

Republic of Lebanon  
National Council for Scientific Research

# Provisional Seismological Bulletin

from the

## NATIONAL SEISMIC NETWORK

January

2016

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](mailto: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  $V_p/V_s$  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	Nov2000-Sep2012
FKH	3414.69N	3624.61E	1152	FAKEHEH	Opened Dec 2004
RCY	3329.79N	3550.14E	1370	RACHAYA	Opened Jun 2006
BEYL	3352.30N	3529.59E	49	BEIRUT	Opened Jul 2006
NAQL	3307.02N	3508.46E	83	NAQOURA	Jul2008-Jan2012
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
ZAHL	3351.48N	3553.12E	1211	ZAHLE	Opened Aug 2015

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

**January 1 2016 Hour: 15: 2 15.1** Agency: REL Distant  
**EMSC OT=15:02:15.1 29.19S 177.05W 35Km M=5.8 KERMADEC ISLANDS, NEW ZEALAND**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 BHL BZ EP 1522 6.98  
 RCY SZ EP 1522 7.58

**January 2 2016 Hour: 4:22 19.0** Agency: REL Distant  
**EMSC OT=04:22:19.0 44.81N 130.01E 586Km M=5.8 HEILONGJIANG, CHINA**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 HWQ SZ EP 432 28.16  
 BHL BZ EP 432 30.33  
 RCY SZ EP 432 31.46

**January 3 2016 Hour: 23: 5 21.3** Agency: REL Distant  
**EMSC OT=23:05:21.3 24.83N 93.63E 50Km M=6.7 MANIPUR, INDIA REGION**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 HWQ BZ EP 2314 14.66  
 RCY SZ EP 2314 16.45  
 SHBL BZ EP 2314 16.90  
 BHL BZ EP 2314 17.23  
 DQRL SZ EP 2314 17.97

**January 4 2016 Hour: 2:58 23.3** Agency: REL Regional  
**EMSC OT=02:58:23.3 36.53N 26.91E 140Km M=3.8 DODECANESE ISLANDS, GREECE**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 BHL BZ EP 3 0 8.11  
 DQRL SZ EP 3 0 8.86  
 RCY SZ EP 3 0 13.71

**January 4 2016 Hour: 23:48 55.3** Agency: REL Regional  
**EMSC OT=23:48:55.3 36.86N 35.45E 7Km M=3.8 CENTRAL TURKEY**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 BHL BZ EP 2349 42.31  
 DQRL SZ EP 2349 44.44  
 RCY SZ EP 2349 48.20

**January 5 2016 Hour: 7:17 18.2 Lat: 34.38N Lon: 33.00E Depth: 31 Agency: REL Regional**  
**Magnitudes: 4.1MC REL Rms: 0.1 secs**  
**CYPRUS REGION**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 BEYL SZ 237 103 EP 717 51.36 0.49 0.2  
 DQRL SZ 249 107 EP 717 52.50 0.04 227 1.0  
 DQRL SN 249 107 ES 718 17.82 0.01 1.0  
 BHL BZ 251 101 EP 717 52.59-0.07 1.0  
 BHL BN 251 101 ES 718 18.11-0.05 1.0  
 HWQ SZ 271 92 EP 717 55.32 0.04 1.0  
 RCY SZ 280 110 EP 717 56.31-0.05 1.0  
 RCY SN 280 110 ES 718 24.65 0.05 1.0

**January 5 2016 Hour: 23:11 49.9** Agency: REL Regional  
**EMSC OT=23:11:49.9 36.53N 26.84E 148Km M=4.4 DODECANESE ISLANDS, GREECE**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 BHL BZ EP 2313 36.50  
 DQRL SZ EP 2313 37.12  
 RCY SZ EP 2313 42.03

**January 7 2016 Hour: 13:10 55.7 Lat: 33.41N Lon: 35.66E Depth: 6 Agency: REL Local**  
**Magnitudes: 2.8MC REL Rms: 0.0 secs**  
**HASBAYA REGION**  
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT  
 SHBL BZ 10 130 EP 1310 57.83 0.02 1.0  
 RCY SZ 19 59 EP 1310 58.96-0.10 43 1.0  
 RCY SE 19 59 ES 1311 1.57 0.04 1.0

