Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

April

2004

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

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.

April 1 2004 Hour: 8:36 1.9 **Agency: REL Distant**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			EP		837	10.26								
HWQ	SZ			EP		837	3.92								

April 1 2004 Hour: 11:35 1.5 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		1136	8.35								
HWQ	SE			ISG		1136	20.32								
BHL	SN			ISG		1136	18.56								

April 1 2004 Hour: 15: 2 0.0 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		15 2	47.93								
HWQ	SE			ISG		15 2	57.79								
BHL	SN			ISG		15 3	11.62								

April 1 2004 Hour: 15: 3 44.9 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		15 4	6.61								
BHL	SZ			IPG		15 4	13.51								
HWQ	SN			ISG		15 4	15.15								

April 2 2004 Hour: 10: 1 1.0 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		10 1	59.31								
HWQ	SZ			IPG		10 2	1.06								
BHL	SE			ISG		10 2	4.28								
HWQ	SE			ISG		10 2	9.85								

April 3 2004 Hour: 6: 4 1.5 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		6 4	47.00								
BHL	SE			ISG		6 4	49.60								
HWQ	SN			ISG		6 4	59.17								

April 3 2004 Hour: 20:10 12.4 Lat: 33.39N Lon: 35.18E Depth: 10 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	72.56	38	IPG		2010	24.53	0.3	40			324	106	18.8	1.0
BHL	SE	72.56	38	ISG		2010	32.29	-0.7							1.0
HWQ	SZ	121.9	36	IPG		2010	32.20	0.1							1.0
HWQ	SE	121.9	36	ISG		2010	47.07	0.3							1.0

April 5 2004 Hour: 17:44 1.1 **Agency: REL Local**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1744	33.53								
HWQ	SZ			IPG		1744	34.39								
HWQ	SE			ISG		1744	41.66								
BHL	SN			ISG		1744	40.52								

April 7 2004 Hour: 22:12 26.8 Lat: 33.58N Lon: 35.71E 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	36.42	351	IPG		2212	32.96	-0.2	35			169	-1	93.1	1.0
BHL	SE	36.42	351	ISG		2212	37.28	-0.6							1.0
HWQ	SZ	80.45	16	IPG		2212	39.95	0.3	51			57	-99	28.0	1.0
HWQ	SE	80.45	16	ISG		2212	49.53	0.4							1.0

April 9 2004 Hour: 13:26 0.4 **Agency: REL Regional**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1326	21.31								
HWQ	SE			ES		1326	41.74								
BHL	SE			ES		1326	37.84								

April 9 2004 Hour: 15: 5 41.2 Lat: 33.62N Lon: 35.41E Depth: 43 Agency: REL Local
Magnitudes: 2.8MC REL **Rms: 0.5 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	39.19	36	IPG		15 5	49.24	-0.6	41			216	0	18.0	1.0
BHL	SN	39.19	36	ISG		15 5	56.54	0.3							1.0
HWQ	SZ	88.63	34	IPG		15 5	56.00	0.6							1.0
HWQ	SE	88.63	34	ISG		15 6	5.66	-0.3							1.0

April 10 2004 Hour: 15: 6 27.3 Lat: 33.83N Lon: 35.00E Depth: 15 Agency: REL Local
Magnitudes: 3.1MC REL **Rms: 0.4 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	61.35	82	IPG		15 6	37.75	0.5	64			179	-82	15.6	1.0
BHL	SE	61.35	82	ISG		15 6	45.08	0.4							1.0
HWQ	SZ	100.9	60	IPG		15 6	42.53	-0.6							1.0
HWQ	SN	100.9	60	ISG		15 6	54.57	-0.3							1.0

April 11 2004 Hour: 8:20 1.8 Lat: 34.30N Lon: 36.24E Depth: 13 Agency: REL Local
Magnitudes: 2.7MC REL **Rms: 0.9 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	27.27	266	IPG		820	5.46	-1.3	41			188	102	48.0	1.0
HWQ	SN	27.27	266	ISG		820	10.99	0.5							1.0
BHL	SZ	69.55	231	IPG		820	14.05	0.8							1.0

