

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Waveform Catalogue for IASPEI Events

by

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This report is preliminary and has not been edited or reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature.

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Introduction

The purpose of this report is to provide a visual catalogue of digitally recorded waveform data available from the United States Geological Survey's National Earthquake Information Center (NEIC). The waveforms selected correspond to events chosen for discussion during a special session on the Analysis of Selected Earthquakes which will be convened by the Commission on Practice at the 1985 IASPEI General Assembly in Tokyo.

The goal of this special session is to provide a focus on modern scientific practice in the areas of earthquake quantification, data exchange, digital seismology, and algorithms. Participants have agreed to analyze a selection of fifty-one recent well-recorded worldwide earthquakes representing a range of sizes, locations, focal depths, and source characteristics.

To facilitate these analyses, the NEIC has expanded its digital data distribution services to provide participants with network-event tapes and, as an aid in using these tapes, this hard copy waveform catalog of the IASPEI events. The intent is to provide the researcher with a quick index both to the availability of data and to the character of the data for each event (e.g. complexity, directionality, etc.).

The network-event tapes are a recent data service initiated by the NEIC. Currently, these tapes contain data from the Global Digital Seismic Network (GDSN), the Regional Seismic Test Network (RSTN) and the Glen Almond, Canada, SRO station. In the future, data from other high-quality stations and arrays, installed and operated by many countries around the world, will be added to the event tapes. The free distribution of event tapes already includes major data centers in many countries. The event tape program is therefore international in both composition and distribution. This type of digital data exchange program would not be possible without the high level of international cooperation that has been the hallmark of seismology.

Network-event tapes contain digital data for earthquakes of magnitude 5.5 or greater in the NEIC network-day tape format. For this catalog, all available vertical component recordings in all period bands are shown, including stations which were electronically saturated, non-operational, or had some other difficulty during the event. The desired size of this catalog precluded showing horizontal components as well. In general, one can expect them to be of approximately the same quality as the vertical components at

any particular time. Most of the available stations do not have the capability for recording short-period horizontal components. All stations which have intermediate-period recordings, however, record all three components in this band. Short- and intermediate-period channels are recorded only when an event is detected. Horizontal components are recorded (when available) whenever the vertical component is, and never otherwise.

Source parameters of the IASPEI events are summarized in Table 1. The remainder of this report consists of vertical component waveforms from all reporting stations organized by event. Each event is prefaced by the station coverage map in which stations and geography within 100° of the source are shown in an azimuthal equi-distant projection centered at the epicenter. Following the coverage map, all short-period, vertical component waveforms are shown in order of increasing epicentral distance. Each waveform is two minutes long and is identified by station code, start time, and epicentral distance, Δ , in degrees. The start time is chosen to be about 15 s before the earliest theoretical arrival time of interest (P, Pdiff, or PKP_{df}, depending on distance). The ordinate is in microns of ground displacement at the dominant period of the instrument response which is taken to be 1 s. Each page of waveforms is titled with the event origin date-time, the Flinn-Engdahl region name, and the component identifier (SPZ). Also, the depth of the event and its average body and surface wave magnitudes are shown for convenience.

Following the short-period waveforms, intermediate-period vertical (IPZ) and finally long-period vertical (LPZ) waveforms are shown. In each case, the format is the same as for the short-period waveforms. Four minutes of intermediate-period data is shown beginning 30 s before the theoretical first arrival and the dominant period is assumed to be 1 s. Fifty minutes of long-period data is shown beginning one minute before the theoretical first arrival and the dominant period is taken to be 25 s. Both short-period and intermediate-period channels are recorded only when an event has been detected. In addition, only about half of the available stations have intermediate-period channels and one (GAC) has no short-period recordings. For these reasons, it is not uncommon for stations with good long-period recordings to have no intermediate-period and perhaps no short-period recordings at all.

Table 1.

Origin	Time	Latitude	Longitude	Depth	m_B	M_{SZ}	Region Name
1980 01 01	16:42:40.00	38.815° N	27.780° W	10.0G	6.0	6.7	Azores Islands
1980 05 25	16:33:44.70	37.600° N	118.840° W	5.0	6.1	6.1	California-Nevada Border Region
1980 06 29	07:20:05.50	34.808° N	139.181° E	15.0	5.8	6.2	Near S. Coast of Honshu, Japan
1980 07 29	14:58:40.80	29.598° N	81.092° E	18.0D	6.1	6.5	Nepal
1980 10 10	12:25:23.50	36.195° N	1.354° E	10.0G	6.5	7.3	Algeria
1980 10 24	14:53:35.10	18.211° N	98.240° W	72.0	6.4		Central Mexico
1980 11 08	10:27:34.00	41.117° N	124.253° W	19.0D	6.2	7.2	Near Coast of Northern Calif.
1980 11 23	18:34:53.80	40.914° N	15.366° E	10.0G	6.0	6.9	Southern Italy
1981 01 18	18:17:24.40	38.640° N	142.750° E	33.0N	6.1	6.9	Near East Coast of Honshu, Japan
1981 01 23	21:13:51.70	30.927° N	101.098° E	33.0N	5.7	6.8	Sichuan Province, China
1981 07 06	03:08:24.18	22.293° S	171.742° E	33.0N	6.9	7.0	Loyalty Islands Region
1981 10 28	04:34:17.78	31.272° S	110.649° W	10.0G	6.2	6.2	Easter Island Region
1981 11 22	15:05:20.56	18.752° N	120.839° E	24.0D	6.2	6.5	Luzon, Philippine Islands
1981 11 27	17:21:45.80	42.913° N	131.076° E	543.0D	5.8		E. USSR-N.E. China Border Reg.
1982 01 03	14:09:50.45	0.972° S	21.870° W	10.0G	5.8	6.5	Central Mid-Atlantic Ridge
1982 01 09	12:53:51.88	46.984° N	66.656° W	10.1G	5.7	5.2	New Brunswick
1982 08 05	20:32:52.95	12.597° S	165.931° E	30.7	6.2	7.1	Santa Cruz Islands
1982 09 06	01:47:02.73	29.325° N	140.360° E	175.8	6.5		South of Honshu, Japan
1982 12 13	09:12:48.05	14.701° N	44.379° E	5.0G	6.0	6.0	Western Arabian Peninsula
1983 02 13	01:40:10.98	39.945° N	75.135° E	16.1	5.6	6.2	Southern Xinjiang, China
1983 04 03	02:50:01.18	8.717° N	83.123° W	37.0D	6.5	7.3	Costa Rica
1983 04 04	02:51:34.36	5.723° N	94.722° E	78.5	6.6		Northern Sumatera
1983 04 11	08:18:10.12	10.419° N	62.764° W	40.0	6.0	5.9	Near Coast of Venezuela
1983 04 18	10:58:51.26	27.793° N	62.054° E	64.0	6.5		Southern Iran
1983 05 02	23:42:37.76	36.219° N	120.317° W	10.2G	6.2	6.5	Central California
1983 05 26	02:59:59.60	40.462° N	139.102° E	23.7	6.8	7.7	Near West Coast of Honshu, Japan
1983 06 01	01:59:54.68	17.038° S	174.605° W	179.6D	6.2		Tonga Islands
1983 06 02	20:12:50.73	9.512° S	71.249° W	598.6	5.9		Peru-Brazil Border Region
1983 06 09	18:46:00.90	51.414° N	174.111° W	20.8	6.2	5.8	Andreanof Islands, Aleutian Is.
1983 06 21	06:25:27.35	41.346° N	139.099° E	9.9	6.7	6.9	Hokkaido, Japan Region
1983 06 24	09:06:45.80	24.176° N	122.402° E	44.1	6.1	6.7	Taiwan Region
1983 07 12	15:10:03.40	61.031° N	147.286° W	37.0	6.1	6.4	Southern Alaska
1983 08 06	15:43:51.24	40.142° N	24.766° E	2.4	6.2	7.0	Aegean Sea
1983 08 17	10:55:54.13	55.867° N	161.287° E	62.6	6.6		Near East Coast of Kamchatka
1983 09 07	19:22:05.15	60.976° N	147.500° W	45.0	6.2	6.2	Southern Alaska
1983 09 12	15:42:08.55	36.502° N	71.082° E	208.8D	6.1		Afghanistan-USSR Border Region
1983 10 04	18:52:13.30	26.535° S	70.563° W	14.8	6.4	7.3	Near Coast of Northern Chile
1983 10 09	11:25:40.58	26.135° S	70.518° W	16.1	5.9	6.2	Near Coast of Northern Chile
1983 10 17	19:36:21.47	37.588° N	17.520° W	10.0G	6.0	6.3	North Atlantic Ocean
1983 10 22	04:21:35.01	60.665° S	25.451° W	24.0D	6.5	6.8	South Sandwich Islands Region
1983 10 30	04:12:27.13	40.330° N	42.187° E	11.6	6.1	6.9	Turkey
1983 11 16	16:13:00.07	19.430° N	155.454° W	12.0G	6.4	6.7	Hawaii
1983 11 24	05:30:34.23	7.481° S	128.168° E	178.5	6.4		Banda Sea
1983 11 30	17:46:00.67	6.852° S	72.110° E	10.0G	6.6	7.6	Chagos Archipelago Region
1983 12 22	04:11:29.23	11.866° N	13.529° W	11.3	6.4	6.2	Northwest Africa
1983 12 30	23:52:39.93	36.372° N	70.738° E	214.5D	6.6		Hindu Kush Region
1984 01 01	09:03:37.59	33.404° N	137.322° E	374.2D	6.5		Near S. Coast of Honshu, Japan
1984 02 07	21:33:20.50	9.924° S	160.455° E	14.2	6.5	7.5	Solomon Islands
1984 03 05	03:33:51.23	8.136° N	123.765° E	650.6D	6.7		Mindanao, Philippine Islands
1984 03 19	20:28:39.80	40.288° N	63.333° E	25.8D	6.5	7.0	Uzbek SSR
1984 03 24	09:44:02.61	44.162° N	148.289° E	43.0D	6.1	7.1	Kuril Islands

Table Definitions

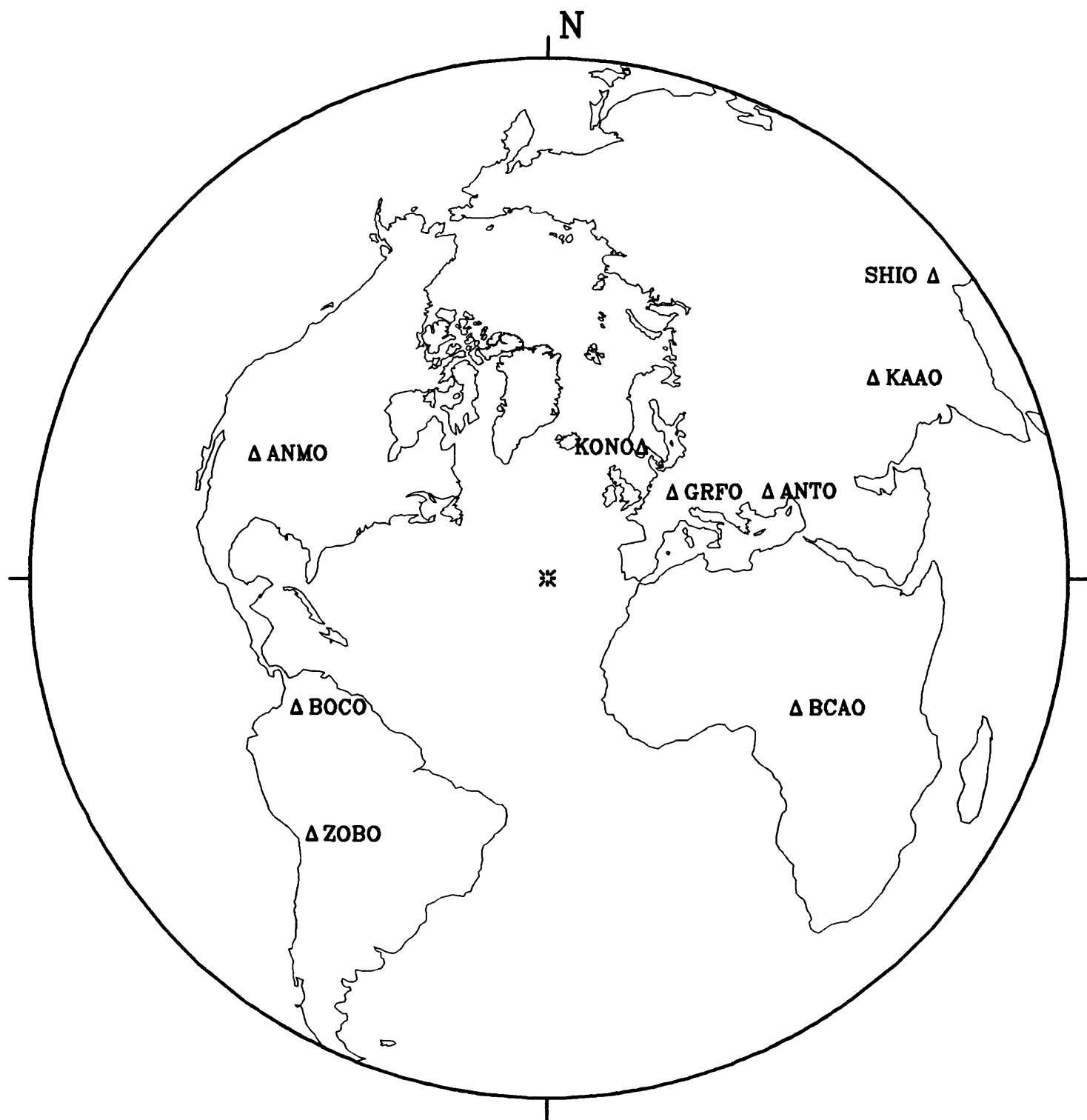
Origin time is listed in coordinated universal time (UTC). Latitude and longitude are in geographical coordinates. Depth is in kilometers. An 'N' following the depth indicates the depth was restrained at 33 km for earthquakes whose character on seismograms indicates a shallow focus but whose depth is not satisfactorily determined by the data. A 'D' following the depth indicates the depth was restrained by the computer program based on 2 or more compatible pP phases and/or unidentified secondary arrivals used as pP. A 'G' following the depth indicates the depth was restrained by an NEIS geophysicist, based on evidence from available seismograms. m_B is body wave magnitude and M_{SZ} is vertical surface wave magnitude. Region name is the Flinn-Engdahl region name associated with a latitude and longitude.

Acknowledgement

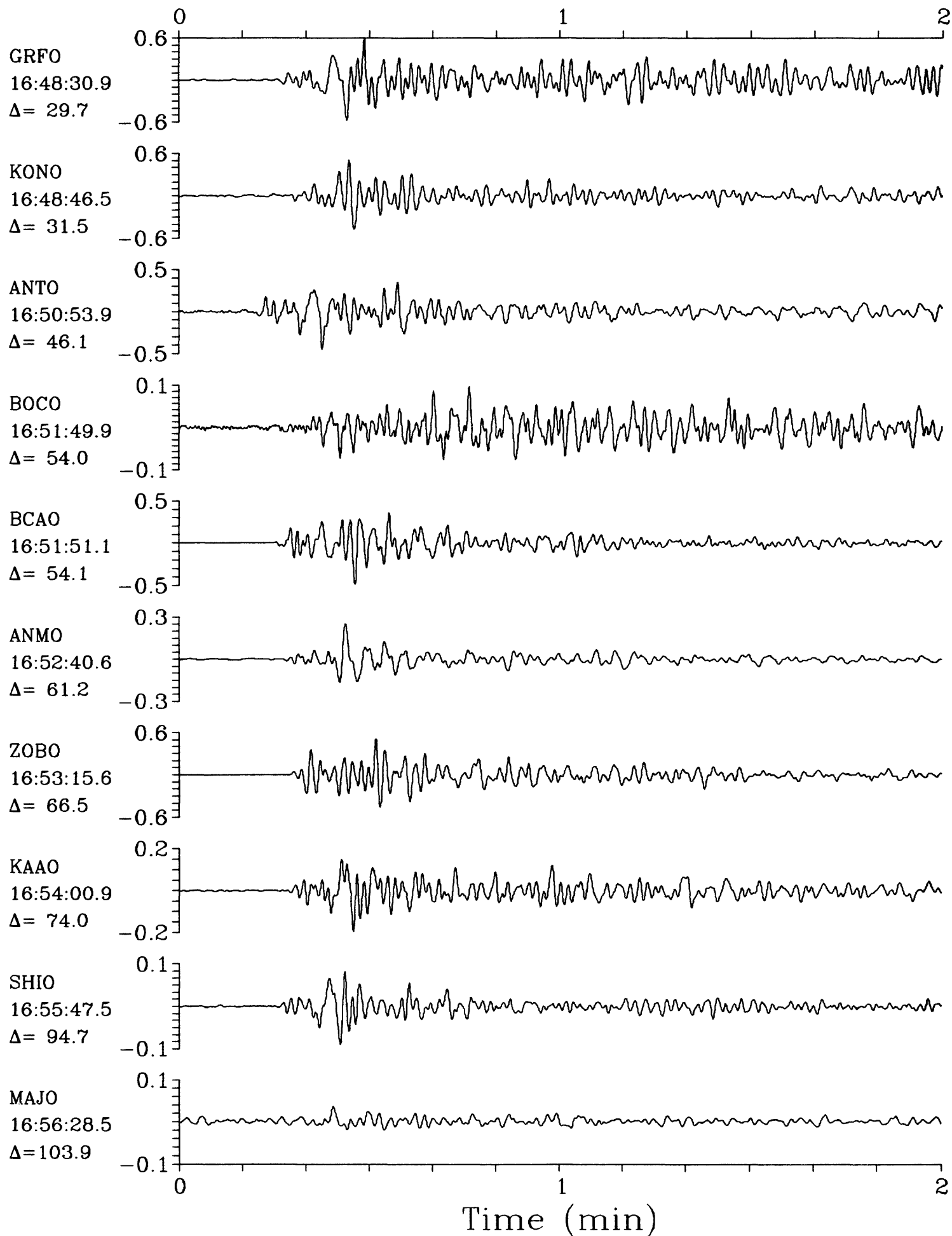
The authors thank Bob Engdahl, Ray Buland, Bob Massé, and Stu Sipkin for many helpful suggestions and for their aid in laying out the figures.

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Azores Islands



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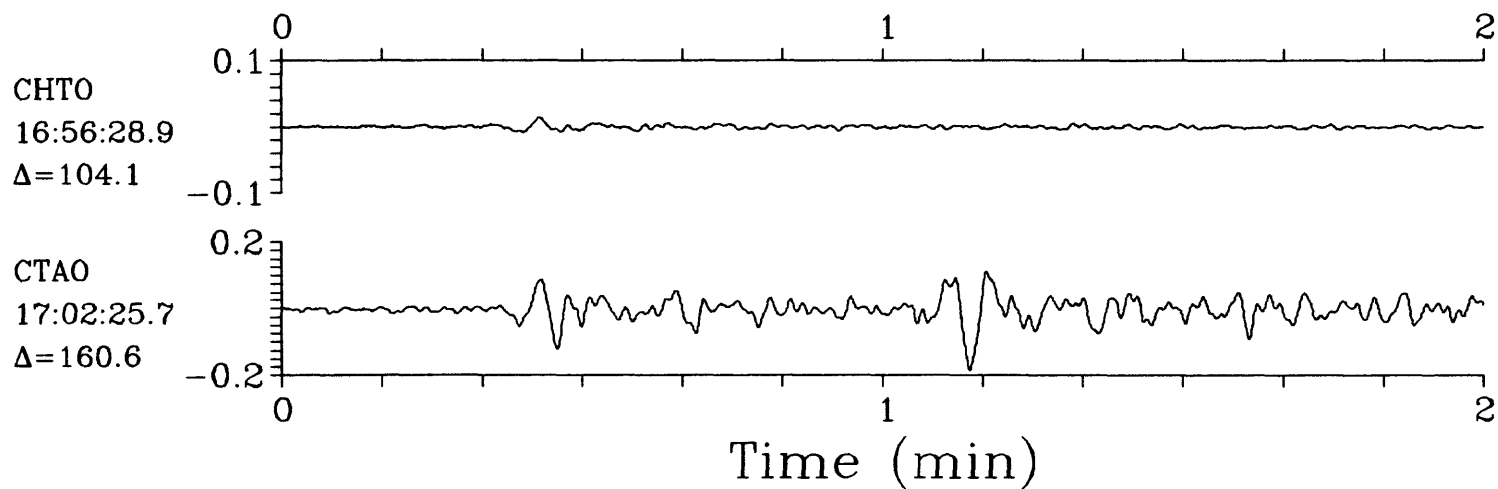


SPZ

01 January 1980 16:42:40.00

SPZ³

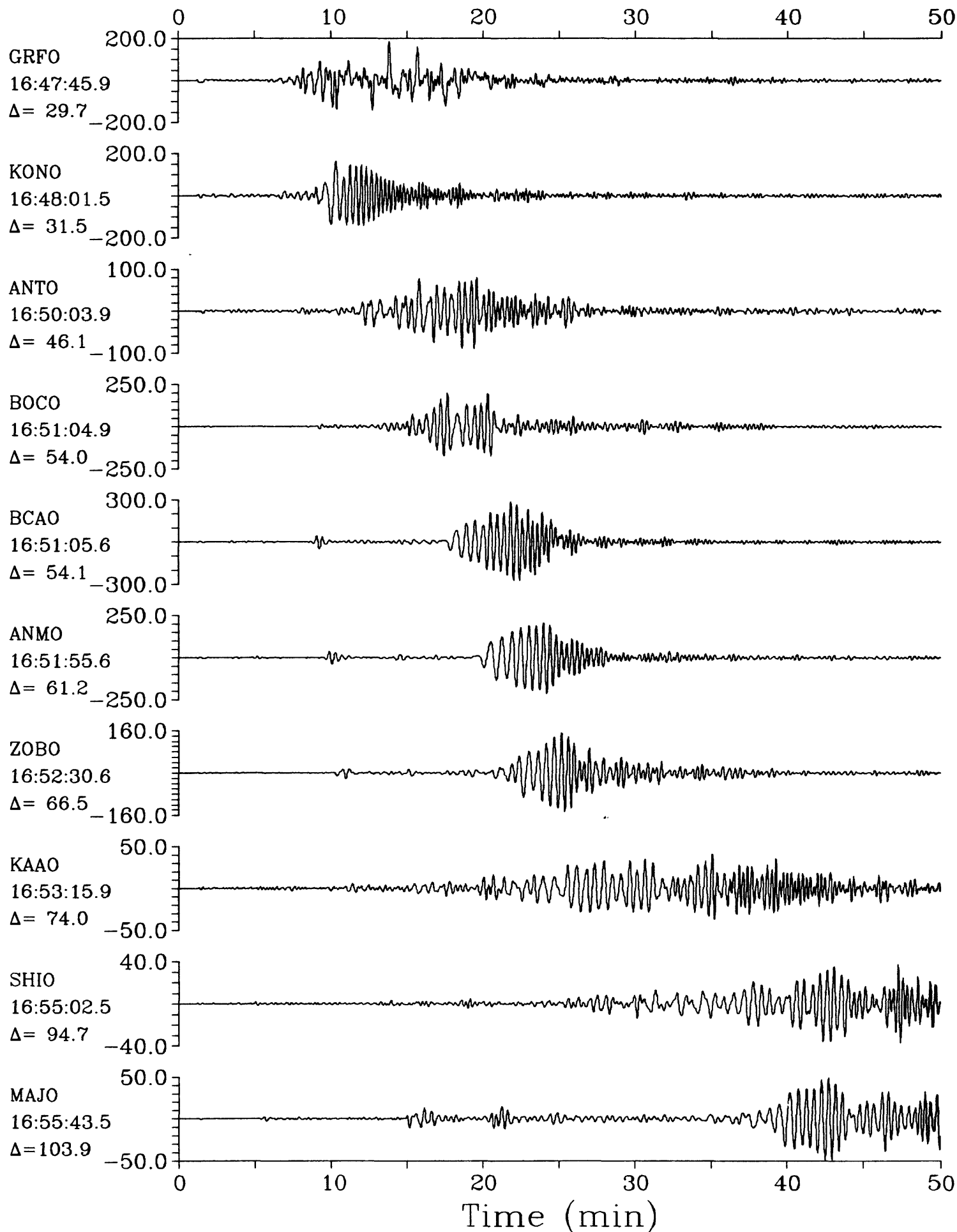
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LPZ

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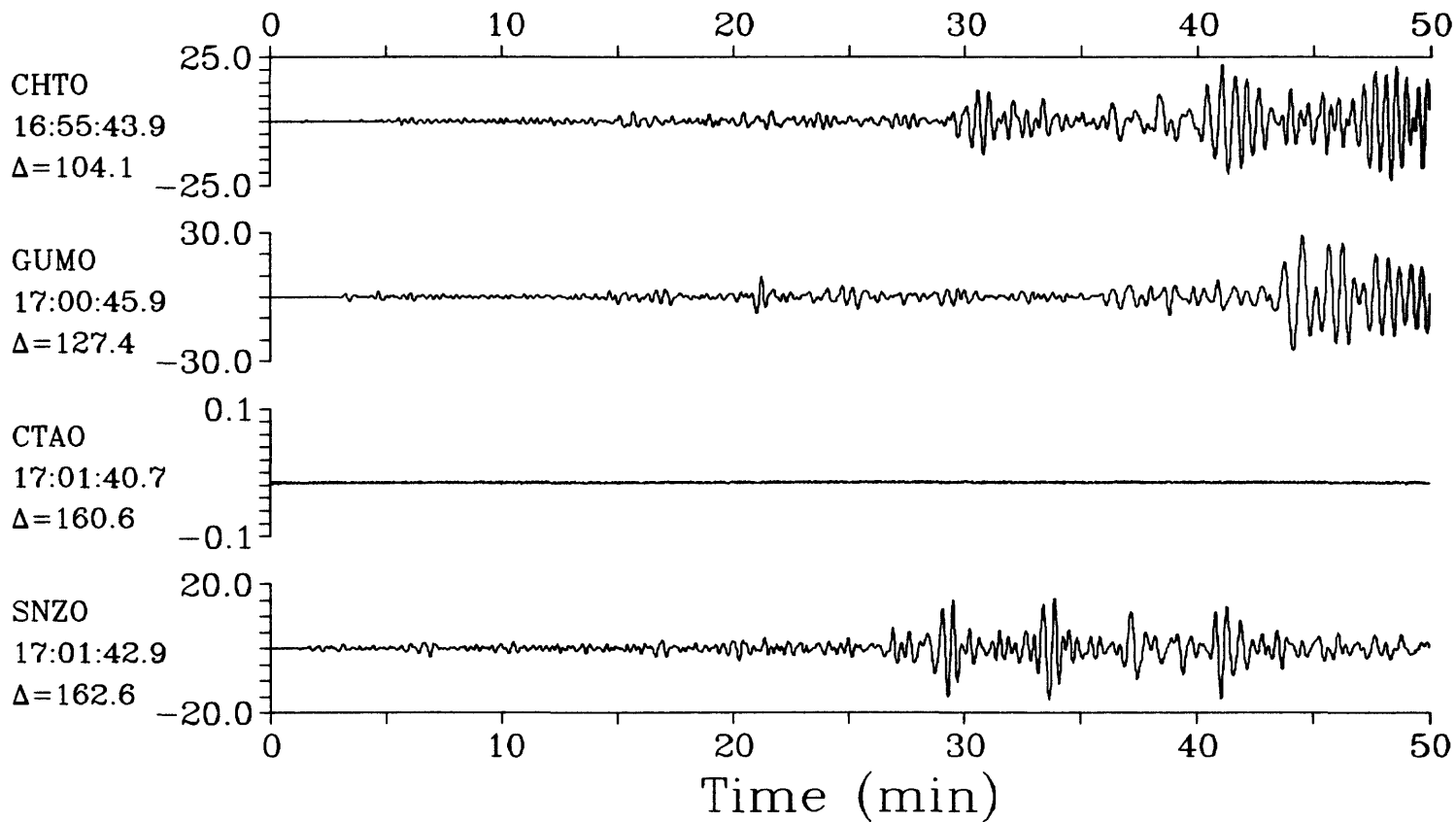
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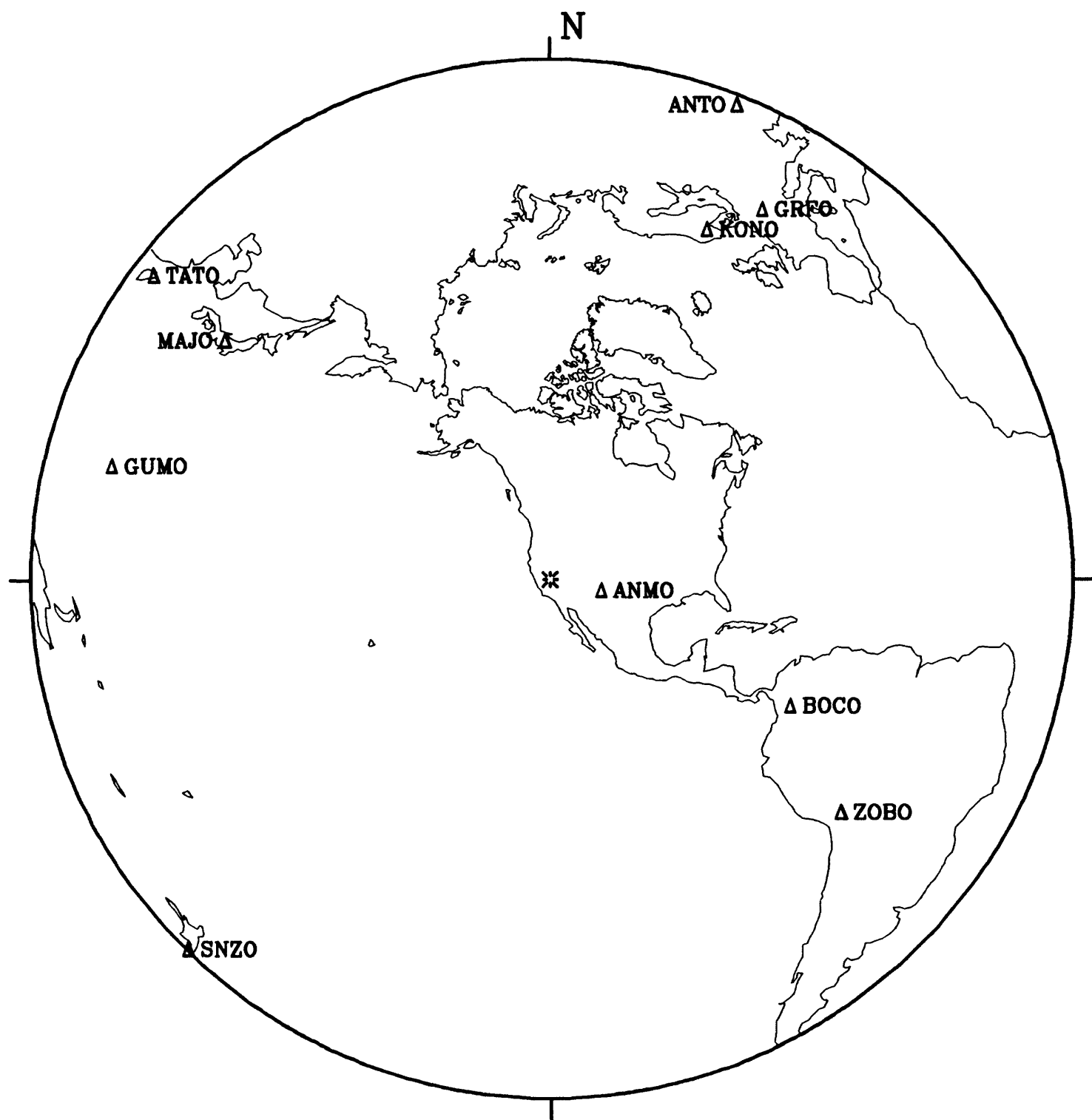
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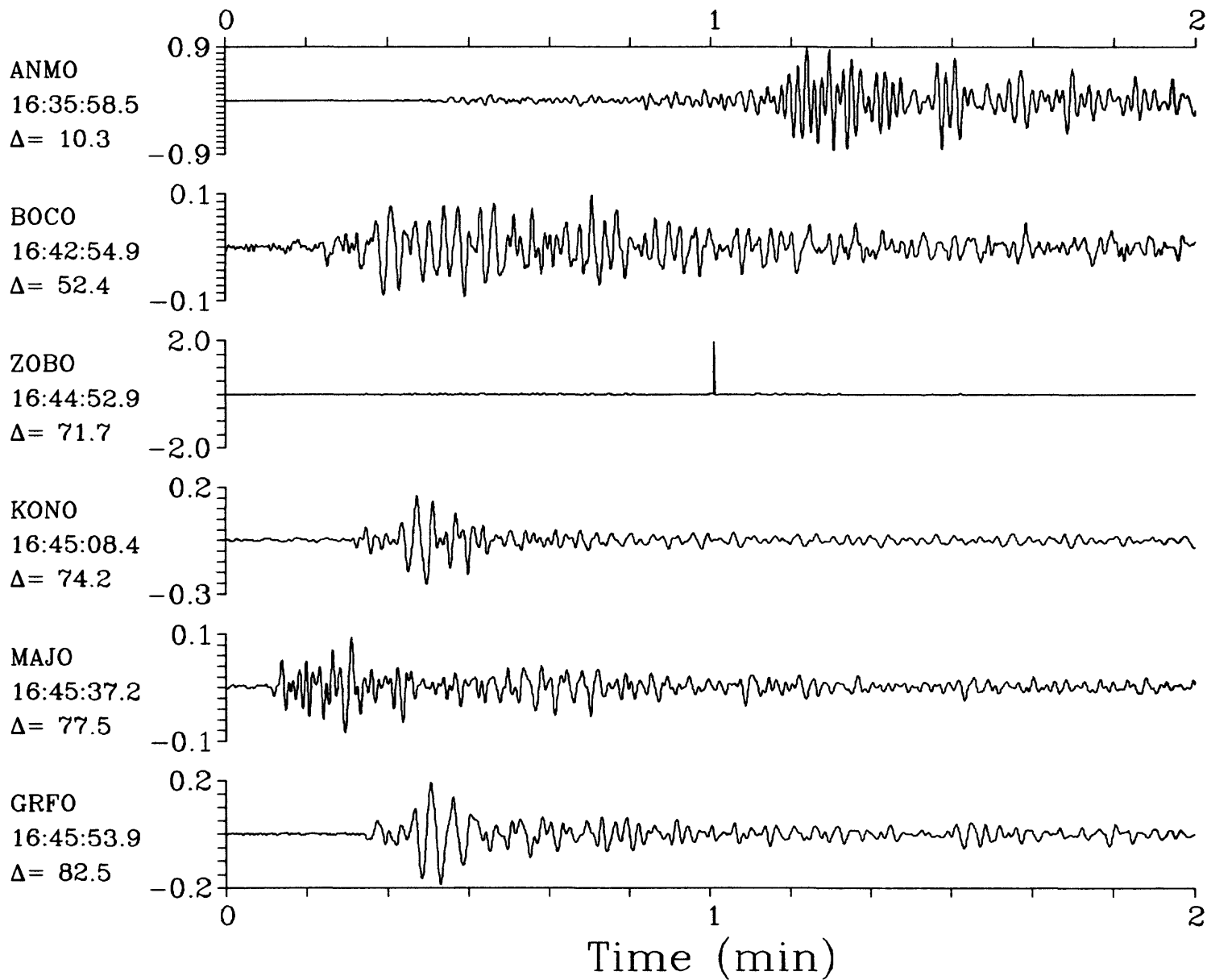
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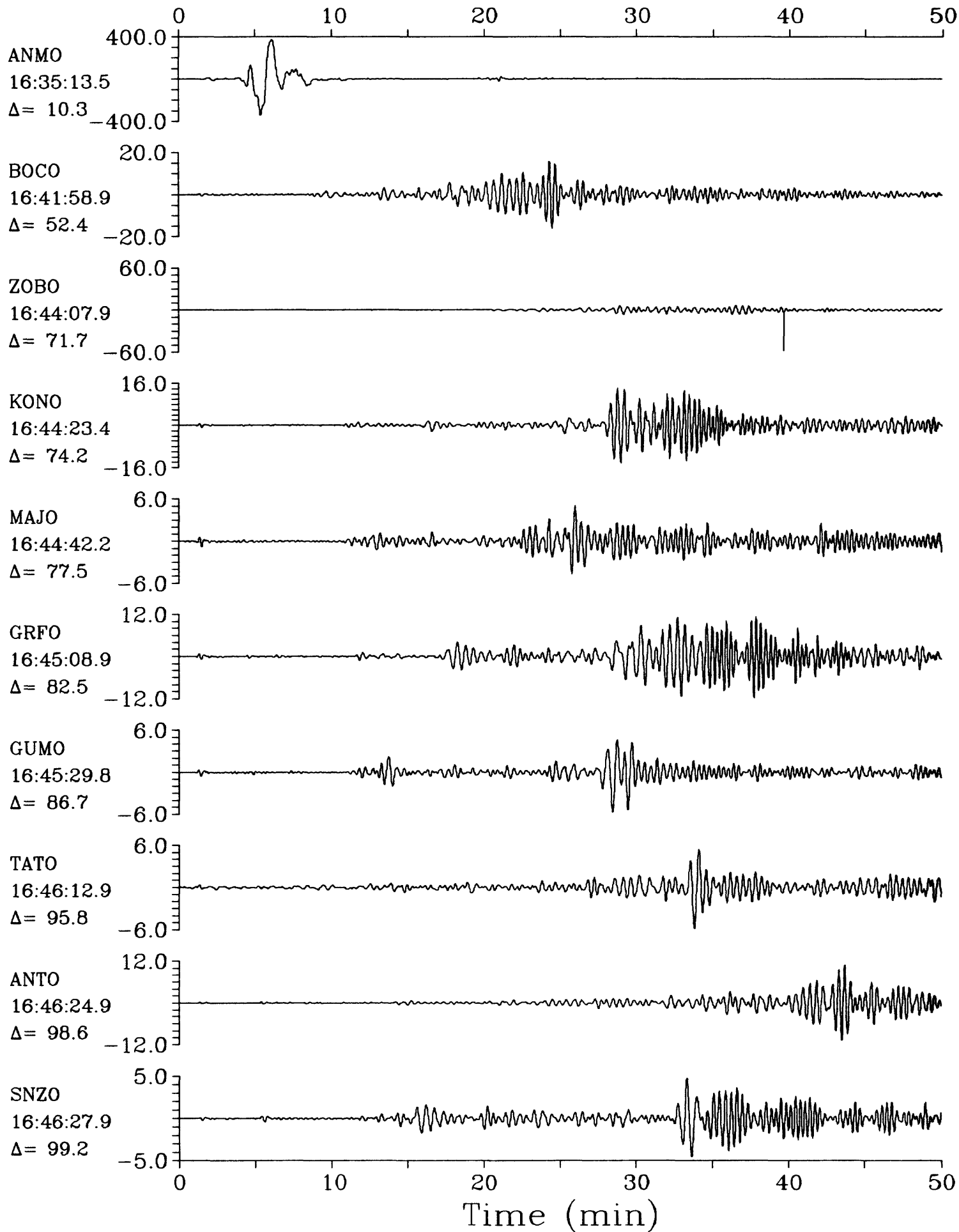
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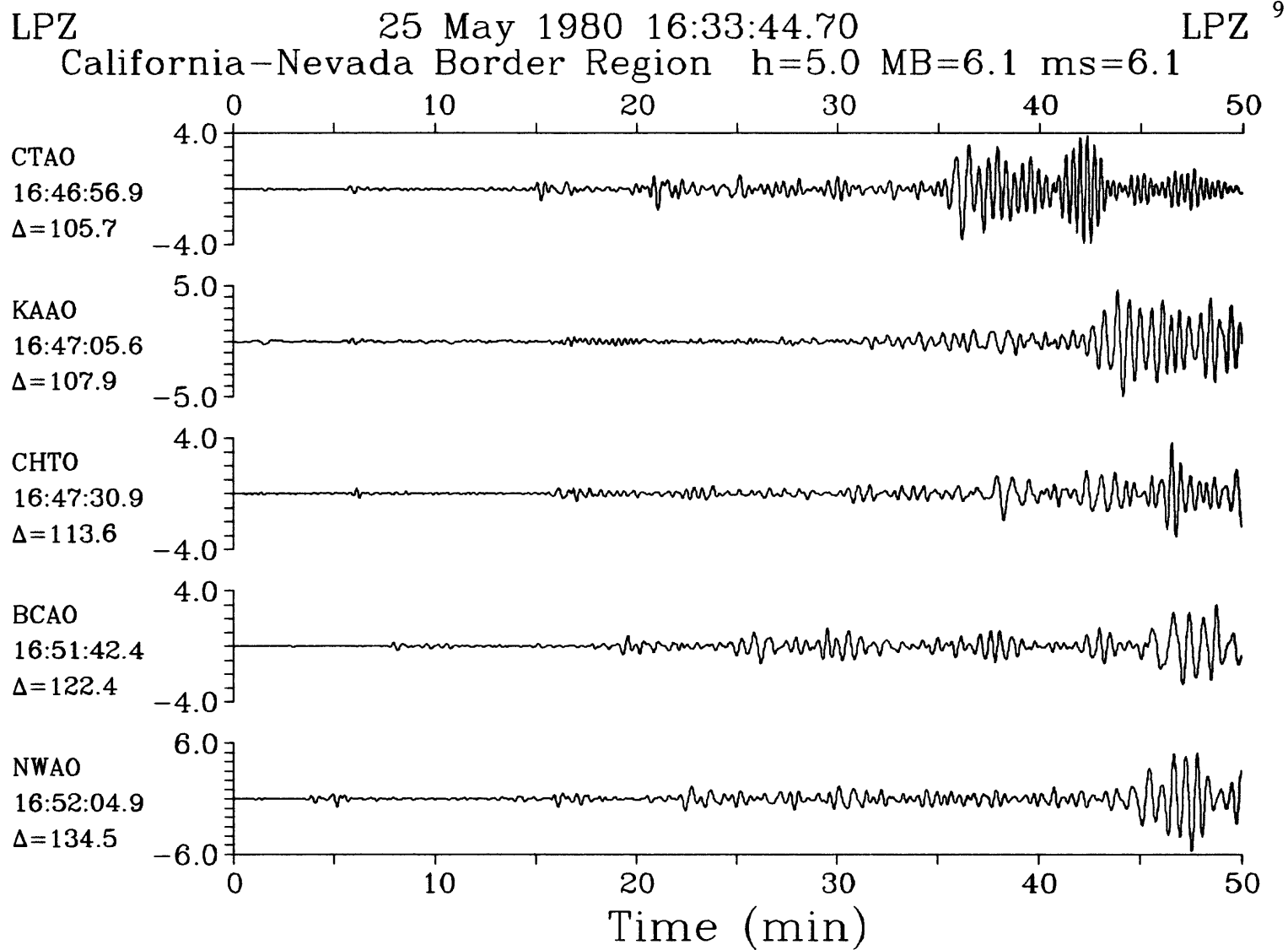
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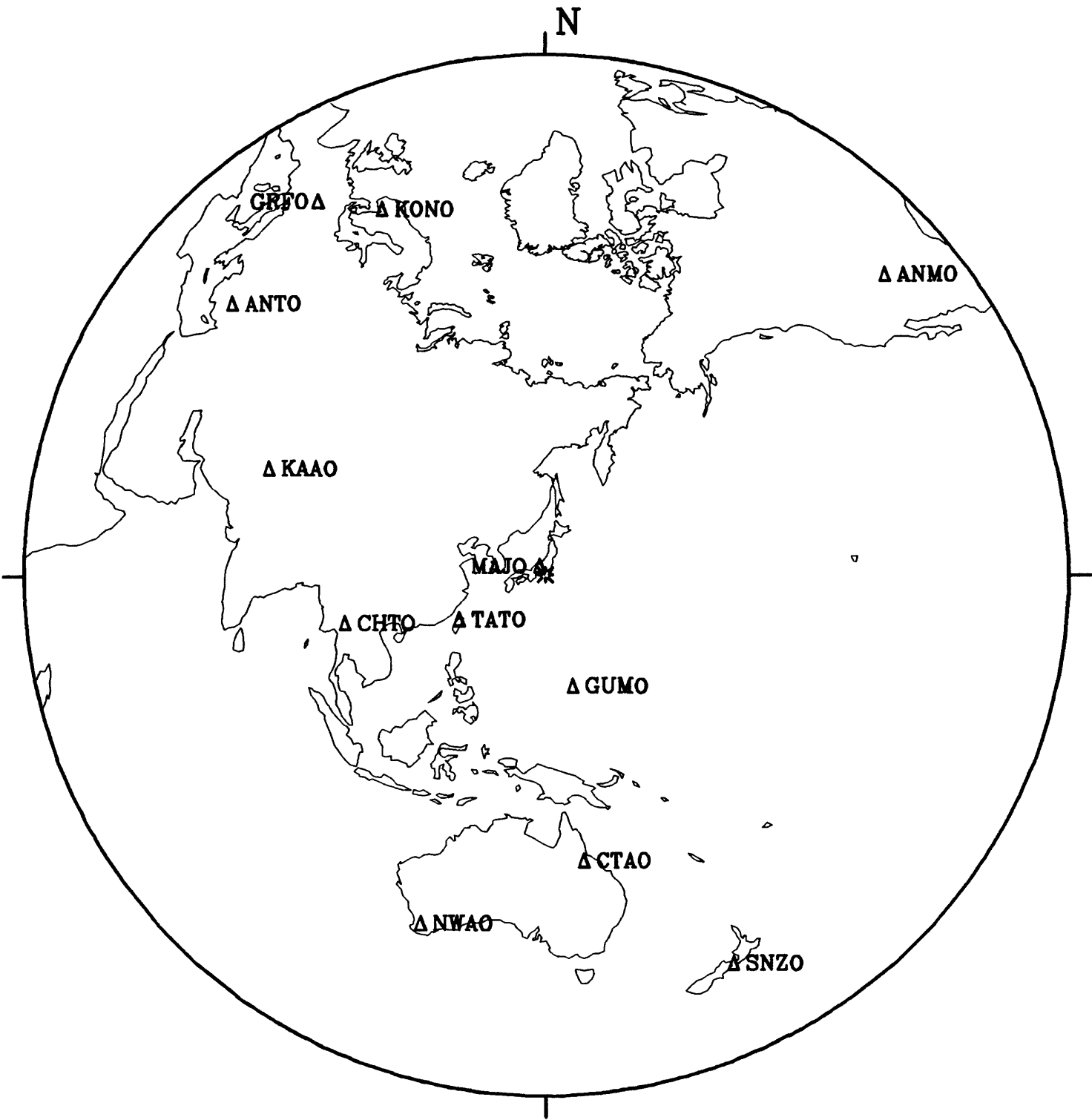
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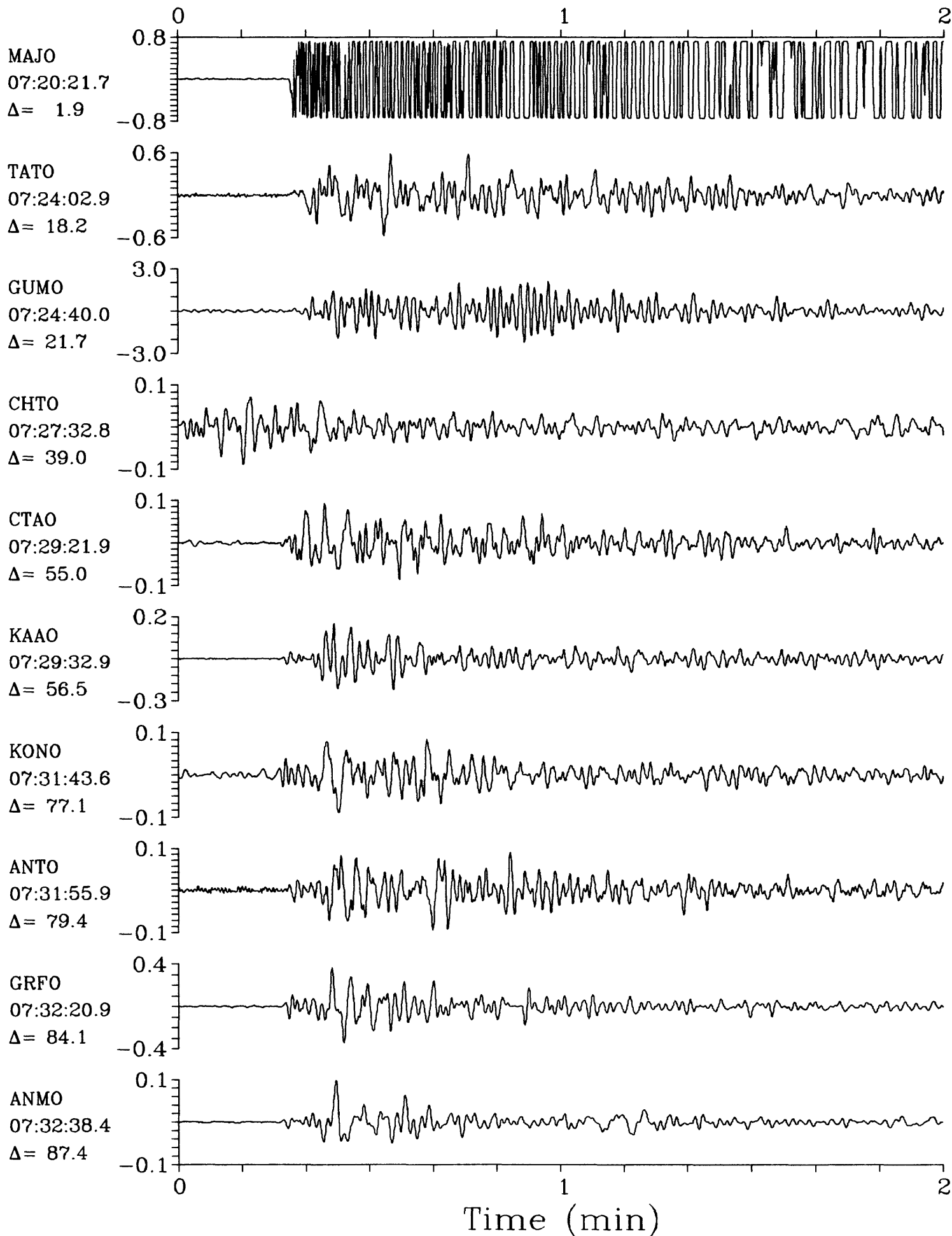


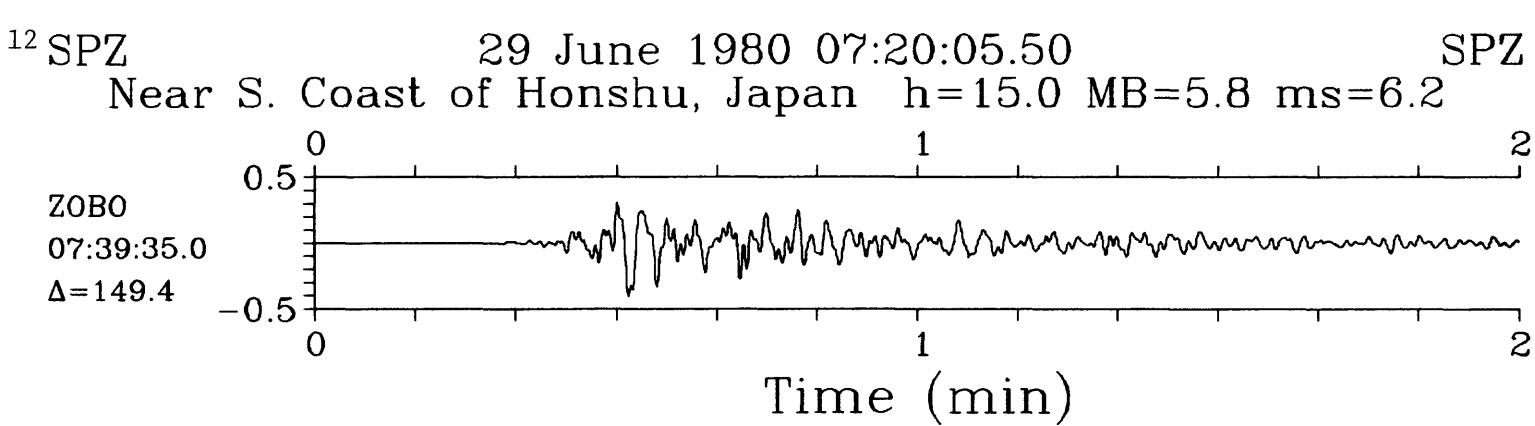


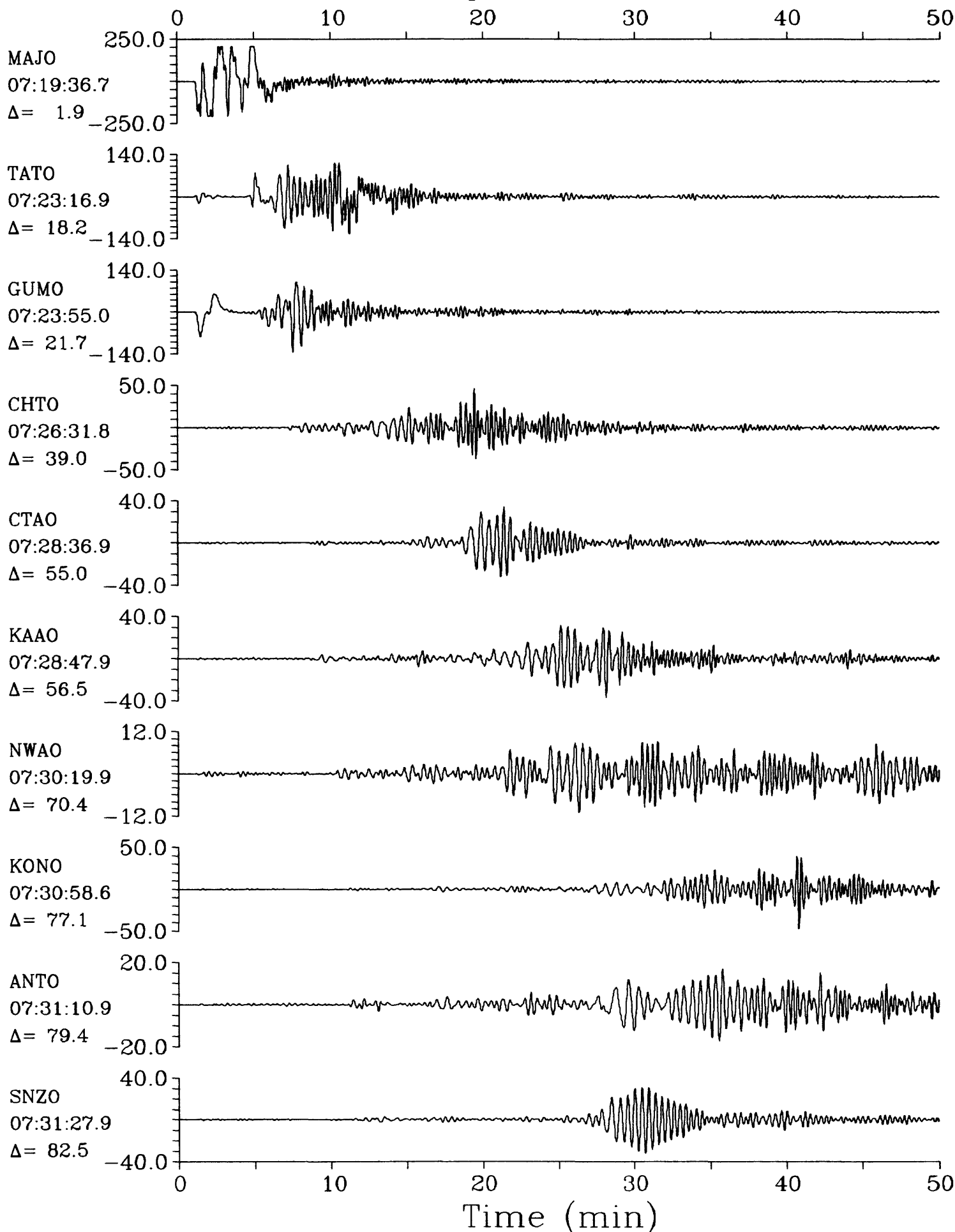
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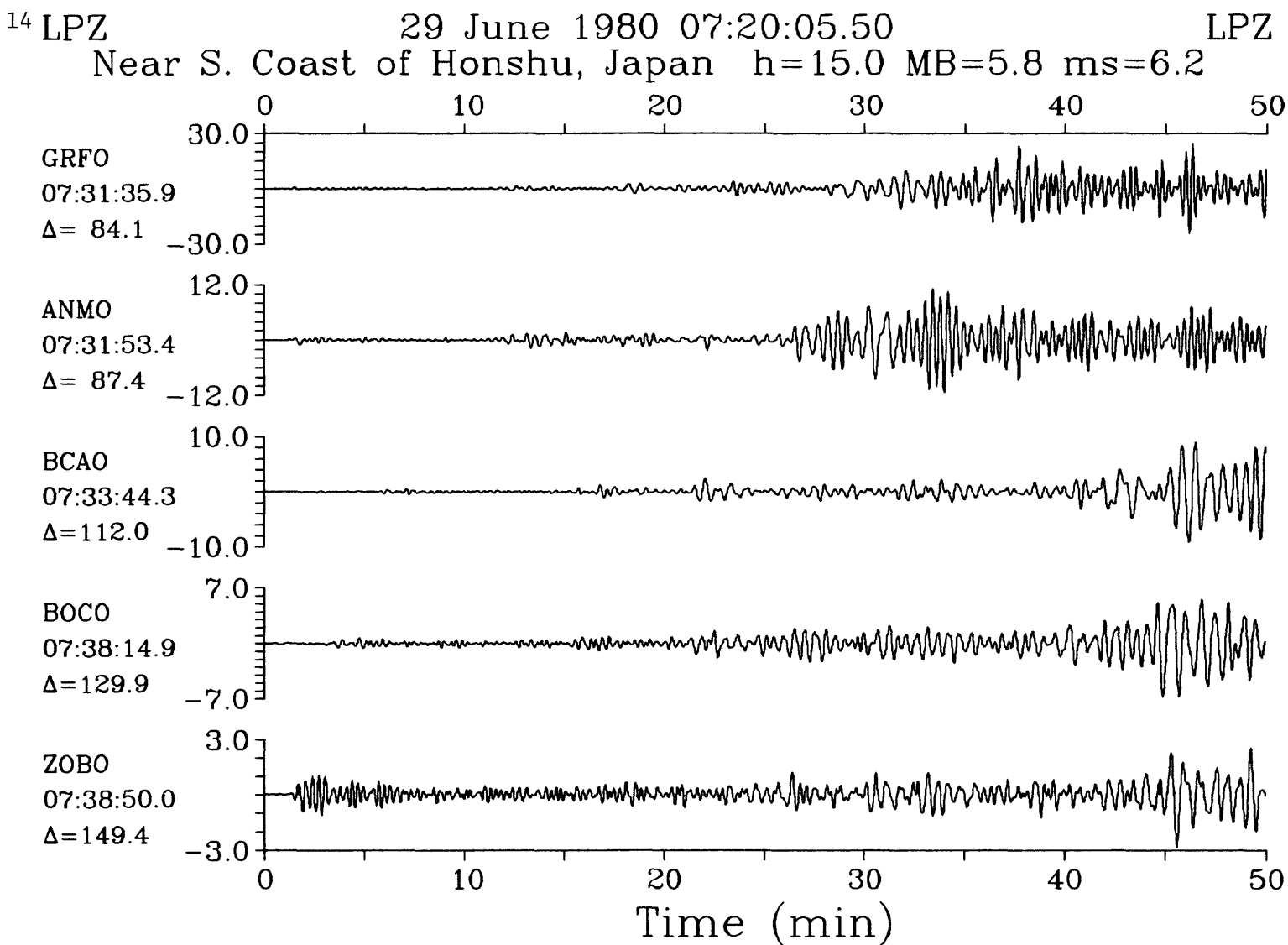
Near S. Coast of Honshu, Japan





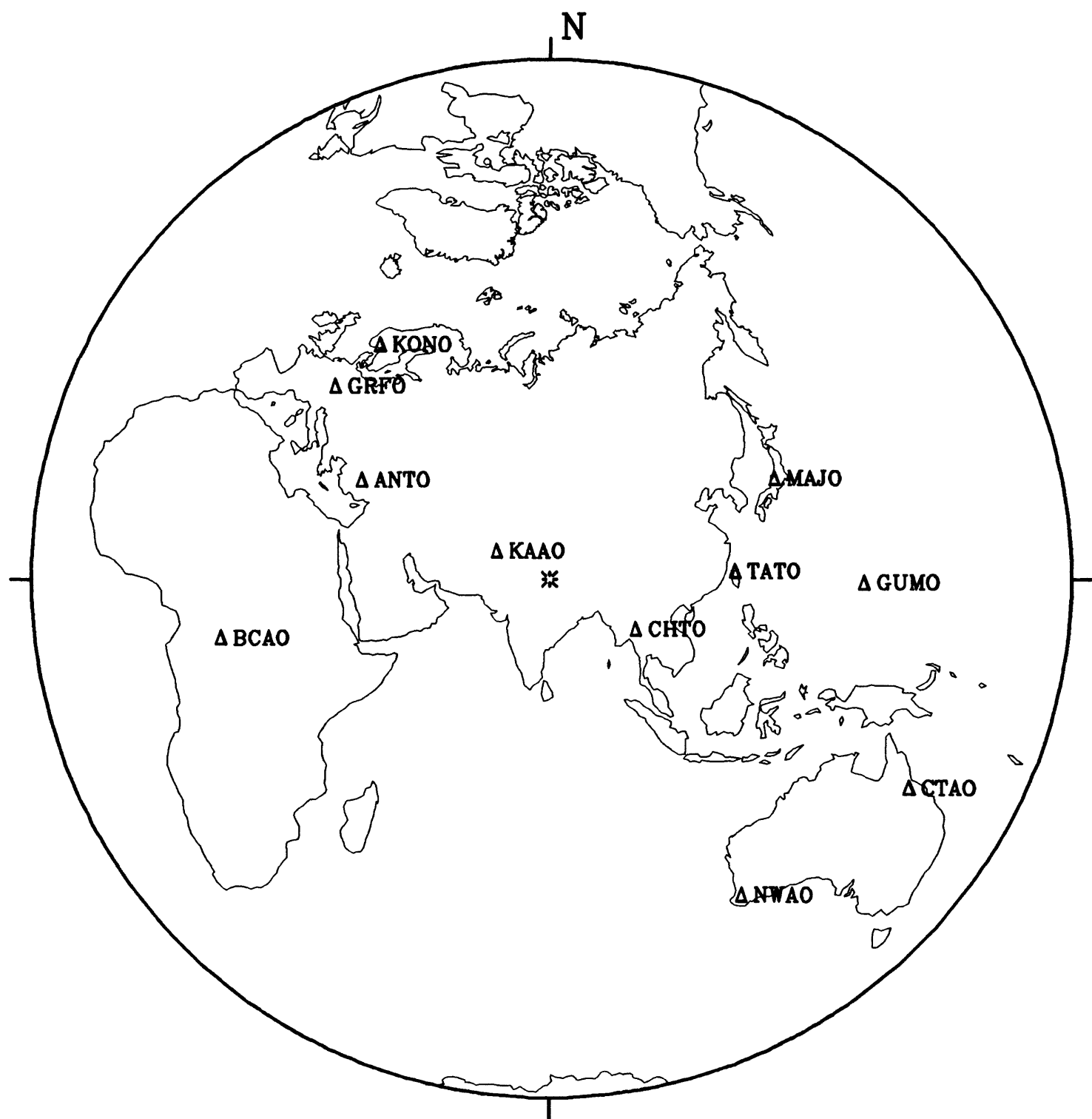


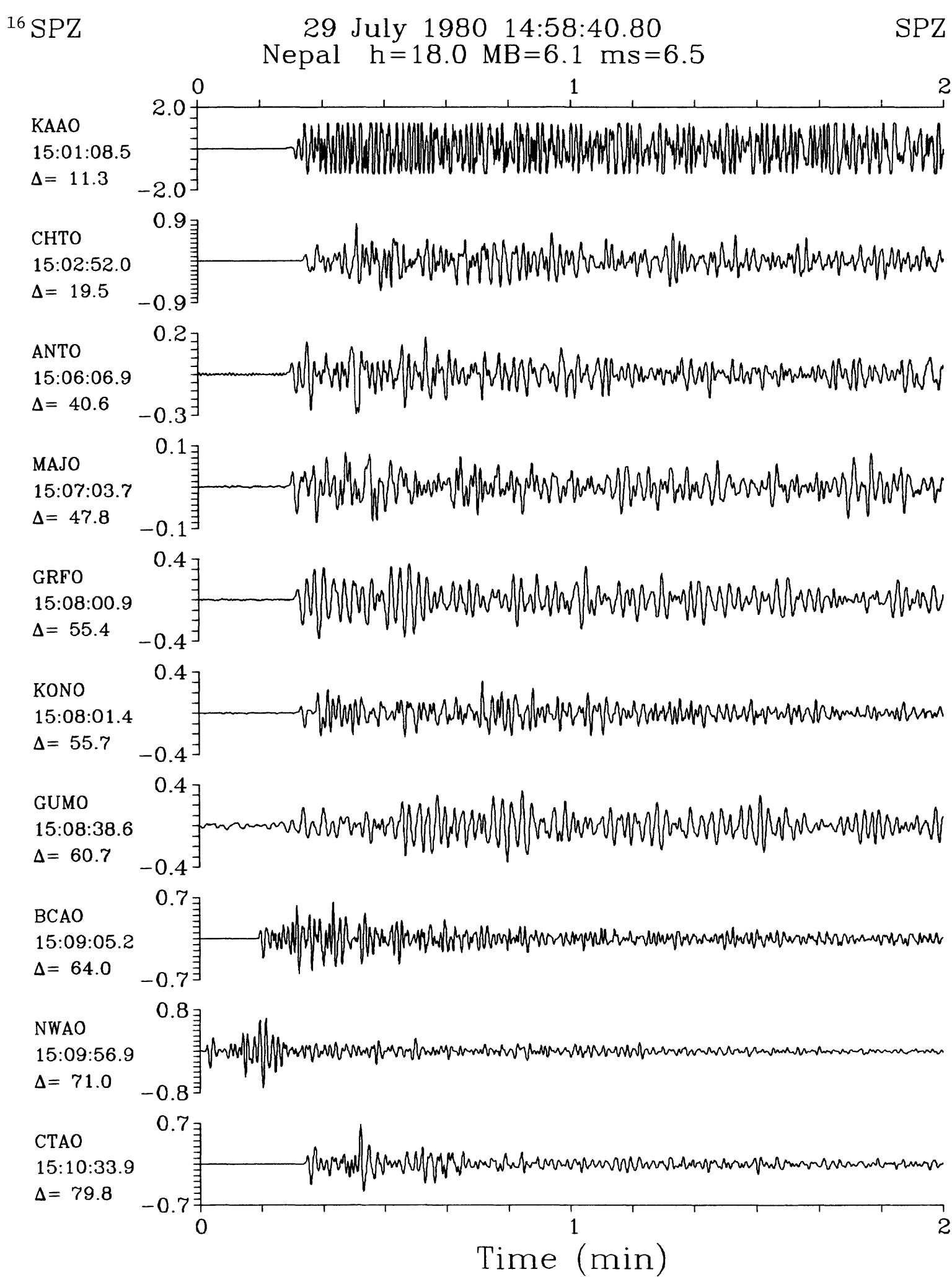




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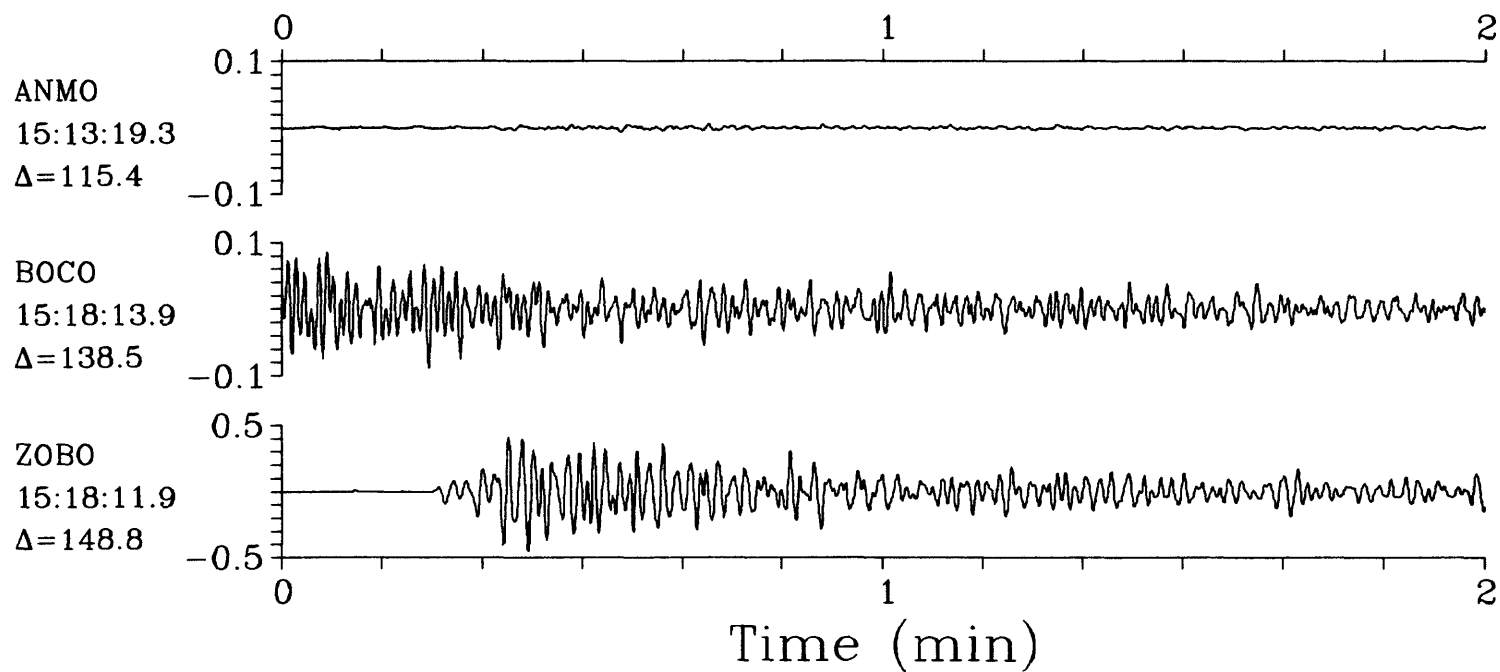


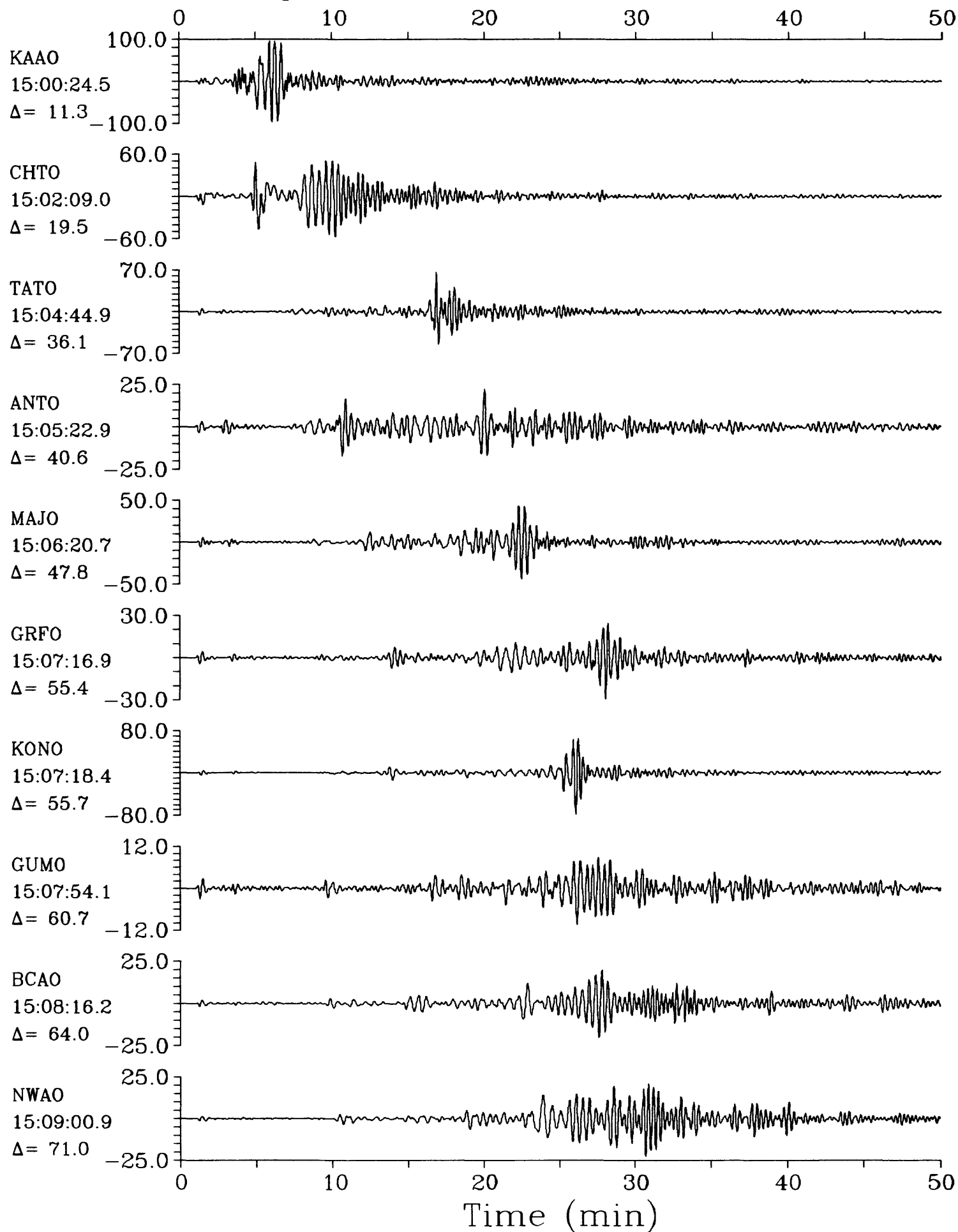


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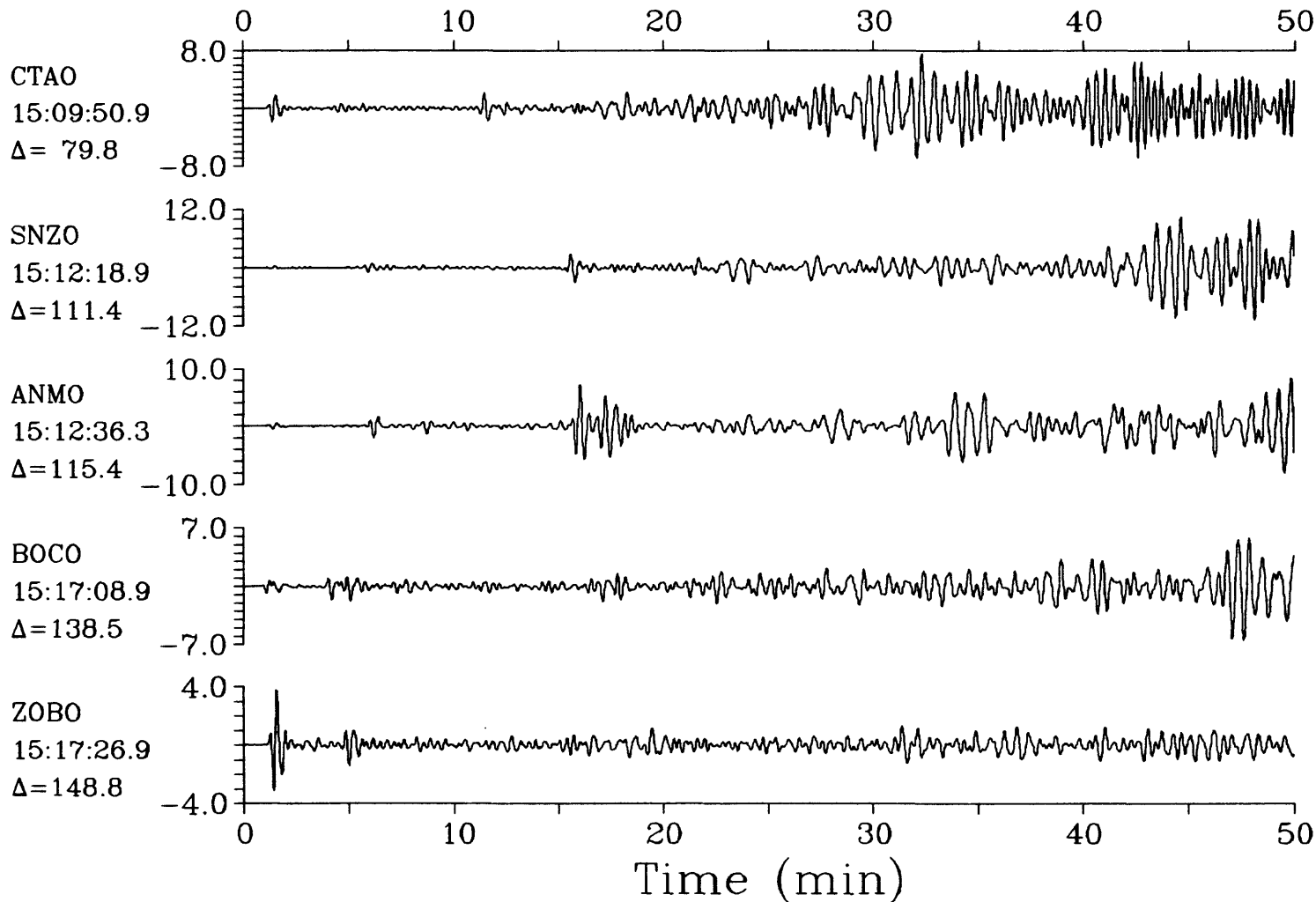
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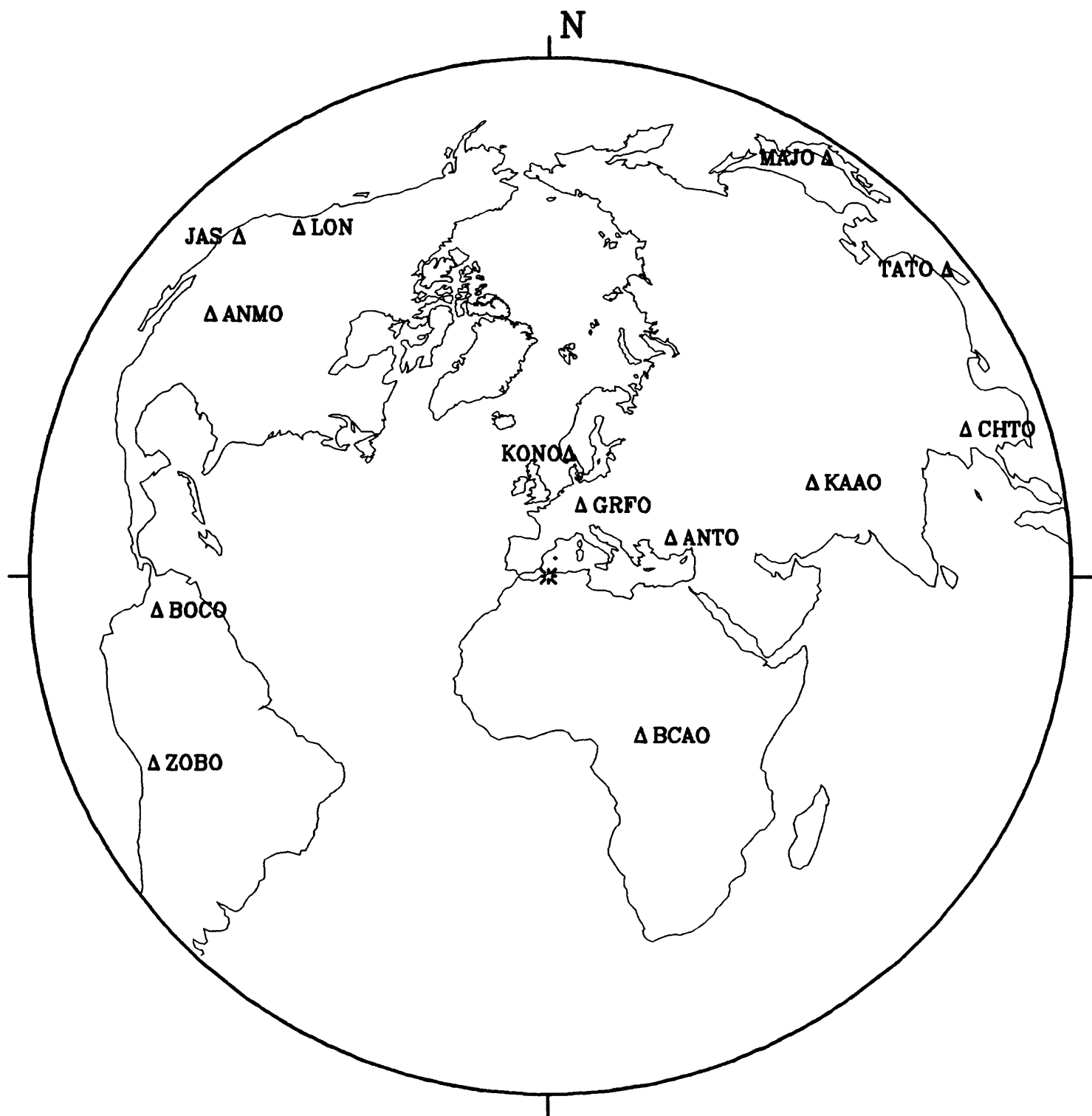