DQRL	SZ	34	346	EP		1311	1.35	0.03									1.0
DQRL	SN	34	346	ES		1311	5.45	-0.02									1.0
HWQ	SZ	100	15	EP		1311	11.94	0.03									1.0

**January 7 2016 Hour: 14:39 58.4 Lat: 33.45N Lon: 36.51E Depth: 17 Agency: REL Local**  
**Magnitudes: 2.6MC REL Rms: 0.1 secs**

**SYRIA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	63	275	EP		1440	8.69	-0.00	31						1.0
RCY	SN	63	275	ES		1440	16.34	0.00							1.0
DQRL	SZ	92	288	EP		1440	13.00	0.09							1.0
BHL	BZ	94	303	EP		1440	13.11	-0.14							1.0
BHL	BN	94	303	ES		1440	24.28	0.01							1.0
HWQ	SZ	106	331	EP		1440	15.02	0.04							1.0

**January 7 2016 Hour: 15: 5 52.9 Lat: 32.62N Lon: 35.10E Depth: 10 Agency: REL Regional**  
**Magnitudes: 3.2MC REL Rms: 0.2 secs**

**DEAD SEA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	119	35	EP		15 6	11.61	-0.05							1.0
RCY	SE	119	35	ES		15 6	25.53	0.01							1.0
DQRL	SZ	128	20	EP		15 6	12.94	-0.05	65						1.0
DQRL	SN	128	20	ES		15 6	27.85	0.02							1.0
BEYL	SZ	144	15	EP		15 6	14.19	-1.01							0.2
BHL	BZ	151	20	EP		15 6	16.51	0.09							1.0
HWQ	SZ	200	23	EP		15 6	22.90	0.06							1.0
HWQ	SN	200	23	ES		15 6	44.94	-0.03							1.0

**January 10 2016 Hour: 11:12 41.4 Lat: 33.62N Lon: 36.64E Depth: 0 Agency: REL Local**  
**Magnitudes: 3.1MC REL Rms: 0.0 secs**

**SYRIA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	75	291	EP		1112	53.43	0.01							1.0
ZAHL	SN	75	291	ES		1113	2.32	-0.04							1.0
RCY	SZ	76	260	EP		1112	53.54	-0.10							1.0
RCY	SN	76	260	ES		1113	2.74	0.01							1.0
SHBL	BZ	89	250	EP		1112	55.72	0.04							1.0
BHL	BZ	97	289	EP		1112	56.97	0.02	61						1.0
HWQ	SZ	97	319	EP		1112	57.14	0.13							0.2
DQRL	SZ	100	276	EP		1112	57.48	0.02							1.0
DQRL	SN	100	276	ES		1113	9.40	0.03							1.0

**January 10 2016 Hour: 13:32 11.4 Lat: 33.40N Lon: 35.70E Depth: 18 Agency: REL Local**  
**Magnitudes: 2.6MC REL Rms: 0.0 secs**

**HASBAYA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	7	143	EP		1332	14.62	0.01	32						1.0
SHBL	BE	7	143	ES		1332	17.01	-0.00							1.0
RCY	SZ	17	48	EP		1332	15.40	-0.01							1.0
DQRL	SZ	36	341	EP		1332	17.80	-0.03							1.0
DQRL	SN	36	341	ES		1332	22.64	0.01							1.0
BHL	BZ	57	356	EP		1332	20.73	0.02							1.0

**January 10 2016 Hour: 17:40 47.9 Agency: REL Regional**  
**EMSC OT=17:40:47.9 39.58N 34.36E 4Km M=5.0 CENTRAL TURKEY**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1742	11.90								
BHL	BZ			EP		1742	15.33								
ZAHL	SZ			EP		1742	17.25								
DQRL	SZ			EP		1742	17.42								
RCY	SZ			EP		1742	22.27								
SHBL	BZ			EP		1742	23.35								

January 11 2016 Hour: 10:48 58.1

Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1049	3.91								
RCY	SZ			EP		1049	12.51								
SHBL	BZ			EP		1049	15.50								

January 11 2016 Hour: 16:38 5.8

Agency: REL Distant

EMSC OT=16:38:05.8 3.96N 126.97E 10Km M=6.5 KEPULAUAN TALAUD, INDONESIA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1650	59.39								
RCY	SZ			EP		1651	0.52								
BHL	BZ			EP		1651	0.34								
SHBL	BZ			EP		1651	0.80								
DQRL	SZ			EP		1651	1.36								

