

Republic of Lebanon  
National Council for Scientific Research

# Provisional Seismological Bulletin

from the

## NATIONAL SEISMIC NETWORK

December

2020

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<br>(km/sec) | depth to top of layer<br>(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 |
| BEIL    | 3432.50N | 3611.08E  | 572        | BEINO      | Opened Jan 2017 |
| SAIL    | 3334.52N | 3524.09E  | 159        | SAIDA      | Opened Jan 2020 |
| CPTL    | 3353.47N | 3528.60E  | 32         | QRAYTEM    | Opened Mar 2020 |

## 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 2020 Hour: 17:20 29.6 Lat: 33.61N Lon: 35.64E Depth: 1 Agency: REL Local**  
**Magnitudes: 2.4MC REL Rms: 0.1 secs**

**CHOUF REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| QRWL | SZ | 8    | 152 | EP    |   | 1720 | 30.80 | -0.13 | 26   |      |      |     |      |      | 1.0 |
| QRWL | SN | 8    | 152 | ES    |   | 1720 | 31.87 | -0.04 |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 13   | 328 | EP    |   | 1720 | 31.63 | -0.03 |      |      |      |     |      |      | 1.0 |
| DQRL | SN | 13   | 328 | ES    |   | 1720 | 33.25 | 0.07  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 22   | 125 | EP    |   | 1720 | 33.13 | -0.05 |      |      |      |     |      |      | 1.0 |
| RCY  | SN | 22   | 125 | ES    |   | 1720 | 36.04 | 0.21  |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 23   | 260 | EP    |   | 1720 | 33.37 | 0.10  |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 31   | 162 | EP    |   | 1720 | 34.52 | -0.04 |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 33   | 2   | EP    |   | 1720 | 34.81 | -0.08 |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 36   | 39  | EP    |   | 1720 | 35.38 | 0.02  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 79   | 21  | EP    |   | 1720 | 42.37 | -0.03 |      |      |      |     |      |      | 1.0 |

**December 1 2020 Hour: 18:49 27.9 Lat: 33.67N Lon: 35.80E Depth: 5 Agency: REL Local**  
**Magnitudes: 2.7MC 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 | 18   | 219 | EP    |   | 1849 | 30.83 | -0.04 | 42   |      |      |     |      |      | 1.0 |
| QRWL | SN | 18   | 219 | ES    |   | 1849 | 33.16 | 0.08  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 20   | 171 | EP    |   | 1849 | 31.09 | -0.10 |      |      |      |     |      |      | 1.0 |
| RCY  | SN | 20   | 171 | ES    |   | 1849 | 33.64 | -0.00 |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 22   | 281 | EP    |   | 1849 | 31.62 | 0.08  |      |      |      |     |      |      | 1.0 |
| DQRL | SN | 22   | 281 | ES    |   | 1849 | 34.25 | -0.00 |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 22   | 20  | EP    |   | 1849 | 31.68 | 0.07  |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 29   | 332 | EP    |   | 1849 | 32.50 | -0.22 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 36   | 189 | EP    |   | 1849 | 33.81 | 0.02  |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 39   | 254 | EP    |   | 1849 | 34.19 | 0.02  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 69   | 11  | EP    |   | 1849 | 39.00 | -0.02 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 103  | 20  | EP    |   | 1849 | 44.65 | 0.14  |      |      |      |     |      |      | 1.0 |

**December 2 2020 Hour: 22:27 5.4 Lat: 33.75N Lon: 36.94E Depth: 23 Agency: REL Regional**  
**Magnitudes: 3.3MC REL Rms: 0.1 secs**