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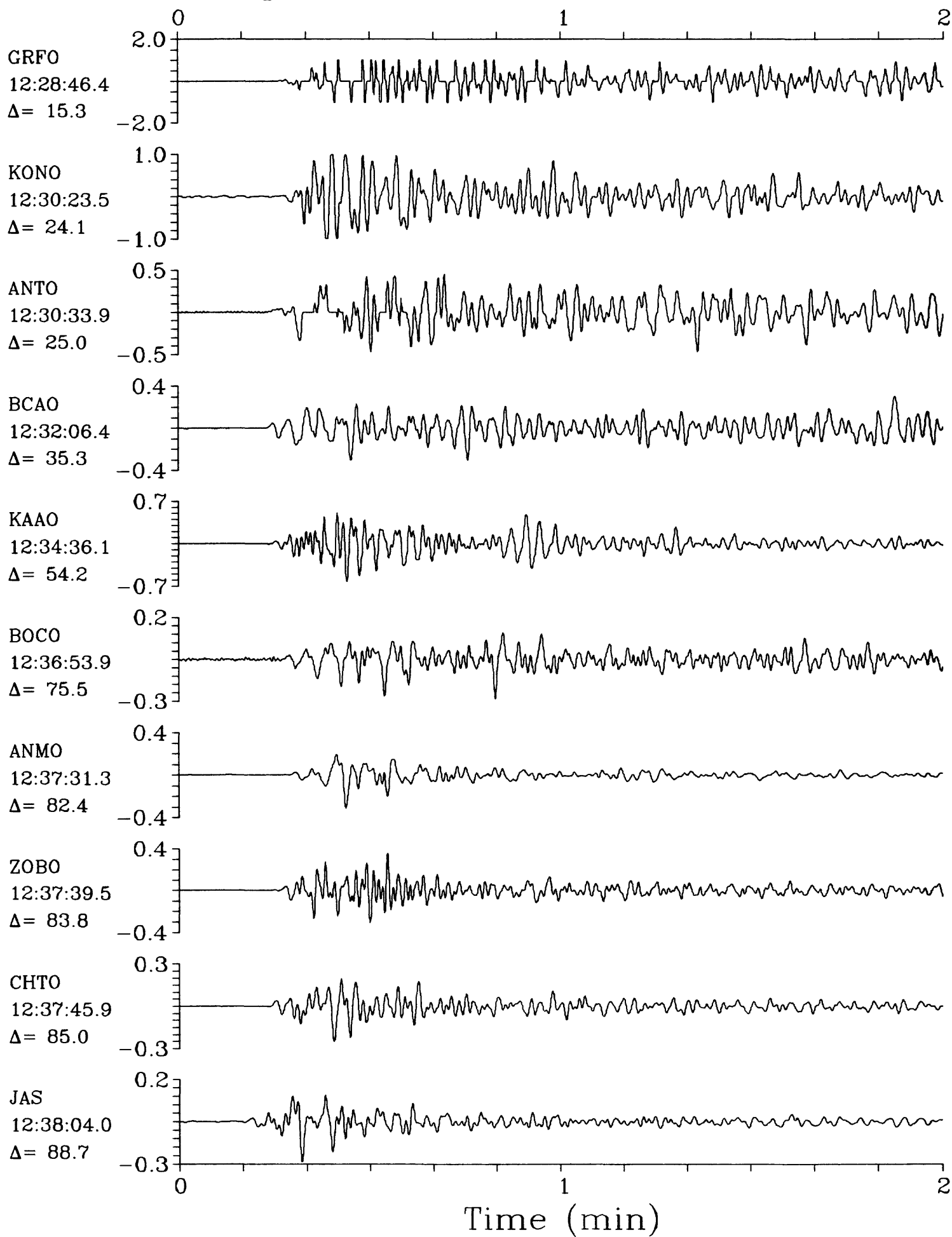
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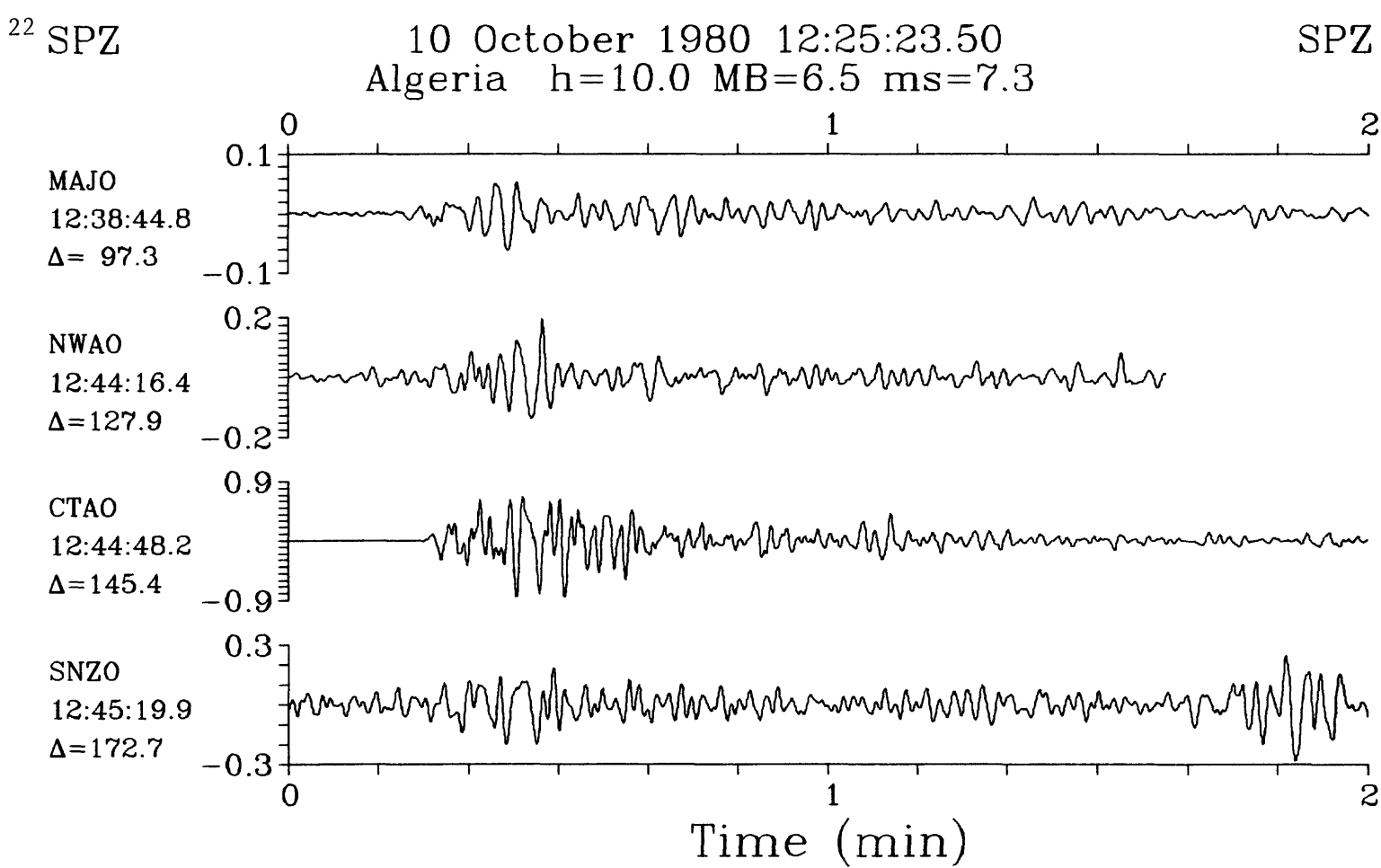
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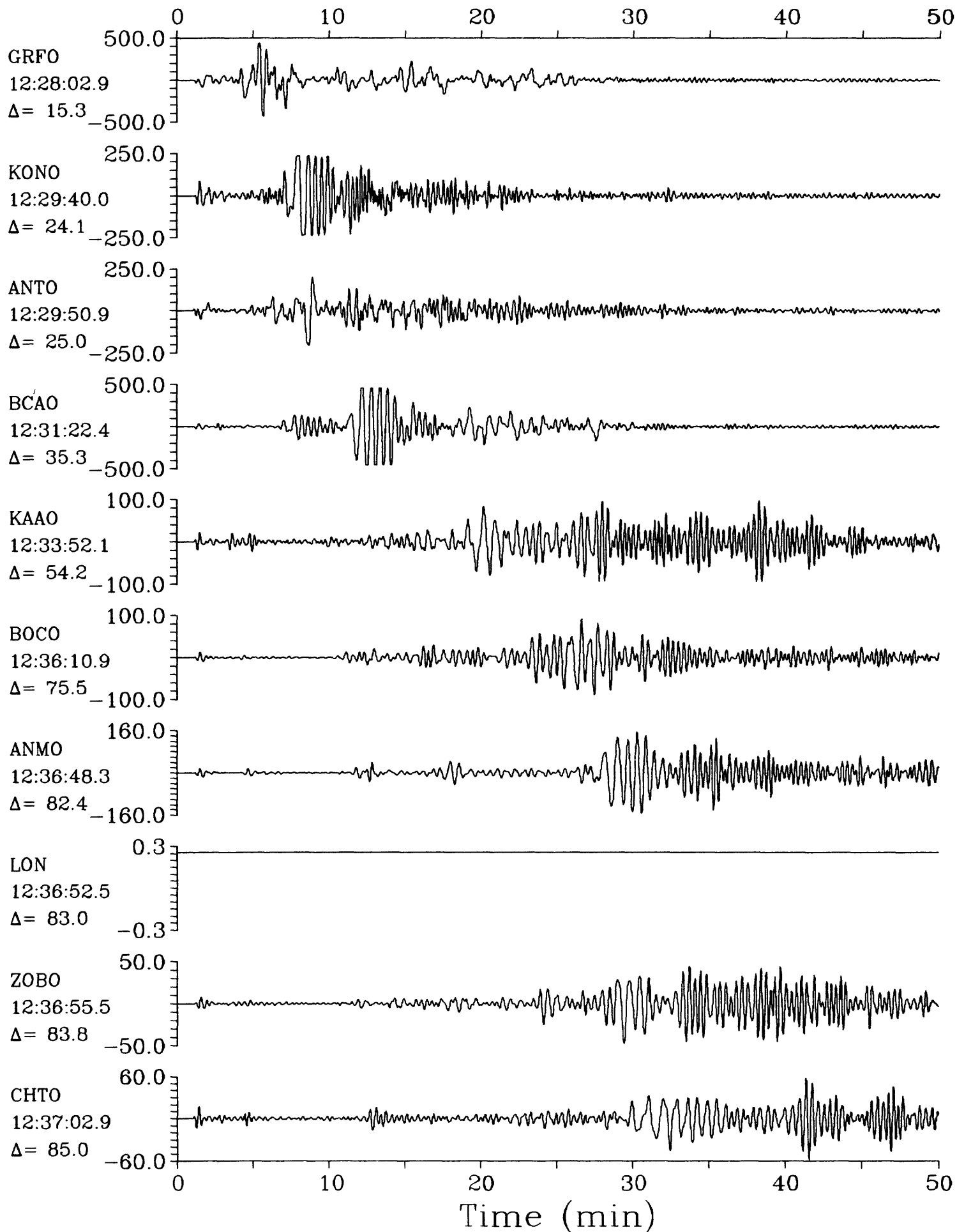
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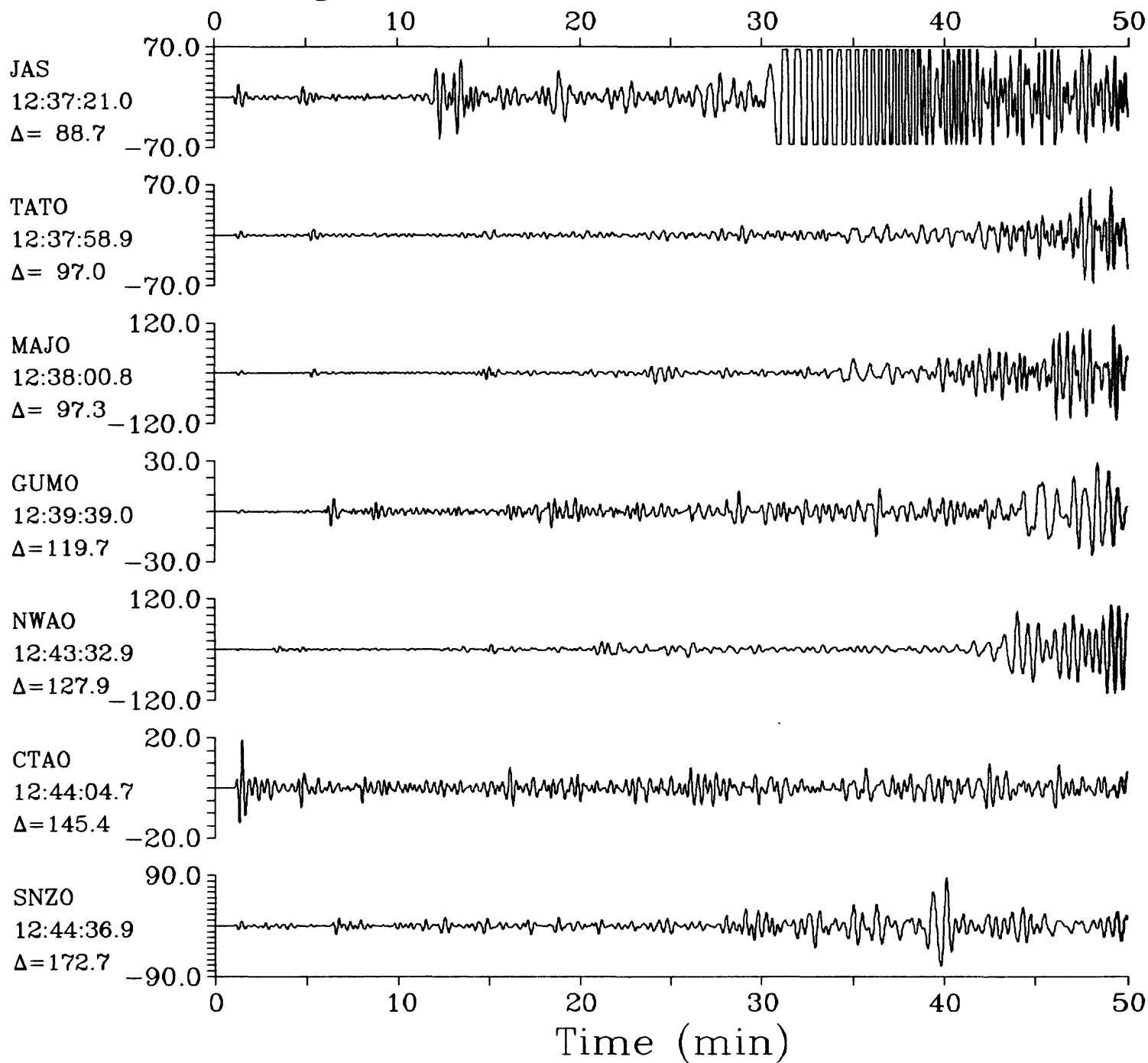


SPZ

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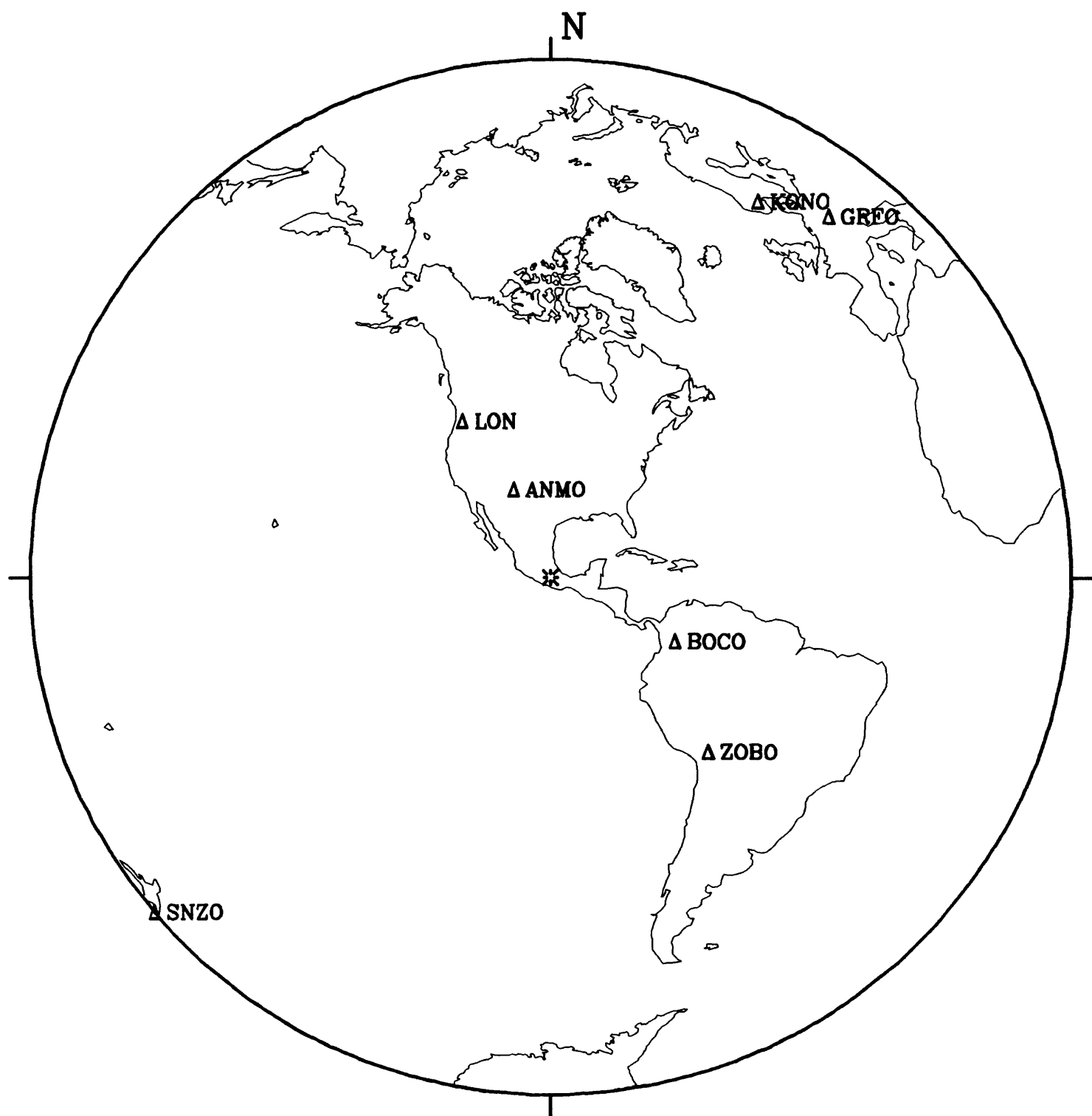


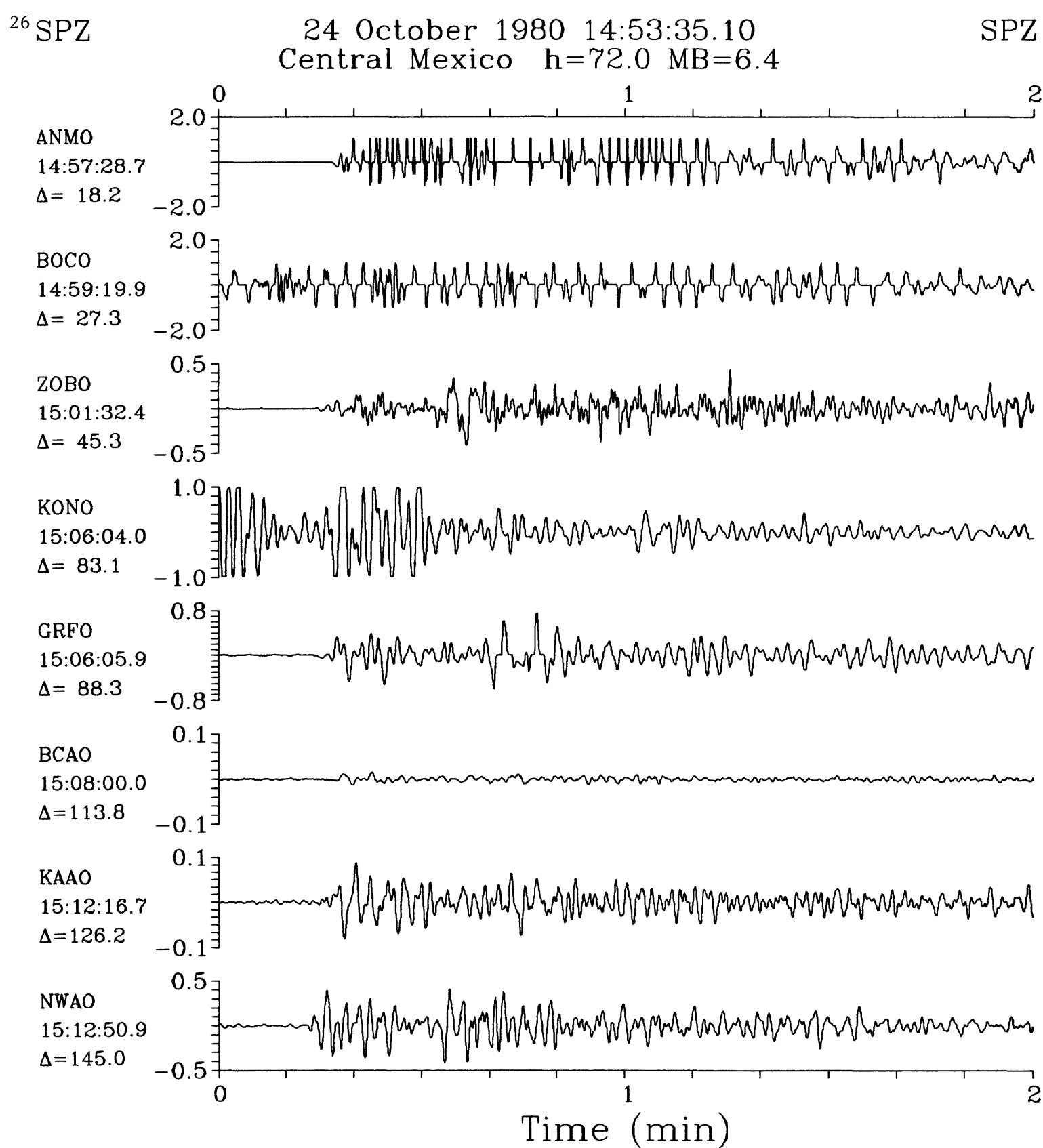


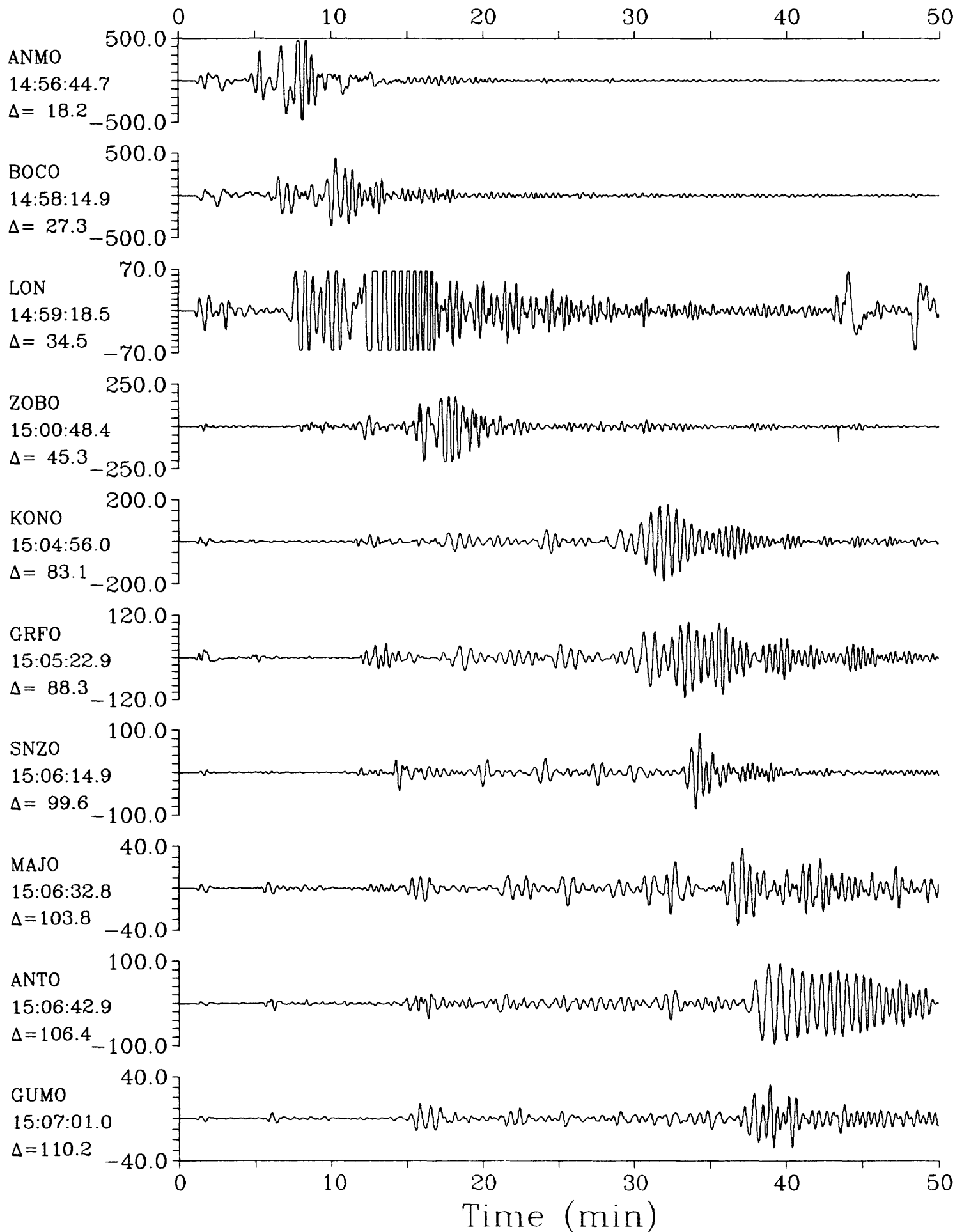
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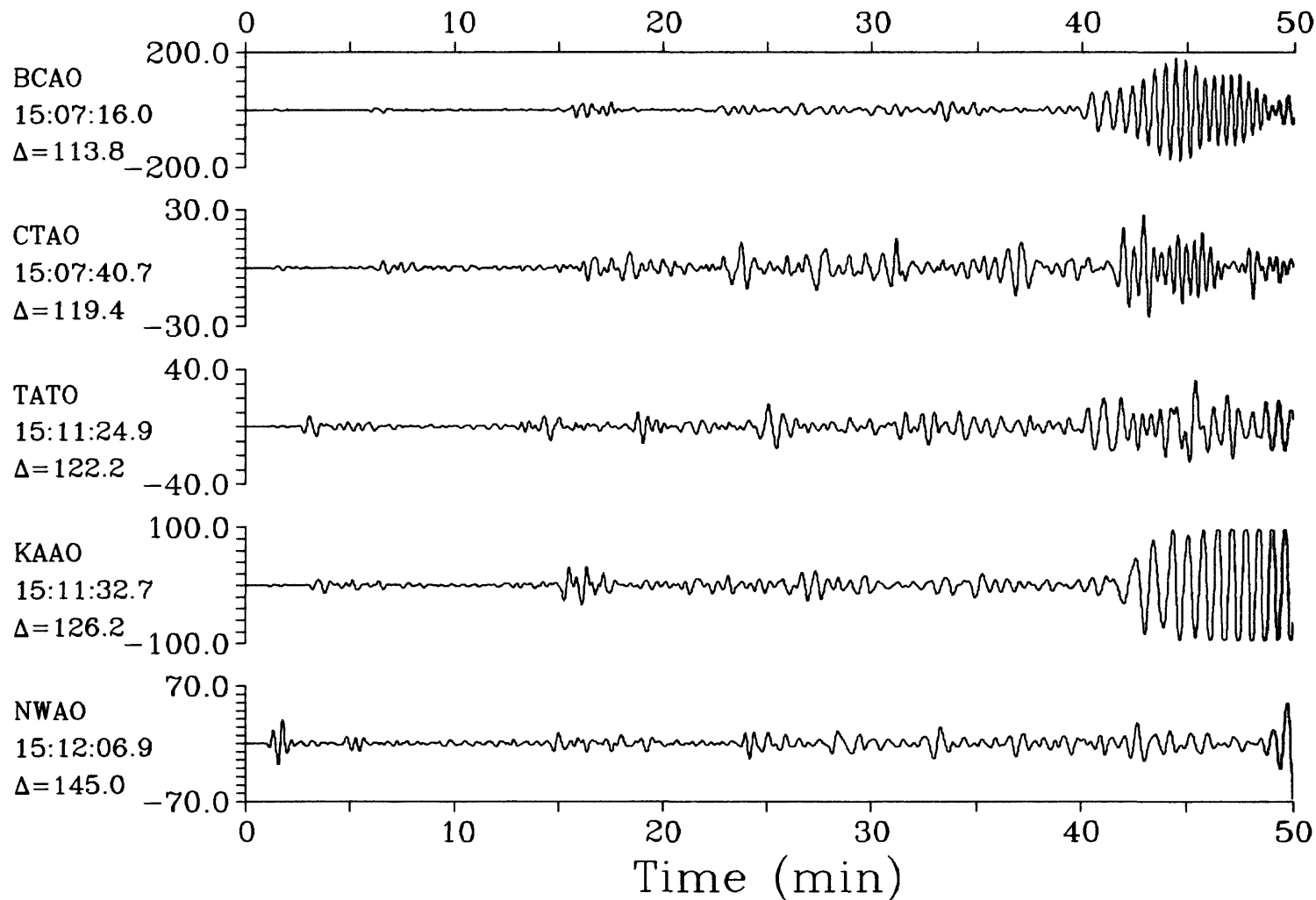
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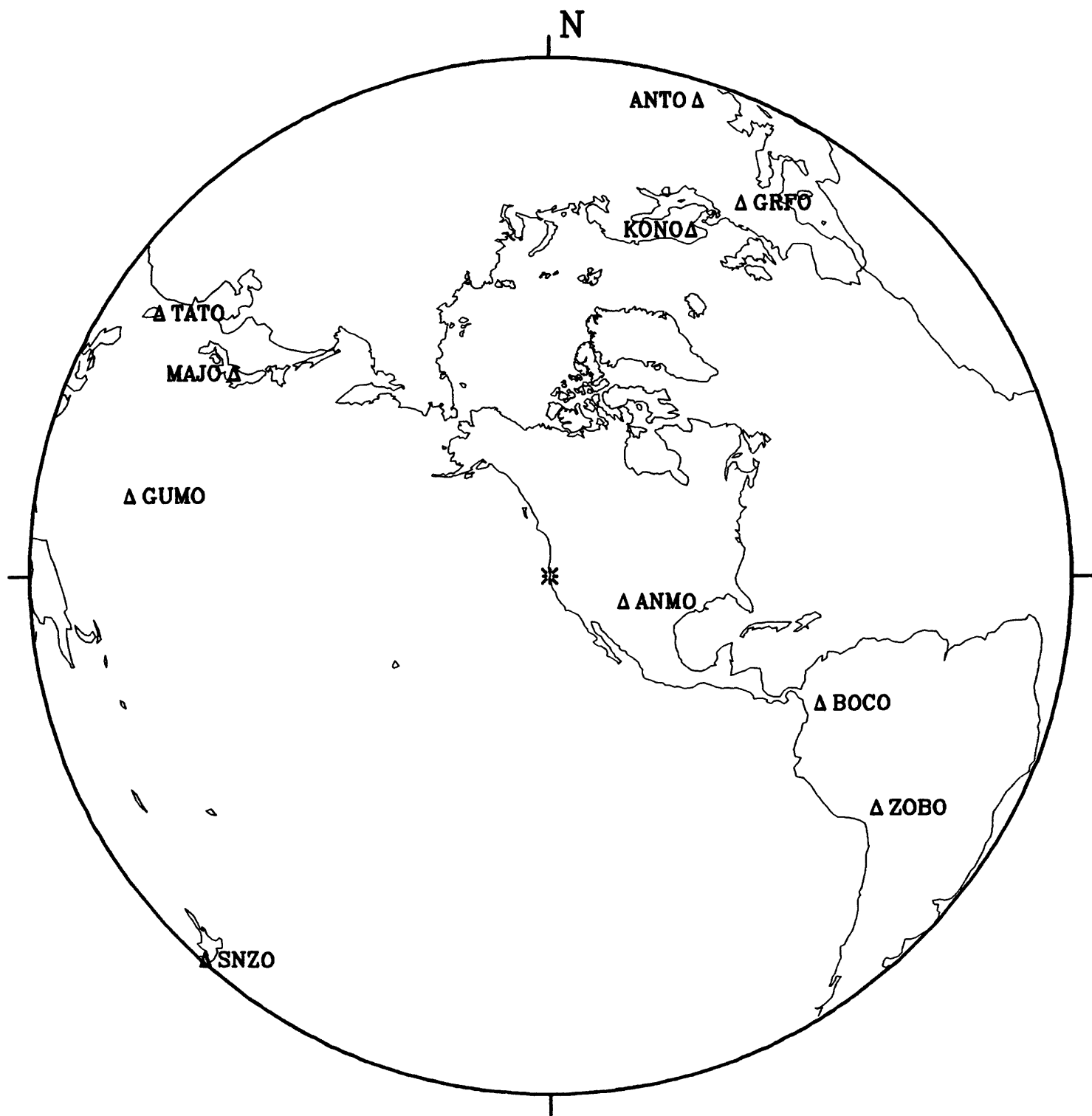


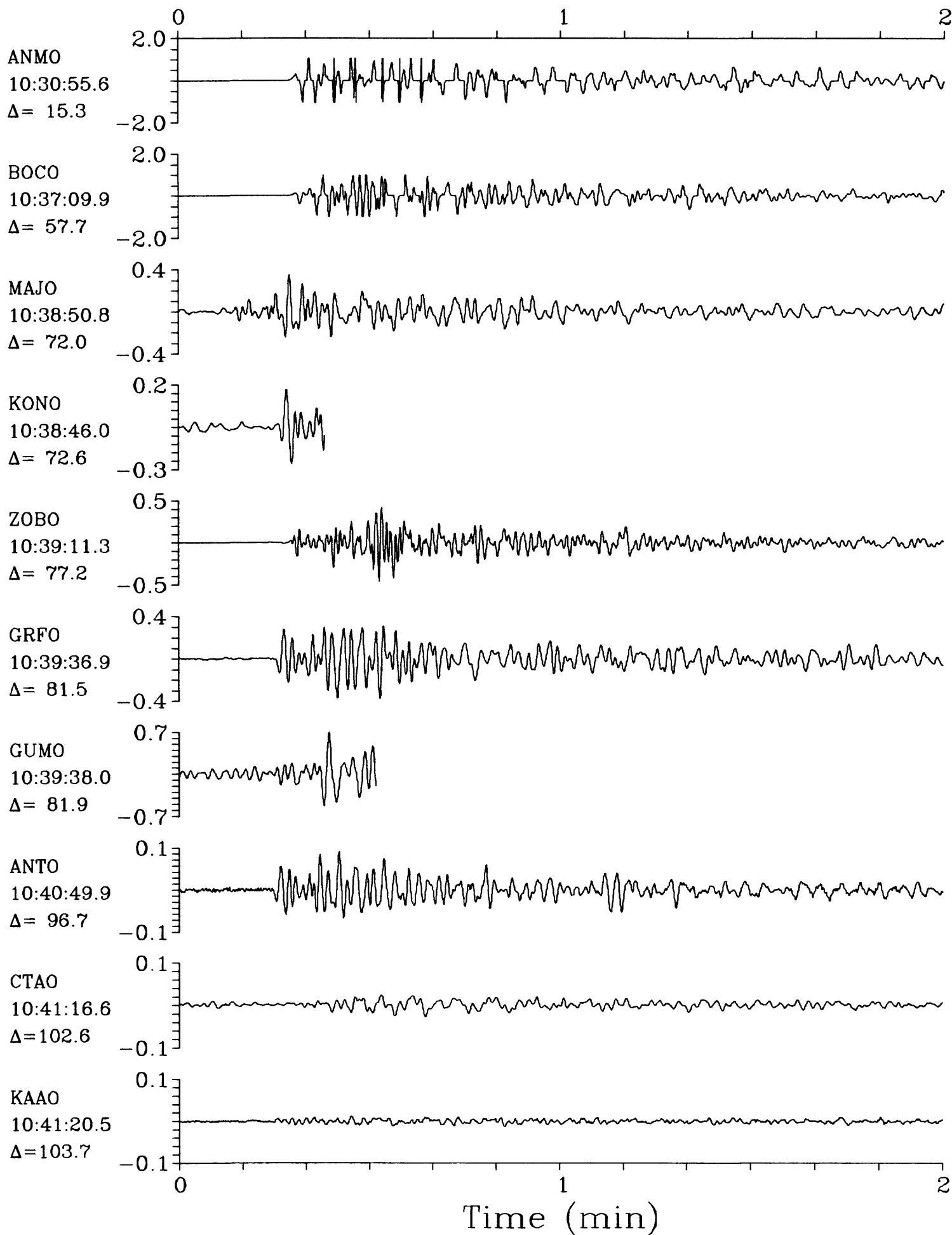
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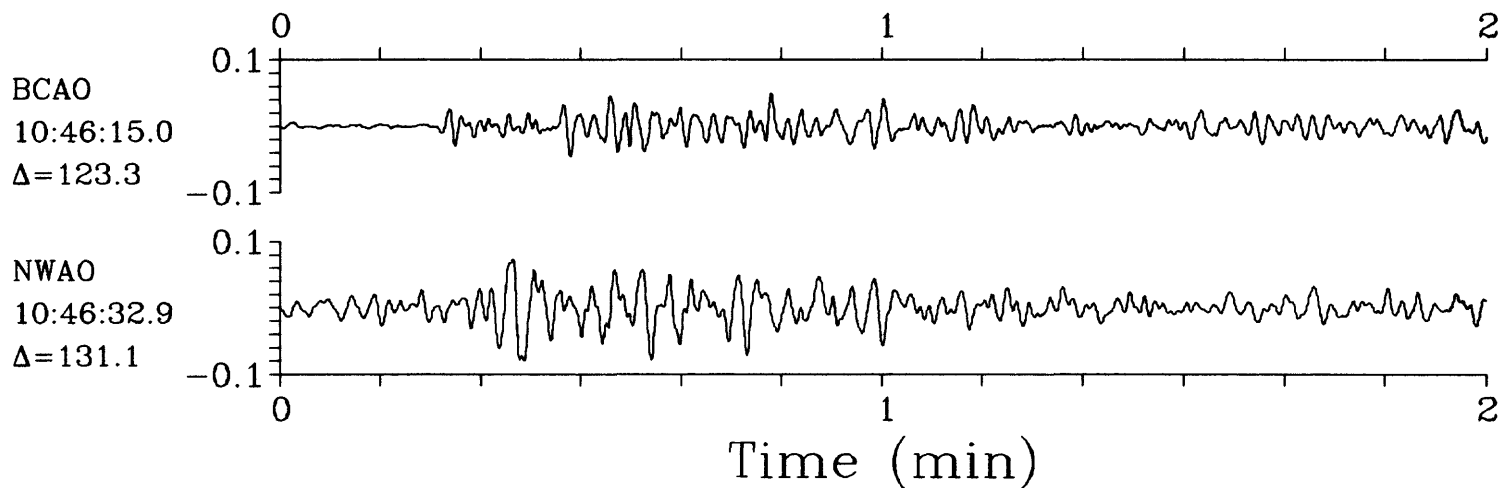
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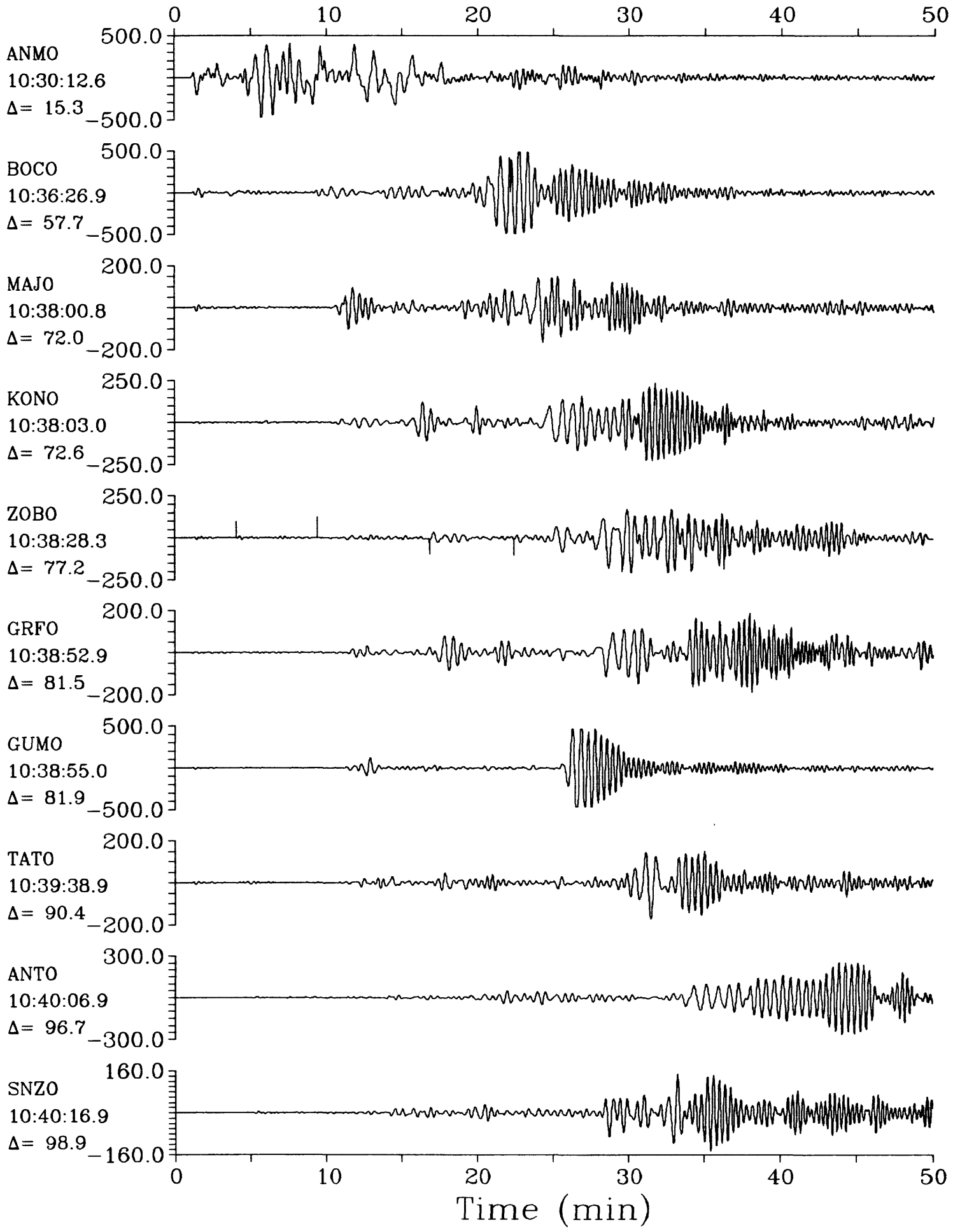
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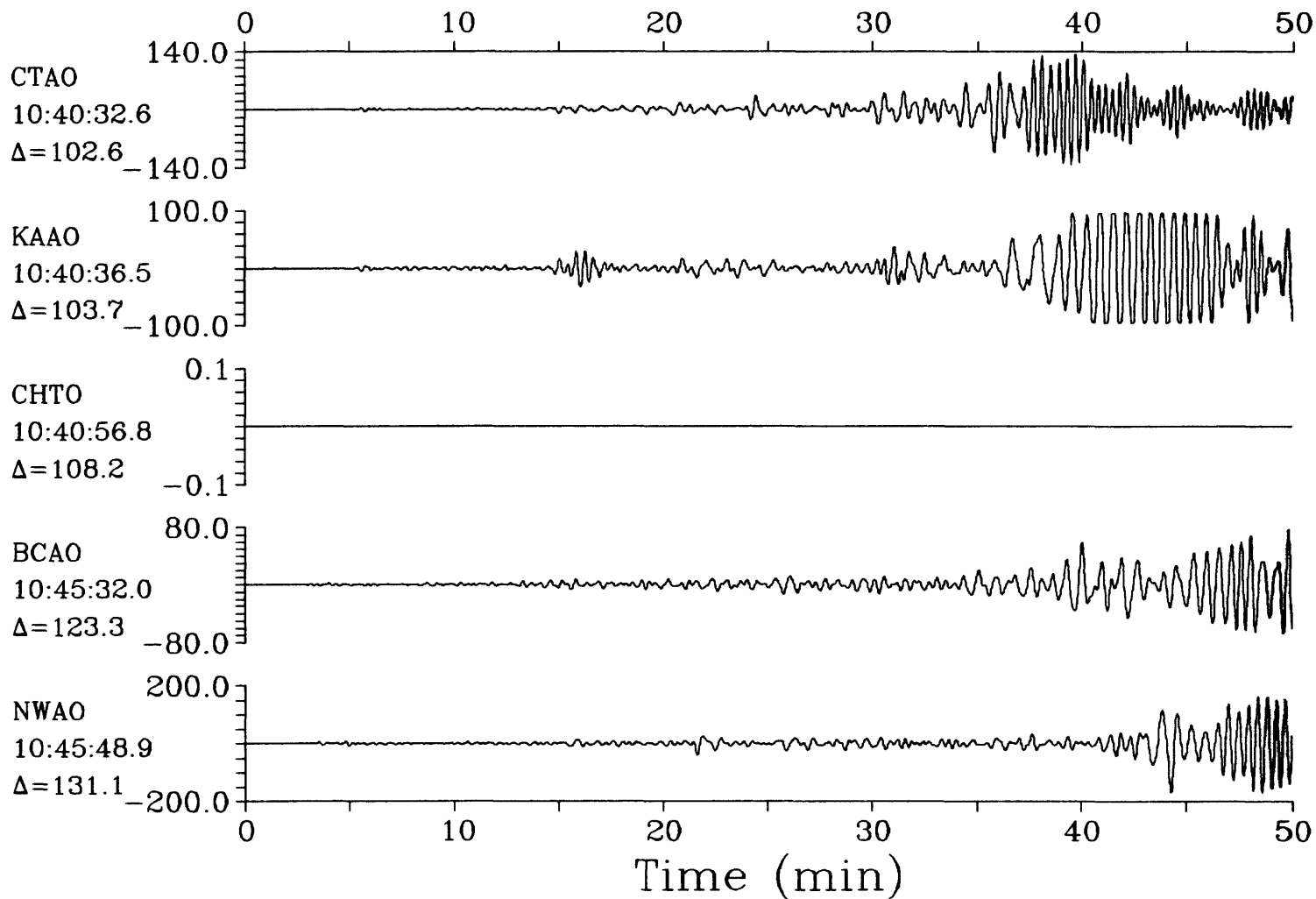
LPZ

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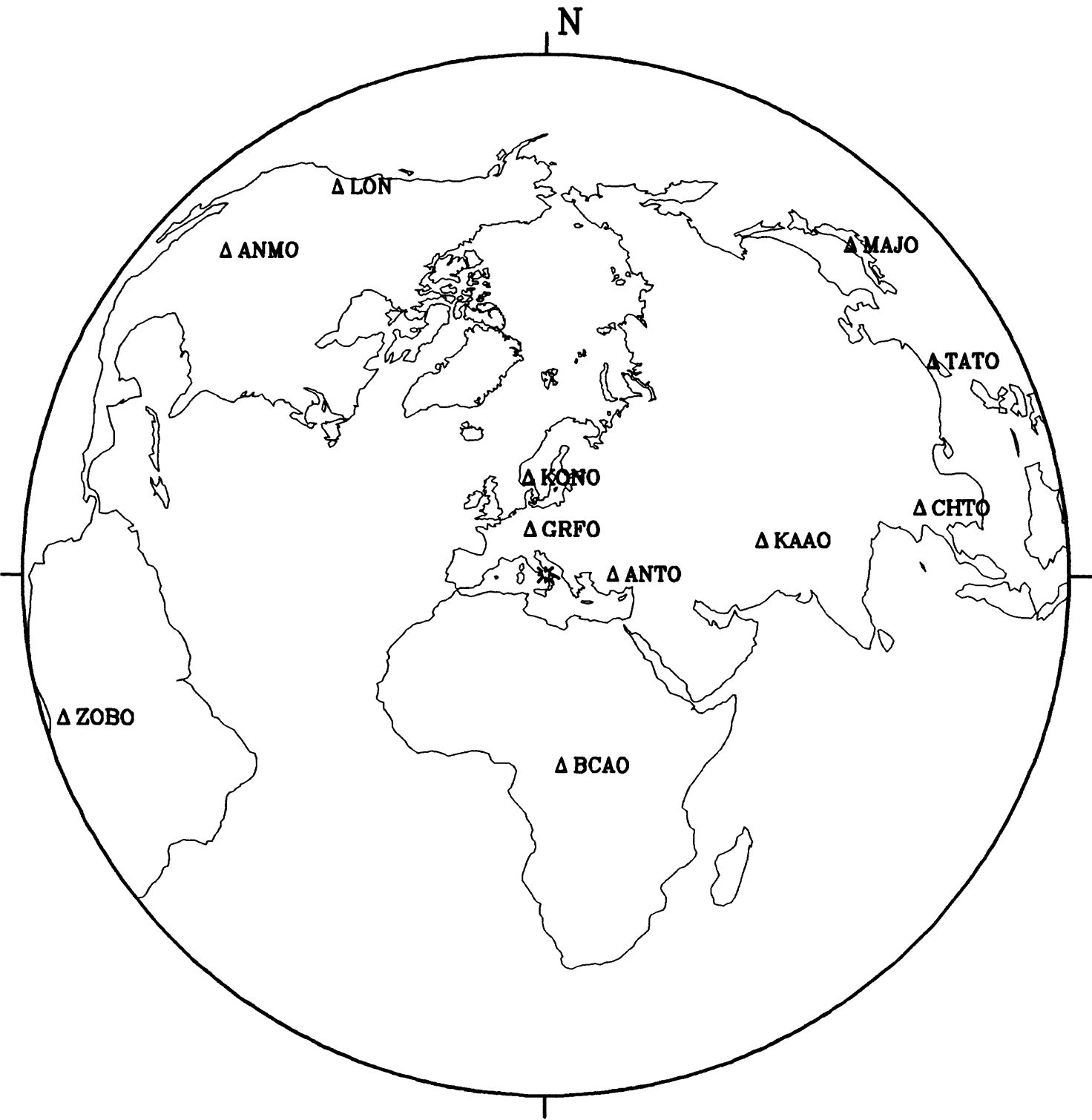
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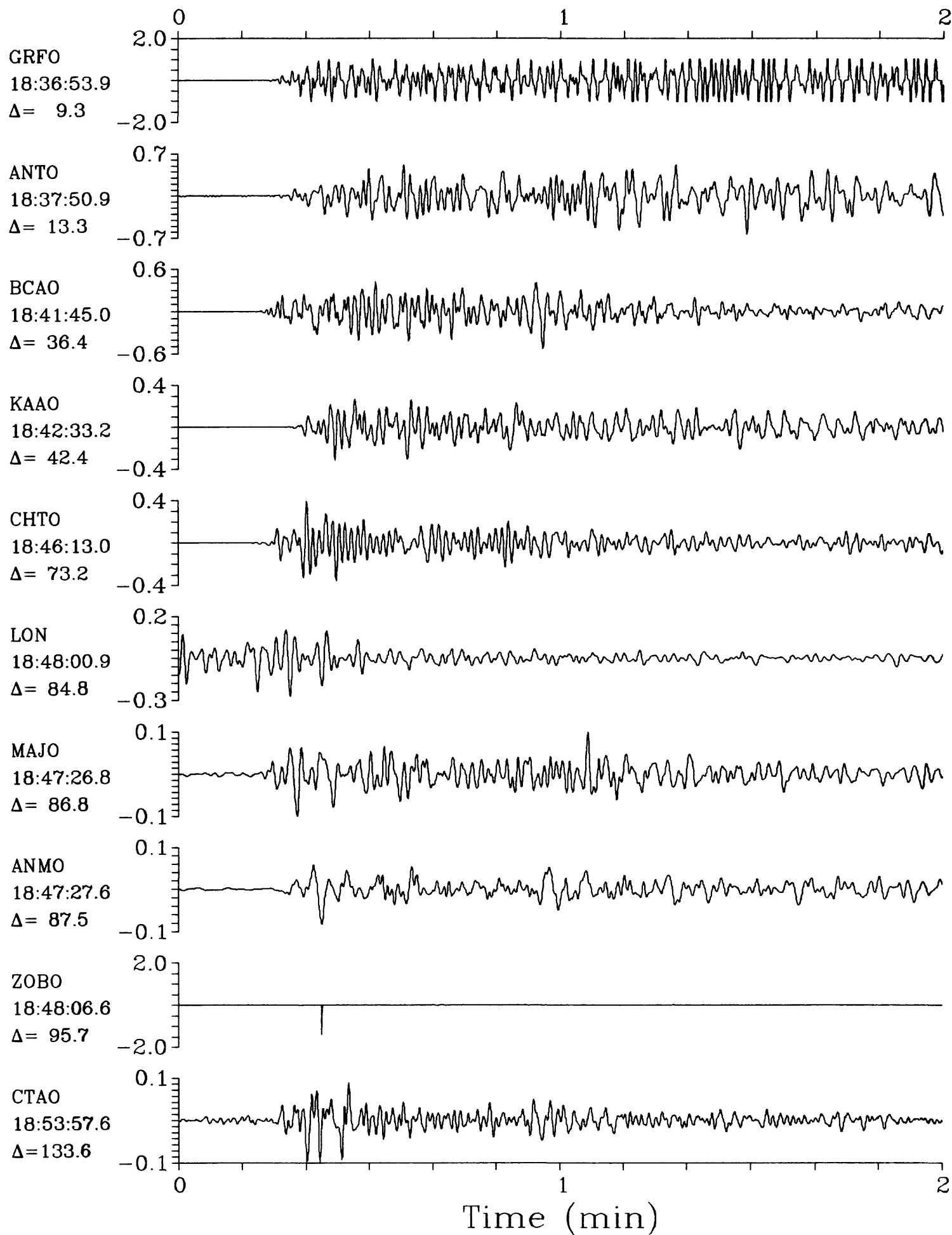
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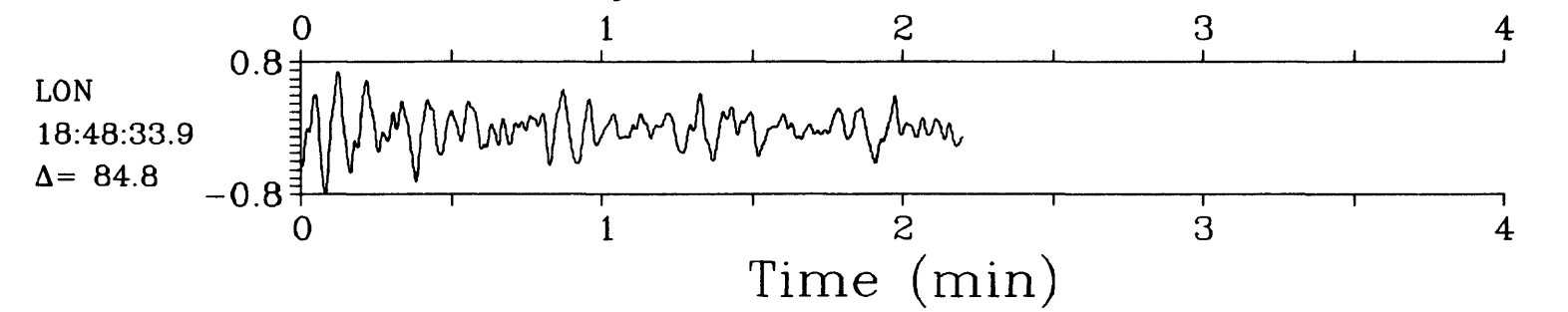
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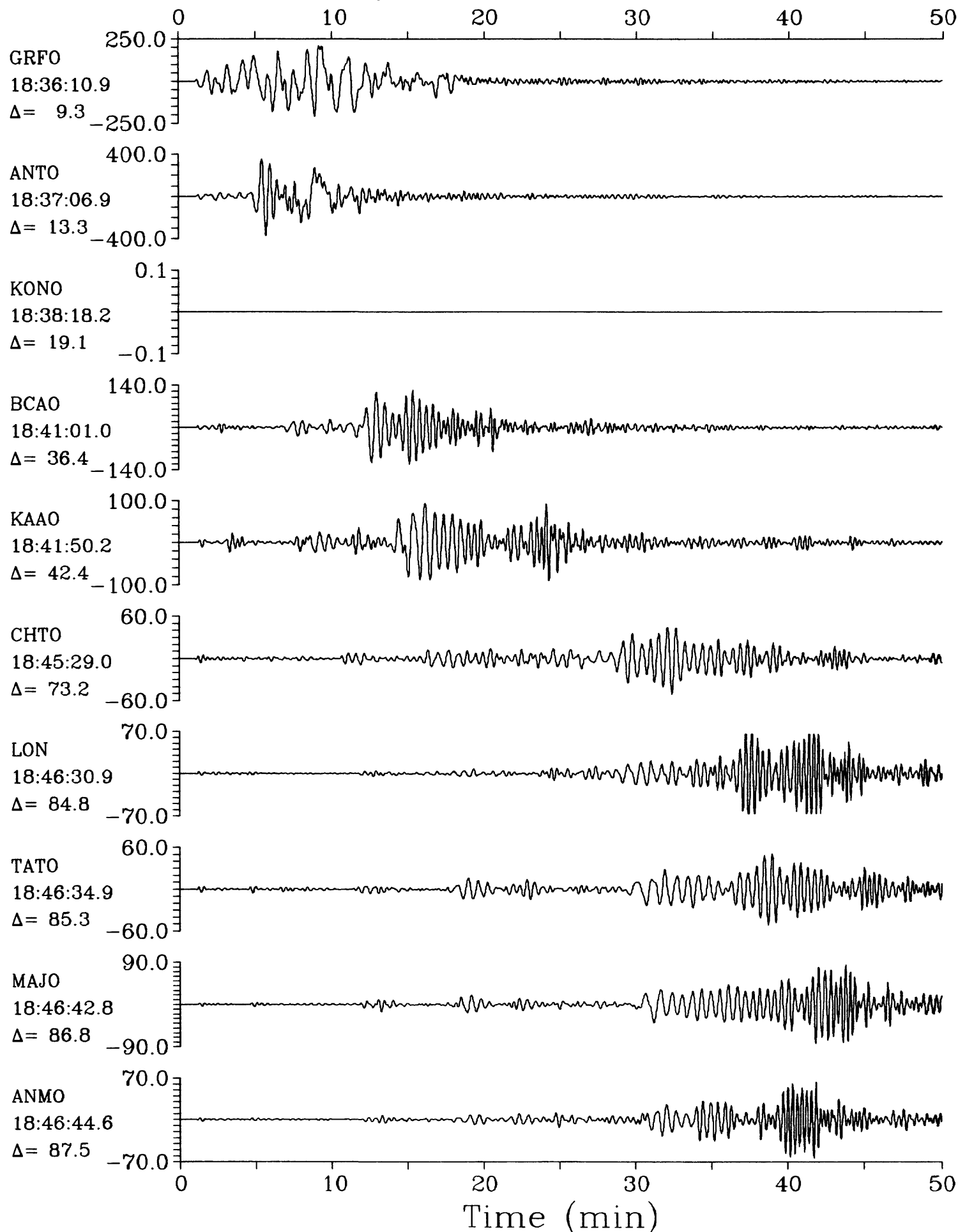
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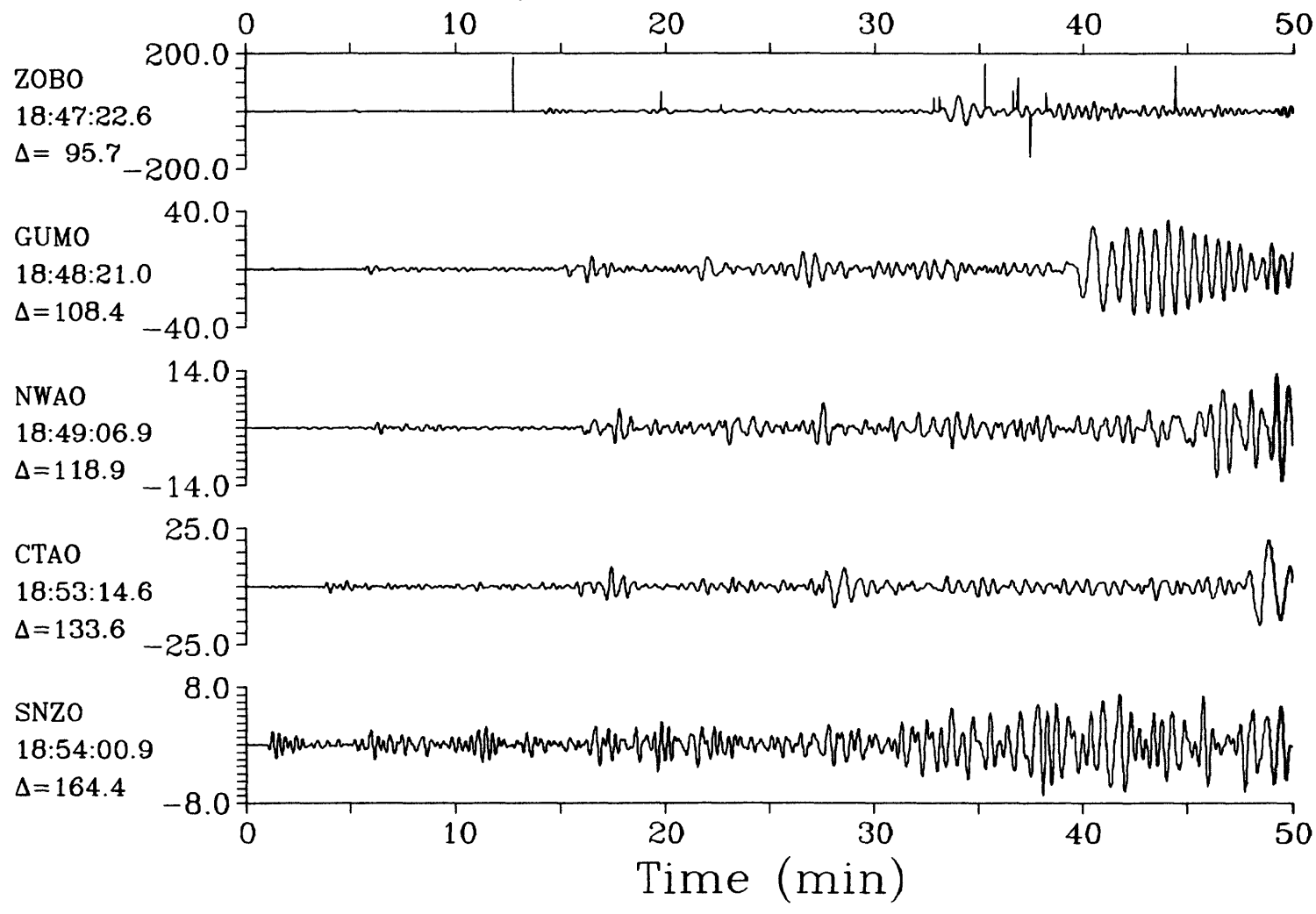


Southern Italy h=10.0 MB=6.0 ms=6.9



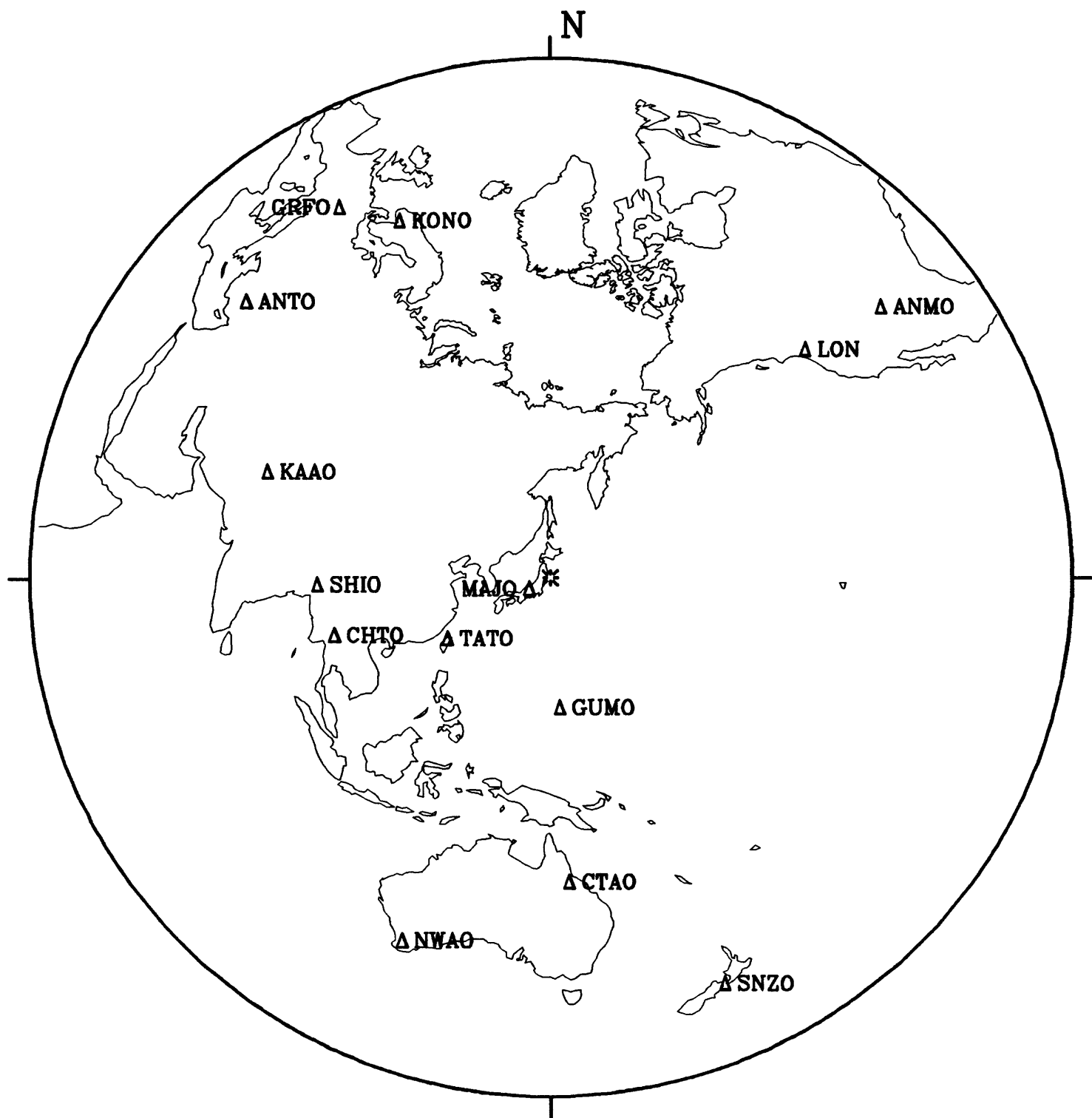


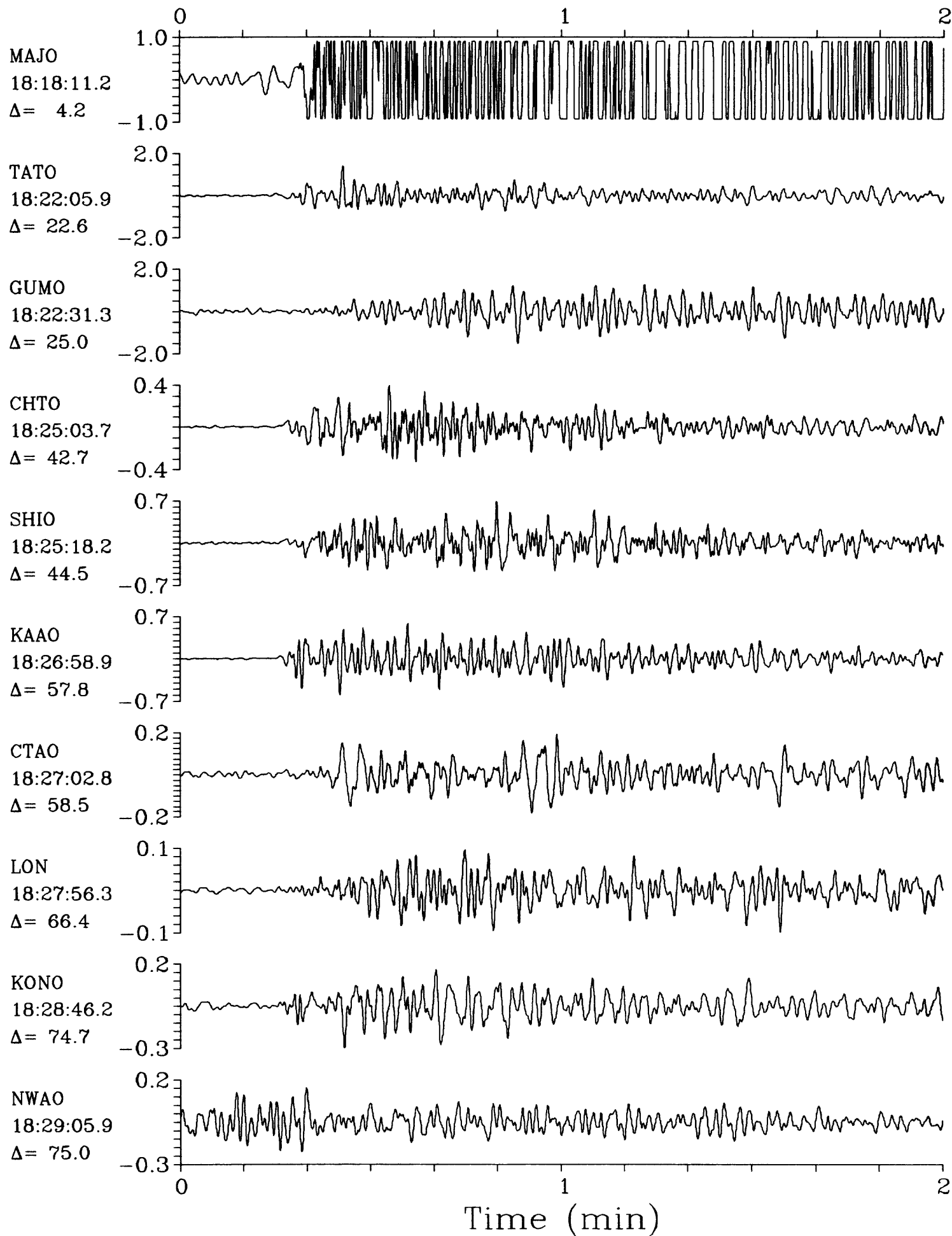
23 November 1980 18:34:53.80
Southern Italy h=10.0 MB=6.0 ms=6.9

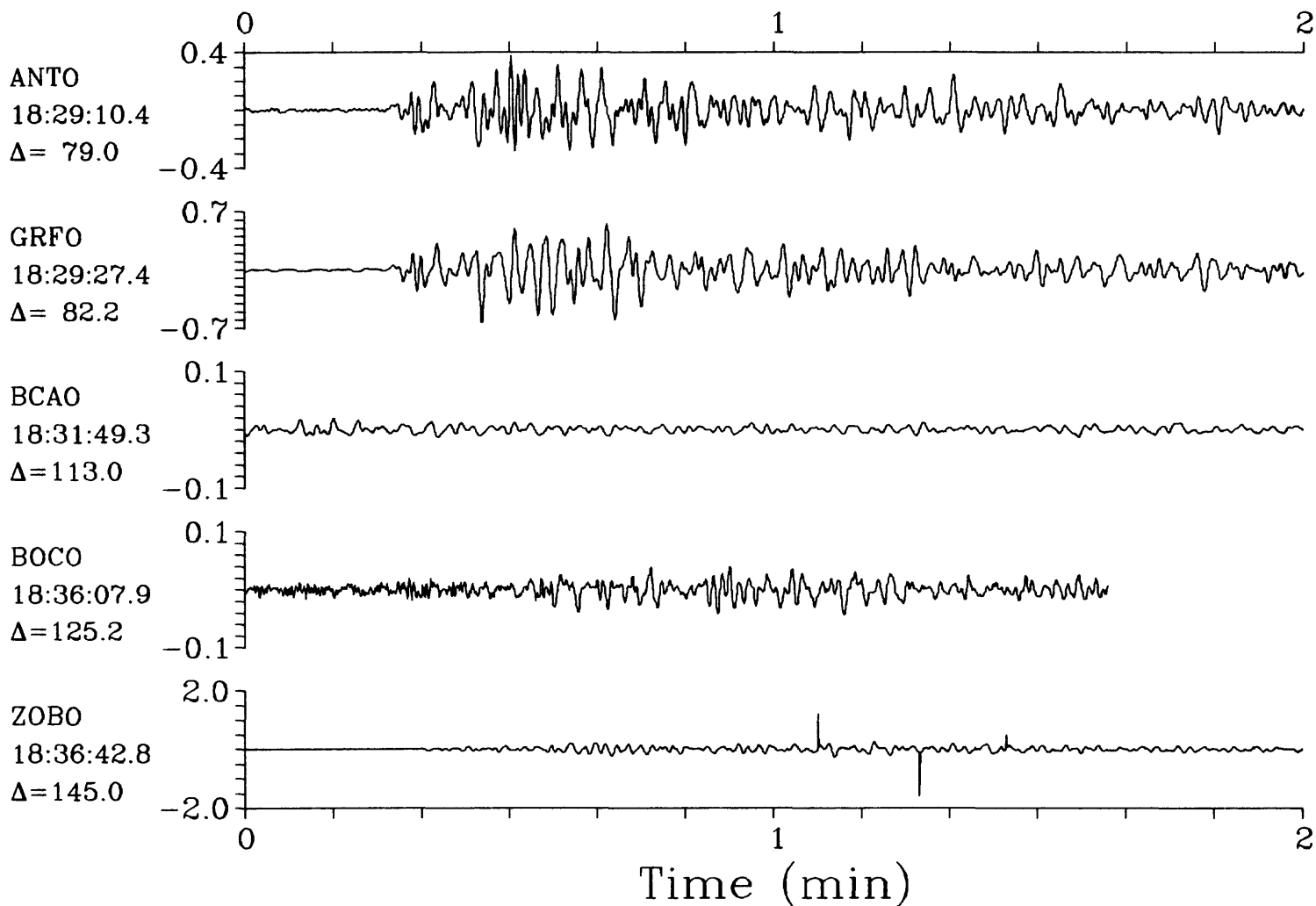


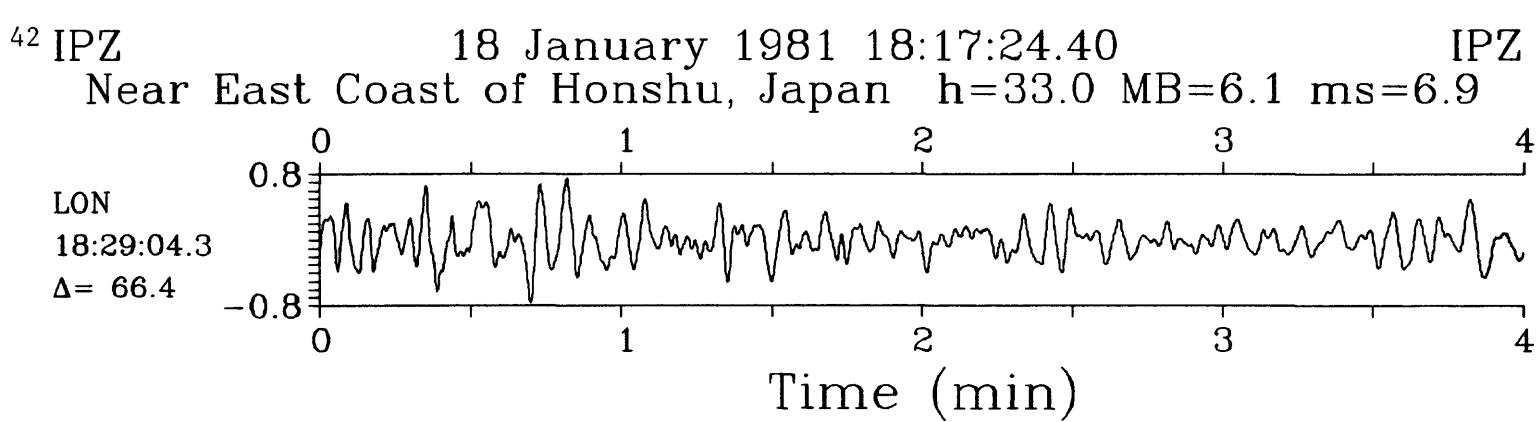
18 January 1981 18:17:24.40

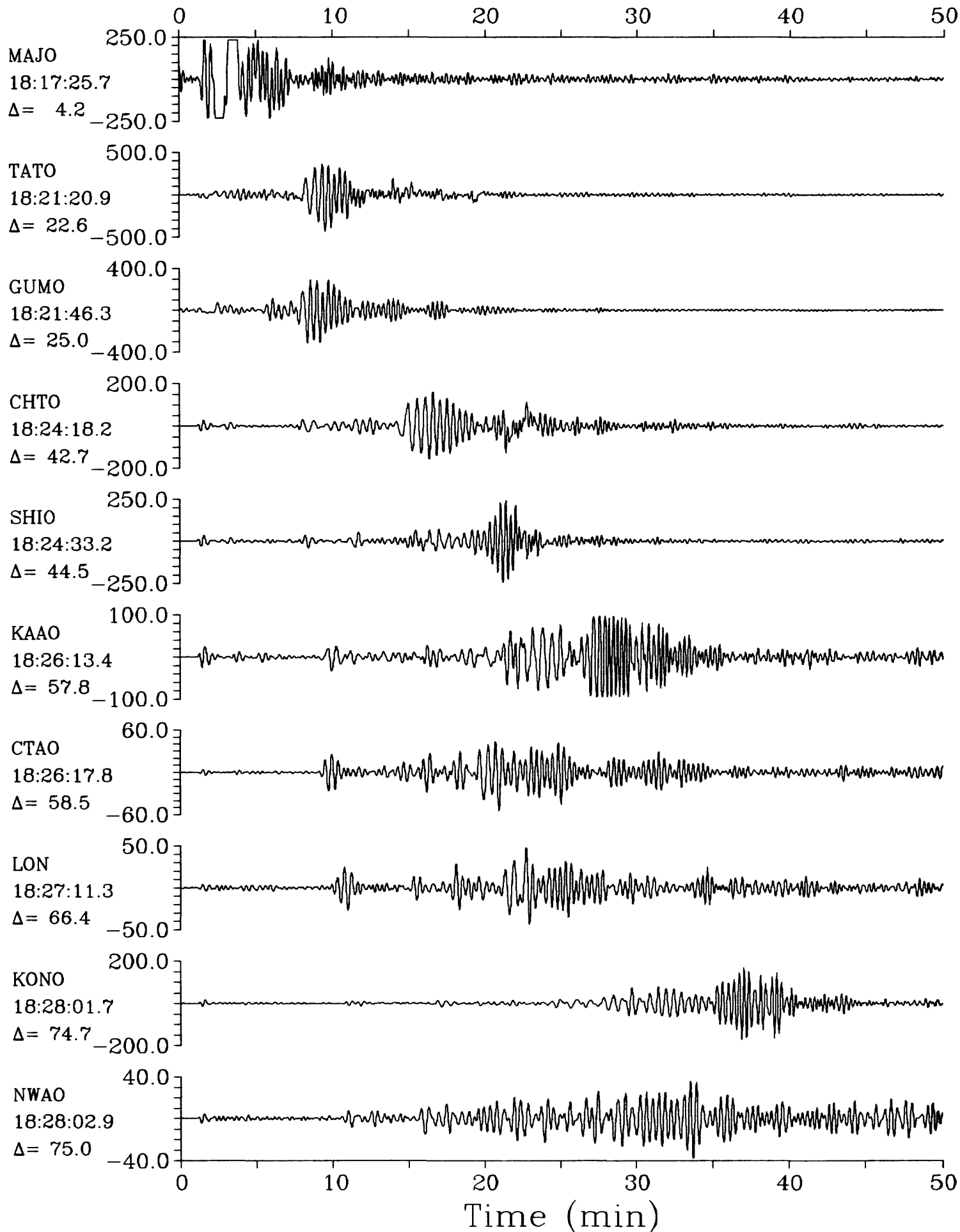
Near East Coast of Honshu, Japan

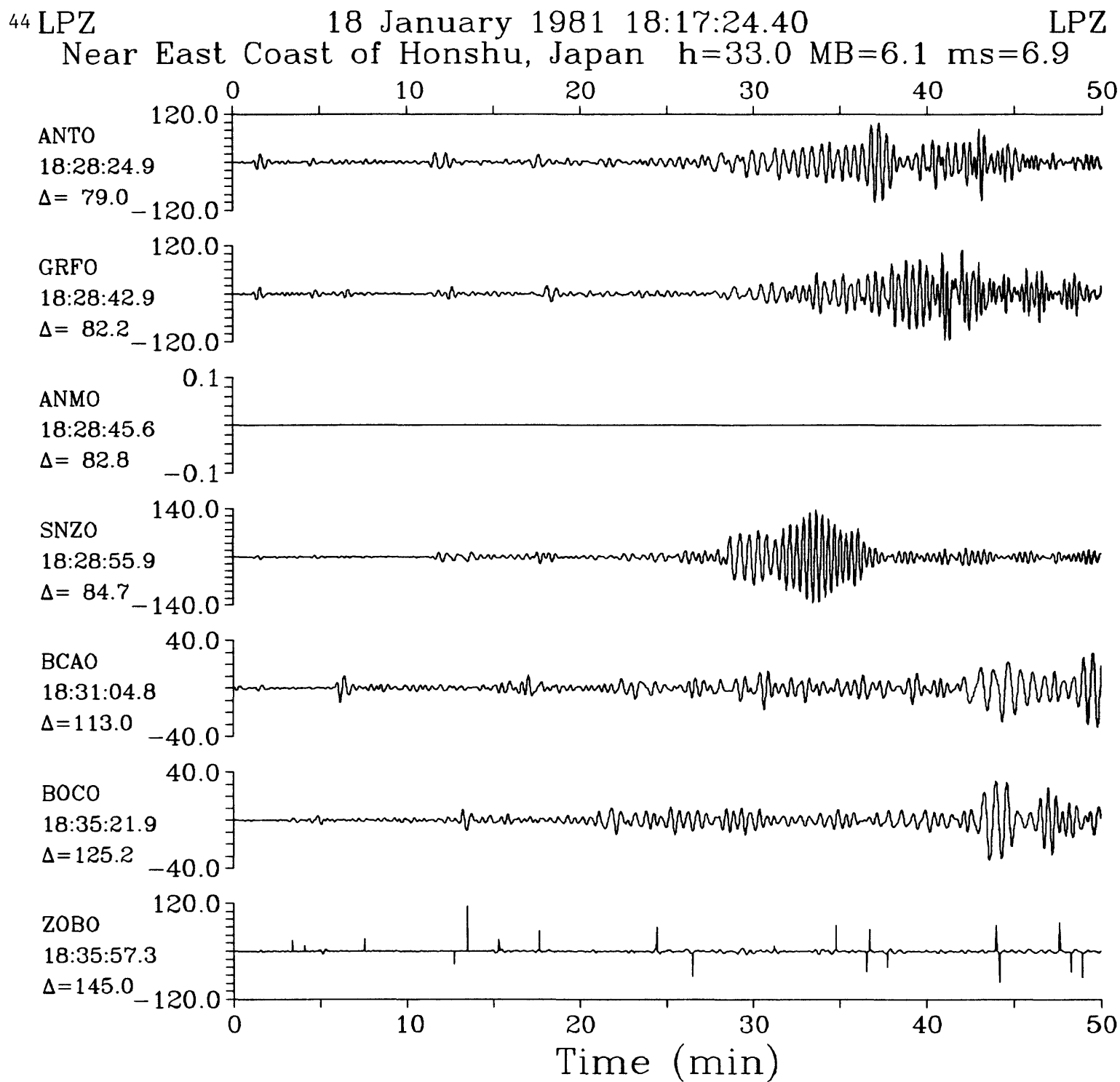






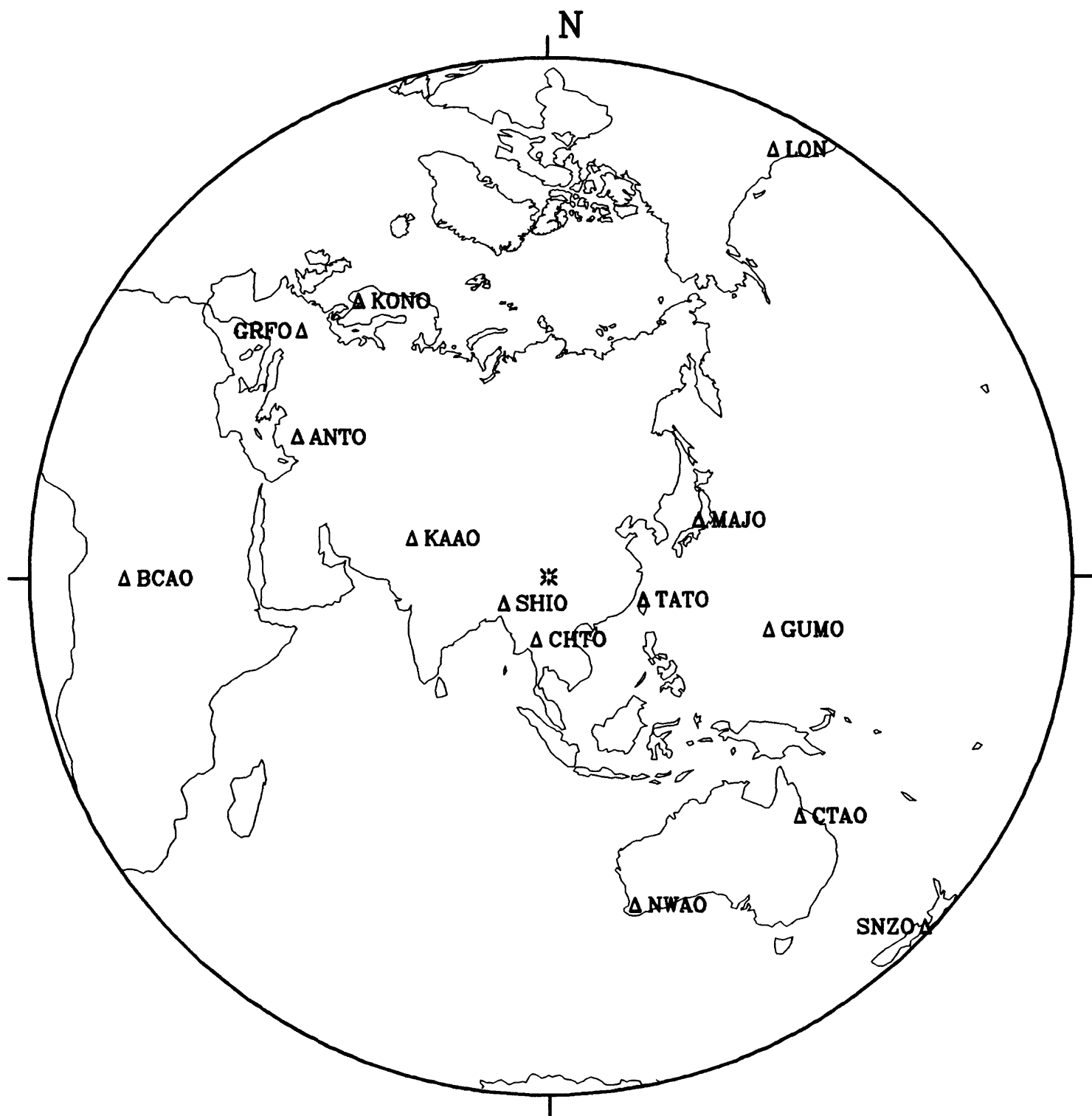


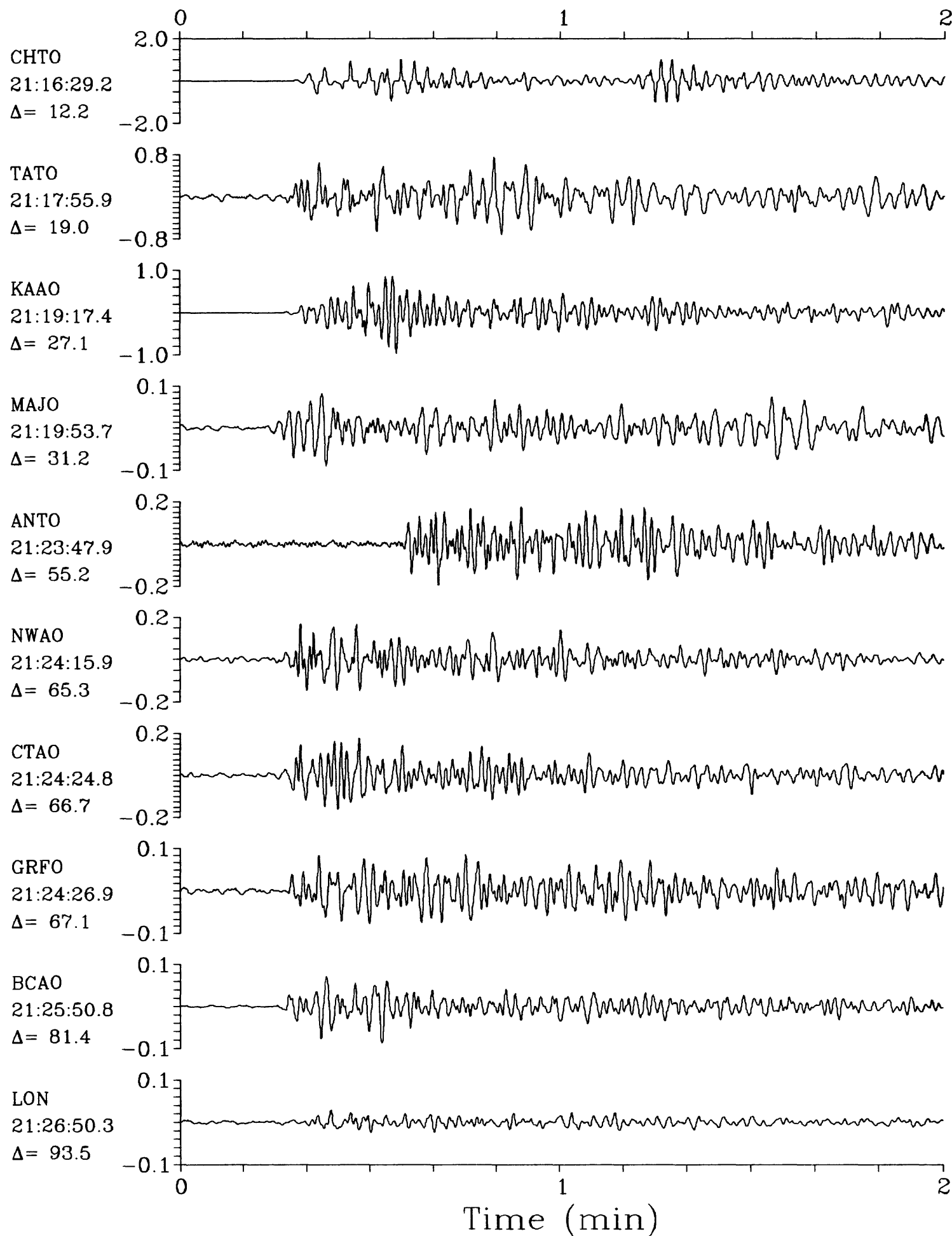




23 January 1981 21:13:51.70

Sichuan Province, China



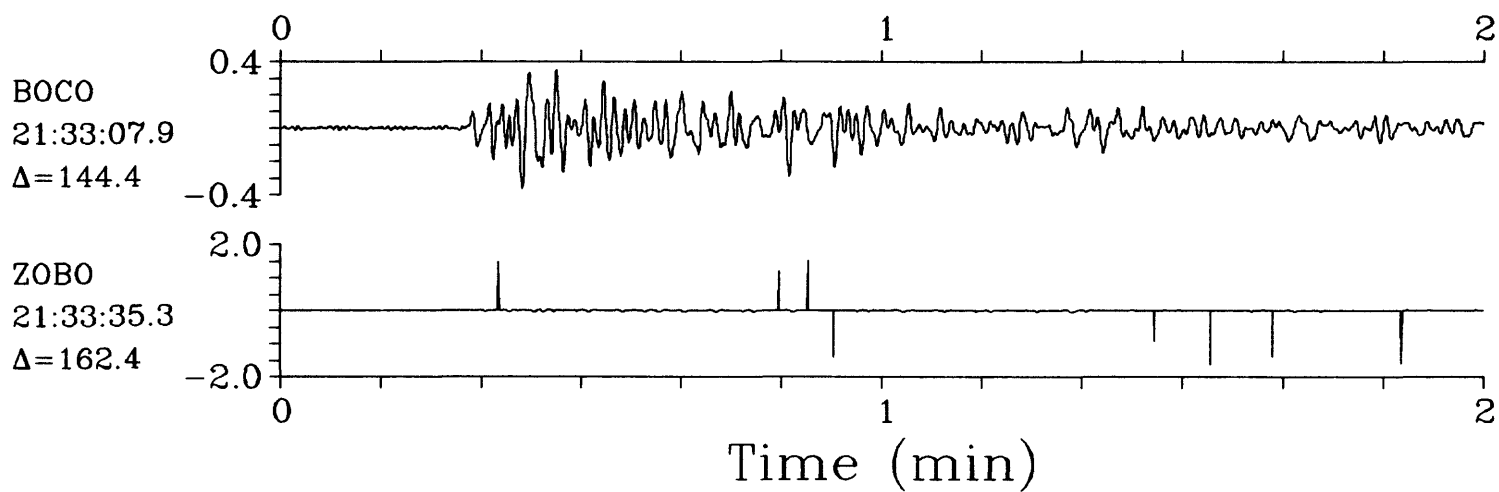


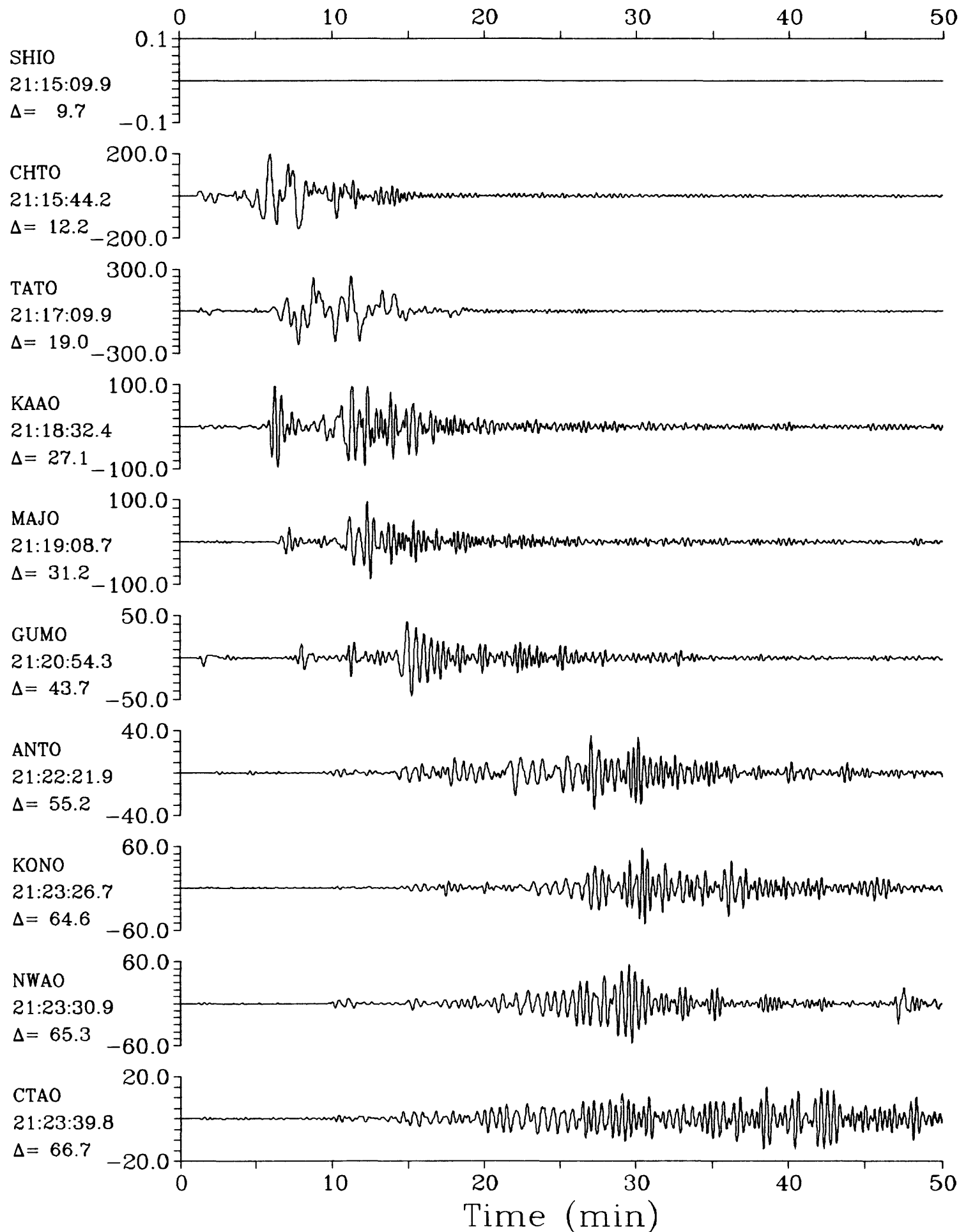
SPZ

23 January 1981 21:13:51.70

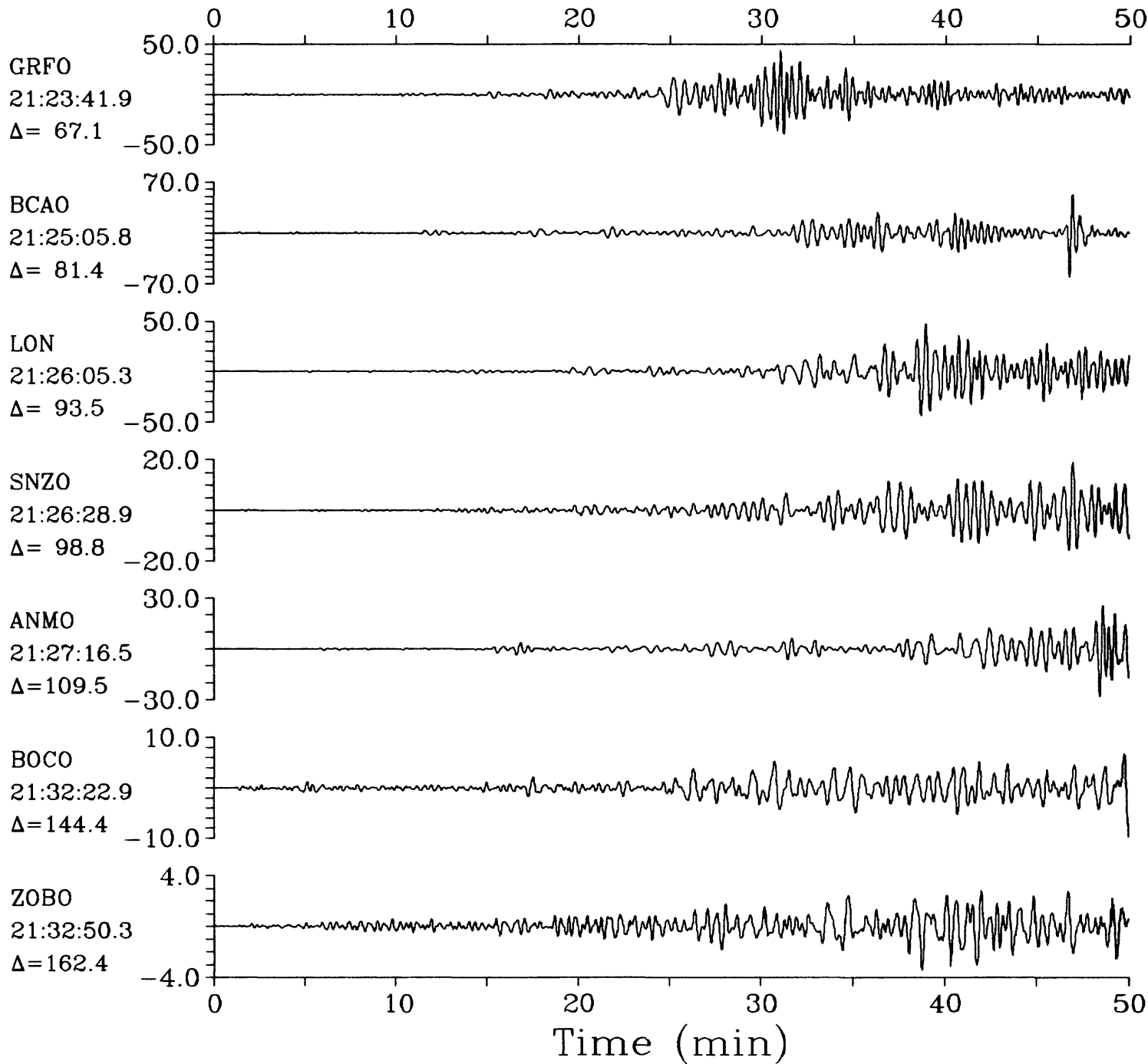
SPZ⁴⁷

Sichuan Province, China h=33.0 MB=5.7 ms=6.8



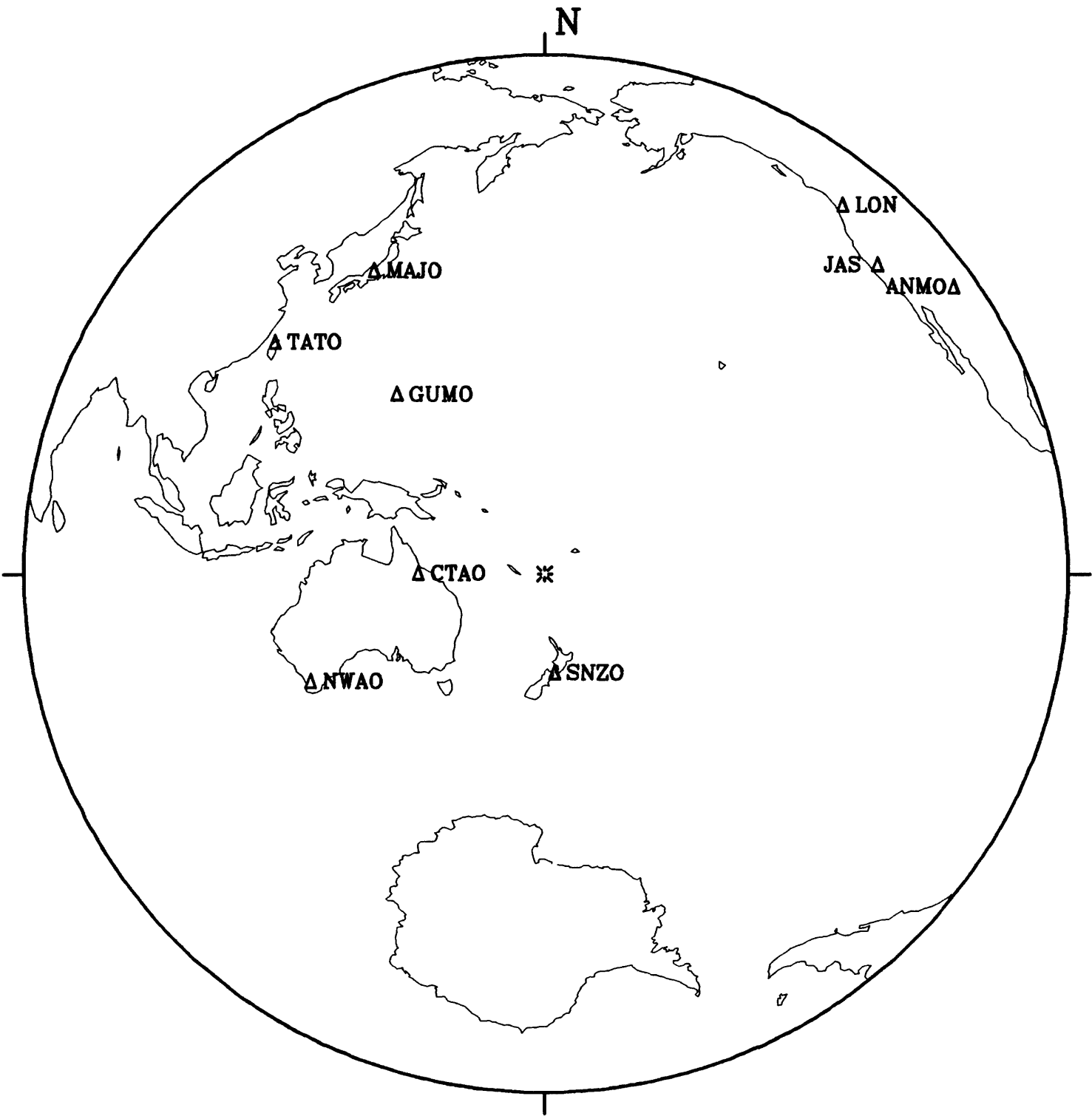
Sichuan Province, China $h=33.0$ MB=5.7 ms=6.8

