

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

October

2004

Prepared by
The National Centre for Geophysical Research
Bhannes

*P.o.b. : 165432
Ashrafyeh Beirut 1100-2040*

*Tel : +9614-981885
Fax : +9614-981886
Email : geophys@cnrs.edu.lb*

GENERAL BULLETIN INFORMATION

The National Centre for Geophysical Research is a governmental agency established 1975 in Lebanon by the National Council for Scientific Research (CNRS). The mission of the Centre, among other assignments, is the monitoring of seismic activity within the national territory. Currently, the national seismic network is under deployment; it has been officially registered as GRAL, an acronym for Geophysical Research Arrays of Lebanon. Station coordinates and status are given below.

Since 1993, the Centre has been participating in a regional initiative by the UNESCO and the USGS known as RELEMR, i.e. Reducing Earthquake Losses in the Eastern Mediterranean Region.

Within this framework, the Centre routinely contributes to the database set up for this purpose and maintained by the Euro-Mediterranean Seismological Centre (EMSC). For coherence, the Centre has adopted the recommended seismic analysis system SEISAN developed by Jens Havskov and Lars Ottemoller from the University of Bergen, Norway.

The localization program currently used for locating earthquakes is Hypocenter (Lienert et al., 1986). Plane parallel layers are assumed for local and regional events, while the IASPEI travel time tables are used for distant events.

The velocity model used for all local and regional events is the one currently adopted by the RELEMR initiative.

P-wave velocity (km/sec)	depth to top of layer (km)
6.2	0.0
6.8	14.0
8.05	34.0
8.25	50.0
8.5	80.0

Magnitudes are calculated from the coda duration. The coda wave magnitude is estimated via the formula:

$$M_c = 0.08 + 1.63 * \log_{10}(T) + 0.0009 * D.$$

where T is the coda duration (sec) and D is the epicentral distance (km). The coefficients above were adopted at the outset of our Centre in 1980 and thus are still in use for the sake of continuity.

All available coda values are used for magnitude calculations. No station corrections are used for either travel times or magnitudes calculations. The Vp/Vs velocity ratio used in both layered models above is 1.74.

As a general policy, neither depths, nor epicenters, are fixed unless stated otherwise since this might restrict later use of the data. Consequently, some event locations might be unrealistic such as zero depth earthquakes or teleseismic locations off by 1000 km. However, the locations are based on the available data and reflect the localization procedure and the models used.

STATIONS USED

The stations listed below are operated by the National Centre for Geophysical Research. They constitute the basic setup of the National Seismic Network of Lebanon.

However, readings from other cooperating agencies are also used in locating the events and thus more stations may appear in the event lists than in the station list; it is worth mentioning the systematic use of arrival times from the Cypriot seismic network CSS and the Syrian seismic network SNSN in order to constrain events corresponding to an active zone off the Lebanese shorelines.

STATION	LATITUDE	LONGITUDE	HEIGHT(m)	NAME	COMMENTS
BHL	3354.25N	3539.25E	1000	BHANNES	Opened May 1980
HWQ	3416.68N	3556.78E	1161	HAWQA	Opened Jan 2001
MATL	3329.32N	3519.78E	5	MATARIH	Opened Nov 2000
FKH	3414.13N	3624.11E	1170	FAKEHEH	Scheduled 2003
RCY	3329.08N	3549.13E	1360	RACHAYA	Scheduled 2003
DWR	3323.13N	3524.08E	420	DWEIR	Scheduled 2003

MACROSEISMIC DATA

Macroseismic data, if available, are included in the bulletin.

MONTHLY EPICENTER MAPS

Maps will be found on the last page.

ELECTRONIC PUBLICATION

This provisional bulletin will be available for download in pdf format on:
<http://www.cnrs.edu.lb/geophysicalresearch/>

REFERENCES

- Havskov, J. and Ottemoller, L.(2001). SEISAN: The Earthquake Analysis Software. -version 7.2-
Institute of Solid Earth Physics, University of Bergen.
<http://www.ifjf.uib.no/seismo/software/seisan.html>
- Lienert, B.R., Berg, E. and Frazer, L.N.(1986). Hypocenter: An earthquake location method using centered, scaled, and adaptively least squares. Bull. Seism. Soc. Am., 76., pp 771-783.

Abbreviations:

TIME: Origin time in UTC (hr. min. and sec.) or data file onset time if event is not located.

