Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

March

2004

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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:

Mc = 0.08 + 1.63 * log10(T) + 0.0009 * D.

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

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

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

STATIONS USED

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

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

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

MACROSEISMIC DATA

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

MONTHLY EPICENTER MAPS

Maps will be found on the last page.

ELECTRONIC PUBLICATION

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

REFERENCES

Havskov, J. and Ottemoller, L.(2001). SEISAN: The Earthquake Analysis Software. -version 7.2-
Institute of Solid Earth Physics, University of Bergen.
http://www.ifjf.uib.no/seismo/software/seisan.html

Lienert, B.R., Berg, E. and Frazer, L.N.(1986). Hypocenter: An earthquake location method using centered, scaled, and adaptively least squares. Bull. Seism. Soc. Am., 76.,
pp 771-783.

Abbreviations:

TIME:	Origin time in UTC (hr. min. and sec.) or data file onset time if event is not located.
LAT:	Latitude of epicenter
LON:	Longitude of epicenter
DEPTH:	Focal depth in kilometer (trailing F indicates fixed depth)
AGENCY:	GRL throughout the bulletin, aka. Geophysical Research Lebanon
MAGNITUDES:	Up to 3 different magnitudes can be given followed by type and and reporting agency, e.g. 3.1 MC GRL - coda magnitude calculated according to GRL standard parameters.
RMS:	Root mean square value of travel time residuals
STAT:	Station code
CO:	Component; S:short period, L:long period, B:broadband.
DIST:	Epicenter distance (km)
AZI:	Azimuth from source to station
PHAS:	Phase; The first letter characterizes onset E(mergent) or I(mpulsive)
P:	Polarity (C for compression, D for dilatation)
HR:	Hour
MN:	Minute
SECON:	Seconds
TRES:	Residual (seconds)
CODA:	Signal duration in seconds
AMPL:	Ground Amplitude (0.5*(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.

March 3 2004 Hour: 20:24 39.5 Lat: 34.21N Lon: 35.33E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	45.02	138	IPG		2024	47.60	0.5	33			258	-60	31.9	1.0
BHL	SN	45.02	138	ISG		2024	52.97	0.2							1.0
HWQ	SZ	57.21	82	IPG		2024	48.61	-0.3							1.0
HWQ	SE	57.21	82	ISG		2024	55.42	-0.4							1.0

March 6 2004 Hour: 8:40 6.9 Lat: 33.81N Lon: 36.23E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	53.89	281	IPG		840	15.29	-0.5				330	131	18.1	1.0
BHL	SN	53.89	281	ISG		840	21.71	-0.7							1.0
HWQ	SZ	57.58	333	IPG		840	17.05	0.7	32						1.0
HWQ	SE	57.58	333	ISG		840	23.94	0.6							1.0

March 6 2004 Hour: 11:47 15.7 Lat: 33.91N Lon: 36.01E Depth: 15 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	33.25	269	IPG		1147	20.86	-0.7	30			34	-54	49.6	1.0
BHL	SE	33.25	269	ISG		1147	26.63	0.7							1.0
HWQ	SZ	41.47	351	IPG		1147	22.39	-0.4							1.0
HWQ	SE	41.47	351	ISG		1147	28.41	0.4							1.0

March 6 2004 Hour: 22: 2 15.2 Lat: 34.24N Lon: 35.31E Depth: 15 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	49.66	139	IPG		22 2	23.63	0.1				303	-16	42.4	1.0
BHL	SN	49.66	139	ISG		22 2	29.55	-0.1							1.0
HWQ	SZ	59.14	86	IPG		22 2	25.07	0.1	46						1.0
HWQ	SE	59.14	86	ISG		22 2	32.03	-0.1							1.0

March 7 2004 Hour: 2:18 20.8 Lat: 34.23N Lon: 35.32E Depth: 15 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	47.72	139	IPG		218	29.13	0.3	29			283	-35	22.6	1.0
BHL	SN	47.72	139	ISG		218	34.82	0.0							1.0
HWQ	SZ	58.33	85	IPG		218	30.33	-0.1							1.0
HWQ	SE	58.33	85	ISG		218	37.25	-0.3							1.0