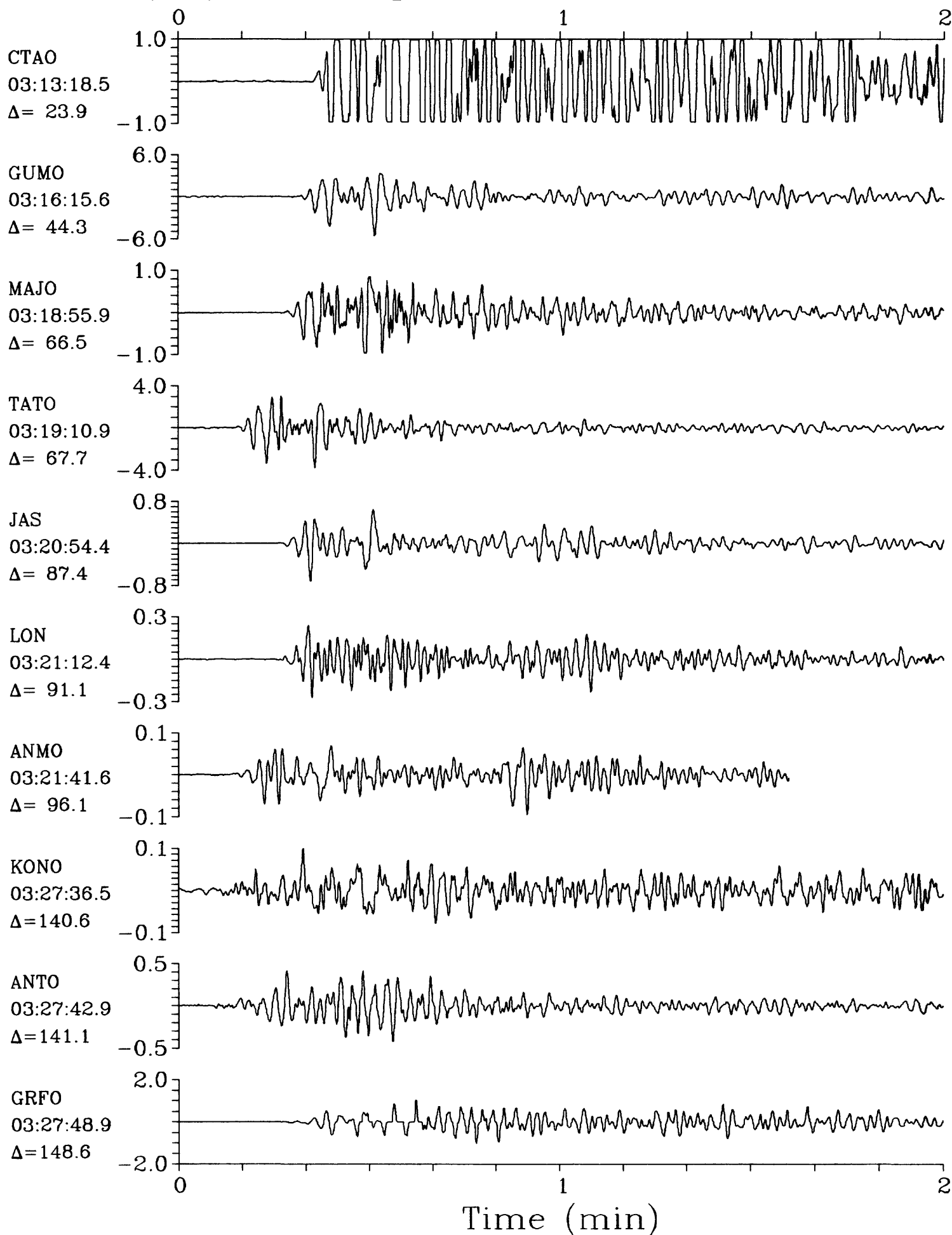
LPZ 23 January 1981 21:13:51.70 LPZ
 Sichuan Province, China h=33.0 MB=5.7 ms=6.8



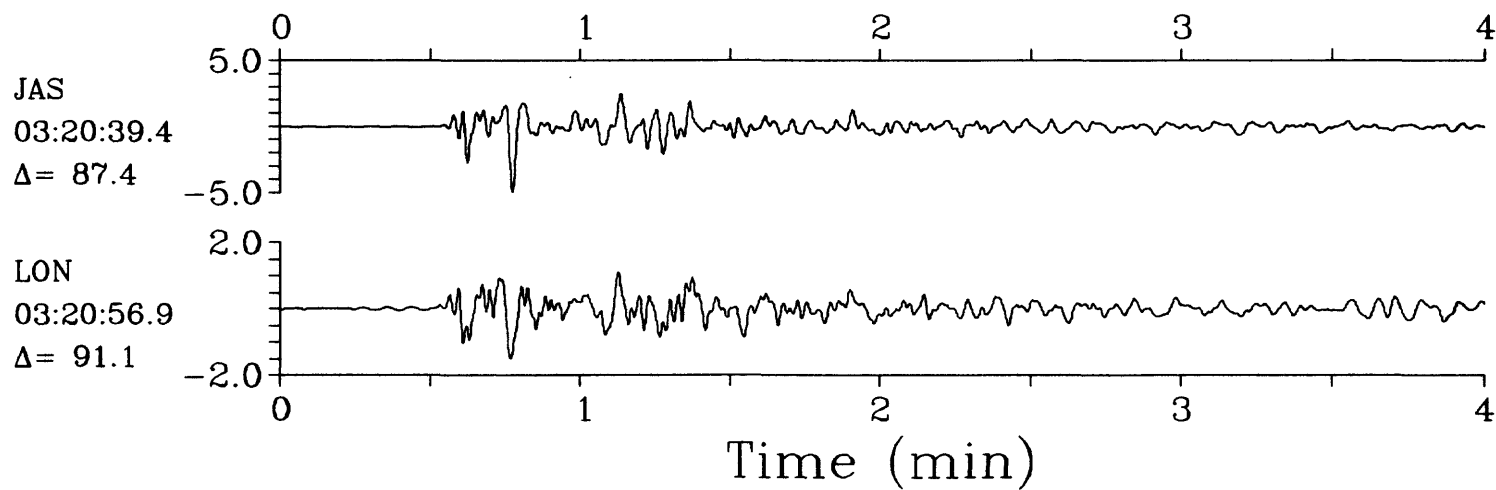
06 July 1981 03:08:24.18

Loyalty Islands Region



Loyalty Islands Region $h=33.0$ MB=6.9 ms=7.0

Loyalty Islands Region h=33.0 MB=6.9 ms=7.0



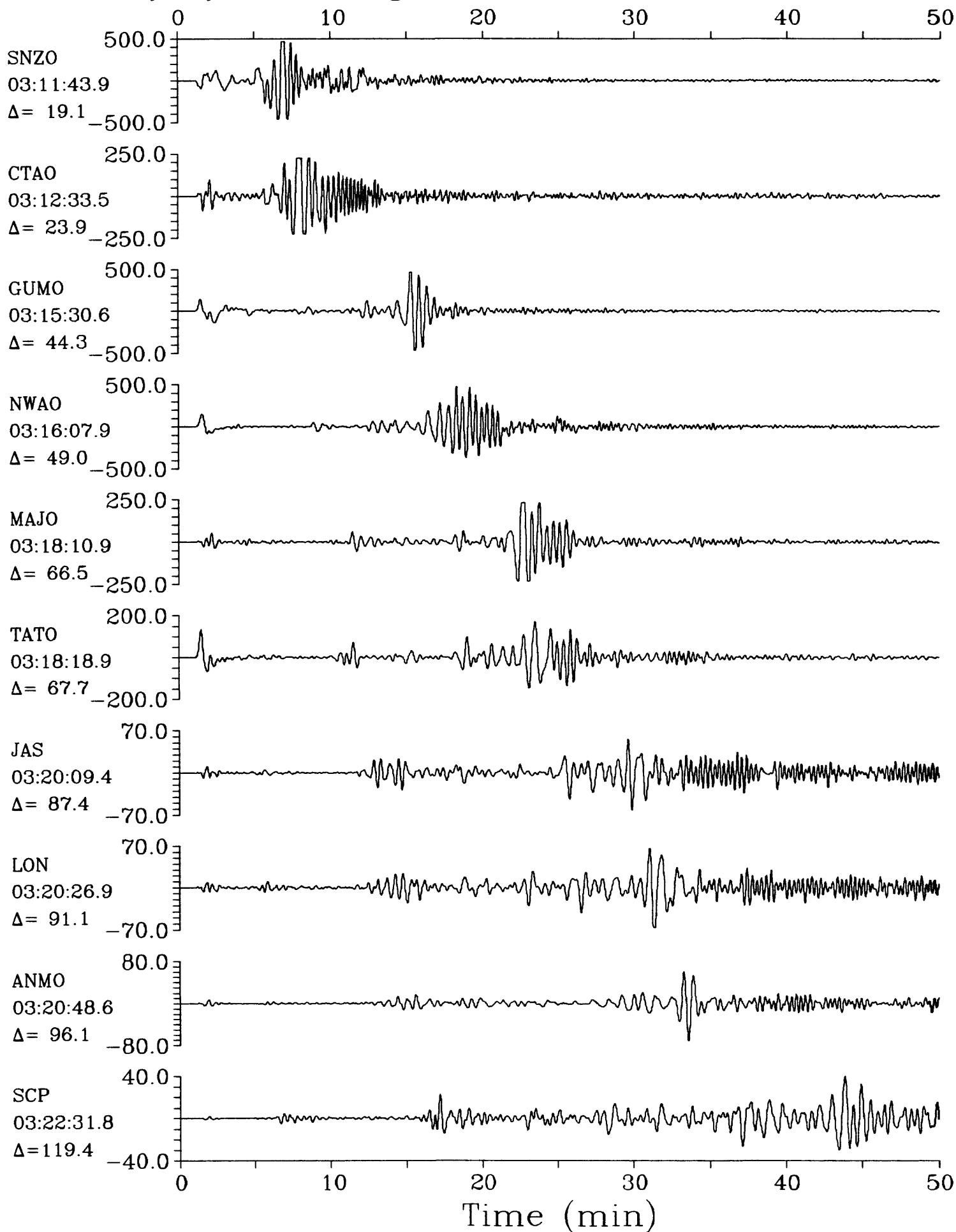
LPZ

06 July 1981 03:08:24.18

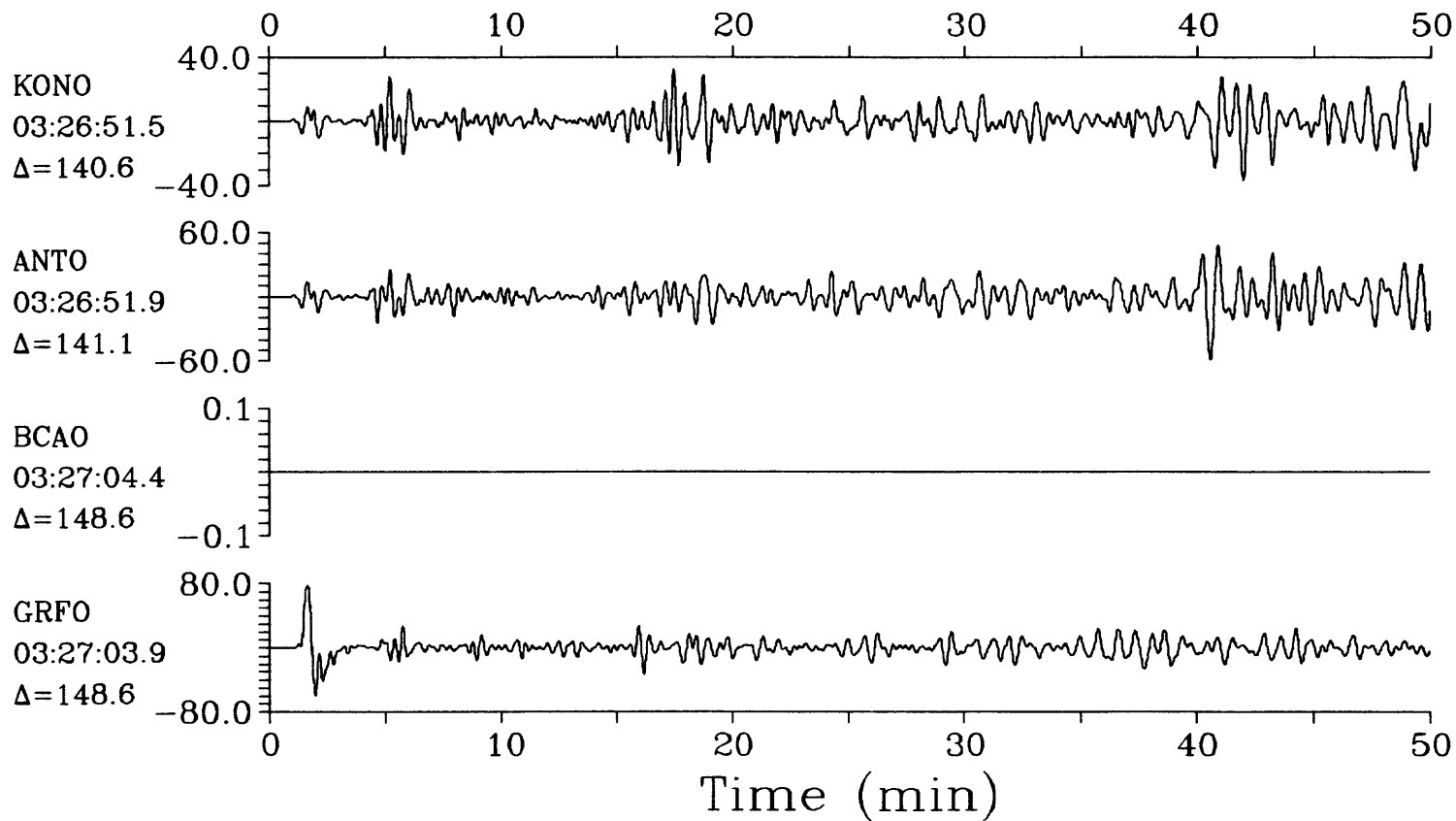
LPZ

53

Loyalty Islands Region h=33.0 MB=6.9 ms=7.0

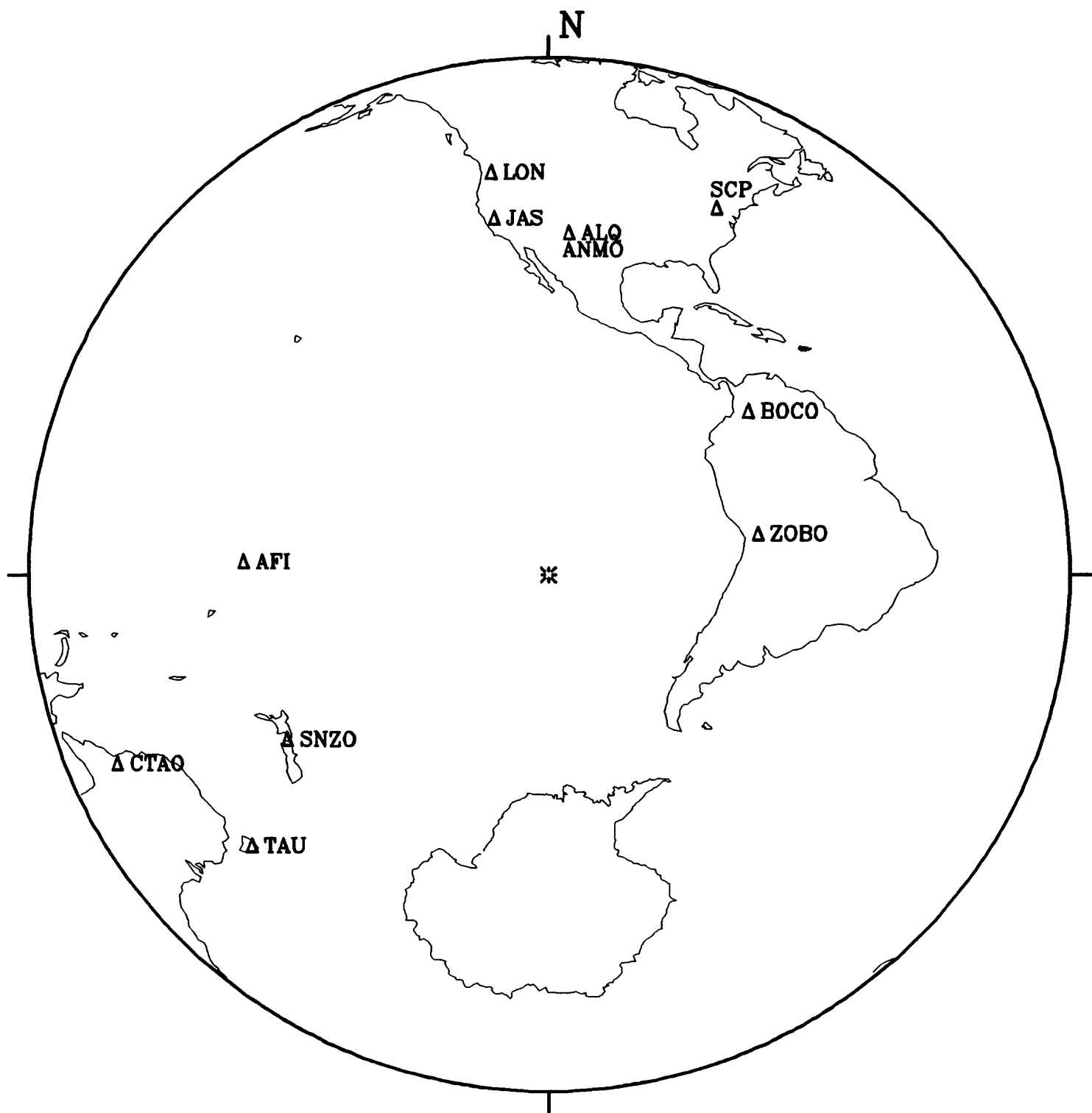


Loyalty Islands Region h=33.0 MB=6.9 ms=7.0



28 October 1981 04:34:17.78

Easter Island Region

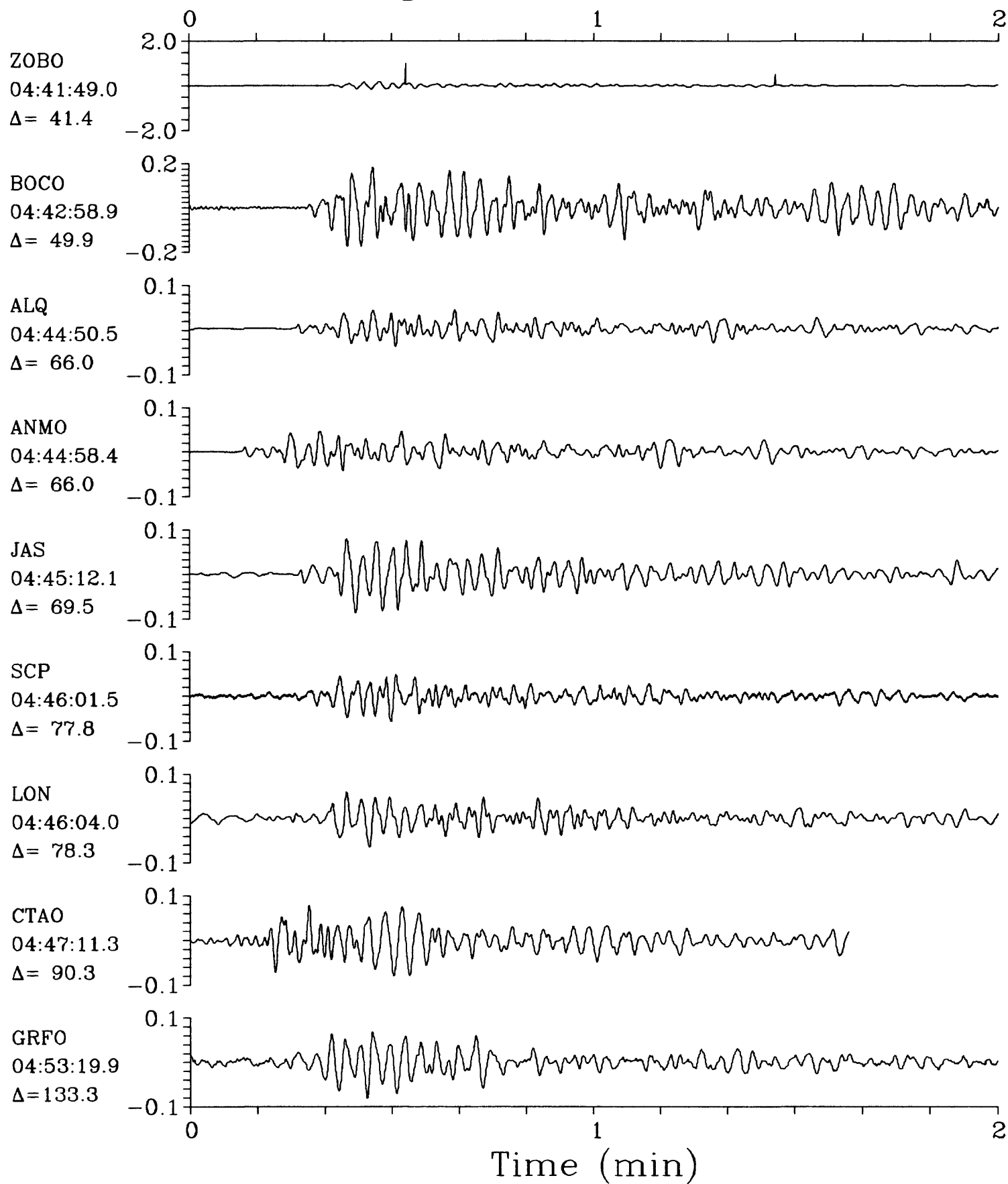


⁵⁶SPZ

28 October 1981 04:34:17.78

SPZ

Easter Island Region h=10.0 MB=6.2 ms=6.2



IPZ

28 October 1981 04:34:17.78

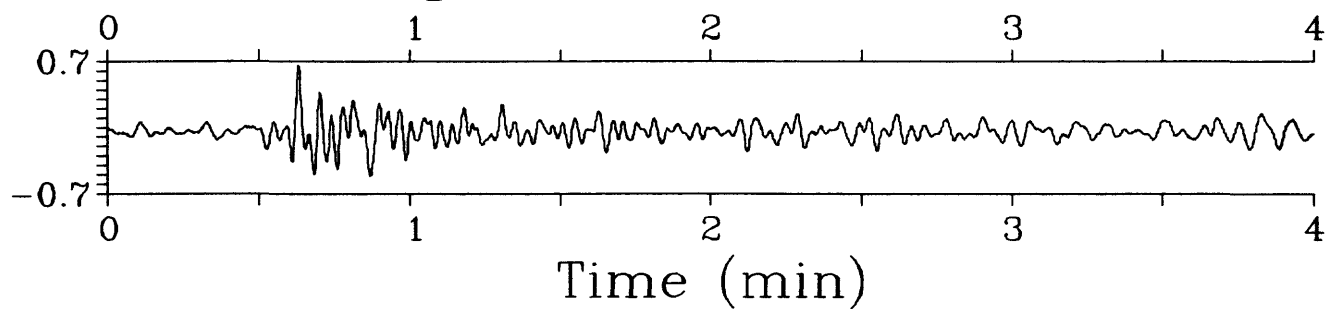
IPZ⁵⁷

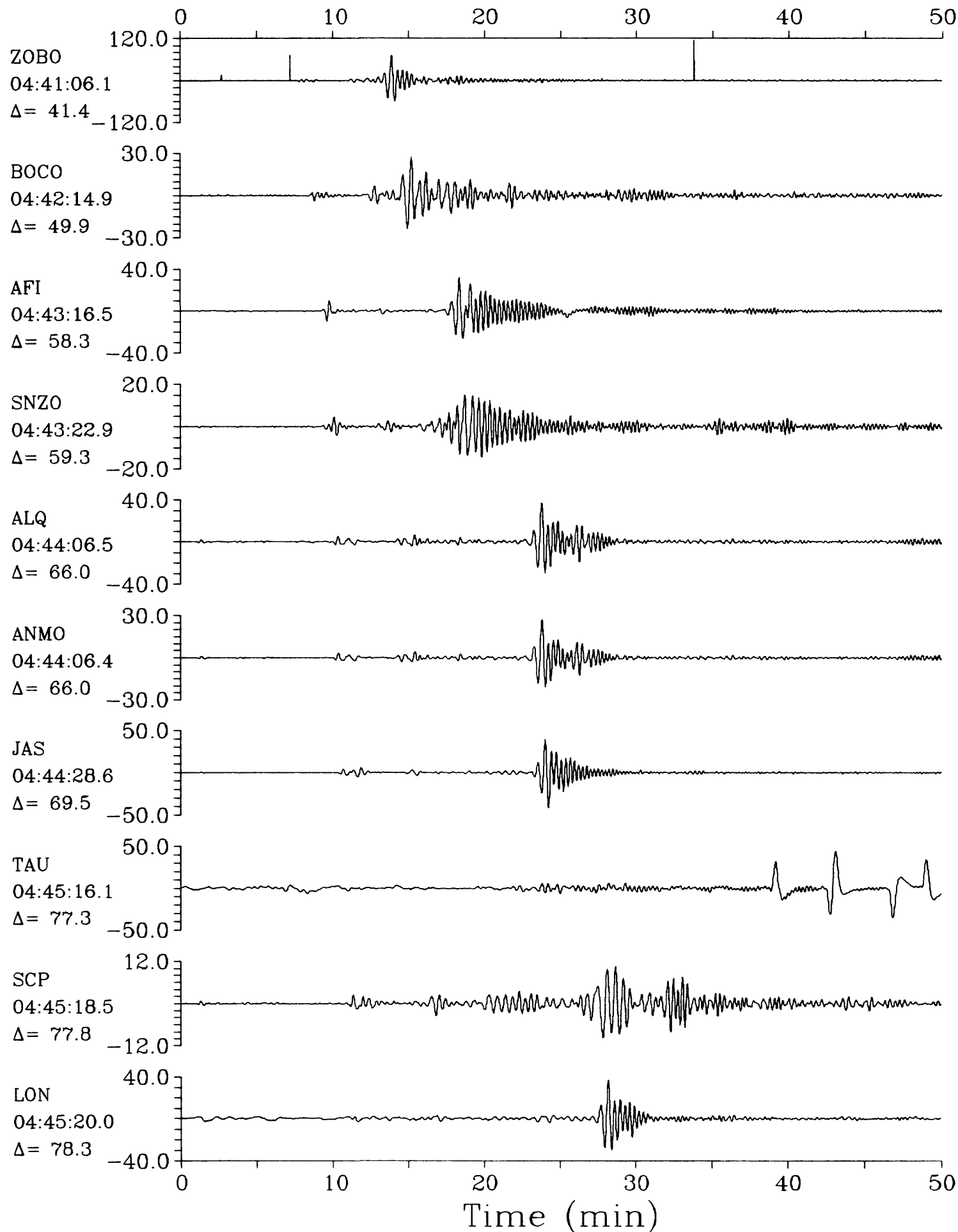
Easter Island Region h=10.0 MB=6.2 ms=6.2

JAS

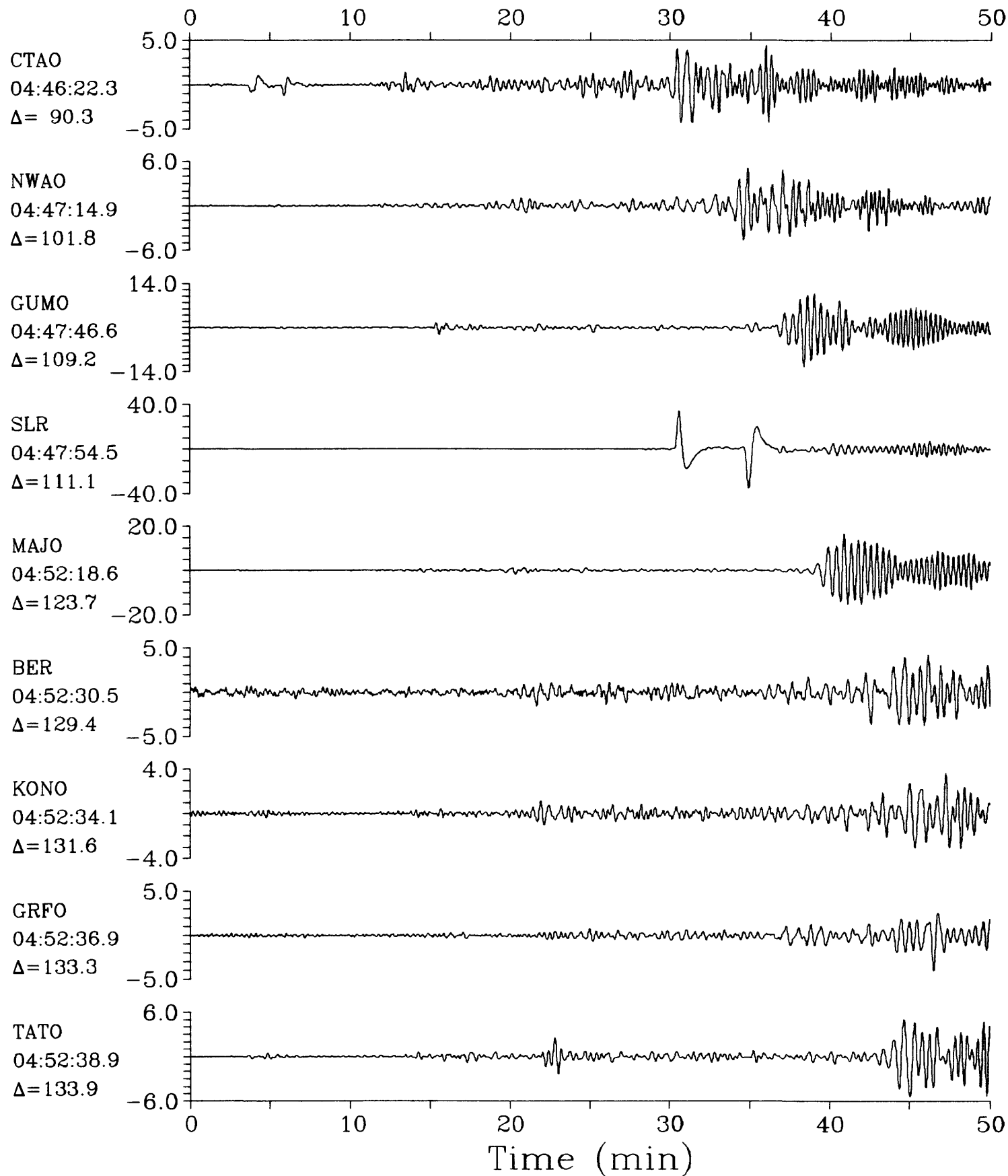
04:44:58.6

$\Delta = 69.5$



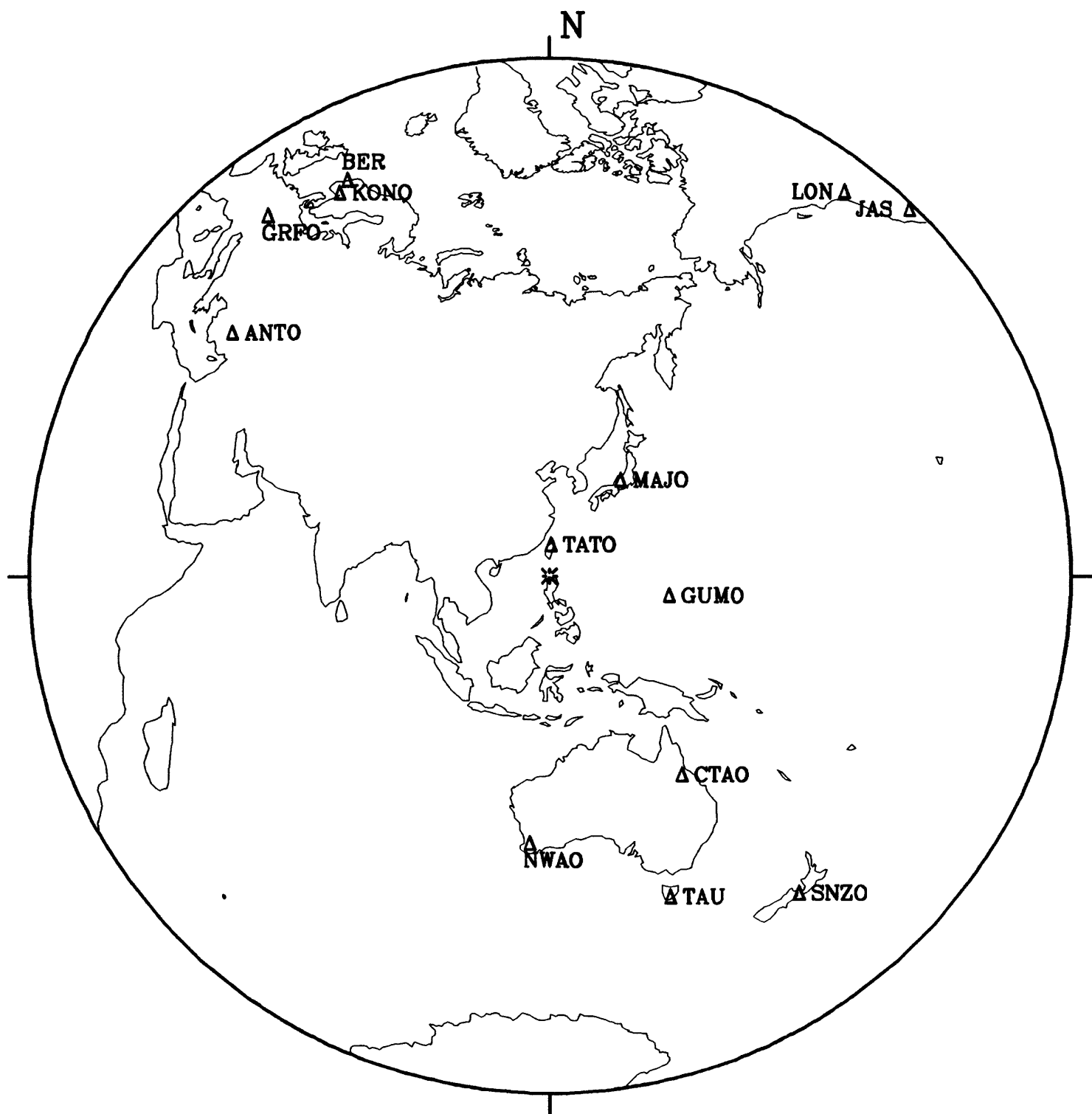
Easter Island Region $h=10.0$ MB=6.2 ms=6.2

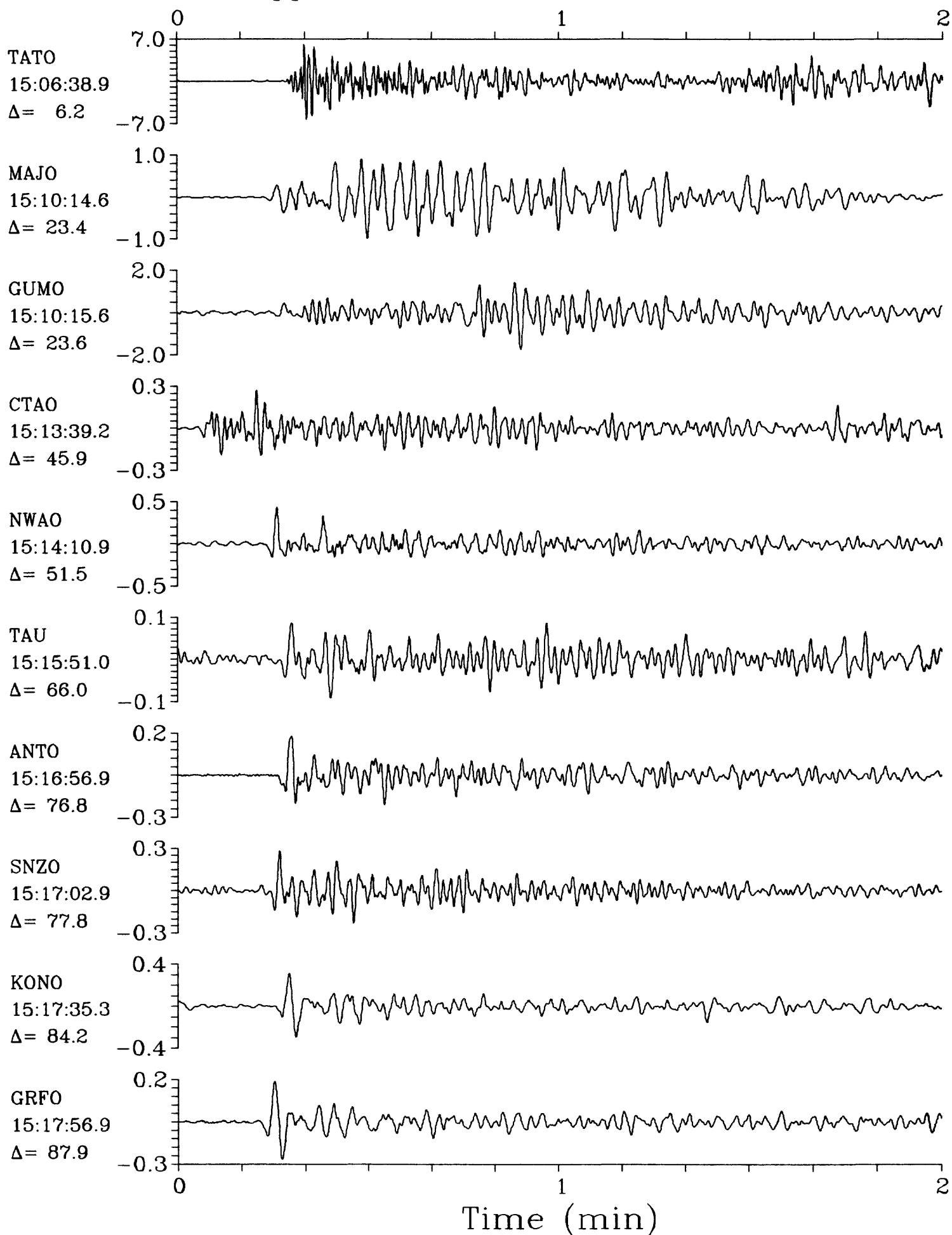
Easter Island Region h=10.0 MB=6.2 ms=6.2

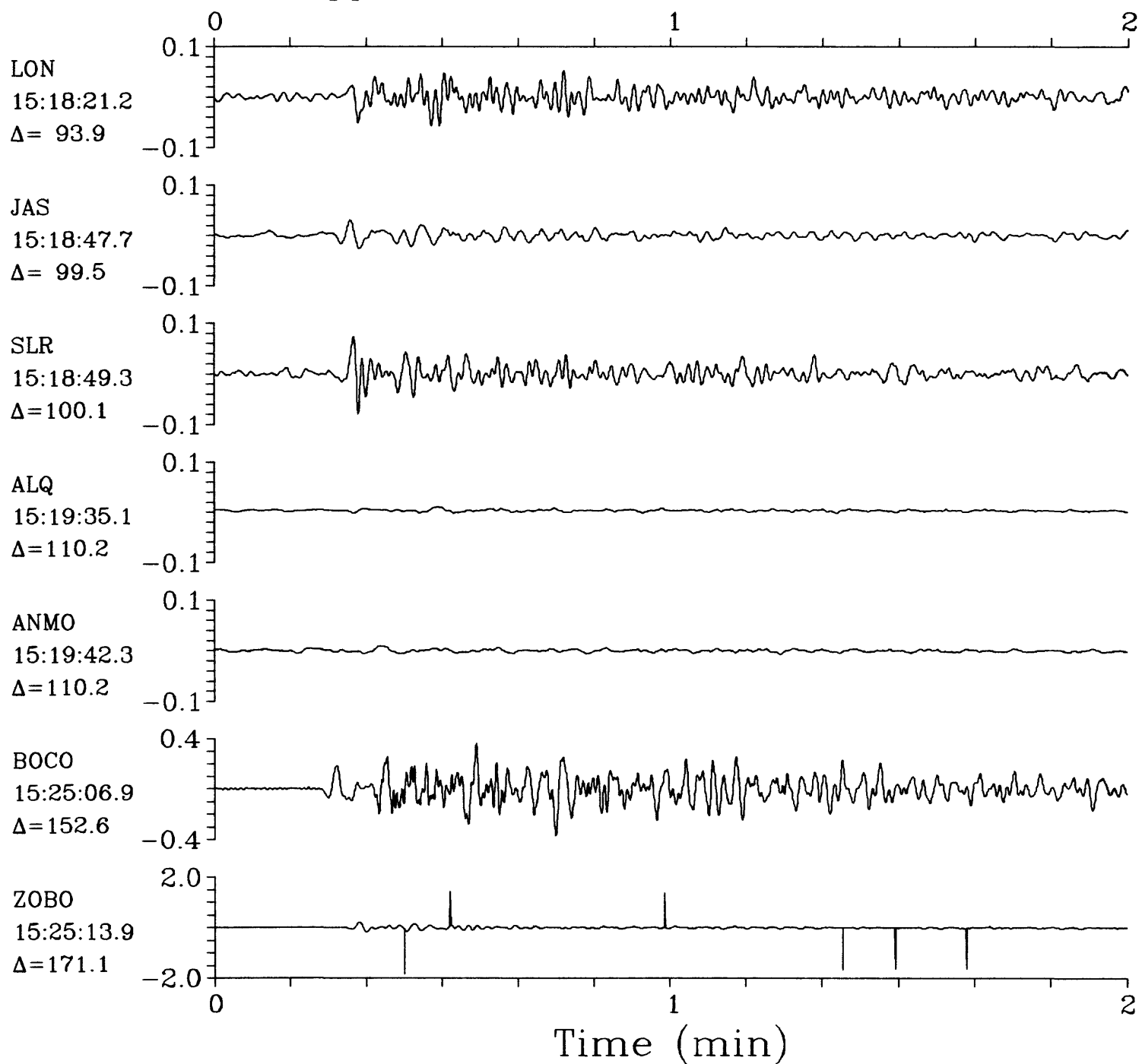


22 November 1981 15:05:20.56

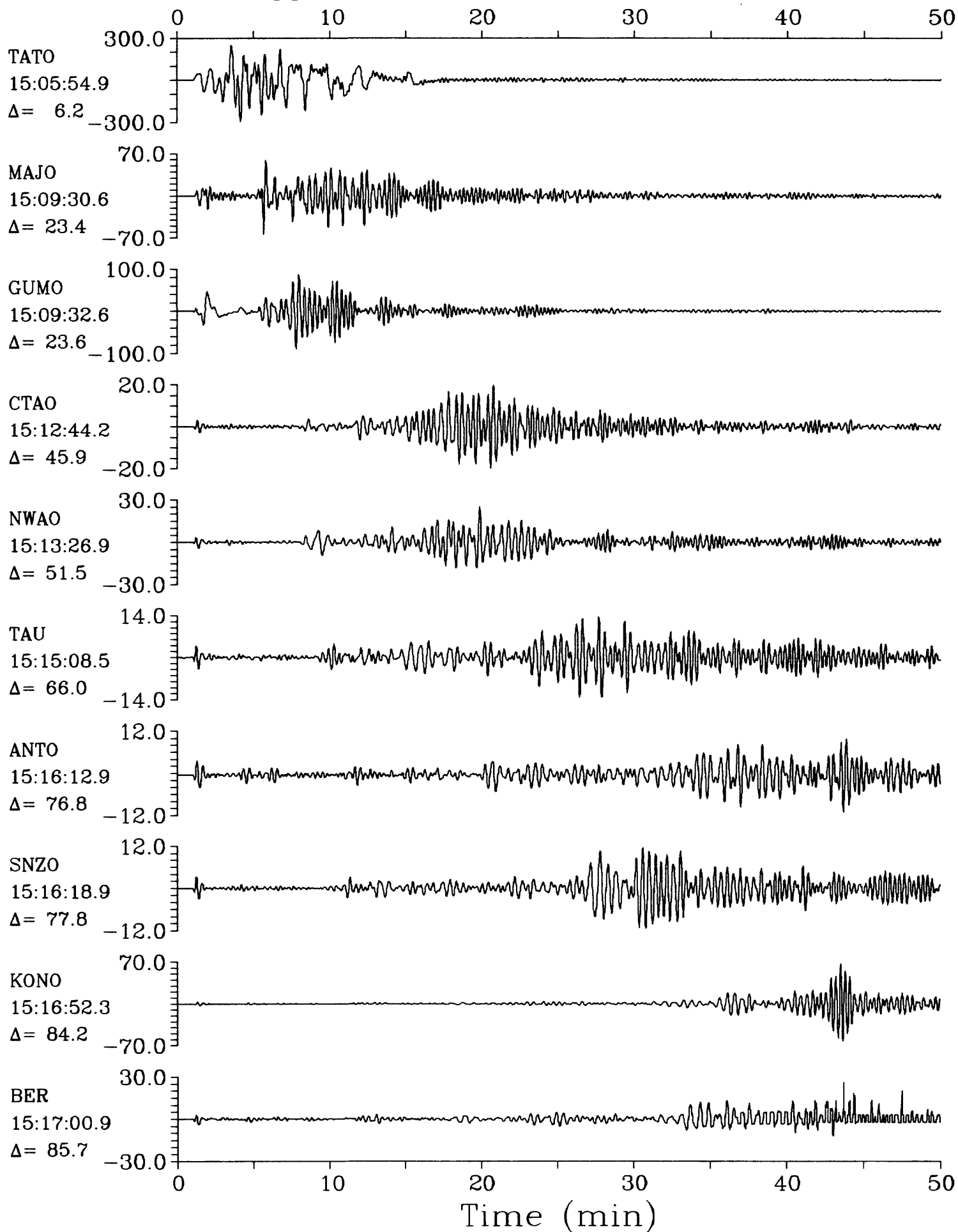
Luzon, Philippine Islands

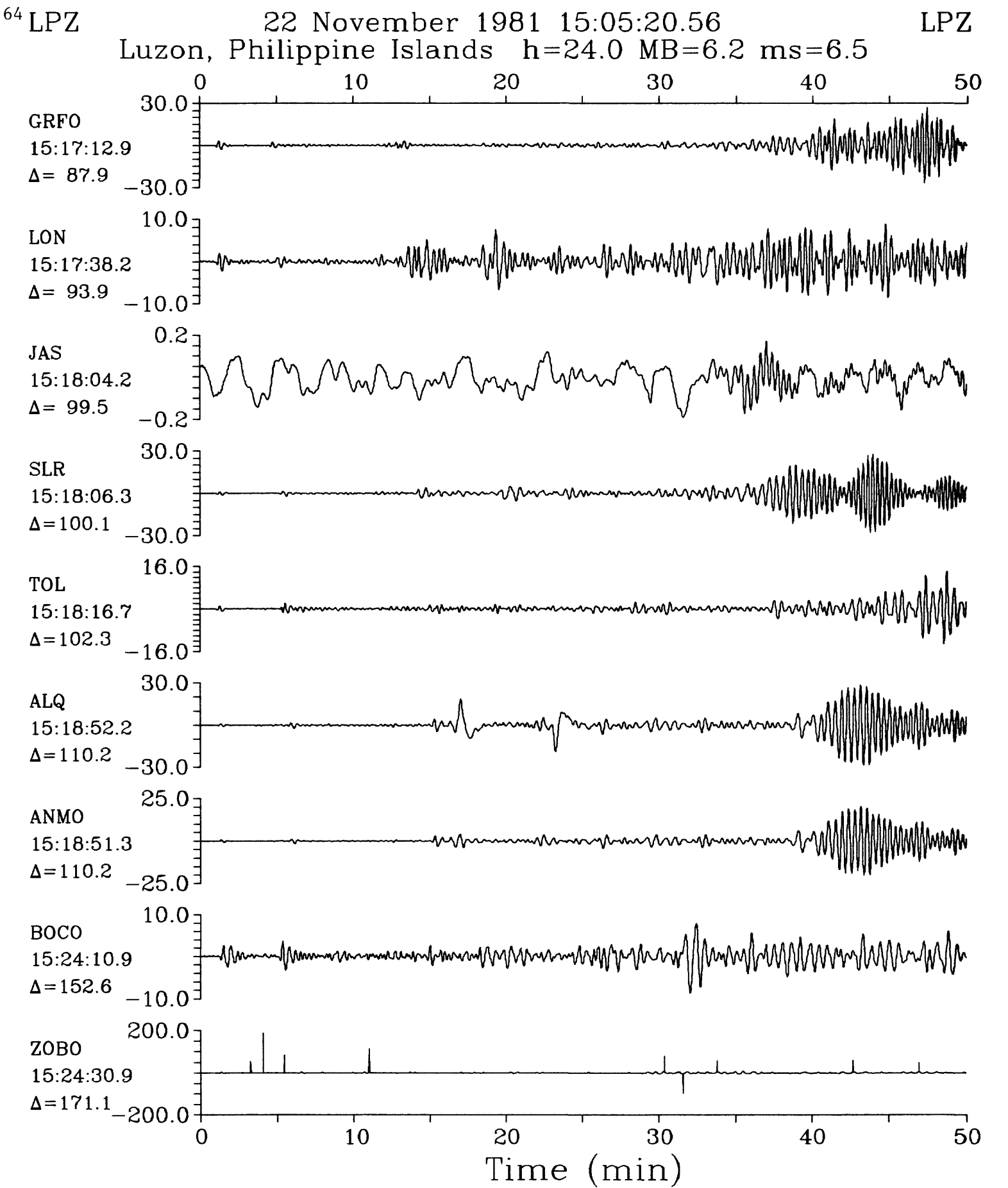






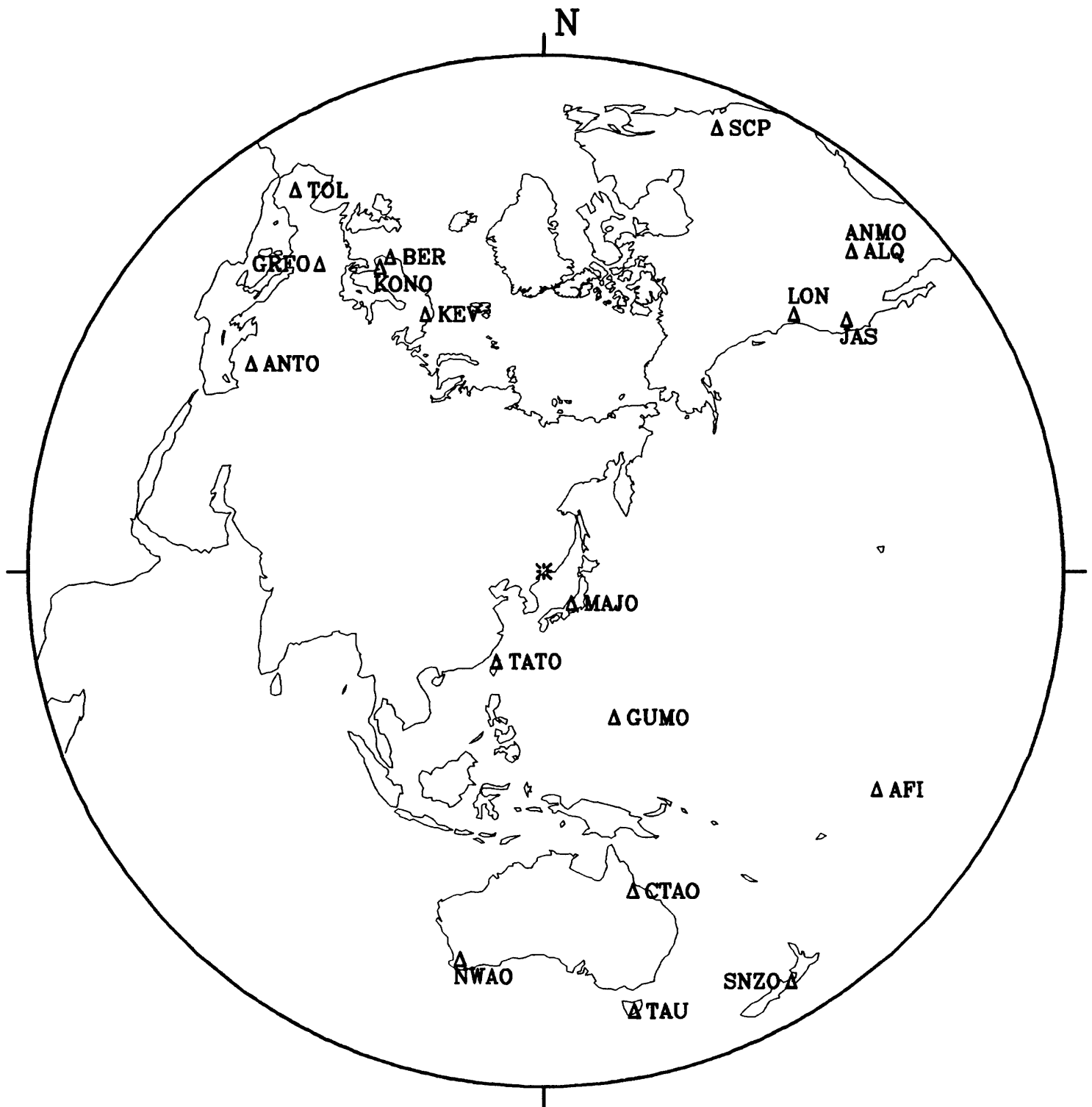
Luzon, Philippine Islands h=24.0 MB=6.2 ms=6.5

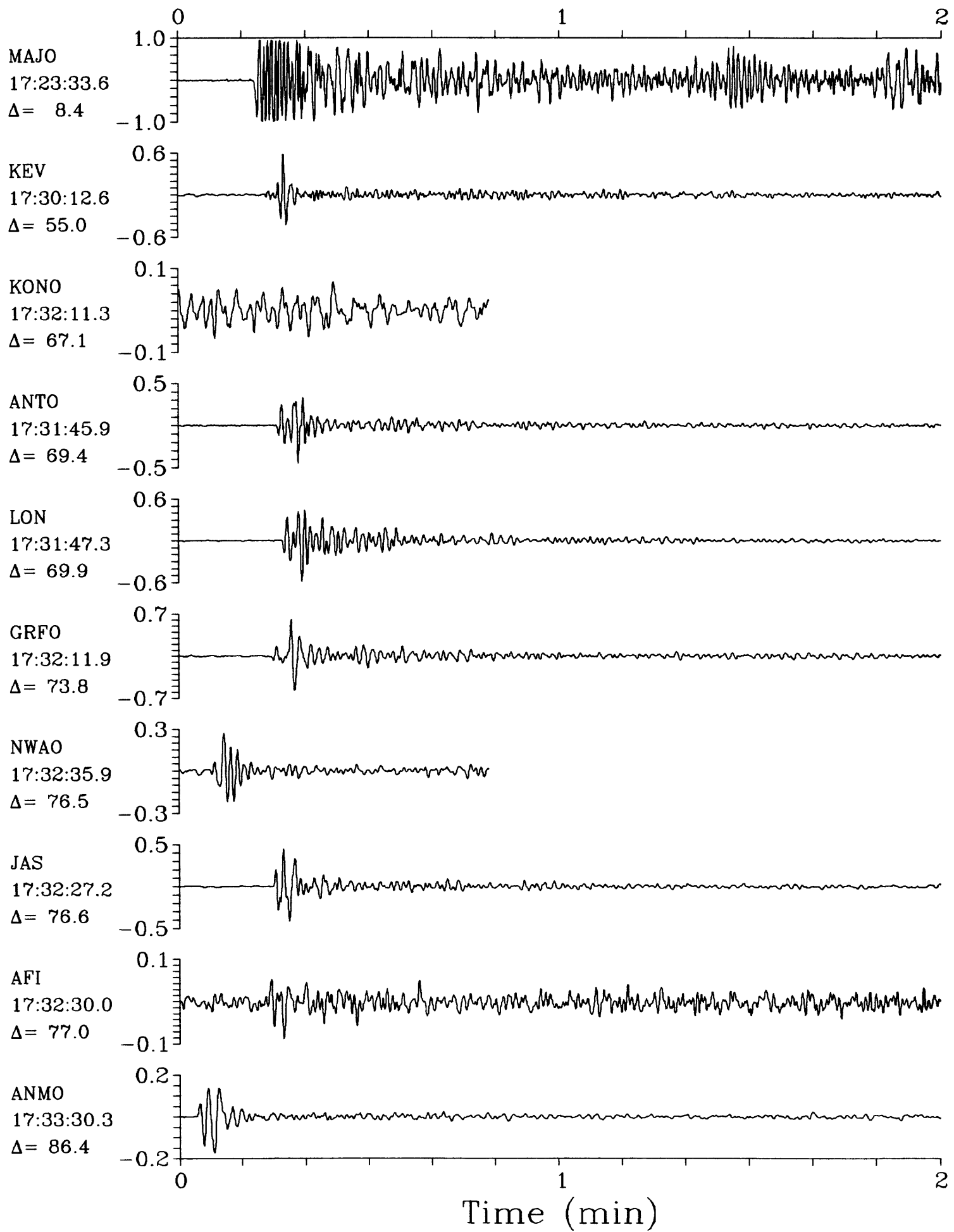


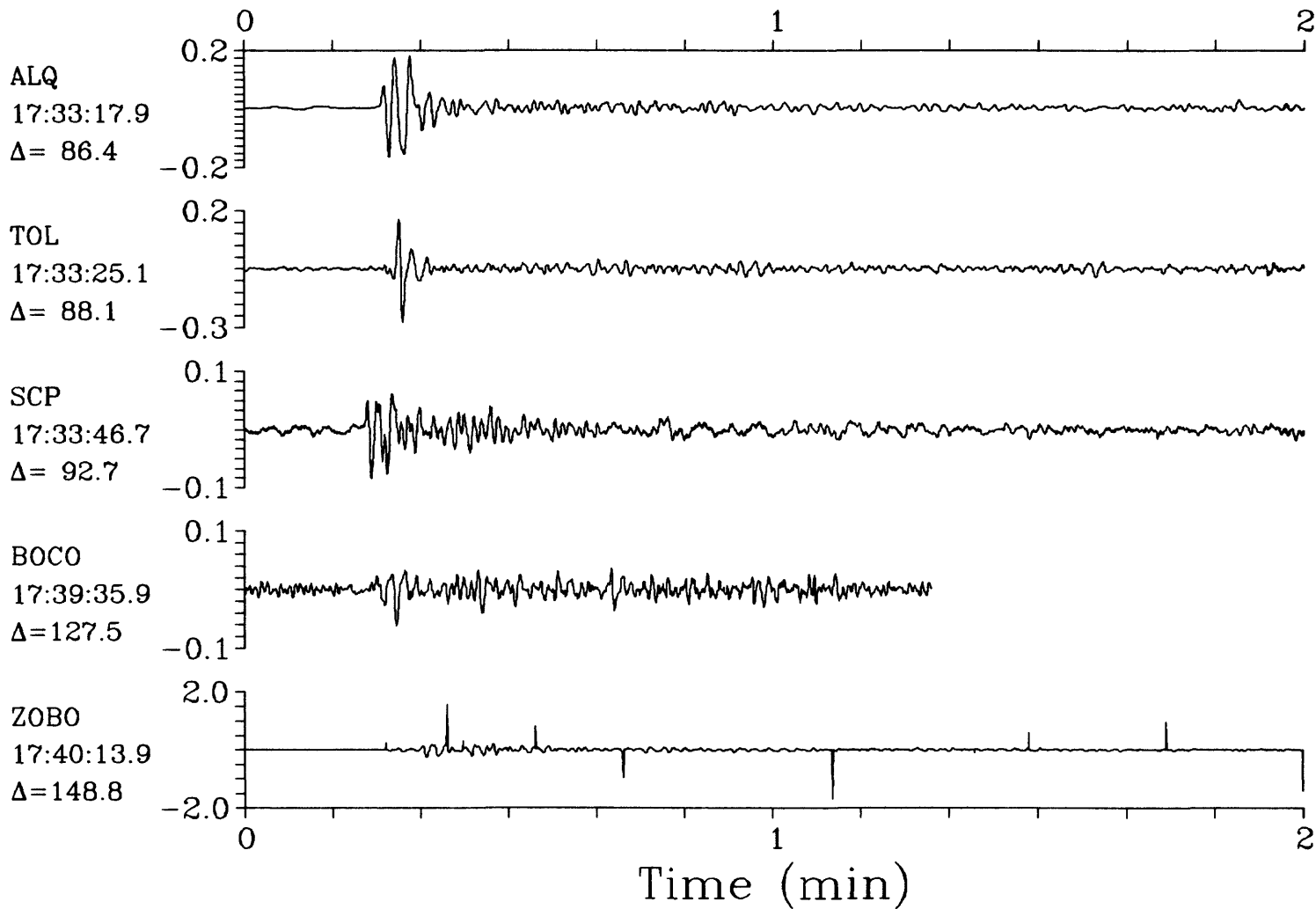


27 November 1981 17:21:45.80

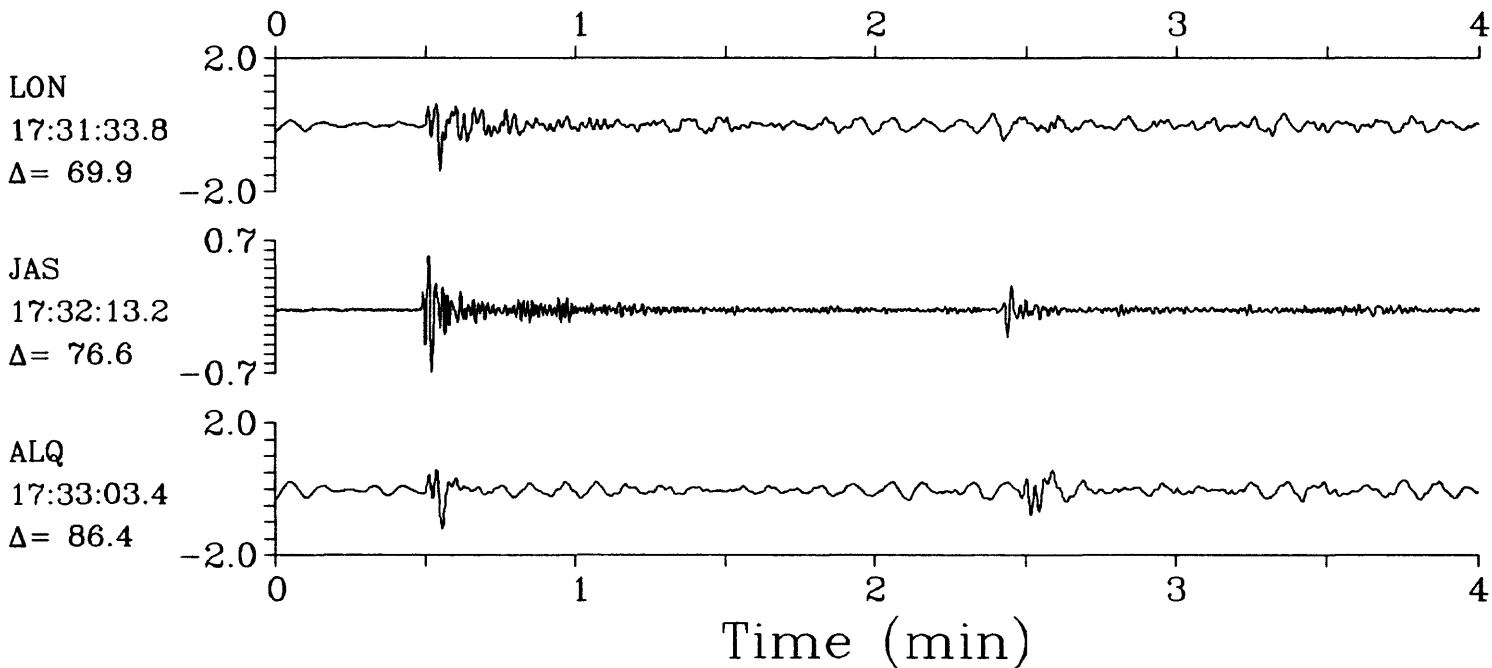
E. USSR–N.E. China Border Reg.