LAT: Latitude of epicenter

LON: Longitude of epicenter

DEPTH: Focal depth in kilometer (trailing F indicates fixed depth)

AGENCY: GRL throughout the bulletin, aka. Geophysical Research Lebanon

MAGNITUDES: Up to 3 different magnitudes can be given followed by type and reporting agency, e.g. 3.1 MC GRL - coda magnitude calculated according to GRL standard parameters.

RMS: Root mean square value of travel time residuals

STAT: Station code

CO: Component; S:short period, L:long period, B:broadband.

DIST: Epicenter distance (km)

AZI: Azimuth from source to station

PHAS: Phase; The first letter characterizes onset E(mergent) or I(mpulsive)

P: Polarity (C for compression, D for dilatation)

HR: Hour

MN: Minute

SECON: Seconds

TRES: Residual (seconds)

CODA: Signal duration in seconds

AMPL: Ground Amplitude ($0.5 \times (\text{peak to peak})$), (nm) at period PERI

PERI: Period where amplitude is measured

BAZ: Back azimuth (station to event)

ARES: Back azimuth residual

VELO: Apparent phase velocity (km/sec)

WT: Weight of phase in the location

*: An asterisk before the phase arrival time implies a potential timing error. If an S phase is read, differential S-P times will be used in the hypocenter location.

October 4 2004 Hour: 13:15 48.0 Lat: 32.99N Lon: 35.14E Depth: 0 Agency: REL Local
 Magnitudes: 3.0MC REL Rms: 1.8 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 MATL SZ57.56 18 IPG 1315 57.79 0.5 1.0
 BHL SZ111.7 25 IPG 1316 3.07 -3.0 1.0
 BHL SE111.7 25 ISG 1316 19.88 0.5 1.0
 HWQ SZ160.8 28 IPG 1316 16.43 2.5 53 1.0
 HWQ SE160.8 28 ISG 1316 32.64 -0.5 1.0

October 5 2004 Hour: 11:12 26.7 Lat: 33.32N Lon: 36.07E Depth: 15 Agency: REL Local
 Magnitudes: 2.9MC REL Rms: 0.3 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ75.27 329 IPG 1112 39.02 0.2 46 207 58 29.0 1.0
 BHL SE75.27 329 ISG 1112 47.75 0.0 1.0
 HWQ SZ106.8 354 IPG 1112 43.67 0.2 1.0
 HWQ SE106.8 354 ISG 1112 55.39 -0.4 1.0

October 5 2004 Hour: 14:23 56.3 Lat: 34.62N Lon: 35.38E Depth: 15 Agency: REL Local
 Magnitudes: 2.8MC REL Rms: 2.8 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ SZ63.90 126 IPG 1424 9.53 2.8 43 70 124 46.8 1.0
 HWQ SE63.90 126 ISG 1424 17.16 2.7 1.0
 BHL SZ82.90 162 IPG 1424 6.68 -2.8 1.0
 BHL SN82.90 162 ISG 1424 16.55 -2.7 1.0

October 5 2004 Hour: 14:48 46.3 Lat: 34.10N Lon: 35.37E Depth: 15 Agency: REL Local
 Magnitudes: 2.7MC REL Rms: 1.4 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ34.42 130 IPG 1448 53.92 1.6 269 -40 35.8 1.0
 BHL SN34.42 130 ISG 1448 58.01 1.2 1.0
 HWQ SZ56.61 70 IPG 1448 54.35 -1.3 37 1.0
 HWQ SE56.61 70 ISG 1449 1.06 -1.5 1.0

October 6 2004 Hour: 9:37 0.7 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ IPG 938 17.03
 HWQ SZ IPG 938 23.91
 BHL SE ISG 938 24.76
 HWQ SE ISG 938 33.73

October 7 2004 Hour: 1: 6 49.0 Agency: REL Regional
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 MATL SZ EPN 1 6 59.15
 BHL SZ EPN 1 6 59.68
 HWQ SZ EPN 1 7 2.19

October 7 2004 Hour: 8:10 1.0 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ IPG 810 51.80
 BHL SN ISG 810 55.67
 HWQ SZ IPG 810 52.51
 HWQ SE ISG 810 57.10

