

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

December

2013

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 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 V_p/V_s 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 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	3414.69N	3624.61E	1152	FAKEHEH	Opened Dec 2004
RCY	3329.79N	3550.14E	1370	RACHAYA	Opened Jun 2006
DWR	3323.13N	3524.08E	420	DWEIR	Scheduled 2003
BEYL	3352.30N	3529.59E	49	BEIRUT	Opened Jul 2006
NAQL	3307.02N	3508.46E	83	NAQOURA	Opened Jul 2008
DQRL	3342.34N	3534.21E	963	DEIR QAMAR	Opened Mar 2010
QRWL	3332.86N	3540.93E	875	QARAOUN	Opened Oct 2011
SHBL	3320.90N	3544.63E	1422	CHEBAA	Opened Oct 2011

REGIONAL AND DISTANT EARTHQUAKES

Because regional events and teleseisms are not localized, but simply identified, EMSC determination data are given along with phase arrivals (in general first arrival) at the stations of our network.

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 is available for download in pdf format on:
<http://www.cnrs.edu.lb/grdownload.html>

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: REL throughout the bulletin, aka. REsearch Lebanon

MAGNITUDES: Up to 3 different magnitudes can be given followed by type and reporting agency, e.g. 3.1 MC REL - coda magnitude calculated according to above mentioned formula.

EMSC: Euro-Mediterranean Seismological Centre.

OT: Origin Time

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 ($0.5 * (\text{peak to peak})$), (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.

December 1 2013 Hour: 10:132.0

Agency: REL Distant

EMSC OT=10:01:32.0 17.58S 178.31W 547Km M=5.4 FIJI REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1020	9.05								
BHL	BZ			EP		1020	8.67								

December 1 2013 Hour: 10:59 41.5 Lat: 33.39N Lon: 35.63E

Depth: 14 Agency: REL Local

Magnitudes: 2.6MC REL

Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	11	114	EP		1059	44.67	0.02							1.0
QRWL	SZ	18	14	EP		1059	45.33	-0.01	32						1.0
QRWL	SN	18	14	ES		1059	48.14	-0.02							1.0
RCY	SZ	22	58	EP		1059	45.83	-0.07							1.0
RCY	SN	22	58	ES		1059	49.19	0.04							1.0
DQRL	SZ	36	350	EP		1059	47.78	0.04							1.0

December 1 2013 Hour: 15:52 8.0 Lat: 33.79N Lon: 35.76E

Depth: 10 Agency: REL Local

Magnitudes: 2.6MC REL

Rms: 0.1 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	16	323	EP		1552	11.05	-0.11	32						1.0
BHL	BN	16	323	ES		1552	13.57	0.03							1.0
DQRL	SZ	20	243	EP		1552	11.66	0.02							1.0
DQRL	SN	20	243	ES		1552	14.39	0.02							1.0
RCY	SZ	33	168	EP		1552	13.58	-0.01							1.0
HWQ	SZ	57	17	EP		1552	17.40	0.05							1.0

December 3 2013 Hour: 8:46 30.8 Lat: 32.76N Lon: 35.66E

Depth: 10 Agency: REL Regional

Magnitudes: 3.1MC REL

Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	65	7	EP		846	41.47	-0.01							1.0
SHBL	BN	65	7	ES		846	49.40	0.00							1.0
RCY	SZ	83	11	EP		846	44.21	0.00	64						1.0
RCY	SN	83	11	ES		846	54.16	0.01							1.0
DQRL	SZ	105	355	EP		846	47.46	0.05							1.0
DQRL	SN	105	355	ES		846	59.71	-0.01							1.0
BHL	BZ	126	360	EP		846	50.55	-0.05							1.0

December 5 2013 Hour: 10:138.8 Lat: 34.07N Lon: 35.65E

Depth: 9 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	18	180	EP		10	1	42.20	-0.00	42					1.0
BHL	BN	18	180	ES		10	1	44.76	0.04						1.0
HWQ	SZ	36	49	EP		10	1	44.90	0.07						1.0
HWQ	SN	36	49	ES		10	1	49.23	-0.06						1.0
DQRL	SZ	41	191	EP		10	1	45.55	-0.06						1.0
DQRL	SE	41	191	ES		10	1	50.64	-0.02						1.0
RCY	SZ	66	165	EP		10	1	49.58	0.06						1.0
RCY	SN	66	165	ES		10	1	57.44	-0.02						1.0