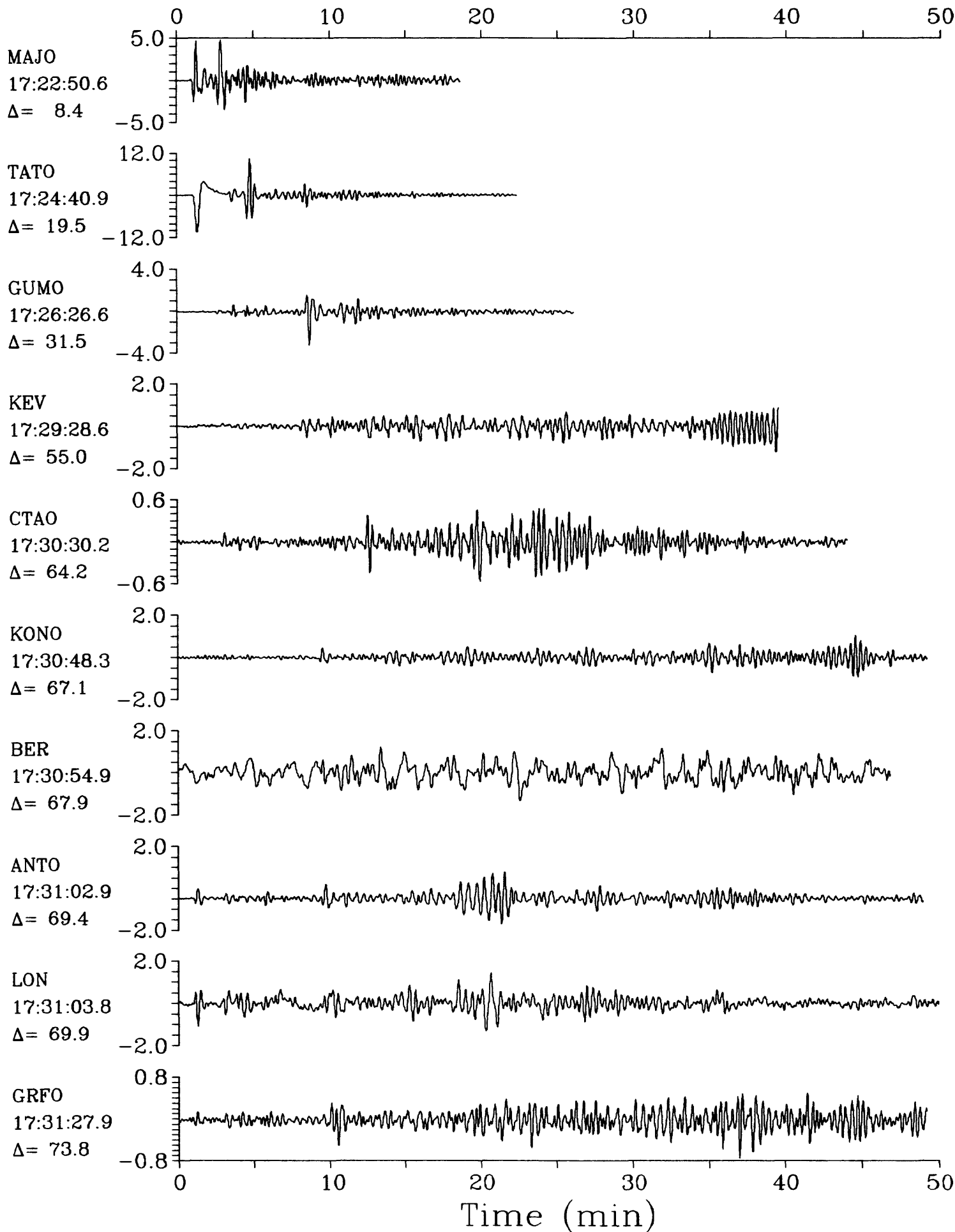


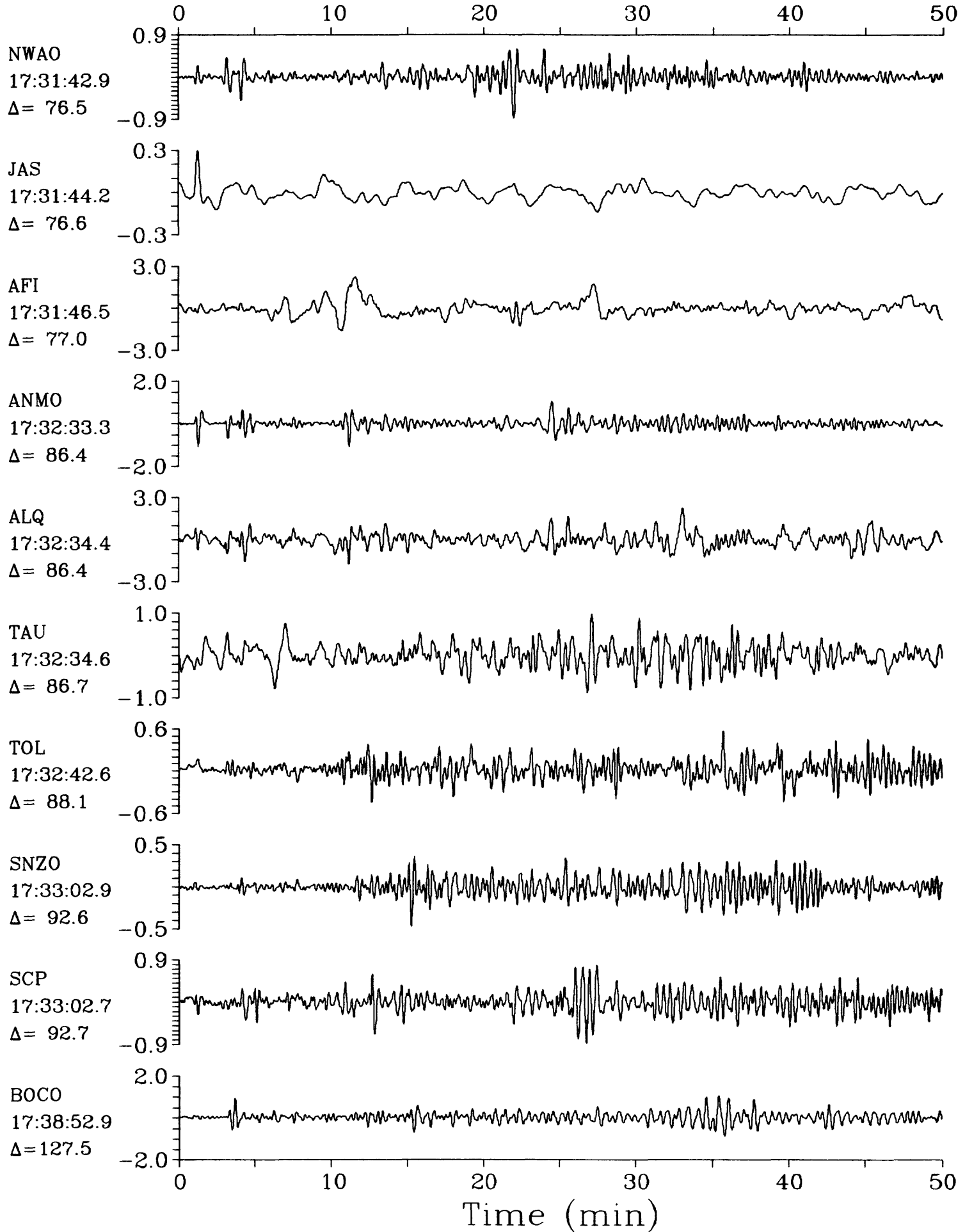


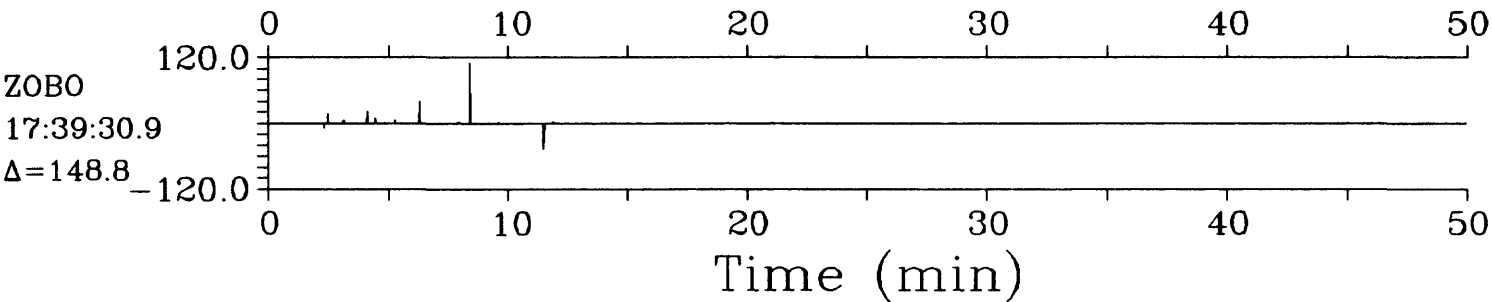


E. USSR-N.E. China Border Reg. h=543.0 MB=5.8



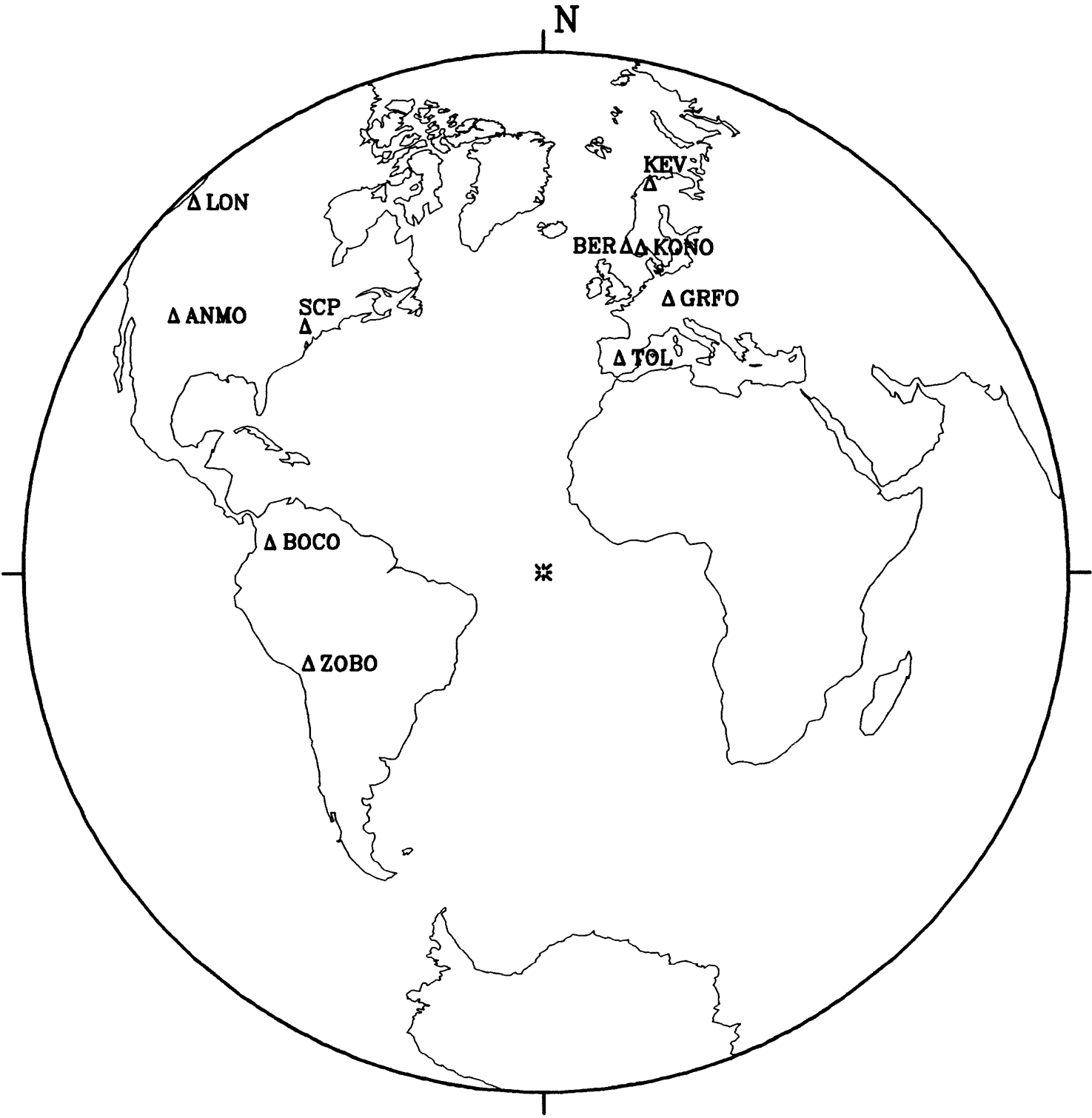


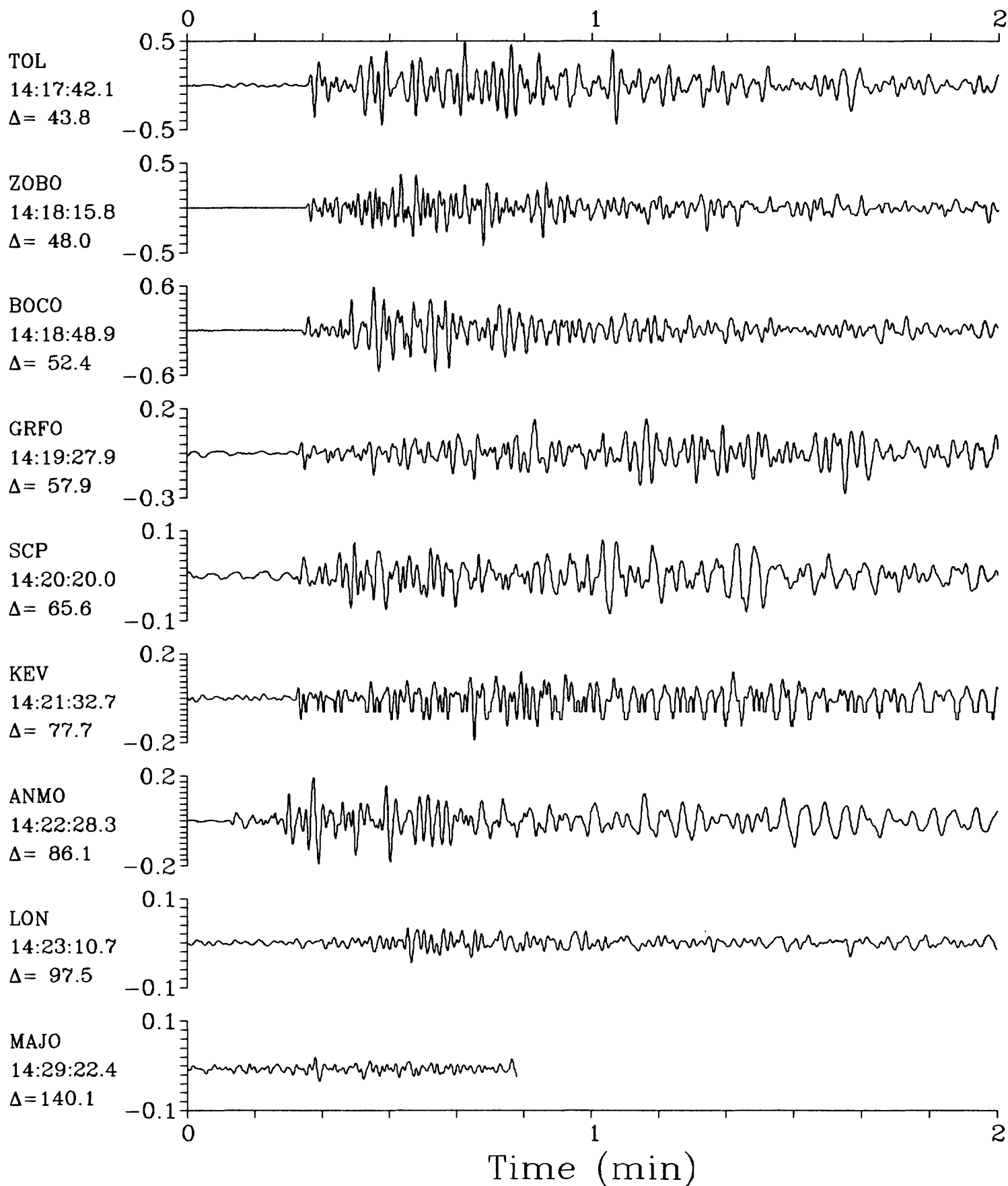




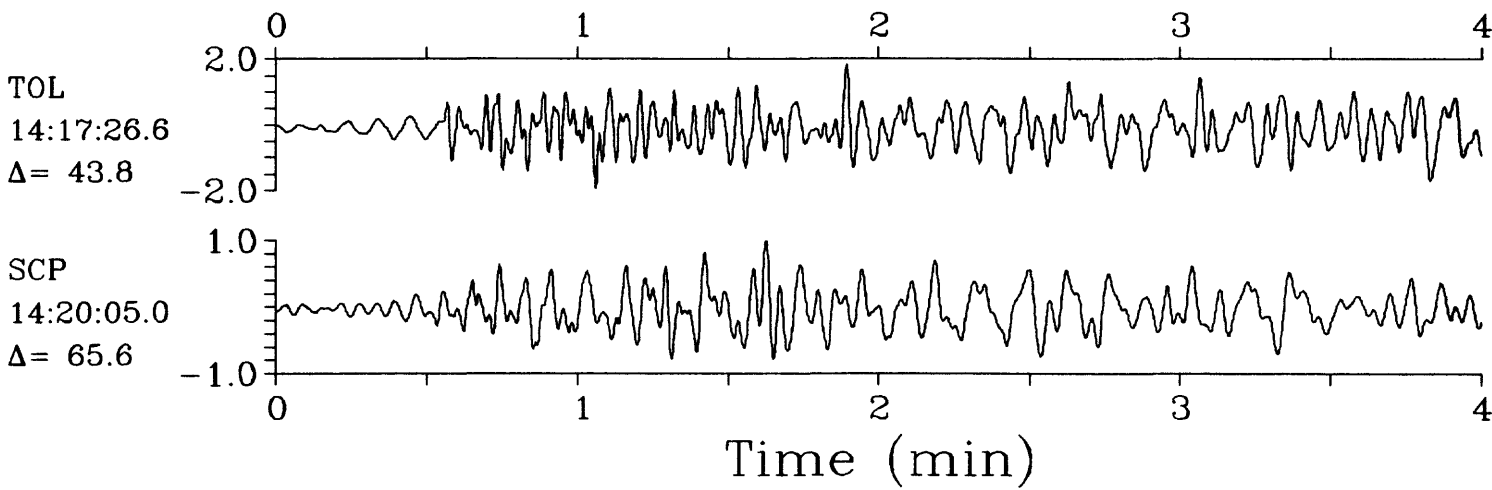
03 January 1982 14:09:50.45

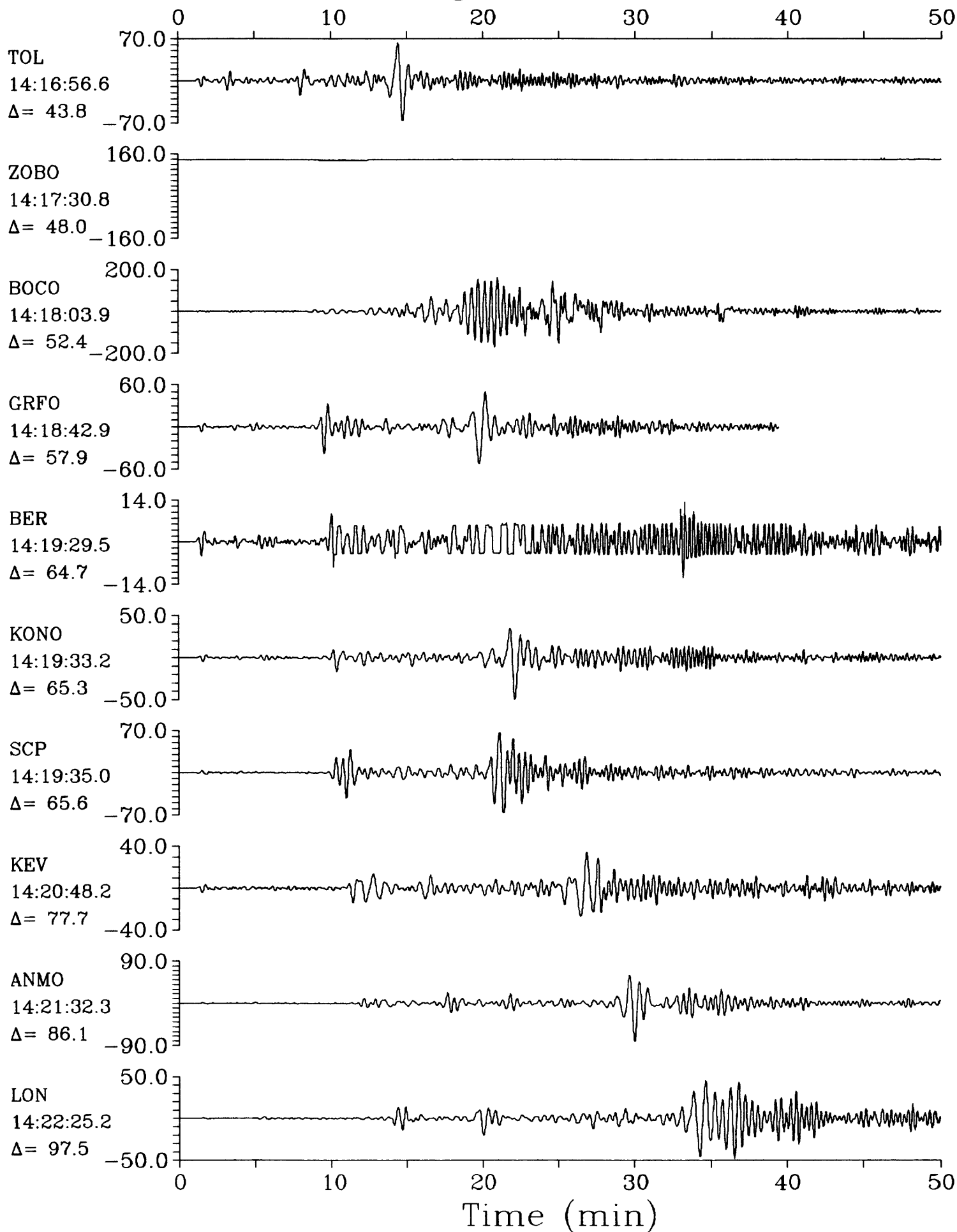
Central Mid-Atlantic Ridge

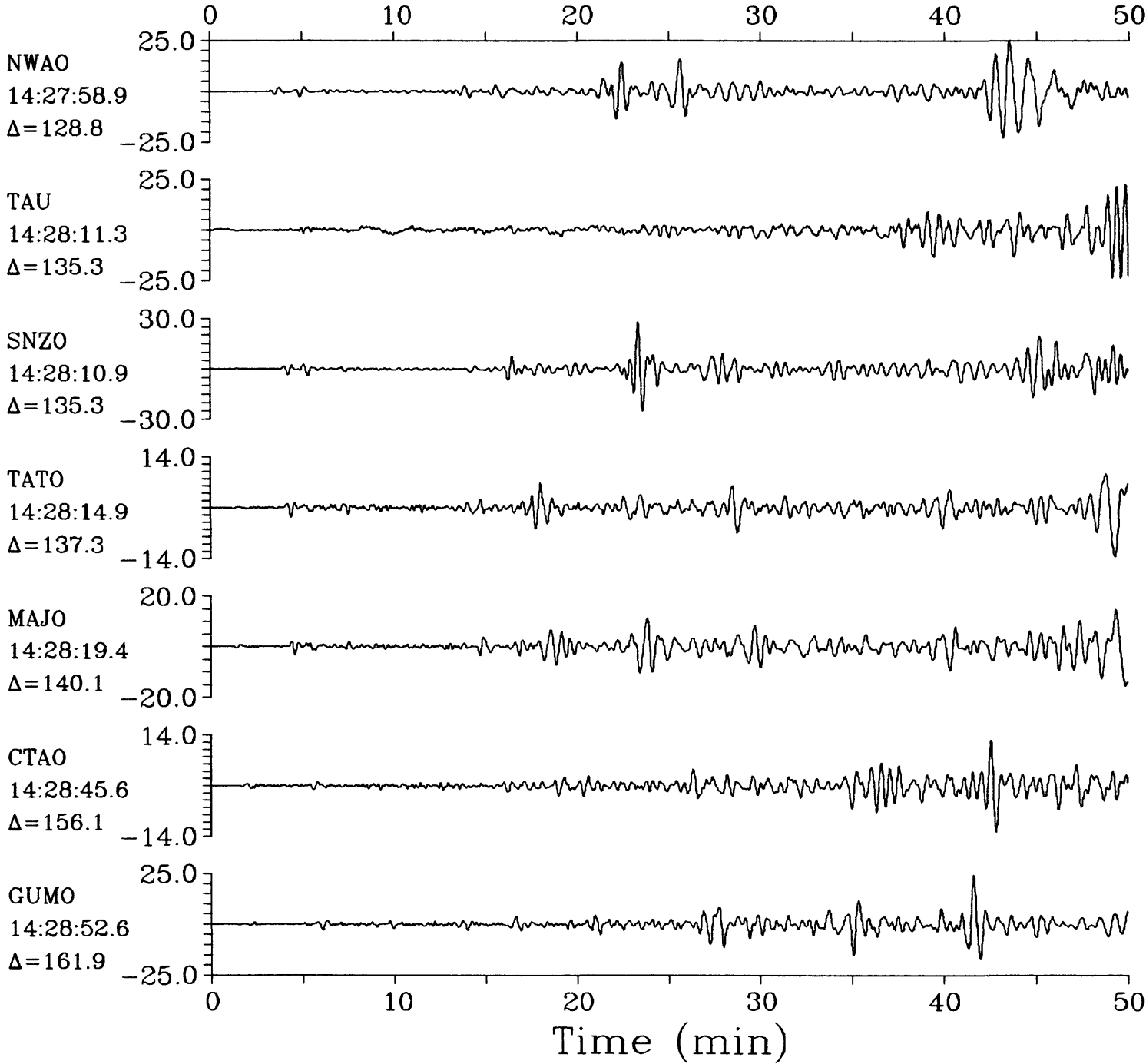




Central Mid-Atlantic Ridge h=10.0 MB=5.8 ms=6.5

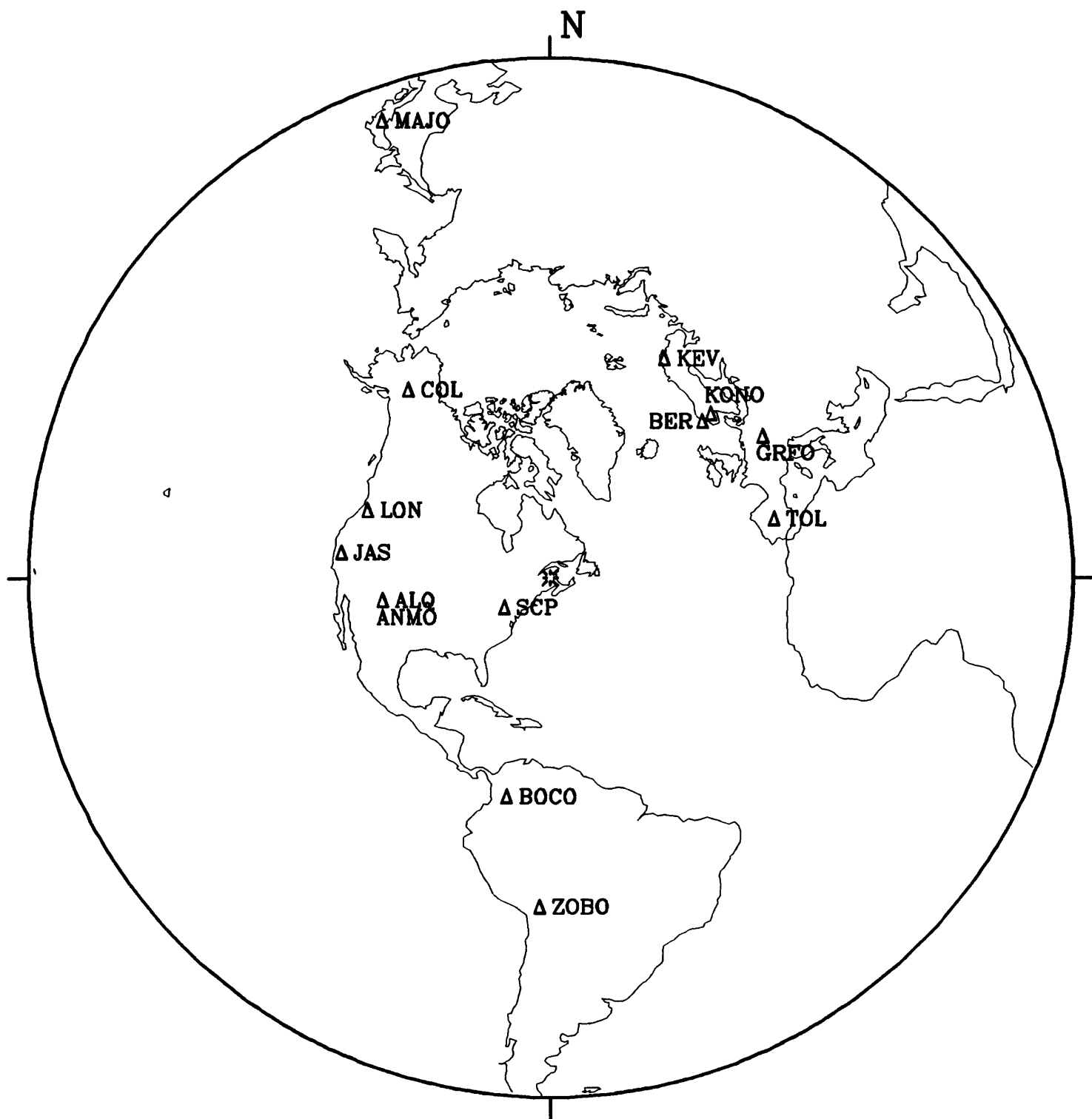


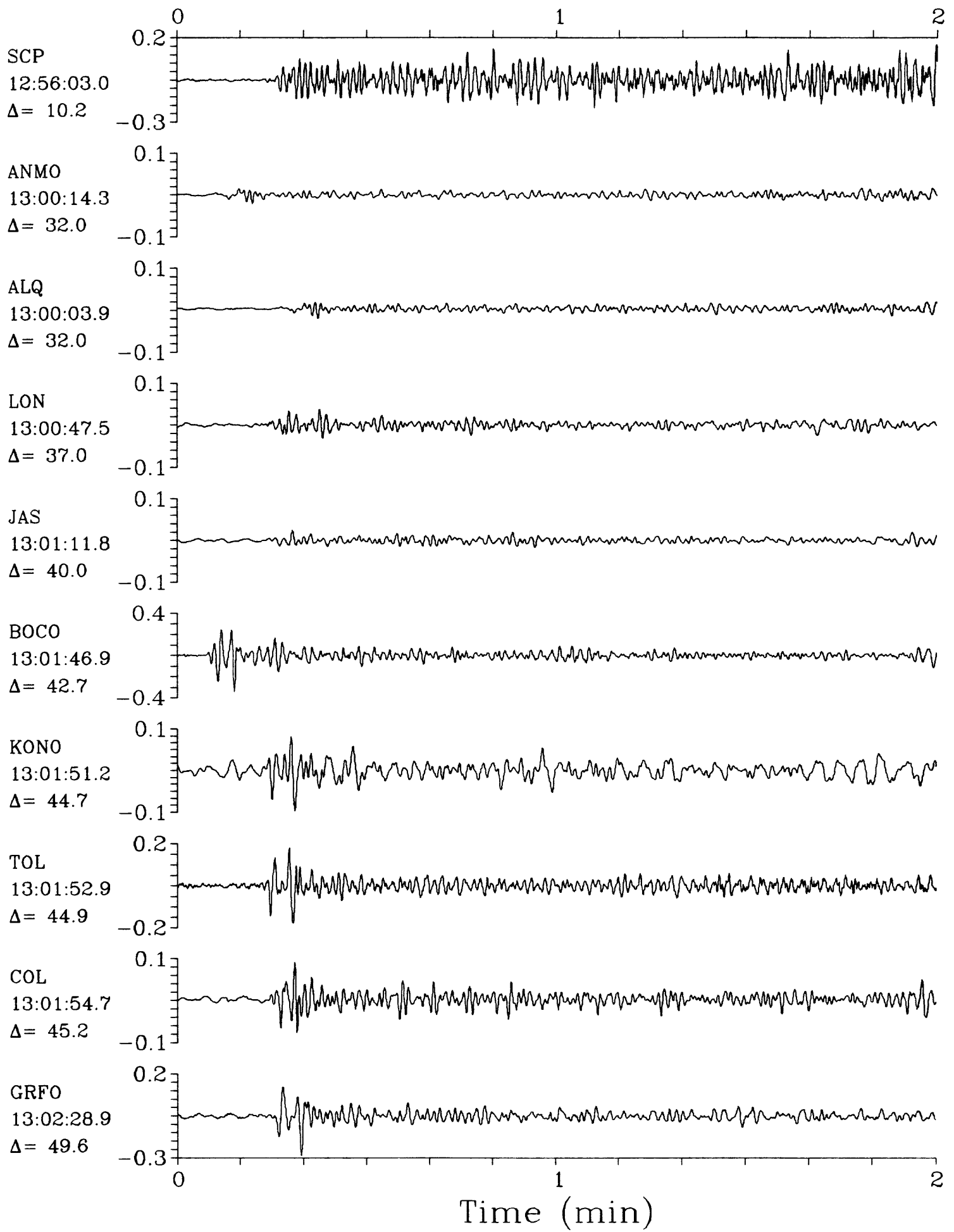


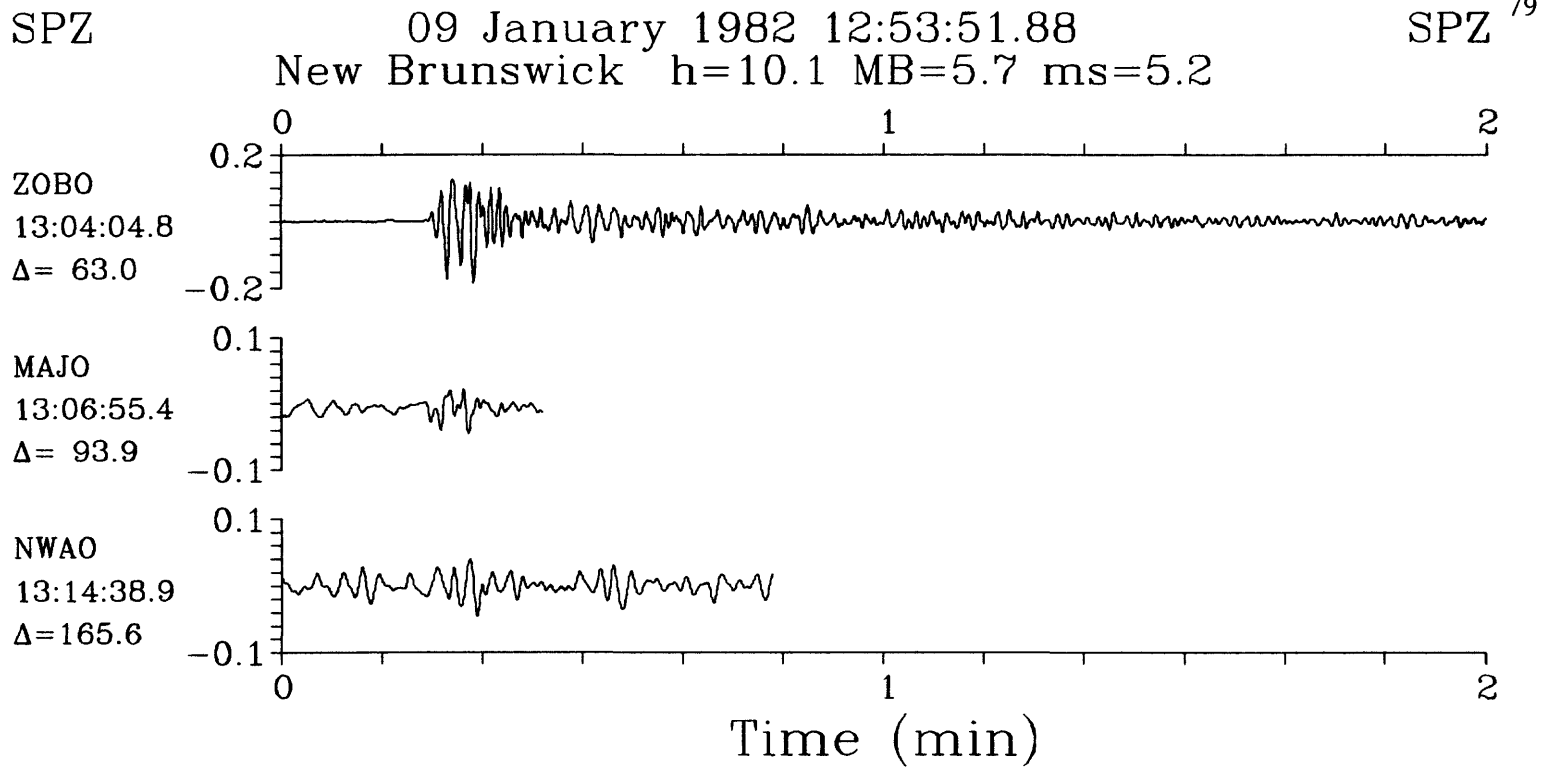


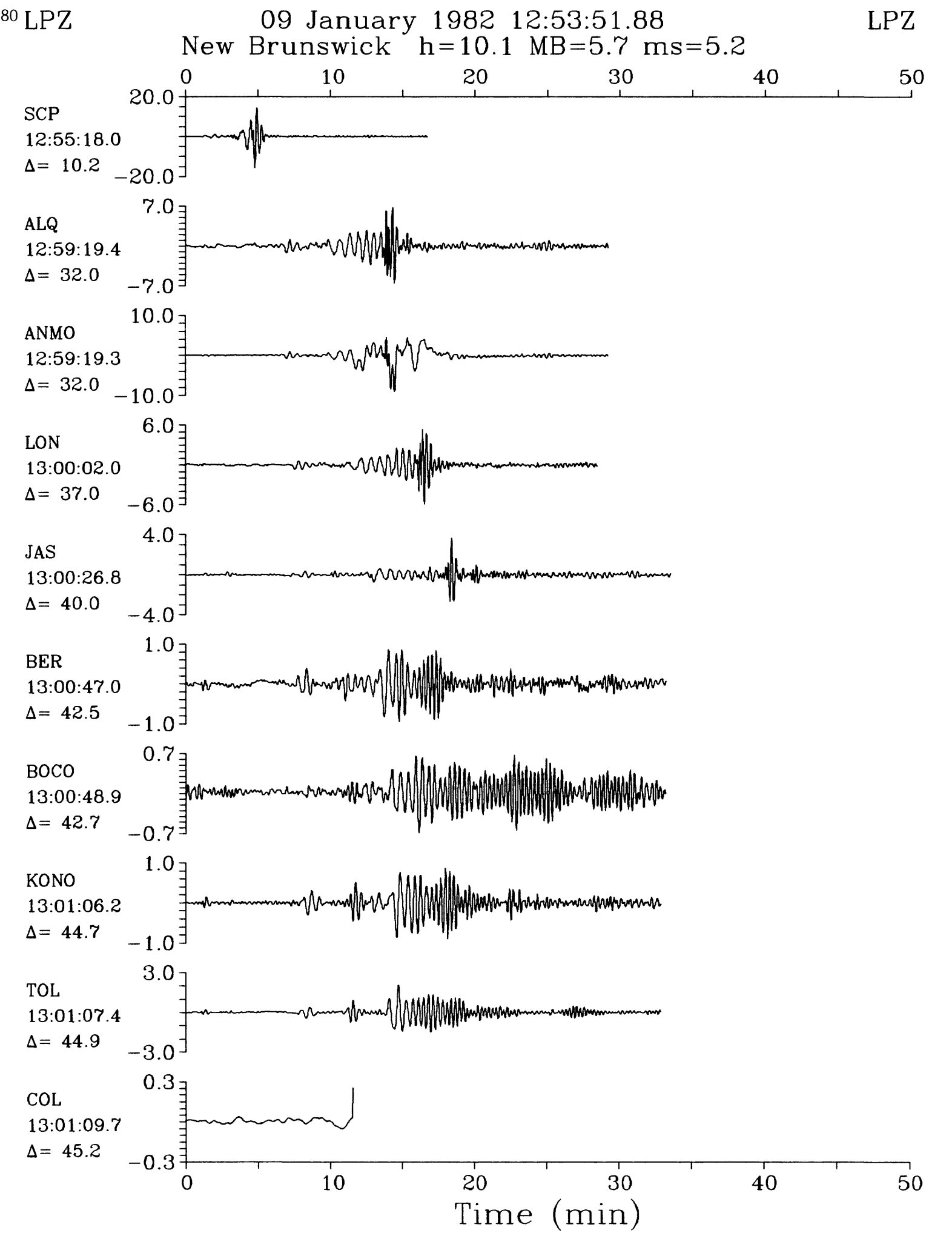
09 January 1982 12:53:51.88

New Brunswick

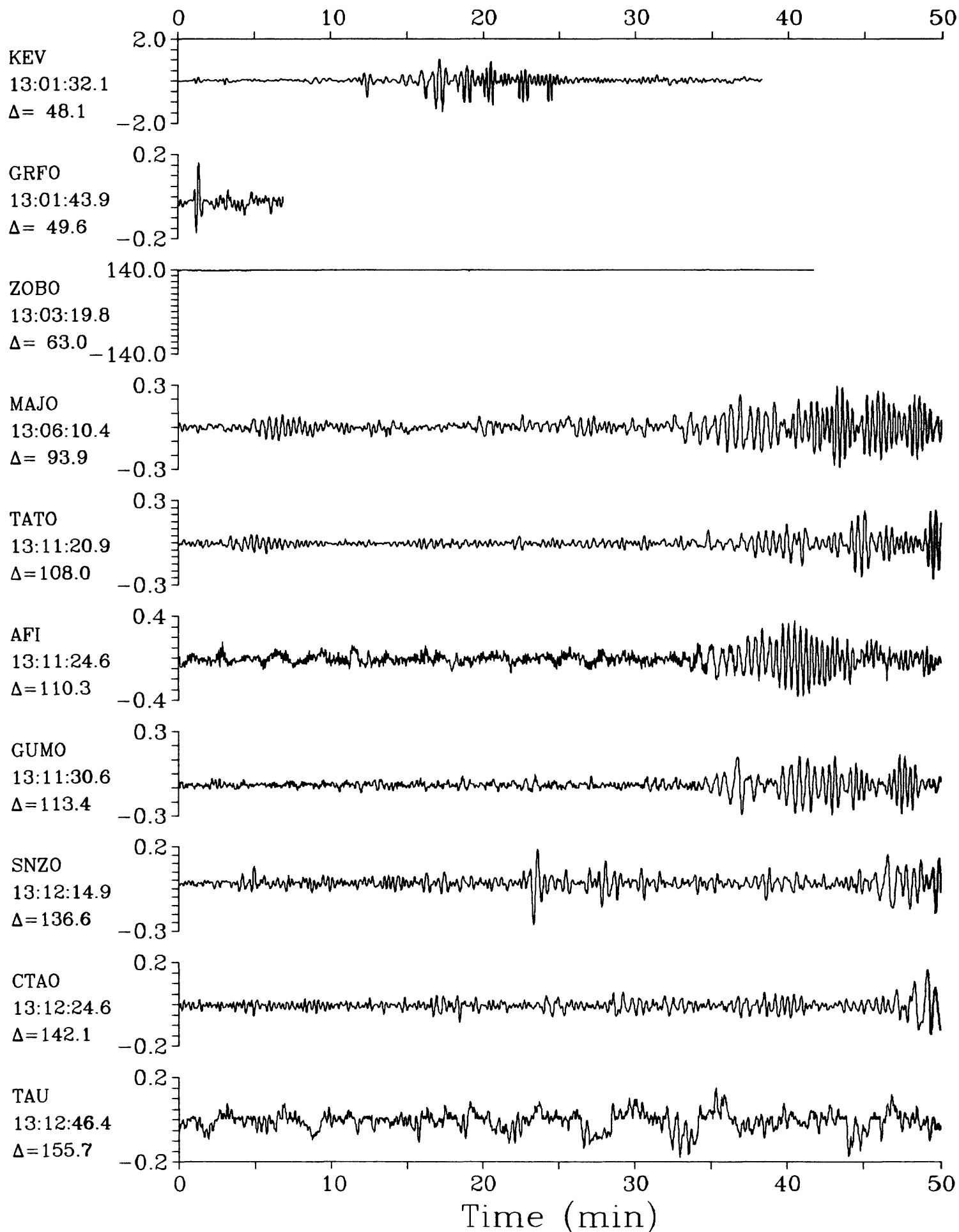






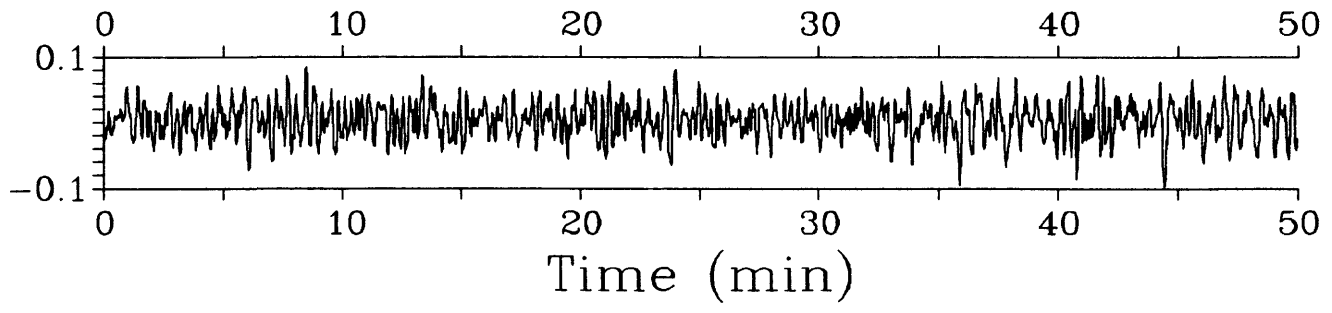


New Brunswick h=10.1 MB=5.7 ms=5.2



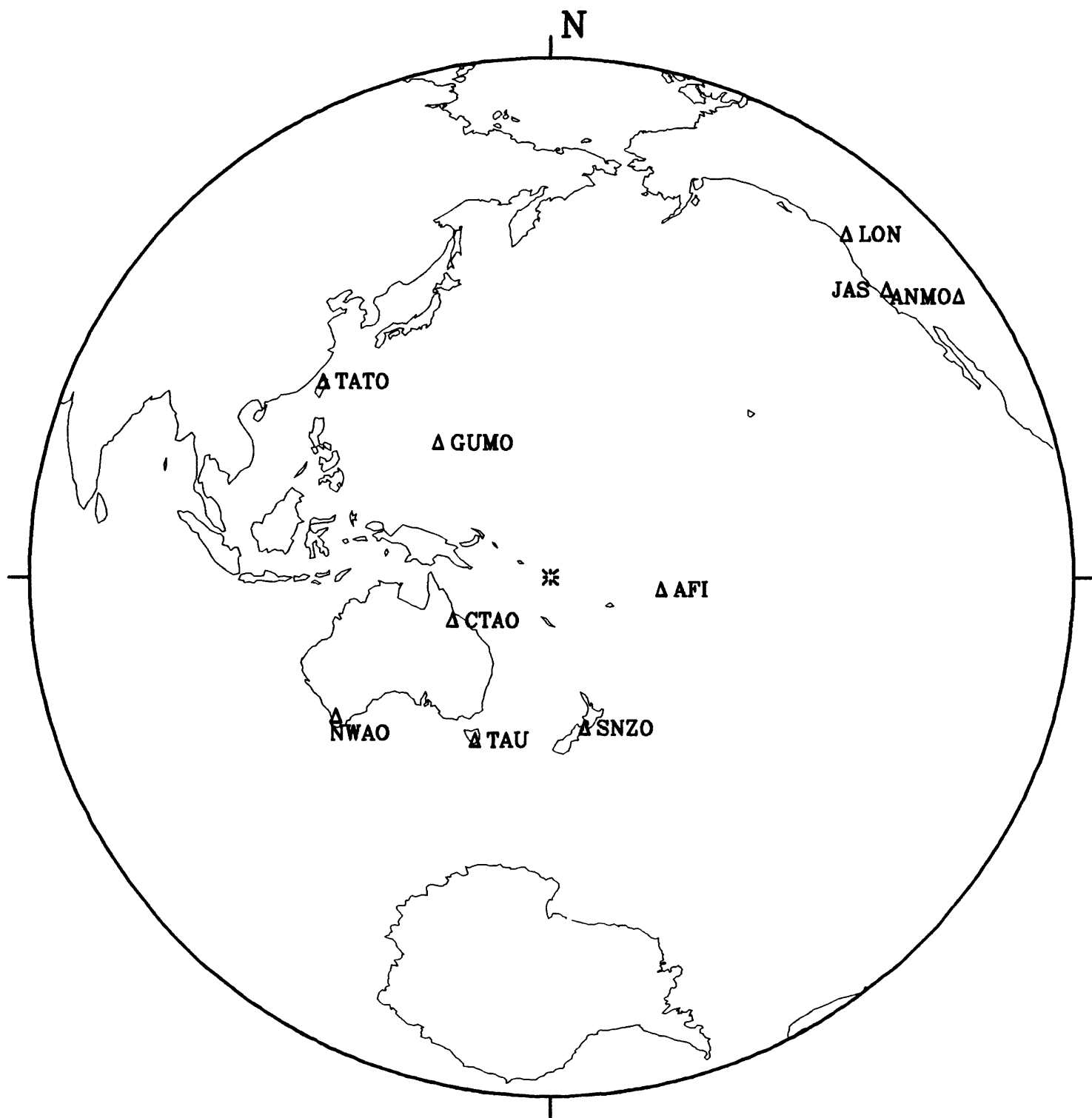
New Brunswick h=10.1 MB=5.7 ms=5.2

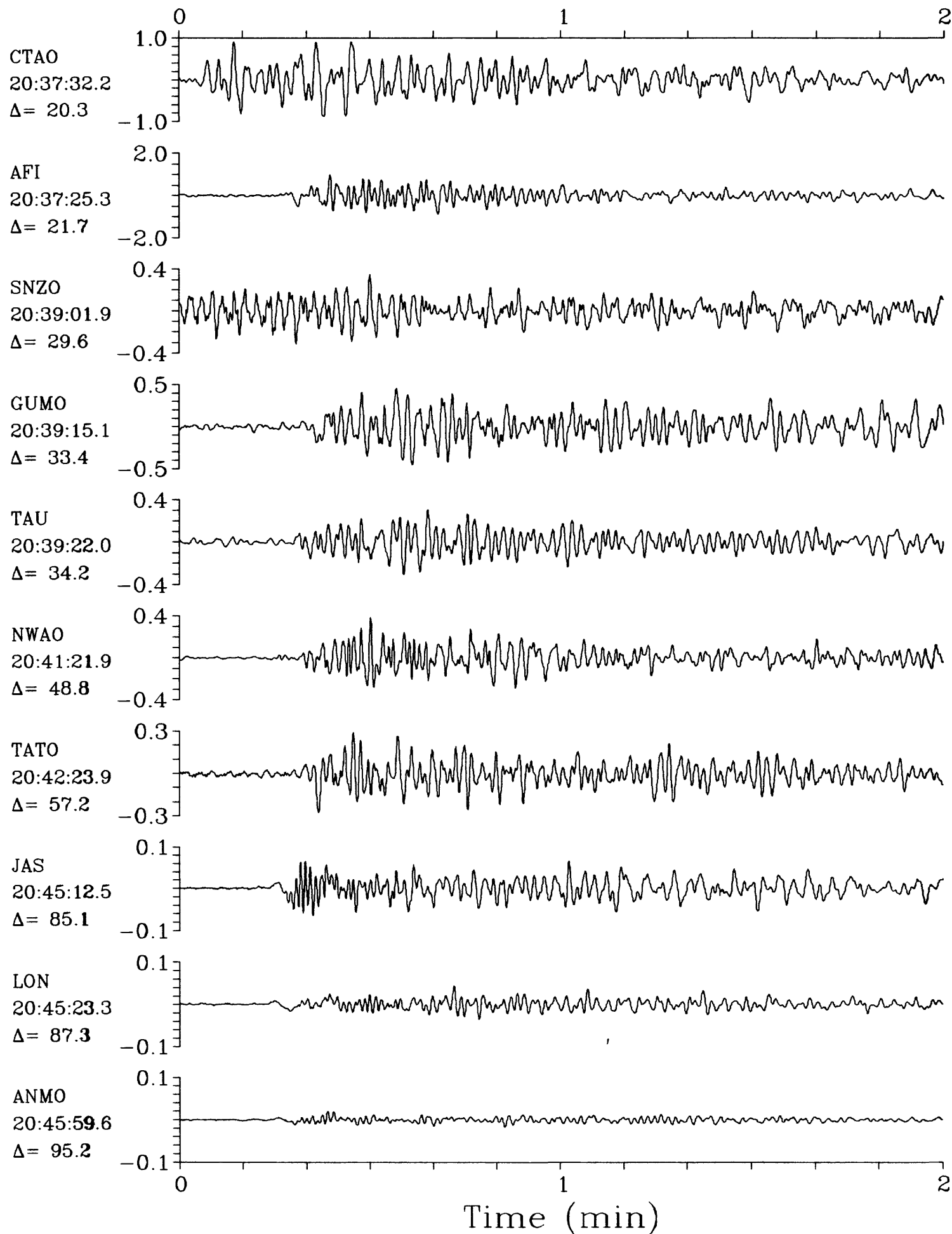
NWAO
13:12:56.9
 $\Delta=165.6$

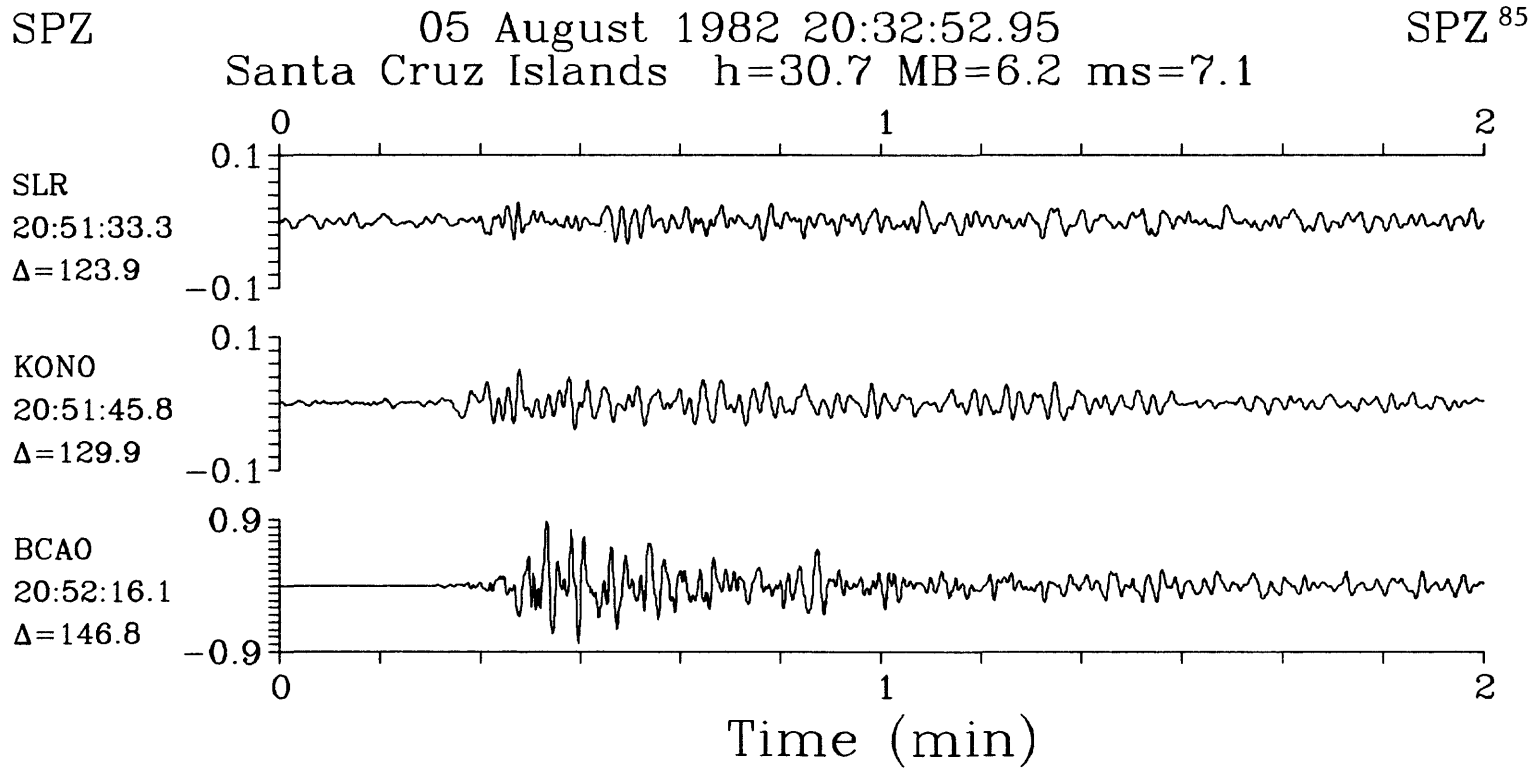


05 August 1982 20:32:52.95

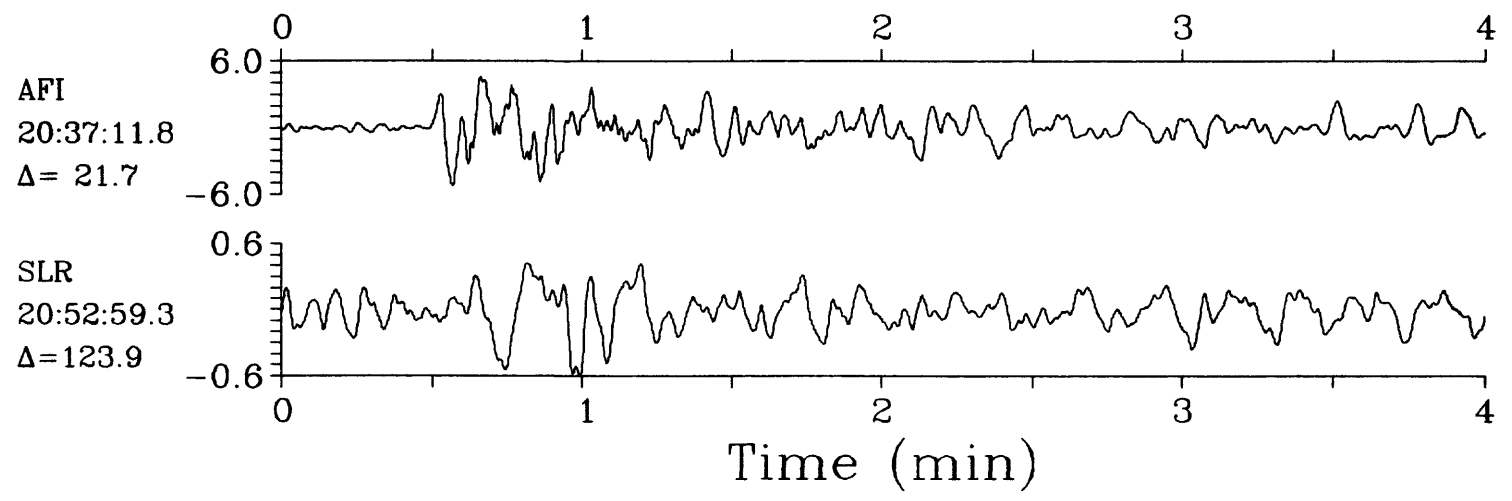
Santa Cruz Islands

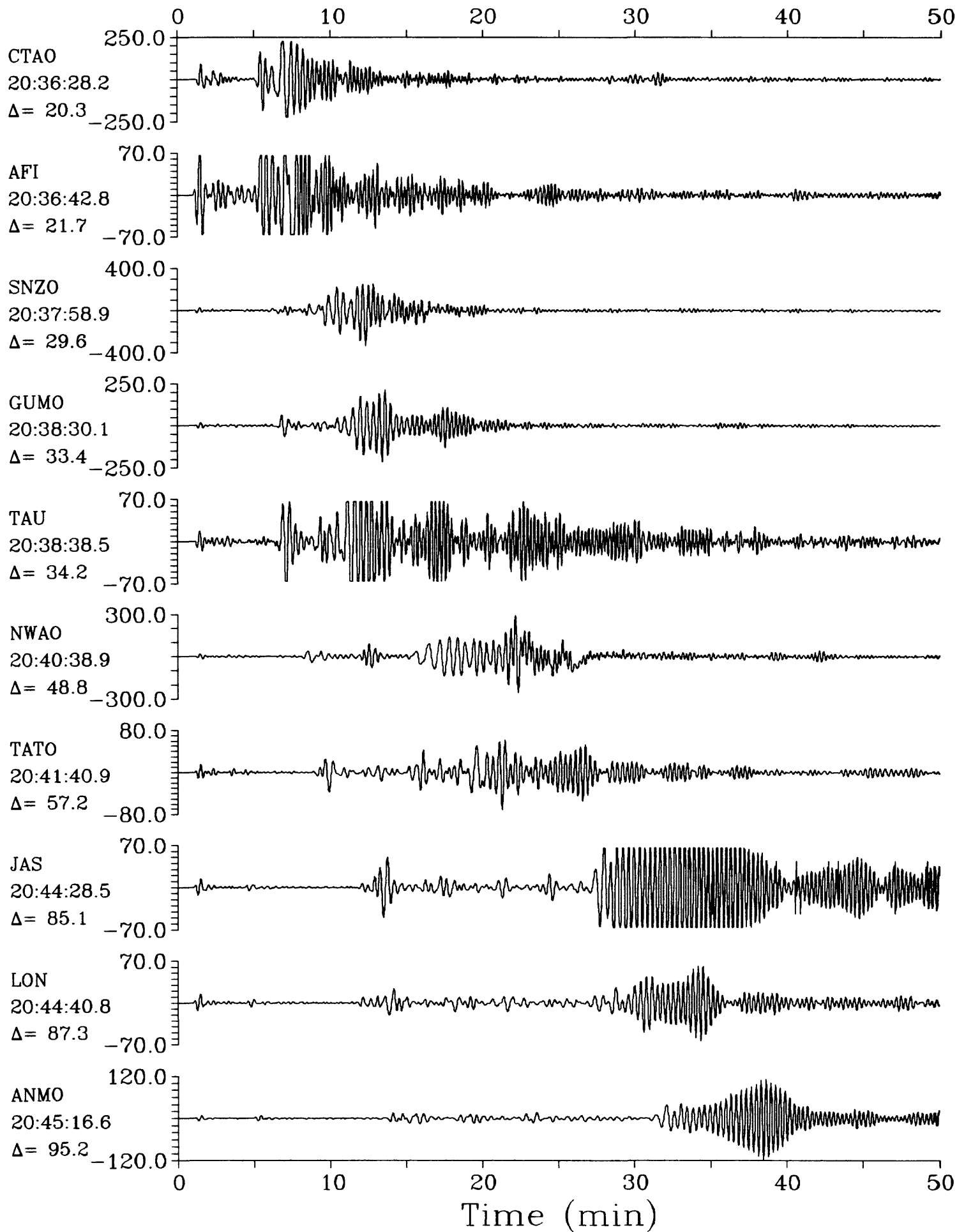


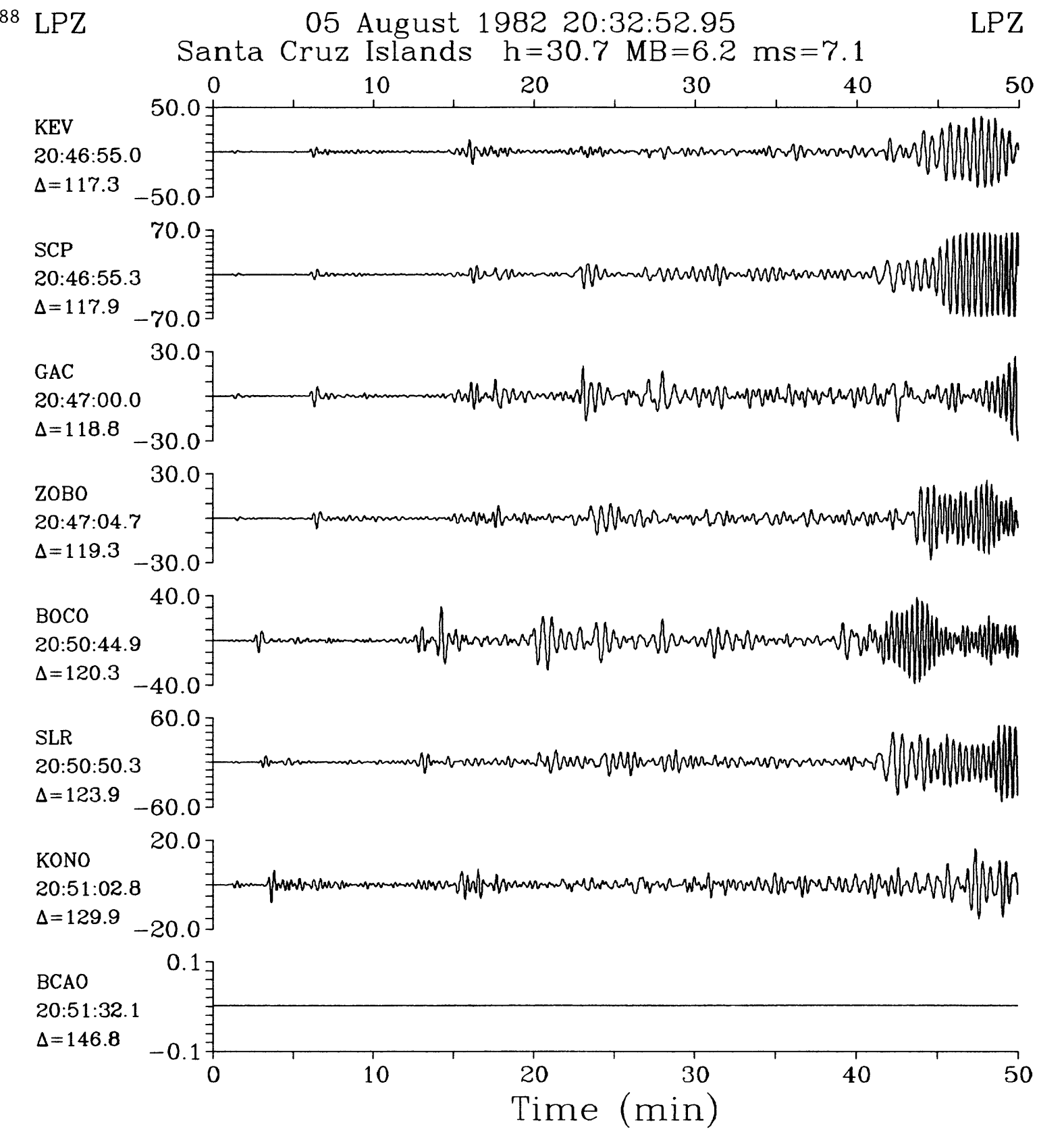




Santa Cruz Islands h=30.7 MB=6.2 ms=7.1

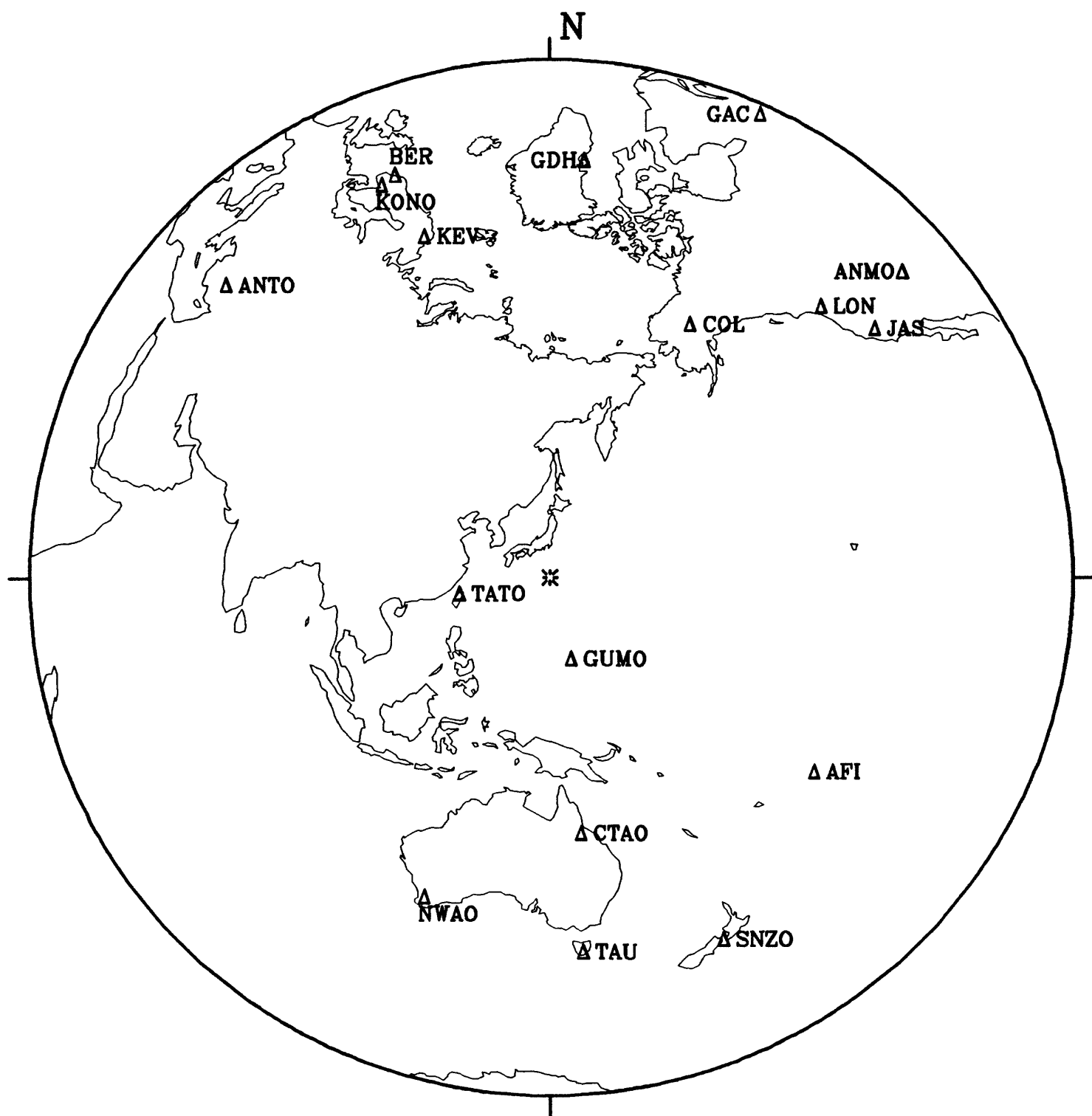


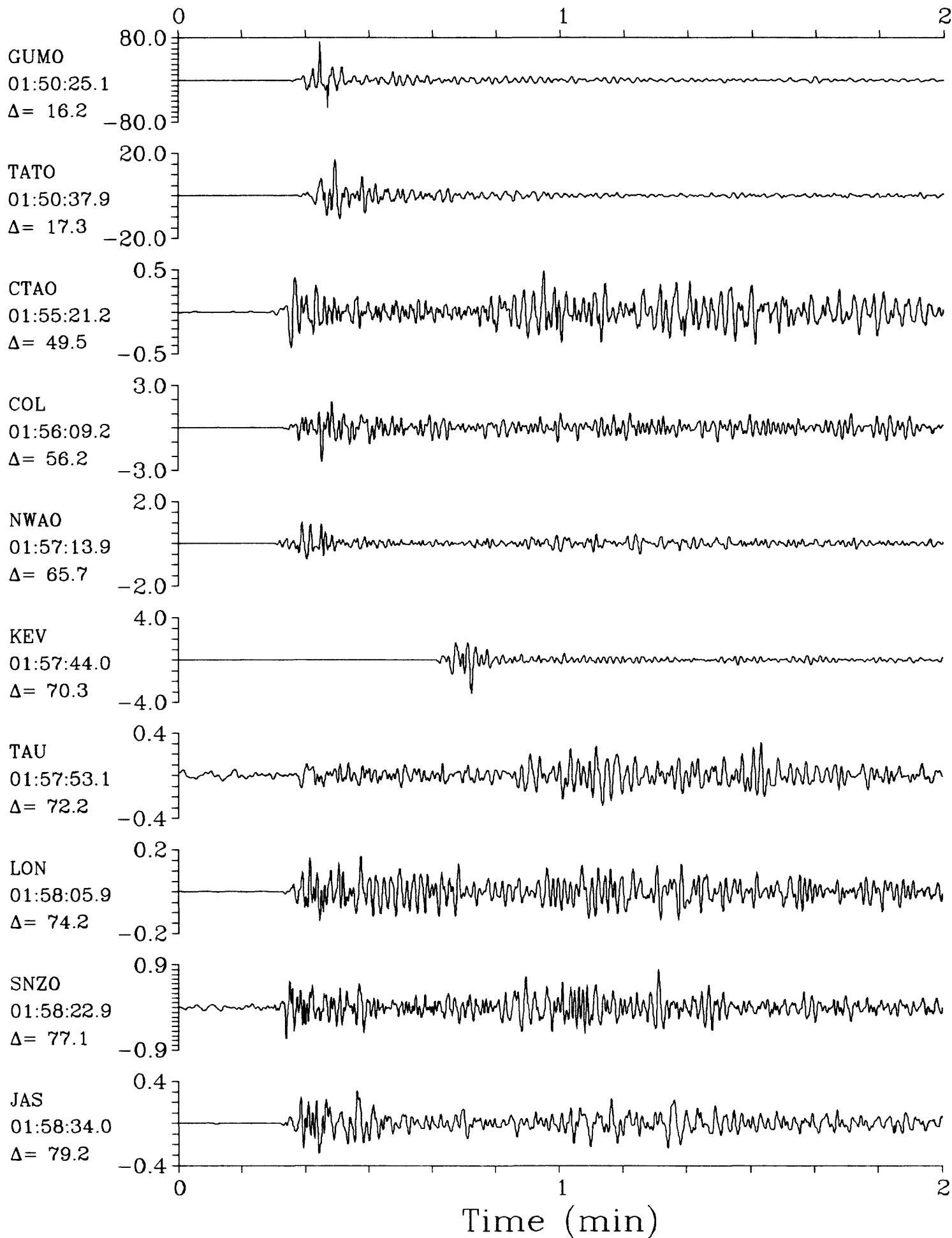


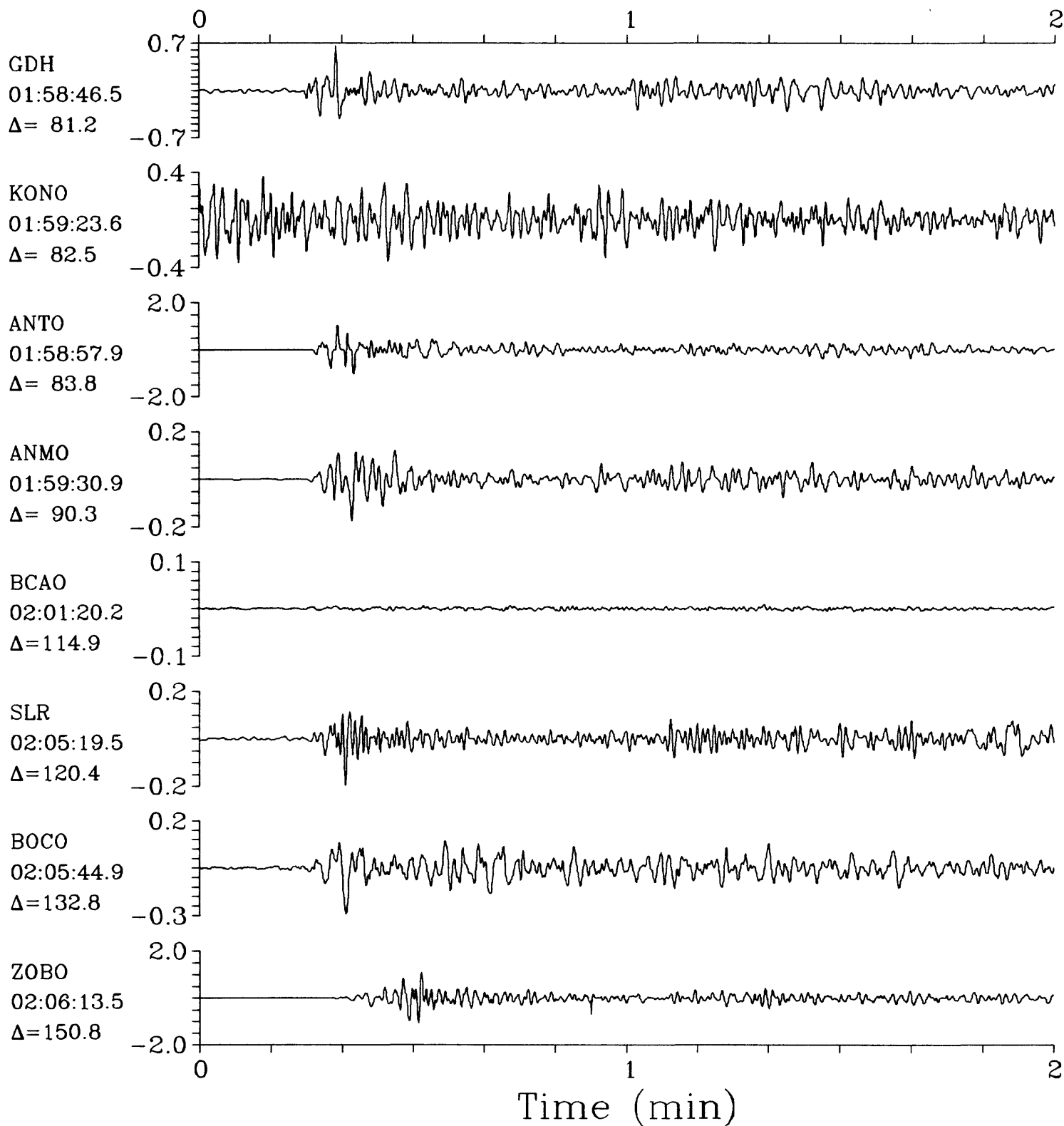


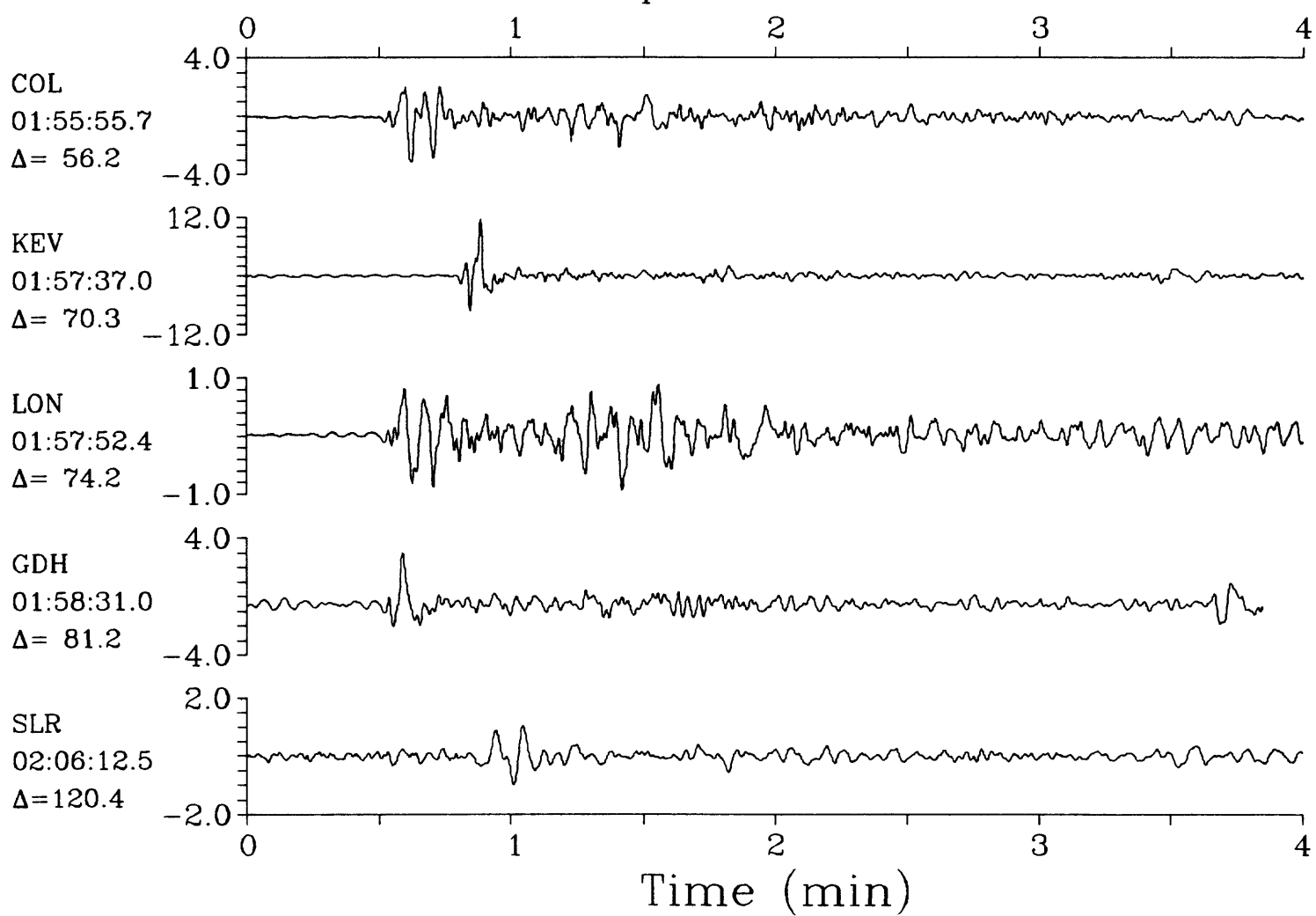
06 September 1982 01:47:02.73

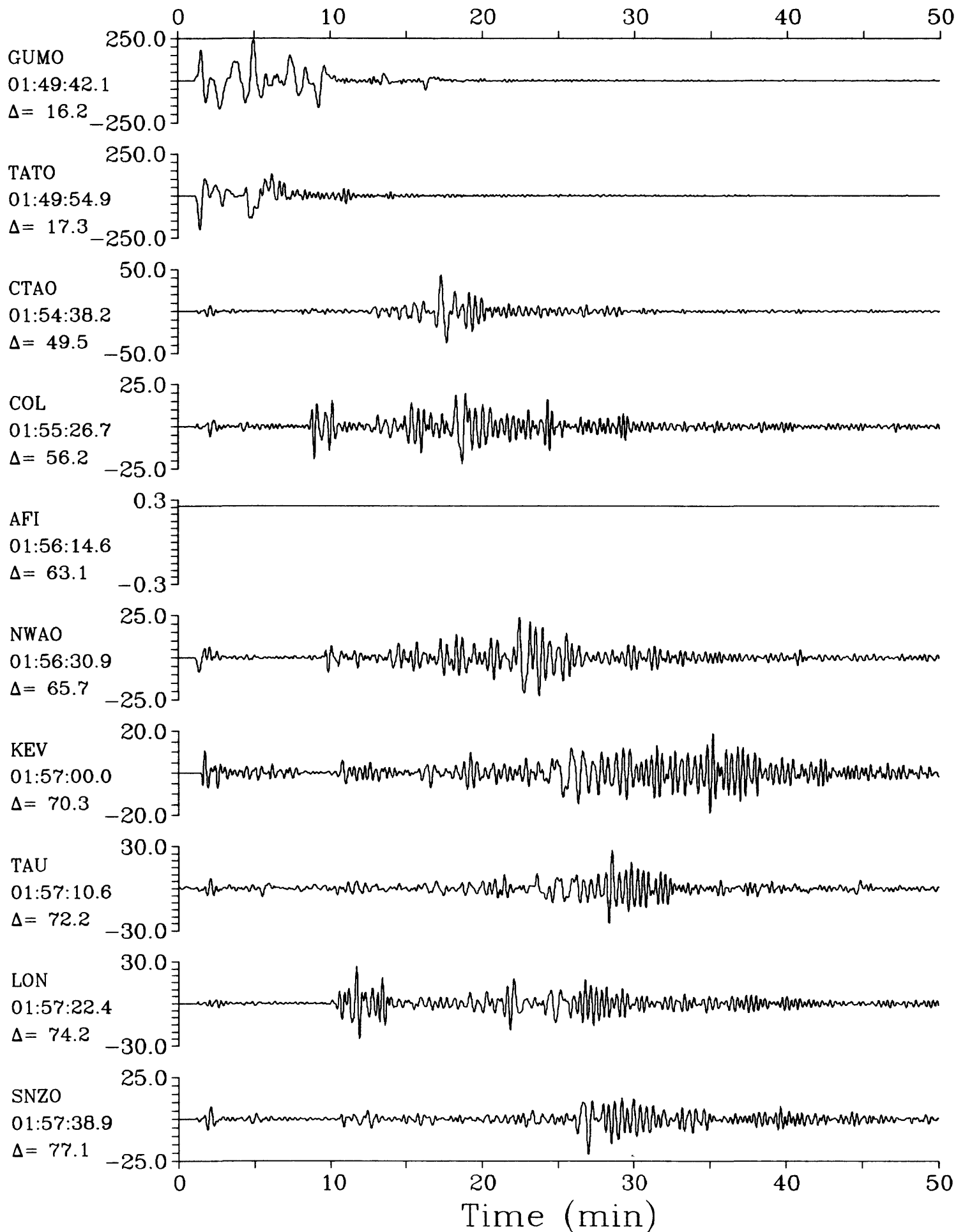
South of Honshu, Japan



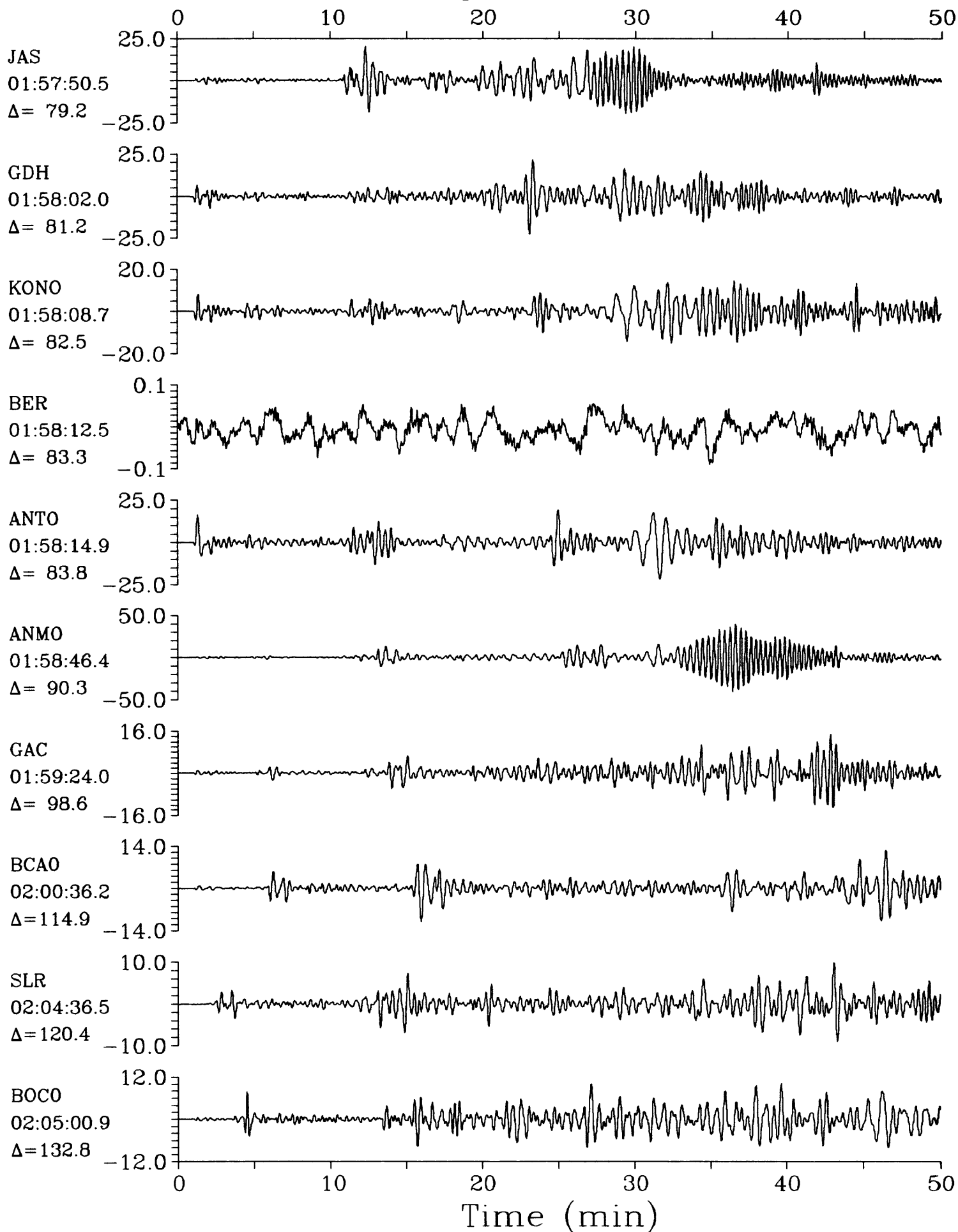




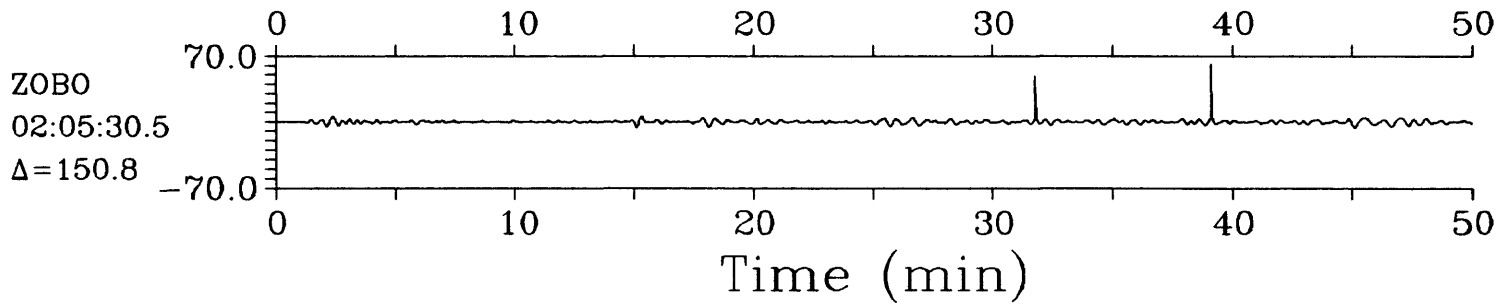




06 September 1982 01:47:02.73
South of Honshu, Japan h=175.8 MB=6.5

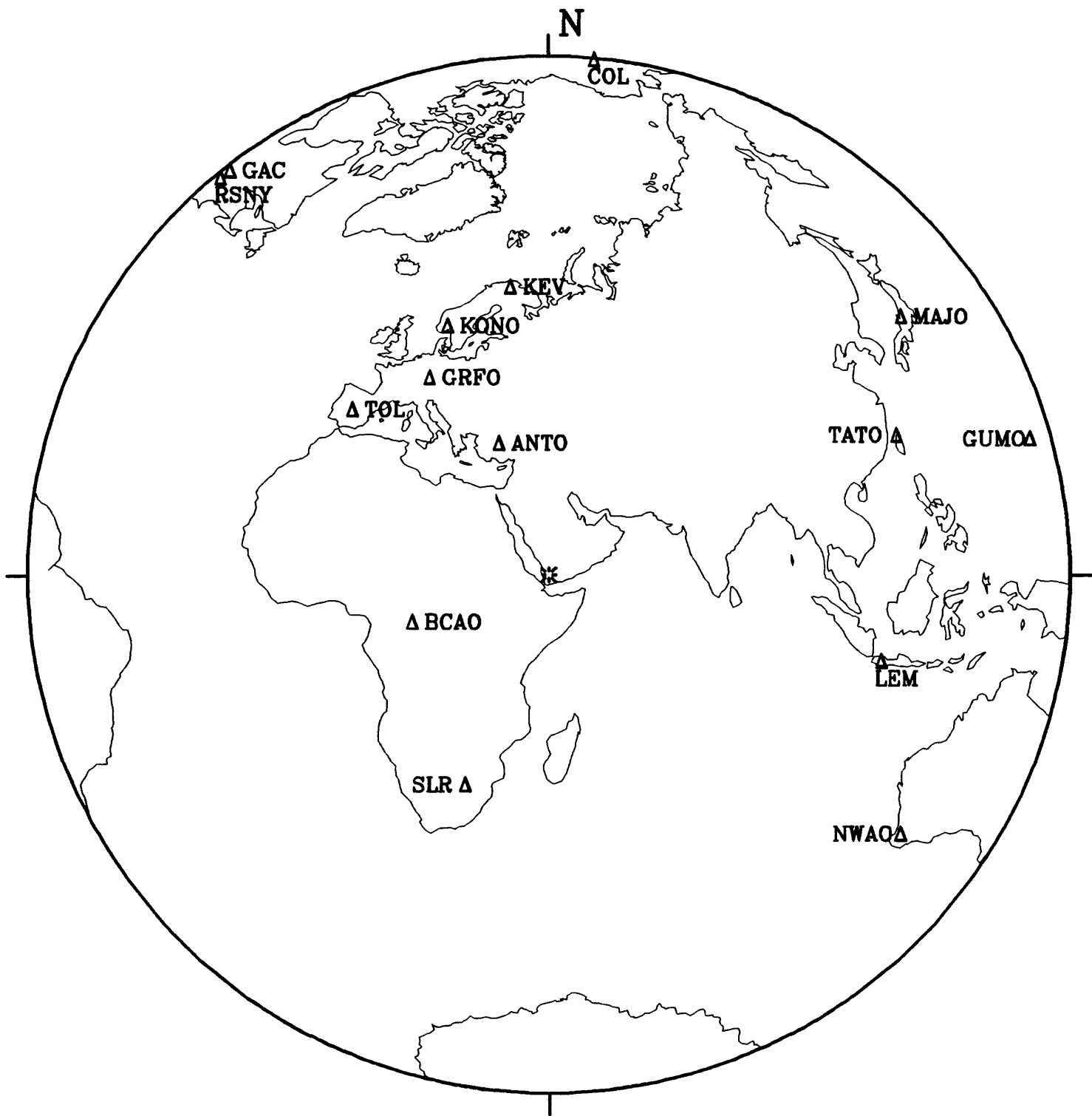


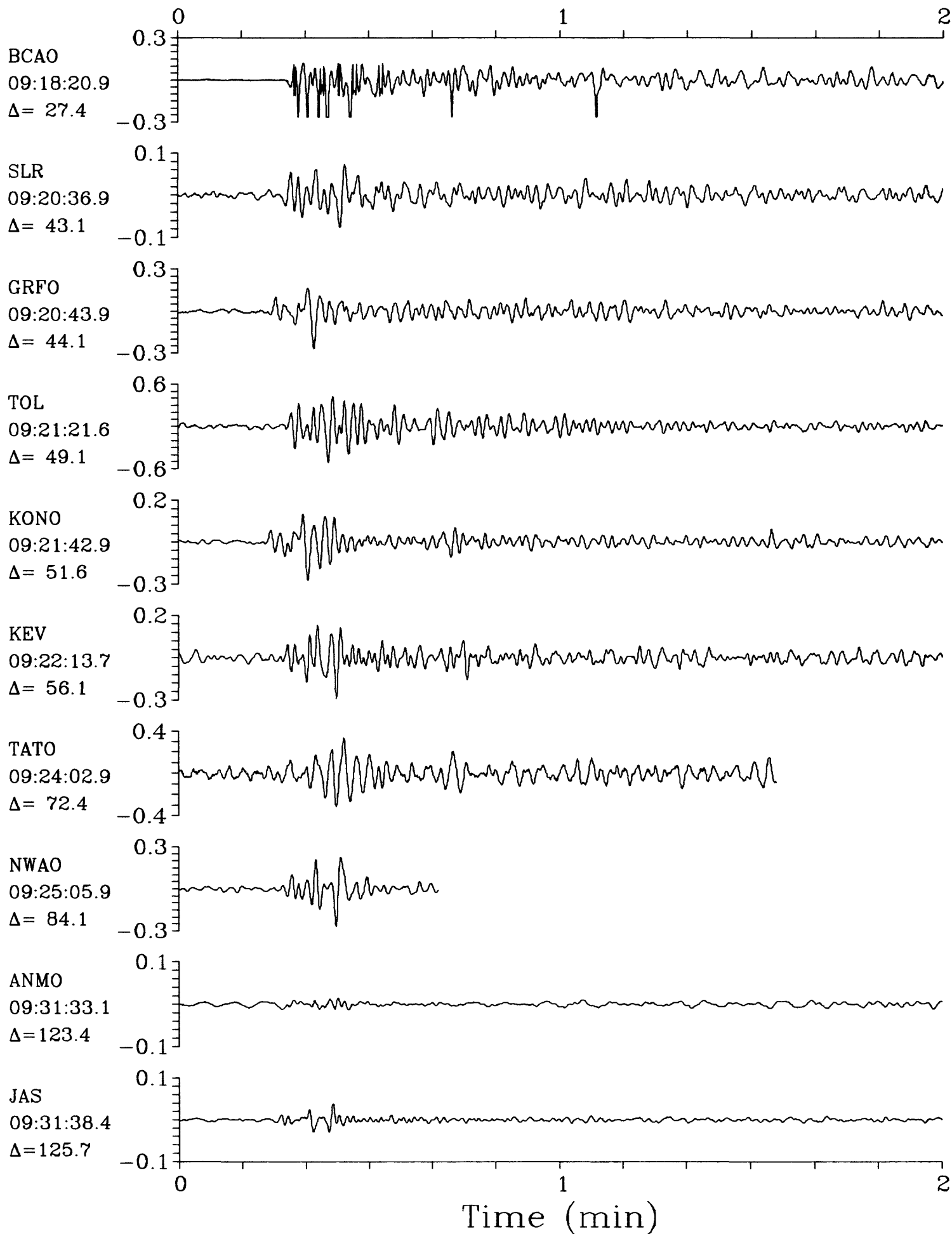