January 11 2016 Hour: 17:8 2.7

Agency: REL Distant

EMSC OT=17:08:02.7 44.48N 141.12E 227Km M=6.1 HOKKAIDO, JAPAN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1719	26.89								
BHL	BZ			EP		1719	29.50								
RCY	SZ			EP		1719	30.87								
DQRL	SZ			EP		1719	31.15								
SHBL	BZ			EP		1719	31.87								

January 12 2016 Hour: 15:11 45.1 Lat: 33.33N Lon: 35.62E Depth: 0 Agency: REL Local

Magnitudes: 2.9MC REL

Rms: 0.0 secs

MARJAAYOUN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	28	48	EP		1511	49.49-0.01		49						1.0
RCY	SN	28	48	ES		1511	52.77-0.02								1.0
DQRL	SZ	42	354	EP		1511	51.74-0.07								1.0
DQRL	SN	42	354	ES		1511	56.81 0.00								1.0
BHL	BZ	64	3	EP		1511	55.36 0.02								1.0
HWQ	SZ	109	16	EP		1512	2.79 0.07								1.0

January 12 2016 Hour: 20:4 59.6

Agency: REL Distant

EMSC OT=20:04:59.6 36.61N 71.08E 237Km M=5.7 HINDU KUSH REGION, AFGHANISTAN

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		2010	35.06								
RCY	SZ			EP		2010	37.75								
BHL	BZ			EP		2010	38.05								
SHBL	BZ			EP		2010	38.75								
DQRL	SZ			EP		2010	39.21								

January 13 2016 Hour: 5:56 1.2

Agency: REL Distant

EMSC OT=05:56:01.2 15.25S 174.87W 254Km M=5.8 TONGA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		615	11.02								
BHL	BZ			EP		615	10.84								
SHBL	BZ			EP		615	11.57								
DQRL	SZ			EP		615	11.66								

January 13 2016 Hour: 10:6 59.5 Lat: 33.81N Lon: 35.78E Depth: 15 Agency: REL Local

Magnitudes: 2.3MC REL

Rms: 0.0 secs

ZAHLE REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	12	60	EP		10 7	2.81 0.00								1.0
ZAHL	SE	12	60	ES		10 7	5.23-0.00								1.0
BHL	BZ	16	314	EP		10 7	3.19-0.01		23						1.0
DQRL	SZ	22	240	EP		10 7	3.95-0.02								1.0
DQRL	SN	22	240	ES		10 7	7.28 0.02								1.0
HWQ	SZ	55	17	EP		10 7	8.58 0.01								1.0

January 13 2016 Hour: 12:46 11.6 Lat: 33.41N Lon: 35.65E Depth: 5 Agency: REL Local  
Magnitudes: 2.8MC REL Rms: 0.1 secs

HASBAYA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	11	126	EP		1246	13.84	0.06							1.0
RCY	SZ	20	61	EP		1246	14.98	-0.09	47						1.0
RCY	SN	20	61	ES		1246	17.60	-0.01							1.0
DQRL	SZ	34	348	EP		1246	17.03	-0.15							1.0
DQRL	SN	34	348	ES		1246	21.35	0.07							1.0
BHL	BZ	55	1	EP		1246	20.53	-0.04							1.0
HWQ	SZ	100	16	EP		1246	28.00	0.14							1.0

January 13 2016 Hour: 13:18 51.8 Lat: 33.46N Lon: 35.71E Depth: 8 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	12	73	EP		1318	54.31	-0.02	34						1.0
SHBL	BZ	13	165	EP		1318	54.40	-0.05							1.0
SHBL	BN	13	165	ES		1318	56.48	0.06							1.0
DQRL	SZ	30	335	EP		1318	56.73	-0.07							1.0
DQRL	SE	30	335	ES		1319	0.56	0.05							1.0
HWQ	SZ	93	14	EP		1319	6.88	0.04							1.0