October 8 2004 Hour: 4:10 1.5 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ IPG 410 31.21
 BHL SE ISG 410 35.28
 HWQ SZ IPG 410 31.97
 HWQ SE ISG 410 37.40

October 8 2004 Hour: 14:46 0.2 Lat: 34.19N Lon: 35.47E Depth: 15 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	36.17	153	IPG		1446	6.97	0.5	45			299	-32	41.2	1.0
BHL	SE	36.17	153	ISG		1446	11.29	0.1							1.0
HWQ	SZ	44.49	78	IPG		1446	7.56	-0.1							1.0
HWQ	SE	44.49	78	ISG		1446	12.84	-0.5							1.0

October 8 2004 Hour: 16: 8 3.1 Lat: 33.90N Lon: 36.80E Depth: 15 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	89.28	298	IPG		16 8	17.23	0.0	46			1	-99	42.4	1.0
HWQ	SN	89.28	298	ISG		16 8	27.62	-0.1							1.0
BHL	SZ	106.3	270	IPG		16 8	19.99	0.3							1.0
BHL	SN	106.3	270	ISG		16 8	31.78	-0.2							1.0

October 8 2004 Hour: 16:45 10.1 Lat: 33.84N Lon: 35.94E Depth: 15 Agency: REL Local
Magnitudes: 2.2MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	27.36	285	IPG		1645	15.43	0.2	18			173	68	14.6	1.0
BHL	SN	27.36	285	ISG		1645	18.81	-0.2							1.0
HWQ	SZ	48.41	1	IPG		1645	18.67	0.4							1.0
HWQ	SE	48.41	1	ISG		1645	23.85	-0.4							1.0

October 9 2004 Hour: 10:59 1.2 Lat: 33.21N Lon: 35.18E Depth: 0 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	34.08	24	IPG		1059	7.20	0.5							1.0
BHL	SZ	88.84	29	IPG		1059	14.36	-1.2							1.0
BHL	SE	88.84	29	ISG		1059	25.08	-1.0							1.0
HWQ	SZ	138.2	31	IPG		1059	24.15	0.7	68						1.0
HWQ	SN	138.2	31	ISG		1059	41.05	1.1							1.0

October 11 2004 Hour: 15:22 1.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		1522	55.20								
BHL	SZ			IPG		1523	2.64								
HWQ	SN			ISG		1523	1.04								
BHL	SE			ISG		1523	16.03								

October 12 2004 Hour: 14:45 26.1 Lat: 34.18N Lon: 35.57E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	32.01	165	IPG		1445	31.99	0.2	36			257	-88	10.1	1.0
BHL	SE	32.01	165	ISG		1445	35.85	-0.2							1.0
HWQ	SZ	36.45	73	IPG		1445	32.67	0.2							1.0
HWQ	SE	36.45	73	ISG		1445	36.93	-0.2							1.0

October 13 2004 Hour: 12:20 53.8 Lat: 32.87N Lon: 35.21E Depth: 15 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	121.7	20	IPG		1221	12.46	-0.2	52			199	0	36.9	1.0
BHL	SE	121.7	20	ISG		1221	26.33	-0.3							1.0
HWQ	SZ	170.3	23	IPG		1221	20.07	0.2							1.0
HWQ	SE	170.3	23	ISG		1221	39.46	0.3							1.0

October 13 2004 Hour: 13:19 37.0 Lat: 34.67N Lon: 33.96E Depth: 41 Agency: REL Local
Magnitudes: 3.7MC REL Rms: 0.8 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
PHNC	SZ	37.55	10	IPG		1319	45.5	0.2							1.0
CSS	SZ	66.19	299	IPG		1319	48.1	-0.4							1.0
MAMC	SZ	87.79	309	IPG		1319	51.0	0.0							1.0
SZAC	SZ	99.31	276	IPG		1319	52.6	0.1							1.0

ALFC	SZ135.8	294	IPG	1319	56.6	-0.4										1.0
PPCY	SZ149.9	280	IPG	1319	58.7	0.0										1.0
AKMC	SZ154.4	285	IPG	1319	59.6	0.3										1.0
BHL	SZ177.5	118	IPG	1320	0.08	-2.1										1.0
BHL	SN177.5	118	ISG	1320	19.44	-1.4										1.0
MATL	SZ182.0	136	IPG	1320	3.52	0.9										1.0
HWQ	SZ187.4	103	IPG	1320	3.91	0.5	123									1.0
HWQ	SE187.4	103	ISG	1320	24.18	1.2										1.0