South of Honshu, Japan h=175.8 MB=6.5

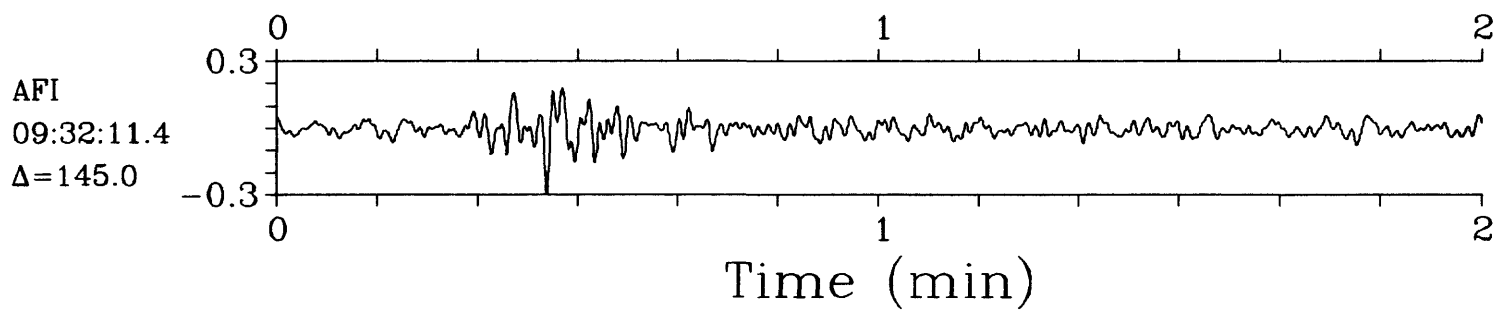


13 December 1982 09:12:48.05

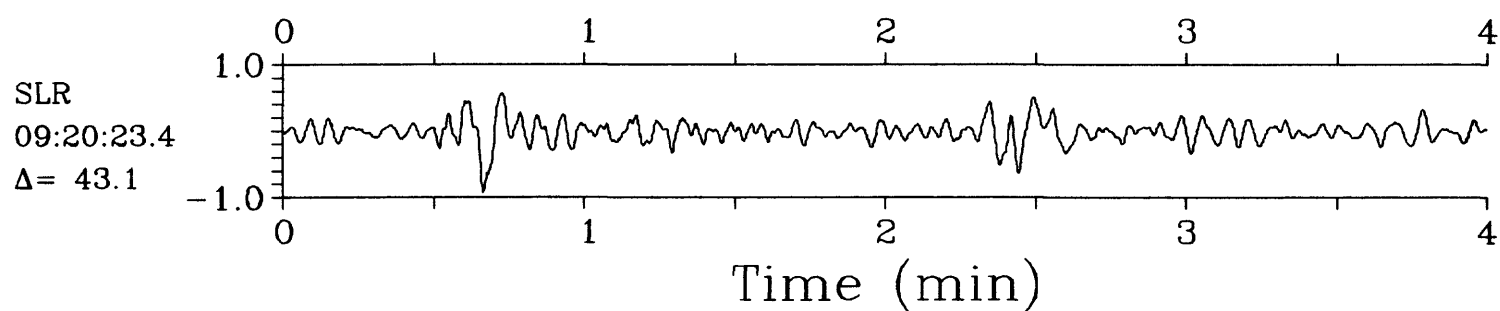
Western Arabian Peninsula

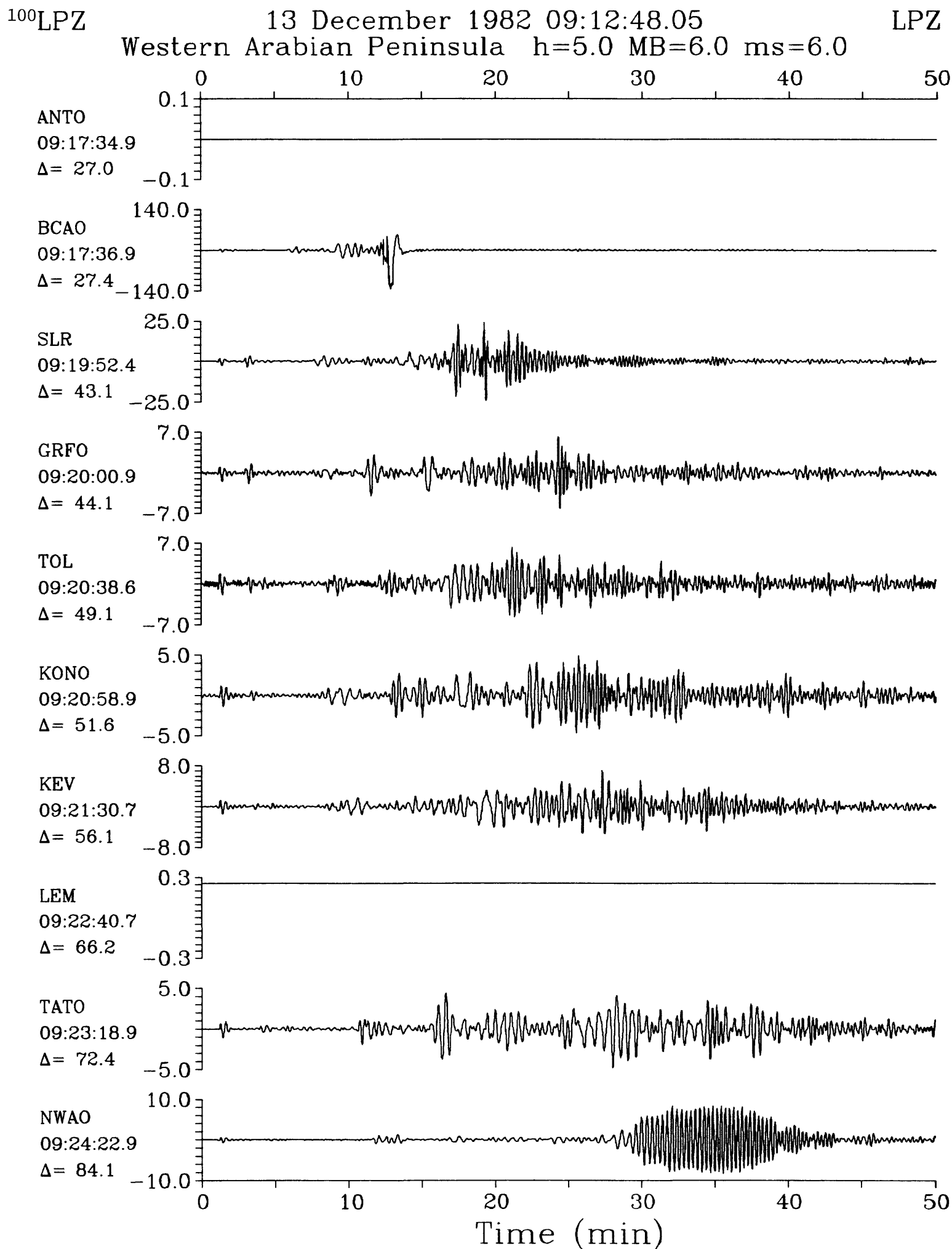




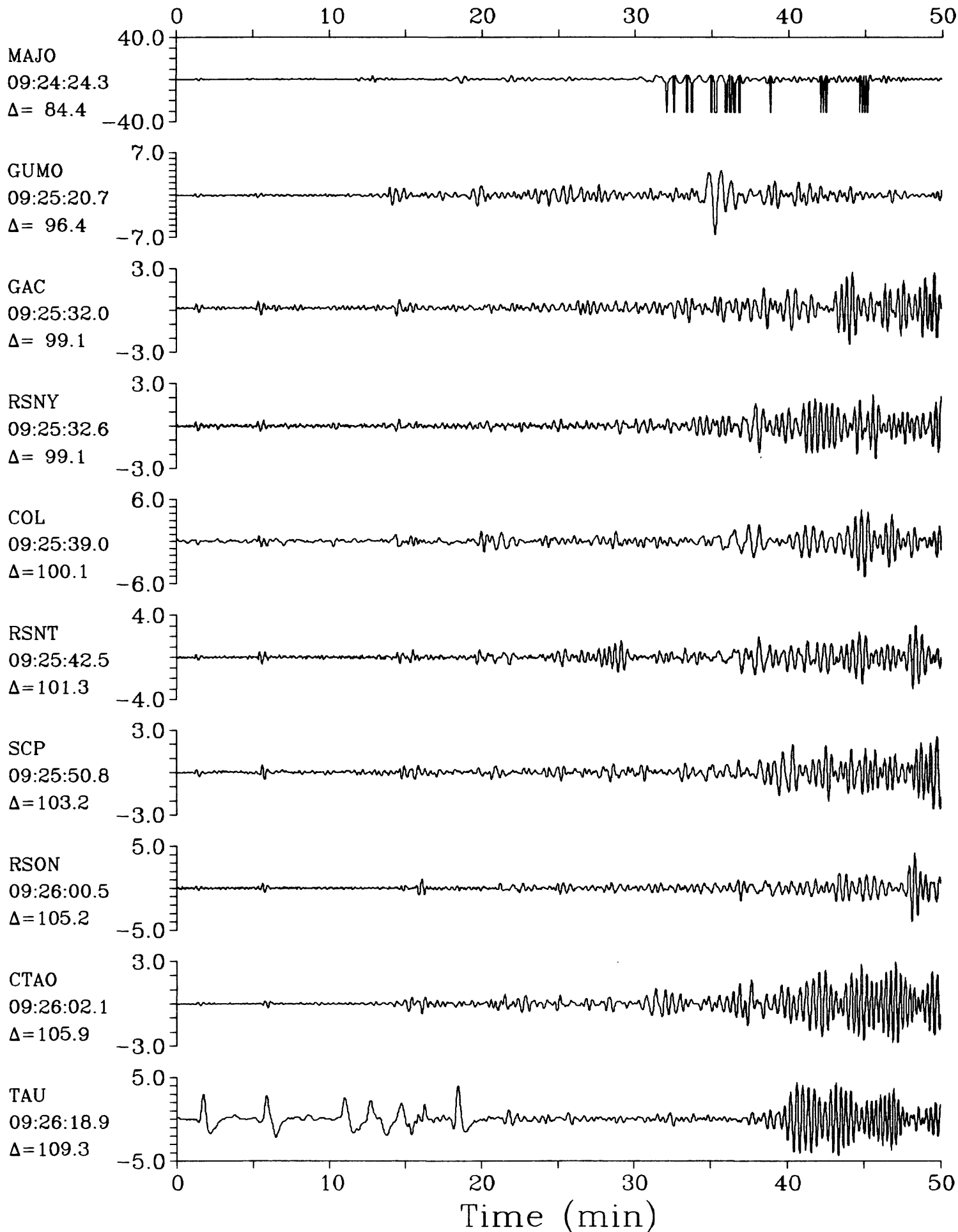


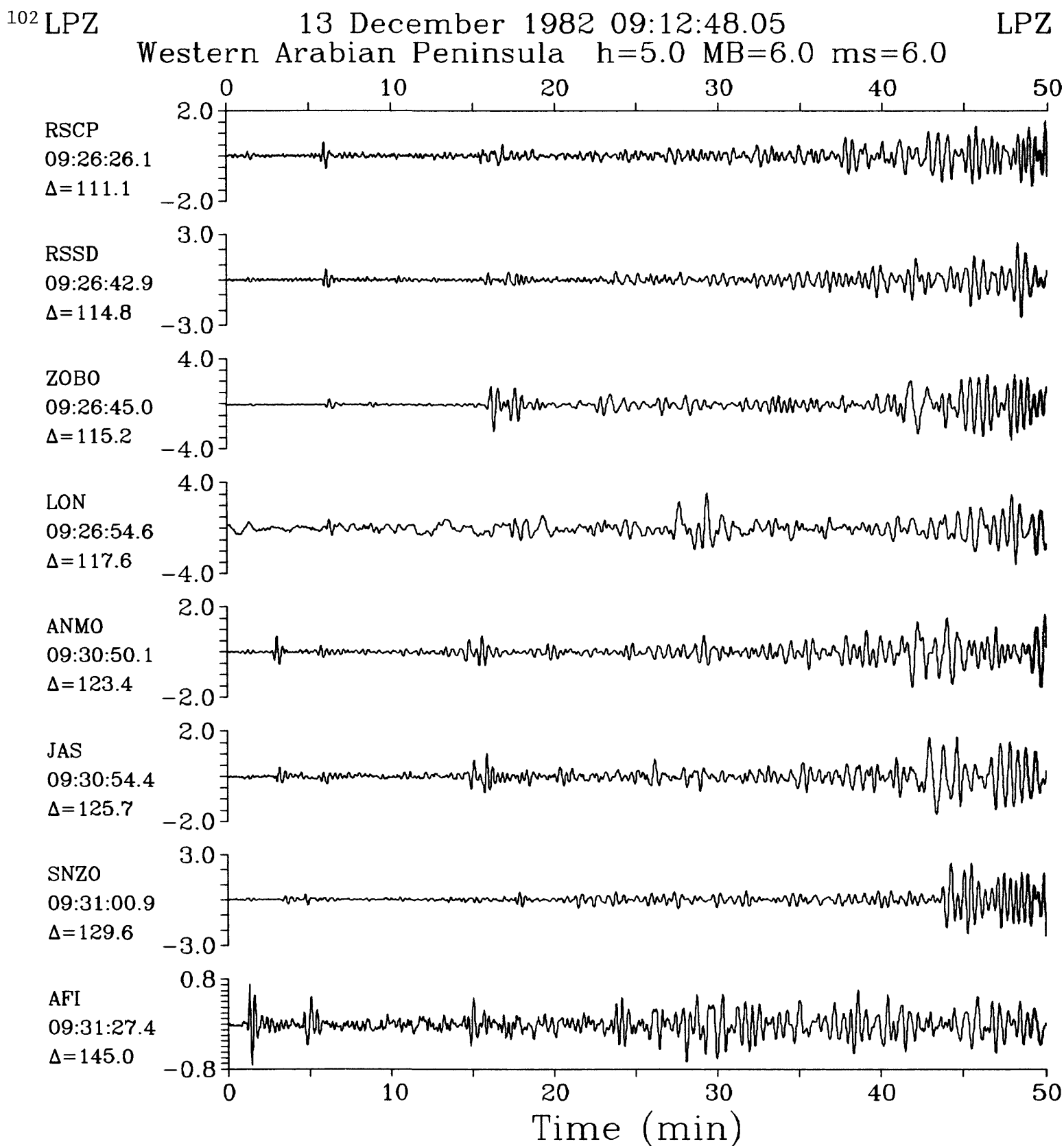
Western Arabian Peninsula h=5.0 MB=6.0 ms=6.0





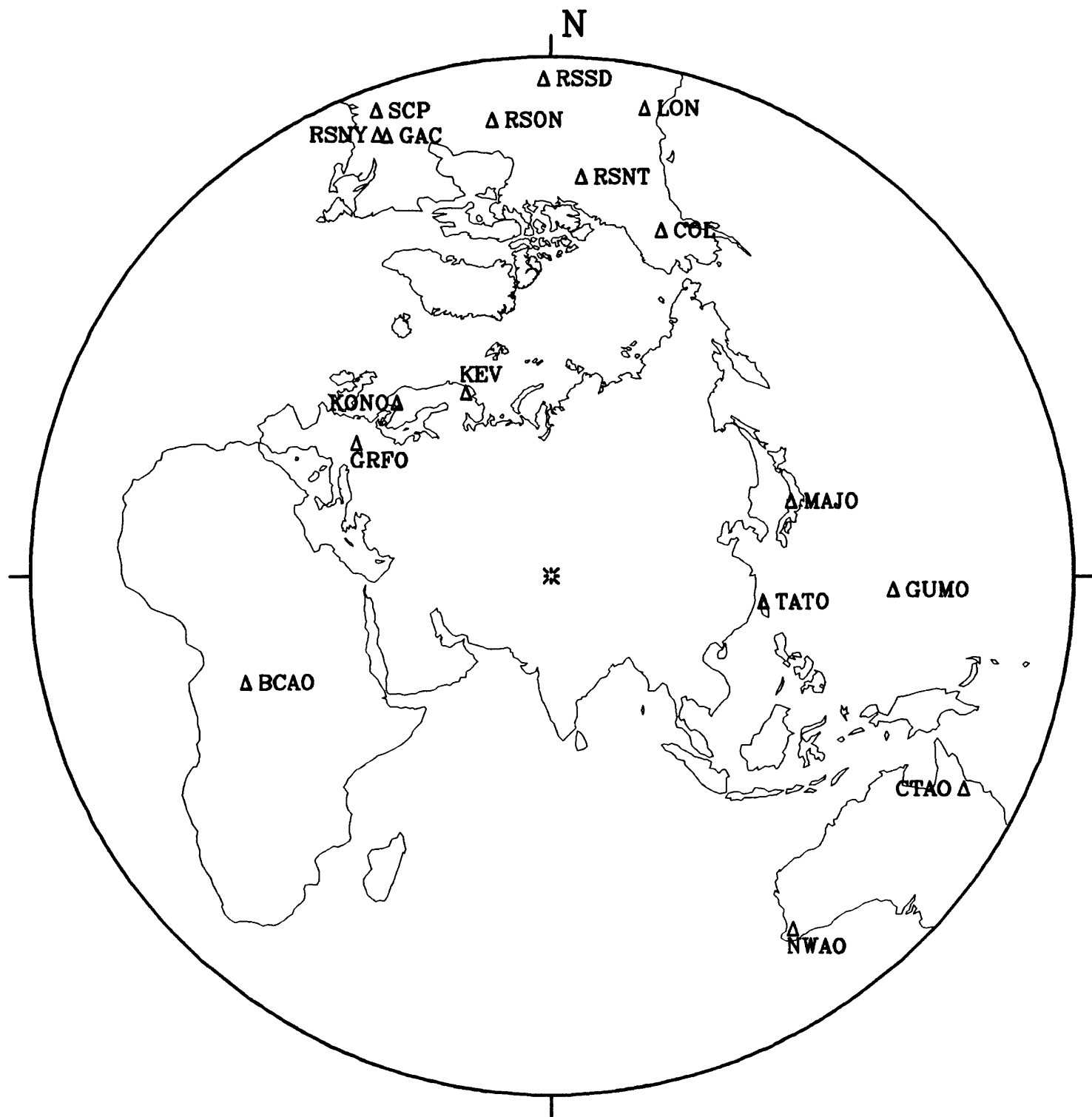
Western Arabian Peninsula h=5.0 MB=6.0 ms=6.0

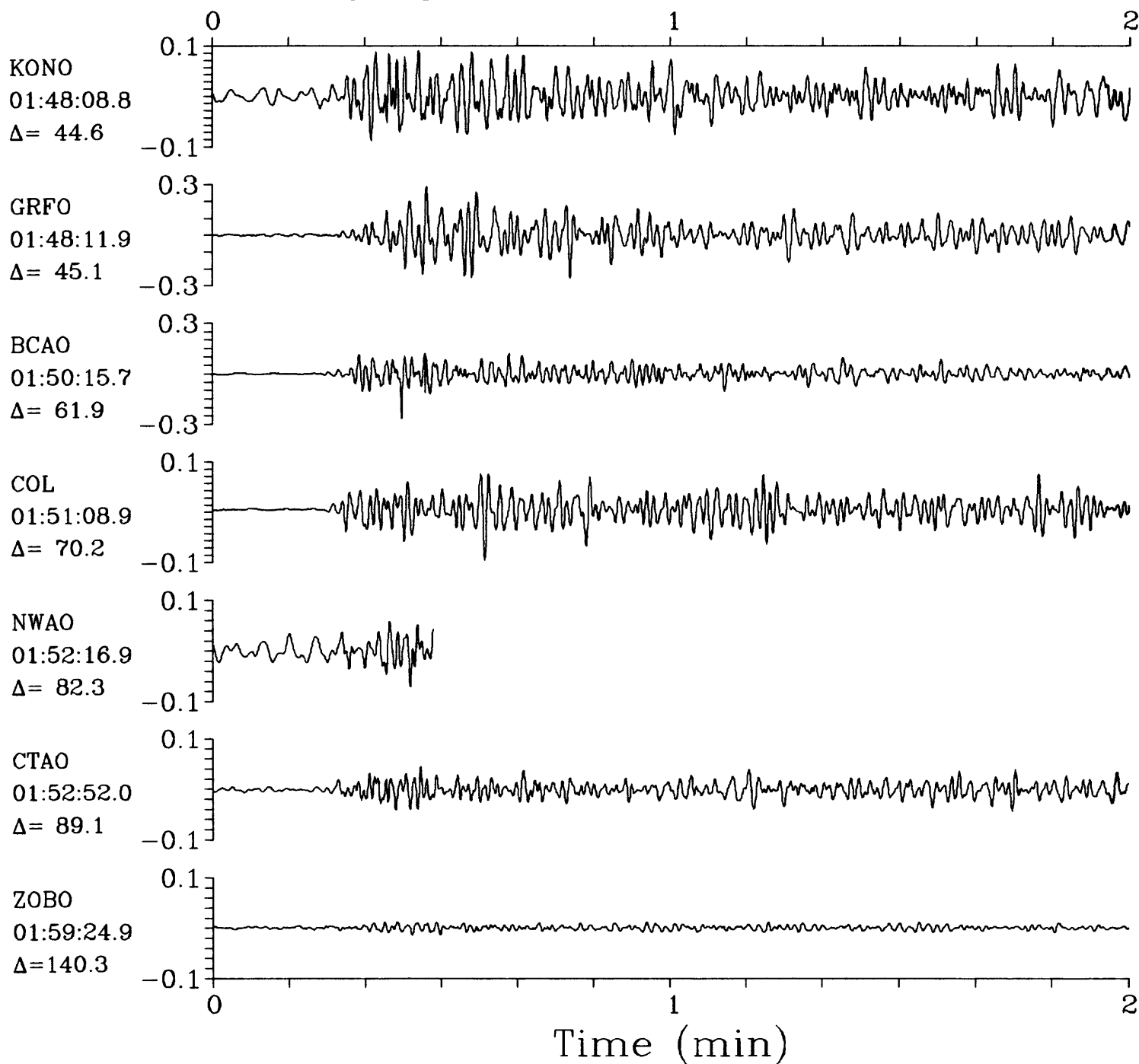


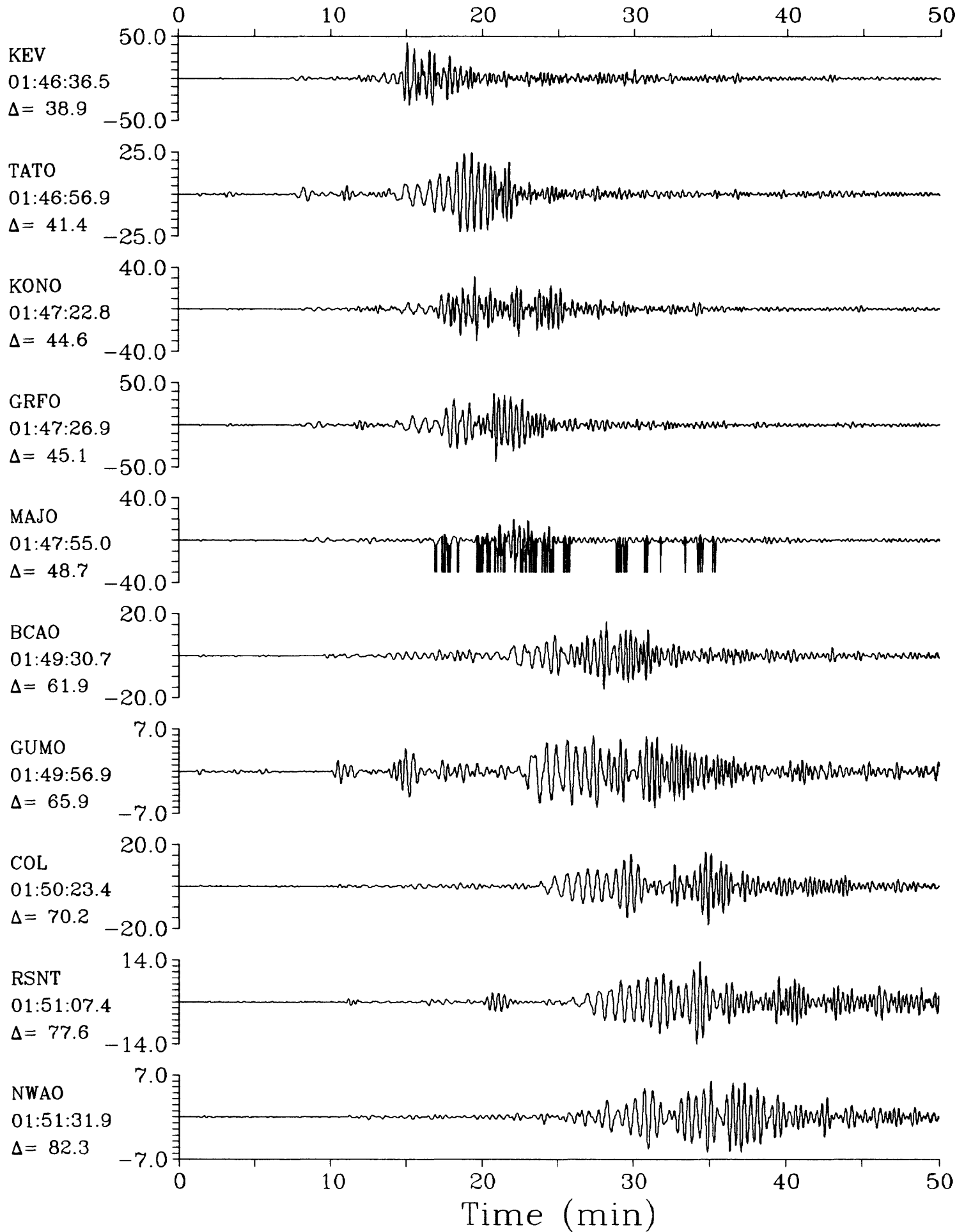


13 February 1983 01:40:10.98

Southern Xinjiang, China

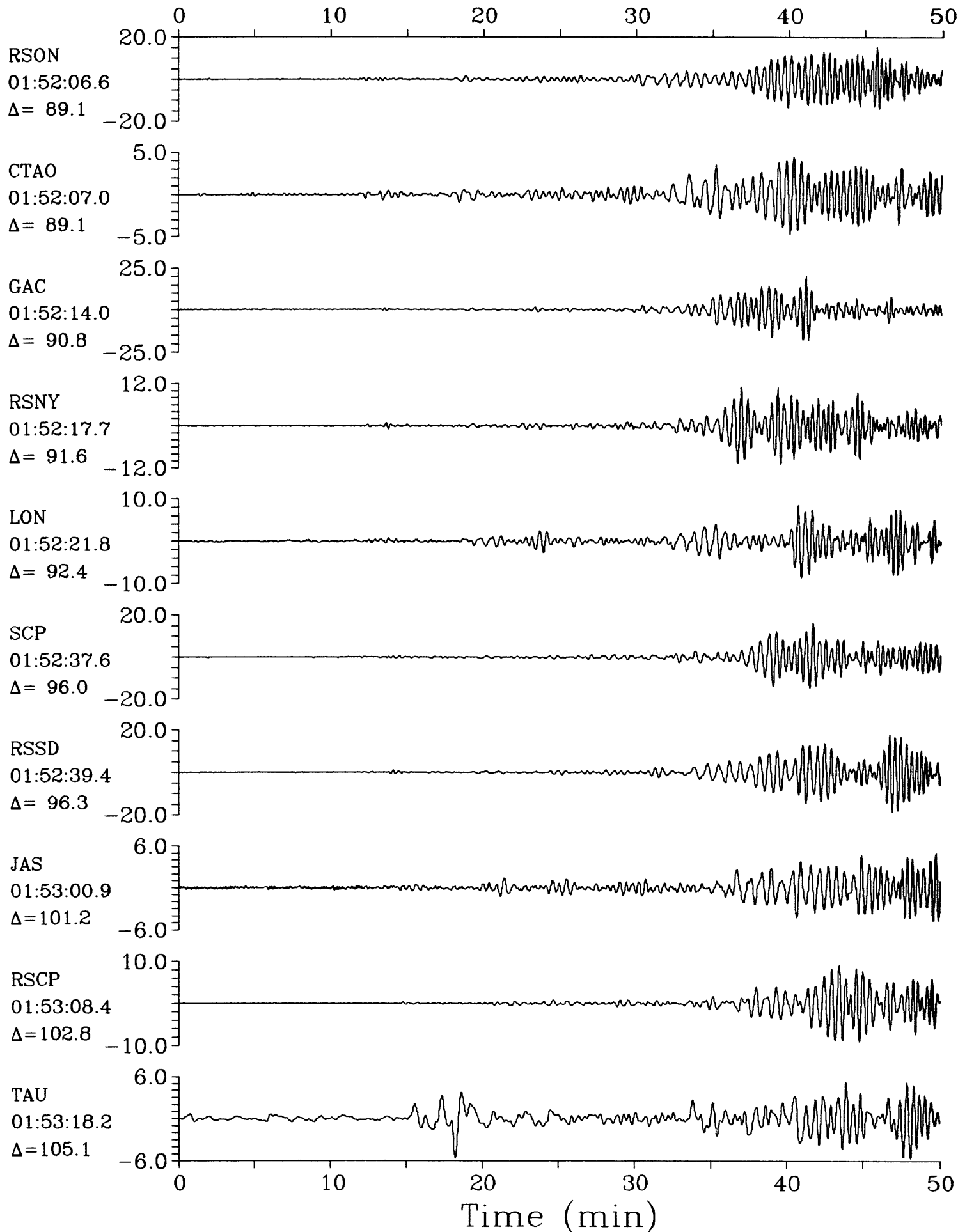


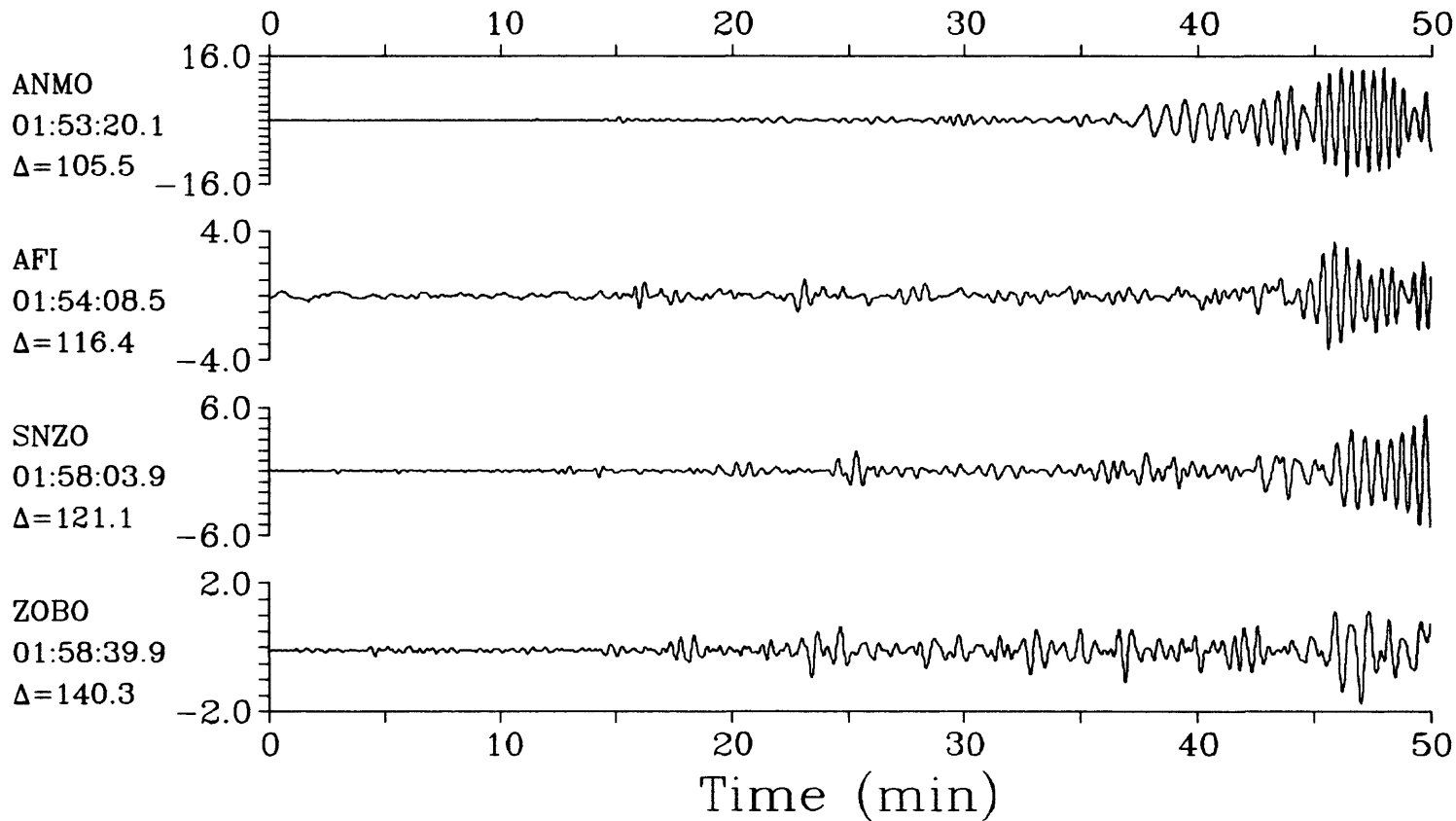




13 February 1983 01:40:10.98

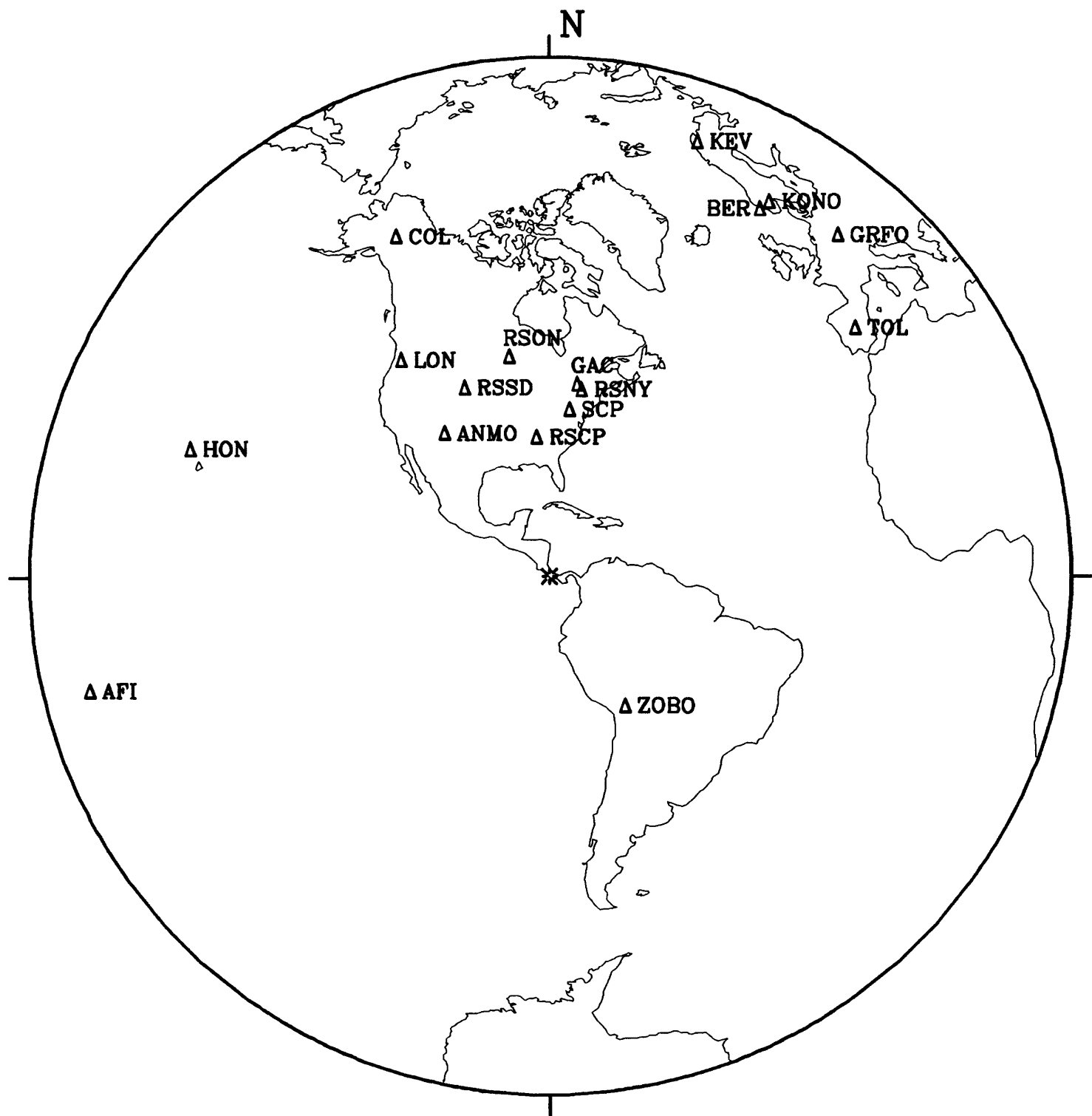
Southern Xinjiang, China h=16.1 MB=5.6 ms=6.2

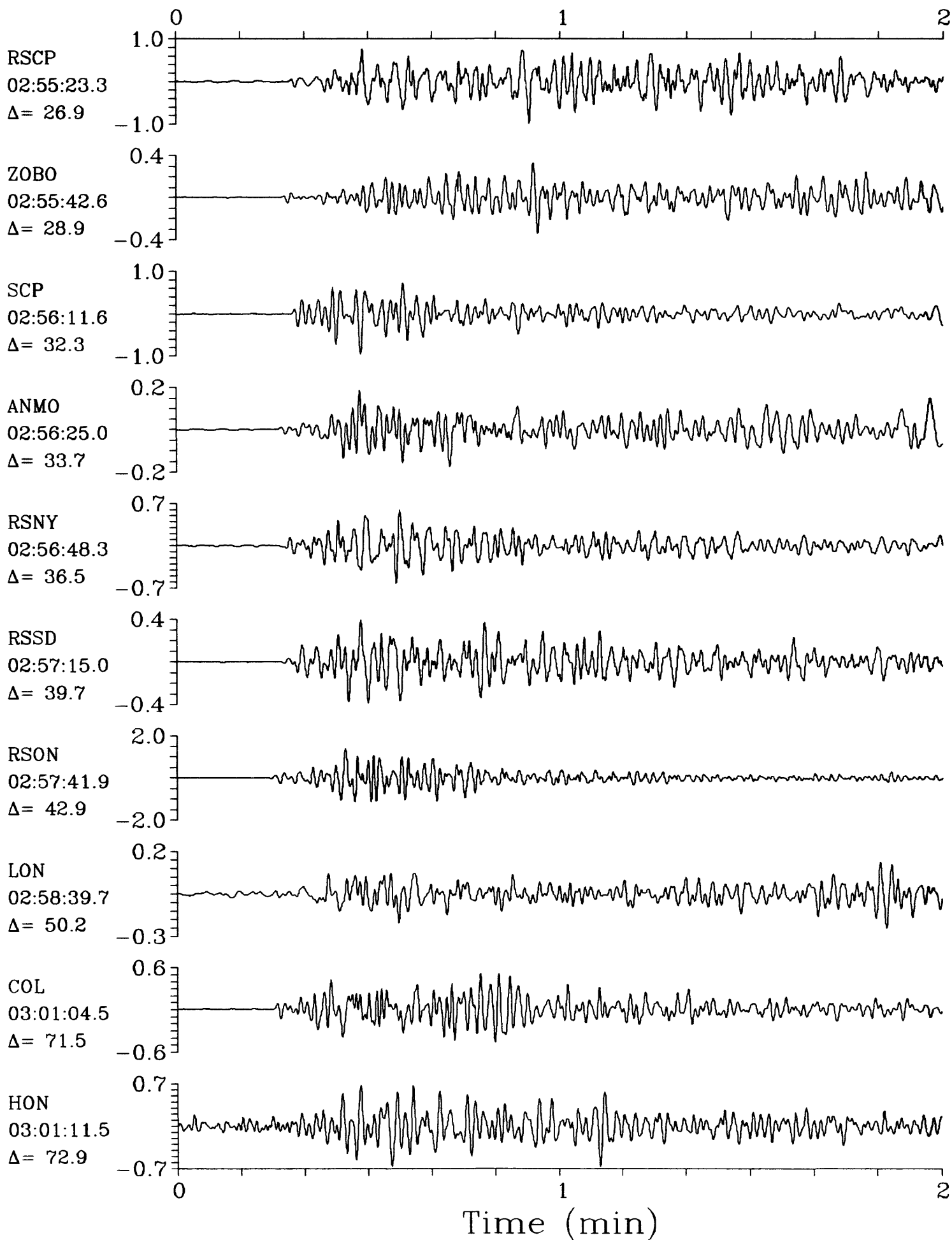


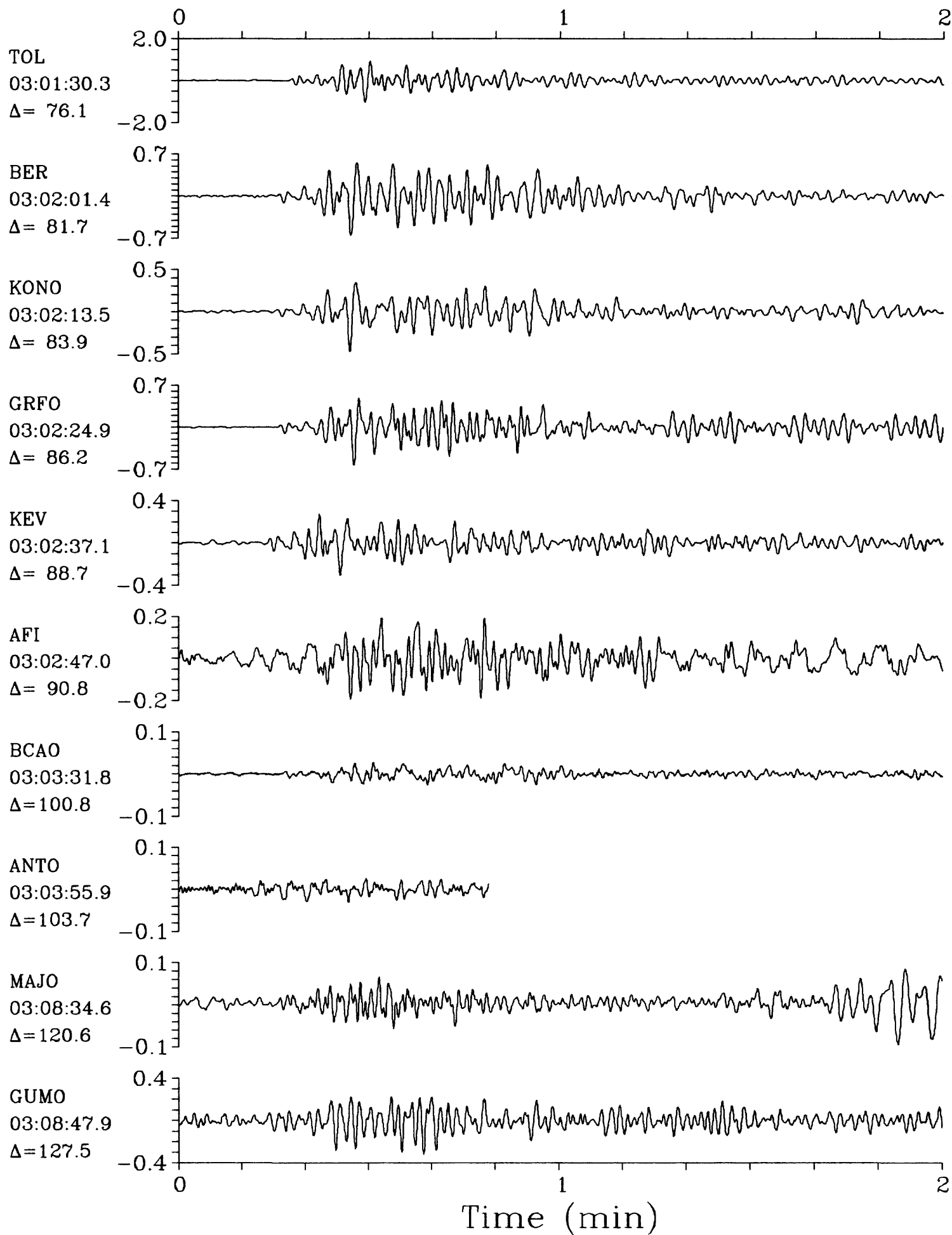


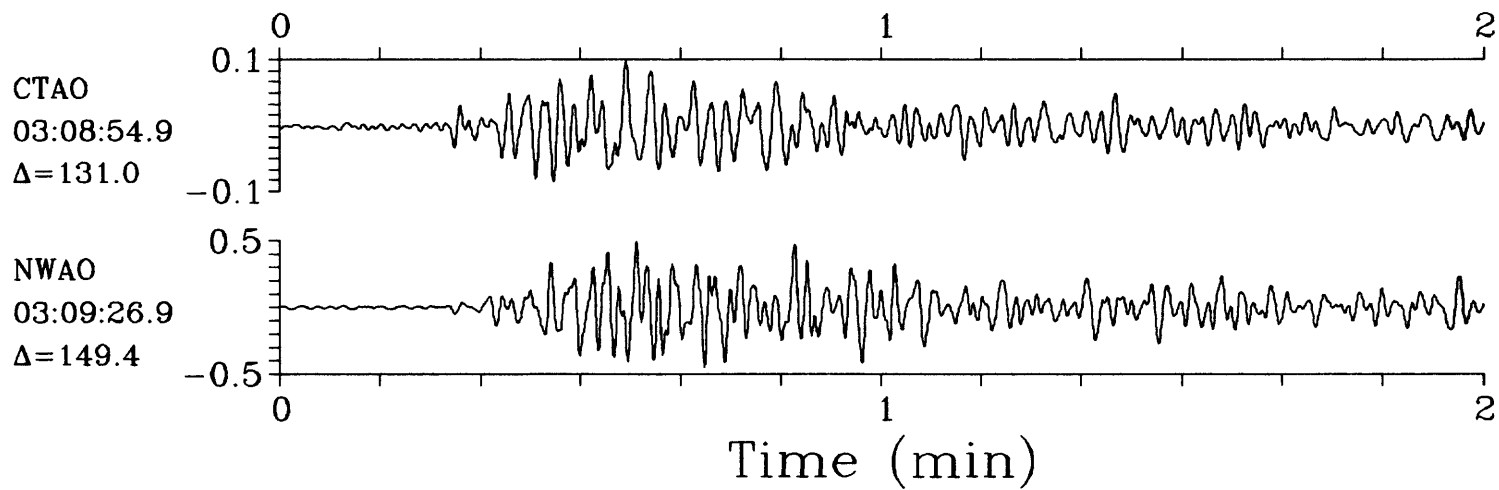
03 April 1983 02:50:01.18

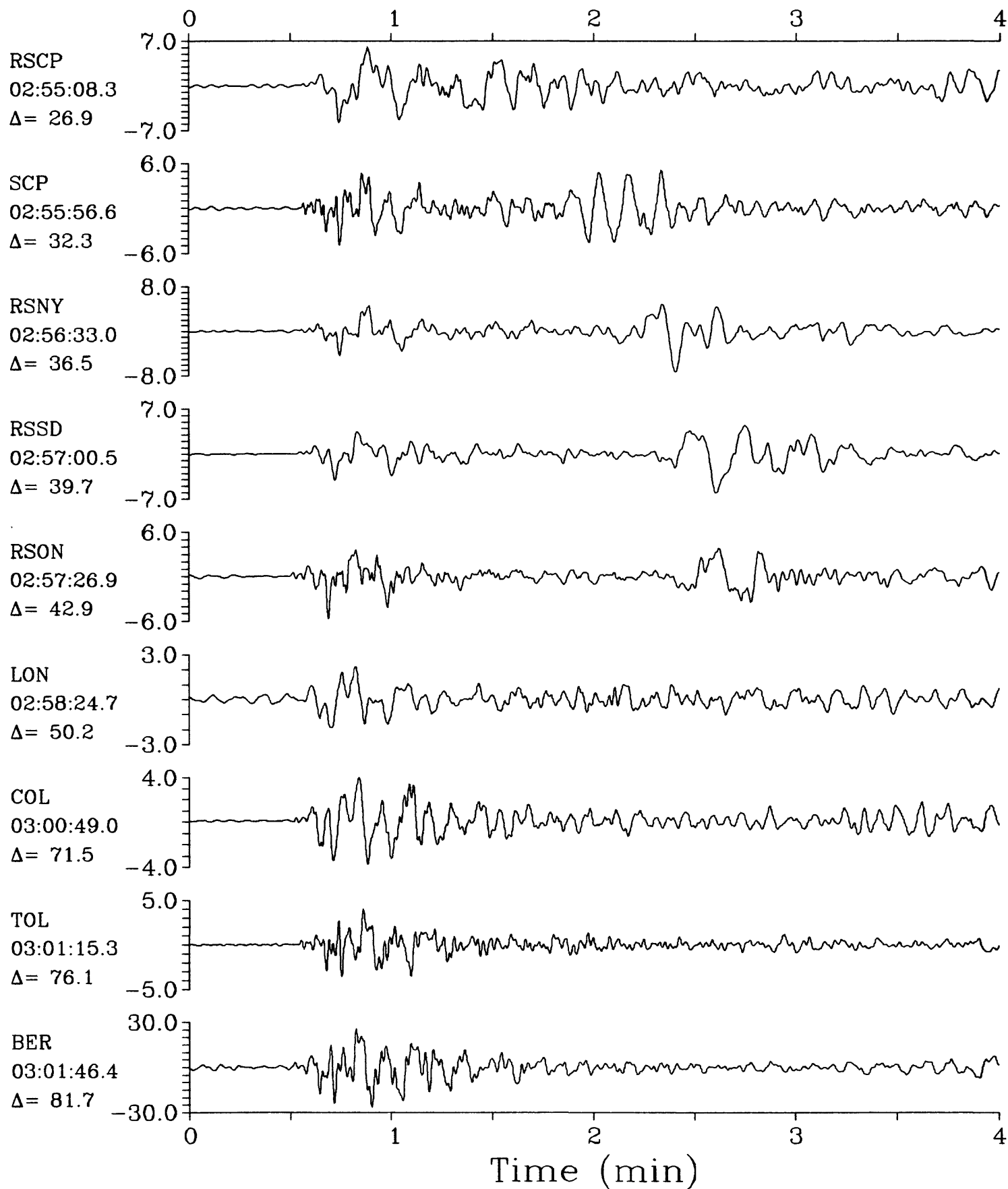
Costa Rica

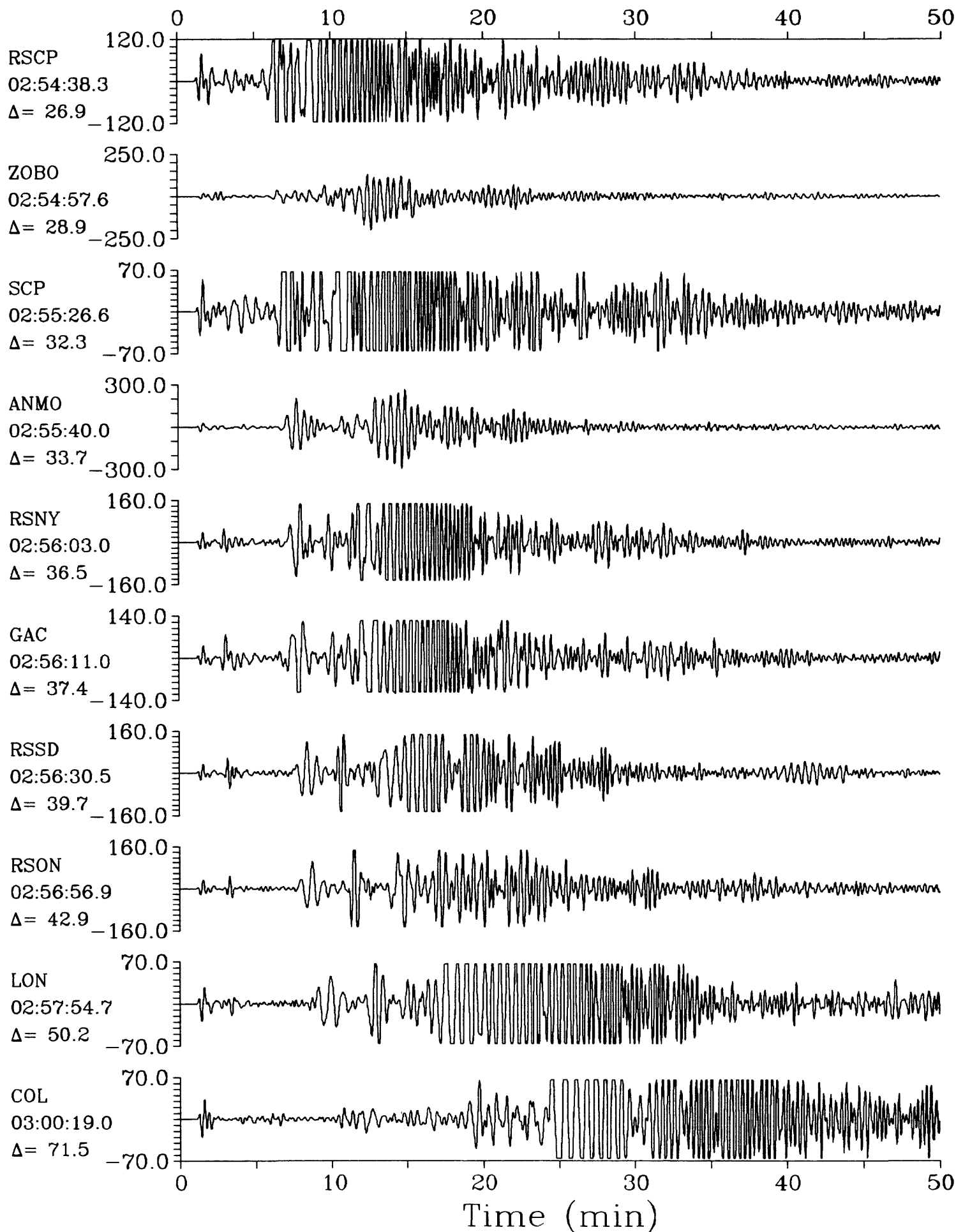




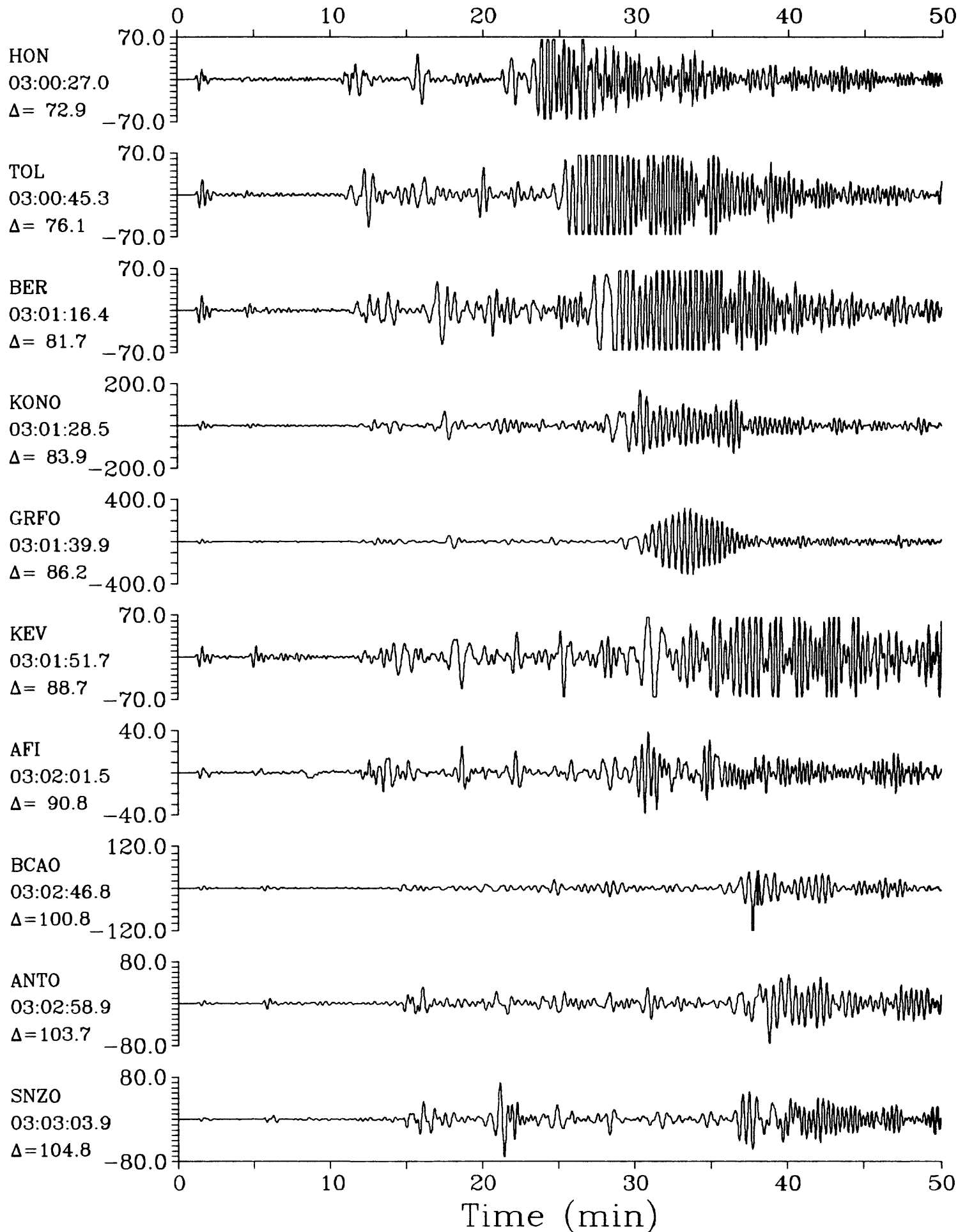


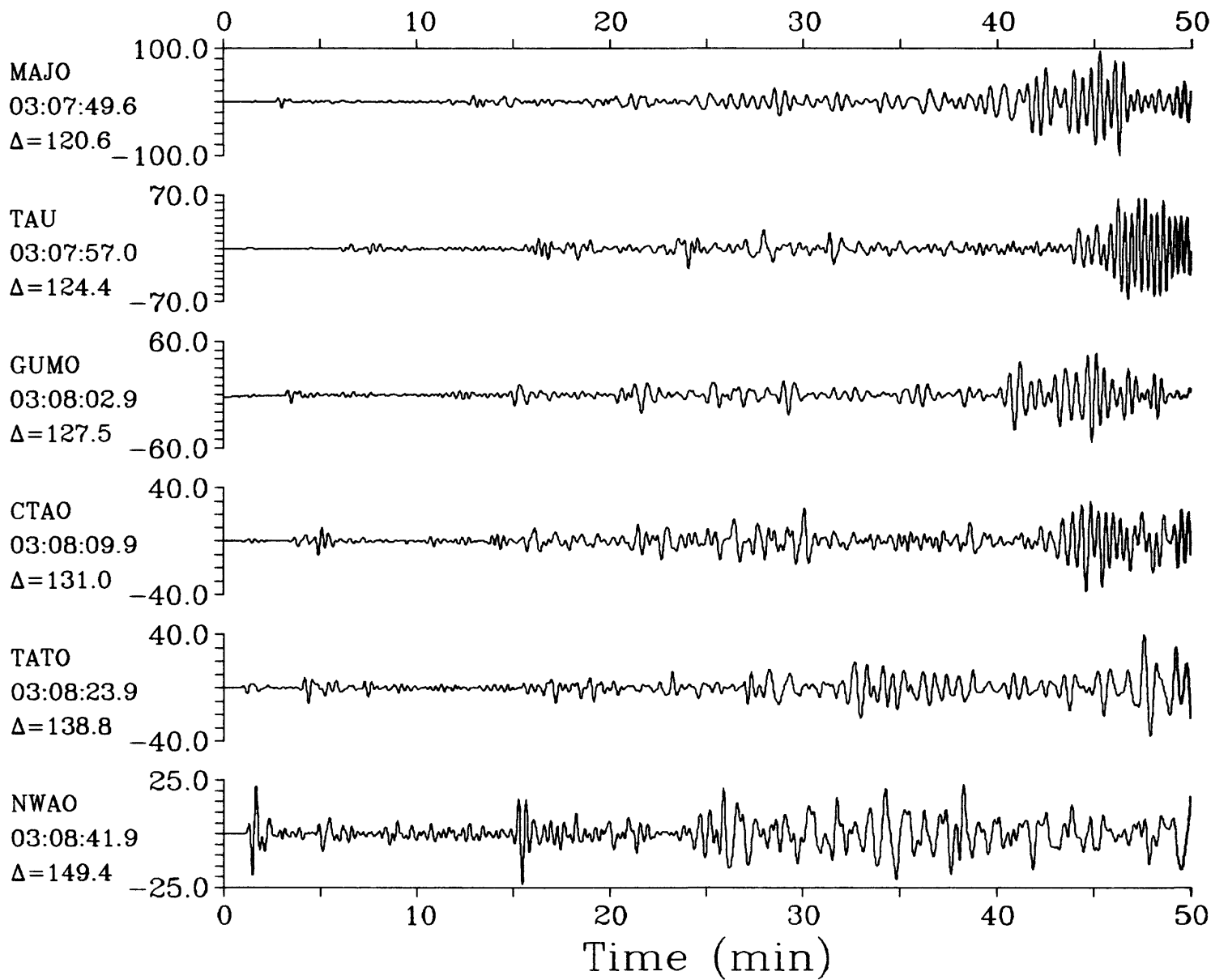


03 April 1983 02:50:01.18
Costa Rica h=37.0 MB=6.5 ms=7.3



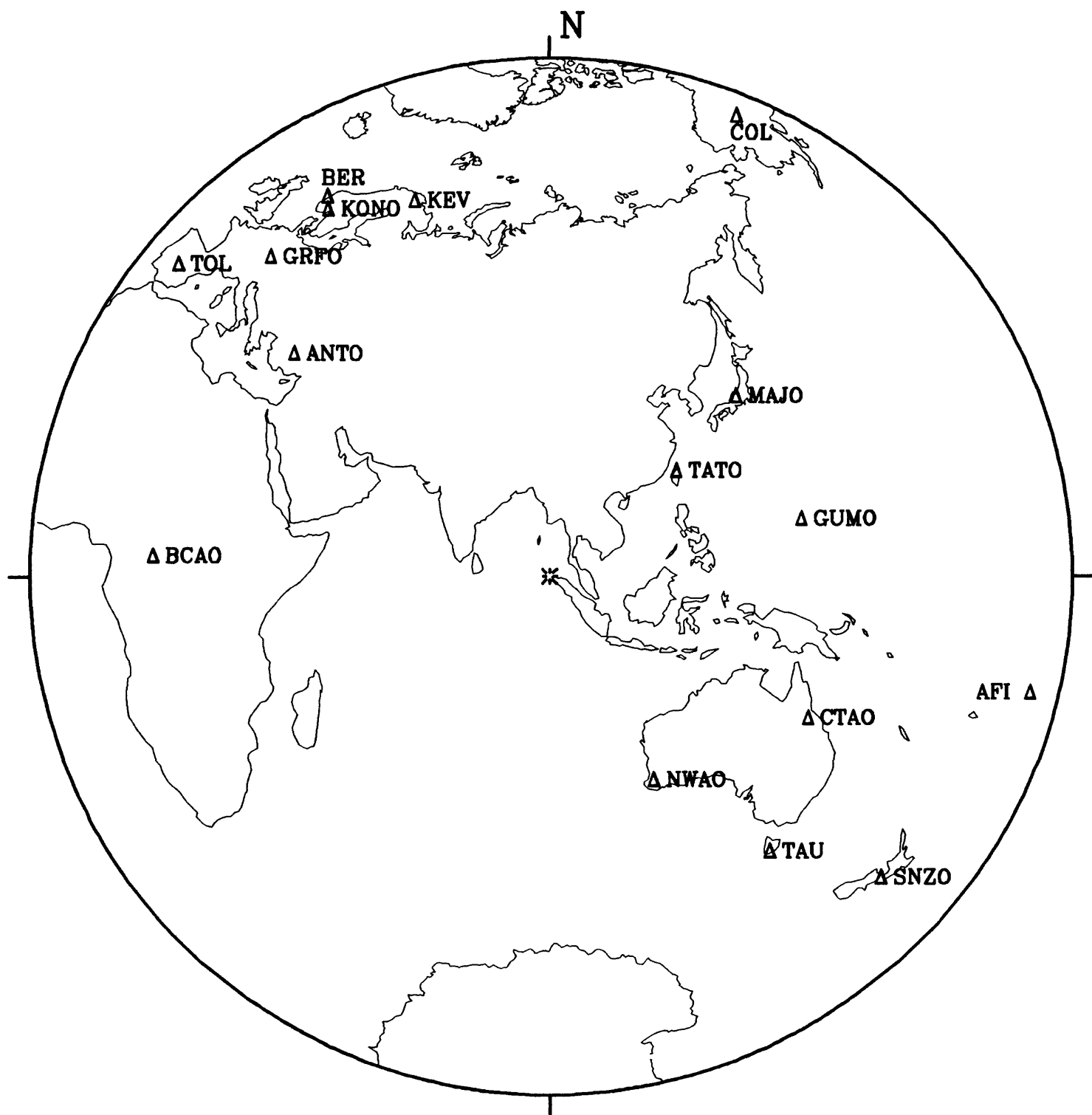
03 April 1983 02:50:01.18
Costa Rica h=37.0 MB=6.5 ms=7.3

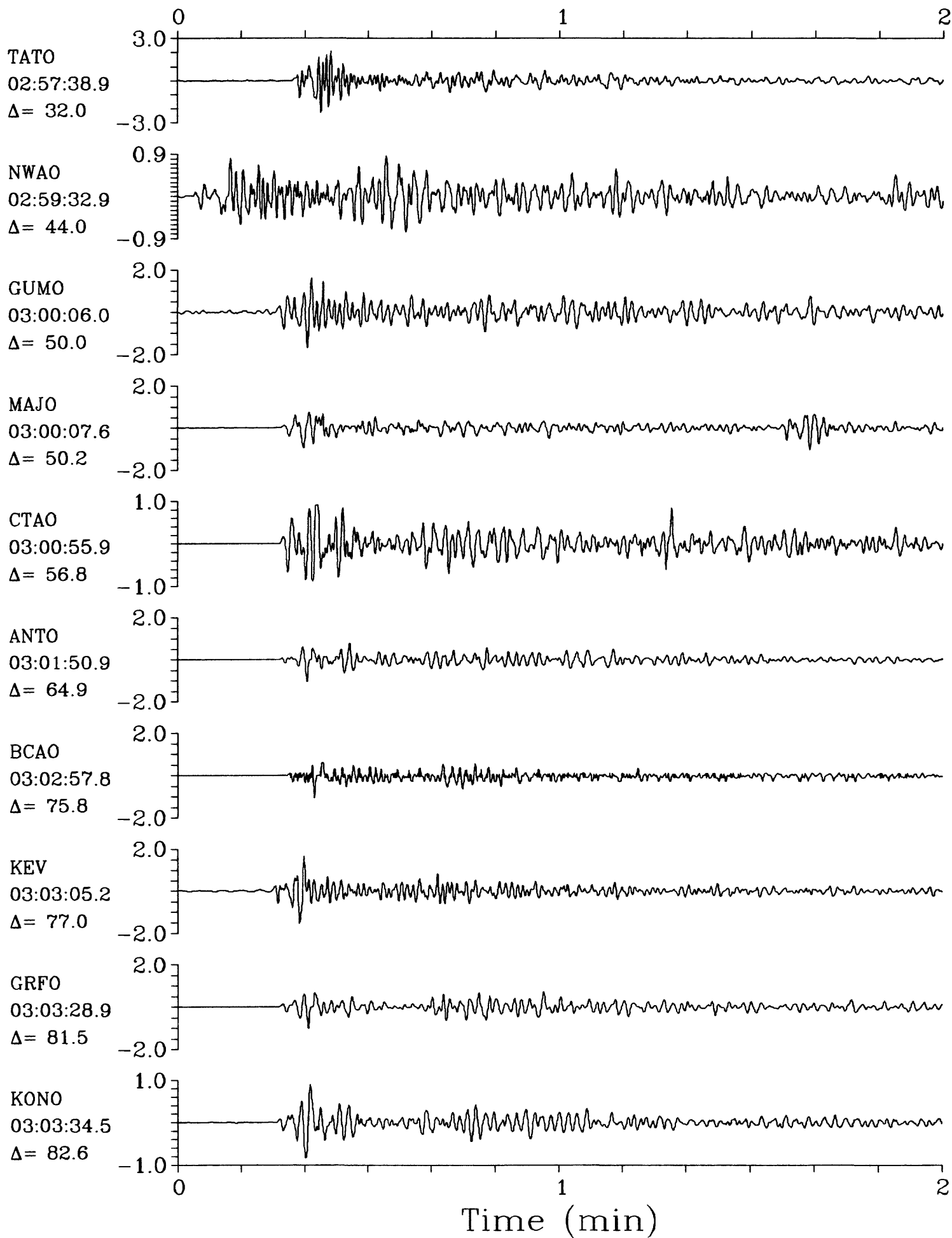


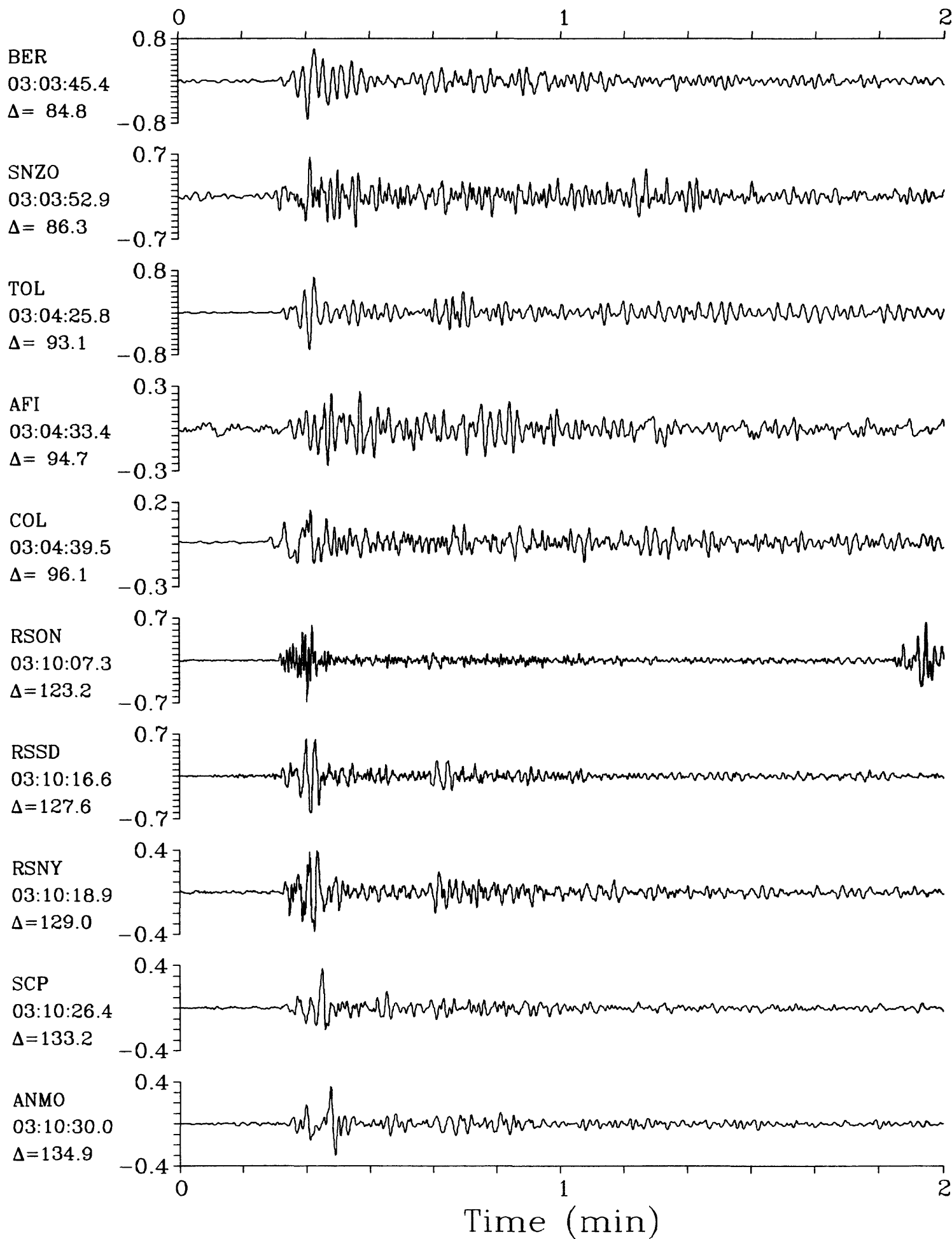


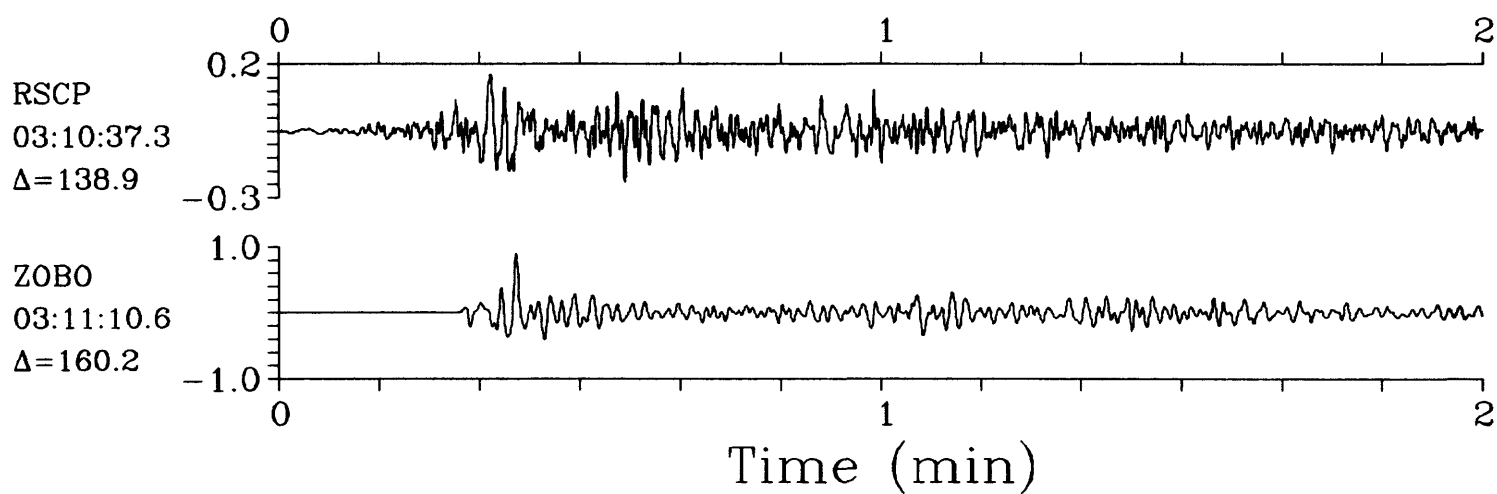
04 April 1983 02:51:34.36

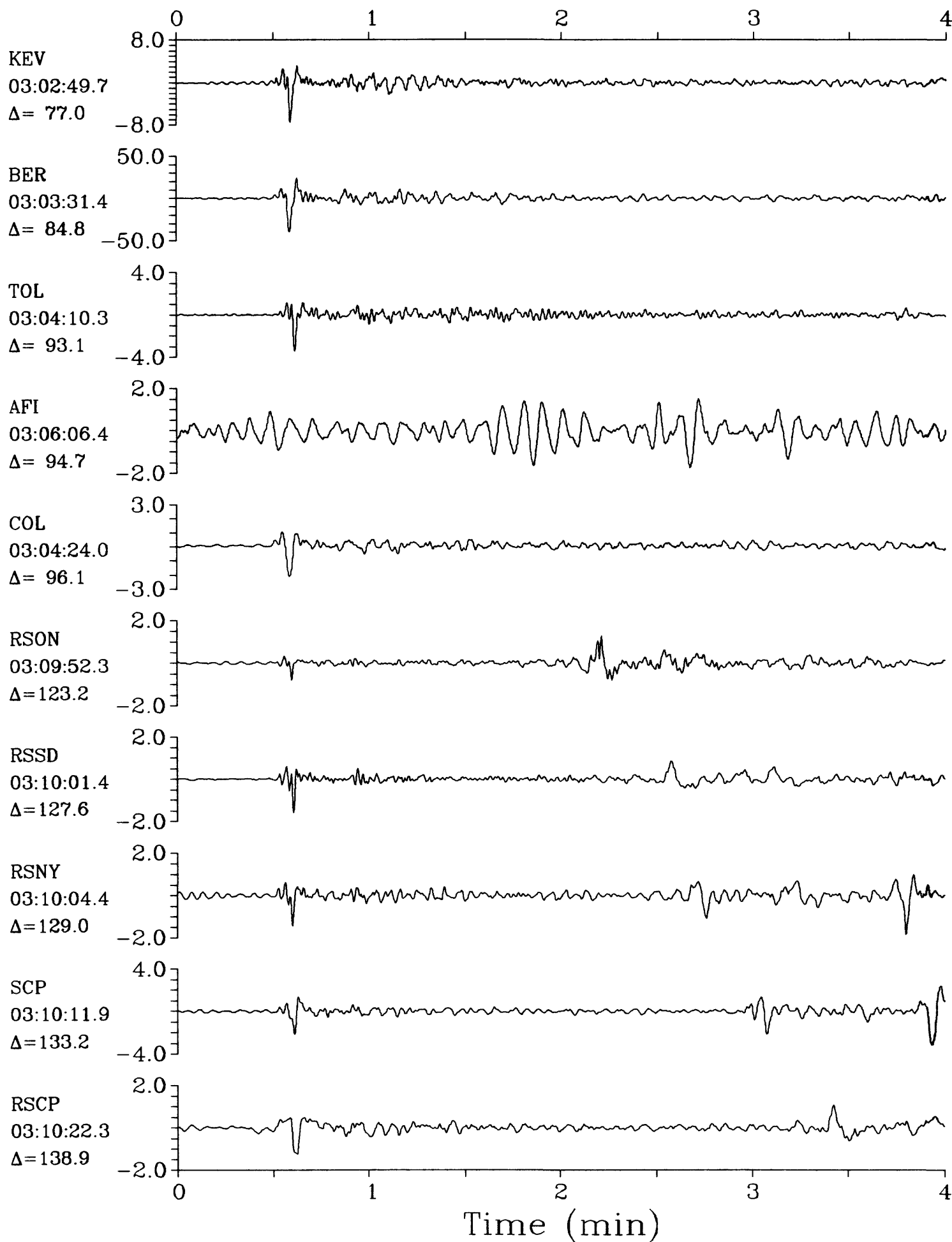
Northern Sumatera

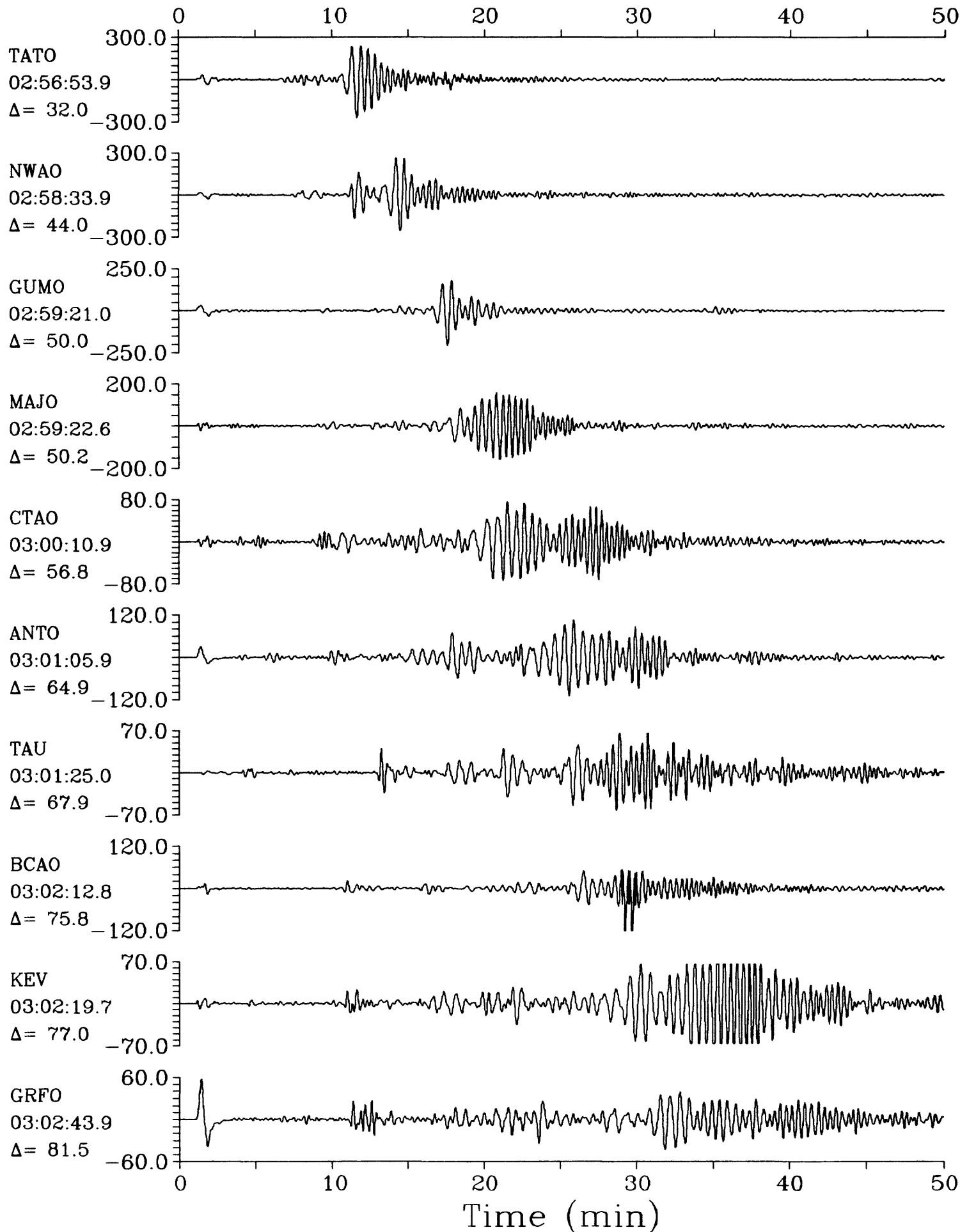




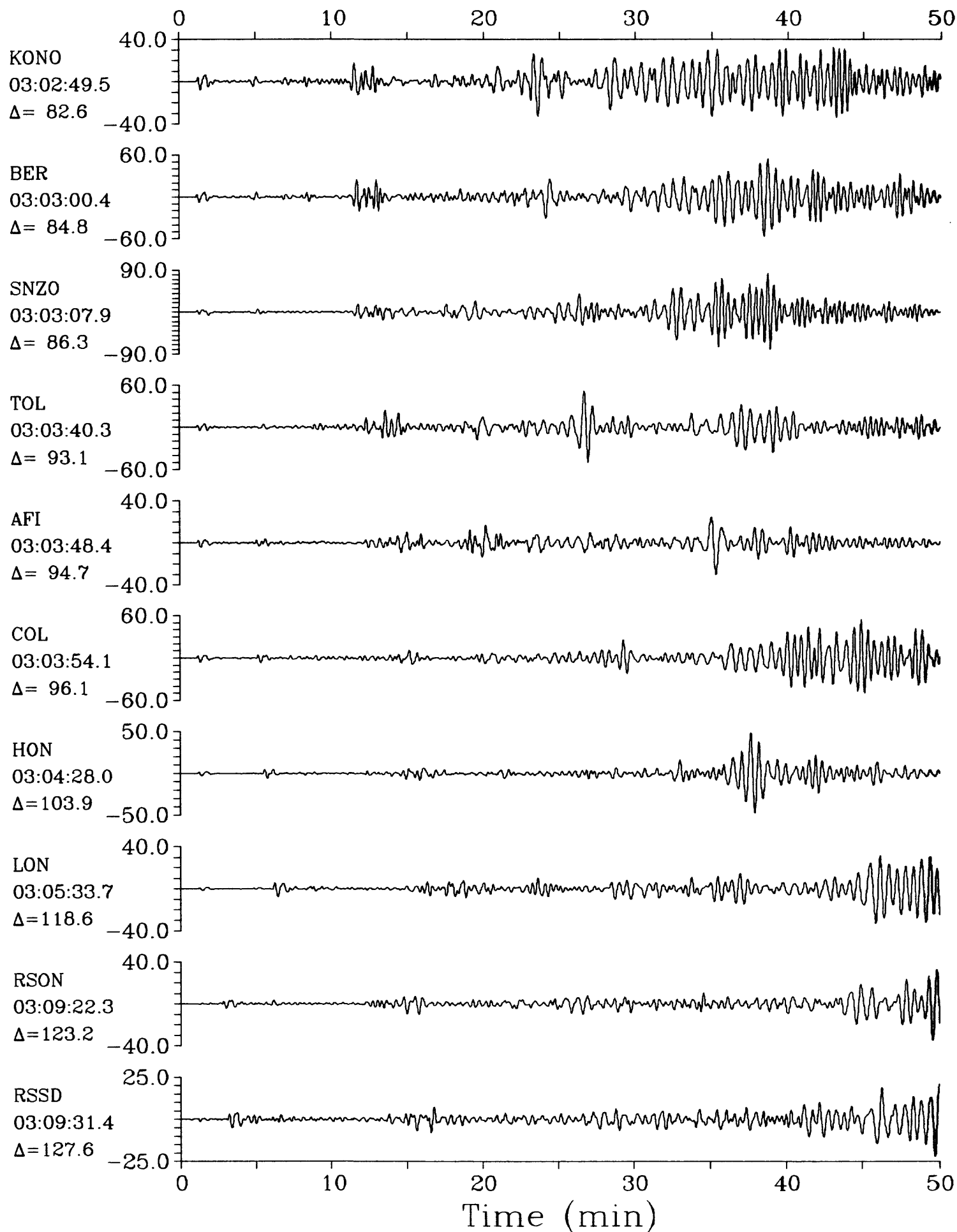


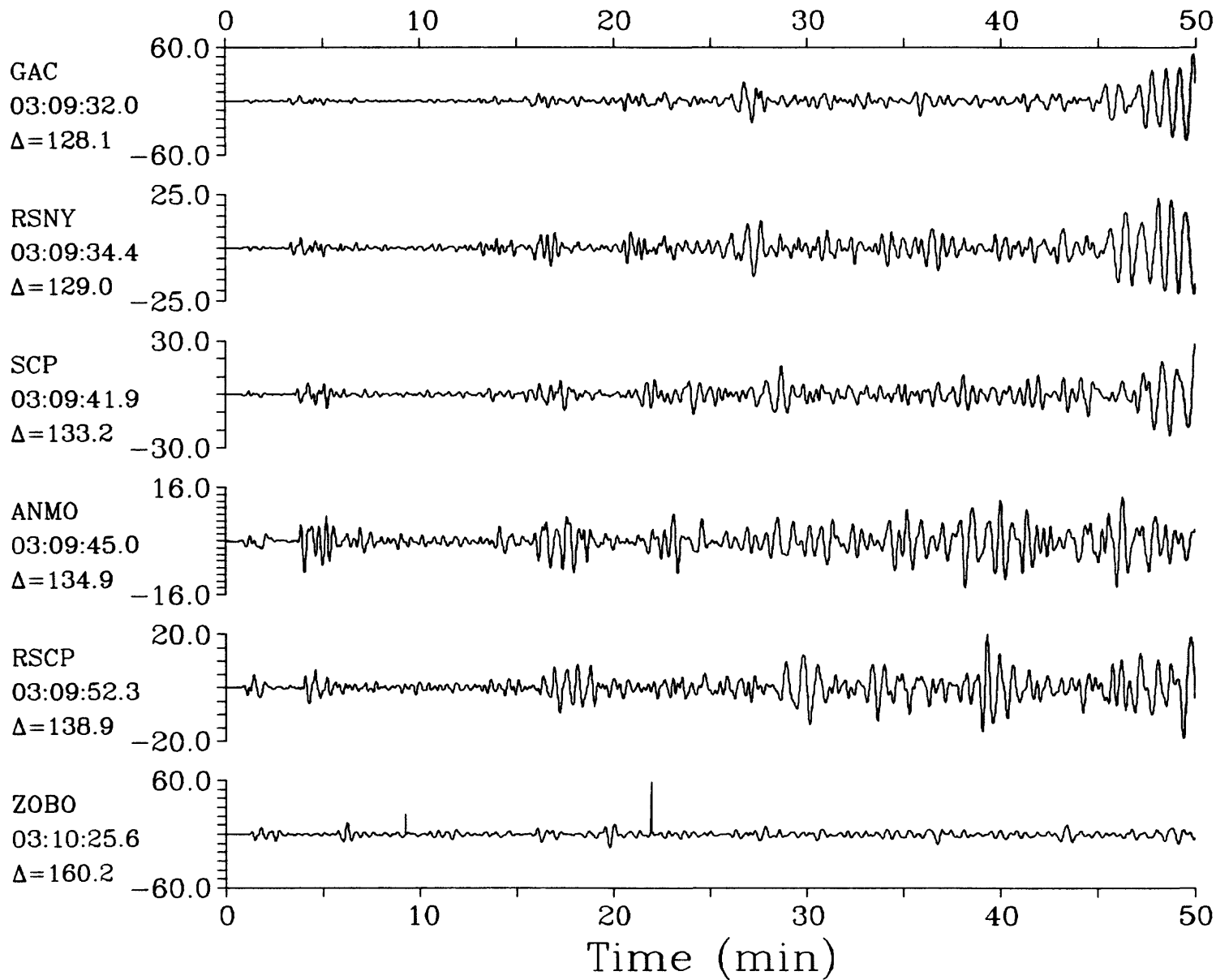






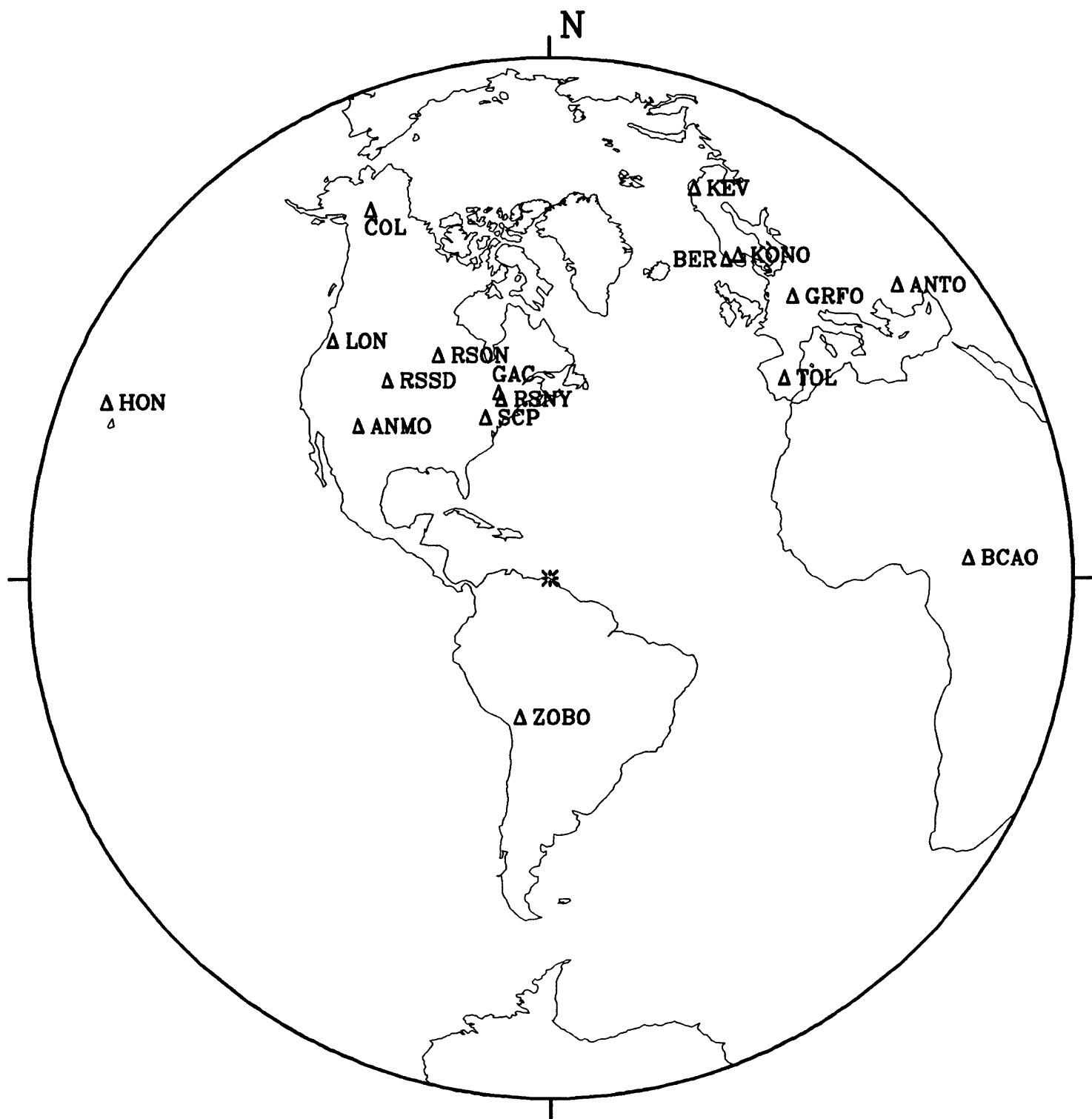
04 April 1983 02:51:34.36
Northern Sumatra h=78.5 MB=6.6

