

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

September

2005

Prepared by
The National Centre for Geophysical Research
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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 of 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 location 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 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 coda duration. The coda wave magnitude is estimated via the formula:

$$M_c = 0.08 + 1.63 * \log_{10}(T) + 0.009 * D.$$

where T is the coda duration (sec) and D is the epicentral distance (km). The coefficients were adopted at the beginning of operation 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 since this might restrict later use of the data. As a consequence, some event locations might be unrealistic like zero depth earthquakes or teleseismic locations off by 1000 km. However, the locations are based on the available data and reflect the location procedure and the models used.

STATIONS USED

The stations listed below are operated by the National Centre for Geophysical Research. They form 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 to mention the systematic use of arrival times from the Cypriot seismic network CSS 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.ifjff.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.

September 1 2005 Hour: 14:44 7.4 Lat: 33.65N Lon: 35.51E Depth: 15 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	32	25	IPg		14	4	53.36	0.3	24		183	-21	13.4	1.0
BHL	BN	32	25	ISg		14	4	56.91	-0.4						1.0
HWQ	SZ	81	30	IPg		14	5	0.02	-0.3						1.0
HWQ	SN	81	30	ISg		14	5	10.31	0.4						1.0

September 1 2005 Hour: 16:52 31.6 INDONESIA M=5.5 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1652	57.15								

September 2 2005 Hour: 1:47 0.3 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SE			Sn		148	15.05								
MATL	SZ			EPn		147	57.86								
BHL	SN			Sn		148	21.55								
HWQ	SZ			EPn		147	49.29		90						

September 2 2005 Hour: 7:29 52.9 EASTERN MED SEA M=4.8 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EPn		744	23.26								
BHL	BN			Sn		745	47.28								

September 2 2005 Hour: 10:18 20.3 Lat: 33.38N Lon: 35.34E Depth: 23 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
MATL	SZ	12	356	IPg		1018	24.74	0.4							1.0
BHL	BZ	65	27	IPg		1018	29.93	-1.0	61						1.0
BHL	BN	65	27	ISg		1018	37.91	-1.0							1.0
HWQ	SZ	114	29	IPg		1018	38.43	0.3							1.0
HWQ	SE	114	29	ISg		1018	52.55	1.2							1.0

September 4 2005 Hour: 2:23 53.0 CRETE M=3.5 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EPn		224	8.80								
HWQ	SE			Sn		225	34.19								
BHL	BN			Sn		225	27.97								
HWQ	SZ			EPn		224	12.46								

September 4 2005 Hour: 12:31 0.6 FIJI M=5.6 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1233	20.62								

September 4 2005 Hour: 18:42 59.5 Lat: 33.23N Lon: 35.29E Depth: 30 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.8 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	29	7	IPg		1843	6.33	0.5							1.0
BHL	BZ	82	24	IPg		1843	11.55	-1.3	52						1.0
BHL	BE	82	24	ISg		1843	22.21	-0.5							1.0
HWQ	SZ	131	27	IPg		1843	20.62	0.7							1.0
HWQ	SN	131	27	ISg		1843	35.71	0.7							1.0

September 5 2005 Hour: 0:6 27.6 CELEBES SEA M=6.3 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		010	26.75								
BHL	BZ			EP		010	29.38								

September 5 2005 Hour: 9:54 49.7 Lat: 33.68N Lon: 35.22E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	47	58	IPg		954	57.73	0.2	31			315	76	17.7	1.0
BHL	BE	47	58	ISg		955	3.17	-0.2							1.0
HWQ	SZ	94	45	IPg		955	4.18	-0.3							1.0
HWQ	SN	94	45	ISg		955	15.76	0.3							1.0

September 6 2005 Hour: 1:18 15.6 TAIWAN M=5.9 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		127	36.75								

September 6 2005 Hour: 11:10 41.9 NICOBAR ISLANDS M=5.1 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1120	43.02								