October 13 2004 Hour: 15:26 13.4 Lat: 33.67N Lon: 35.68E Depth: 9 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ26.09	355	IPG			1526	17.21	-0.7	39						1.0
BHL	SE26.09	355	ISG			1526	21.46	0.2							1.0
MATL	SZ38.11	238	IPG			1526	19.93	0.2							1.0
HWQ	SZ71.86	20	IPG			1526	25.17	0.1							1.0
HWQ	SE71.86	20	ISG			1526	34.00	0.2							1.0

October 13 2004 Hour: 18:19 46.4 Lat: 33.73N Lon: 35.89E Depth: 13 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 1.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ29.75	312	IPG			1819	50.82	-1.0	31			101	-30	11.0	1.0
BHL	SE29.75	312	ISG			1819	54.39	-1.3							1.0
HWQ	SZ61.40	4	IPG			1819	57.81	1.2							1.0
HWQ	SE61.40	4	ISG			1820	5.28	1.1							1.0

October 14 2004 Hour: 9:33 41.6 Lat: 33.36N Lon: 35.22E Depth: 7 Agency: REL Local
Magnitudes: 3.1MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ73.07	34	IPG			933	53.33	-0.1	65			109	-99	38.1	1.0
BHL	SE73.07	34	ISG			934	0.79	-1.5							1.0
HWQ	SZ122.5	33	IPG			934	2.10	0.7							1.0
HWQ	SE122.5	33	ISG			934	17.00	0.9							1.0

October 16 2004 Hour: 15:28 27.9 Lat: 34.35N Lon: 33.35E Depth: 34 Agency: REL Local
Magnitudes: 4.1MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SZAC	SZ62.06	317	IPG			1528	38.6	0.0							1.0
CSS	SZ68.21	359	IPG			1528	39.1	-0.3							1.0
MAMC	SZ92.12	353	IPG			1528	42.3	-0.1							1.0
PHNC	SZ96.32	41	IPG			1528	43.5	0.6							1.0
PPCY	SZ109.4	303	IPG			1528	44.4	-0.1							1.0
ALFC	SZ112.8	323	IPG			1528	44.7	-0.3							1.0
AKMC	SZ119.7	309	IPG			1528	46.0	0.2							1.0
MATL	SZ206.8	117	IPG			1528	56.82	0.2							1.0
BHL	SZ218.7	102	IPG			1528	57.71	-0.4	236						1.0
BHL	SE218.7	102	ISG			1529	20.13	-0.4							1.0
HWQ	SZ239.6	91	IPG			1529	1.27	0.5							1.0
HWQ	SN239.6	91	ISG			1529	24.99	-0.1							1.0

October 17 2004 Hour: 9:53 4.3 Lat: 33.79N Lon: 35.64E Depth: 13 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ13.00	5	IPG			953	6.66	-0.8							1.0
BHL	SN13.00	5	ISG			953	9.87	0.1							1.0
MATL	SZ43.97	221	IPG			953	12.39	0.7							1.0
HWQ	SZ61.28	27	IPG			953	13.27	-1.2	35						1.0
HWQ	SE61.28	27	ISG			953	23.28	1.3							1.0

October 17 2004 Hour: 14:44 21.0 Lat: 33.54N Lon: 35.47E Depth: 37 Agency: REL Local
 Magnitudes: 2.8MC REL Rms: 0.5 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ43.36 23 IPG 1444 30.36 0.7 42 203 0 19.2 1.0
 BHL SN43.36 23 ISG 1444 35.78 -0.4 1.0
 HWQ SZ92.47 28 IPG 1444 34.99 -0.7 1.0
 HWQ SE92.47 28 ISG 1444 46.85 0.4 1.0

October 18 2004 Hour: 15:3 24.3 Lat: 33.88N Lon: 35.63E Depth: 27 Agency: REL Local
 Magnitudes: 2.5MC REL Rms: 0.2 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ3.430 47 IPG 15 3 29.08 0.3 29 1.0
 BHL SN3.430 47 ISG 15 3 31.97 -0.1 1.0
 MATL SZ51.71 212 IPG 15 3 33.14 -0.2 1.0
 HWQ SZ52.79 34 IPG 15 3 33.85 0.3 1.0
 HWQ SE52.79 34 ISG 15 3 40.16 -0.3 1.0