**SYRIA REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| ZAHL | SZ | 98   | 277 | EP    |   | 2227 | 20.66 | -0.21 |      |      |      |     |      |      | 1.0 |
| ZAHL | SN | 98   | 277 | ES    |   | 2227 | 32.37 | 0.03  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 106  | 255 | EP    |   | 2227 | 22.13 | 0.10  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 108  | 303 | EP    |   | 2227 | 22.55 | 0.16  | 77   |      |      |     |      |      | 1.0 |
| BEIL | SZ | 112  | 322 | EP    |   | 2227 | 22.77 | -0.06 |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 112  | 322 | ES    |   | 2227 | 35.81 | 0.05  |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 118  | 259 | EP    |   | 2227 | 23.88 | 0.05  |      |      |      |     |      |      | 1.0 |
| QRWL | SN | 118  | 259 | ES    |   | 2227 | 37.47 | -0.03 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 119  | 248 | EP    |   | 2227 | 24.09 | 0.09  |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 120  | 279 | EP    |   | 2227 | 23.84 | -0.20 |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 127  | 268 | EP    |   | 2227 | 25.07 | 0.03  |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 144  | 263 | EP    |   | 2227 | 27.15 | 0.06  |      |      |      |     |      |      | 0.2 |

**December 3 2020 Hour: 5:45 21.9**

**Agency: REL Regional**

**EMSC OT=05:45:21.9 38.00N 41.71E 14Km M=5.0 EASTERN TURKEY**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 546  | 44.49 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 546  | 48.49 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 546  | 55.48 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 546  | 58.12 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 546  | 58.06 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 546  | 59.13 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 547  | 0.33  |      |      |      |      |     |      |      |    |
| SAIL | SZ |      |     | EP    |   | 547  | 6.43  |      |      |      |      |     |      |      |    |

December 5 2020 Hour: 9:22 27.3 Lat: 34.19N Lon: 36.33E Depth: 12 Agency: REL Local  
Magnitudes: 2.5MC REL Rms: 0.1 secs

**BAALBECK REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| HWQ  | BZ | 37   | 285 | EP    |   | 922  | 33.70 | -0.03 | 31   |      |      |     |      |      | 1.0 |
| HWQ  | BN | 37   | 285 | ES    |   | 922  | 38.39 | -0.06 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 41   | 340 | EP    |   | 922  | 34.24 | -0.08 |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 41   | 340 | ES    |   | 922  | 39.55 | 0.07  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 56   | 228 | EP    |   | 922  | 36.74 | 0.13  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 89   | 233 | EP    |   | 922  | 41.61 | 0.12  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 90   | 211 | EP    |   | 922  | 41.49 | -0.18 |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 94   | 220 | EP    |   | 922  | 42.16 | -0.01 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 108  | 210 | EP    |   | 922  | 44.42 | 0.03  |      |      |      |     |      |      | 1.0 |

December 5 2020 Hour: 12:44 40.8 Lat: 35.99N Lon: 31.70E Depth: 46 Agency: REL Regional  
Magnitudes: 4.9MC REL Rms: 0.2 secs

**Earthquake was felt**

**EASTERN MEDITERRANEAN SEA**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| BEYL | SZ | 419  | 123 | EP    |   | 1245 | 35.45 | 0.14  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 431  | 115 | EP    |   | 1245 | 36.95 | 0.02  | 491  |      |      |     |      |      | 1.0 |
| HWQ  | BN | 431  | 115 | ES    |   | 1246 | 18.59 | 0.15  |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 432  | 127 | EP    |   | 1245 | 36.78 | -0.14 |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 436  | 124 | EP    |   | 1245 | 37.22 | -0.20 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 439  | 110 | EP    |   | 1245 | 37.47 | -0.30 |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 439  | 110 | ES    |   | 1246 | 19.96 | 0.05  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 450  | 121 | EP    |   | 1245 | 39.19 | 0.01  |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 455  | 125 | EP    |   | 1245 | 39.83 | 0.13  |      |      |      |     |      |      | 1.0 |
| QRWL | SN | 455  | 125 | ES    |   | 1246 | 23.06 | -0.20 |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 469  | 125 | EP    |   | 1245 | 41.72 | 0.18  |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 473  | 127 | EP    |   | 1245 | 42.14 | 0.17  |      |      |      |     |      |      | 1.0 |