December 6 2013 Hour: 9:30 22.0

Agency: REL Regional

EMSC OT=09:30:22.0 36.11N 31.17E 40Km M=4.1 WESTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		931	27.69								
RCY	SZ			EP		931	30.47								

December 6 2013 Hour: 9:58 49.4 Lat: 33.49N Lon: 35.64E Depth: 15 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.0 secs

SAIDA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	30	EP		958	52.33	0.01	26						1.0
QRWL	SN	8	30	ES		958	54.48	-0.01							1.0
RCY	SZ	18	87	EP		958	53.38	0.00							1.0
SHBL	BZ	18	148	EP		958	53.38	-0.02							1.0
SHBL	BN	18	148	ES		958	56.37	0.01							1.0
DQRL	SZ	25	345	EP		958	54.26	0.06							0.2

December 6 2013 Hour: 16:37 28.0

Agency: REL Regional

EMSC OT=16:37:28.0 35.12N 30.59E 46Km M=4.4 EASTERN MED SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1638	30.63								
DQRL	SZ			EP		1638	31.39								
HWQ	SZ			EP		1638	33.44								
QRWL	SZ			EP		1638	33.75								
RCY	SZ			EP		1638	35.59								

December 7 2013 Hour: 7: 0 41.8

Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		7 3	52.98								
SHBL	BZ			EP		7 3	53.47								
RCY	SZ			EP		7 3	55.10								

December 7 2013 Hour: 11:22 45.1

Agency: REL Regional

EMSC OT=11:22:45.1 31.43N 35.06E 3Km M=3.5 DEAD SEA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		1123	22.97								
DQRL	SZ			EP		1123	25.25								
BHL	BZ			EP		1123	27.43								
HWQ	SZ			EP		1123	33.49								

December 8 2013 Hour: 17:31 57.0

Agency: REL Regional

EMSC OT=17:31:57.0 36.54N 31.26E 90Km M=4.9 WESTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1733	0.66								
HWQ	SZ			EP		1733	1.48								
DQRL	SZ			EP		1733	3.00								
QRWL	SZ			EP		1733	5.00								
RCY	SZ			EP		1733	6.92								

December 12 2013 Hour: 21: 2 23.0

Agency: REL Regional

EMSC OT=21:02:23.0 31.36N 35.21E 6Km M=3.5 DEAD SEA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		21 3	0.35								
BHL	BZ			EP		21 3	5.89								
HWQ	SZ			EP		21 3	11.25								

December 17 2013 Hour: 12:36 35.8 Lat: 33.47N Lon: 35.67E Depth: 4 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	5	EP		1236	37.30	-0.01	32						1.0
QRWL	SN	8	5	ES		1236	38.47	0.00							1.0
RCY	SZ	15	80	EP		1236	38.36	0.00							1.0
SHBL	BZ	15	155	EP		1236	38.36	-0.02							1.0
SHBL	BN	15	155	ES		1236	40.35	0.02							1.0
DQRL	SZ	28	339	EP		1236	40.28	0.02							1.0

December 17 2013 Hour: 17: 2 0.0

Agency: REL Distant

EMSC OT=17:02:00.0 20.76S 178.69W 584Km M=5.7 FIJI REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1720	35.32								
SHBL	BZ			EP		1720	36.15								

December 17 2013 Hour: 23:37 23.6 Lat: 33.73N Lon: 35.51E

Depth: 6 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.1 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	6	118	EP		2337	25.06	-0.08	42						1.0
DQRL	SN	6	118	ES		2337	26.37	0.06							1.0
BEYL	BZ	16	354	EP		2337	25.77	-0.52							0.2
BHL	BZ	23	35	EP		2337	27.57	0.05							1.0
BHL	BN	23	35	ES		2337	30.41	-0.02							1.0
QRWL	SZ	26	142	EP		2337	27.80	-0.12							1.0
QRWL	SN	26	142	ES		2337	31.15	0.01							1.0
RCY	SZ	40	131	EP		2337	30.10	-0.04							1.0
RCY	SN	40	131	ES		2337	35.03	0.03							1.0
HWQ	SZ	73	34	EP		2337	35.42	0.05							1.0