September 6 2005 Hour: 14:54 17.1 Lat: 33.94N Lon: 36.01E Depth: 0 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	33	264	IPg		1454	22.47	0.0	30			84	0	24.0	1.0
BHL	BN	33	264	ISg		1454	26.41	0.0							1.0
HWQ	SZ	38	351	IPg		1454	23.30	0.0							1.0
HWQ	SE	38	351	ISg		1454	27.83	0.0							1.0

September 6 2005 Hour: 16:51 11.3 Lat: 34.39N Lon: 35.24E Depth: 15 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	66	144	IPg		1651	22.01	0.0	38			56	91	45.3	1.0
BHL	BN	66	144	ISg		1651	29.93	-0.1							1.0
HWQ	SZ	67	101	IPg		1651	22.17	0.1							1.0
HWQ	SE	67	101	ISg		1651	30.13	0.1							1.0

September 7 2005 Hour: 8:35 43.8 Lat: 32.06N Lon: 35.57E Depth: 0 Agency: REL Regional
Magnitudes: 3.7MC REL Rms: 1.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	160	352	EPn		836	8.73	-1.0							1.0
BHL	SZ	205	2	EPn		836	14.94	-0.4	121						0.5
BHL	SE	205	2	Sn		836	38.89	0.2							1.0
HWQ	SZ	249	8	EPn		836	20.73	-0.1							1.0
HWQ	SE	249	8	Sn		836	51.48	3.3							1.0

September 7 2005 Hour: 23:39 38.3 Lat: 35.78N Lon: 34.39E Depth: 13 Agency: REL Regional
Magnitudes: 3.6MC REL Rms: 1.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
PHNC	SZ	91	201	IPg		2339	52.10	-1.1							1.0
PHNC	SZ	91	201	ISg		2340	04.60	0.4							1.0
MAMC	SZ	125	238	IPg		2339	58.10	-0.5							1.0
MAMC	SZ	125	238	ISg		2340	15.60	1.9							1.0
CSS	SZ	132	227	IPg		2339	57.70	-1.9							1.0
CSS	SZ	132	227	ISg		2340	15.90	0.5							1.0
ALFC	SZ	176	248	IPg		2340	04.20	-2.6							1.0
ALFC	SZ	176	248	ISg		2340	26.90	-1.0							1.0
SZAC	SZ	177	231	IPg		2340	08.20	1.2							1.0
SZAC	SZ	177	231	ISg		2340	29.20	1.0							1.0
PPCY	SZ	210	243	IPg		2340	13.10	0.8							1.0
HWQ	SZ	219	139	EPn		2340	11.06	0.9	112						1.0
HWQ	SN	219	139	Sn		2340	34.21	0.4							1.0
BHL	SZ	238	150	EPn		2340	13.95	1.4							1.0
BHL	SE	238	150	Sn		2340	34.32	-3.6							1.0
FKH	SZ	251	132	EPn		2340	15.76	1.5							1.0
FKH	SE	251	132	Sn		2340	41.50	0.7							1.0

September 8 2005 Hour: 4:22 14.1 **MOLUCCA SEA** **M=5.7** **Agency: REL Distant**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		423	5.70								

September 8 2005 Hour: 14: 5 27.6 Lat: 34.75N Lon: 36.38E Depth: 0 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.8 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	57	178	IPg		14	5	36.30	-0.5						1.0
FKH	SE	57	178	ISg		14	5	43.84	0.3						1.0
HWQ	SZ	65	217	IPg		14	5	39.38	1.2	47					1.0
HWQ	SE	65	217	ISg		14	5	44.99	-1.0						1.0
BHL	SZ	115	216	IPg		14	5	45.36	-0.7						1.0
BHL	SN	115	216	ISg		14	6	0.48	0.7						1.0

September 9 2005 Hour: 7:27 4.9 **NEW IRELAND** **M=7.6** **Agency: REL Distant**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		745	16.45								