December 5 2020 Hour: 17:38 52.8 Lat: 34.87N Lon: 36.40E Depth: 0 Agency: REL Regional  
Magnitudes: 2.5MC REL Rms: 0.1 secs

**SYRIA REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| BEIL | SZ | 42   | 209 | EP    |   | 1738 | 59.42 | -0.13 | 27   |      |      |     |      |      | 1.0 |
| BEIL | SN | 42   | 209 | ES    |   | 1739 | 4.52  | -0.03 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 78   | 213 | EP    |   | 1739 | 5.44  | 0.03  |      |      |      |     |      |      | 1.0 |
| HWQ  | BN | 78   | 213 | ES    |   | 1739 | 14.78 | 0.03  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 122  | 203 | EP    |   | 1739 | 12.61 | 0.10  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 151  | 211 | EP    |   | 1739 | 16.89 | 0.05  |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 161  | 205 | EP    |   | 1739 | 18.37 | -0.06 |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 161  | 199 | EP    |   | 1739 | 18.48 | 0.01  |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 180  | 200 | EP    |   | 1739 | 21.17 | 0.00  |      |      |      |     |      |      | 1.0 |

December 6 2020 Hour: 1:37 5.1 Agency: REL Regional

**EMSC OT=01:37:05.1 37.12N 34.55E 25Km M=4.0 CENTRAL TURKEY**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 137  | 49.67 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 137  | 51.63 |      |      |      |      |     |      |      |    |
| BEYL | SZ |      |     | EP    |   | 137  | 54.48 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 137  | 56.89 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 137  | 56.65 |      |      |      |      |     |      |      |    |
| SAIL | SZ |      |     | EP    |   | 138  | 0.10  |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 137  | 59.62 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 138  | 1.31  |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 138  | 2.77  |      |      |      |      |     |      |      |    |

December 8 2020 Hour: 2:46 27.0 Lat: 33.66N Lon: 35.84E Depth: 13 Agency: REL Local  
Magnitudes: 2.5MC 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 | 19   | 182 | EP    |   | 246  | 30.64 | -0.12 | 29   |      |      |     |      |      | 1.0 |
| RCY  | SN | 19   | 182 | ES    |   | 246  | 33.65 | 0.09  |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 20   | 229 | EP    |   | 246  | 30.82 | -0.06 |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 22   | 10  | EP    |   | 246  | 31.25 | 0.06  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 26   | 280 | EP    |   | 246  | 31.65 | -0.06 |      |      |      |     |      |      | 1.0 |
| DQRL | SN | 26   | 280 | ES    |   | 246  | 35.32 | 0.10  |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 32   | 327 | EP    |   | 246  | 32.46 | -0.15 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 36   | 195 | EP    |   | 246  | 33.30 | 0.04  |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 42   | 257 | EP    |   | 246  | 34.13 | 0.02  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 69   | 8   | EP    |   | 246  | 38.27 | 0.09  |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 102  | 18  | EP    |   | 246  | 43.06 | -0.01 |      |      |      |     |      |      | 1.0 |

December 9 2020 Hour: 19:22 16.4

Agency: REL Regional

EMSC OT=19:22:16.4 36.60N 36.00E 10Km M=3.4 TURKEY-SYRIA BORDER REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 1922 | 51.40 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 1922 | 55.50 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 1923 | 0.24  |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 1923 | 1.64  |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 1923 | 4.38  |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 1923 | 8.19  |      |      |      |      |     |      |      |    |

December 10 2020 Hour: 11:41 21.5

Agency: REL Distant

EMSC OT=11:41:21.5 22.18S 179.47W 583Km M=5.4 SOUTH OF FIJI ISLANDS REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| RCY  | SZ |      |     | EP    |   | 1159 | 59.82 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 1159 | 59.59 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 1159 | 58.60 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 12 0 | 0.20  |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 12 0 | 0.51  |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 12 0 | 0.20  |      |      |      |      |     |      |      |    |
| BEIL | SZ |      |     | EP    |   | 12 0 | 3.57  |      |      |      |      |     |      |      |    |