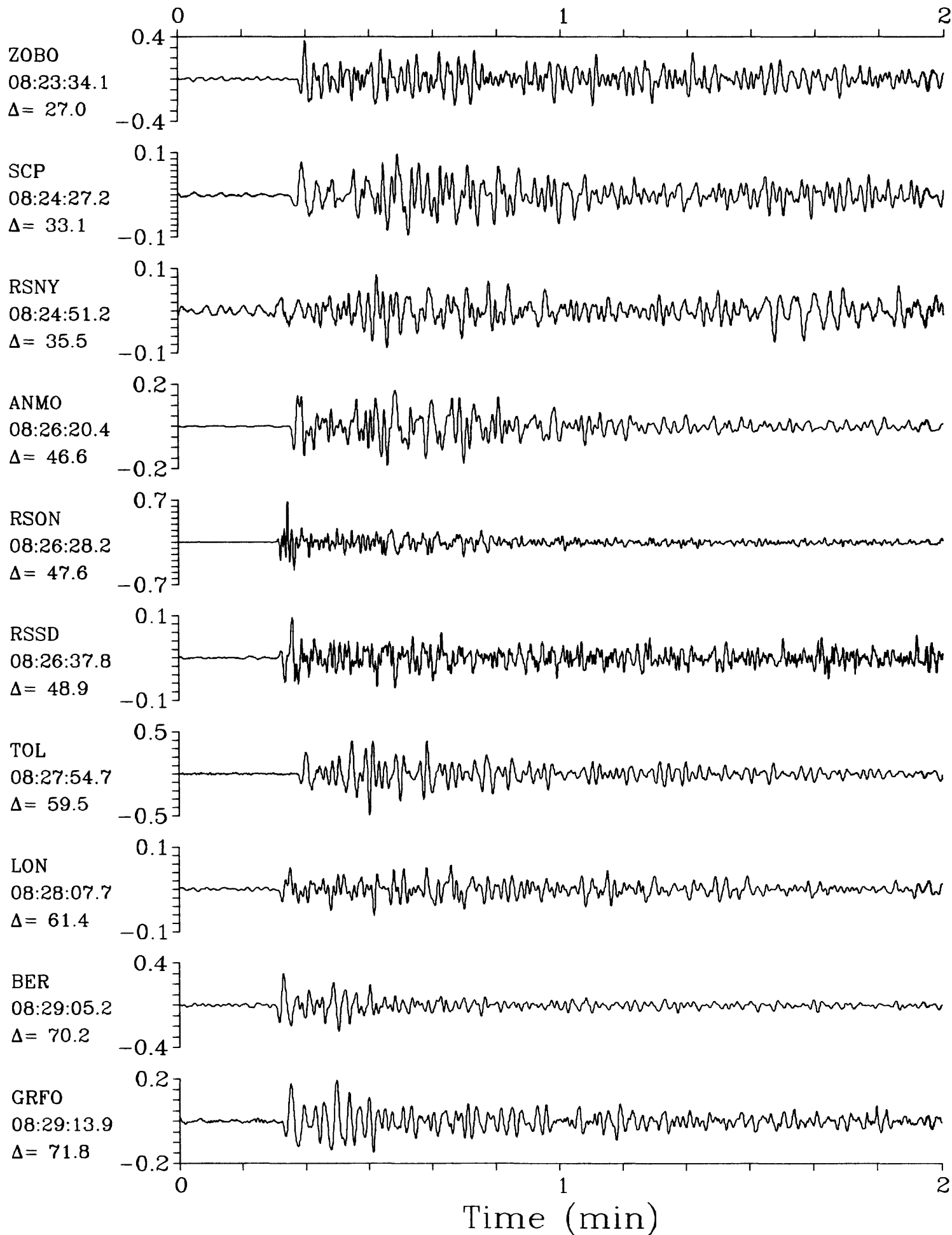




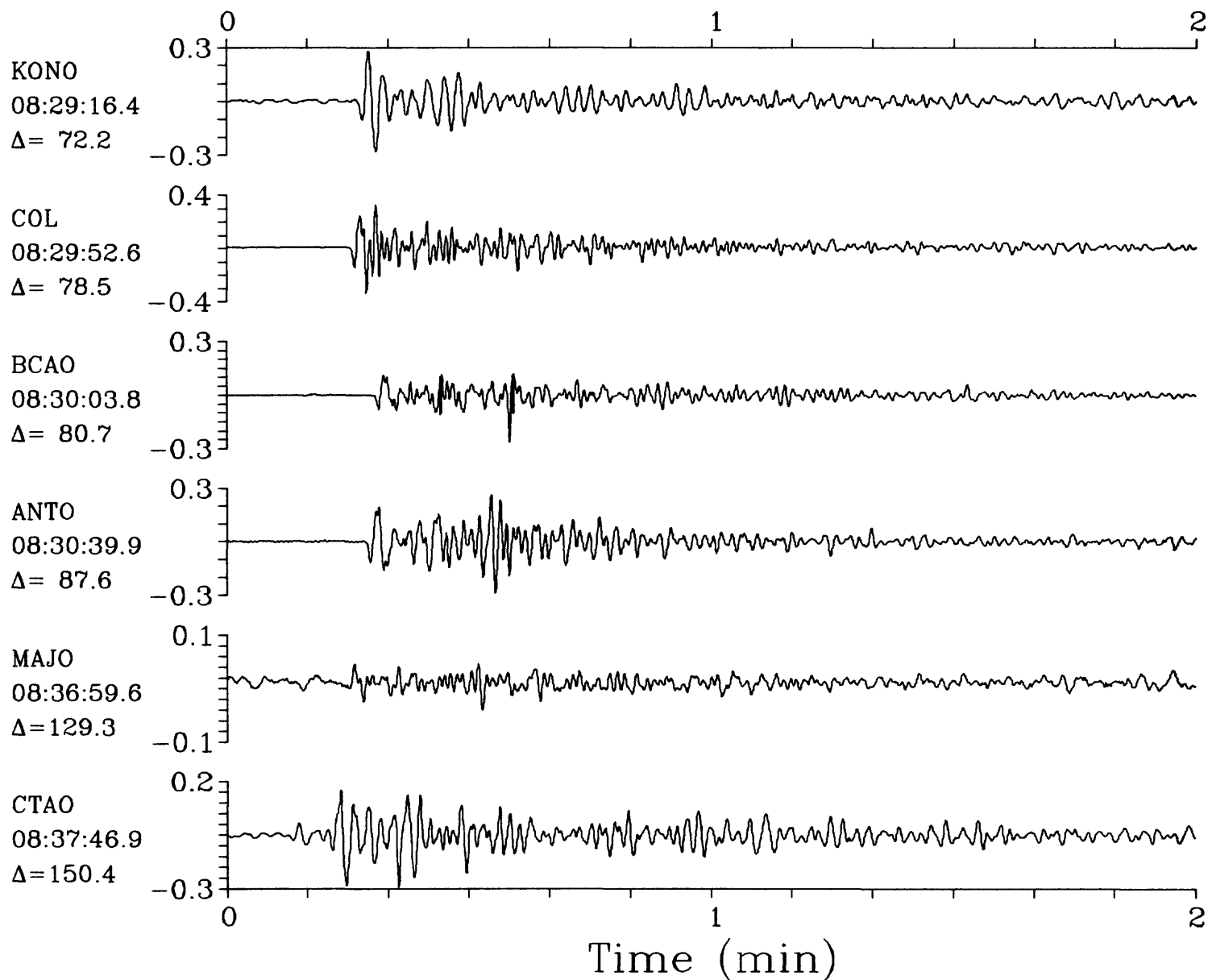
11 April 1983 08:18:10.12

Near Coast of Venezuela



Near Coast of Venezuela $h=40.0$ MB=6.0 ms=5.9

Near Coast of Venezuela h=40.0 MB=6.0 ms=5.9

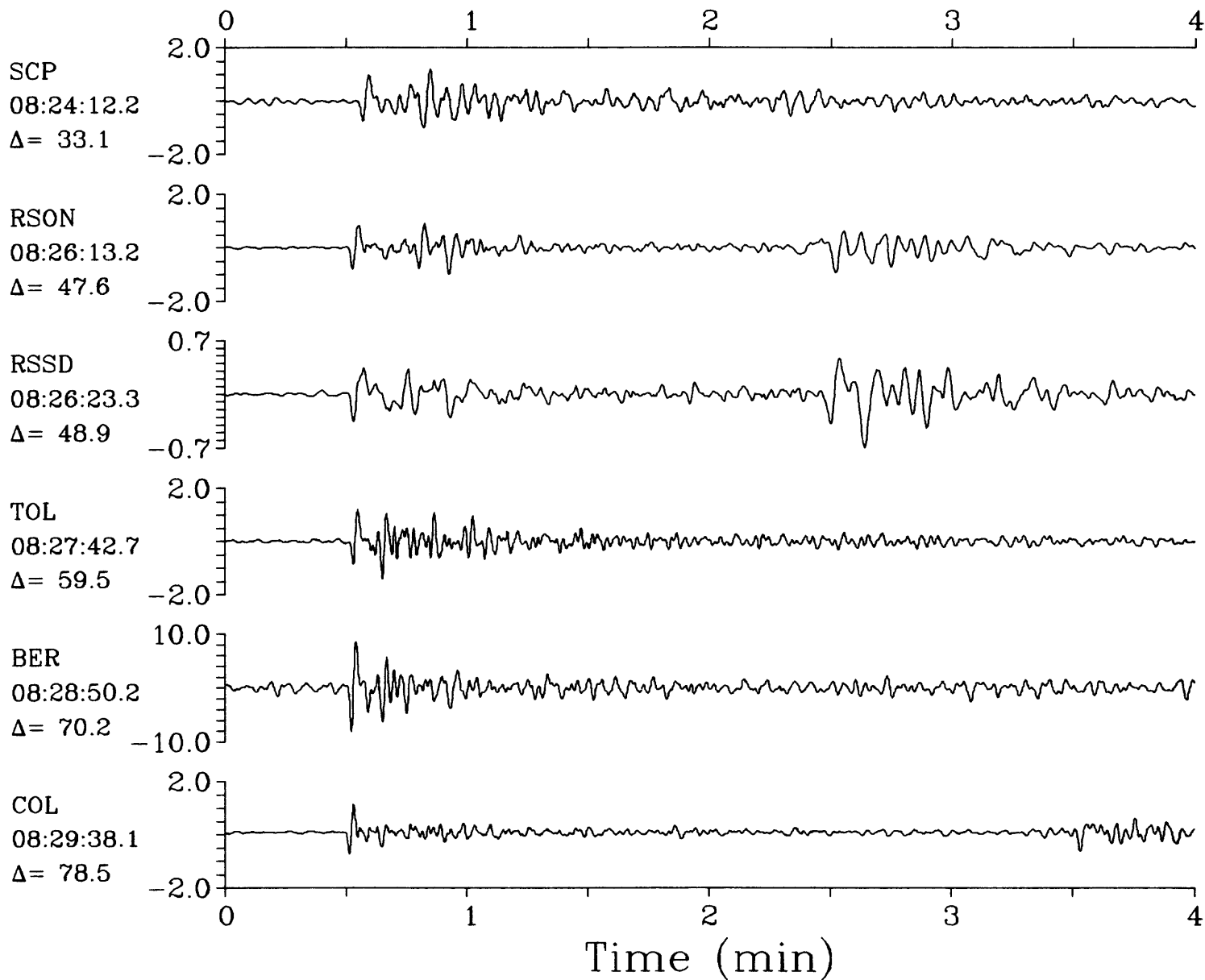


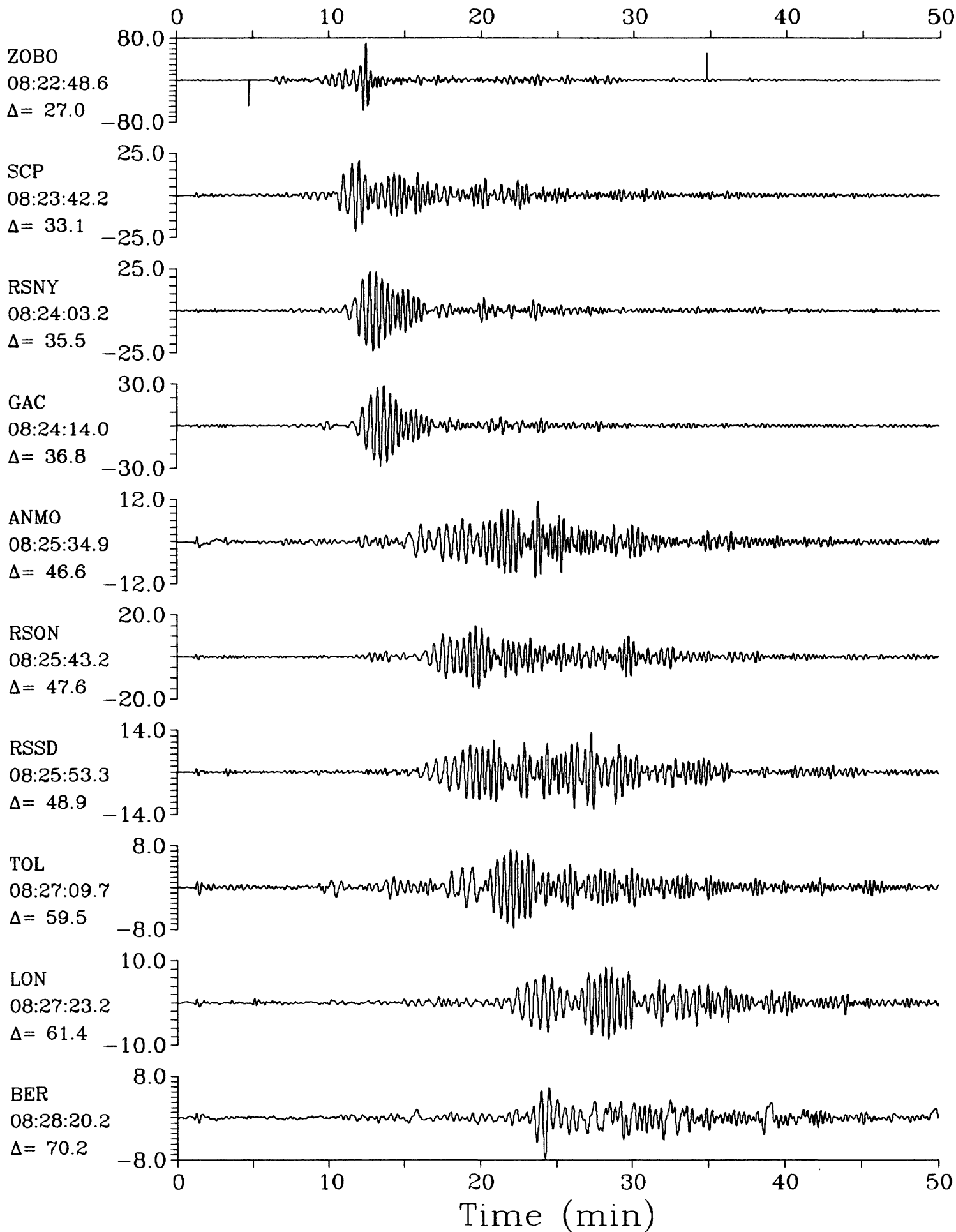
IPZ

11 April 1983 08:18:10.12

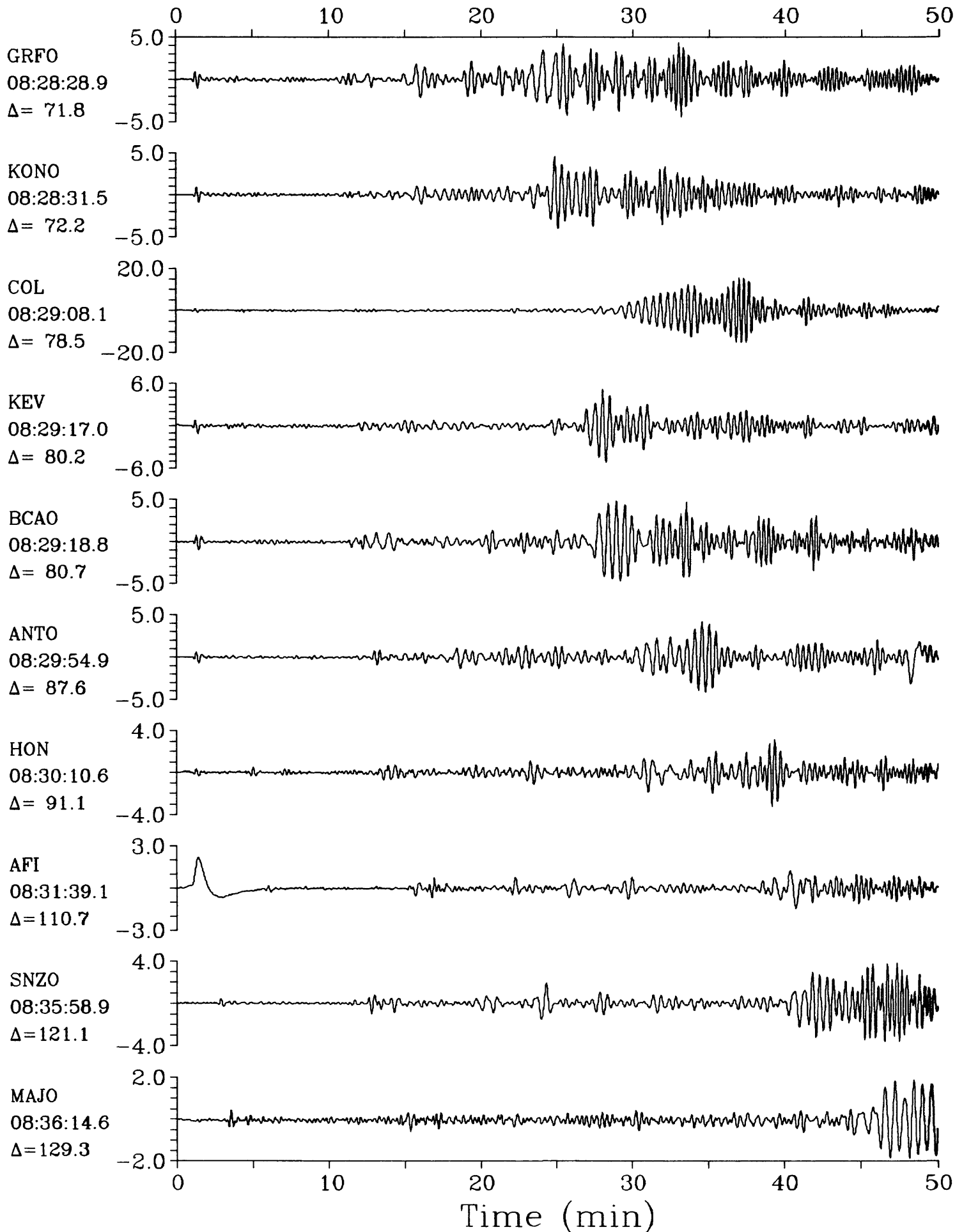
IPZ¹²⁷

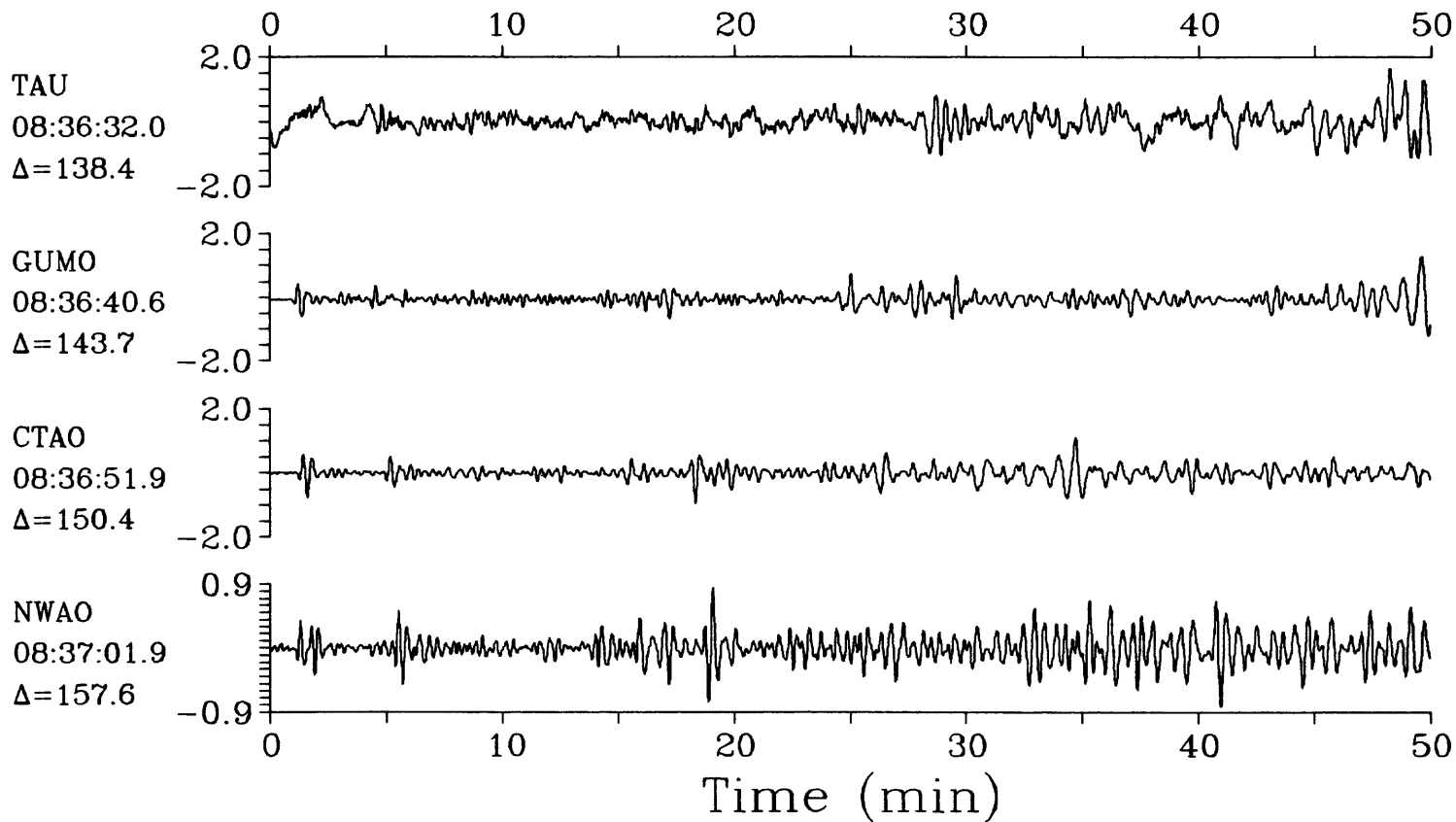
Near Coast of Venezuela h=40.0 MB=6.0 ms=5.9



Near Coast of Venezuela $h=40.0$ MB=6.0 ms=5.9

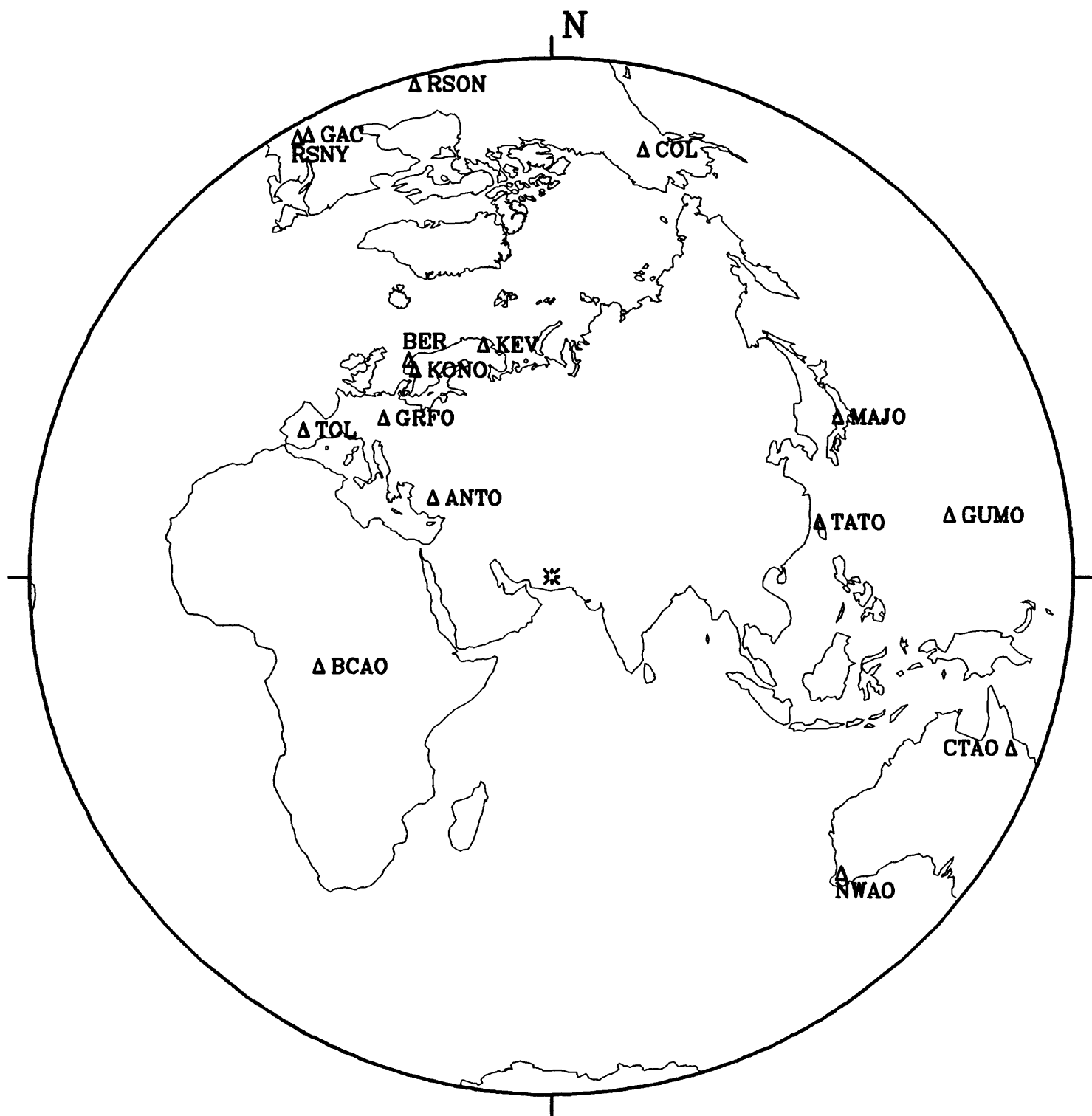
Near Coast of Venezuela h=40.0 MB=6.0 ms=5.9

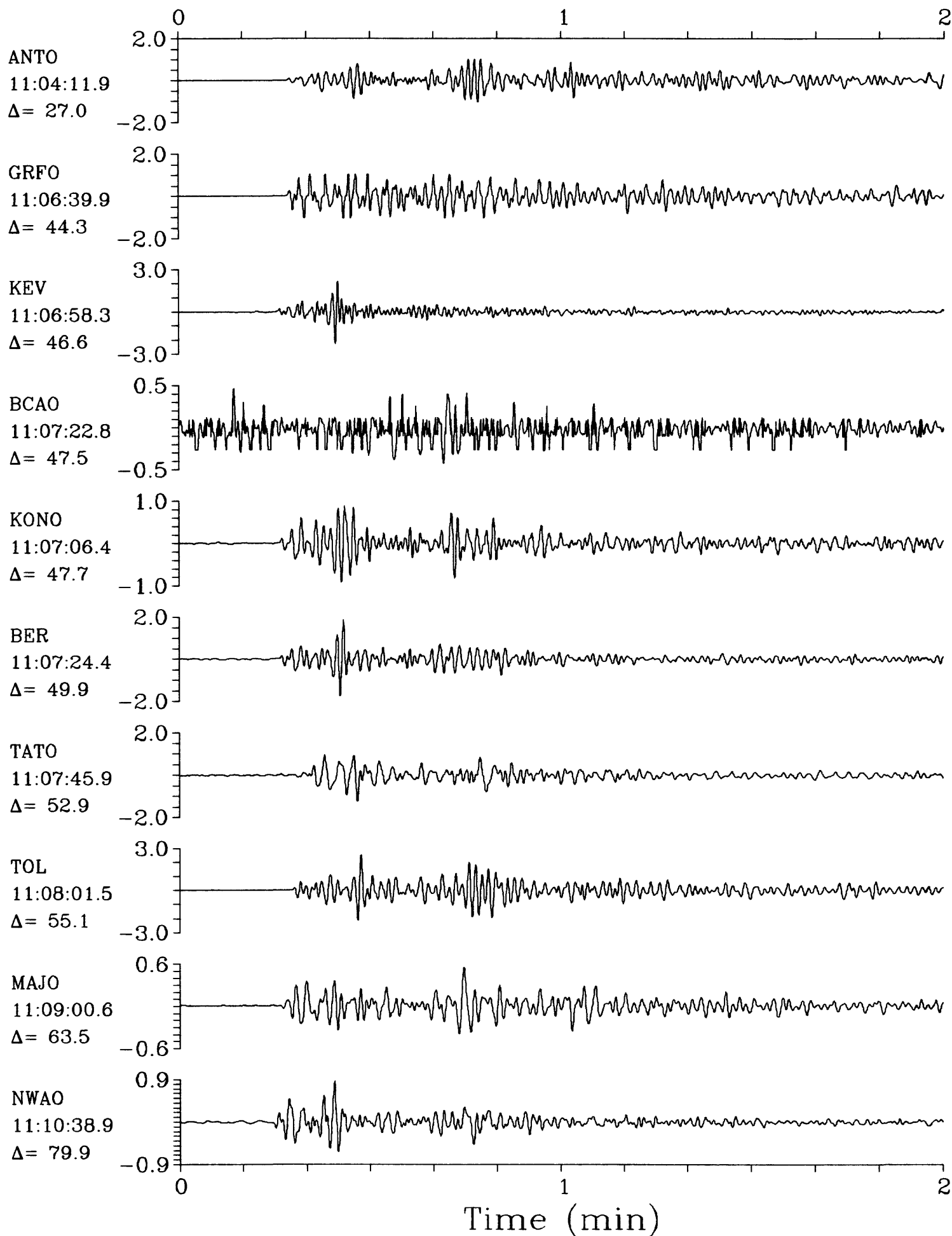


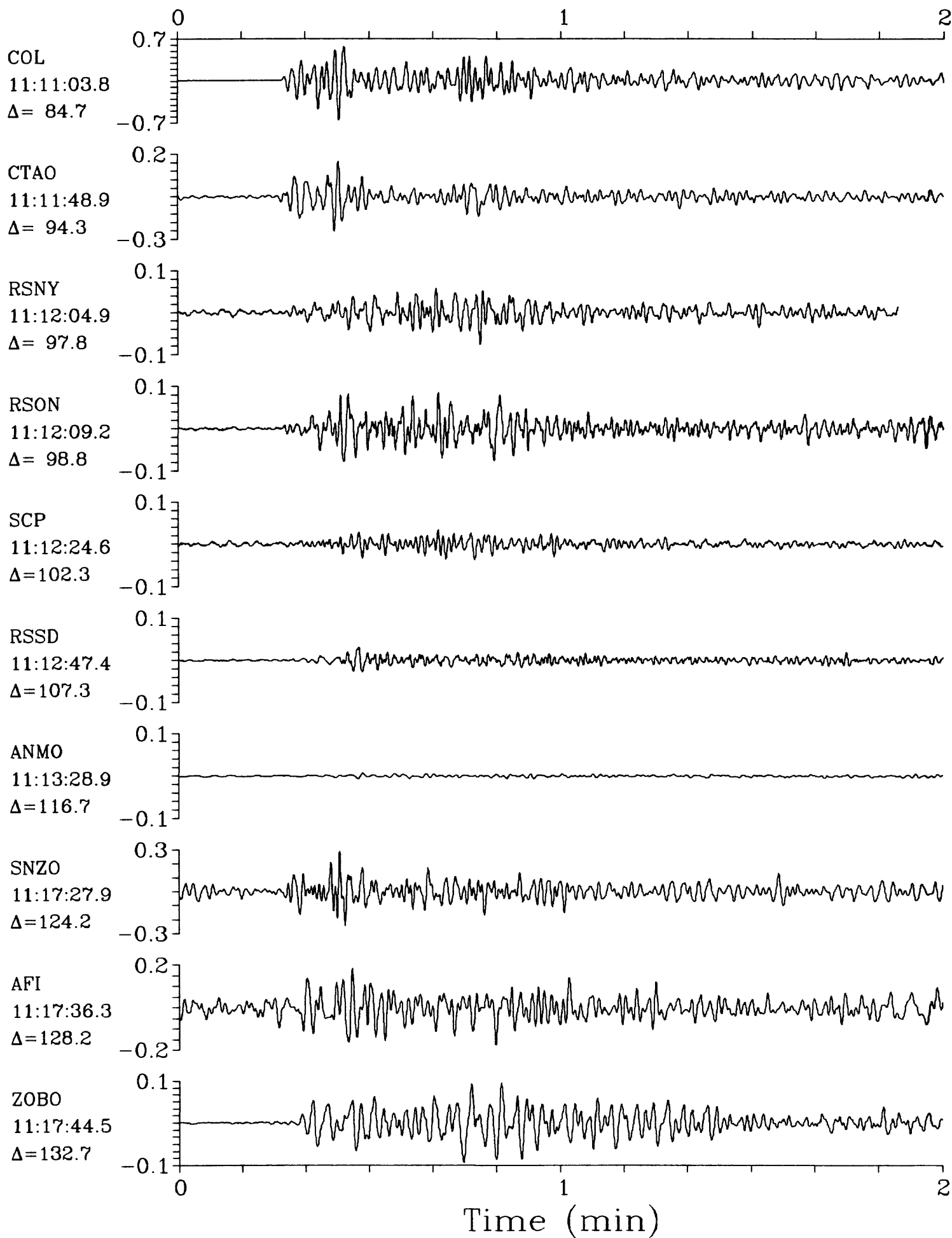
Near Coast of Venezuela $h=40.0$ MB=6.0 ms=5.9

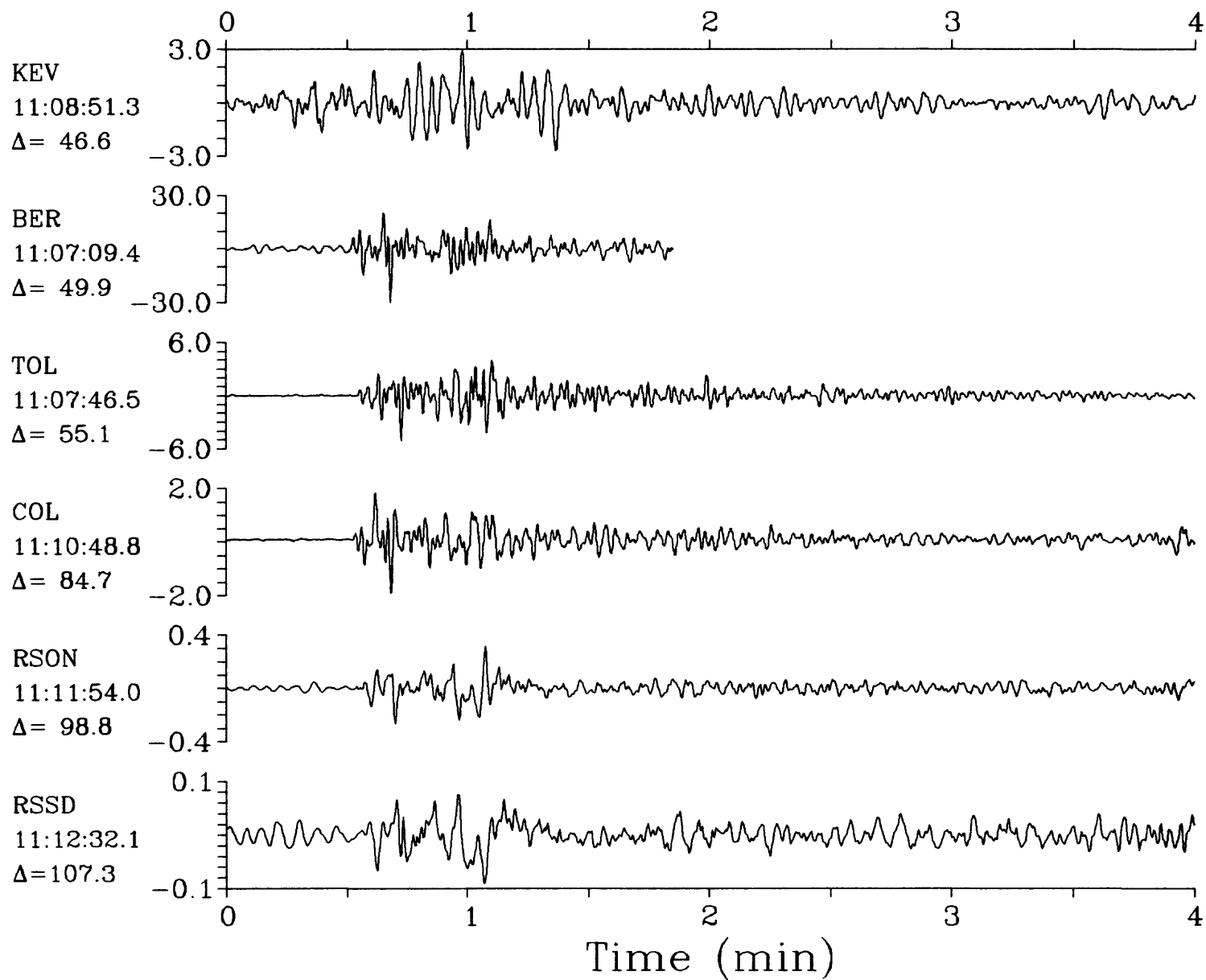
18 April 1983 10:58:51.26

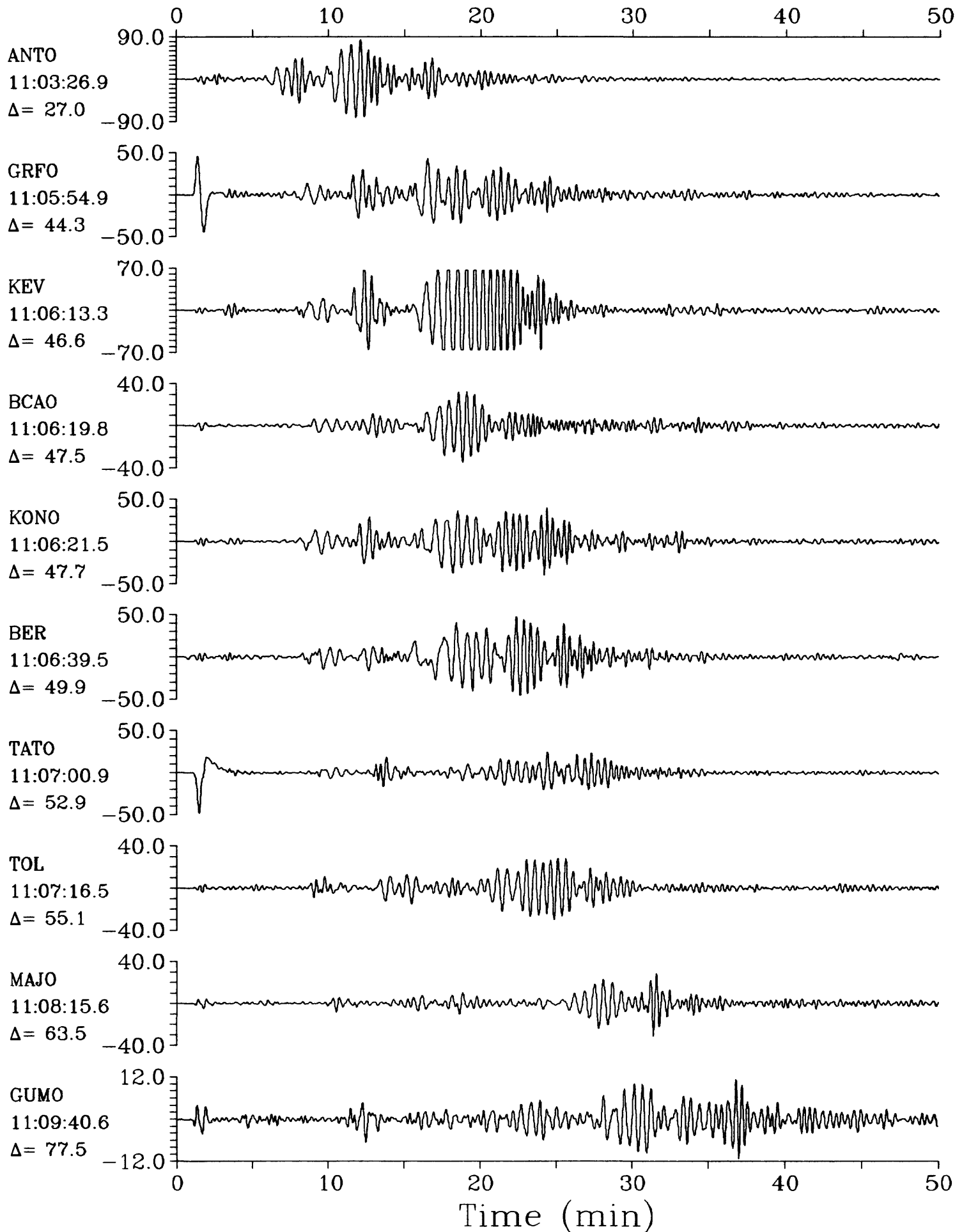
Southern Iran



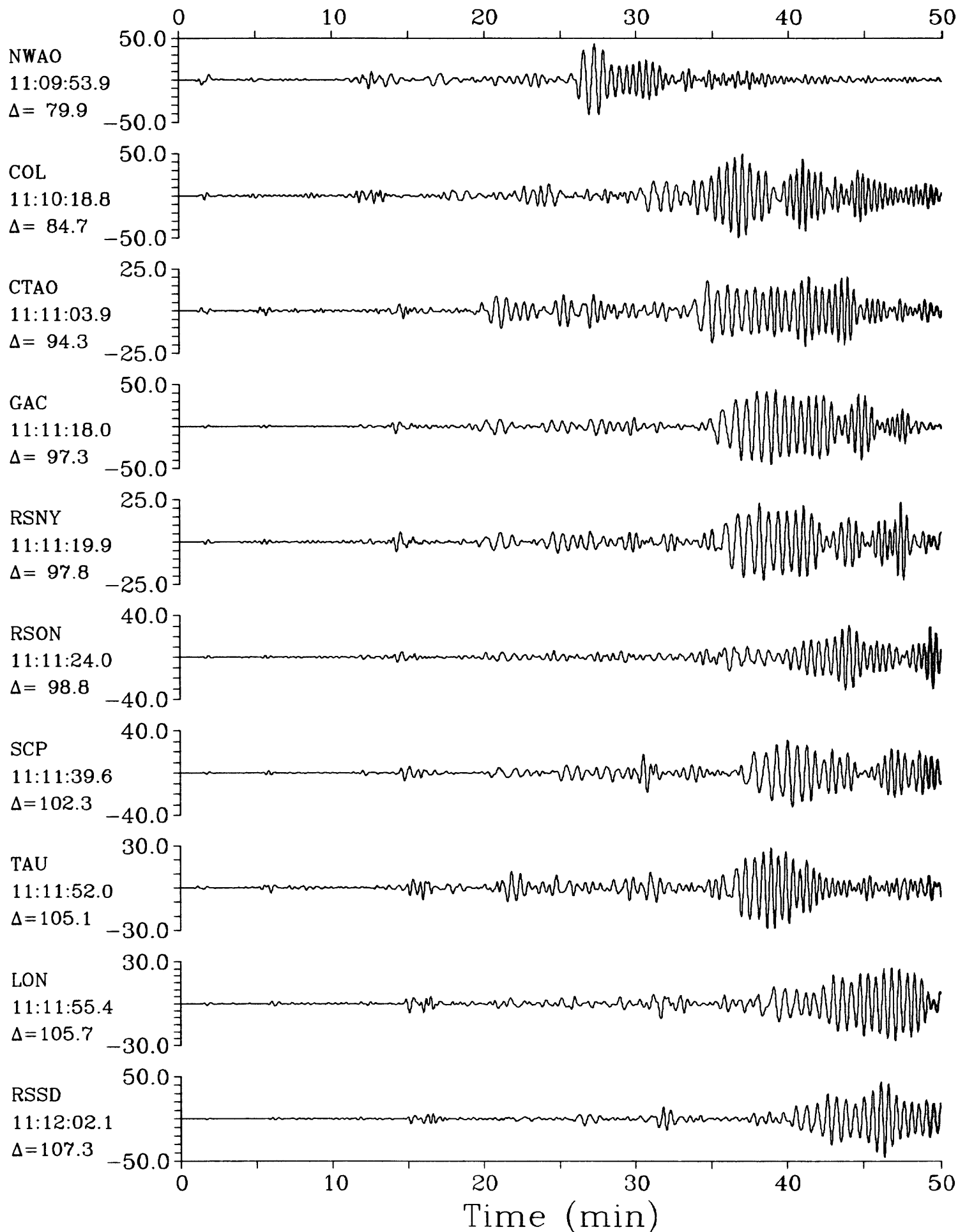


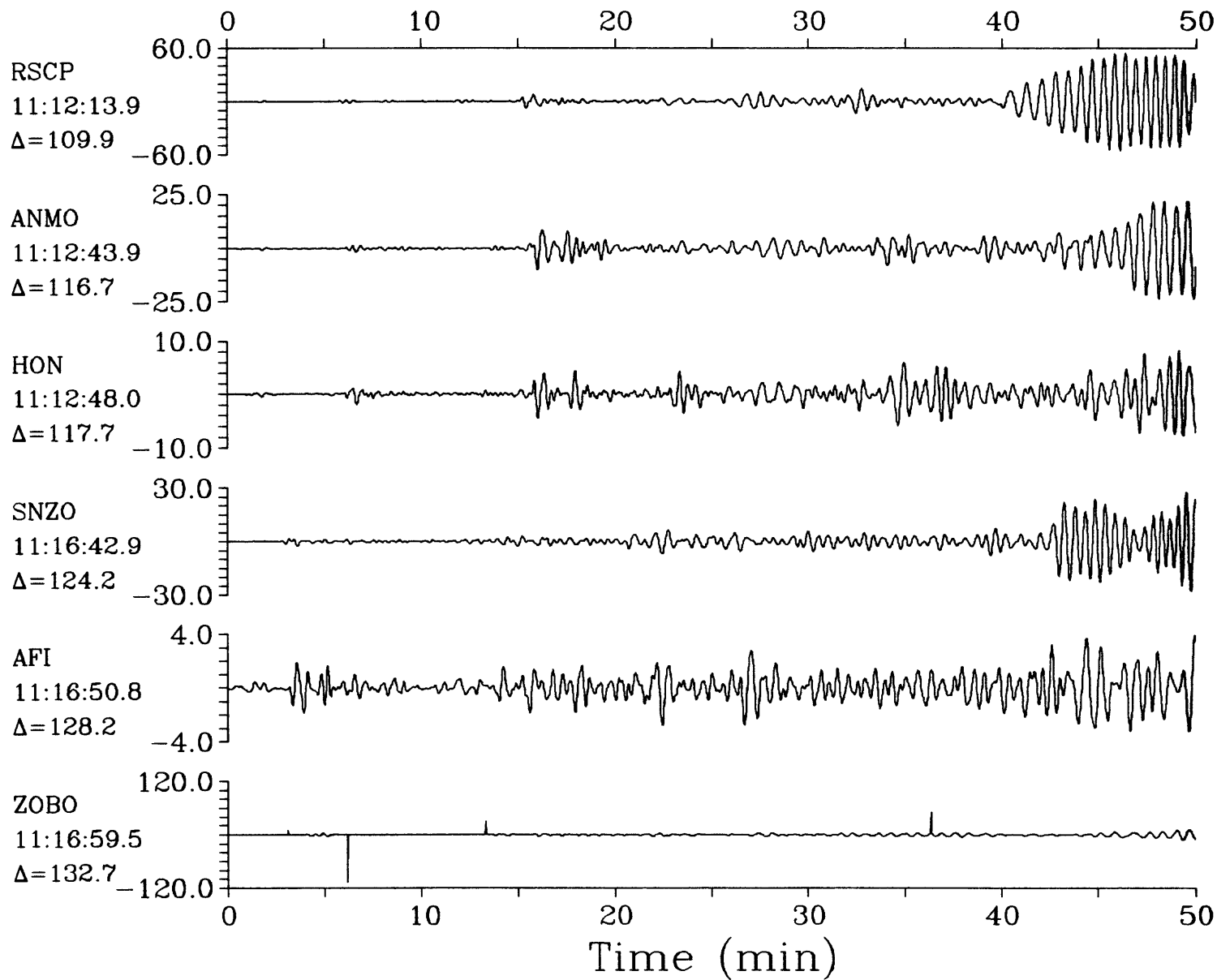






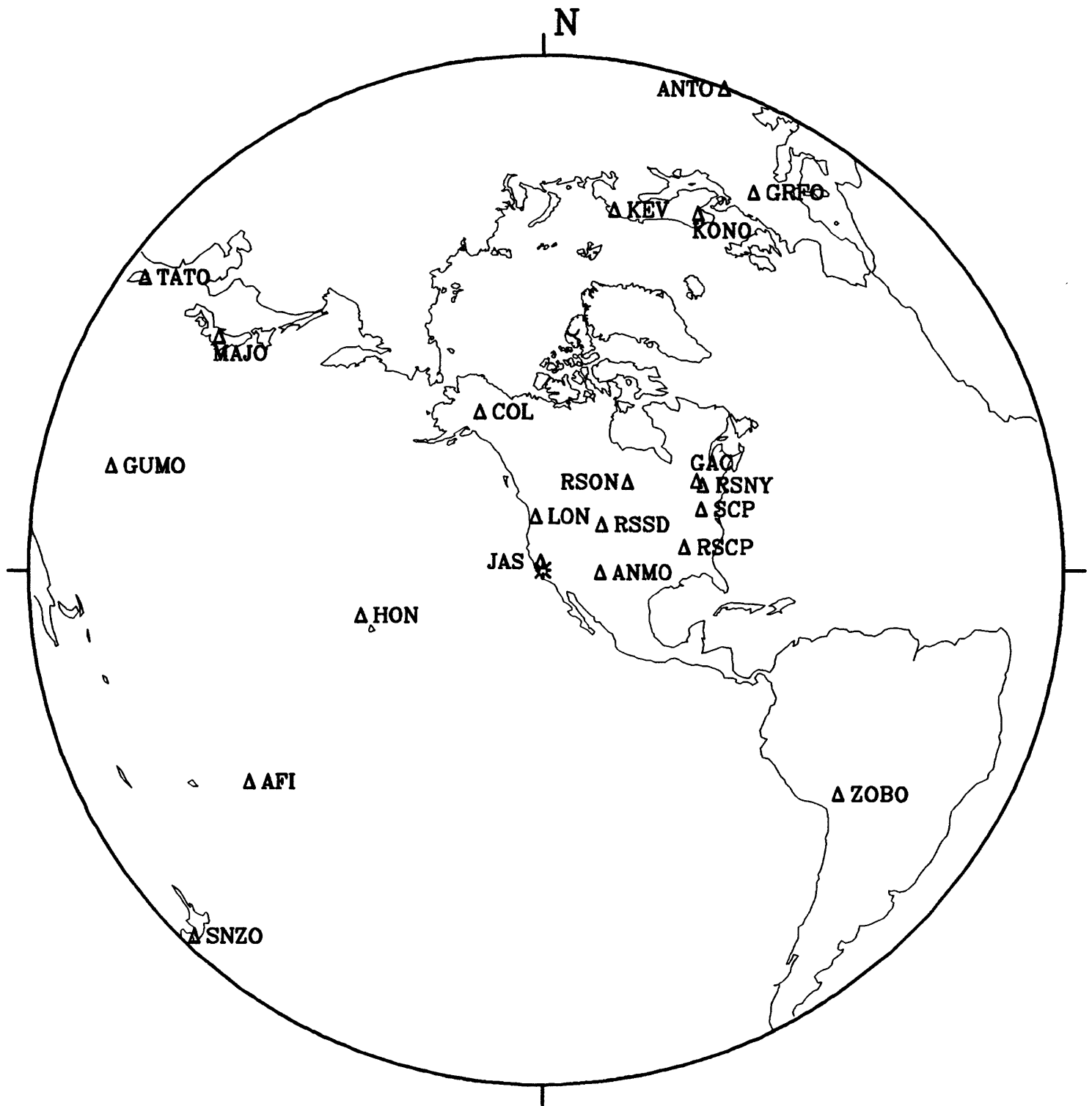
18 April 1983 10:58:51.26
Southern Iran h=64.0 MB=6.5

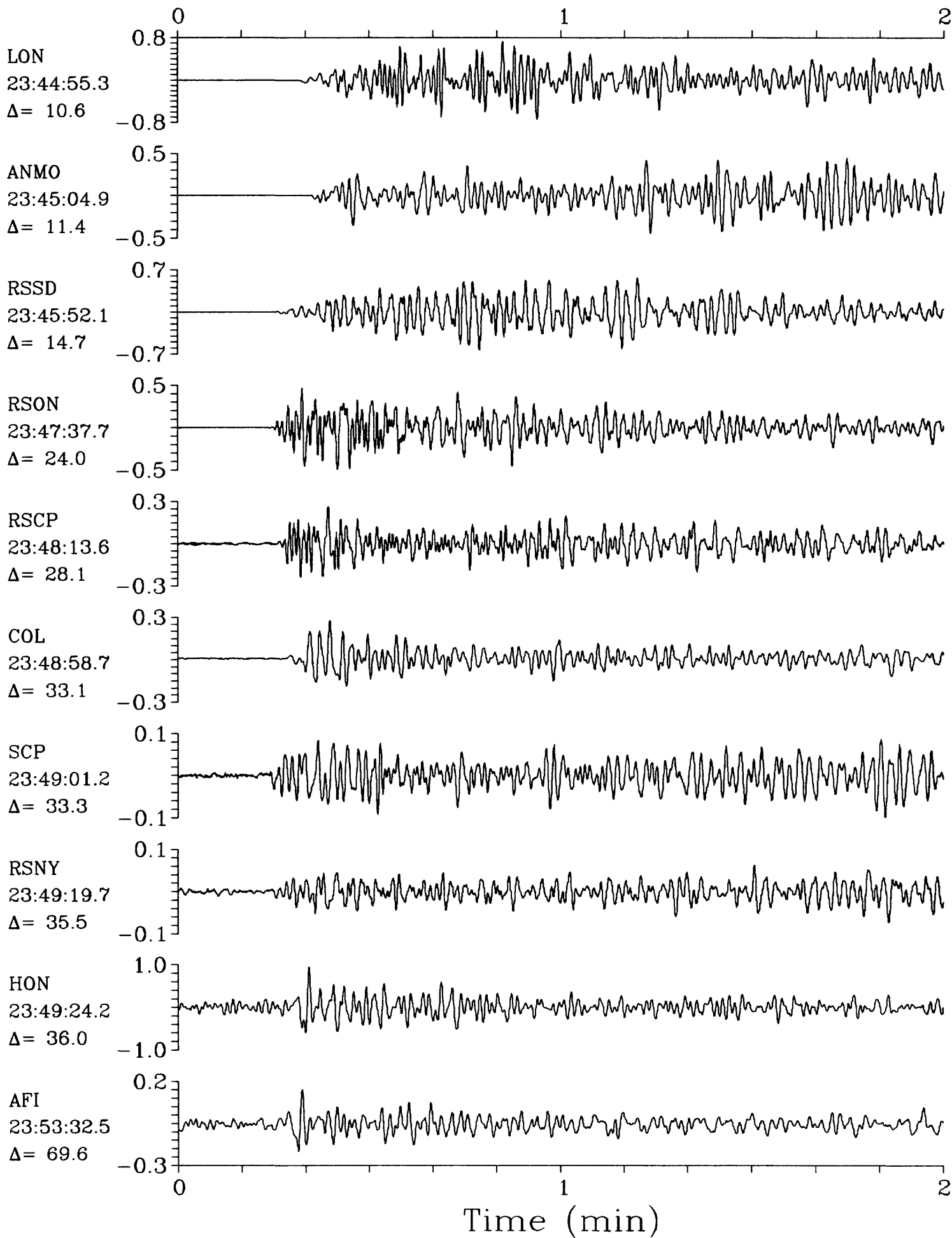


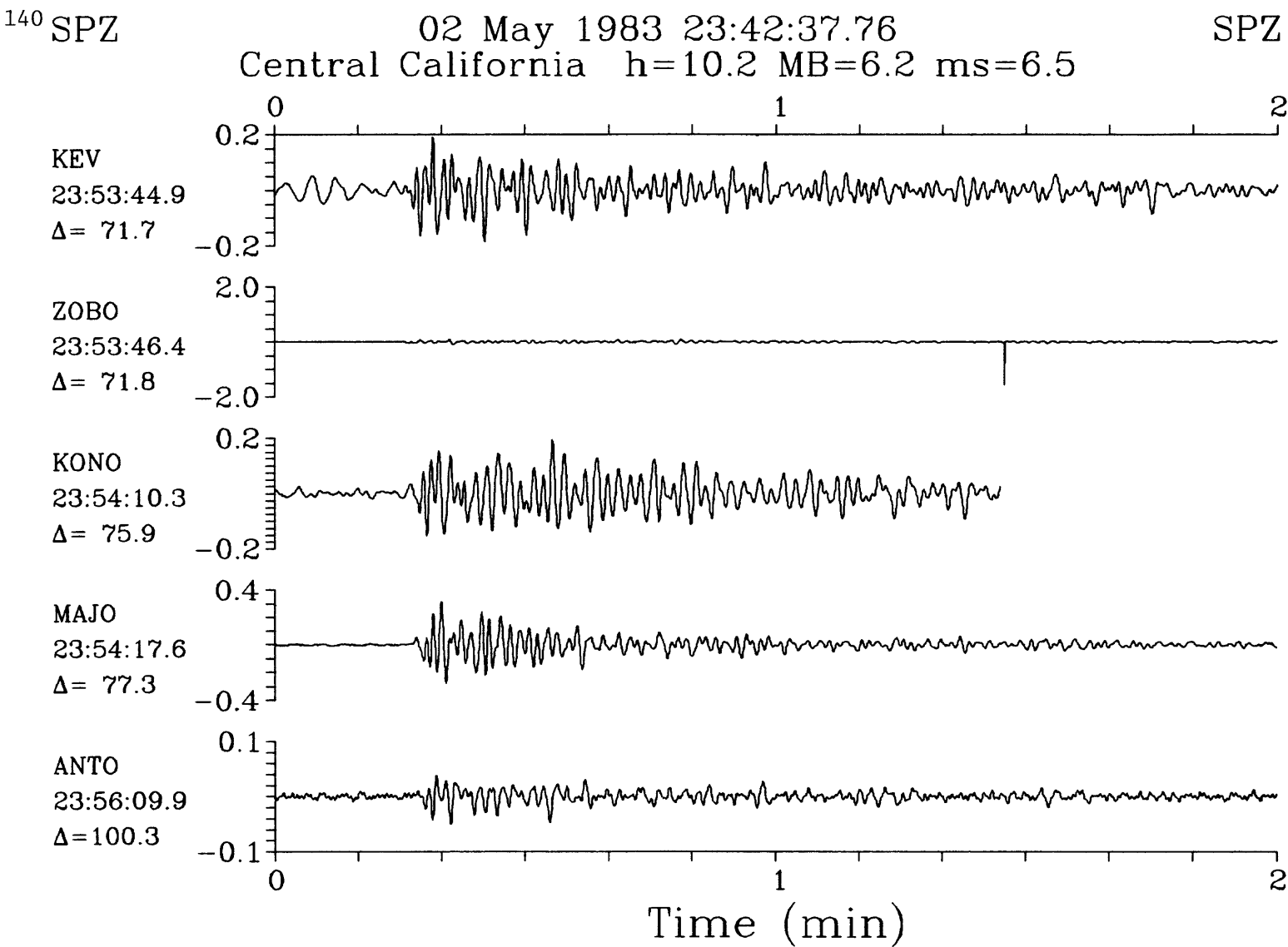


02 May 1983 23:42:37.76

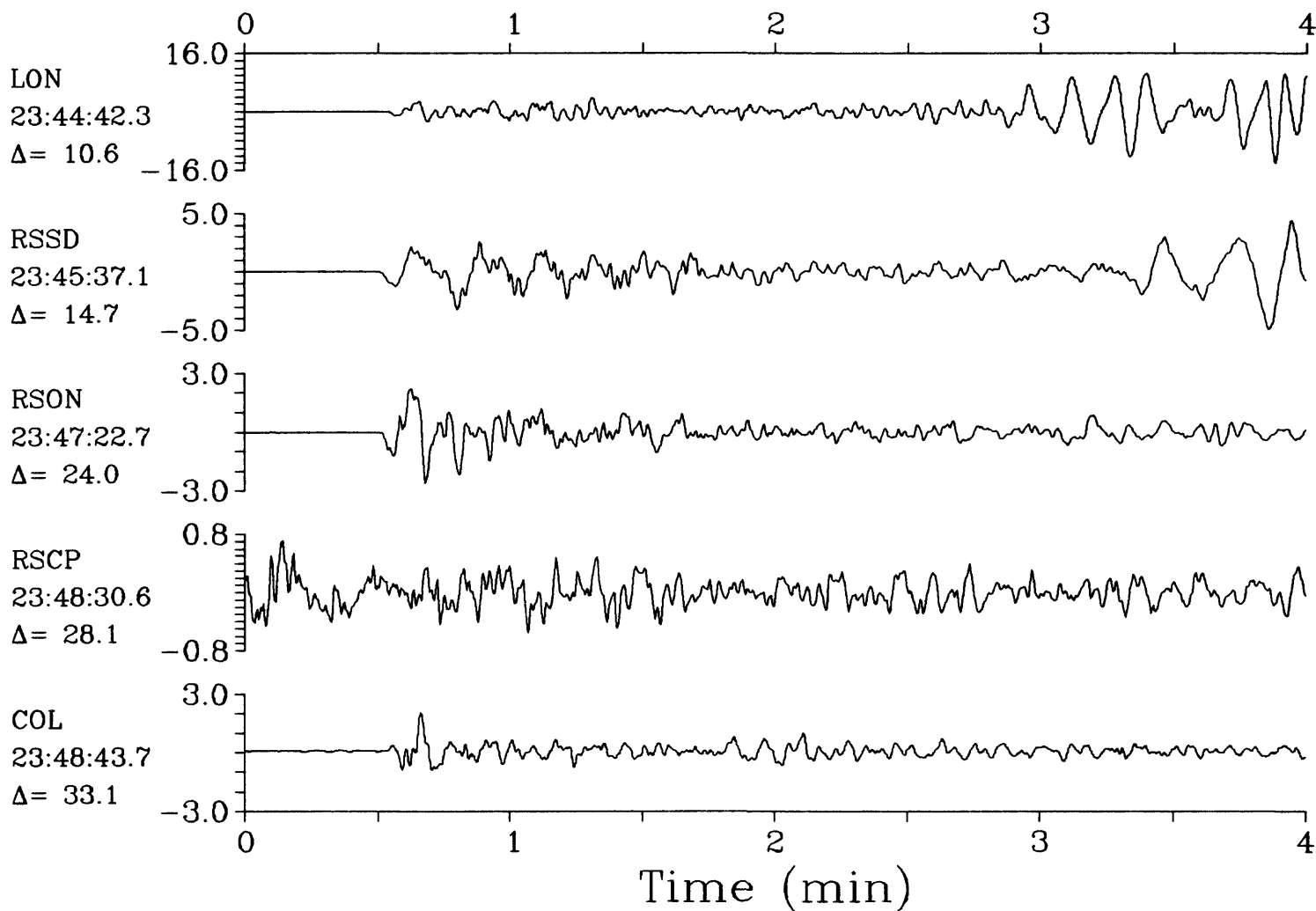
Central California



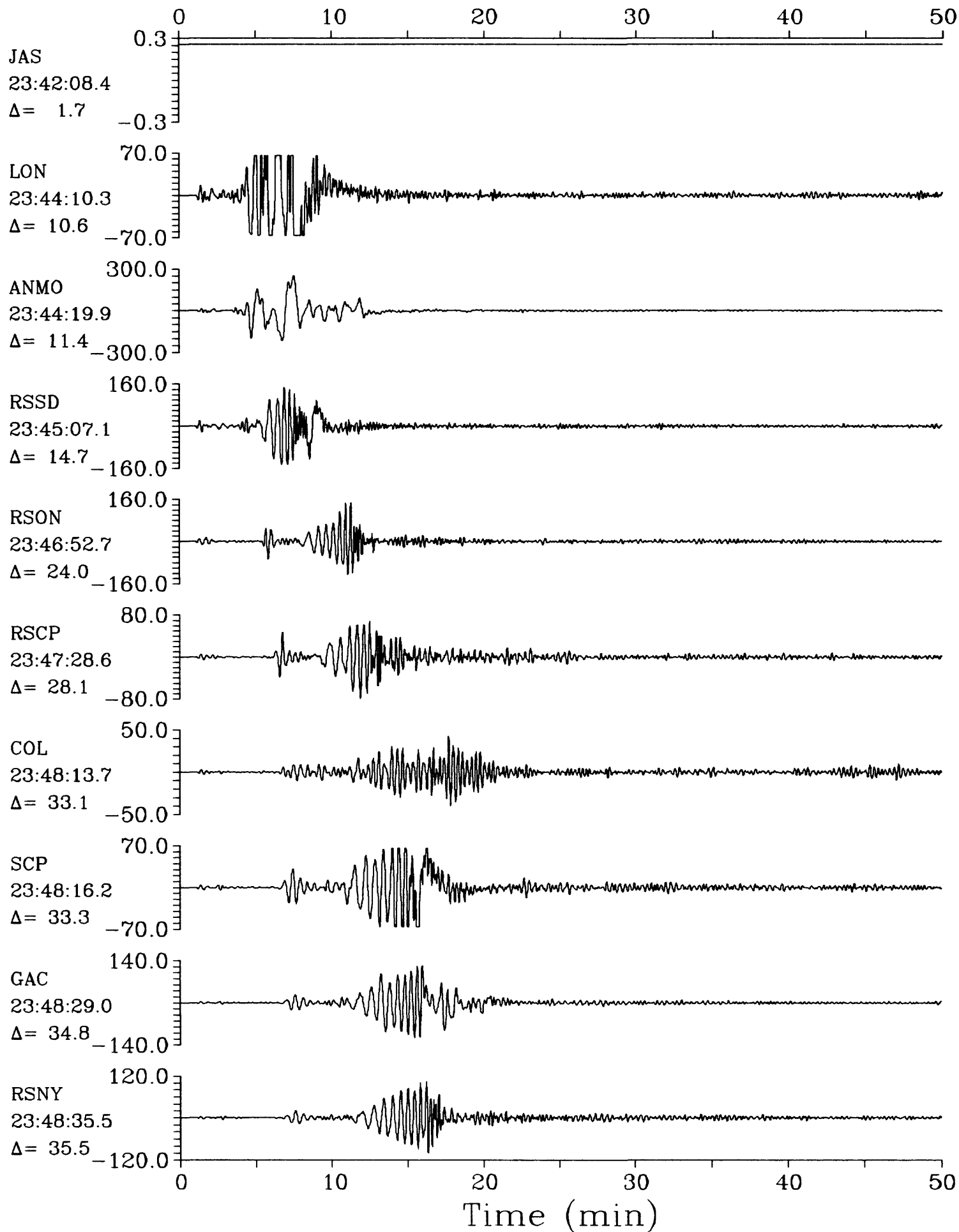


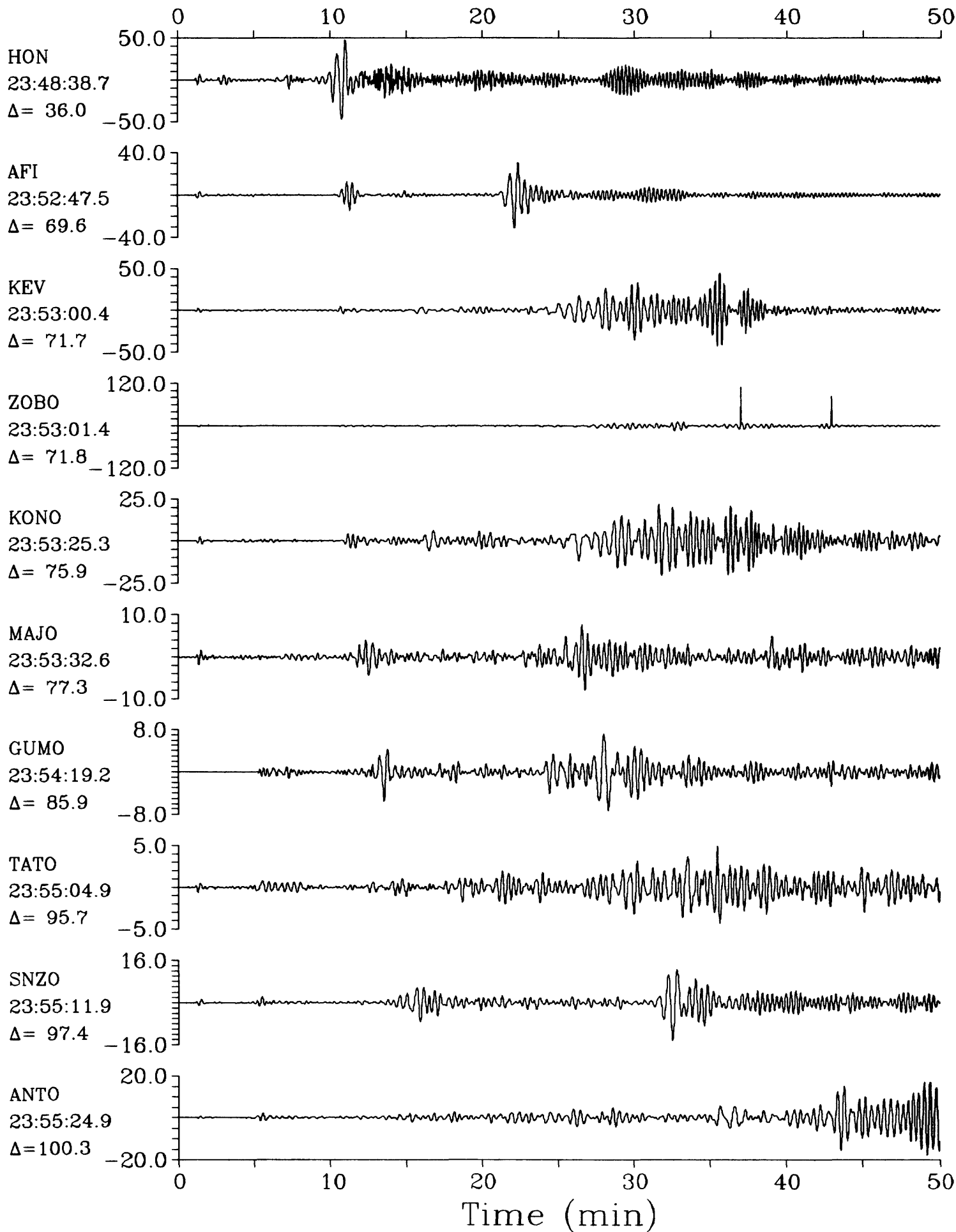


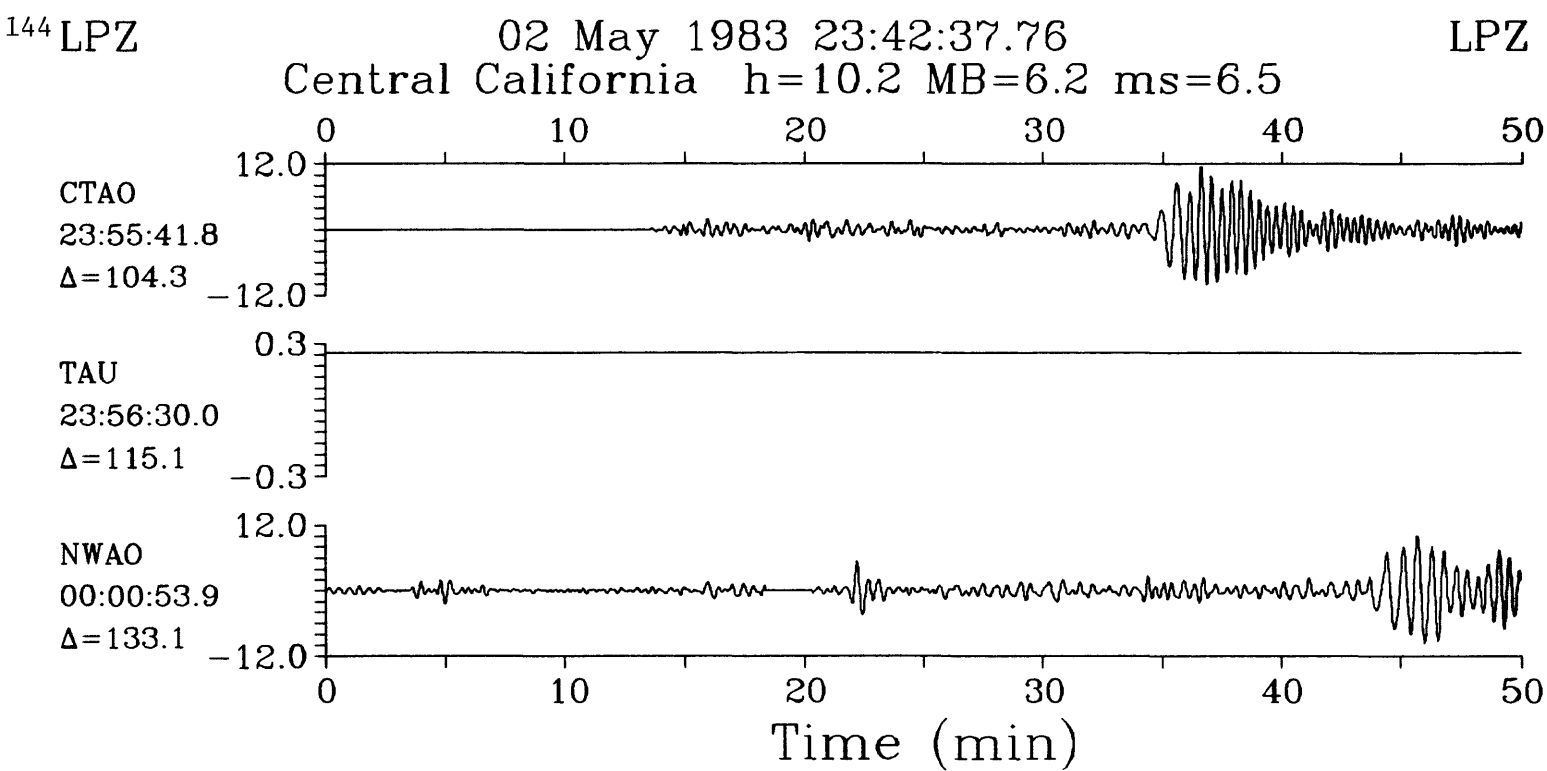
IPZ

02 May 1983 23:42:37.76
Central California h=10.2 MB=6.2 ms=6.5IPZ¹⁴¹

02 May 1983 23:42:37.76

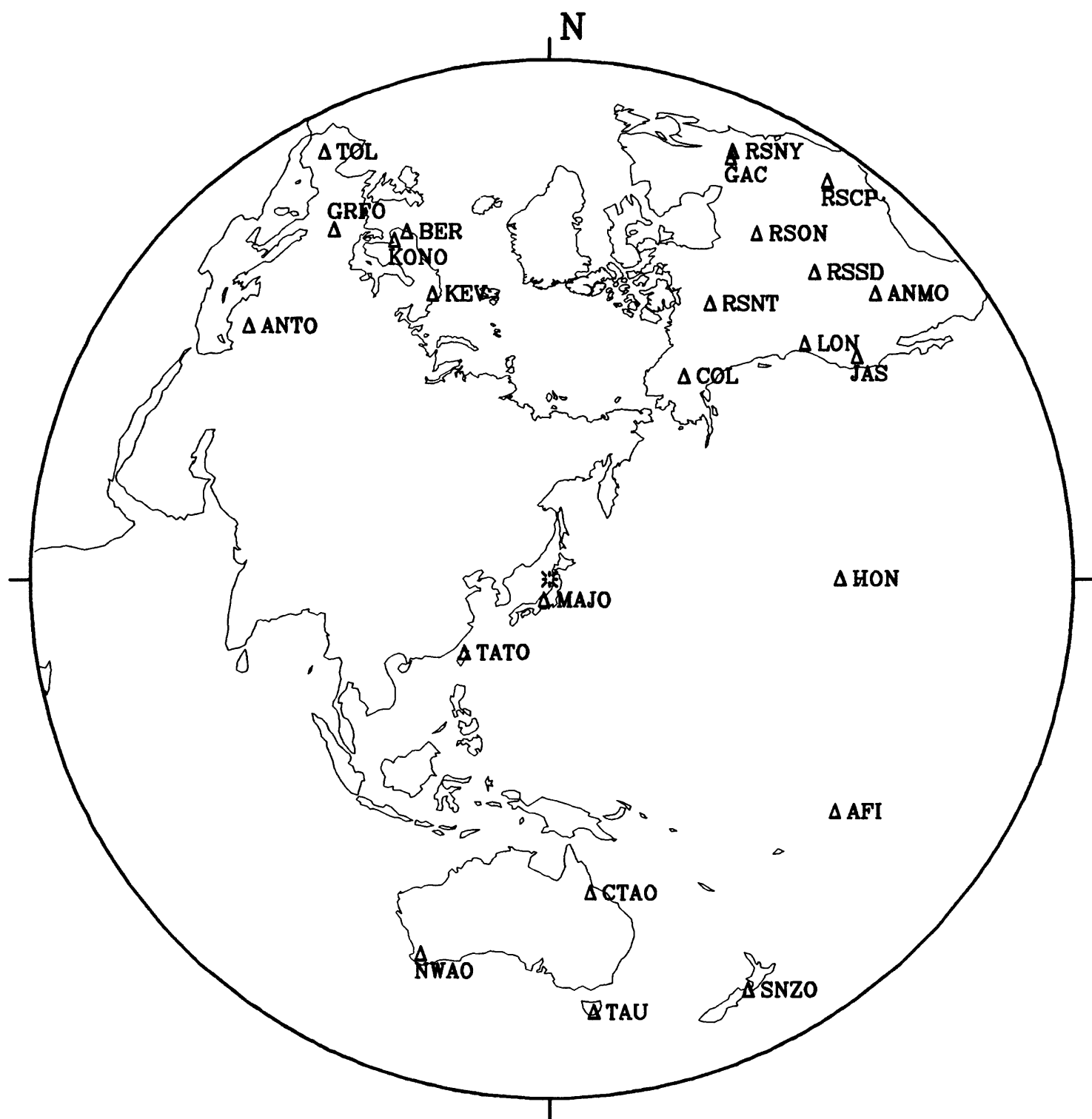
Central California $h=10.2$ MB=6.2 ms=6.5

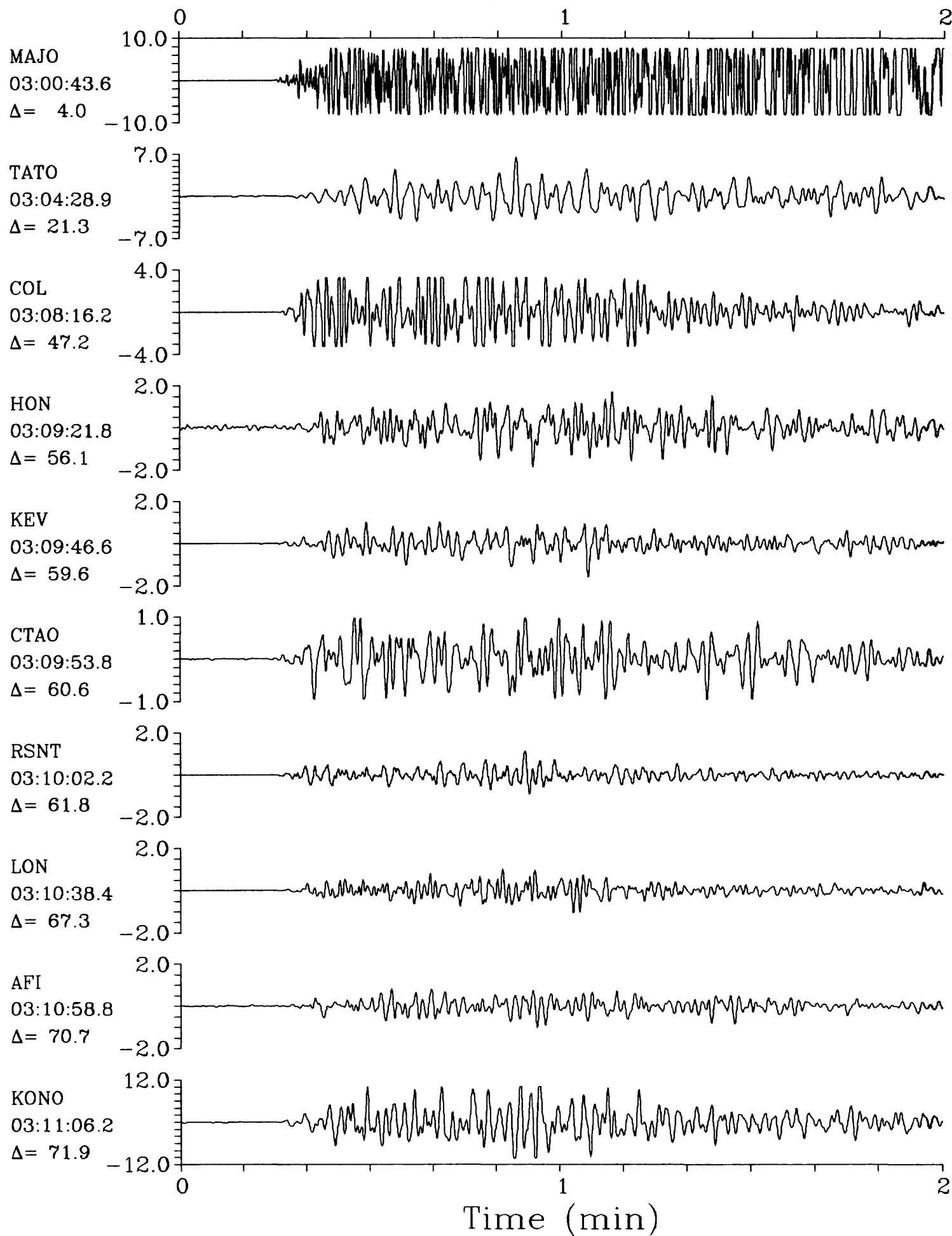
Central California $h=10.2$ MB=6.2 ms=6.5