September 9 2005 Hour: 14:43 39.0 Lat: 34.20N Lon: 35.48E Depth: 15 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	36	153	IPg		1443	45.56	0.2	58			320	-12	14.9	1.0
BHL	SE	36	153	ISg		1443	49.90	-0.1							1.0
HWQ	SZ	44	78	IPg		1443	46.56	0.1							1.0
HWQ	SN	44	78	ISg		1443	51.78	-0.2							1.0

September 10 2005 Hour: 17: 7 10.8 **INDONESIA** **M=5.8** **Agency: REL Distant**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		17	8	5.19							

September 11 2005 Hour: 20:42 46.5 Lat: 34.41N Lon: 36.36E Depth: 14 Agency: REL Local
Magnitudes: 2.2MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	20	169	IPg		2042	50.63	0.1	19						1.0
FKH	SN	20	169	ISg		2042	53.50	-0.1							1.0
HWQ	SZ	41	248	IPg		2042	53.46	0.0							1.0
HWQ	SN	41	248	ISg		2042	58.67	0.0							1.0
BHL	SN	86	229	ISg		2043	10.34	0.1							1.0

September 12 2005 Hour: 21:31 24.9 **GREECE-ALBANIA** **M=4.2** **Agency: REL Distant**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		2133	57.84								
FKH	SZ			EP		2133	57.84								

September 14 2005 Hour: 13: 3 58.3 Lat: 33.54N Lon: 35.85E Depth: 0 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 1.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	44	335	IPg		13	4	3.69	-1.7						1.0
BHL	SN	44	335	ISg		13	4	10.72	0.0						1.0
MATL	SZ	49	263	IPg		13	4	7.04	0.9						1.0
HWQ	SZ	82	6	IPg		13	4	11.25	-0.3	74					1.0
HWQ	SN	82	6	ISg		13	4	22.42	1.1						1.0

September 15 2005 Hour: 10:41 10.1 Lat: 34.46N Lon: 36.92E Depth: 0 Agency: REL Local
Magnitudes: 3.1MC REL Rms: 1.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	53	243	IPg		1041	17.88	-0.9	65						1.0
FKH	SE	53	243	ISg		1041	23.09	-2.0							1.0
HWQ	SZ	92	258	IPg		1041	25.67	0.8							1.0
HWQ	SN	92	258	ISg		1041	35.43	-0.4							1.0
BHL	SZ	132	243	IPg		1041	31.47	0.1							1.0
BHL	SN	132	243	ISg		1041	49.50	2.4							1.0

September 15 2005 Hour: 14:56 24.7 Lat: 34.18N Lon: 35.54E Depth: 15 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	33	161	IPg		1456	30.66	0.2	61			341	0	21.7	1.0
BHL	SN	33	161	ISg		1456	34.66	-0.1							1.0
HWQ	SZ	39	74	IPg		1456	31.19	-0.2							1.0
HWQ	SE	39	74	ISg		1456	36.47	0.1							1.0

September 18 2005 Hour: 7:31 18.3 MYANMAR-INDIA M=5.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		735	0.80								
FKH	SZ			EP		734	55.88								

September 20 2005 Hour: 2: 9 23.5 ETHIOPIA M=4.7 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		222	56.56								

September 21 2005 Hour: 2:32 50.8 KURIL ISLANDS M=6.1 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		237	7.14								

September 21 2005 Hour: 9:37 0.7 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SN			ISg		937	43.24								
BHL	SN			ISg		937	41.96								
HWQ	SZ			IPg		937	28.53								

September 22 2005 Hour: 0:18 0.8 TONGA ISLANDS M=5.3 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		027	12.53								

September 22 2005 Hour: 3:13 20.2 ETHIOPIA M=5.0 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		317	27.19								

September 22 2005 Hour: 10:23 0.1 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPg		1023	34.14								
HWQ	SN			ISg		1023	42.91								
BHL	SN			ISg		1023	53.94								

September 22 2005 Hour: 10:51 0.3 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPg		1051	11.98								
HWQ	SZ			IPg		1051	13.53								
BHL	SN			ISg		1051	23.20								
HWQ	SE			ISg		1051	24.35								