December 10 2020 Hour: 19: 3 38.3 Lat: 34.90N Lon: 34.08E Depth: 0 Agency: REL Regional

Magnitudes: 3.1MC REL

Rms: 0.2 secs

CYPRUS REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| BHL  | BZ | 182  | 127 | EP    |   | 19 4 | 6.61  | -0.36 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 185  | 111 | EP    |   | 19 4 | 7.68  | 0.30  |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 197  | 101 | EP    |   | 19 4 | 8.85  | 0.00  | 55   |      |      |     |      |      | 1.0 |
| BEIL | SE | 197  | 101 | ES    |   | 19 4 | 31.37 | -0.08 |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 202  | 124 | EP    |   | 19 4 | 9.55  | -0.02 |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 224  | 133 | EP    |   | 19 4 | 12.33 | -0.00 |      |      |      |     |      |      | 1.0 |
| RCY  | SN | 224  | 133 | ES    |   | 19 4 | 37.63 | 0.11  |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 230  | 138 | EP    |   | 19 4 | 13.13 | 0.04  |      |      |      |     |      |      | 1.0 |

December 10 2020 Hour: 20:42 8.1

Agency: REL Distant

EMSC OT=20:42:08.1 33.03S 179.72W 100Km M=5.9 SOUTH OF KERMADEC ISLANDS

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| HWQ  | BZ |      |     | EP    |   | 21 1 | 40.19 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 21 1 | 40.89 |      |      |      |      |     |      |      |    |
| BEIL | SZ |      |     | EP    |   | 21 1 | 41.17 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 21 1 | 41.58 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 21 1 | 41.93 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 21 1 | 41.93 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 21 1 | 41.93 |      |      |      |      |     |      |      |    |

December 10 2020 Hour: 20:48 56.7

Agency: REL Distant

EMSC OT=20:48:56.7 17.64S 174.78W 10Km M=5.9 TONGA

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 21   | 8     | 39.35 |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 21   | 8     | 38.41 |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 21   | 8     | 39.79 |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 21   | 8     | 40.16 |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 21   | 8     | 39.94 |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 21   | 8     | 41.18 |      |      |      |     |      |      |    |

December 13 2020 Hour: 5:14 14.4 Lat: 33.64N Lon: 35.79E Depth: 22 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 | 14   | 226 | EP    |   | 514  | 18.84 | 0.10  |      |      |      |     |      |      | 1.0 |
| QRWL | SN | 14   | 226 | ES    |   | 514  | 21.86 | -0.08 |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 16   | 166 | EP    |   | 514  | 18.99 | 0.04  | 24   |      |      |     |      |      | 1.0 |
| DQRL | SZ | 22   | 290 | EP    |   | 514  | 19.43 | -0.05 |      |      |      |     |      |      | 1.0 |
| DQRL | SN | 22   | 290 | ES    |   | 514  | 23.29 | 0.06  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 26   | 19  | EP    |   | 514  | 19.92 | 0.00  |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 32   | 336 | EP    |   | 514  | 20.65 | -0.02 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 32   | 188 | EP    |   | 514  | 20.70 | -0.03 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 72   | 11  | EP    |   | 514  | 26.20 | -0.01 |      |      |      |     |      |      | 1.0 |

December 14 2020 Hour: 1:57 10.7

Agency: REL Distant

EMSC OT=01:57:10.7 24.02S 179.93E 531Km M=5.6 SOUTH OF FIJI ISLANDS

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 215  | 54.21 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 215  | 54.35 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 215  | 55.33 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 215  | 55.40 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 215  | 55.40 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 215  | 55.66 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 215  | 56.26 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 215  | 55.66 |      |      |      |      |     |      |      |    |