March 7 2004 Hour: 9:30 18.1 Lat: 33.80N Lon: 36.19E Depth: 15 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	50.47	283	IPG		930	26.31	-0.2	45			329	134	42.9	1.0
BHL	SN	50.47	283	ISG		930	32.32	-0.4							1.0
HWQ	SZ	57.40	337	IPG		930	27.93	0.4							1.0
HWQ	SE	57.40	337	ISG		930	34.80	0.3							1.0

March 10 2004 Hour: 11:36 52.2 Lat: 34.19N Lon: 35.36E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	42.43	139	IPG		1136	59.64	0.1	31			150	-99	18.2	1.0
BHL	SN	42.43	139	ISG		1137	4.71	-0.1							1.0
HWQ	SZ	55.19	80	IPG		1137	1.46	0.1							1.0
HWQ	SE	55.19	80	ISG		1137	8.03	-0.1							1.0

March 12 2004 Hour: 20:22 43.2 Lat: 34.07N Lon: 36.33E Depth: 15 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	42.14	304	IPG		2022	50.53	0.1	26			37	-86	39.9	1.0
HWQ	SE	42.14	304	ISG		2022	55.25	-0.5							1.0
BHL	SZ	64.55	254	IPG		2022	54.71	1.0							1.0
BHL	SN	64.55	254	ISG		2023	0.83	-0.6							1.0

March 15 2004 Hour: 2: 9 1.3 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		210	18.96		63						
HWQ	SN			ISG		210	40.65								
BHL	SE			ISG		210	38.70								

March 15 2004 Hour: 10:12 0.9 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1012	37.71								
HWQ	SZ			IPG		1012	38.38								
HWQ	SE			ISG		1012	45.80								

March 15 2004 Hour: 23:49 51.7 Lat: 31.13N Lon: 35.81E Depth: 15 Agency: REL Local
Magnitudes: 4.4MC REL **Rms: 0.4 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	265.4	350	IPG		2350	31.85	0.2							1.0
BHL	SZ	307.9	357	IPG		2350	38.18	0.2	309						1.0
BHL	SN	307.9	357	ISG		2351	11.70	-0.5							1.0
HWQ	SZ	349.3	2	IPG		2350	43.54	-0.5							1.0
HWQ	SN	349.3	2	ISG		2351	23.27	0.5							1.0

March 16 2004 Hour: 0:25 1.7 **Agency: REL Regional**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		025	59.99								
BHL	SZ			EP		026	6.08								

March 17 2004 Hour: 5:21 1.4 Lat: 34.68N Lon: 23.18E Depth: 80 Agency: REL Regional
Magnitudes: 5.7MC REL **Rms: 0.7 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
AKMC	SZ	837.4	85	EP		522	44.70	-0.1							1.0
PPCY	SZ	838.9	86	EP		522	44.80	-0.1							1.0
ALFC	SZ	862.0	84	EP		522	47.40	-0.3							1.0
ALFC	SZ	862.0	84	ES		524	04.50	-1.9							1.0
SZAC	SZ	888.5	87	EP		522	50.80	0.0							1.0
MAMC	SZ	918.4	84	EP		522	53.30	-1.0							1.0
CSS	SZ	928.8	85	EP		522	55.70	0.2							1.0
CSS	SZ	928.8	85	ES		524	20.70	0.7							1.0
PHNC	SZ	992.8	85	EP		523	04.90	1.9							1.0
MATL	SZ	1128	93	EP		523	18.78	-0.2							0.9
BHL	SZ	1151	91	EP		523	21.63	-0.1	653						0.9
BHL	SE	1151	91	ES		525	5.07	-0.5							0.9
HWQ	SZ	1173	89	EP		523	25.29	1.0							0.9
HWQ	SN	1173	89	ES		525	11.31	1.2							0.9

March 18 2004 Hour: 5: 6 1.5 **Agency: REL Regional**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SE			SN		5 7	27.28								
BHL	SE			SN		5 7	25.22								
HWQ	SZ			EPN		5 7	5.96		72						

March 18 2004 Hour: 15:14 27.5 Lat: 36.26N Lon: 26.79E Depth: 0 Agency: REL Regional
Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	838.5	109	EP		1516	15.42	-0.4							1.0
BHL	SZ	849.0	105	EP		1516	15.60	-1.6							1.0
BHL	SE	849.0	105	ES		1517	37.66	-0.6							1.0
HWQ	SZ	861.1	102	EP		1516	18.65	0.1							1.0
HWQ	SE	861.1	102	ES		1517	42.11	1.3							1.0