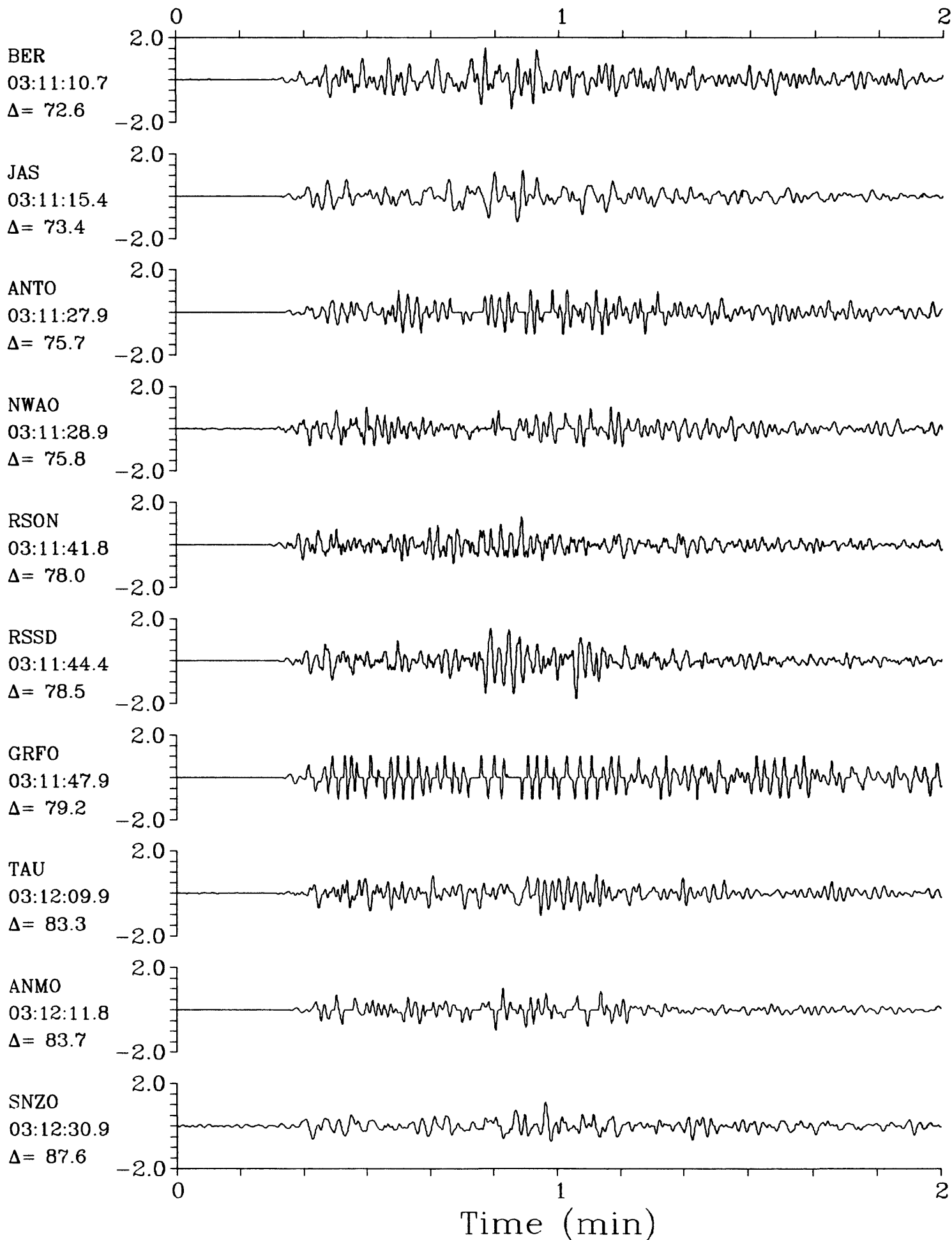


26 May 1983 02:59:59.60

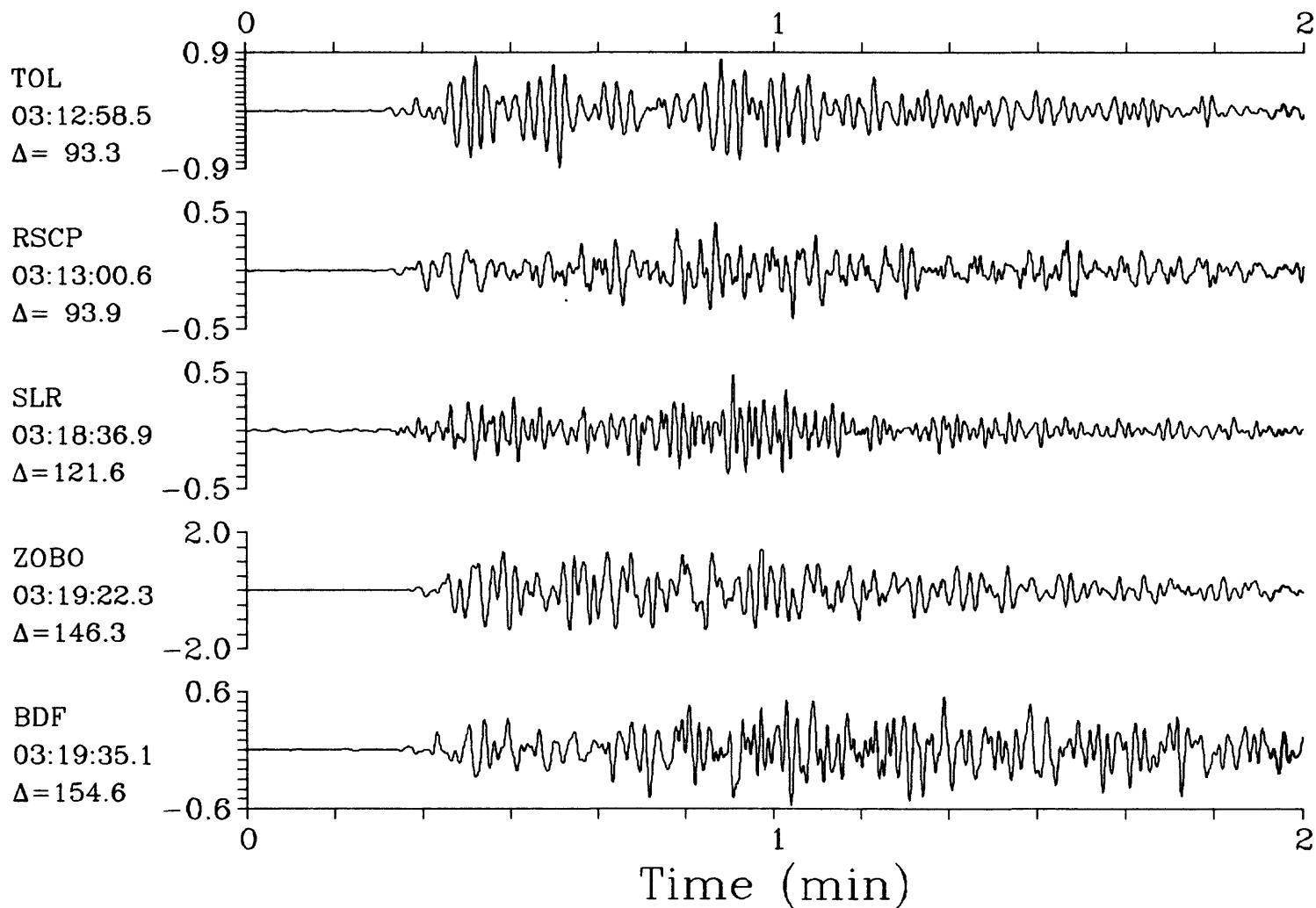
Near West Coast of Honshu, Japan

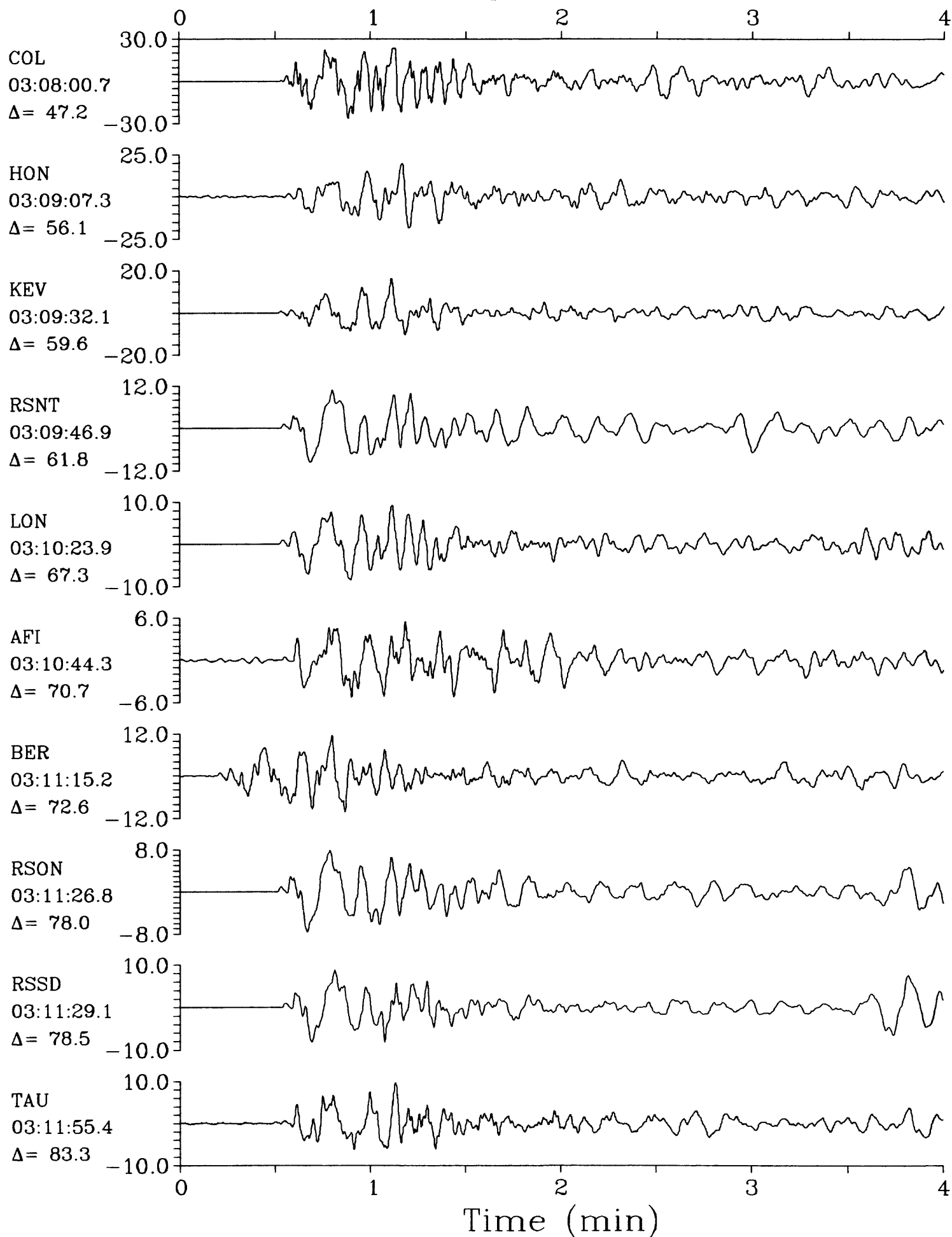


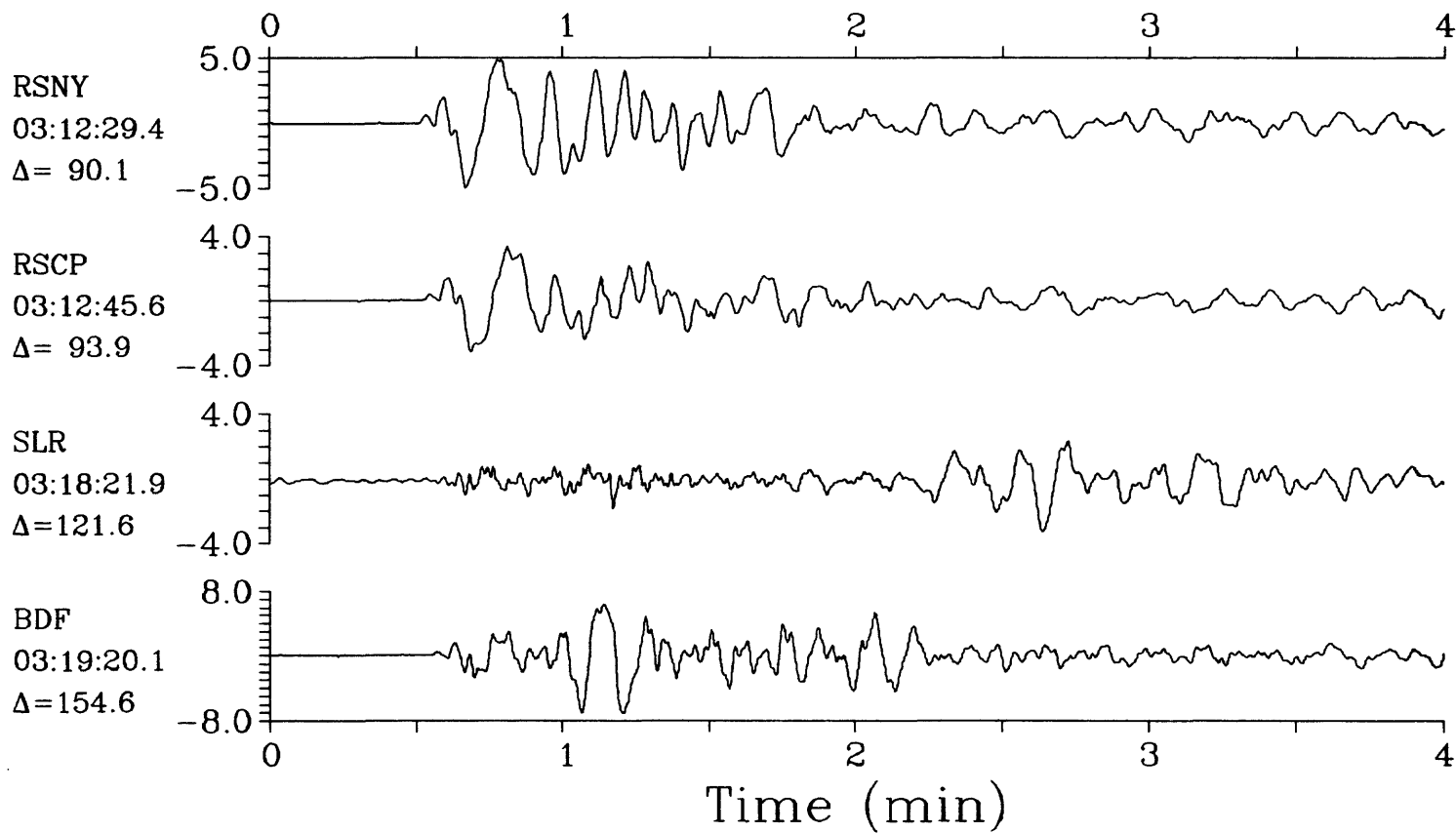


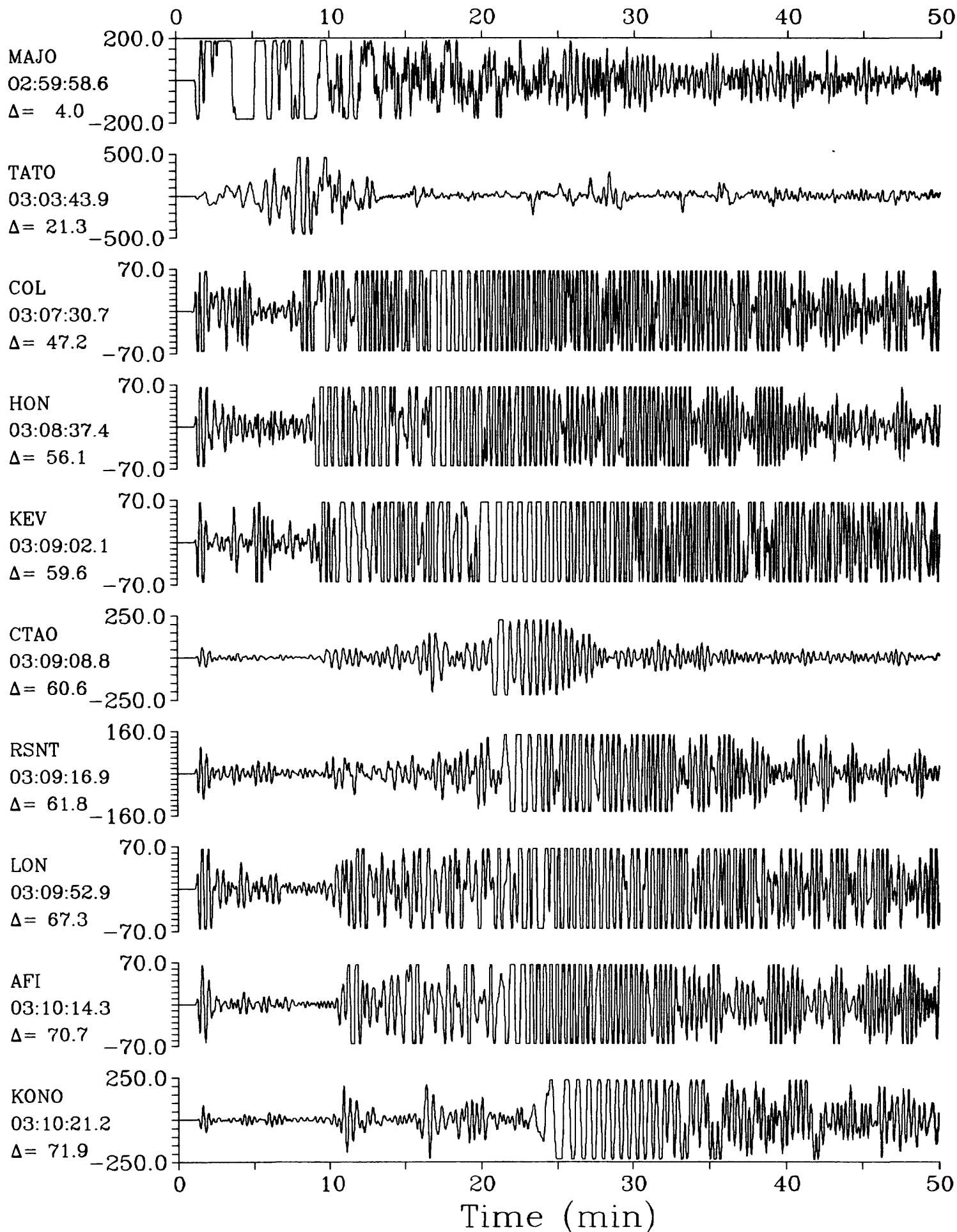


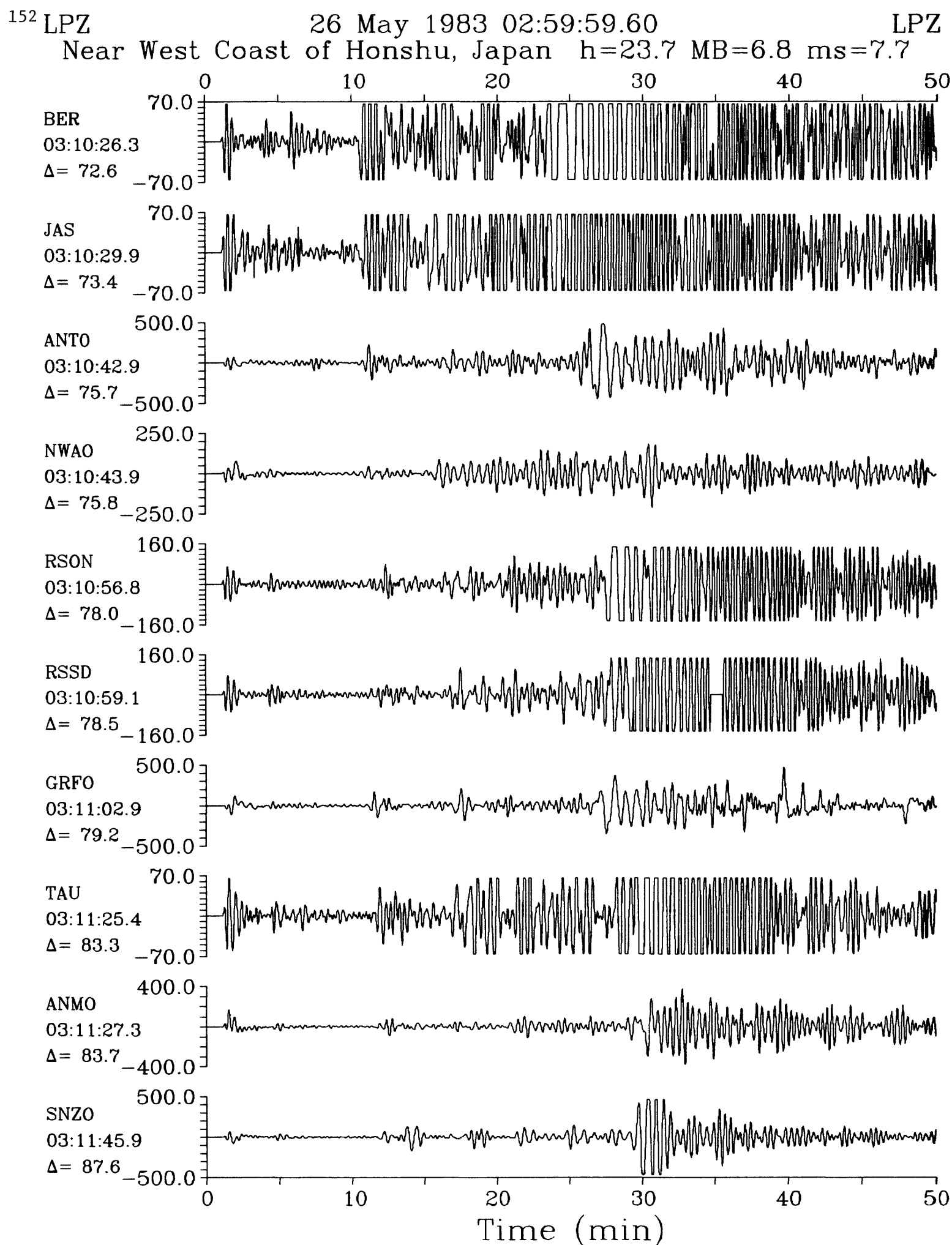
Near West Coast of Honshu, Japan h=23.7 MB=6.8 ms=7.7

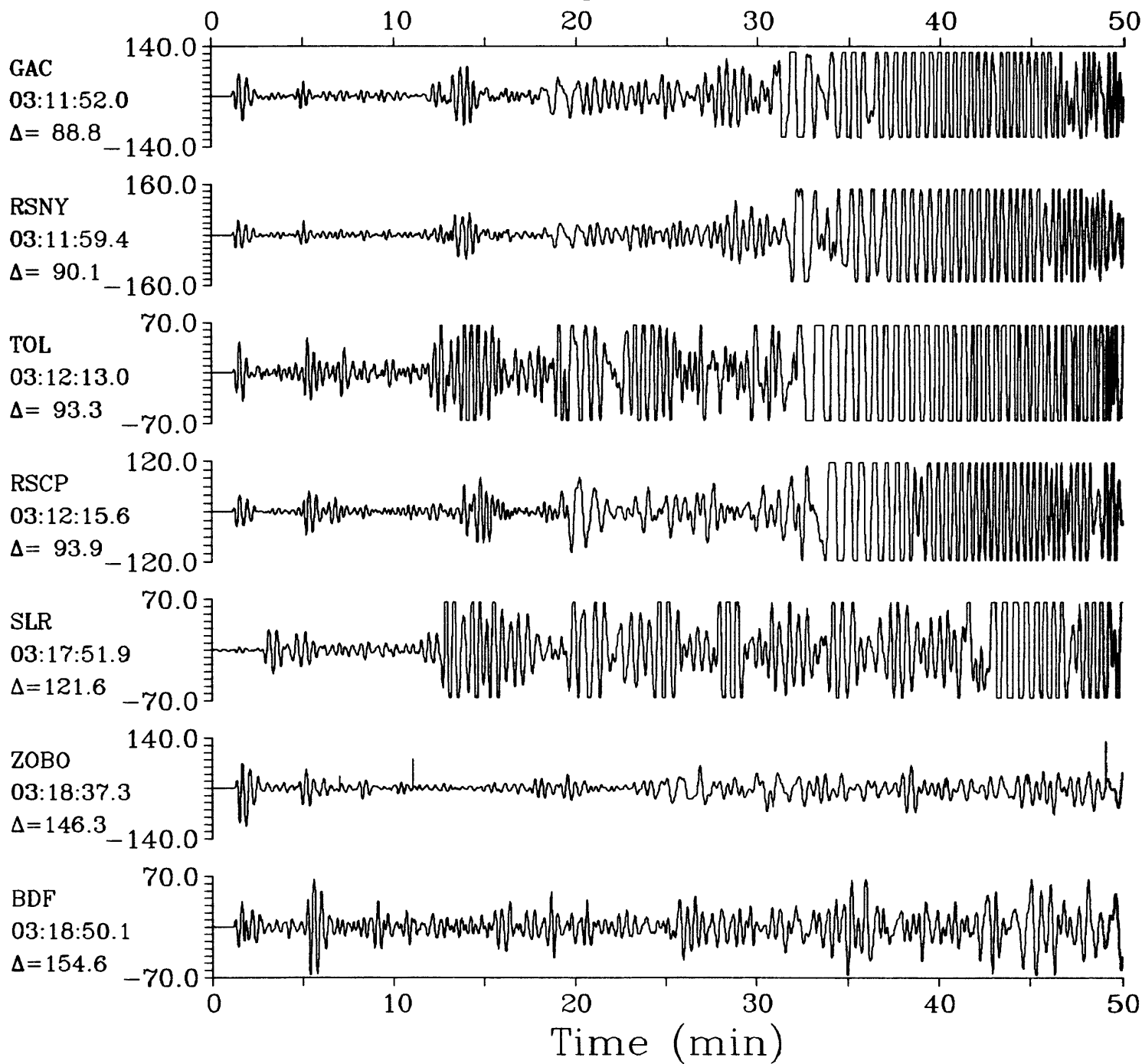




Near West Coast of Honshu, Japan $h=23.7$ MB=6.8 ms=7.7

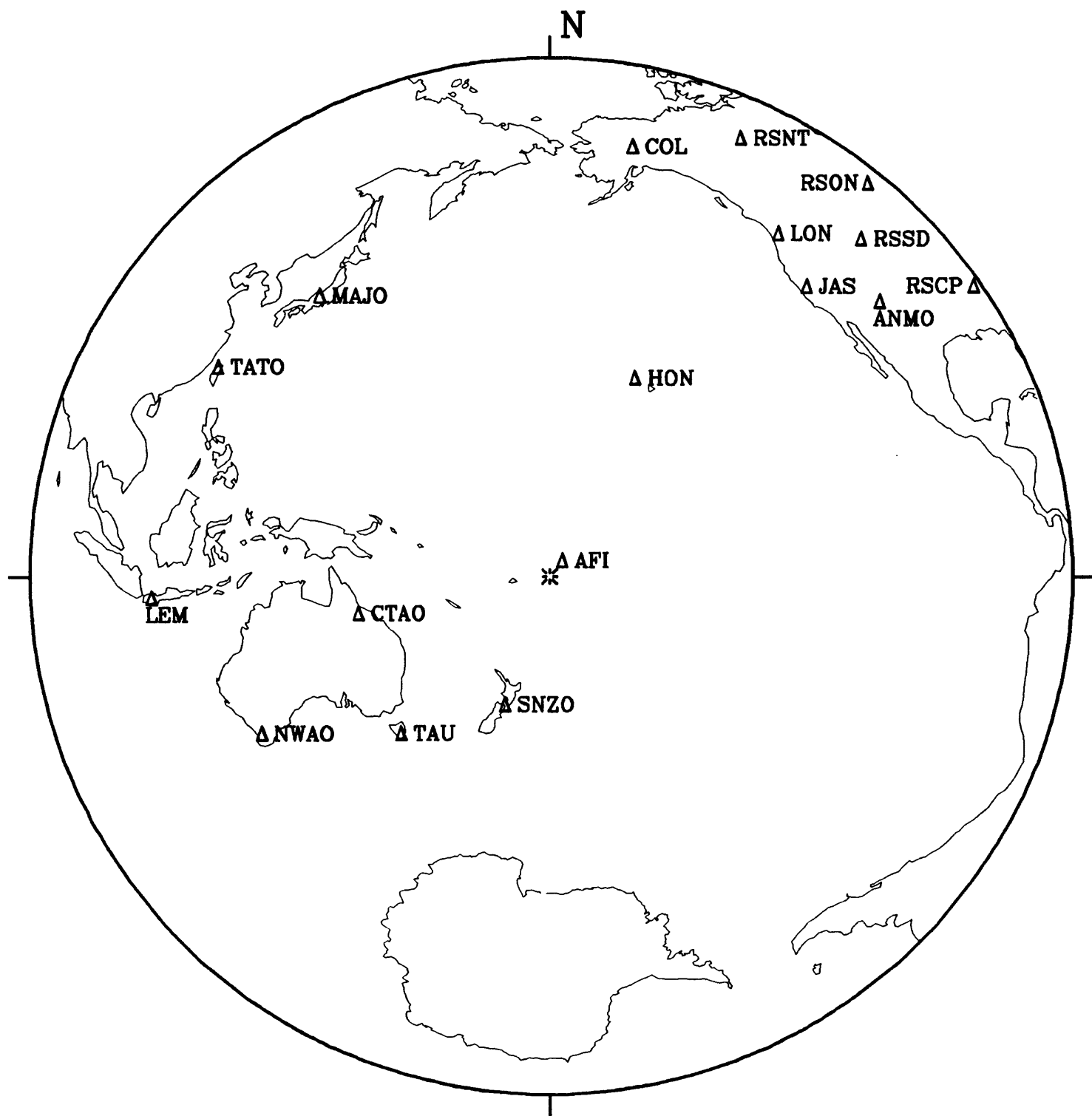


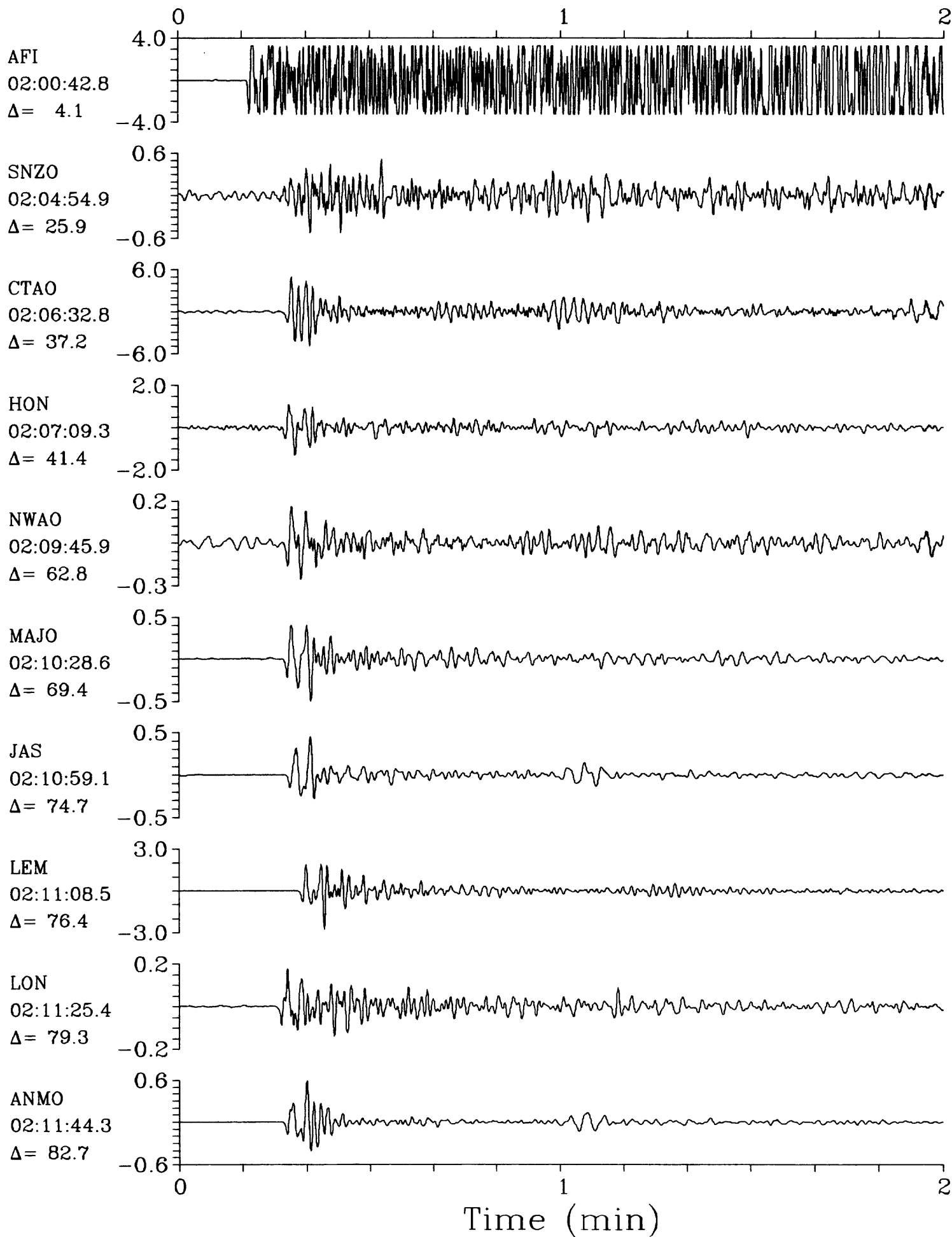


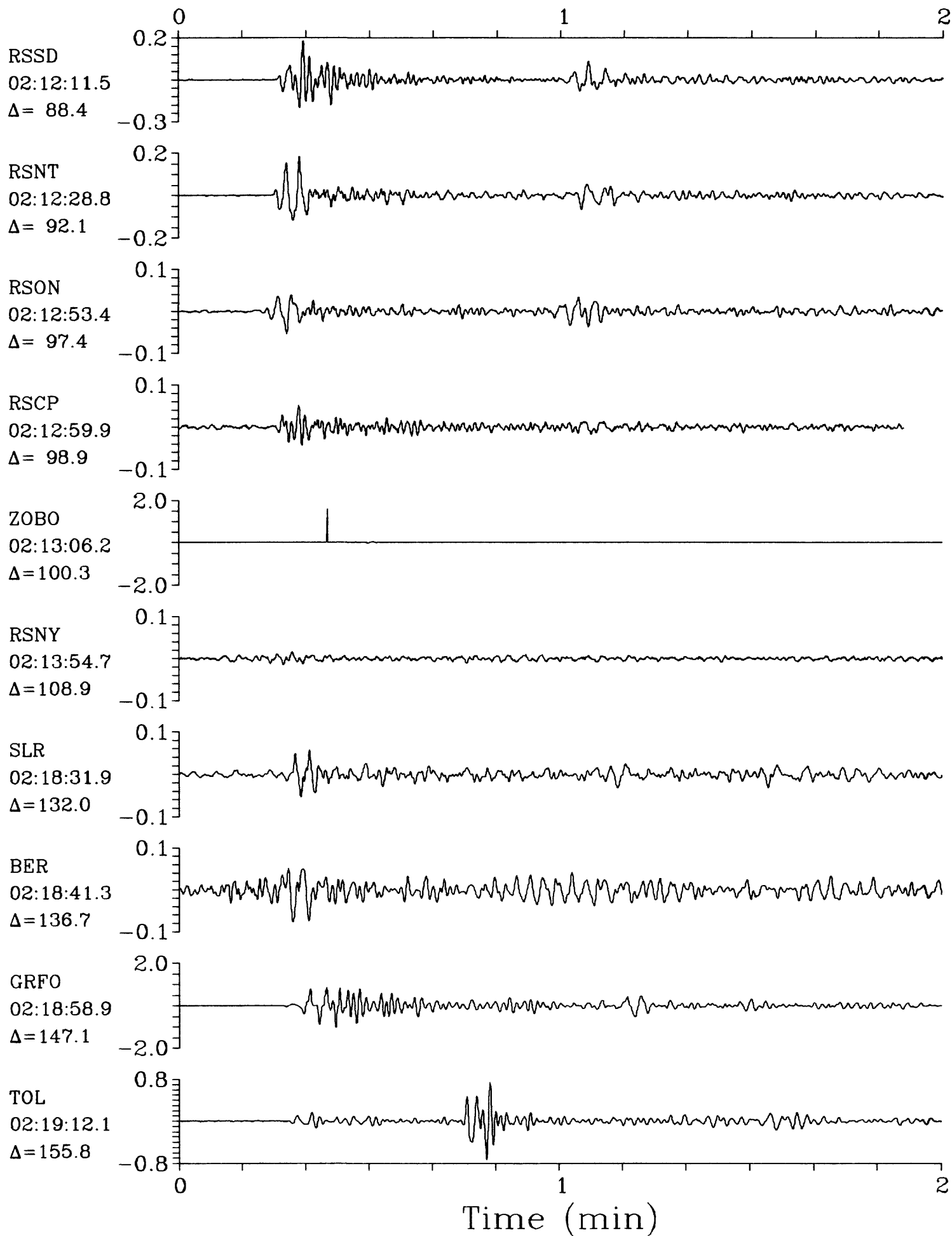


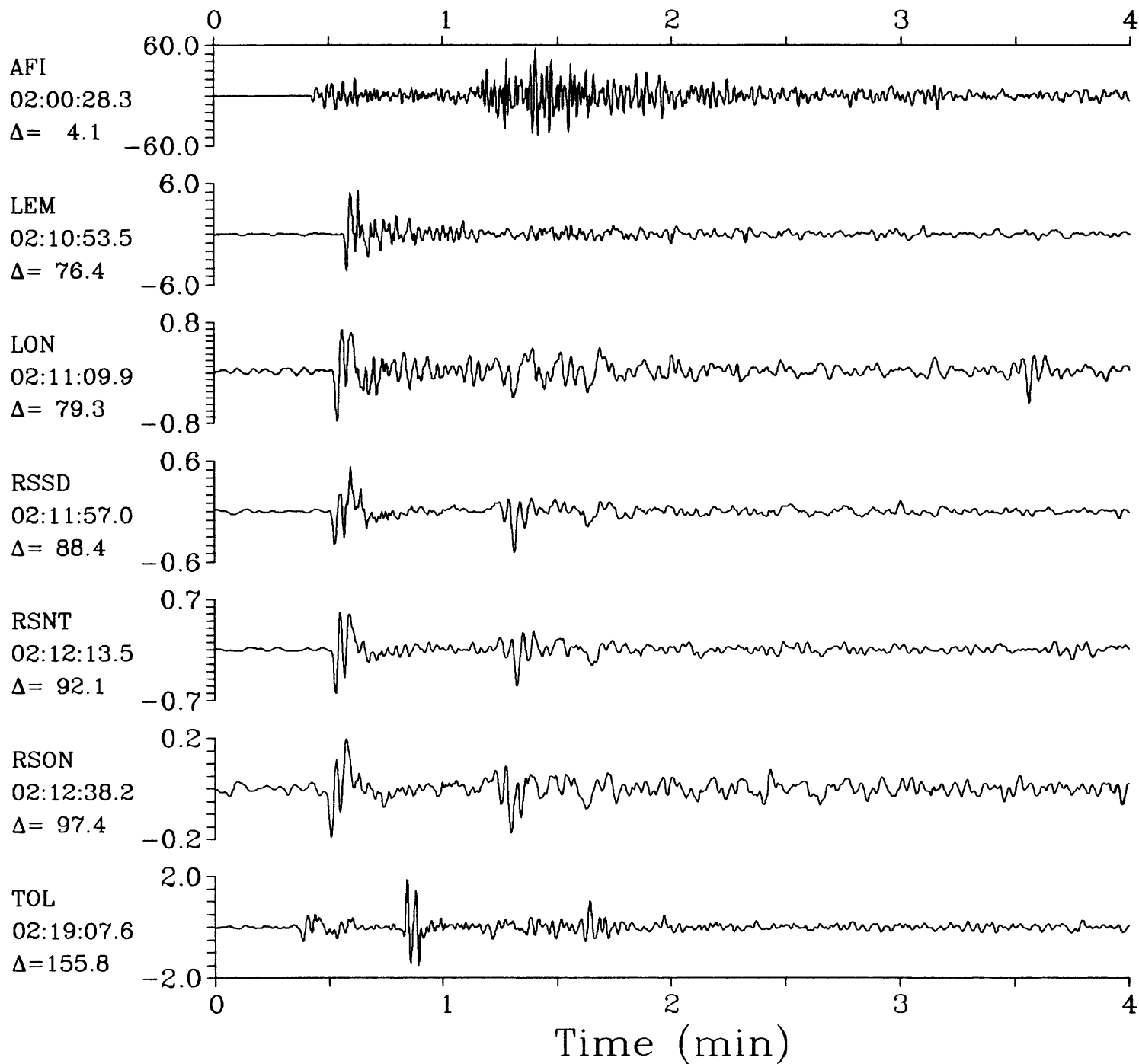
01 June 1983 01:59:54.68

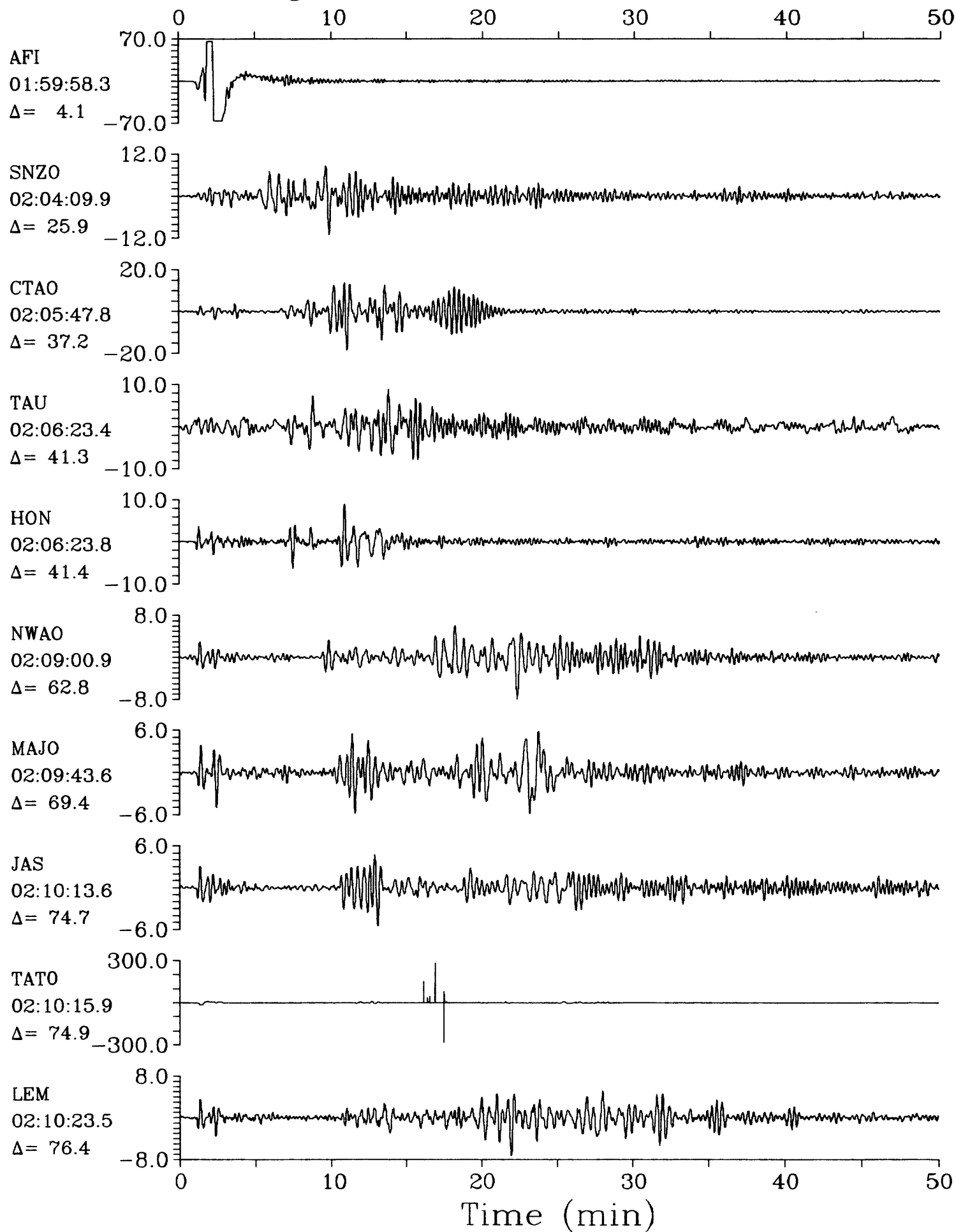
Tonga Islands

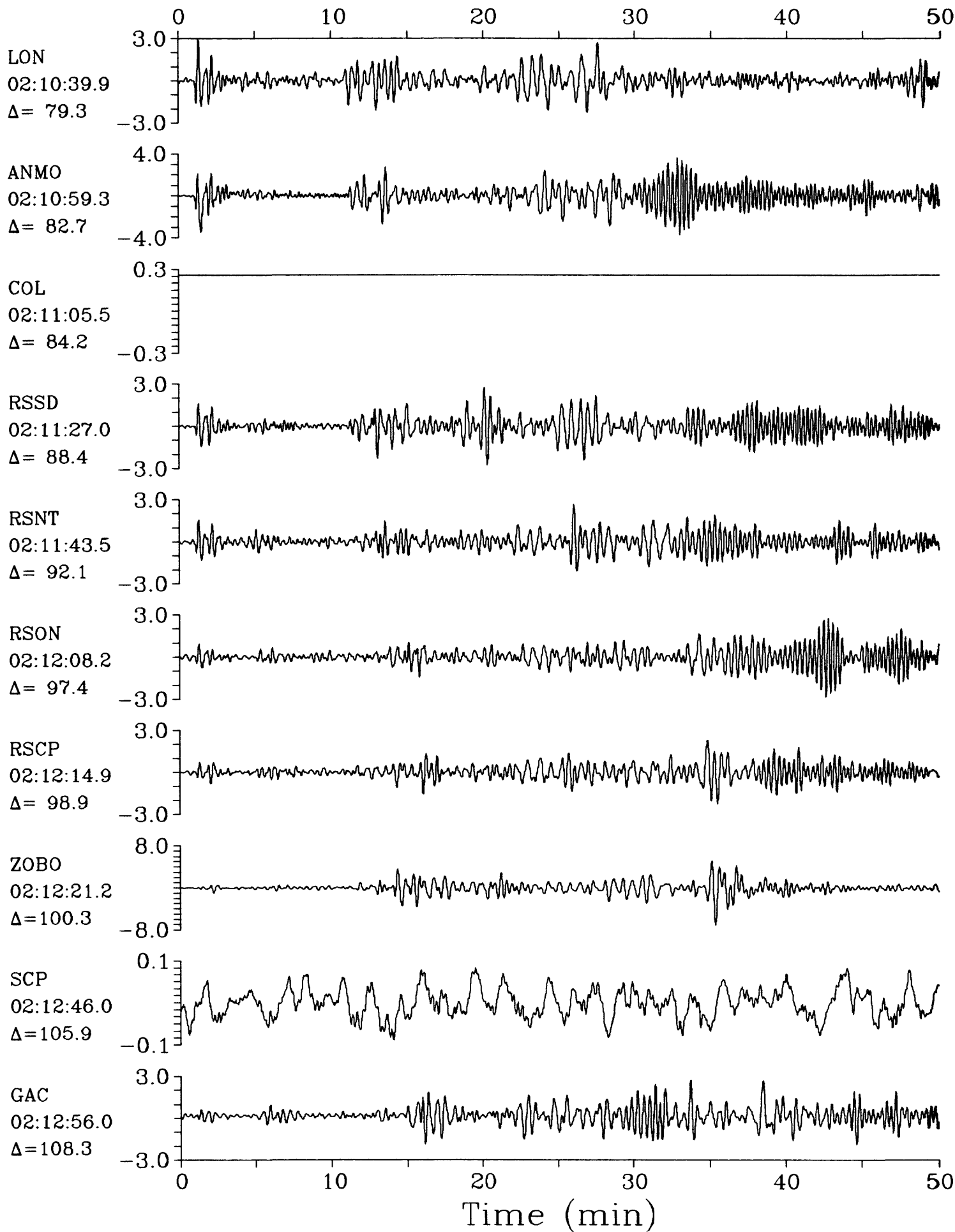






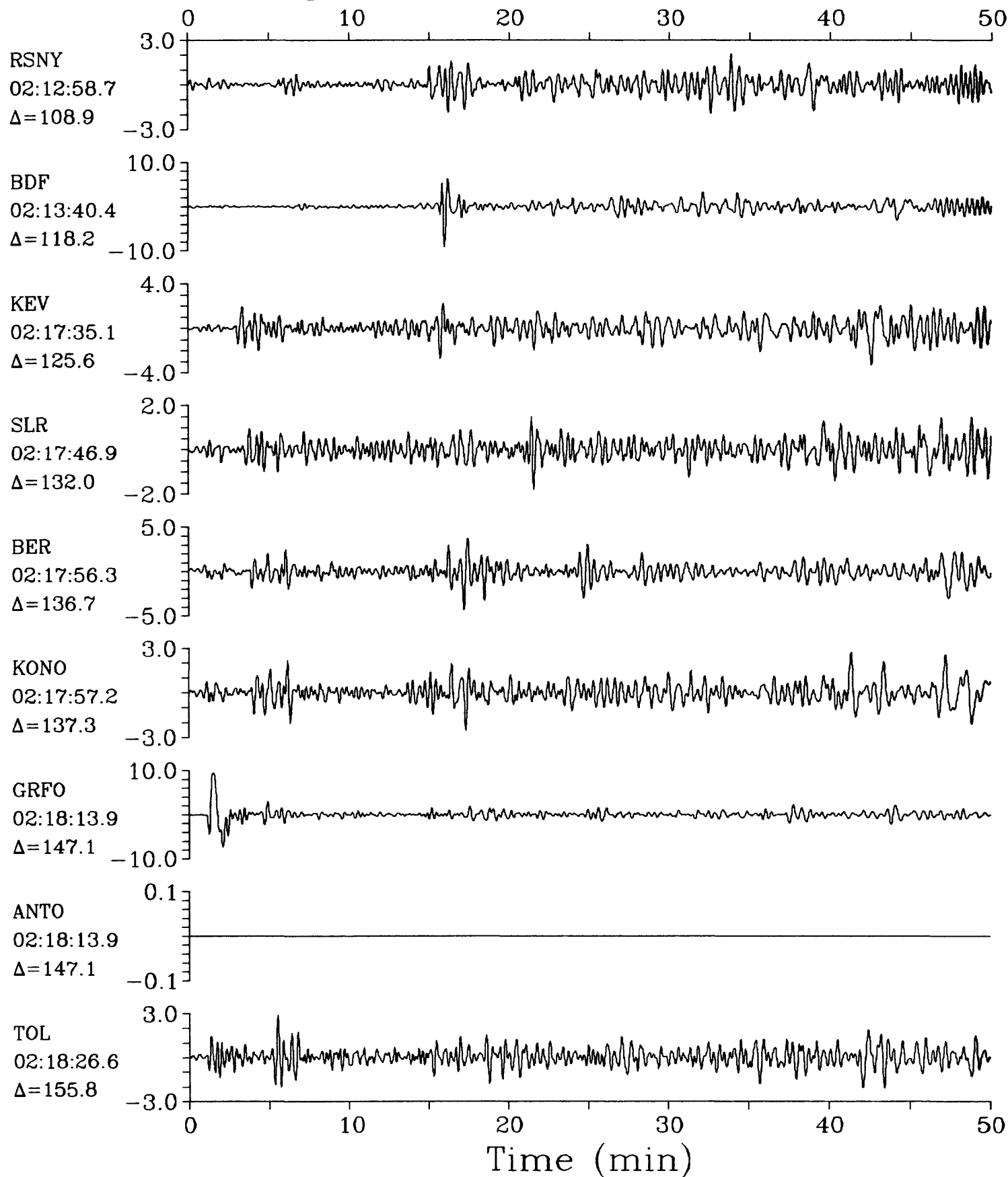


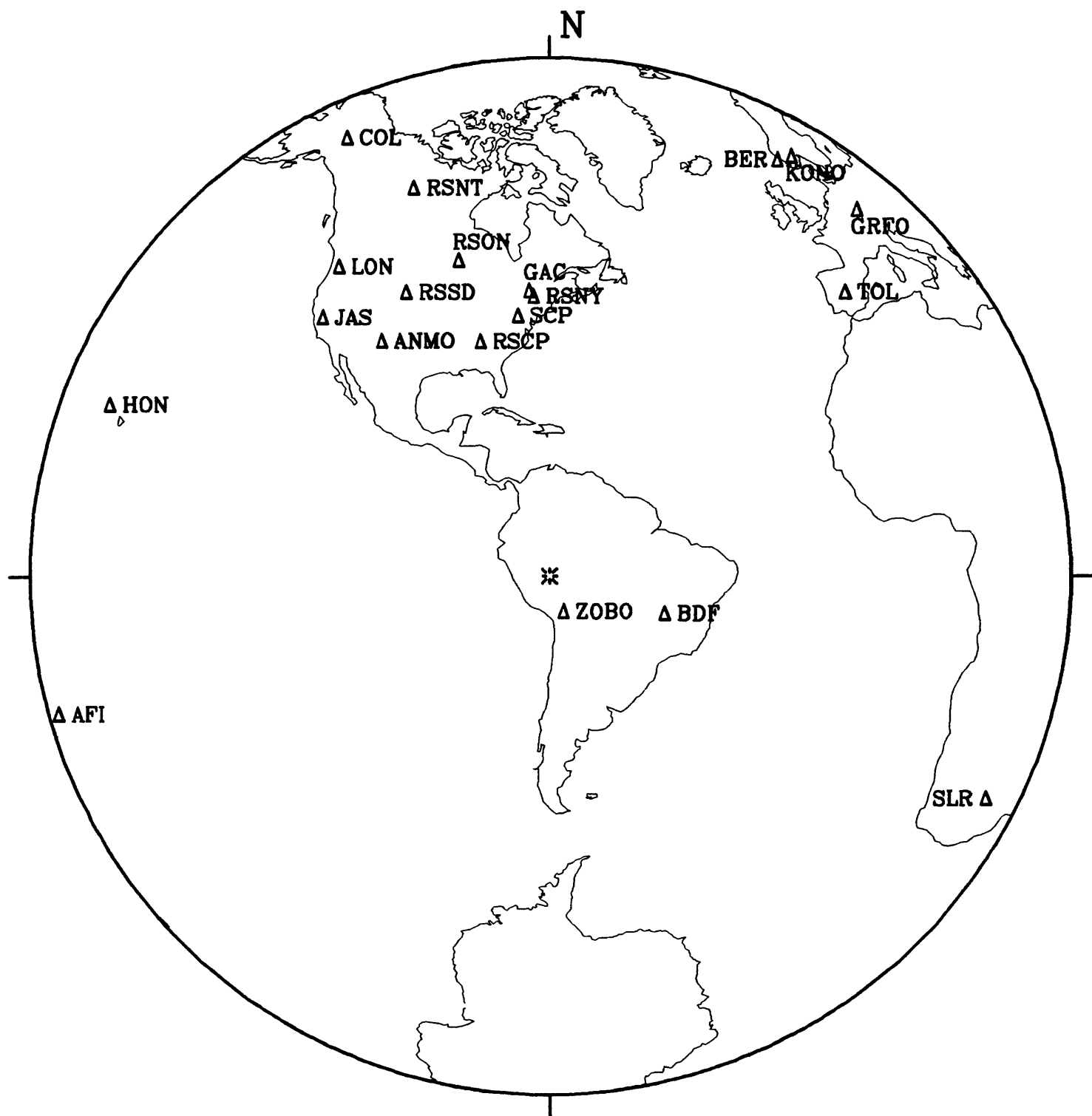


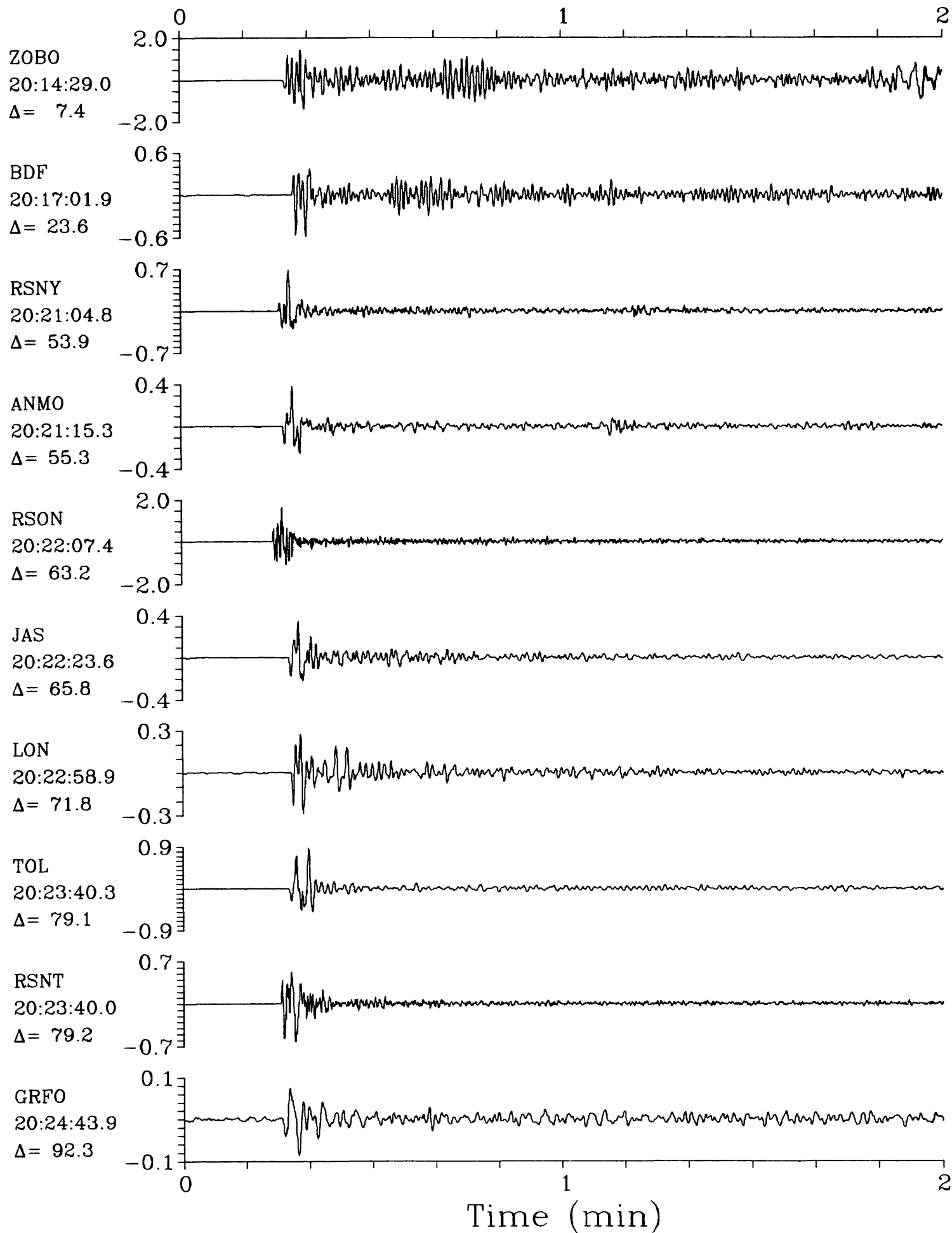


¹⁶⁰LPZ01 June 1983 01:59:54.68
Tonga Islands h=179.6 MB=6.2

LPZ

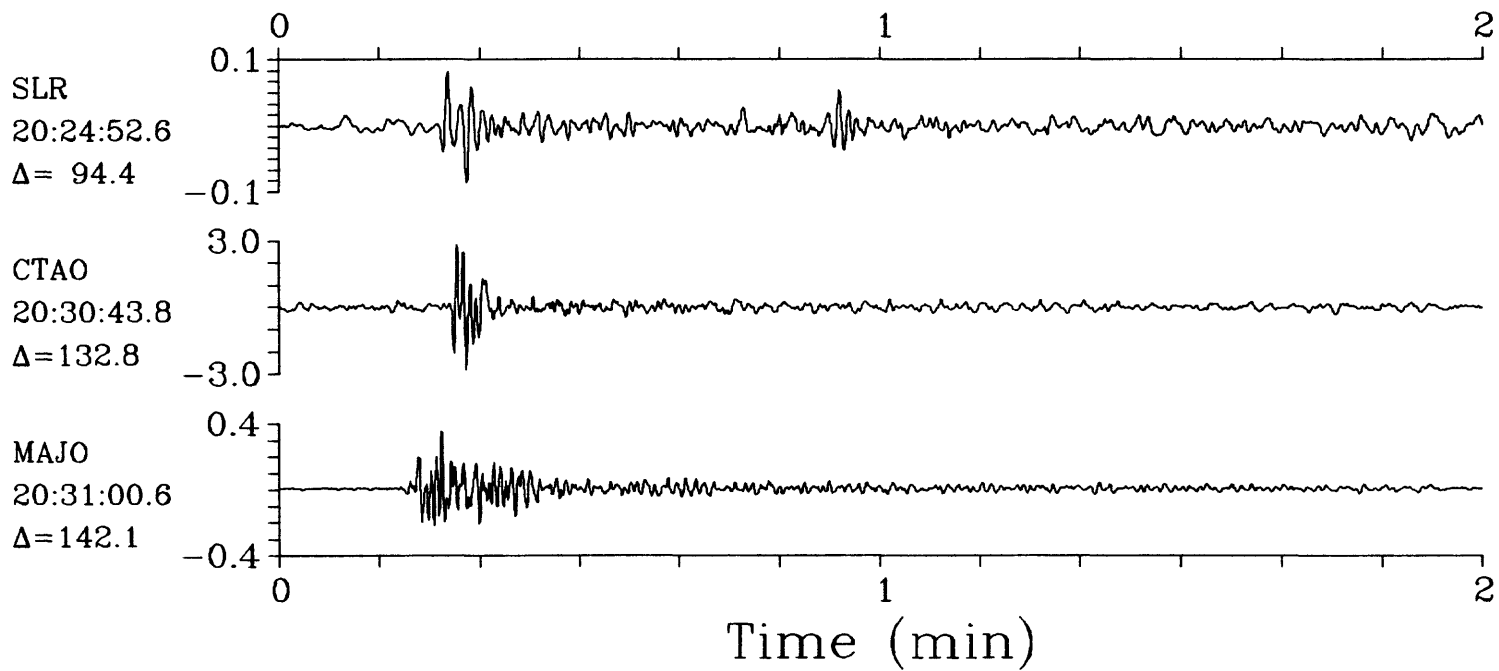


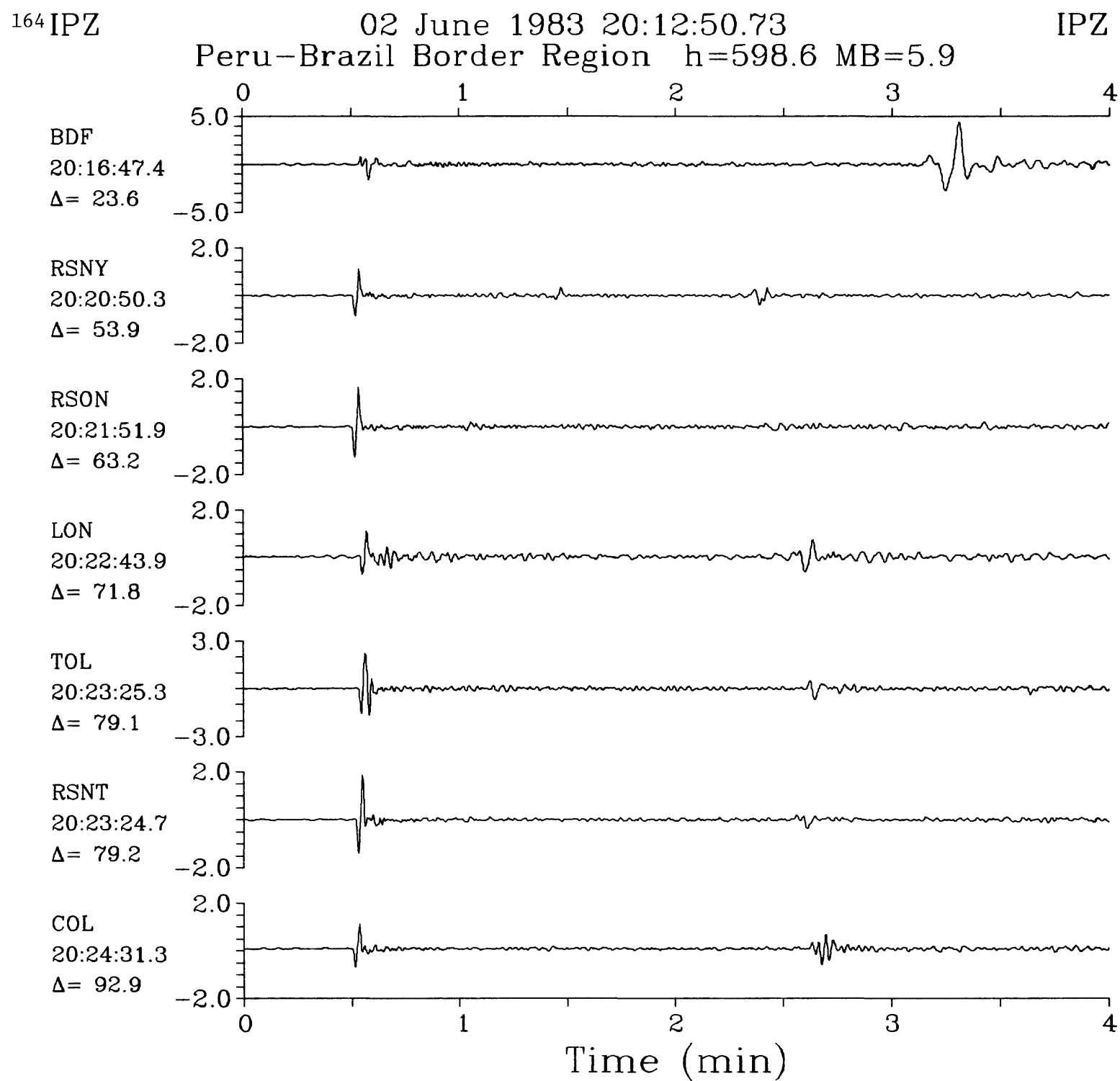


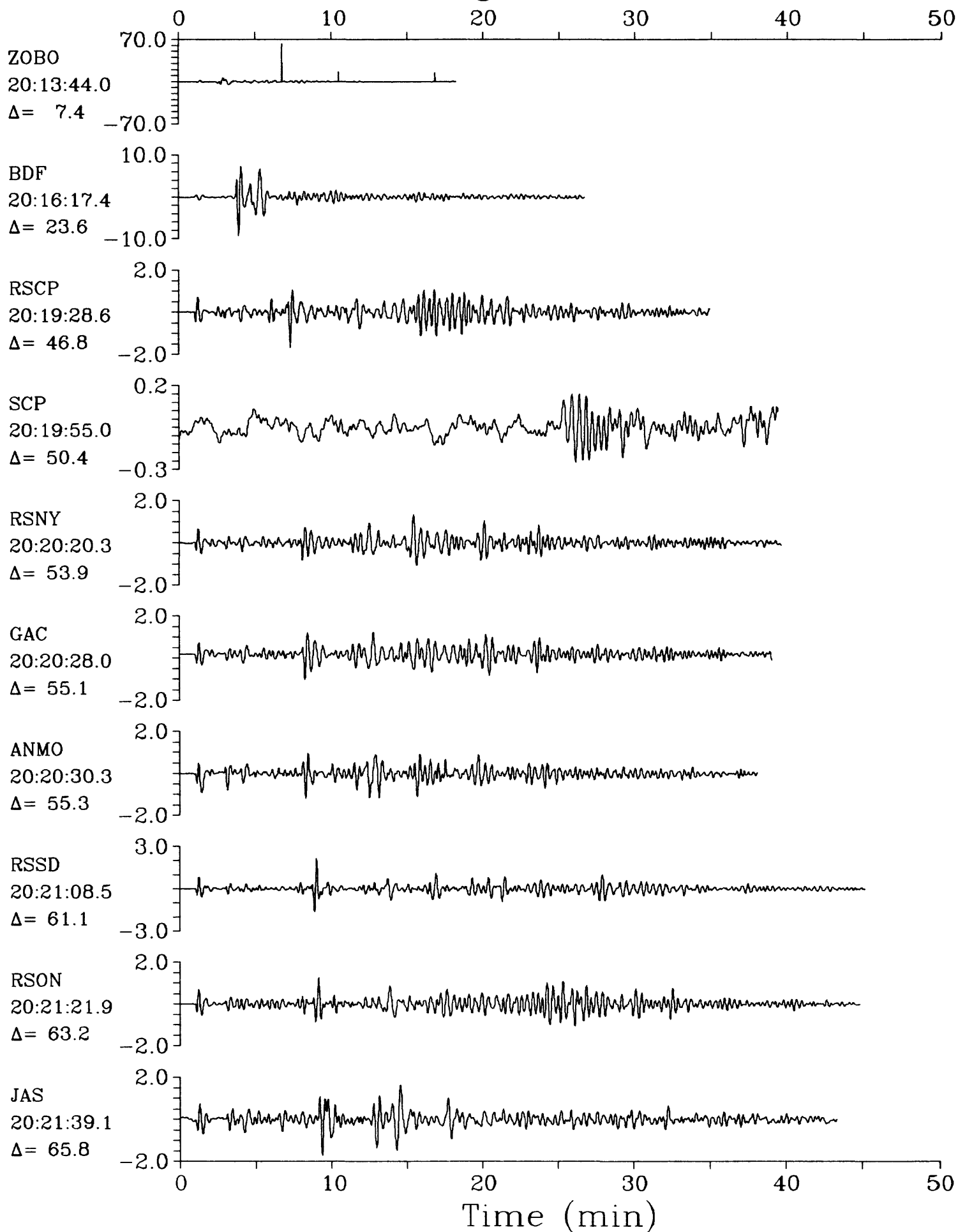
Peru-Brazil Border Region $h=598.6$ MB=5.9

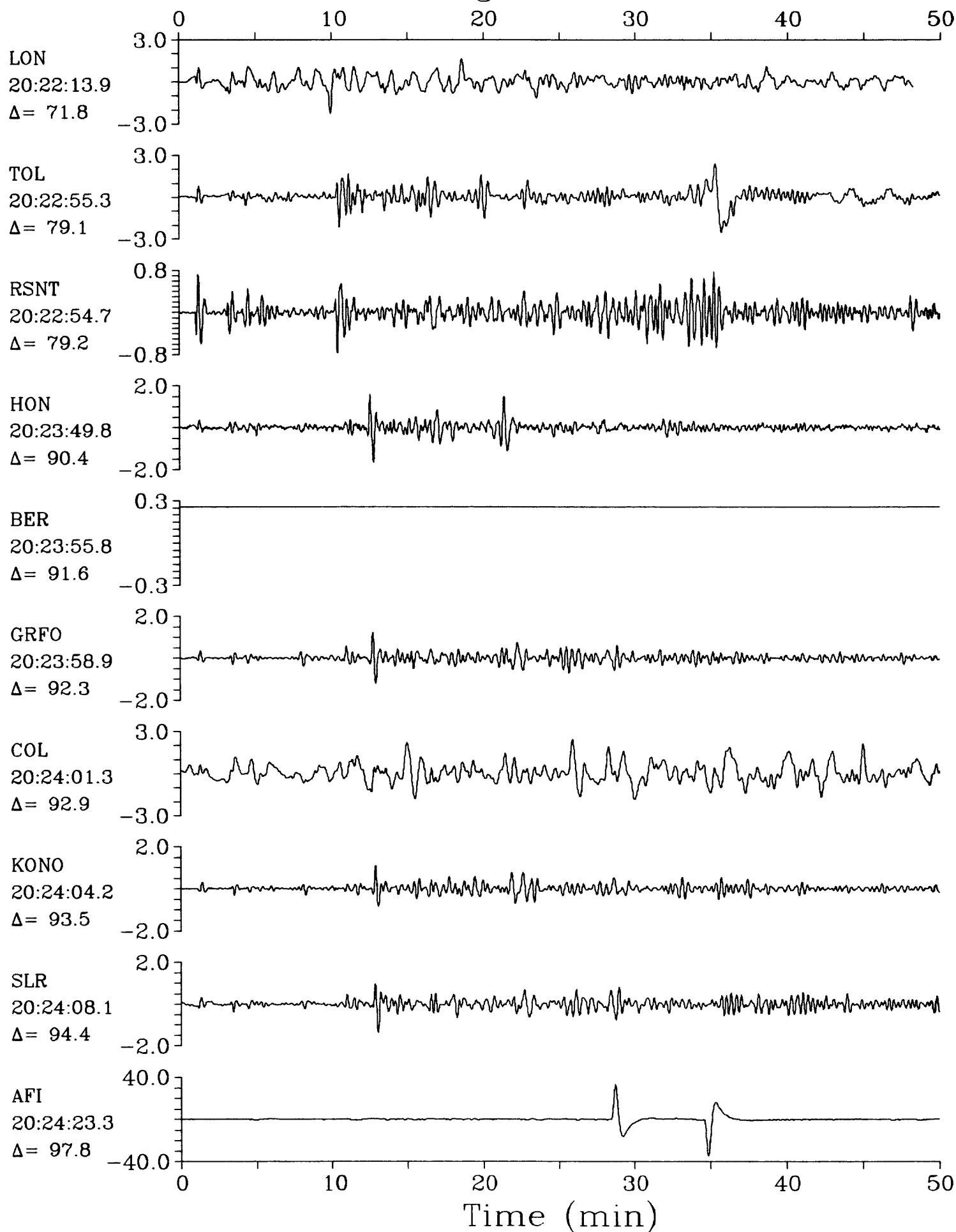
SPZ

02 June 1983 20:12:50.73

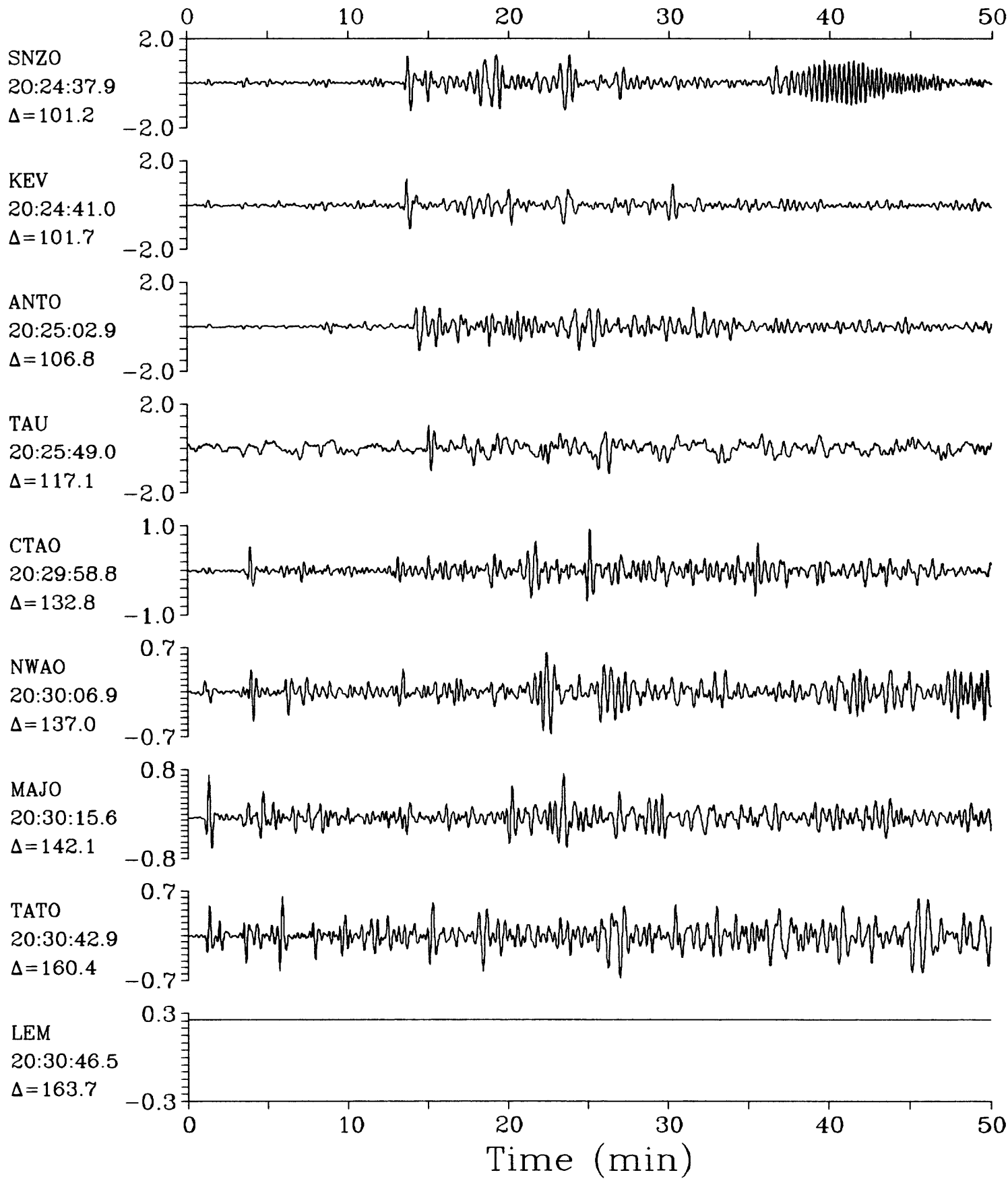
SPZ¹⁶³Peru-Brazil Border Region $h=598.6$ MB=5.9



Peru-Brazil Border Region $h=598.6$ MB=5.9

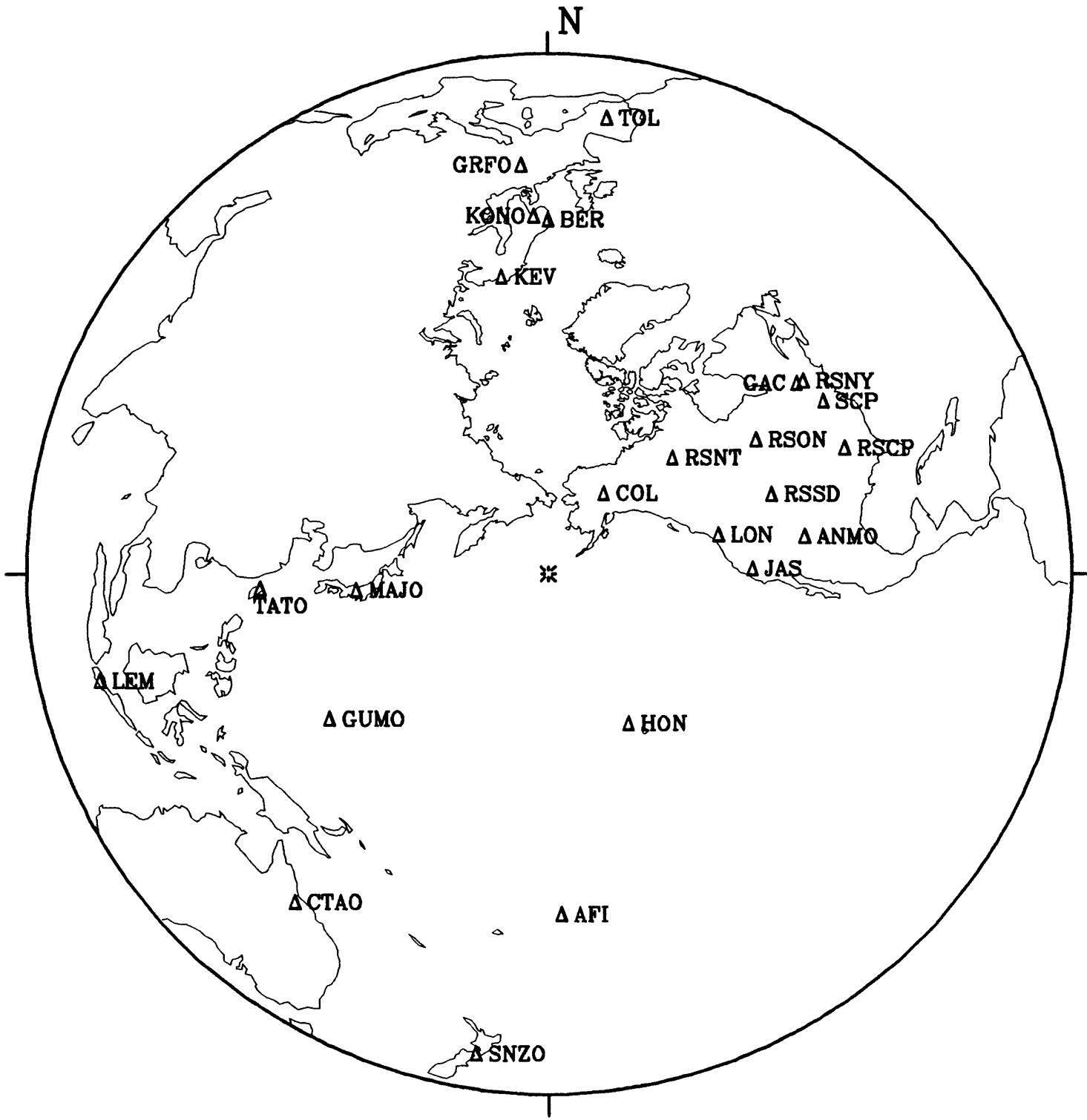
Peru-Brazil Border Region $h=598.6$ MB=5.9

Peru-Brazil Border Region h=598.6 MB=5.9

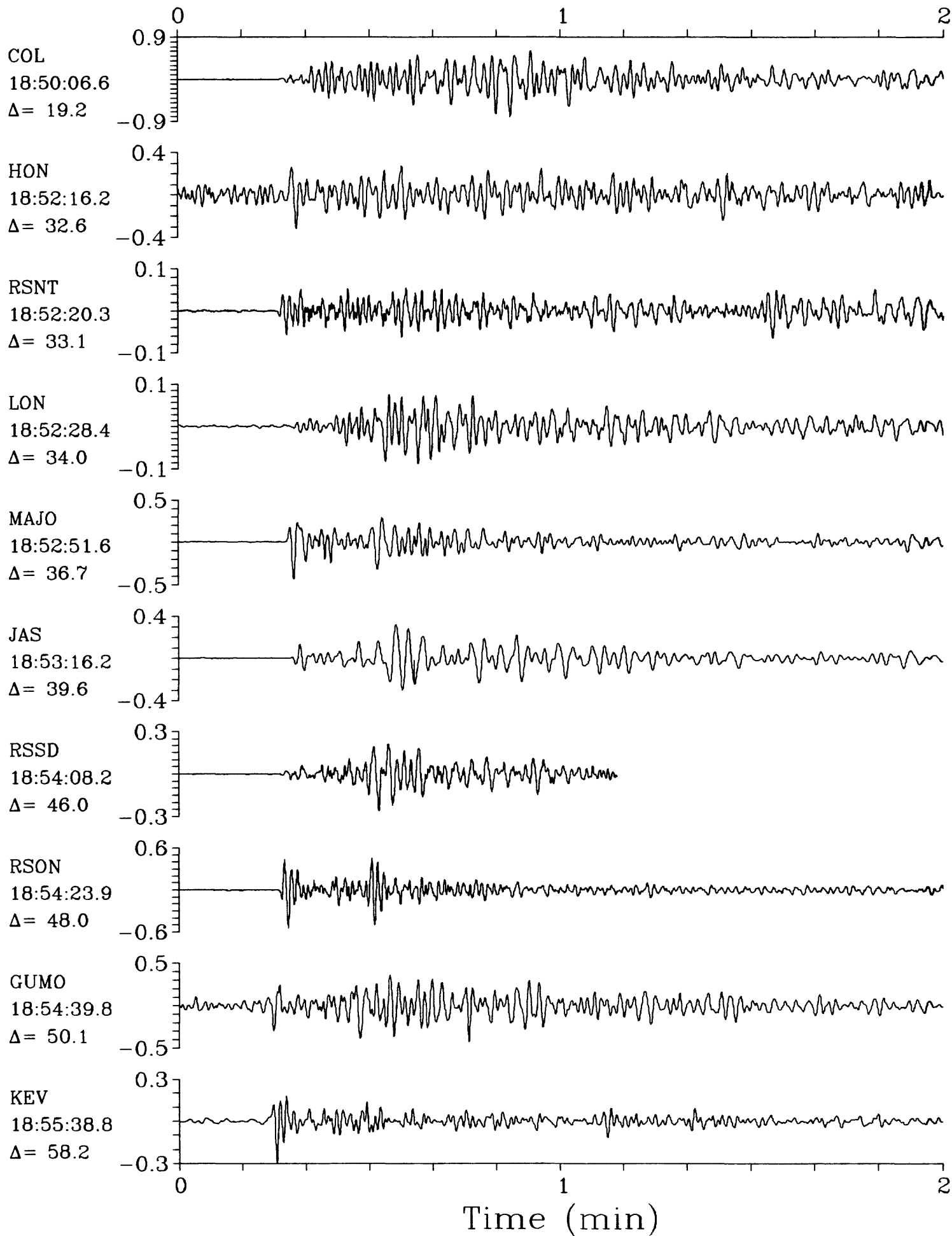


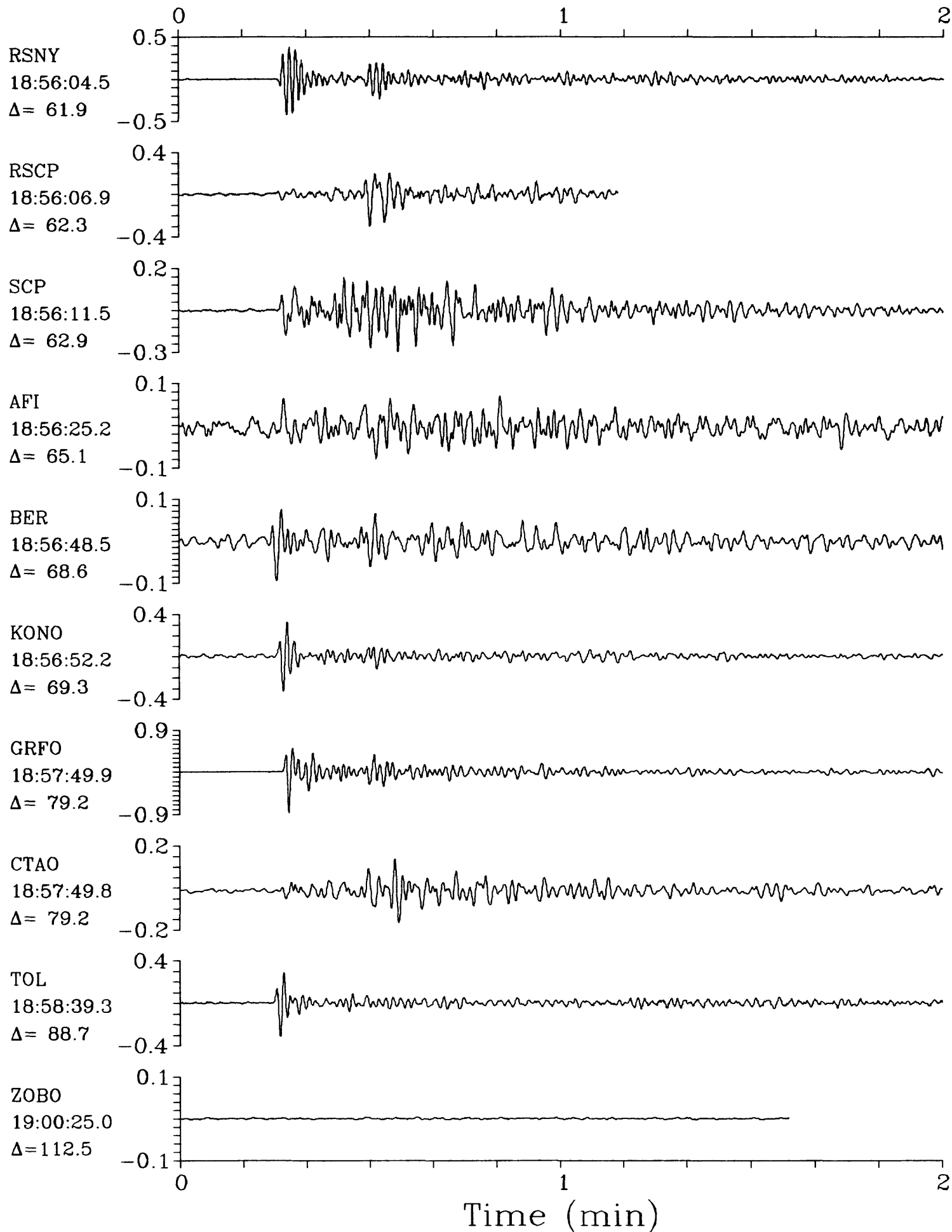
09 June 1983 18:46:00.90

Andreanof Islands, Aleutian Is.