April 11 2004 Hour: 9:50 23.9 Lat: 34.50N Lon: 34.80E Depth: 35 Agency: REL Local
Magnitudes: 3.4MC REL **Rms: 1.0 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	103.0	130	IPG		950	38.86	-1.0	92						1.0
BHL	SE	103.0	130	ISG		950	49.85	-1.8							1.0
HWQ	SZ	108.2	103	IPG		950	40.87	0.4							1.0
HWQ	SE	108.2	103	ISG		950	53.51	0.7							1.0
MATL	SZ	122.7	156	IPG		950	40.98	-1.2							1.0
BIDA	SZ	150.2	67	IPG		950	45.50	-0.2							1.0
QASN	SZ	173.6	128	IPG		950	47.42	-1.2							1.0
SLNF	SZ	177.4	47	IPG		950	49.13	0.0							1.0
SLNF	SZ	177.4	47	ISG		951	07.83	0.0							1.0
WRDH	SZ	184.5	52	IPG		950	50.05	0.1							1.0
WRDH	SZ	184.5	52	IPG		951	09.12								
BTCH	SZ	227.4	41	IPG		950	55.68	0.4							1.0
BTCH	SZ	227.4	41	ISG		951	18.63	0.2							1.0
TCHB	SZ	230.5	152	IPG		950	56.75	1.1							1.0
TCHB	SZ	230.5	152	ISG		951	21.44	2.4							1.0

April 12 2004 Hour: 0:53 34.8 Lat: 33.43N Lon: 35.80E Depth: 15 Agency: REL Local
Magnitudes: 2.4MC REL **Rms: 0.9 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	54.33	346	IPG		053	44.28	0.5	25			299	133	47.0	1.0
BHL	SN	54.33	346	ISG		053	49.62	-0.8							1.0
HWQ	SZ	95.20	8	IPG		053	51.09	1.3							1.0
HWQ	SE	95.20	8	ISG		053	59.94	-1.0							1.0

April 12 2004 Hour: 11:58 1.5 Lat: 35.09N Lon: 36.03E Depth: 14 Agency: REL Local
Magnitudes: 2.9MC REL **Rms: 1.1 secs**

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	90.71	185	IPG		1158	16.99	1.1	46			235	130	45.2	1.0
HWQ	SE	90.71	185	ISG		1158	25.47	-1.0							1.0
BHL	SZ	136.3	195	IPG		1158	21.43	-1.1							1.0
BHL	SN	136.3	195	ISG		1158	39.15	1.0							1.0

April 13 2004 Hour: 8:59 36.1 Lat: 33.91N Lon: 35.64E Depth: 20 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.1 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	1.723	103	IPG		859	39.34	-0.2	25			283	0	10.3	1.0
BHL	SN	1.723	103	ISG		859	42.08	0.1							1.0
HWQ	SZ	50.08	35	IPG		859	44.81	0.2							1.0
HWQ	SN	50.08	35	ISG		859	50.84	-0.1							1.0

April 13 2004 Hour: 9:35 0.3 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			EP		935	48.91								
HWQ	SZ			EP		935	49.35								
HWQ	SE			ES		935	57.13								
BHL	SN			ES		935	56.19								

April 13 2004 Hour: 13:59 0.5 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		1359	33.93								
HWQ	SE			ISG		1359	39.28								
BHL	SZ			IPG		1359	41.00								

April 18 2004 Hour: 10: 9 12.6 Lat: 34.46N Lon: 34.93E Depth: 15 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	90.94	132	IPG		10 9	25.55	-1.4	38			319	6	14.1	1.0
BHL	SN	90.94	132	ISG		10 9	37.53	0.0							1.0
HWQ	SZ	95.87	102	IPG		10 9	28.85	1.2							1.0
HWQ	SE	95.87	102	ISG		10 9	39.13	0.3							1.0