March 20 2004 Hour: 5:13 0.9 Lat: 33.73N Lon: 36.56E Depth: 15 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 2.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	83.13	317	IPG		513	17.31	3.2	25			64	-71	18.6	1.0
HWQ	SE	83.13	317	ISG		513	21.60	-2.3							1.0
BHL	SE	86.16	283	ISG		513	23.68	-1.0							1.0

March 20 2004 Hour: 13:43 22.7 Lat: 34.92N Lon: 36.46E Depth: 15 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	85.09	214	IPG		1343	36.81	0.5	56			278	116	42.1	1.0
HWQ	SN	85.09	214	ISG		1343	46.05	-0.2							1.0
BHL	SZ	134.6	213	IPG		1343	42.98	-0.5							1.0
BHL	SE	134.6	213	ISG		1343	59.11	0.2							1.0

March 20 2004 Hour: 15: 9 36.4 Lat: 33.79N Lon: 35.19E Depth: 30 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	45.16	73	IPG		15 9	44.38	-0.5	33			253	0	24.5	1.0
BHL	SE	45.16	73	ISG		15 9	51.34	0.3							1.0
HWQ	SZ	88.85	52	IPG		15 9	51.24	0.5							1.0
HWQ	SE	88.85	52	ISG		1510	1.19	-0.3							1.0

March 21 2004 Hour: 15:44 37.3 Lat: 33.70N Lon: 36.22E Depth: 15 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.7 secs *Felt in Yahfoufa*

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	57.53	293	IPG		1544	47.49	0.7	40			158	45	49.4	1.0
BHL	SN	57.53	293	ISG		1544	54.37	0.6							1.0
HWQ	SZ	69.10	338	IPG		1544	47.84	-0.6							1.0
HWQ	SN	69.10	338	ISG		1544	56.06	-0.7							1.0

March 21 2004 Hour: 22:20 17.6 Lat: 34.00N Lon: 35.72E Depth: 50 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	12.37	210	IPG		2220	26.39	1.2							1.0
BHL	SE	12.37	210	ISG		2220	30.77	-0.1							1.0
HWQ	SZ	37.12	34	IPG		2220	27.48	0.8	28						1.0
HWQ	SE	37.12	34	ISG		2220	32.51	-1.0							1.0
MATL	SZ	67.39	213	IPG		2220	28.56	-1.0							1.0

March 22 2004 Hour: 15:20 0.2 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		1520	32.28								
HWQ	SN			ISG		1520	41.05								
BHL	SE			ISG		1520	54.23								

March 23 2004 Hour: 8:58 23.1 Lat: 30.92N Lon: 37.45E Depth: 0 Agency: REL Regional
Rms: 1.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	347.8	326	EPN		859	13.36	1.1							1.0
BHL	SZ	371.4	333	EPN		859	15.42	0.1							1.0
BHL	SE	371.4	333	SN		859	52.59	-1.4							1.0
HWQ	SZ	398.2	340	EPN		859	17.51	-1.2							1.0
HWQ	SN	398.2	340	SN		9 0	1.27	1.4							1.0

March 23 2004 Hour: 9: 4 47.4 Lat: 34.46N Lon: 36.58E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.6 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	61.46	251	IPG		9 4	57.28	0.0	44			73	2	19.5	1.0
HWQ	SN	61.46	251	ISG		9 5	3.91	-0.7							1.0
BHL	SE	105.1	234	ISG		9 5	17.72	0.8							1.0

March 23 2004 Hour: 12: 3 42.2 Lat: 35.15N Lon: 35.88E Depth: 15 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	96.50	176	IPG		12 3	57.84	0.4	52			355	0	37.8	1.0
HWQ	SE	96.50	176	ISG		12 4	8.02	-0.6							1.0
BHL	SZ	139.3	189	IPG		12 4	3.26	-0.4							1.0
BHL	SN	139.3	189	ISG		12 4	20.23	0.6							1.0