September 22 2005 Hour: 11: 2 1.4 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPg		11 2	43.01								
HWQ	SN			ISg		11 2	52.72								
BHL	SN			ISg		11 3	3.26								

September 22 2005 Hour: 11:36 1.1 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPg		1136	28.09								
HWQ	SZ			IPg		1136	28.37								
HWQ	SN			ISg		1136	37.82								

September 22 2005 Hour: 11:44 5.0 Lat: 34.40N Lon: 36.87E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	47	247	IPg		1144	11.81	-0.8	44						1.0
FKH	SN	47	247	ISg		1144	16.88	-1.4							1.0
HWQ	SZ	87	261	IPg		1144	19.43	0.5							1.0
HWQ	SE	87	261	ISg		1144	29.34	0.0							1.0
BHL	SZ	125	244	IPg		1144	25.62	0.4							1.0
BHL	SN	125	244	ISg		1144	41.63	1.4							1.0

September 22 2005 Hour: 13:59 58.8 ETHIOPIA M=4.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		14	3	37.69							

September 22 2005 Hour: 15: 5 0.7 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPg		15	6	2.90							
BHL	SN			ISg		15	6	10.94							
HWQ	SN			ISg		15	6	13.40							

September 22 2005 Hour: 15:52 29.2 Lat: 33.84N Lon: 35.14E Depth: 34 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	43	156	IPg		1552	37.42	-0.1							1.0
BHL	BZ	48	81	IPg		1552	37.84	-0.4	75						1.0
BHL	BE	48	81	ISg		1552	45.22	0.3							1.0
HWQ	SZ	89	57	IPg		1552	44.19	0.5							1.0
HWQ	SE	89	57	ISg		1552	54.08	-0.4							1.0

September 22 2005 Hour: 19:53 21.4 ETHIOPIA M=4.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1956	46.72								

September 22 2005 Hour: 23:25 0.9 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			EPn		2325	42.37								
HWQ	SZ			EPn		2325	51.48								
BHL	SN			Sn		2326	6.03								
HWQ	SE			Sn		2326	18.80								

September 23 2005 Hour: 4:55 43.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		5	2	45.82							

September 23 2005 Hour: 11:20 57.8 Lat: 33.77N Lon: 35.62E Depth: 14 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	16	13	IPg		1121	0.96	-0.3	54			193	0	27.3	1.0
BHL	BN	16	13	ISg		1121	4.01	0.2							1.0
MATL	SZ	41	221	IPg		1121	5.18	0.4							1.0
HWQ	SZ	64	28	IPg		1121	7.49	-0.9	67						1.0
HWQ	SN	64	28	ISg		1121	16.99	0.7							1.0

September 24 2005 Hour: 7: 3 34.9 ETHIOPIA M=5.1 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		7	5	14.41							

September 24 2005 Hour: 9:22 11.7 Lat: 33.98N Lon: 35.49E Depth:158 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 1.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	18	118	IPg		922	33.85	1.7							1.0
BHL	SN	18	118	ISg		922	47.92	0.7							1.0
HWQ	SE	54	52	ISg		922	48.00	-1.0							1.0
MATL	SZ	56	195	IPg		922	31.54	-1.5	47						1.0

September 24 2005 Hour: 9:29 55.9 Lat: 33.93N Lon: 35.38E Depth: 15 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 2.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	26	97	IPg		929	59.37	-1.3	58			265	-11	70.3	1.0
BHL	BN	26	97	ISg		930	4.85	0.6							1.0
MATL	SZ	50	185	IPg		930	6.06	2.0							1.0
HWQ	SZ	65	54	IPg		930	2.90	-3.5							1.0
HWQ	SN	65	54	ISg		930	16.55	2.3							1.0

September 24 2005 Hour: 19:23 43.8 ETHIOPIA M=5.6 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1928	56.74								

September 25 2005 Hour: 0:39 42.6 ETHIOPIA M=5.1 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		042	23.22								

September 25 2005 Hour: 1:13 6.9 ETHIOPIA M=4.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		115	55.18								