April 18 2004 Hour: 13:22 58.6 Lat: 34.84N Lon: 36.39E Depth: 15 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	74.79	213	IPG		1323	10.78	0.1							1.0
HWQ	SN	74.79	213	ISG		1323	19.42	-0.1							1.0
BHL	SZ	124.2	213	IPG		1323	17.61	-0.3	49			345	48	30.0	1.0
BHL	SN	124.2	213	ISG		1323	32.44	0.3							1.0

April 21 2004 Hour: 10: 9 1.1 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			EP		1010	13.99								
BHL	SN			ES		1010	22.76								
HWQ	SN			ES		1010	24.45								
BHL	SZ			EP		1010	11.32								

April 21 2004 Hour: 13:24 0.6 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ			IPG		1324	39.46								
HWQ	SN			ISG		1324	48.03								
BHL	SZ			IPG		1324	44.86								

April 21 2004 Hour: 17:27 1.5 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1728	22.97								
HWQ	SZ			IPG		1728	22.97								
HWQ	SE			ISG		1728	30.57								
BHL	SN			ISG		1728	31.34								

April 21 2004 Hour: 22:59 57.7 Lat: 35.71N Lon: 37.90E Depth: 15 Agency: REL Local
Magnitudes: 3.5MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	238.4	229	IPG		23 0	35.03	1.2	88			47	0	37.7	1.0
HWQ	SN	238.4	229	ISG		23 1	0.29	-0.2							1.0
BHL	SZ	286.6	226	IPG		23 0	39.61	-1.2							1.0
BHL	SN	286.6	226	ISG		23 1	12.96	0.2							1.0

April 24 2004 Hour: 10:48 0.5 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1048	55.39								
BHL	SE			ISG		1049	4.15								
HWQ	SE			ISG		1049	7.36								

April 24 2004 Hour: 11:49 13.2 Lat: 33.59N Lon: 35.57E Depth: 45 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
BHL	SZ	36.11	12	IPG		1149	21.03	-0.7	38			192	0	8.8	1.0
BHL	SN	36.11	12	ISG		1149	28.56	0.4							1.0
HWQ	SZ	84.17	24	IPG		1149	27.74	0.7							1.0
HWQ	SN	84.17	24	ISG		1149	36.79	-0.4							1.0

April 24 2004 Hour: 20: 9 46.0 Lat: 33.52N Lon: 35.28E Depth: 13 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	55.07	40	IPG		20 9	54.31	-0.9	29			334	114	27.9	1.0
BHL	SE	55.07	40	ISG		2010	1.48	-0.5							1.0
HWQ	SZ	104.4	36	IPG		2010	3.74	0.7							1.0
HWQ	SE	104.4	36	ISG		2010	16.29	0.7							1.0

April 25 2004 Hour: 12:38 54.4 Lat: 34.84N Lon: 36.58E Depth: 27 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	85.44	223	IPG		1239	8.26	0.0	44			43	0	30.2	1.0
HWQ	SN	85.44	223	ISG		1239	18.45	0.0							1.0
BHL	SZ	134.4	220	IPG		1239	15.32	0.0							1.0
BHL	SE	134.4	220	ISG		1239	30.80	0.0							1.0

April 25 2004 Hour: 15:21 50.3 Lat: 33.66N Lon: 37.31E Depth: 15 Agency: REL Local
Magnitudes: 3.3MC REL Rms: 2.3 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	SZ	143.7	299	IPG		1522	9.83	-2.6	74			287	169	20.4	1.0
HWQ	SE	143.7	299	ISG		1522	26.98	-1.9							1.0
BHL	SZ	156.1	280	IPG		1522	16.03	1.8							1.0
BHL	SE	156.1	280	ISG		1522	34.66	2.7							1.0

April 26 2004 Hour: 7: 4 35.8 Lat: 34.16N Lon: 35.46E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	33.36	147	IPG		7 4	42.60	0.9	36			304	-22	21.0	1.0
BHL	SN	33.36	147	ISG		7 4	46.58	0.5							1.0
HWQ	SZ	47.08	73	IPG		7 4	43.10	-0.6							1.0
HWQ	SN	47.08	73	ISG		7 4	48.70	-0.9							1.0