October 18 2004 Hour: 19:2 0.4 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ IPG 19 3 58.73
 BHL SN ISG 19 4 5.43
 HWQ SZ IPG 19 4 2.46
 HWQ SE ISG 19 4 20.64

October 19 2004 Hour: 10:22 48.0 Lat: 33.99N Lon: 35.51E Depth: 15 Agency: REL Local
 Magnitudes: 2.6MC REL Rms: 0.2 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ16.04 127 IPG 1022 51.72 0.1 36 335 29 7.4 1.0
 BHL SE16.04 127 ISG 1022 54.02 -0.3 1.0
 HWQ SZ51.01 51 IPG 1022 56.41 -0.1 1.0
 HWQ SE51.01 51 ISG 1023 3.11 0.3 1.0

October 21 2004 Hour: 4:42 1.4 Agency: REL Local
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ SZ IPG 443 36.51
 HWQ SE ISG 443 55.04
 BHL SE ISG 443 42.85

October 23 2004 Hour: 12:47 43.4 Lat: 34.17N Lon: 35.51E Depth: 15 Agency: REL Local
 Magnitudes: 2.9MC REL Rms: 0.3 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ32.73 156 IPG 1247 49.75 0.5 52 219 -99 12.7 1.0
 BHL SN32.73 156 ISG 1247 53.66 0.1 1.0
 HWQ SZ41.68 74 IPG 1247 50.49 -0.1 1.0
 HWQ SE41.68 74 ISG 1247 55.44 -0.4 1.0

October 23 2004 Hour: 14:27 49.5 Lat: 33.77N Lon: 35.61E Depth: 33 Agency: REL Local
 Magnitudes: 2.8MC REL Rms: 0.7 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL SZ15.93 16 IPG 1427 54.42 -0.8 43 196 0 37.3 1.0
 BHL SN15.93 16 ISG 1427 59.97 0.5 1.0
 HWQ SZ64.86 29 IPG 1428 1.48 0.8 1.0
 HWQ SN64.86 29 ISG 1428 8.50 -0.5 1.0

October 24 2004 Hour: 1:17 35.4 Lat: 33.30N Lon: 35.29E Depth: 13 Agency: REL Local
 Magnitudes: 2.7MC REL Rms: 1.1 secs
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 MATL SZ21.30 9 IPG 117 40.00 0.5 38 1.0
 BHL SZ75.05 27 IPG 117 46.62 -1.1 1.0
 BHL SN75.05 27 ISG 117 55.42 -1.4 1.0
 HWQ SZ124.3 29 IPG 117 56.05 0.5 1.0
 HWQ SE124.3 29 ISG 118 12.03 1.5 1.0

October 24 2004 Hour: 9:11 57.6 Lat: 33.93N Lon: 35.05E Depth: 0 Agency: REL Local
 Magnitudes: 2.9MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	55.56	152	IPG		912	7.17	0.6							1.0
BHL	SZ	56.25	93	IPG		912	5.36	-1.3	48						1.0
BHL	SN	56.25	93	ISG		912	13.36	0.0							1.0
HWQ	SZ	91.53	65	IPG		912	12.44	0.1							1.0
HWQ	SN	91.53	65	ISG		912	23.88	0.6							1.0

October 24 2004 Hour: 13: 4 1.2 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		13	4	23.95							
BHL	SE			ISG		13	4	46.83							
HWQ	SE			ISG		13	4	31.56							
BHL	SZ			IPG		13	4	32.85							

October 27 2004 Hour: 13:39 27.2 Lat: 34.16N Lon: 35.49E Depth: 15 Agency: REL Local
 Magnitudes: 2.6MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	31.82	152	IPG		1339	33.62	0.8	33			245	-86	21.6	1.0
BHL	SN	31.82	152	ISG		1339	37.42	0.3							1.0
HWQ	SZ	43.81	72	IPG		1339	34.22	-0.4							1.0
HWQ	SN	43.81	72	ISG		1339	39.43	-0.7							1.0

October 27 2004 Hour: 15:47 43.5 Lat: 33.27N Lon: 35.65E Depth: 15 Agency: REL Local
 Magnitudes: 2.7MC REL Rms: 1.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	38.53	309	IPG		1547	51.31	1.2	37						1.0
BHL	SZ	70.34	0	IPG		1547	51.87	-3.0							1.0
BHL	SN	70.34	0	ISG		1548	2.41	-0.9							1.0
HWQ	SZ	115.1	14	IPG		1548	2.57	1.1							1.0
HWQ	SE	115.1	14	ISG		1548	16.33	1.6							1.0