March 24 2004 Hour: 1: 2 59.0 Lat: 34.24N Lon: 34.72E Depth: 0 Agency: REL Local
Magnitudes: 3.5MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	94.12	113	IPG		1 3	15.30	1.2				326	32	24.3	1.0
BHL	BN	94.12	113	ISG		1 3	25.35	0.0							1.0
HWQ	SZ	113.0	88	IPG		1 3	18.25	1.1	107						1.0
HWQ	SN	113.0	88	ISG		1 3	31.65	1.0							1.0

March 24 2004 Hour: 6:17 45.7 Lat: 33.71N Lon: 35.77E Depth: 15 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 1.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	23.79	333	IPG		617	50.73	0.4	28			184	32	22.0	1.0
BHL	SE	23.79	333	ISG		617	53.84	0.1							1.0
HWQ	SZ	64.65	14	IPG		617	57.58	1.3							1.0
HWQ	SE	64.65	14	ISG		618	2.24	-1.8							1.0

March 24 2004 Hour: 15:54 3.6 Lat: 33.99N Lon: 35.12E Depth: 0 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	50.41	101	IPG		1554	10.80	-0.9	49						1.0
BHL	SE	50.41	101	ISG		1554	17.91	0.2							1.0
MATL	SZ	59.09	161	IPG		1554	13.40	0.3							1.0
HWQ	SZ	82.66	67	IPG		1554	17.17	0.3							1.0
HWQ	SE	82.66	67	ISG		1554	26.88	0.1							1.0

March 24 2004 Hour: 18:13 32.9 Lat: 33.85N Lon: 37.21E Depth: 15 Agency: REL Local
Magnitudes: 3.5MC REL Rms: 0.4 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	126.0	292	IPG		1813	52.43	0.0	107						1.0
HWQ	SN	126.0	292	ISG		1814	7.16	0.3							1.0
BHL	SZ	144.2	273	IPG		1813	54.56	-0.6							1.0
BHL	SE	144.2	273	ISG		1814	11.36	-0.2							1.0
MATL	SZ	179.1	258	IPG		1814	0.72	0.5							1.0

March 25 2004 Hour: 1:46 33.3 Lat: 33.63N Lon: 35.56E Depth: 14 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	26.91	233	IPG		146	38.21	0.0							1.0
BHL	SZ	31.15	16	IPG		146	38.70	-0.2	30						1.0
BHL	SE	31.15	16	ISG		146	43.12	0.1							1.0
HWQ	SZ	79.78	26	IPG		146	46.58	0.2							1.0
HWQ	SE	79.78	26	ISG		146	56.01	-0.1							1.0

March 25 2004 Hour: 19:31 1.3 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			EP		1932	36.73								
HWQ	SZ			EP		1932	30.95								

March 28 2004 Hour: 3:52 0.8 Agency: REL Distant

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			EP		352	58.23								
HWQ	SZ			EP		352	52.41								

March 28 2004 Hour: 7:25 36.7 Lat: 33.47N Lon: 35.71E Depth: 34 Agency: REL Local
Magnitudes: 2.9MC REL **Rms: 0.3 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	48.21	354	IPG		725	45.53	-0.3	49			174	0	20.0	1.0
BHL	SE	48.21	354	ISG		725	52.78	0.2							1.0
HWQ	SZ	92.14	14	IPG		725	51.65	0.3							1.0
HWQ	SE	92.14	14	ISG		726	1.93	-0.2							1.0

March 29 2004 Hour: 11:24 37.8 Lat: 33.49N Lon: 35.85E Depth: 0 Agency: REL Local
Magnitudes: 2.7MC REL **Rms: 0.6 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	48.05	270	IPG		1124	46.12	0.5							1.0
BHL	SZ	49.30	339	IPG		1124	44.69	-1.1	36						1.0
BHL	SE	49.30	339	ISG		1124	51.67	0.0							1.0
HWQ	SZ	87.91	6	IPG		1124	52.00	0.0							1.0
HWQ	SN	87.91	6	ISG		1125	3.15	0.6							1.0

March 30 2004 Hour: 11:24 44.3 Lat: 33.44N Lon: 36.50E Depth: 15 Agency: REL Local
Magnitudes: 2.8MC REL **Rms: 0.4 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	94.07	304	IPG		1124	58.92	-0.2	40			245	122	16.1	1.0
BHL	SN	94.07	304	ISG		1125	10.44	0.4							1.0
HWQ	SZ	106.4	331	IPG		1125	1.26	0.3							1.0
HWQ	SN	106.4	331	ISG		1125	12.72	-0.5							1.0