January 14 2016 Hour: 3:25 33.6 Agency: REL Distant  
EMSC OT=03:25:33.6 42.07N 142.67E 50Km M=6.6 HOKKAIDO, JAPAN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		337	30.50								
ZAHL	SZ			EP		337	32.95								
BHL	BZ			EP		337	33.22								
RCY	SZ			EP		337	34.48								
DQRL	SZ			EP		337	34.61								
SHBL	BZ			EP		337	35.27								

January 14 2016 Hour: 14:0 42.2 Lat: 33.86N Lon: 35.84E Depth: 0 Agency: REL Local  
Magnitudes: 2.5MC REL Rms: 0.1 secs

ZAHLE REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	4	91	EP		14 0	42.90	-0.04	30						1.0
BHL	BZ	18	286	EP		14 0	45.04	-0.05							1.0
BHL	BN	18	286	ES		14 0	47.20	-0.02							1.0
DQRL	SZ	30	236	EP		14 0	47.14	0.06							1.0
RCY	SZ	40	180	EP		14 0	48.80	0.09							1.0
RCY	SN	40	180	ES		14 0	53.44	-0.07							1.0
HWQ	SZ	48	12	EP		14 0	49.92	0.03							1.0

January 15 2016 Hour: 10:24 35.3 Lat: 33.45N Lon: 35.63E Depth: 0 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	12	24	EP		1024	37.13	-0.14							1.0
SHBL	BZ	15	136	EP		1024	37.83	0.01							1.0
RCY	SZ	20	74	EP		1024	38.50	-0.04	34						1.0
RCY	SN	20	74	ES		1024	40.99	0.07							1.0
DQRL	SZ	29	349	EP		1024	40.10	0.09							1.0
DQRL	SN	29	349	ES		1024	43.49	0.01							1.0

January 15 2016 Hour: 14:12 46.3 Lat: 33.78N Lon: 35.79E Depth: 1 Agency: REL Local  
Magnitudes: 2.4MC REL Rms: 0.0 secs

ALEY REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	12	48	EP		1412	48.32	-0.01							1.0
BHL	BZ	18	318	EP		1412	49.22	-0.02	25						1.0
DQRL	SZ	22	247	EP		1412	49.78	-0.03							1.0



DQRL	SN	22	247	ES		1412	52.45	0.03									1.0
RCY	SZ	32	172	EP		1412	51.43	-0.04									1.0
RCY	SN	32	172	ES		1412	55.33	0.03									1.0
HWQ	SZ	57	15	EP		1412	55.51	0.04									1.0

**January 15 2016 Hour: 15:43 5.4 Lat: 33.80N Lon: 35.78E Depth: 13 Agency: REL Local**  
**Magnitudes: 2.4MC REL Rms: 0.1 secs**

**ZAHLE REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	12	57	EP		1543	8.40	-0.06							1.0
ZAHL	SN	12	57	ES		1543	10.77	0.02							1.0
BHL	BZ	16	316	EP		1543	8.95	0.02	26						1.0
DQRL	SZ	22	242	EP		1543	9.60	-0.02							1.0
DQRL	SN	22	242	ES		1543	12.80	0.03							1.0
QRWL	SZ	29	198	EP		1543	10.52	-0.13							1.0
RCY	SZ	34	171	EP		1543	11.49	0.12							1.0
HWQ	SZ	55	16	EP		1543	14.55	0.01							1.0

**January 16 2016 Hour: 10:42 0.2 Lat: 33.47N Lon: 35.67E Depth: 0 Agency: REL Local**  
**Magnitudes: 2.8MC REL Rms: 0.1 secs**

**WEST BEKAA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	9	7	EP		1042	1.55	-0.14	45						1.0
SHBL	BZ	15	153	EP		1042	2.62	-0.05							1.0
SHBL	BN	15	153	ES		1042	4.54	0.07							1.0
RCY	SZ	16	78	EP		1042	2.81	0.02							1.0
DQRL	SZ	28	341	EP		1042	4.64	-0.12							1.0
DQRL	SN	28	341	ES		1042	8.25	0.16							1.0
HWQ	SZ	93	16	EP		1042	15.38	0.07							1.0

**January 16 2016 Hour: 18:51 19.3 Agency: REL Regional**

**EMSC OT=18:51:19.3 35.49N 31.27E 60Km M=4.1 CYPRUS REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1852	16.59								
DQRL	SZ			EP		1852	17.15								
HWQ	SZ			EP		1852	18.28								
ZAHL	SZ			EP		1852	19.03								
RCY	SZ			EP		1852	20.88								
SHBL	BZ			EP		1852	21.25								