December 16 2020 Hour: 11:16 9.2 Lat: 33.67N Lon: 35.47E Depth: 0 Agency: REL Local  
Magnitudes: 2.6MC REL Rms: 0.2 secs

CHOUF REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| DQRL | SZ | 10   | 65  | EP    |   | 1116 | 10.93 | -0.00 | 35   |      |      |     |      |      | 1.0 |
| DQRL | SN | 10   | 65  | ES    |   | 1116 | 12.18 | -0.00 |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 12   | 212 | EP    |   | 1116 | 11.14 | -0.02 |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 24   | 123 | EP    |   | 1116 | 12.90 | -0.19 |      |      |      |     |      |      | 1.0 |
| QRWL | SN | 24   | 123 | ES    |   | 1116 | 15.81 | -0.12 |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 32   | 33  | EP    |   | 1116 | 14.10 | -0.23 |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 39   | 119 | EP    |   | 1116 | 15.44 | -0.09 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 44   | 144 | EP    |   | 1116 | 16.56 | 0.28  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 44   | 61  | EP    |   | 1116 | 16.88 | 0.52  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 81   | 33  | EP    |   | 1116 | 22.24 | -0.07 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 117  | 34  | EP    |   | 1116 | 28.13 | -0.06 |      |      |      |     |      |      | 1.0 |

December 17 2020 Hour: 13:36 46.4

Agency: REL Regional

EMSC OT=13:36:46.4 35.61N 26.34E 27Km M=4.9 CRETE, GREECE

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| DQRL | SZ |      |     | EP    |   | 1338 | 37.76 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 1338 | 39.98 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 1338 | 41.59 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 1338 | 41.34 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 1338 | 43.98 |      |      |      |      |     |      |      |    |
| BEIL | SZ |      |     | EP    |   | 1338 | 42.84 |      |      |      |      |     |      |      |    |



December 20 2020 Hour: 2:39 8.1

Agency: REL Regional

EMSC OT=02:39:08.1 36.05N 36.5E 27Km M=2.3 TURKEY-SYRIA BORDER REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 239  | 30.65 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 239  | 35.69 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 239  | 45.69 |      |      |      |      |     |      |      |    |

December 20 2020 Hour: 4:32 52.9

Agency: REL Regional

EMSC OT=04:32:52.9 37.94N 43.87E 2Km M=4.4 TURKEY-IRAQ BORDER REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 434  | 38.71 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 434  | 43.29 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 434  | 47.09 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 434  | 49.91 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 434  | 51.66 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 434  | 51.66 |      |      |      |      |     |      |      |    |

December 20 2020 Hour: 10:14 47.8 Lat: 34.20N Lon: 36.33E Depth: 7

Agency: REL Local

Magnitudes: 2.6MC REL

Rms: 0.0 secs

BAALBECK REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| HWQ  | BZ | 36   | 285 | EP    |   | 1014 | 53.77 | -0.02 | 33   |      |      |     |      |      | 1.0 |
| HWQ  | BN | 36   | 285 | ES    |   | 1014 | 58.24 | -0.01 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 41   | 341 | EP    |   | 1014 | 54.44 | 0.01  |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 41   | 341 | ES    |   | 1014 | 59.40 | 0.02  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 55   | 228 | EP    |   | 1014 | 56.74 | -0.07 |      |      |      |     |      |      | 1.0 |
| ZAHL | SN | 55   | 228 | ES    |   | 1015 | 3.56  | 0.04  |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 70   | 243 | EP    |   | 1014 | 59.13 | -0.02 |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 89   | 232 | EP    |   | 1015 | 2.16  | 0.04  |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 94   | 220 | EP    |   | 1015 | 2.96  | 0.07  |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 108  | 210 | EP    |   | 1015 | 5.09  | -0.04 |      |      |      |     |      |      | 1.0 |