December 18 2013 Hour: 0:26 35.7 Lat: 33.80N Lon: 35.79E

Depth: 15 Agency: REL Local

Magnitudes: 2.5MC REL

Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	18	313	EP		026	39.53	0.00	31						1.0
DQRL	SZ	23	244	EP		026	40.23	0.03							1.0
DQRL	SN	23	244	ES		026	43.51	-0.02							1.0
RCY	SZ	34	173	EP		026	41.66	-0.02							1.0
RCY	SN	34	173	ES		026	46.11	0.01							1.0
HWQ	SZ	55	15	EP		026	44.85	-0.00							1.0

December 18 2013 Hour: 10:40 2.0 Lat: 33.80N Lon: 35.79E

Depth: 14 Agency: REL Local

Magnitudes: 2.6MC REL

Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	312	EP		1040	5.67	-0.01	35						1.0
BHL	BE	17	312	ES		1040	8.39	-0.01							1.0
DQRL	SZ	23	242	EP		1040	6.42	-0.05							1.0
DQRL	SN	23	242	ES		1040	9.81	0.05							1.0
RCY	SZ	34	173	EP		1040	8.07	-0.03							1.0
RCY	SE	34	173	ES		1040	12.63	0.02							1.0
HWQ	SZ	55	16	EP		1040	11.09	0.04							1.0

December 19 2013 Hour: 2: 3 35.0

Agency: REL Regional

EMSC OT=02:03:35.0 34.94N 28.91E 10Km M=4.2 EASTERN MED SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		2 4	58.04								
BHL	BZ			EP		2 4	59.20								
RCY	SZ			EP		2 5	2.41								
HWQ	SZ			EP		2 5	2.19								

December 19 2013 Hour: 11:49 47.4 Lat: 33.48N Lon: 35.66E

Depth: 12 Agency: REL Local

Magnitudes: 2.5MC REL

Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	16	EP		1149	49.72	-0.05	30						1.0
QRWL	SN	8	16	ES		1149	51.58	0.02							1.0
RCY	SZ	16	84	EP		1149	50.78	0.01							1.0
SHBL	BZ	17	152	EP		1149	50.82	0.00							1.0
SHBL	BN	17	152	ES		1149	53.38	0.00							1.0
DQRL	SZ	26	341	EP		1149	52.10	0.02							1.0

December 19 2013 Hour: 12: 4 27.1 Lat: 33.96N Lon: 35.88E Depth: 9 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	22	254	EP		12 4	30.98	0.01	28						1.0
BHL	BE	22	254	ES		12 4	33.82	-0.02							1.0
DQRL	SZ	40	225	EP		12 4	33.76	-0.00							1.0
DQRL	SE	40	225	ES		12 4	38.70	0.01							1.0
RCY	SZ	51	184	EP		12 4	35.58	0.00							1.0

December 19 2013 Hour: 19:46 36.0 Agency: REL Regional
EMSC OT=19:46:36.0 38.46N 39.63E 15Km M=3.8 EASTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1947	53.96								
BHL	BZ			EP		1948	1.12								
DQRL	SZ			EP		1948	5.05								
QRWL	SZ			EP		1948	4.97								

December 20 2013 Hour: 20: 7 19.0 Lat: 33.06N Lon: 35.62E Depth: 11 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.1 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	52	23	EP		20 7	27.67	-0.05	32						1.0
RCY	SN	52	23	ES		20 7	34.16	0.01							1.0
QRWL	SZ	54	6	EP		20 7	28.00	-0.01							1.0
QRWL	SN	54	6	ES		20 7	34.68	0.03							1.0
DQRL	SZ	72	356	EP		20 7	30.68	-0.05							1.0
DQRL	SE	72	356	ES		20 7	39.33	-0.04							1.0
BHL	BZ	94	2	EP		20 7	34.07	0.12							1.0

December 21 2013 Hour: 13:14 8.8 Lat: 33.47N Lon: 35.69E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	357	EP		1314	10.17	-0.02	45						1.0
RCY	SZ	14	79	EP		1314	11.13	-0.00							1.0
RCY	SN	14	79	ES		1314	12.82	-0.00							1.0
SHBL	BZ	15	159	EP		1314	11.22	-0.03							1.0
SHBL	BN	15	159	ES		1314	13.04	0.01							1.0
DQRL	SZ	28	337	EP		1314	13.41	0.05							1.0
DQRL	SN	28	337	ES		1314	16.68	-0.02							1.0
BHL	BZ	48	356	EP		1314	16.58	0.01							1.0

December 22 2013 Hour: 12: 4 37.7 Lat: 33.45N Lon: 35.64E Depth: 0 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