April 27 2004 Hour: 9: 6 5.2 Lat: 33.98N Lon: 35.39E Depth: 15 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.7 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	26.04	108	IPG		9 6	10.60	0.5	29			171	-99	11.6	1.0
BHL	SN	26.04	108	ISG		9 6	13.19	-0.5							1.0
HWQ	SZ	61.53	57	IPG		9 6	16.04	0.8							1.0
HWQ	SE	61.53	57	ISG		9 6	21.77	-0.9							1.0

April 28 2004 Hour: 0:11 0.4 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		011	55.37								
BHL	SE			ISG		011	59.03								
HWQ	SN			ISG		012	12.01								

April 28 2004 Hour: 15:23 27.3 Lat: 33.62N Lon: 35.85E Depth: 15 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 1.5 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	35.90	330	IPG		1523	31.98	-1.6	26			359	151	16.4	1.0
BHL	SE	35.90	330	ISG		1523	36.27	-2.0							1.0
MATL	SZ	50.46	253	IPG		1523	36.57	0.9							1.0
HWQ	SZ	73.09	7	IPG		1523	40.32	1.3							1.0
HWQ	SE	73.09	7	ISG		1523	49.07	1.3							1.0

April 28 2004 Hour: 18:21 42.1 Lat: 33.83N Lon: 35.70E Depth: 0 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.9 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ	8.869	330	IPG		1821	41.89	-1.6	25						1.0
BHL	SE	8.869	330	ISG		1821	45.29	0.7							1.0
MATL	SZ	51.66	222	ISG		1821	57.05	0.5							1.0
HWQ	SZ	54.06	25	IPG		1821	50.28	-0.5							1.0
HWQ	SE	54.06	25	ISG		1821	58.10	0.9							1.0

April 29 2004 Hour: 14:51 0.7 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	SZ			IPG		1452	15.18								
HWQ	SZ			IPG		1452	15.77								
HWQ	SN			ISG		1452	20.82								
BHL	SN			ISG		1452	18.57								

April 29 2004 Hour: 16:25 48.4 Lat: 34.35N Lon: 35.21E 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	64.81	140	IPG		1625	59.04	0.1							1.0
BHL	SE	64.81	140	ISG		1626	6.56	-0.2							1.0
HWQ	SZ	68.54	97	IPG		1625	59.39	-0.1	40			39	122	67.1	1.0
HWQ	SE	68.54	97	ISG		1626	7.82	0.1							1.0

April 29 2004 Hour: 17:54 1.9 Lat: 33.86N Lon: 36.42E 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
HWQ	SZ	63.30	317	IPG		1754	12.63	0.4							1.0
HWQ	SE	63.30	317	ISG		1754	20.20	0.3							1.0
BHL	SZ	70.58	274	IPG		1754	12.95	-0.4	43			343	110	14.5	1.0
BHL	SN	70.58	274	ISG		1754	21.37	-0.4							1.0

April 29 2004 Hour: 18:34 45.4 Lat: 32.93N Lon: 35.66E Depth: 15 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	69.53	334	IPG		1834	56.53	0.0	32						1.0
BHL	SE	108.5	360	ISG		1835	14.88	0.0							1.0
HWQ	SN	152.4	10	ISG		1835	26.12	0.0							1.0

April 29 2004 Hour: 21:26 12.0 Lat: 33.31N Lon: 35.50E Depth: 23 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 1.2 secs

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
MATL	SZ	25.35	321	IPG		2126	18.17	0.8	51						1.0
BHL	SZ	67.33	12	IPG		2126	21.73	-1.4							1.0
BHL	SE	67.33	12	ISG		2126	30.11	-1.2							1.0
HWQ	SZ	114.9	21	IPG		2126	30.17	0.1							1.0
HWQ	SE	114.9	21	ISG		2126	45.00	1.7							1.0

Seismic Events of April 2004 as recorded by the GRAL network

Total events: 40
Selected events: 24

Magnitudes:

Unknown +

M = 1

M = 2

M = 3