September 25 2005 Hour: 10: 5 6.3 ETHIOPIA M=5.0 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		10	7	7.99							

September 25 2005 Hour: 10:29 0.7 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPg		1029	37.89								
HWQ	SN			ISg		1029	51.09								
BHL	SE			ISg		1029	53.22								

September 25 2005 Hour: 11:21 26.2 ETHIOPIA M=5.1 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1124	58.61								

September 25 2005 Hour: 13:10 47.5 VANUATU ISLANDS M=5.7 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1315	3.45								

September 25 2005 Hour: 16:24 7.9 ETHIOPIA M=4.7 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1626	57.56								

September 26 2005 Hour: 2: 5 24.0 PERU M=7.5 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		210	2.18								

September 26 2005 Hour: 14:46 59.7 Lat: 34.20N Lon: 35.46E 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
BHL	SZ	37	150	IPg		1447	6.25	0.1	52			60	89	12.5	1.0
BHL	SN	37	150	ISg		1447	10.69	-0.3							1.0
HWQ	SZ	46	79	IPg		1447	7.60	0.1							1.0
HWQ	SN	46	79	ISg		1447	13.22	0.0							1.0

September 26 2005 Hour: 18:56 52.4 IRAN M=5.1 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EPn		1859	40.18								
HWQ	SZ			EPn		1859	30.88								
BHL	BE			Sn		19 2	15.13								
HWQ	SN			Sn		19 1	56.61								

September 26 2005 Hour: 20:33 31.8 ETHIOPIA M=4.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		2034	55.81								

September 26 2005 Hour: 21:27 14.3 ETHIOPIA M=4.9 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		2129	57.20								

September 26 2005 Hour: 23:55 6.8 ETHIOPIA M=4.5 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		2358	1.52								

September 27 2005 Hour: 13:27 6.6 KERMADec M=5.5 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1327	41.92								

September 28 2005 Hour: 1:48 0.4 GREECE M=4.2 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EPn		148	52.94								
HWQ	SN			Sn		150	11.39								
BHL	SE			Sn		150	8.23								

**September 28 2005 Hour: 15:38 46.4 Lat: 33.78N Lon: 35.91E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 1.7 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	28	301	IPg		1538	48.61	-2.3	45						1.0
BHL	SN	28	301	ISg		1538	54.72	0.5							1.0
HWQ	SZ	56	3	IPg		1538	53.89	-1.6							1.0
HWQ	SN	56	3	ISg		1539	3.93	1.8							1.0
MATL	SZ	63	240	IPg		1538	58.13	1.6							1.0

September 28 2005 Hour: 16:35 3.9 ETHIOPIA M=5.1 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1636	31.31								

**September 29 2005 Hour: 3:28 6.8 Lat: 34.00N Lon: 35.34E Depth: 15 Agency: REL Local
Magnitudes: 2.1MC REL Rms: 0.1 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	31	110	IPg		328	12.44	0.1	16			94	163	17.9	1.0
BHL	BN	31	110	ISg		328	16.33	-0.1							1.0
HWQ	SZ	64	61	IPg		328	17.06	-0.1							1.0
HWQ	SE	64	61	ISg		328	24.94	0.1							1.0

**September 29 2005 Hour: 13:02 27.0 Lat: 34.58N Lon: 37.04E Depth: 0 Agency: REL Local
Magnitudes: 3.3MC REL Rms: 0.9 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	106	252	IPg		13 0	43.27	-0.8	77			81	10	20.3	1.0
HWQ	SN	106	252	ISg		13 0	55.86	-0.9							1.0
BHL	SZ	148	240	IPg		13 0	51.76	0.9							1.0
BHL	SN	148	240	ISg		13 1	9.38	0.8							1.0

September 29 2005 Hour: 13:16 46.0 Lat: 35.03N Lon: 36.26E Depth: 0 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
HWQ	SZ	88	199	IPg		1317	0.52	0.3	58			14	-4	24.9	1.0
HWQ	SE	88	199	ISg		1317	10.29	-0.5							1.0
BHL	SZ	137	204	IPg		1317	7.94	-0.1							1.0
BHL	SE	137	204	ISg		1317	24.59	0.2							1.0