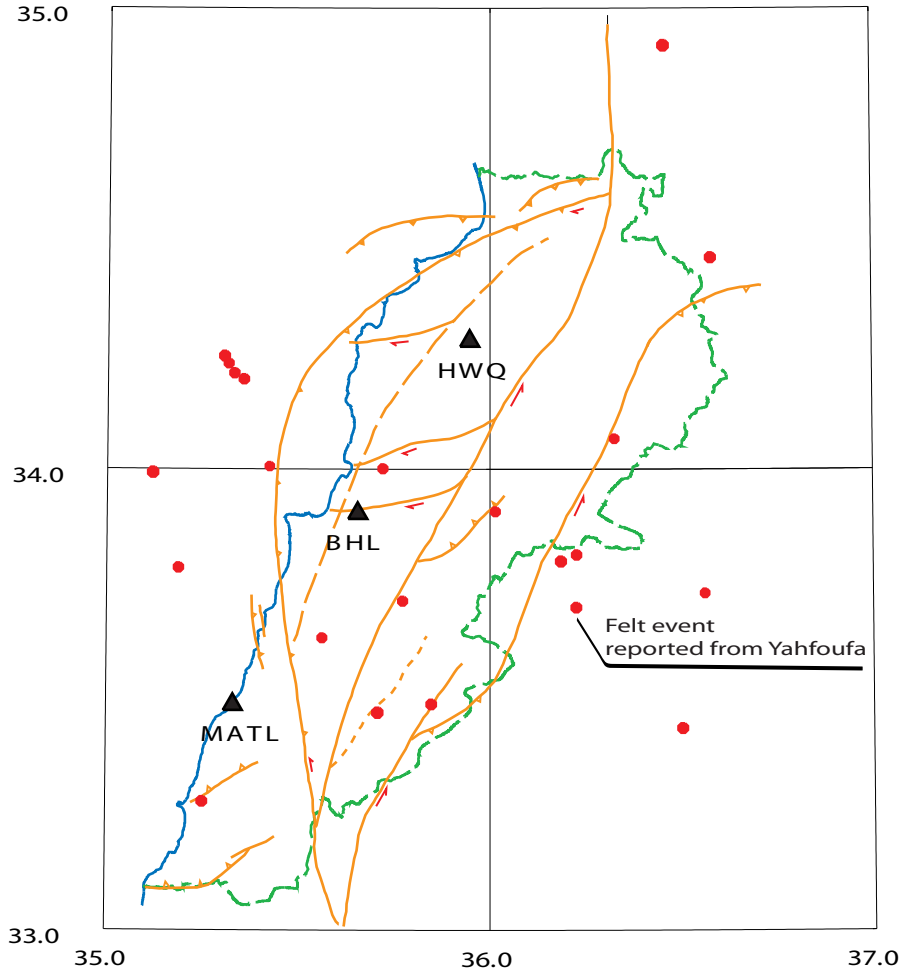
March 30 2004 Hour: 13:21 18.7 Lat: 34.01N Lon: 35.42E Depth: 21 Agency: REL Local
Magnitudes: 2.3MC REL **Rms: 0.6 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	24.12	118	IPG		1321	24.57	0.7	23			298	0	17.7	1.0
BHL	SE	24.12	118	ISG		1321	27.23	-0.4							1.0
HWQ	SZ	56.87	58	IPG		1321	27.44	-0.7							1.0
HWQ	SE	56.87	58	ISG		1321	35.66	0.4							1.0

March 31 2004 Hour: 0:20 26.3 Lat: 33.28N Lon: 35.25E Depth: 0 Agency: REL Local
Magnitudes: 2.7MC REL **Rms: 1.3 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	78.79	28	IPG		020	38.54	-0.5	35			158	-50	59.3	1.0
BHL	SE	78.79	28	ISG		020	46.51	-1.9							1.0
HWQ	SZ	128.2	30	IPG		020	48.18	1.2							1.0
HWQ	SE	128.2	30	ISG		021	3.45	1.2							1.0

Seismic Events of March 2004 as recorded by the GRAL network



Magnitudes:

Unknown +

M = 1 •

M = 2 •

M = 3 •

M = 4 •

M = 5 •