December 20 2020 Hour: 17:23 22.5

Agency: REL Distant

EMSC OT=17:23:22.5 40.87N 142.56E 35Km M=6.3 EAST COAST HONSHU, JAPAN

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 1735 | 23.40 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 1735 | 24.82 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 1735 | 26.72 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 1735 | 27.09 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 1735 | 28.45 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 1735 | 28.38 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 1735 | 28.57 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 1735 | 29.18 |      |      |      |      |     |      |      |    |
| SAIL | SZ |      |     | EP    |   | 1735 | 30.35 |      |      |      |      |     |      |      |    |

December 21 2020 Hour: 17:8 54.9

Agency: REL Distant

EMSC OT=17:08:54.9 16.63S 177.44W 2Km M=5.7 FIJI REGION

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 1728 | 34.43 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 1728 | 34.52 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 1728 | 36.41 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 1728 | 36.41 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 1728 | 37.16 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 1728 | 37.16 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 1728 | 36.78 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 1728 | 36.41 |      |      |      |      |     |      |      |    |

**December 22 2020 Hour: 12:45 15.5 Lat: 35.85N Lon: 36.63E Depth: 4 Agency: REL Regional**  
**Magnitudes: 4.0MC REL Rms: 0.1 secs**

**SYRIA REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| BEIL | SZ | 150  | 196 | EP    |   | 1245 | 39.06 | -0.11 | 206  |      |      |     |      |      | 1.0 |
| BEIL | SN | 150  | 196 | ES    |   | 1245 | 56.77 | 0.07  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 185  | 200 | EP    |   | 1245 | 43.95 | -0.18 |      |      |      |     |      |      | 1.0 |
| HWQ  | BN | 185  | 200 | ES    |   | 1246 | 5.47  | 0.14  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 231  | 197 | EP    |   | 1245 | 49.79 | -0.06 |      |      |      |     |      |      | 1.0 |
| ZAHL | SN | 231  | 197 | ES    |   | 1246 | 15.08 | -0.20 |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 233  | 203 | EP    |   | 1245 | 50.18 | 0.06  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 256  | 203 | EP    |   | 1245 | 52.84 | -0.18 |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 269  | 199 | EP    |   | 1245 | 54.74 | 0.14  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 270  | 196 | EP    |   | 1245 | 55.05 | 0.24  |      |      |      |     |      |      | 1.0 |
| SAIL | SZ | 276  | 204 | EP    |   | 1245 | 55.43 | 0.08  |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 289  | 197 | EP    |   | 1245 | 57.08 | 0.01  |      |      |      |     |      |      | 1.0 |

**December 23 2020 Hour: 22:1 54.0 Lat: 33.42N Lon: 34.67E Depth: 25 Agency: REL Local**  
**Magnitudes: 3.2MC REL Rms: 0.1 secs**

**OFFSHORE SOUTH LEBANON**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| DQRL | SZ | 89   | 69  | EP    |   | 22 2 | 8.33  | 0.11  | 74   |      |      |     |      |      | 1.0 |
| QRWL | SZ | 95   | 81  | EP    |   | 22 2 | 9.02  | -0.03 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 100  | 95  | EP    |   | 22 2 | 9.69  | -0.16 |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 105  | 59  | EP    |   | 22 2 | 10.63 | 0.02  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 108  | 85  | EP    |   | 22 2 | 10.97 | -0.09 |      |      |      |     |      |      | 1.0 |
| RCY  | SN | 108  | 85  | ES    |   | 22 2 | 23.76 | 0.07  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 122  | 67  | EP    |   | 22 2 | 13.25 | 0.25  |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 151  | 51  | EP    |   | 22 2 | 16.58 | 0.00  |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 187  | 48  | EP    |   | 22 2 | 20.88 | -0.06 |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 187  | 48  | ES    |   | 22 2 | 40.75 | -0.11 |      |      |      |     |      |      | 1.0 |