**January 19 2016 Hour: 9:47 52.4 Lat: 33.85N Lon: 35.84E Depth: 0 Agency: REL Local**  
**Magnitudes: 2.4MC REL Rms: 0.1 secs**

**ZAHLE REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	4	81	EP		947	53.12	-0.05	27						1.0
BHL	BZ	18	289	EP		947	55.26	-0.08							1.0
BHL	BN	18	289	ES		947	57.65	0.14							1.0
DQRL	SZ	30	237	EP		947	57.02	-0.20							1.0
RCY	SZ	39	181	EP		947	58.72	-0.06							1.0
RCY	SN	39	181	ES		948	3.67	0.17							1.0
HWQ	SZ	48	12	EP		948	0.29	0.09							1.0

**January 19 2016 Hour: 19:4 43.5 Agency: REL Regional**

**EMSC OT=19:04:43.5 36.65N 26.94E 137Km M=4.7 DODECANESE ISLANDS, GREECE**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		19 6	29.00								
DQRL	SZ			EP		19 6	29.67								
HWQ	SZ			EP		19 6	31.18								
RCY	SZ			EP		19 6	34.07								

January 20 2016 Hour: 17:13 14.0

Agency: REL Distant

EMSC OT=17:13:14.0 37.72N 101.65E 10Km M=5.9 NORTHERN QINGHAI, CHINA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1722	25.06								
BHL	BZ			EP		1722	27.78								
RCY	SZ			EP		1722	29.02								
DQRL	SZ			EP		1722	29.70								

January 20 2016 Hour: 21:39 28.7 Lat: 33.74N Lon: 35.69E

Depth: 3 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.1 secs

CHOUF REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	11	252	EP		2139	30.52	-0.11							1.0
DQRL	SN	11	252	ES		2139	32.15	0.06							1.0
BHL	BZ	19	351	EP		2139	31.77	0.01	37						1.0
RCY	SZ	30	153	EP		2139	33.51	-0.06							1.0
RCY	SN	30	153	ES		2139	37.24	0.03							1.0
HWQ	SZ	65	22	EP		2139	39.12	0.03							1.0

January 21 2016 Hour: 9:22 25.7

Agency: REL Regional

EMSC OT=09:22:25.7 34.26N 24.64E 54Km M=4.2 CRETE, GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		924	35.56								
HWQ	SZ			EP		924	37.04								

January 21 2016 Hour: 10:33 8.6 Lat: 33.48N Lon: 35.69E

Depth: 1 Agency: REL Local

Magnitudes: 2.6MC REL

Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	356	EP		1033	9.99	0.03	33						1.0
RCY	SZ	14	81	EP		1033	10.86	-0.06							1.0
SHBL	BZ	15	160	EP		1033	11.10	-0.01							1.0
SHBL	BN	15	160	ES		1033	12.99	0.03							1.0
DQRL	SZ	28	337	EP		1033	13.03	-0.08							1.0
DQRL	SN	28	337	ES		1033	16.43	0.01							1.0
HWQ	SZ	92	15	EP		1033	23.57	0.09							1.0

January 22 2016 Hour: 10:52 23.1 Lat: 33.39N Lon: 35.64E

Depth: 14 Agency: REL Local

Magnitudes: 2.5MC REL

Rms: 0.0 secs

HASBAYA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	10	115	EP		1052	26.17	0.03							1.0
QRWL	SZ	18	12	EP		1052	26.86	-0.06	29						1.0
RCY	SZ	22	56	EP		1052	27.38	-0.04							1.0
RCY	SN	22	56	ES		1052	30.63	0.03							1.0
DQRL	SZ	36	349	EP		1052	29.45	0.04							1.0
DQRL	SN	36	349	ES		1052	34.06	0.01							1.0

January 22 2016 Hour: 11:4 45.8 Lat: 33.47N Lon: 35.69E

Depth: 1 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.0 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	357	EP		11 4	47.12	-0.11							1.0
QRWL	SE	8	357	ES		11 4	48.30	0.04							1.0
RCY	SZ	14	79	EP		11 4	48.16	0.01	41						1.0
SHBL	BZ	15	159	EP		11 4	48.27	0.02							1.0
DQRL	SZ	28	337	EP		11 4	50.40	0.02							1.0
DQRL	SN	28	337	ES		11 4	53.75	0.02							1.0

