the spherical one (vertical, radial and transversal).

A grid search at the 5.0-10 degree was realised

Për zgjidhjen përfundimtare është përdorur programi FOCMEC (Snoke. et al., 1984), ndërsa për të

optimizuar zgjidhjen është përdorur programi HASH (Hardebeck & Shearer, 2003).

Focmec programe has been used (Snoke. et al., 1984). Whereas, to optimize the solution HASHroutine(Hardebeck& Shearer, 2003), has been

applied as well.

Identifikimi i ngjarjes (Event ID)	Parametrat e burimit (Source paremeters)	Magnituda (Magnitude)	Parametrat e Mekanizmit (Focal Mechanism parameters)	Tipi (Focal Type)
2013.02.02.1859	41.90 (N) 20.19 (E) 23 (km)	3.5	P1: 91, 56, 78 P2: 250, 36, -107 T: 172, 10 P: 37, 76	
2013.02.05.0905	40.70 (N) 19.86 (E) 3 (km)	3.4	P1: 191, 30, 80 P2: 22, 60, 96 T: 108, 15 P: 307, 74	

Harta e epiqendrave të tërmeteve (The map of earthquake epicenters)