October 29 2004 Hour: 2: 9 22.8 Lat: 36.20N Lon: 34.69E Depth: 16 Agency: REL Regional
 Magnitudes: 3.4MC REL Rms: 5.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	241.8	151	EPN		210	3.87	6.5	76			30	58	22.7	1.0
HWQ	SN	241.8	151	SN		210	26.25	3.3							1.0
BHL	SZ	269.2	161	EPN		2	9	57.42	-3.3						1.0
BHL	SE	269.2	161	SN		210	22.29	-6.5							1.0

October 29 2004 Hour: 3:51 34.9 Lat: 33.15N Lon: 35.58E Depth: 13 Agency: REL Local
 Magnitudes: 3.3MC REL Rms: 0.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	43.97	328	IPG		351	41.86	-0.5							1.0
BHL	SZ	83.56	5	IPG		351	48.03	-0.6	88						1.0
BHL	SE	83.56	5	ISG		351	58.87	0.1							1.0
HWQ	SZ	129.3	15	IPG		351	55.22	-0.7							1.0
HWQ	SE	129.3	15	ISG		352	12.52	1.1							1.0

October 29 2004 Hour: 6:10 9.7 Lat: 33.16N Lon: 35.58E Depth: 6 Agency: REL Local
 Magnitudes: 3.2MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	43.52	328	IPG		610	15.65	-1.2							1.0
BHL	SZ	83.16	5	IPG		610	22.45	-0.8							1.0
BHL	SN	83.16	5	ISG		610	33.70	0.5							1.0
HWQ	SZ	128.9	15	IPG		610	30.13	-0.4	74						1.0
HWQ	SN	128.9	15	ISG		610	47.02	1.0							1.0

October 29 2004 Hour: 13:10 36.2 Lat: 34.13N Lon: 35.40E Depth: 15 Agency: REL Local
 Magnitudes: 2.6MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	34.65	136	IPG		1310	43.48	1.1	32			223	-93	12.9	1.0
BHL	SN	34.65	136	ISG		1310	47.61	0.7							1.0
HWQ	SZ	53.42	72	IPG		1310	44.28	-0.8							1.0
HWQ	SE	53.42	72	ISG		1310	50.63	-1.0							1.0

October 29 2004 Hour: 14:47 52.5 Lat: 33.98N Lon: 35.73E Depth: 15 Agency: REL Local
 Magnitudes: 2.7MC REL Rms: 1.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	11.20	219	IPG		1447	54.38	-1.2	40			263	136	54.0	1.0
BHL	SN	11.20	219	ISG		1447	56.90	-1.0							1.0
HWQ	SZ	38.34	31	IPG		1448	0.12	1.0							1.0
HWQ	SN	38.34	31	ISG		1448	5.41	1.3							1.0

October 29 2004 Hour: 14:55 0.4 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			EPN		1456	20.79								
HWQ	SZ			EPN		1456	22.31								

October 30 2004 Hour: 12:52 12.6 Lat: 34.33N Lon: 35.24E Depth: 15 Agency: REL Local
 Magnitudes: 2.8MC REL Rms: 0.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	61.23	141	IPG		1252	22.62	0.0				203	-99	19.9	1.0
BHL	SN	61.23	141	ISG		1252	29.93	-0.1							1.0
HWQ	SZ	65.35	95	IPG		1252	23.26	0.1	42						1.0
HWQ	SE	65.35	95	ISG		1252	31.02	0.0							1.0

October 31 2004 Hour: 7:22 2.0 Lat: 33.06N Lon: 35.44E Depth: 15 Agency: REL Local
 Magnitudes: 2.9MC REL Rms: 0.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	95.79	12	IPG		722	16.51	-0.6	50			96	-95	97.2	1.0
BHL	SN	95.79	12	ISG		722	27.94	-0.3							1.0
HWQ	SZ	143.0	19	IPG		722	24.13	0.1							1.0
HWQ	SN	143.0	19	ISG		722	41.20	0.8							1.0

Epicentral Map of Lebanon

OCTOBER 2004