January 22 2016 Hour: 15: 8 3.7 Lat: 33.80N Lon: 35.76E Depth: 8 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.0 secs

**ALEY REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	13	60	EP		15	8	6.34	0.02						1.0
ZAHL	SN	13	60	ES		15	8	8.25	-0.01						1.0
BHL	BZ	15	319	EP		15	8	6.54	-0.09	33					1.0
BHL	BN	15	319	ES		15	8	8.83	0.04						1.0
DQRL	SZ	21	240	EP		15	8	7.42	0.02						1.0
HWQ	SZ	56	18	EP		15	8	12.83	0.02						1.0

January 22 2016 Hour: 20:51 48.0 Agency: REL Distant

**EMSC OT=20:51:48.0 28.31N 55.36E 30Km M=5.1 SOUTHERN IRAN**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ			EP		2055	48.76								
DQRL	SZ			EP		2055	53.21								
BHL	BZ			EP		2055	52.53								

January 23 2016 Hour: 4: 0 44.7 Agency: REL Regional

**EMSC OT=04:00:44.7 36.72N 29.48E 27Km M=4.0 WESTERN TURKEY**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		4	2	9.47							
HWQ	SZ			EP		4	2	11.36							
RCY	SZ			EP		4	2	14.21							

January 26 2016 Hour: 3:46 36.4 Agency: REL Distant

**EMSC OT=03:46:36.4 20.53S 177.57W 508Km M=5.4 FIJI REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		4	5	24.02							
RCY	SZ			EP		4	5	24.08							

January 26 2016 Hour: 13:43 21.4 Lat: 33.46N Lon: 35.70E Depth: 14 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.0 secs

**HASBAYA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	13	162	EP		1343	24.65	0.01							1.0
RCY	SZ	13	71	EP		1343	24.66	-0.01	35						1.0
DQRL	SZ	30	336	EP		1343	26.80	0.00							1.0
DQRL	SE	30	336	ES		1343	30.79	-0.01							1.0
ZAHL	SZ	48	21	EP		1343	29.36	-0.02							1.0
ZAHL	SE	48	21	ES		1343	35.30	0.01							1.0
BHL	BZ	50	355	EP		1343	29.73	0.05							0.2

January 27 2016 Hour: 4: 8 45.2 Lat: 34.58N Lon: 36.42E Depth: 18 Agency: REL Local  
Magnitudes: 2.9MC REL Rms: 0.1 secs

**AKKAR REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	94	212	EP		4	9	0.06	0.06						1.0
ZAHL	SE	94	212	ES		4	9	11.02	0.04						1.0
BHL	BZ	103	224	EP		4	9	1.26	-0.05	44					1.0
BHL	BN	103	224	ES		4	9	13.22	-0.04						1.0
DQRL	SZ	125	219	EP		4	9	4.59	0.09						1.0
RCY	SZ	132	205	EP		4	9	5.45	-0.09						1.0
SHBL	BZ	150	205	EP		4	9	8.21	0.00						1.0

January 27 2016 Hour: 11:16 17.8 Lat: 33.48N Lon: 35.69E Depth: 2 Agency: REL Local  
Magnitudes: 2.4MC REL Rms: 0.1 secs

**WEST BEKAA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	355	EP		1116	19.09	-0.10	28						1.0
RCY	SZ	14	81	EP		1116	20.15	0.03							1.0
SHBL	BZ	15	160	EP		1116	20.29	-0.02							1.0
SHBL	BN	15	160	ES		1116	22.20	0.04							1.0

DQRL SZ 28 337 EP 1116 22.24-0.08 1.0  
 DQRL SE 28 337 ES 1116 25.78 0.13 1.0

**January 27 2016 Hour: 11:33 8.1 Lat: 33.87N Lon: 35.86E Depth: 5 Agency: REL Local**  
**Magnitudes: 3.0MC REL Rms: 0.0 secs**