MOUNT HERMON REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	11	22	EP		12 4	39.42	-0.05	32						1.0
SHBL	BZ	15	139	EP		12 4	40.13	-0.02							1.0
SHBL	BN	15	139	ES		12 4	42.02	0.02							1.0
RCY	SZ	19	76	EP		12 4	40.76	0.01							1.0
RCY	SN	19	76	ES		12 4	43.04	0.00							1.0
DQRL	SZ	29	348	EP		12 4	42.30	0.04							1.0

December 22 2013 Hour: 12:59 52.9 Lat: 33.54N Lon: 35.71E Depth: 0 Agency: REL Local
Magnitudes: 2.3MC REL Rms: 0.0 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	3	291	EP		1259	53.39	-0.05	23						1.0
QRWL	SN	3	291	ES		1259	53.83	0.02							1.0
RCY	SZ	13	112	EP		1259	54.97	-0.03							1.0
RCY	SN	13	112	ES		1259	56.54	0.02							1.0
SHBL	BZ	21	171	EP		1259	56.42	0.01							1.0

DQRL SZ 23 325 EP 1259 56.62 0.02 1.0

December 22 2013 Hour: 14: 4 53.0

Agency: REL Regional

EMSC OT=14:04:53.0 33.82N 32.10E 10Km M=3.3 EASTERN MED SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		14 5	37.71								
QRWL	SZ			EP		14 5	39.62								
RCY	SZ			EP		14 5	41.60								
HWQ	SZ			EP		14 5	42.79								

December 22 2013 Hour: 15:41 33.9 Lat: 33.79N Lon: 35.78E Depth: 4 Agency: REL Local

Magnitudes: 2.5MC REL

Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	318	EP		1541	36.70	-0.05	31						1.0
BHL	BN	17	318	ES		1541	38.92	0.03							1.0
DQRL	SZ	21	244	EP		1541	37.46	0.06							1.0
DQRL	SN	21	244	ES		1541	39.98	-0.04							1.0
RCY	SZ	33	171	EP		1541	39.23	0.00							1.0
HWQ	SZ	56	16	EP		1541	42.99	-0.01							1.0

December 23 2013 Hour: 13:49 11.8 Lat: 33.37N Lon: 35.48E Depth: 16 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.0 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	25	94	EP		1349	16.70	0.01							1.0
SHBL	BN	25	94	ES		1349	20.30	-0.00							1.0
RCY	SZ	36	66	EP		1349	18.24	0.00	41						1.0
DQRL	SZ	39	13	EP		1349	18.57	0.01							1.0
DQRL	SN	39	13	ES		1349	23.55	-0.01							1.0

December 23 2013 Hour: 15: 8 10.2 Lat: 33.49N Lon: 35.60E Depth: 4 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.0 secs

SAIDA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	21	140	EP		15 8	13.69	-0.03							1.0
SHBL	BN	21	140	ES		15 8	16.39	0.04							1.0
RCY	SZ	22	89	EP		15 8	13.84	-0.04	39						1.0
RCY	SN	22	89	ES		15 8	16.62	-0.00							1.0
DQRL	SZ	24	354	EP		15 8	14.02	-0.05							1.0
DQRL	SN	24	354	ES		15 8	16.97	0.01							1.0
BHL	BZ	46	7	EP		15 8	17.68	0.07							1.0

December 24 2013 Hour: 3:32 50.0

Agency: REL Regional

EMSC OT=03:32:50.0 34.85N 26.27E 15Km M=4.6 CRETE, GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		334	39.81								
QRWL	SZ			EP		334	43.71								
RCY	SZ			EP		334	45.91								
HWQ	SZ			EP		334	45.99								

December 24 2013 Hour: 15:17 49.2 Lat: 33.80N Lon: 35.79E Depth: 10 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	314	EP		1517	52.57	0.02	39						1.0
BHL	BN	17	314	ES		1517	55.03	0.01							1.0
DQRL	SZ	22	243	EP		1517	53.31	0.03							1.0
DQRL	SN	22	243	ES		1517	56.27	-0.04							1.0
RCY	SZ	34	172	EP		1517	54.97	0.01							1.0
HWQ	SZ	55	15	EP		1517	58.31	-0.03							1.0

December 25 2013 Hour: 9:24 28.9 Lat: 33.63N Lon: 35.63E Depth: 9 Agency: REL Local
Magnitudes: 2.3MC REL Rms: 0.0 secs