**December 24 2020 Hour: 23:43 42.6 Agency: REL Distant**  
**EMSC OT=23:43:42.6 13.83N 120.62E 119Km M=6.3 MINDORO, PHILIPPINES**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| BEIL | SZ |      |     | EP    |   | 2355 | 27.54 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 2355 | 28.73 |      |      |      |      |     |      |      |    |
| ZAHL | SZ |      |     | EP    |   | 2355 | 30.07 |      |      |      |      |     |      |      |    |
| RCY  | SZ |      |     | EP    |   | 2355 | 30.42 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 2355 | 30.72 |      |      |      |      |     |      |      |    |
| QRWL | SZ |      |     | EP    |   | 2355 | 30.72 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 2355 | 32.31 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 2355 | 31.12 |      |      |      |      |     |      |      |    |
| SAIL | SZ |      |     | EP    |   | 2355 | 35.79 |      |      |      |      |     |      |      |    |

**December 25 2020 Hour: 23:7 55.8 Lat: 33.07N Lon: 35.56E Depth: 1 Agency: REL Regional**  
**Magnitudes: 2.8MC REL Rms: 0.1 secs**

**SOUTH LEBANON BORDERS**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| SHBL | SZ | 35   | 28  | EP    |   | 23 8 | 1.68  | 0.12  | 42   |      |      |     |      |      | 1.0 |
| SHBL | SN | 35   | 28  | ES    |   | 23 8 | 5.72  | -0.07 |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 54   | 12  | EP    |   | 23 8 | 4.63  | 0.01  |      |      |      |     |      |      | 1.0 |
| QRWL | SN | 54   | 12  | ES    |   | 23 8 | 11.19 | 0.07  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 71   | 0   | EP    |   | 23 8 | 7.28  | 0.02  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 93   | 19  | EP    |   | 23 8 | 10.71 | -0.07 |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 93   | 5   | EP    |   | 23 8 | 10.79 | -0.08 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 139  | 15  | EP    |   | 23 8 | 18.02 | -0.07 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 173  | 19  | EP    |   | 23 8 | 23.19 | 0.07  |      |      |      |     |      |      | 1.0 |

**December 26 2020 Hour: 16:43 12.4 Lat: 34.04N Lon: 35.94E Depth: 0 Agency: REL Local**  
**Magnitudes: 2.7MC REL Rms: 0.1 secs**

**KESROUAN REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| ZAHL | SZ | 21   | 194 | EP    |   | 1643 | 15.78 | -0.05 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 26   | 1   | EP    |   | 1643 | 16.65 | 0.02  | 38   |      |      |     |      |      | 1.0 |
| HWQ  | BN | 26   | 1   | ES    |   | 1643 | 19.76 | 0.01  |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 31   | 240 | EP    |   | 1643 | 17.38 | 0.02  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 51   | 223 | EP    |   | 1643 | 20.56 | -0.04 |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 60   | 22  | EP    |   | 1643 | 22.21 | 0.16  |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 60   | 22  | ES    |   | 1643 | 29.05 | -0.13 |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 60   | 204 | EP    |   | 1643 | 22.02 | -0.06 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 79   | 193 | EP    |   | 1643 | 25.27 | 0.08  |      |      |      |     |      |      | 1.0 |

**December 26 2020 Hour: 21:9 39.0 Lat: 32.93N Lon: 35.57E Depth: 2 Agency: REL Regional**  
**Magnitudes: 3.2MC REL Rms: 0.2 secs**