**ZAHLE REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	2	119	EP		1133	9.16	-0.01	63						1.0
BHL	BZ	20	282	EP		1133	11.41	-0.01							1.0
BHL	BN	20	282	ES		1133	13.93	0.02							1.0
DQRL	SZ	33	237	EP		1133	13.43	0.00							1.0
QRWL	SZ	39	205	EP		1133	14.40	-0.09							1.0
RCY	SZ	41	184	EP		1133	14.89	0.08							1.0
RCY	SN	41	184	ES		1133	19.80	0.00							1.0

**January 27 2016 Hour: 13:7 11.5 Lat: 33.42N Lon: 35.67E Depth: 7 Agency: REL Local**  
**Magnitudes: 2.8MC REL Rms: 0.0 secs**

**HASBAYA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	10	137	EP		13 7	13.63	0.01							1.0
QRWL	SZ	15	5	EP		13 7	14.14	-0.05							1.0
RCY	SZ	18	60	EP		13 7	14.69	0.00	43						1.0
RCY	SN	18	60	ES		13 7	17.06	0.01							1.0
DQRL	SZ	34	344	EP		13 7	17.06	0.01							1.0
DQRL	SN	34	344	ES		13 7	21.19	0.02							1.0

**January 28 2016 Hour: 11:12 32.0 Lat: 33.48N Lon: 35.68E Depth: 2 Agency: REL Local**  
**Magnitudes: 2.6MC REL Rms: 0.1 secs**

**WEST BEKAA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	0	EP		1112	33.23	-0.08							1.0
RCY	SZ	14	82	EP		1112	34.41	0.03	36						1.0
SHBL	BZ	16	158	EP		1112	34.50	-0.06							1.0
SHBL	BN	16	158	ES		1112	36.53	0.06							1.0
DQRL	SZ	27	338	EP		1112	36.36	-0.03							1.0
DQRL	SN	27	338	ES		1112	39.75	0.09							1.0

**January 29 2016 Hour: 0:35 29.7 Lat: 34.51N Lon: 34.27E Depth: 0 Agency: REL Regional**  
**Magnitudes: 3.3MC REL Rms: 0.0 secs**

**OFFSHORE NORTH LEBANON**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	144	117	EP		035	52.89	0.04							1.0
DQRL	SZ	150	126	EP		035	53.57	-0.06							1.0
ZAHL	SZ	166	116	EP		035	55.99	-0.01							1.0
RCY	SZ	183	127	EP		035	58.62	0.01	79						1.0
RCY	SN	183	127	ES		036	20.01	-0.01							1.0
SHBL	BZ	188	133	EP		035	59.21	0.01							1.0
SHBL	BN	188	133	ES		036	21.05	0.02							1.0

**January 30 2016 Hour: 1:10 1.0 Agency: REL Regional**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ			EP		110	16.11								
DQRL	SZ			EP		110	22.07								
BHL	BZ			EP		110	25.49								

**January 30 2016 Hour: 3:25 9.8 Agency: REL Distant**  
**EMSC OT=03:25:09.8 54.03N 158.54E 159Km M=7.2 KAMCHATKA PENINSULA, RUSSIA**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		336	55.53								
ZAHL	SZ			EP		336	57.54								
BHL	BZ			EP		336	58.10								
DQRL	SZ			EP		336	59.46								
RCY	SZ			EP		337	0.02								
SHBL	BZ			EP		337	0.90								

January 30 2016 Hour: 14:26 46.7 Lat: 34.85N Lon: 36.43E Depth: 15 Agency: REL Local  
Magnitudes: 3.0MC REL Rms: 0.2 secs

SYRIA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	78	215	EP		1426	59.11	0.02	60						1.0
HWQ	SN	78	215	ES		1427	8.06	-0.22							1.0
ZAHL	SZ	121	204	EP		1427	5.44	-0.05							1.0
BHL	BZ	127	214	EP		1427	6.54	0.19							1.0
DQRL	SZ	150	212	EP		1427	9.72	0.03							1.0
DQRL	SN	150	212	ES		1427	26.84	0.11							1.0
RCY	SZ	160	200	EP		1427	10.87	-0.33							1.0
SHBL	BZ	178	201	EP		1427	13.64	0.15							1.0
SHBL	BN	178	201	ES		1427	33.45	0.11							1.0