SAIDA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	10	325	EP		924	31.26	0.03							1.0
QRWL	SZ	11	153	EP		924	31.29	-0.03	23						1.0
QRWL	SN	11	153	ES		924	33.10	-0.01							1.0
RCY	SZ	24	129	EP		924	33.25	0.03							1.0
RCY	SN	24	129	ES		924	36.42	0.01							1.0
BHL	BZ	30	4	EP		924	34.03	-0.02							1.0

December 25 2013 Hour: 18:11 36.0

Agency: REL Regional

EMSC OT=18:11:36.0 36.94N 31.06E 91Km M=4.6 WESTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1812	43.76								
HWQ	SZ			EP		1812	44.08								
DQRL	SZ			EP		1812	44.82								
RCY	SZ			EP		1812	50.10								

December 26 2013 Hour: 4:37 12.2 Lat: 33.55N Lon: 35.58E Depth: 6 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.1 secs

SAIDA REGION

Earthquake was felt

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	10	90	EP		437	14.10	-0.06							1.0
DQRL	SZ	18	358	EP		437	15.34	0.09	80						1.0
DQRL	SE	18	358	ES		437	17.54	-0.00							1.0
RCY	SZ	25	103	EP		437	16.38	0.03							1.0
RCY	SN	25	103	ES		437	19.48	0.02							1.0
BEYL	BZ	37	348	EP		437	18.41	0.22							0.2
BHL	BZ	40	10	EP		437	18.70	-0.06							1.0
BHL	BN	40	10	ES		437	23.63	-0.02							1.0
HWQ	SZ	88	23	EP		437	26.48	0.08							0.2

December 26 2013 Hour: 16:40 44.6 Lat: 33.80N Lon: 35.77E Depth: 13 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	16	317	EP		1640	48.05	-0.00	26						1.0
DQRL	SZ	21	241	EP		1640	48.74	0.00							1.0
DQRL	SN	21	241	ES		1640	51.79	0.00							1.0
RCY	SZ	34	170	EP		1640	50.56	-0.04							1.0
RCY	SN	34	170	ES		1640	55.05	0.02							1.0
HWQ	SZ	56	17	EP		1640	53.85	0.01							1.0

December 27 2013 Hour: 0:52 48.8 Lat: 33.94N Lon: 35.64E Depth: 3 Agency: REL Local
Magnitudes: 3.1MC REL Rms: 0.1 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	4	160	EP		052	49.77	0.01	68						1.0
BHL	BE	4	160	ES		052	50.52	0.02							1.0
BEYL	BZ	15	240	EP		052	51.40	0.08							1.0
DQRL	SZ	27	194	EP		052	53.04	-0.11							1.0
DQRL	SN	27	194	ES		052	56.26	-0.13							1.0
HWQ	SZ	47	37	EP		052	56.32	-0.07							1.0
RCY	SZ	53	160	EP		052	57.38	0.10							1.0
RCY	SN	53	160	ES		053	3.58	0.01							1.0

December 27 2013 Hour: 16:58 57.9 Lat: 33.73N Lon: 35.73E Depth: 18 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	15	262	EP		1659	1.80	0.01	27						1.0
BHL	BZ	21	340	EP		1659	2.47	0.03							1.0
BHL	BN	21	340	ES		1659	5.75	-0.03							1.0
RCY	SZ	27	159	EP		1659	3.18	-0.05							1.0
RCY	SN	27	159	ES		1659	7.19	0.03							1.0
HWQ	SZ	64	18	EP		1659	8.58	0.13							0.2

December 28 2013 Hour: 15:21 5.0

Agency: REL Regional

EMSC OT=15:21:05.0 35.96N 31.29E 64Km M=5.9 CYPRUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEYL	BZ			EP		1522	4.73								
BHL	BZ			EP		1522	5.38								
HWQ	BZ			EP		1522	7.36								
DQRL	SZ			EP		1522	7.21								
RCY	SZ			EP		1522	11.26								
SHBL	BZ			EP		1522	11.44								

December 28 2013 Hour: 18:55 4.0

Agency: REL Regional

EMSC OT=18:55:04.0 35.71N 31.40E 48Km M=4.5 CYPRUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1856	3.61								
HWQ	SZ			EP		1856	4.81								
RCY	SZ			EP		1856	8.12								

Epicentral Map of Lebanon

DECEMBER 2013