**GOLAN REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| SHBL | SZ | 49   | 19  | EP    |   | 21 9 | 46.88 | -0.13 | 78   |      |      |     |      |      | 1.0 |
| SHBL | SN | 49   | 19  | ES    |   | 21 9 | 53.09 | 0.19  |      |      |      |     |      |      | 1.0 |
| QRWL | SZ | 69   | 8   | EP    |   | 21 9 | 49.93 | -0.32 |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 86   | 360 | EP    |   | 21 9 | 52.99 | 0.04  |      |      |      |     |      |      | 1.0 |
| DQRL | SN | 86   | 360 | ES    |   | 2110 | 3.35  | 0.11  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 107  | 16  | EP    |   | 21 9 | 56.24 | -0.09 |      |      |      |     |      |      | 1.0 |
| BHL  | BZ | 108  | 4   | EP    |   | 21 9 | 56.46 | -0.08 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 154  | 13  | EP    |   | 2110 | 3.52  | 0.15  |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 188  | 17  | EP    |   | 2110 | 8.57  | 0.43  |      |      |      |     |      |      | 1.0 |
| BEIL | SN | 188  | 17  | ES    |   | 2110 | 29.37 | -0.30 |      |      |      |     |      |      | 1.0 |

**December 27 2020 Hour: 21:39 14.8 Agency: REL Distant**  
**EMSC OT=21:39:14.8 39.33S 74.94W 10Km M=6.7 COAST OF LOS LAGOS, CHILE**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES | CODA | AMPL | PERI | BAZ | ARES | VELO | WT |
|------|----|------|-----|-------|---|------|-------|------|------|------|------|-----|------|------|----|
| QRWL | SZ |      |     | EP    |   | 2158 | 16.02 |      |      |      |      |     |      |      |    |
| SHBL | SZ |      |     | EP    |   | 2158 | 16.21 |      |      |      |      |     |      |      |    |
| HWQ  | BZ |      |     | EP    |   | 2158 | 17.16 |      |      |      |      |     |      |      |    |
| BHL  | BZ |      |     | EP    |   | 2158 | 16.02 |      |      |      |      |     |      |      |    |
| DQRL | SZ |      |     | EP    |   | 2158 | 16.78 |      |      |      |      |     |      |      |    |
| BEIL | SZ |      |     | EP    |   | 2158 | 17.66 |      |      |      |      |     |      |      |    |

**December 31 2020 Hour: 15:35 36.0 Lat: 34.03N Lon: 35.74E Depth: 3 Agency: REL Local**  
**Magnitudes: 2.6MC REL Rms: 0.1 secs**

**KESROUAN REGION**

| STAT | CO | DIST | AZI | PHASE | P | HRMN | SECON | TRES  | CODA | AMPL | PERI | BAZ | ARES | VELO | WT  |
|------|----|------|-----|-------|---|------|-------|-------|------|------|------|-----|------|------|-----|
| BHL  | BZ | 16   | 211 | EP    |   | 1535 | 38.55 | -0.18 | 35   |      |      |     |      |      | 1.0 |
| BHL  | BN | 16   | 211 | ES    |   | 1535 | 40.81 | 0.08  |      |      |      |     |      |      | 1.0 |
| ZAHL | SZ | 23   | 145 | EP    |   | 1535 | 39.72 | -0.08 |      |      |      |     |      |      | 1.0 |
| HWQ  | BZ | 33   | 34  | EP    |   | 1535 | 41.42 | -0.05 |      |      |      |     |      |      | 1.0 |
| HWQ  | BN | 33   | 34  | ES    |   | 1535 | 45.58 | 0.08  |      |      |      |     |      |      | 1.0 |
| DQRL | SZ | 39   | 204 | EP    |   | 1535 | 42.48 | 0.08  |      |      |      |     |      |      | 1.0 |
| RCY  | SZ | 60   | 172 | EP    |   | 1535 | 45.81 | 0.15  |      |      |      |     |      |      | 1.0 |
| BEIL | SZ | 70   | 35  | EP    |   | 1535 | 47.32 | -0.01 |      |      |      |     |      |      | 1.0 |
| SHBL | SZ | 75   | 180 | EP    |   | 1535 | 48.15 | -0.06 |      |      |      |     |      |      | 1.0 |

# Epicentral Map of Lebanon

## DECEMBER 2020