January 30 2016 Hour: 19:10 15.2 Lat: 33.67N Lon: 35.79E Depth: 6 Agency: REL Local  
Magnitudes: 2.4MC REL Rms: 0.0 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	20	168	EP		1910	18.64	-0.03	27						1.0
RCY	SE	20	168	ES		1910	21.23	0.03							1.0
DQRL	SZ	21	281	EP		1910	18.78	-0.04							1.0
DQRL	SN	21	281	ES		1910	21.45	-0.01							1.0
ZAHL	SZ	23	23	EP		1910	19.02	-0.05							1.0
BHL	BZ	29	334	EP		1910	20.13	0.09							1.0

January 31 2016 Hour: 7: 9 34.7 Lat: 33.48N Lon: 35.63E Depth: 4 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	9	36	EP		7 9	36.31	-0.05							1.0
QRWL	SE	9	36	ES		7 9	37.58	-0.03							1.0
SHBL	BZ	18	143	EP		7 9	37.70	-0.10							1.0
SHBL	BE	18	143	ES		7 9	40.18	0.08							1.0
RCY	SZ	20	85	EP		7 9	38.02	0.05							1.0
DQRL	SZ	25	348	EP		7 9	38.83	-0.04	34						1.0
DQRL	SE	25	348	ES		7 9	42.05	0.09							1.0

January 31 2016 Hour: 11:36 11.4 Lat: 33.39N Lon: 35.73E Depth: 26 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.2 secs

HASBAYA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	5	163	EP		1136	16.08	0.27							1.0
SHBL	BE	5	163	ES		1136	18.90	-0.15							1.0
RCY	SZ	15	40	EP		1136	16.09	-0.26	36						1.0
RCY	SE	15	40	ES		1136	20.15	0.15							1.0
DQRL	SZ	38	337	EP		1136	18.66	0.00							1.0
BHL	BZ	57	353	EP		1136	21.18	-0.05							0.2

January 31 2016 Hour: 15: 7 45.7 Lat: 33.54N Lon: 36.49E Depth: 7 Agency: REL Local  
Magnitudes: 2.7MC REL Rms: 0.1 secs

SYRIA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	61	265	EP		15 7	55.55	-0.03	35						1.0
RCY	SE	61	265	ES		15 8	2.96	0.06							1.0
ZAHL	SZ	66	302	EP		15 7	56.32	-0.08							1.0
DQRL	SZ	87	282	EP		15 7	59.78	0.00							1.0
DQRL	SE	87	282	ES		15 8	10.19	-0.03							1.0
HWQ	SZ	96	329	EP		15 8	1.26	0.07							1.0

January 31 2016 Hour: 15:43 45.3 Lat: 33.42N Lon: 35.66E Depth: 0 Agency: REL Local  
Magnitudes: 2.5MC REL Rms: 0.0 secs

**HASBAYA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	BZ	11	135	EP		1543	47.05	0.01							1.0
RCY	SZ	18	61	EP		1543	48.25	-0.03	28						1.0
RCY	SN	18	61	ES		1543	50.47	-0.01							1.0
DQRL	SZ	33	345	EP		1543	50.64	-0.04							1.0
DQRL	SE	33	345	ES		1543	54.65	-0.00							1.0
BHL	BZ	54	359	EP		1543	54.04	-0.01							1.0
HWQ	SZ	99	15	EP		1544	1.38	0.08							1.0

January 31 2016 Hour: 23:39 25.8 Lat: 33.85N Lon: 35.74E Depth: 4 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.0 secs

**BAABDA REGION**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	10	309	EP		2339	27.70	0.02	35						1.0
BHL	BN	10	309	ES		2339	29.05	0.00							1.0
ZAHL	SZ	14	84	EP		2339	28.13	-0.05							1.0
ZAHL	SN	14	84	ES		2339	29.94	0.02							1.0
DQRL	SZ	22	225	EP		2339	29.47	-0.03							1.0
RCY	SZ	40	167	EP		2339	32.35	0.04							1.0
RCY	SN	40	167	ES		2339	37.09	-0.02							1.0
HWQ	SZ	52	22	EP		*2339	34.32	0.12							0.0
SHBL	BZ	55	180	EP		2339	34.81	0.02							1.0

# Epicentral Map of Lebanon

## January 2016