September 29 2005 Hour: 14:33 1.5 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPg		1434	1.16								
BHL	SZ			IPg		1434	0.79								
BHL	SN			ISg		1434	5.11								
HWQ	SN			ISg		1434	6.65								

September 29 2005 Hour: 16: 6 18.8 NEW BRITAIN M=6.0 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		16 9	51.37								

September 29 2005 Hour: 19:29 34.0 Lat: 34.80N Lon: 36.89E Depth: 13 Agency: REL Local
Magnitudes: 3.3MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	104	236	IPg		1929	50.70	-0.3	83						1.0
HWQ	SN	104	236	ISg		1930	3.42	-0.1							1.0
BHL	BZ	151	229	IPg		1929	58.59	0.1				82	34	15.6	1.0
BHL	BN	151	229	ISg		1930	16.83	0.3							1.0

September 29 2005 Hour: 20:26 59.8 Lat: 35.15N Lon: 36.65E Depth: 15 Agency: REL Local
Magnitudes: 3.3MC REL Rms: 0.8 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	116	214	IPg		2027	18.84	1.0							1.0
HWQ	SN	116	214	ISg		2027	30.20	-1.0							1.0
BHL	BZ	165	214	IPg		2027	24.59	-0.5	75			158	125	20.5	1.0
BHL	BN	165	214	ISg		2027	44.31	0.5							1.0

September 29 2005 Hour: 21:50 30.7 Lat: 35.09N Lon: 33.79E Depth: 52 Agency: REL Local
Magnitudes: 3.6MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
PHNC	SZ	24	115	IPg		2150	39.20	0.2							1.0
CSS	SZ	45	251	IPg		2150	39.90	-0.7							1.0
CSS	SZ	45	251	ISg		2150	47.70	-0.2							1.0
MAMC	SZ	53	279	IPg		2150	41.40	0.0							1.0
SZAC	SZ	91	246	IPg		2150	45.90	0.3							1.0
SZAC	SZ	91	246	ISg		2150	57.50	1.0							1.0
ALFC	SZ	109	274	EPg		2150	47.20	-0.5							1.0
ALFC	SZ	109	274	ESg		2151	00.10	-0.1							1.0
AKMC	SZ	134	267	EPg		2150	50.50	-0.1							1.0
PPCY	SZ	134	261	IPg		2150	50.80	0.2							1.0
BHL	SZ	216	127	EPg		2151	0.01	-0.6							1.0
BHL	SN	216	127	ESg		2151	21.59	-1.1							1.0
HWQ	SZ	217	114	EPg		2151	1.32	0.6	113						1.0
HWQ	SN	217	114	ESg		2151	24.23	1.3							1.0
MATL	SZ	227	141	EPg		2151	1.40	-0.5							1.0

September 30 2005 Hour: 1:38 27.9 Lat: 34.87N Lon: 36.79E Depth: 0 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	102	230	IPg		138	43.88	-0.4	72			50	0	22.8	1.0
HWQ	SN	102	230	ISg		138	56.30	-0.2							1.0
BHL	BZ	150	225	IPg		138	52.51	0.4							1.0
BHL	BN	150	225	ISg		139	10.13	0.2							1.0

September 30 2005 Hour: 14:49 13.5 Lat: 33.93N Lon: 36.01E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	34	266	IPg		1449	19.90	0.4	36			95	10	54.0	1.0
BHL	SZ	34	266	ISg		1449	23.88	0.0							1.0
HWQ	SZ	39	351	IPg		1449	20.32	0.0							1.0
HWQ	SE	39	351	ISg		1449	24.99	-0.4							1.0

Epicentral Map of Lebanon

SEPTEMBER 2005

Magnitudes

- Ml = 2
- Ml = 3
- Ml = 4
- Ml = 5