Andreanof Islands, Aleutian Is. h=20.8 MB=6.2 ms=5.8



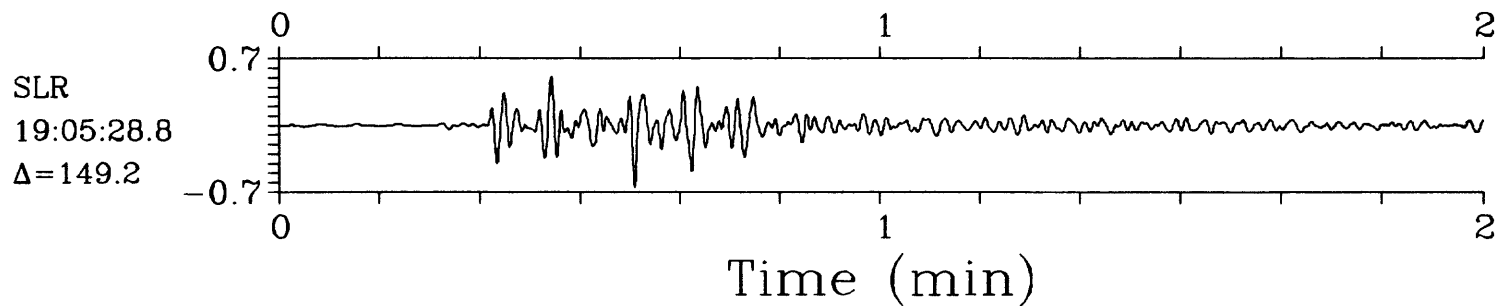


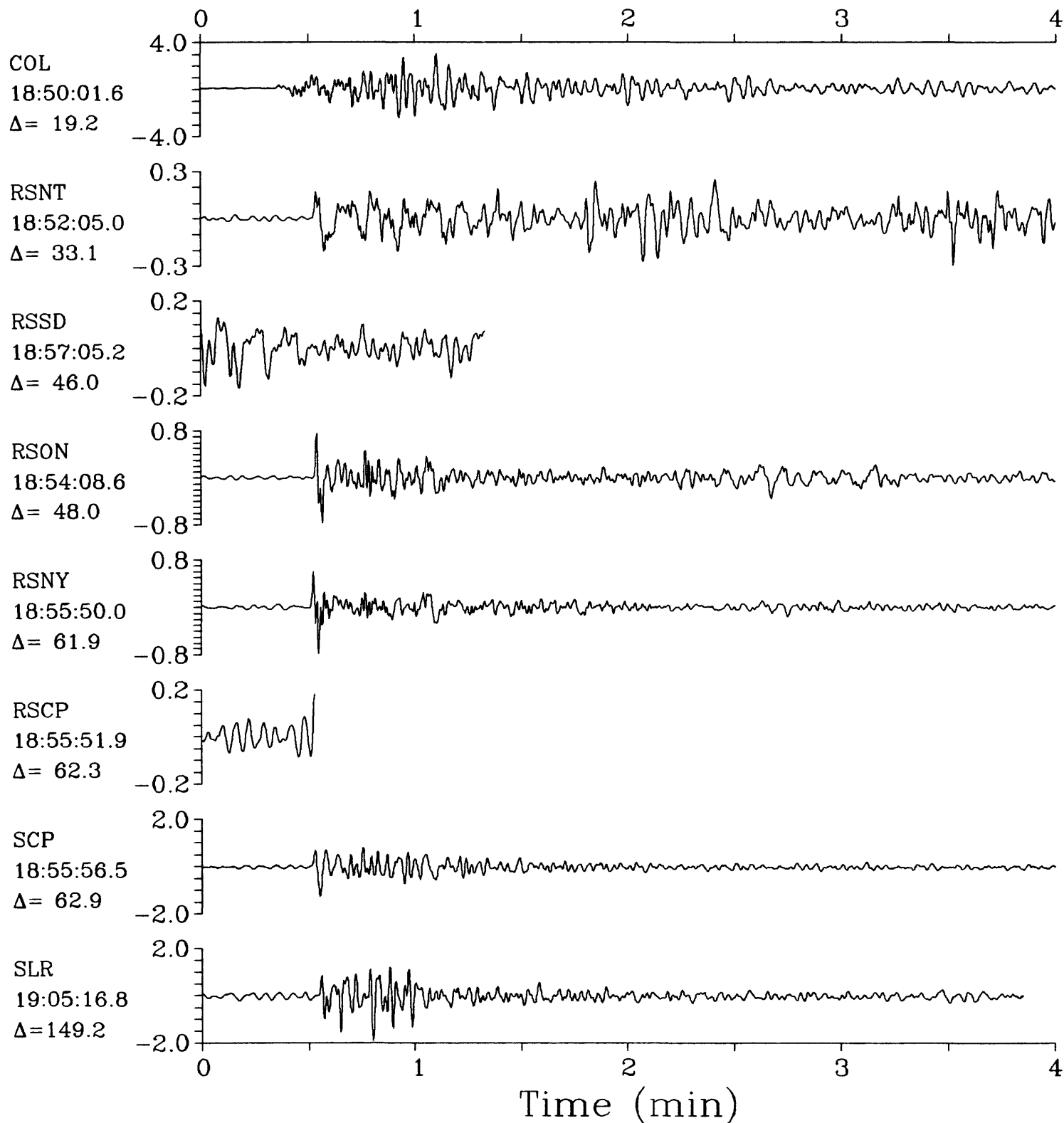
SPZ

09 June 1983 18:46:00.90

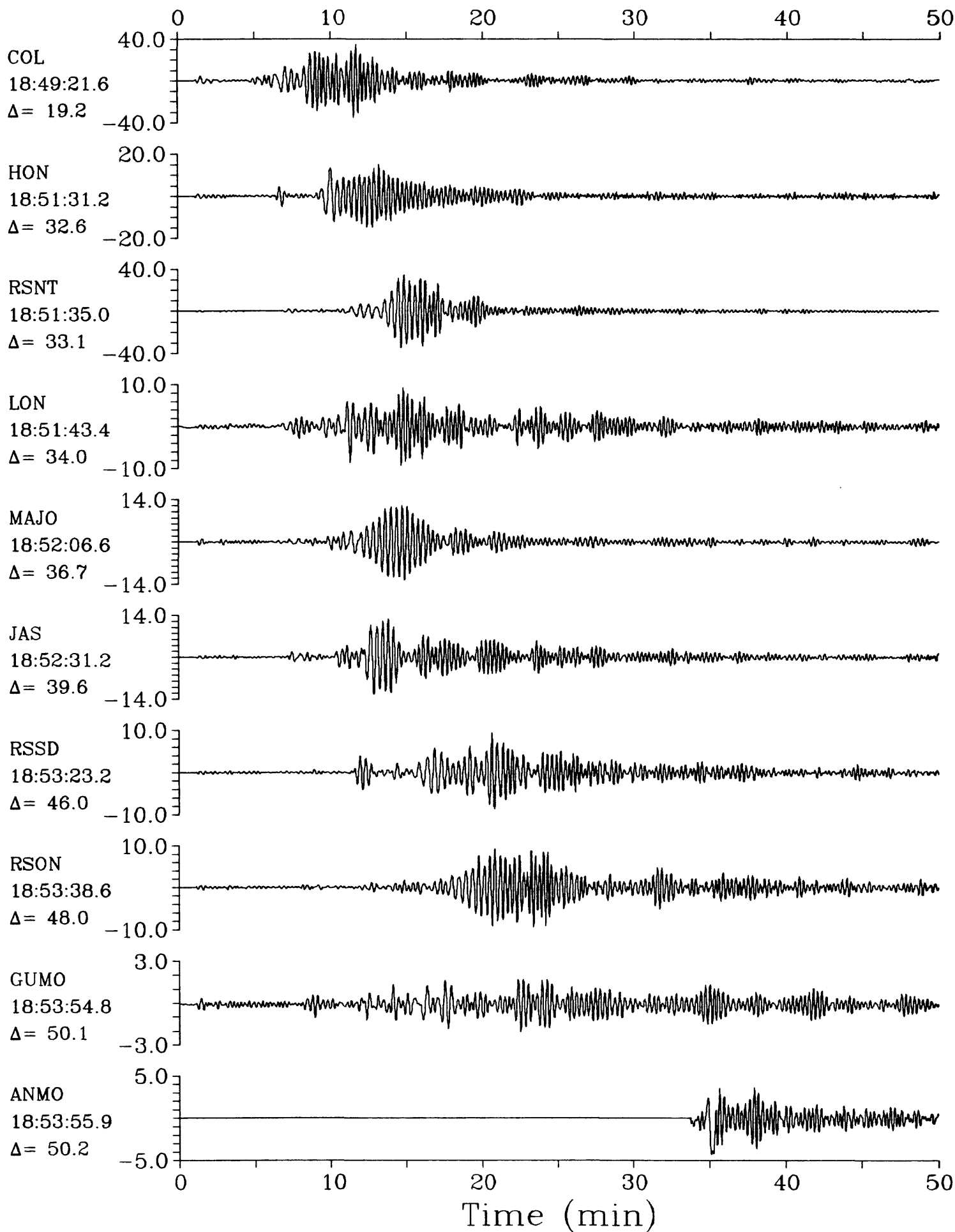
SPZ¹⁷¹

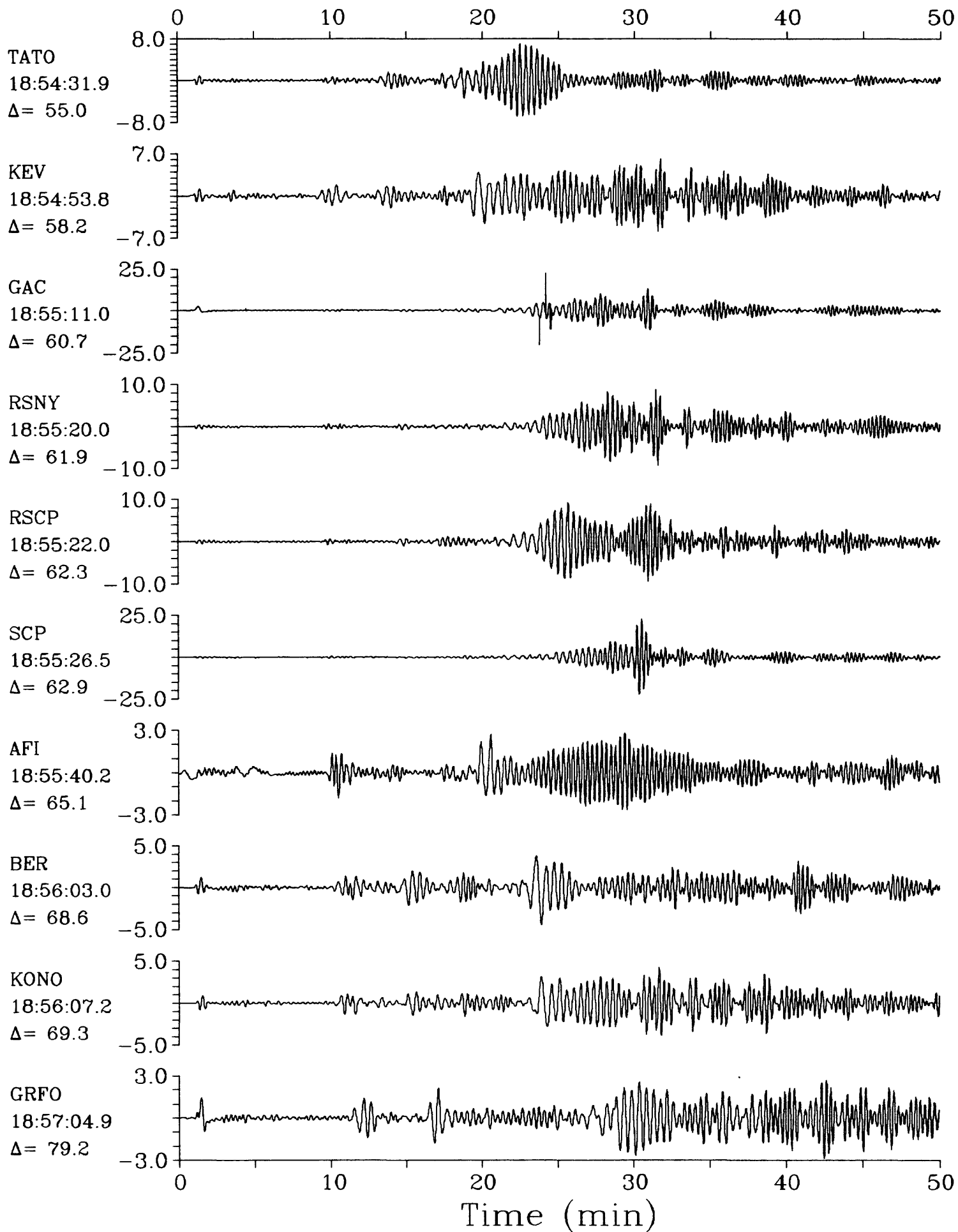
Andreanof Islands, Aleutian Is. h=20.8 MB=6.2 ms=5.8



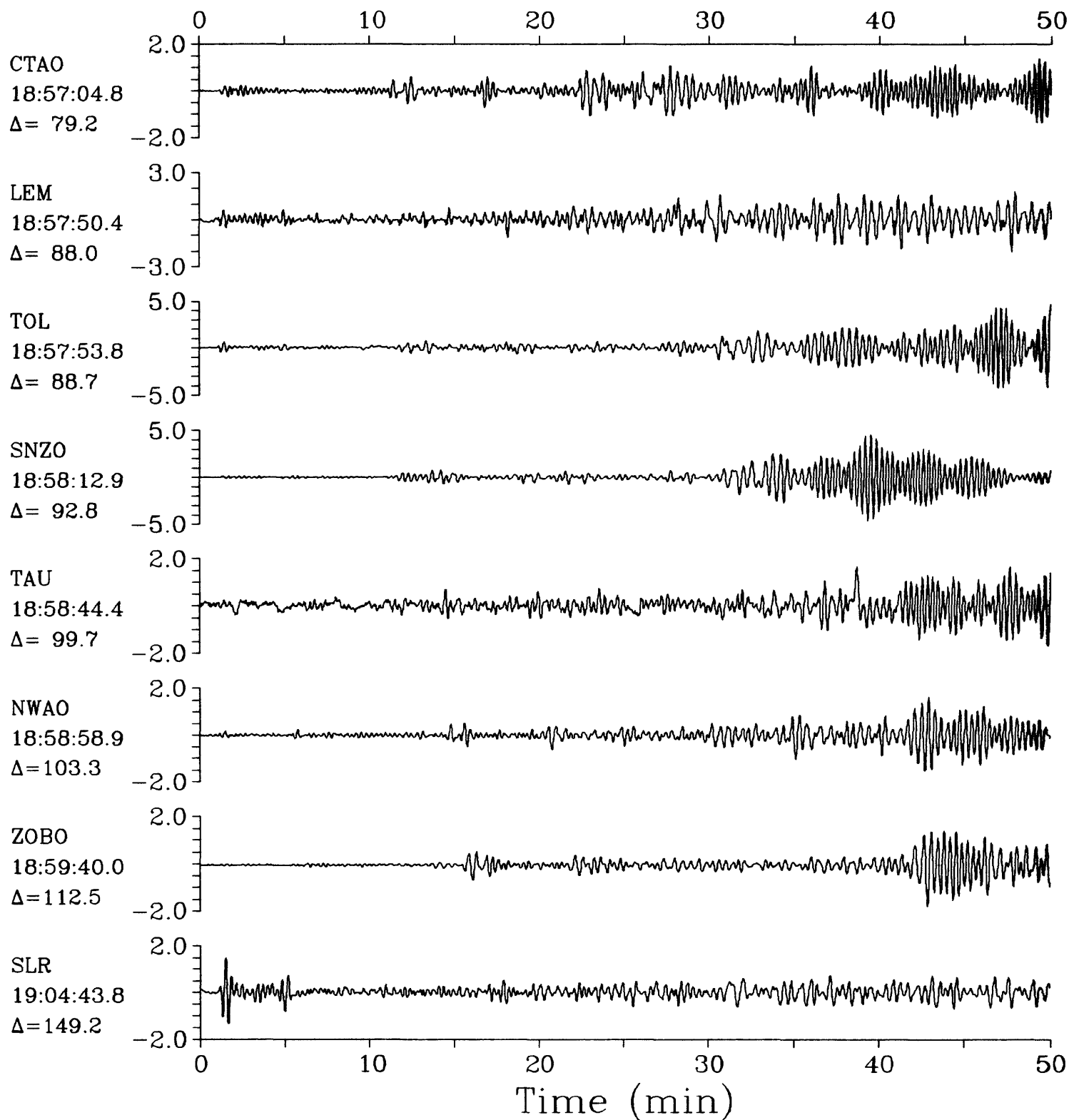


Andreanof Islands, Aleutian Is. h=20.8 MB=6.2 ms=5.8



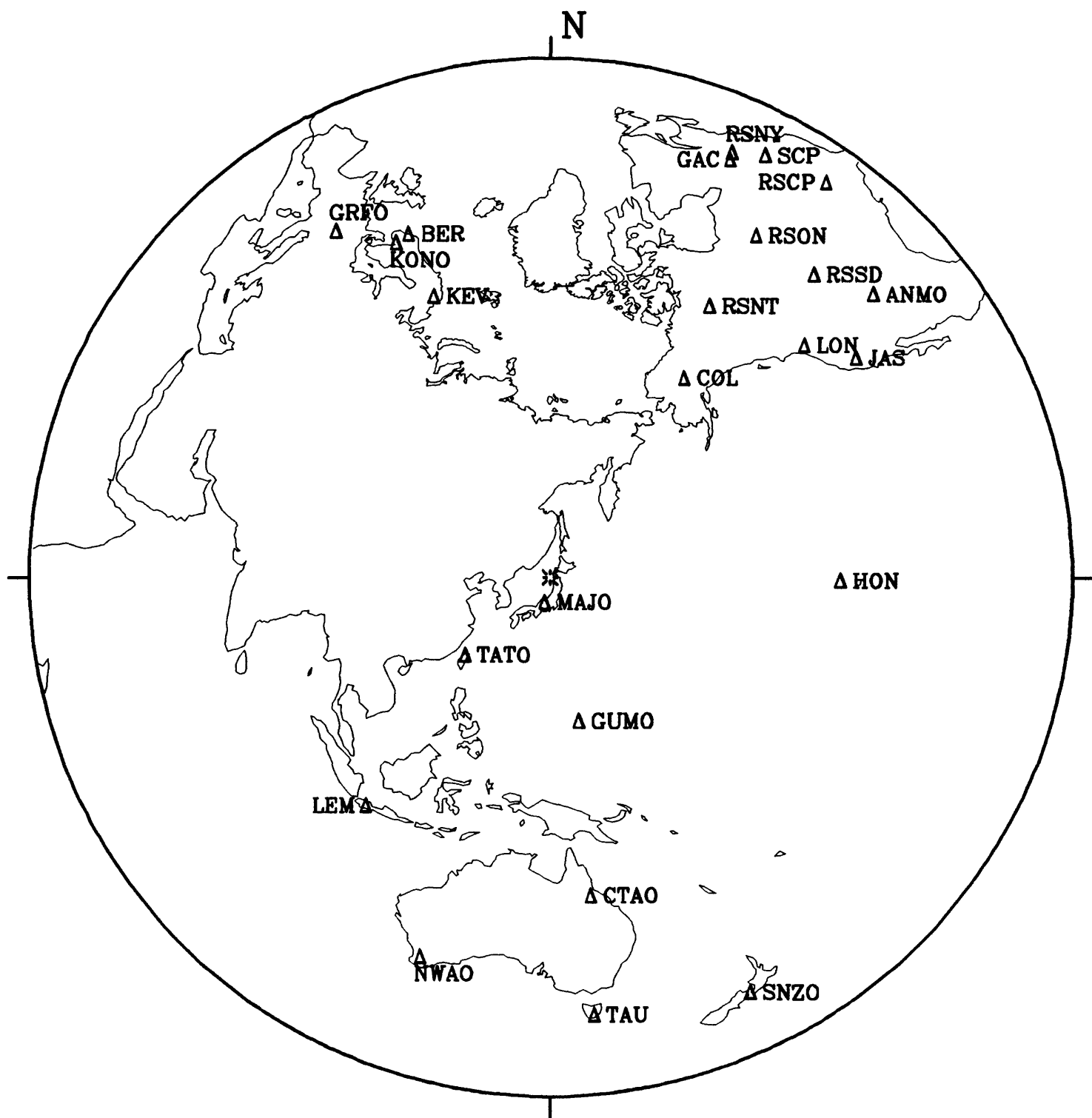
Andreanof Islands, Aleutian Is. $h=20.8$ MB=6.2 ms=5.8

Andreanof Islands, Aleutian Is. h=20.8 MB=6.2 ms=5.8



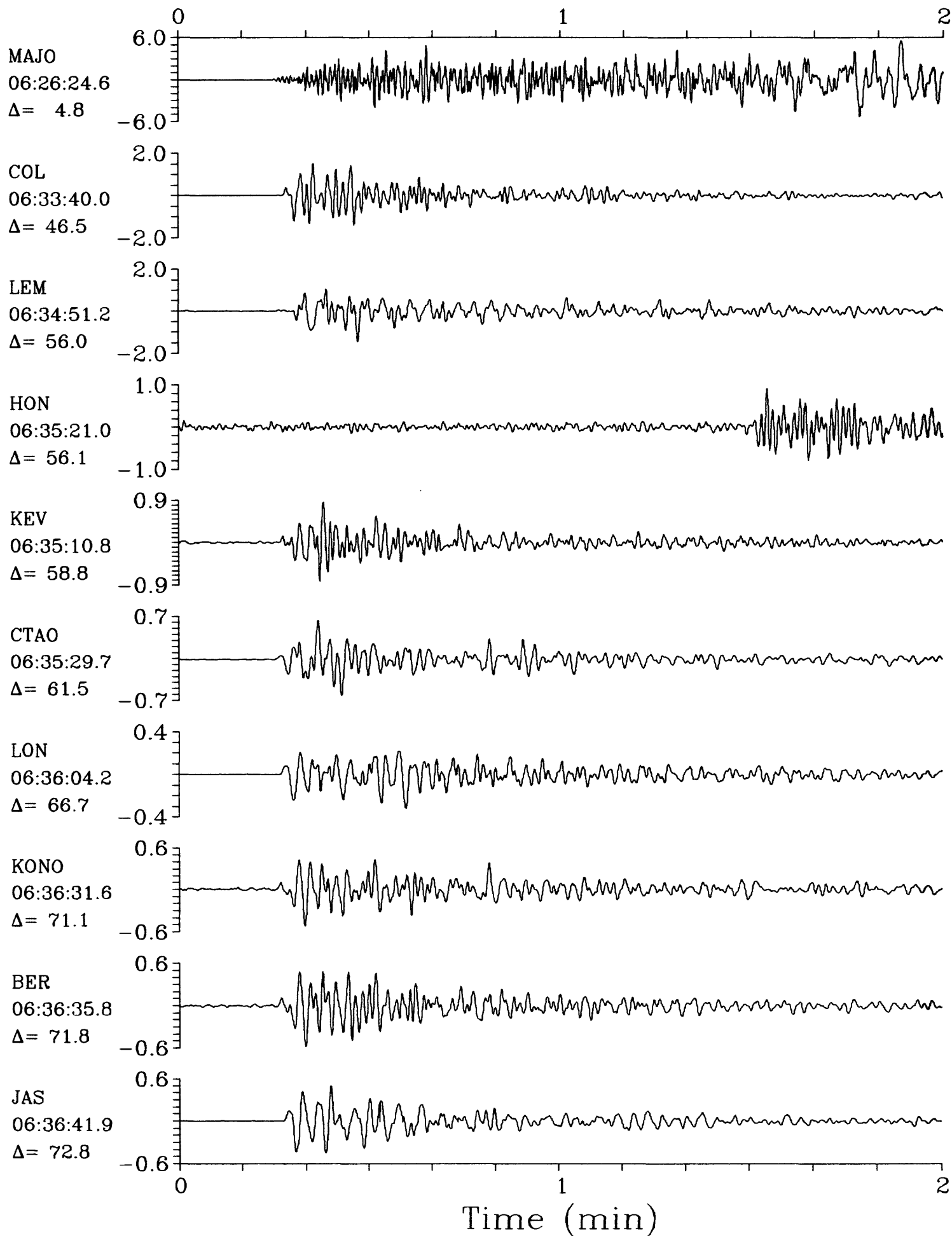
21 June 1983 06:25:27.35

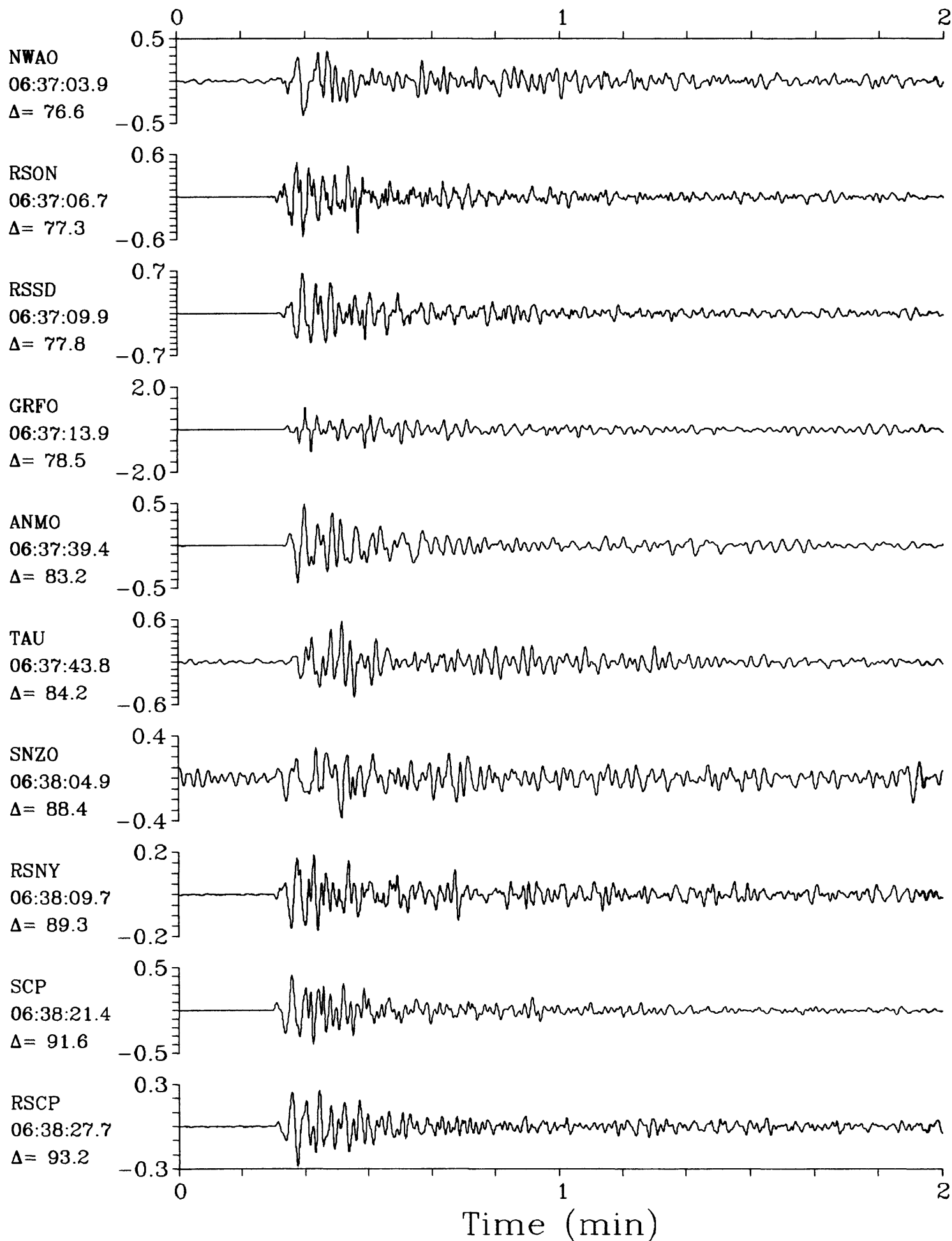
Hokkaido, Japan Region



SPZ

21 June 1983 06:25:27.35

SPZ¹⁷⁷Hokkaido, Japan Region $h = 9.9$ MB=6.7 ms=6.9

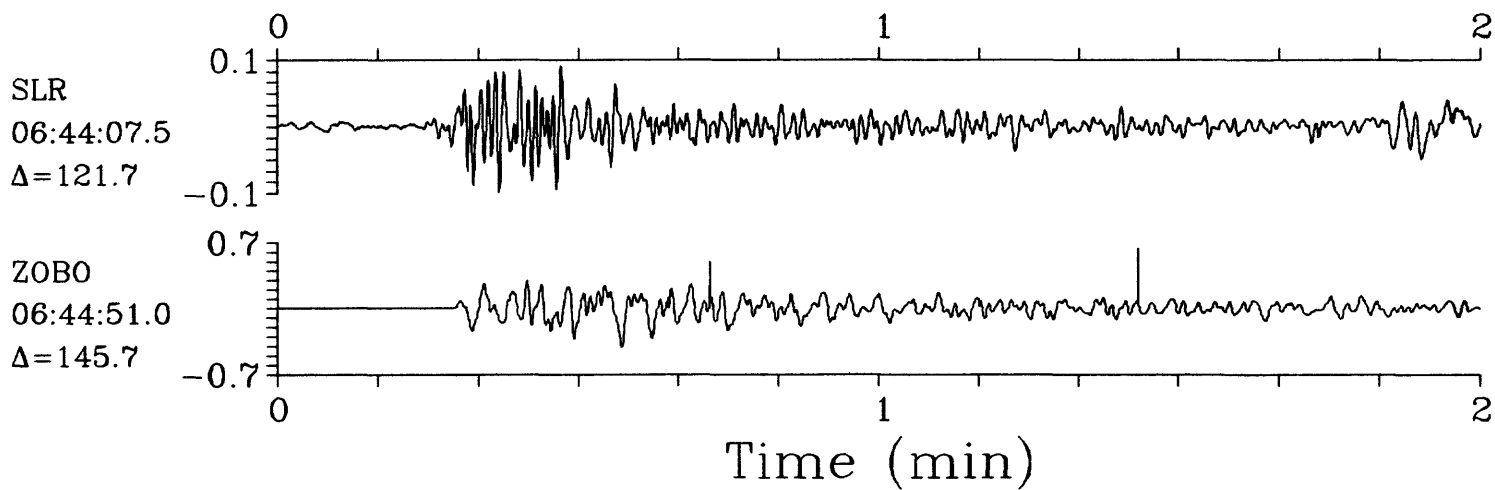
Hokkaido, Japan Region $h = 9.9$ MB=6.7 ms=6.9

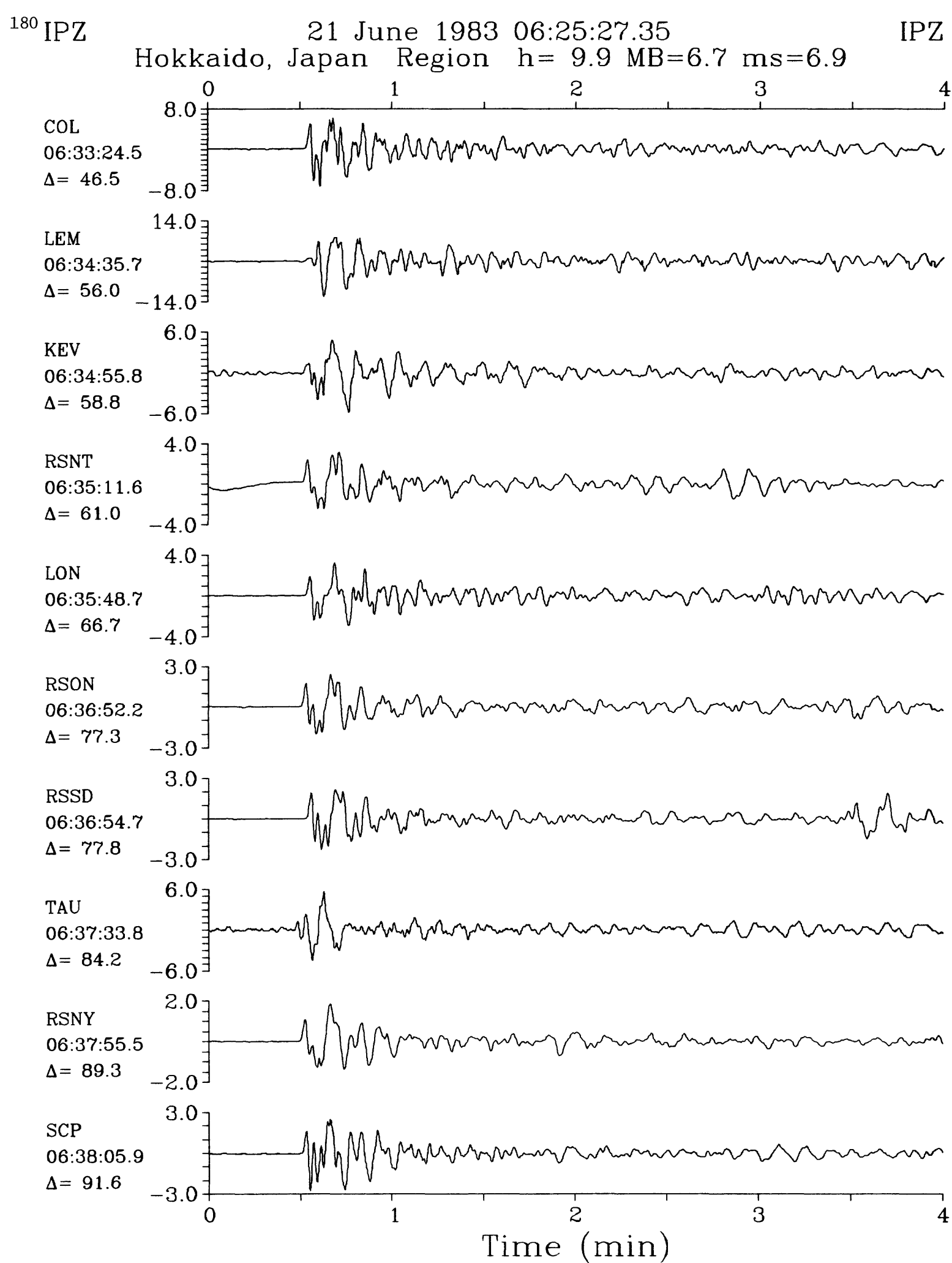
SPZ

21 June 1983 06:25:27.35

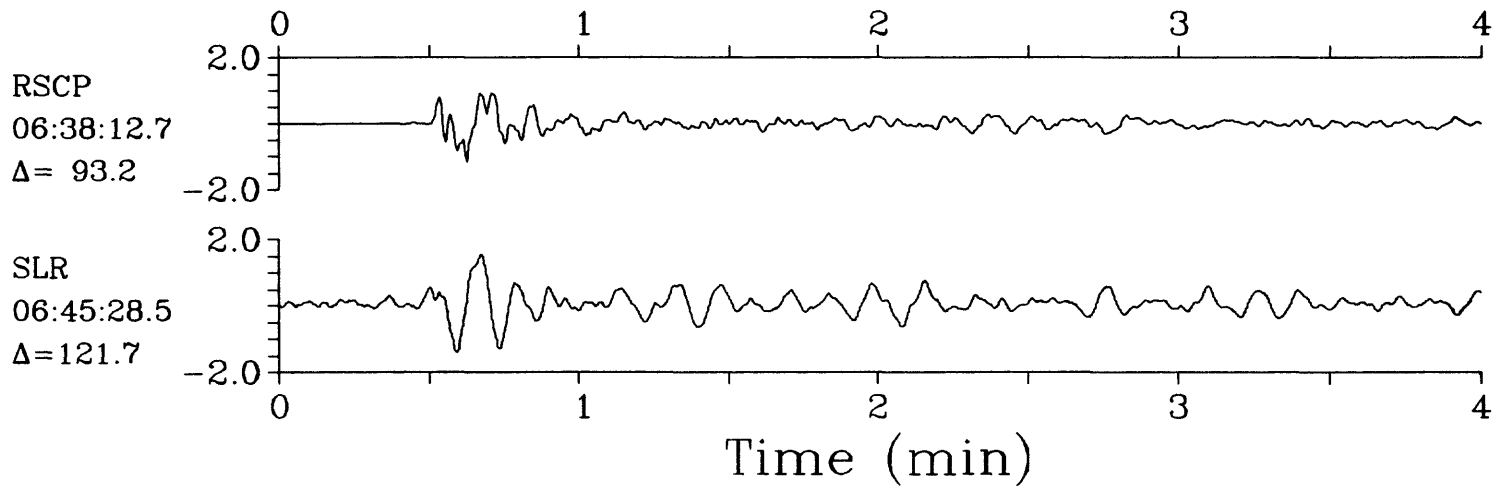
SPZ¹⁷⁹

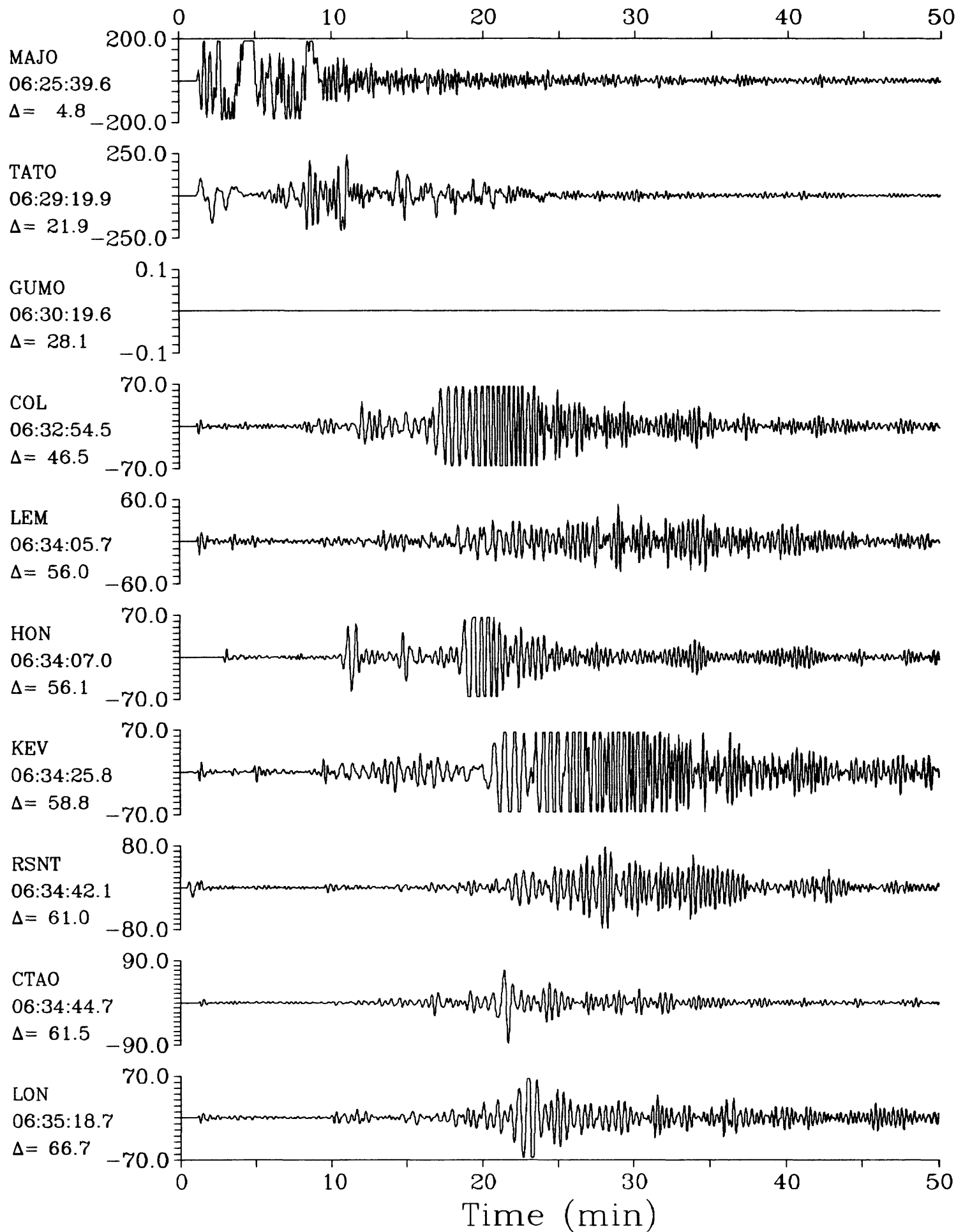
Hokkaido, Japan Region h= 9.9 MB=6.7 ms=6.9

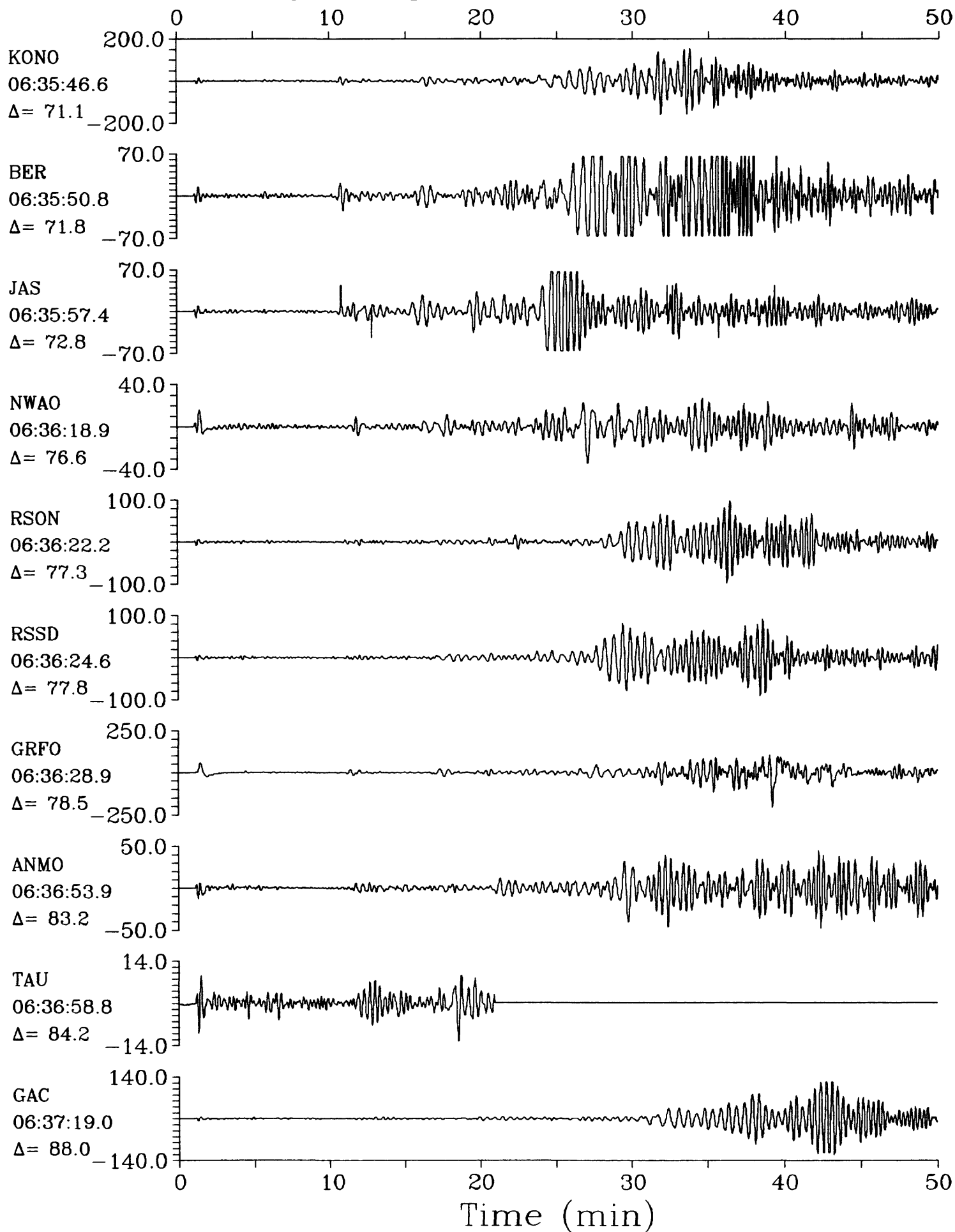


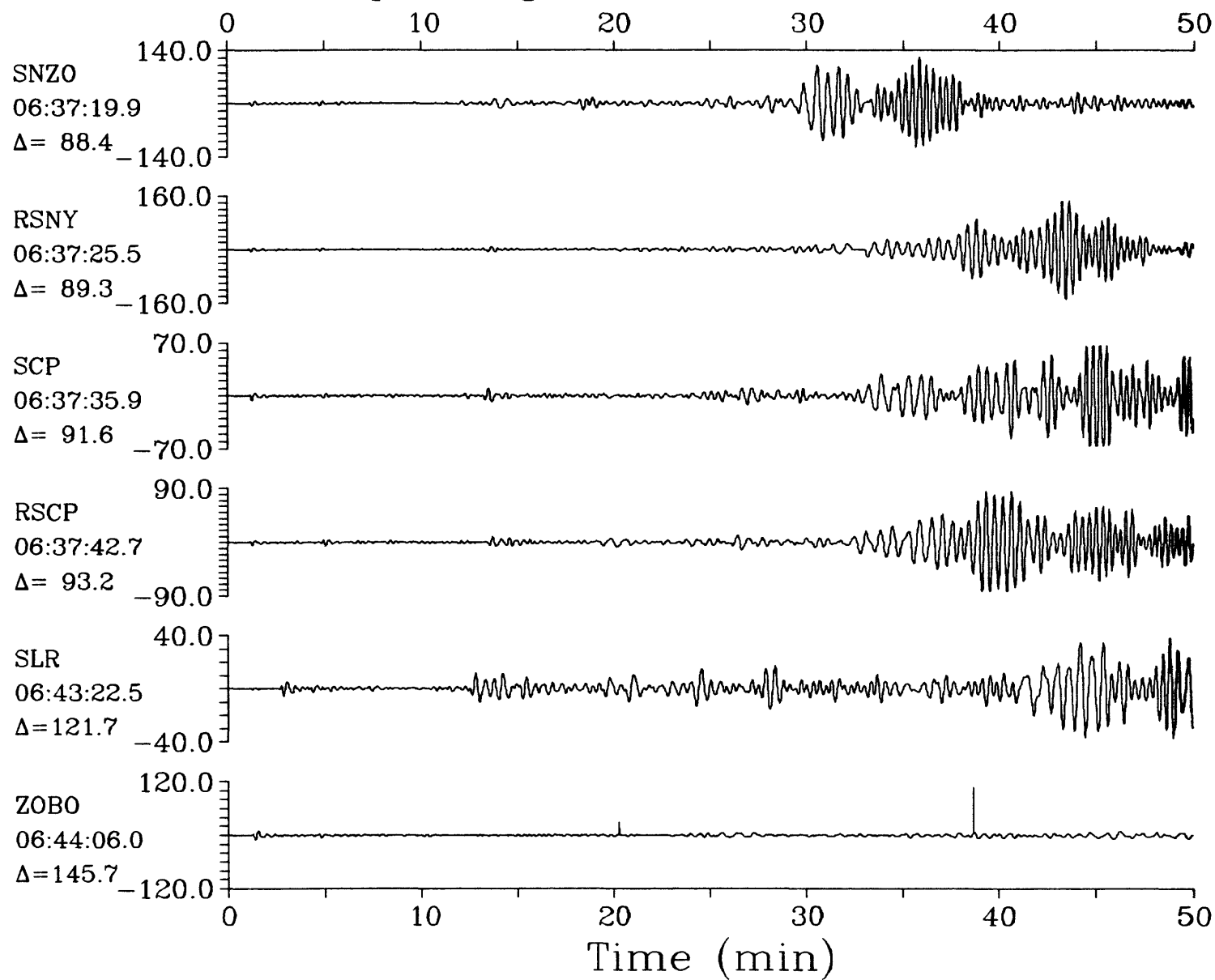


Hokkaido, Japan Region h= 9.9 MB=6.7 ms=6.9



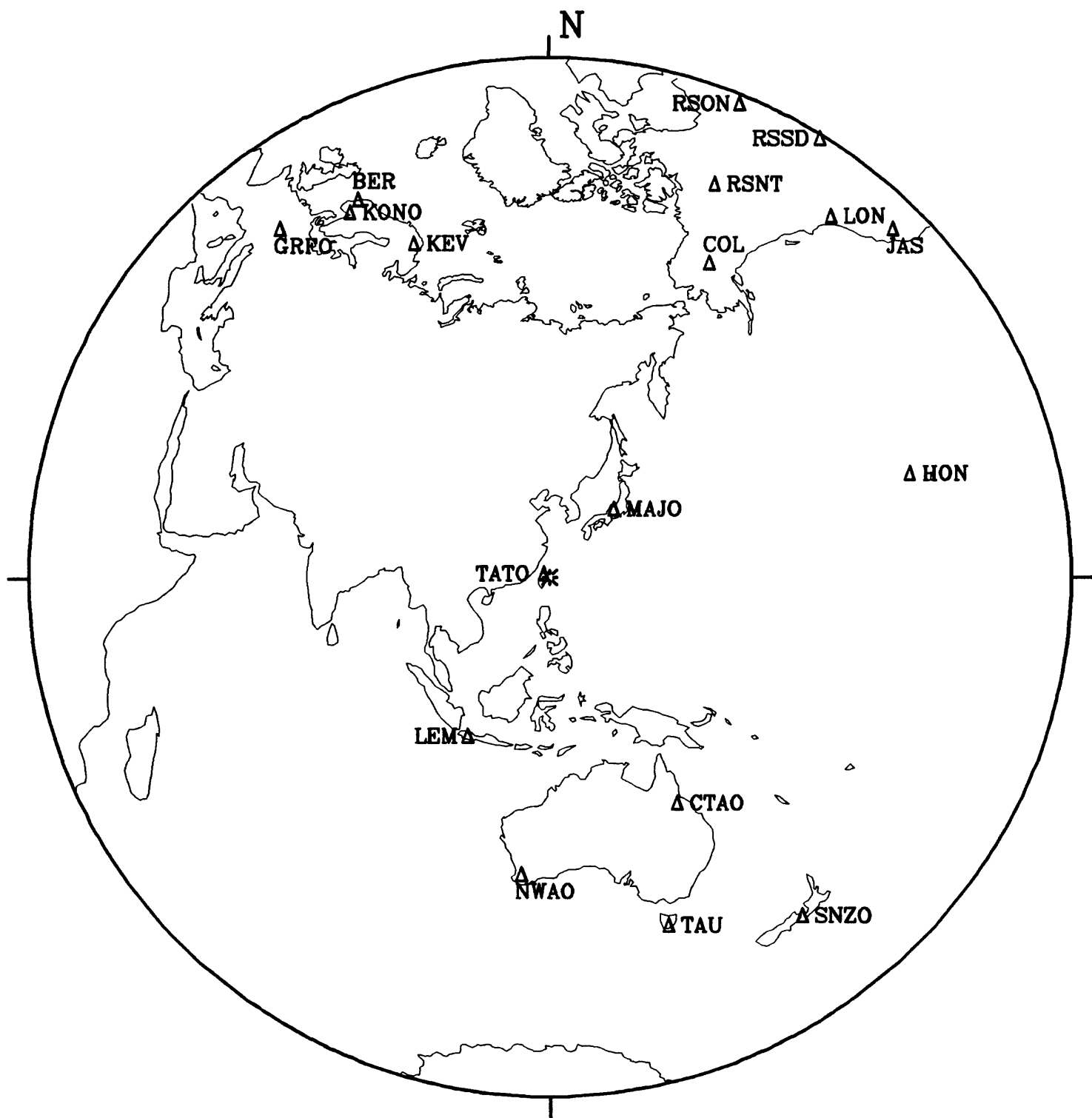
Hokkaido, Japan Region $h=9.9$ MB=6.7 ms=6.9

Hokkaido, Japan Region $h=9.9$ MB=6.7 ms=6.9

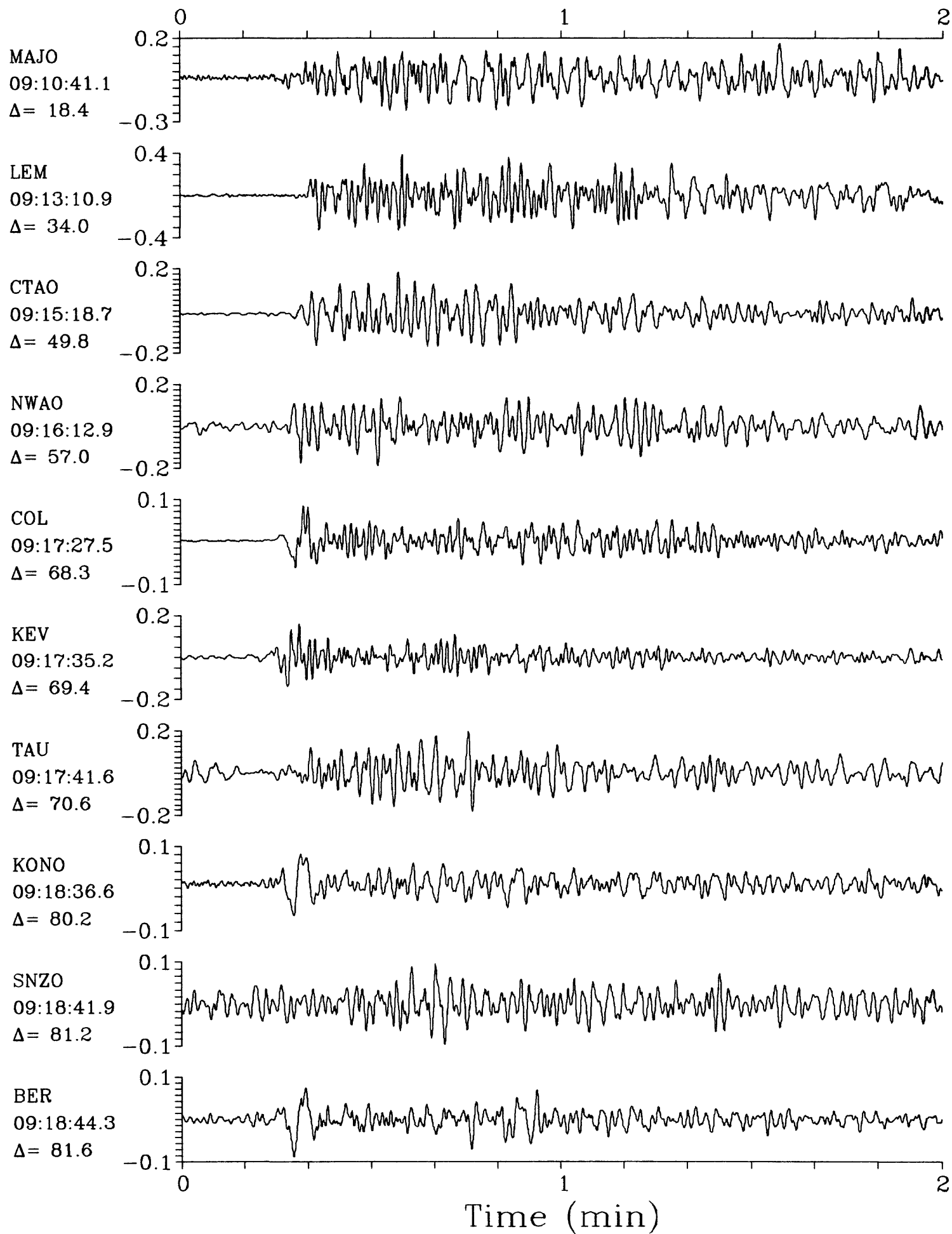
Hokkaido, Japan Region $h = 9.9$ MB=6.7 ms=6.9

24 June 1983 09:06:45.80

Taiwan Region



Taiwan Region h=44.1 MB=6.1 ms=6.7

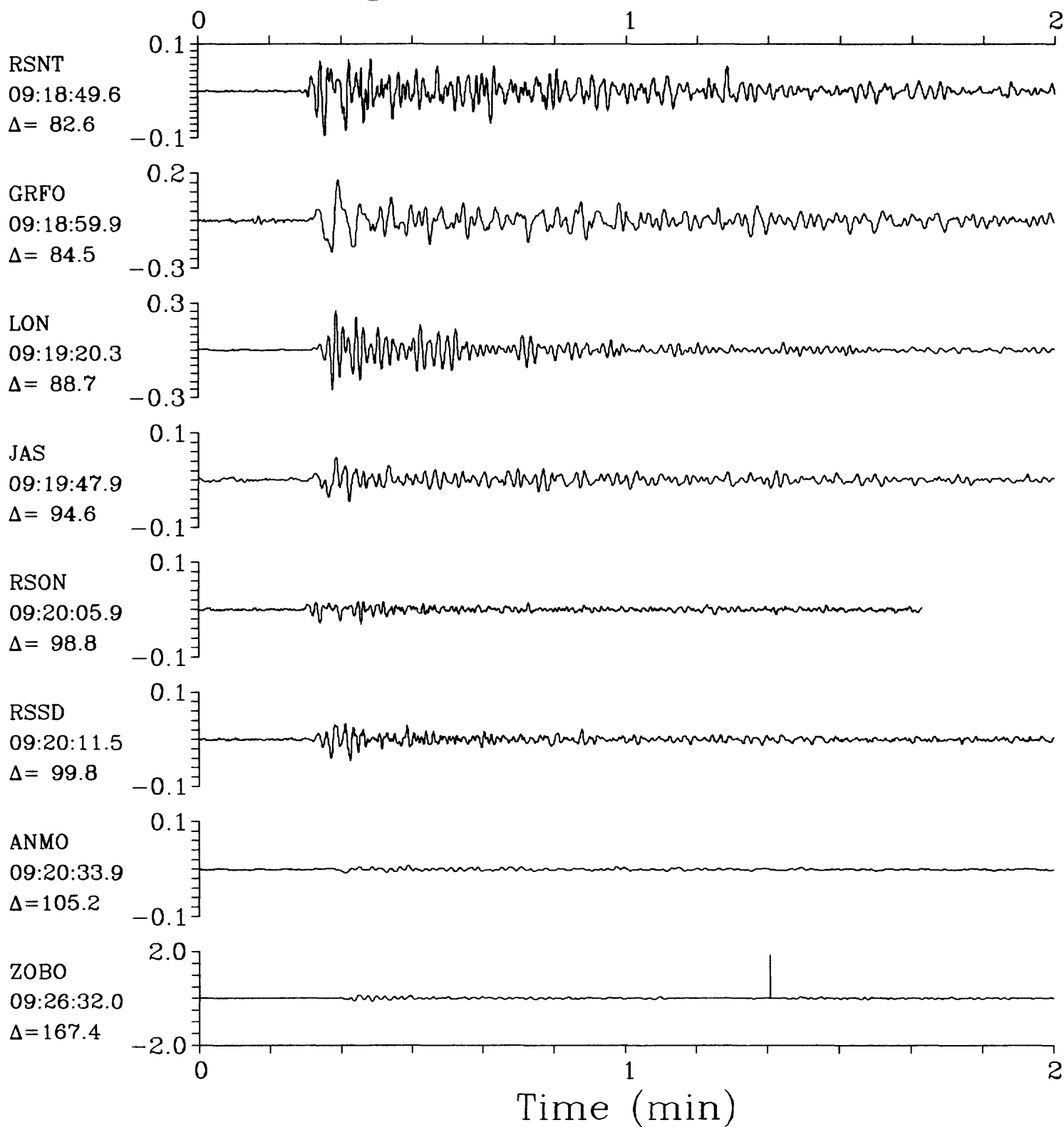


SPZ

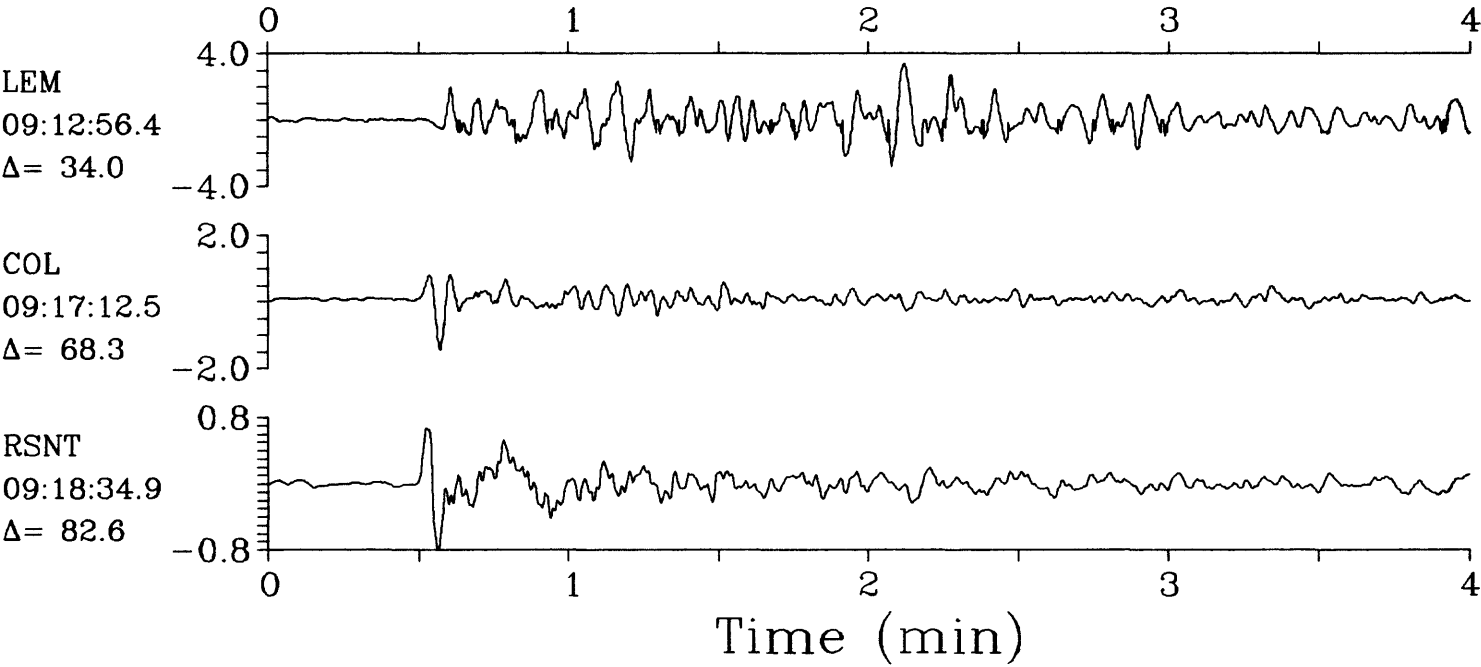
24 June 1983 09:06:45.80

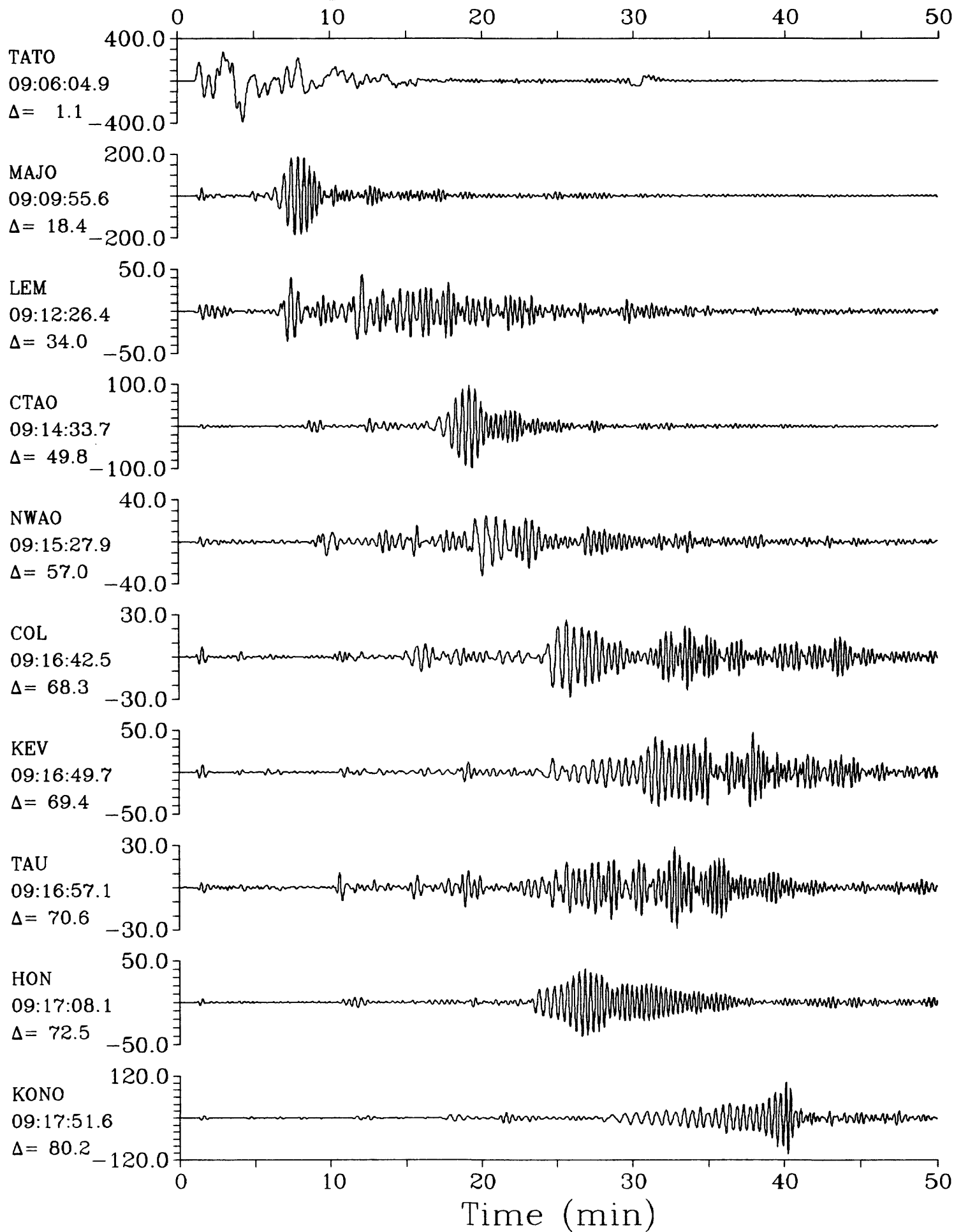
SPZ¹⁸⁷

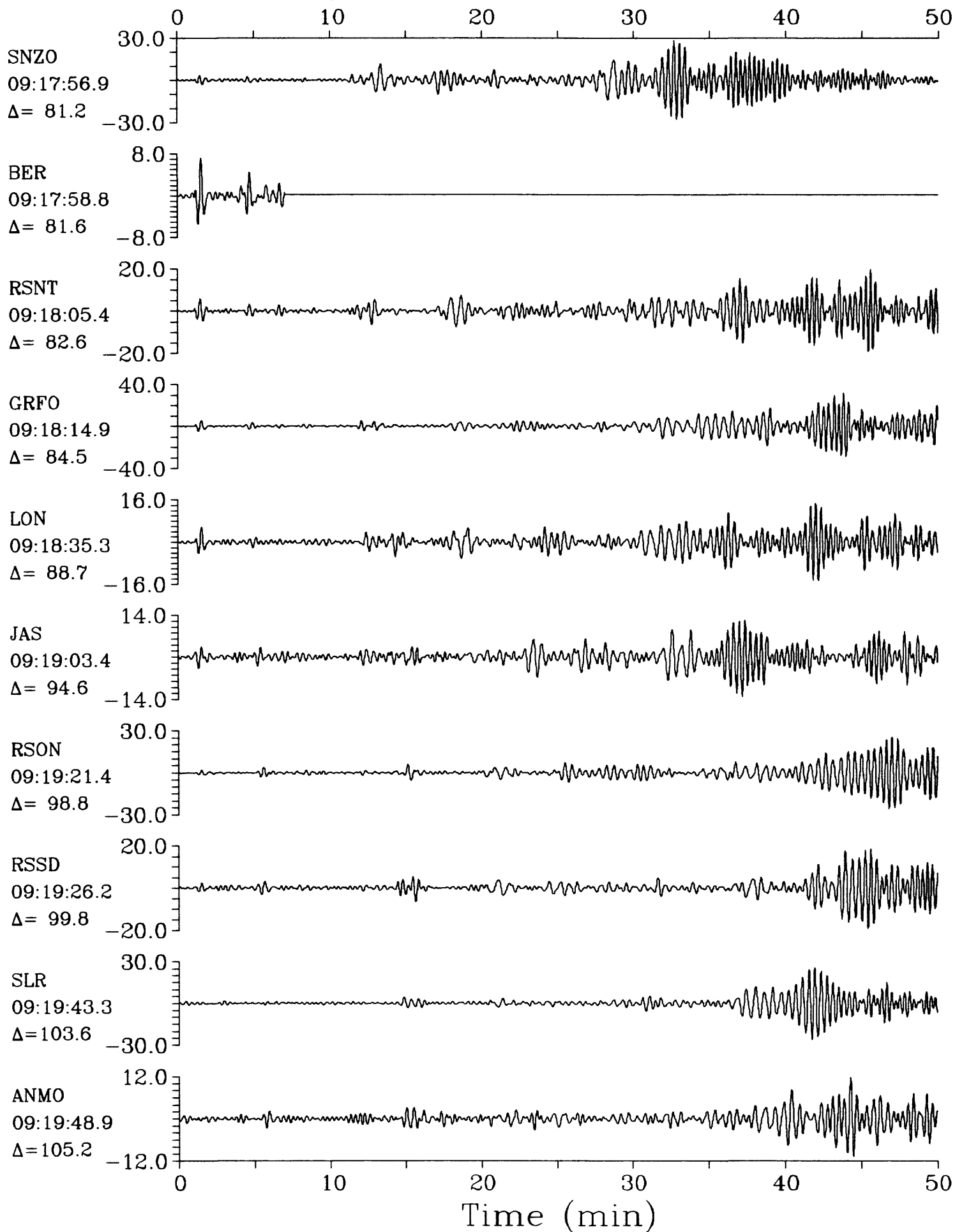
Taiwan Region h=44.1 MB=6.1 ms=6.7

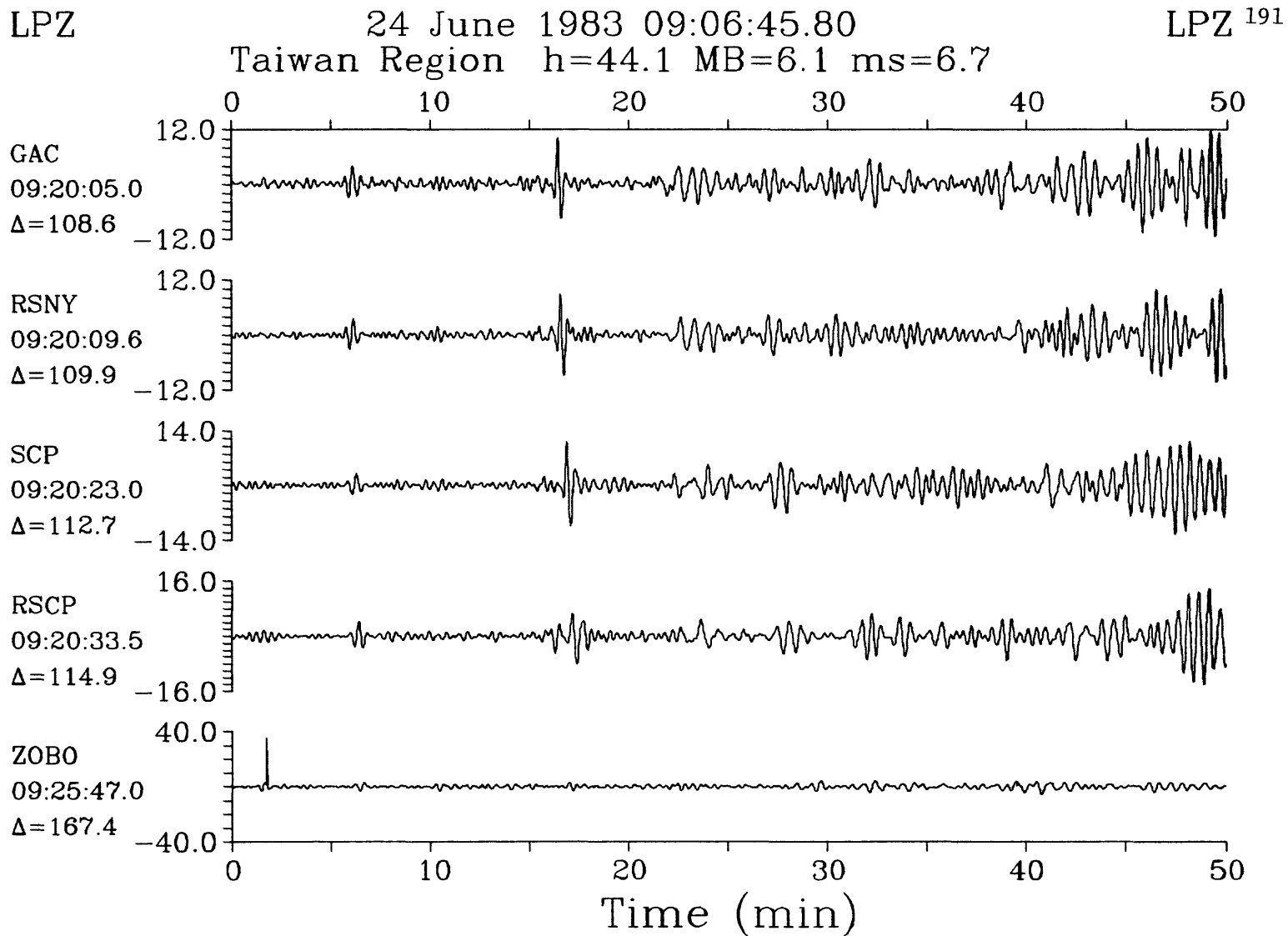


Taiwan Region h=44.1 MB=6.1 ms=6.7



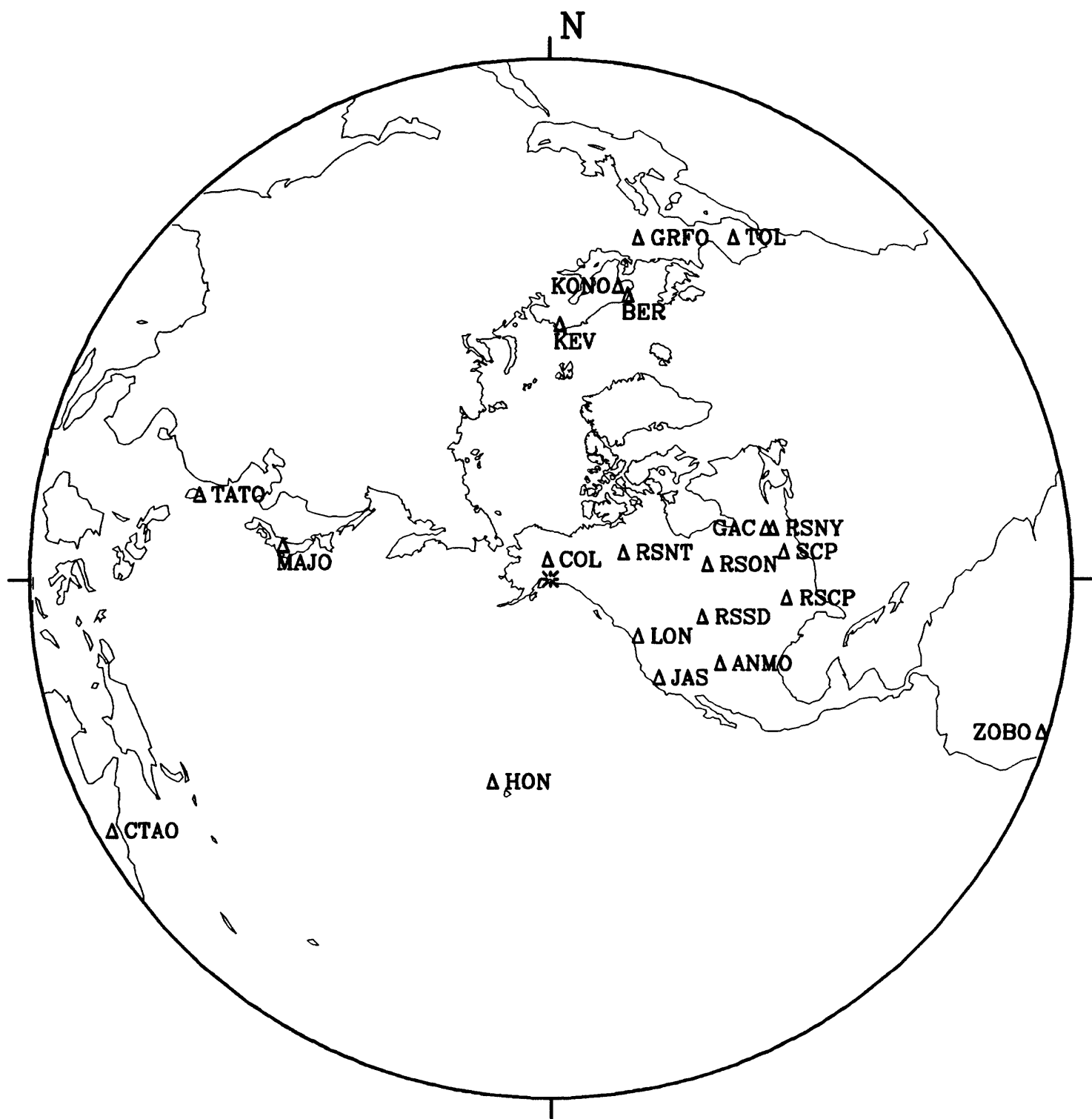
Taiwan Region $h=44.1$ MB=6.1 ms=6.7

Taiwan Region $h=44.1$ MB=6.1 ms=6.7



12 July 1983 15:10:03.40

Southern Alaska

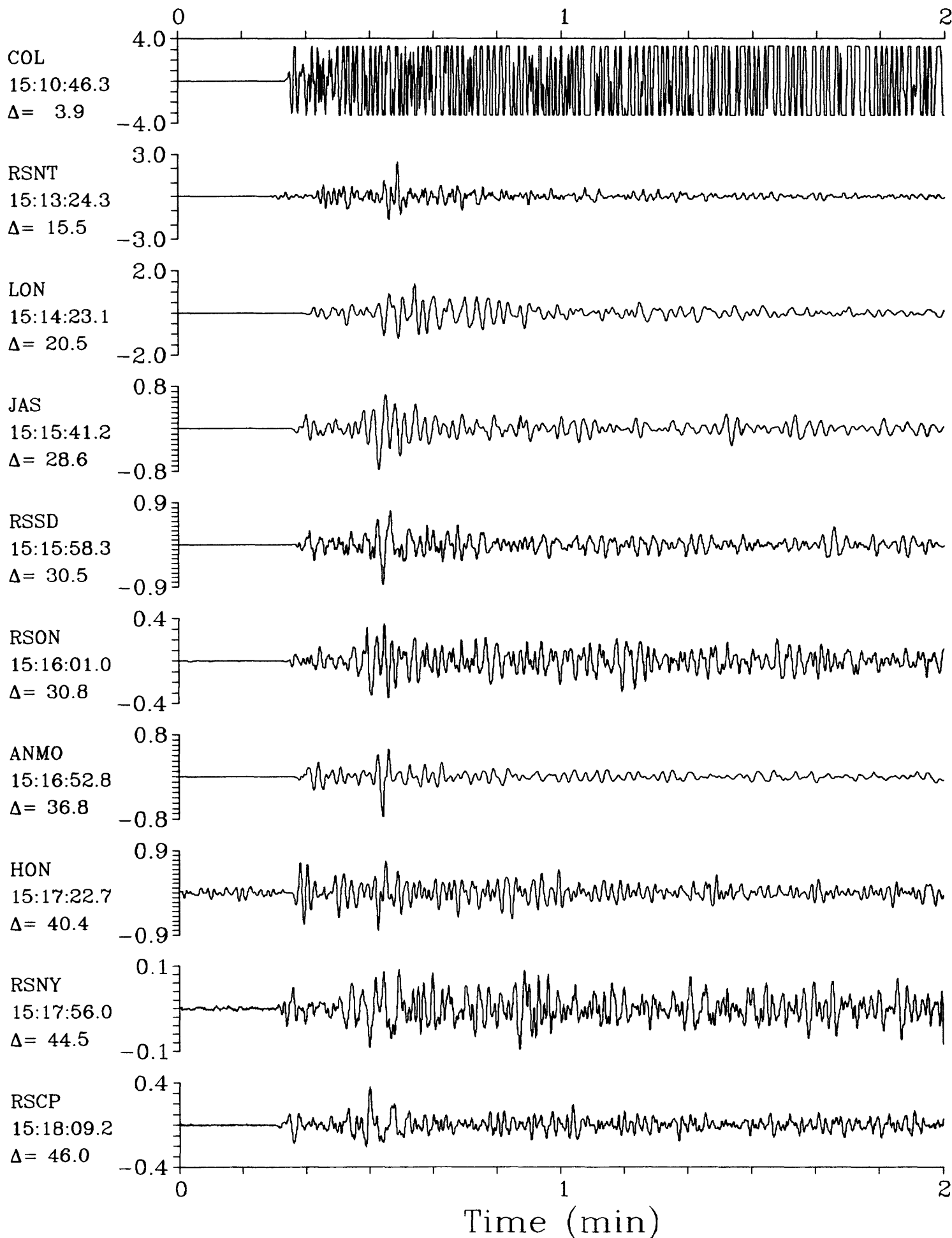


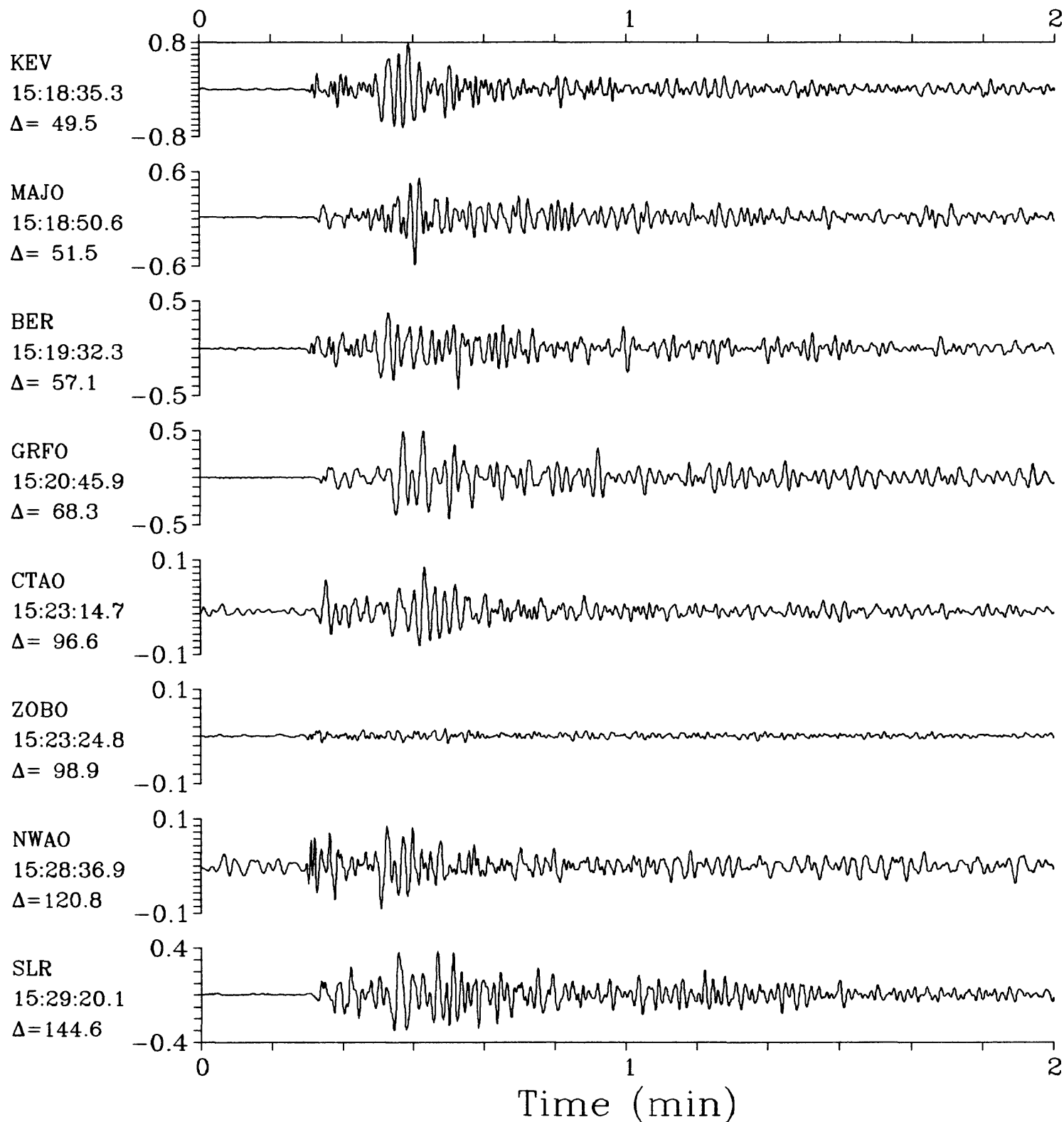
SPZ

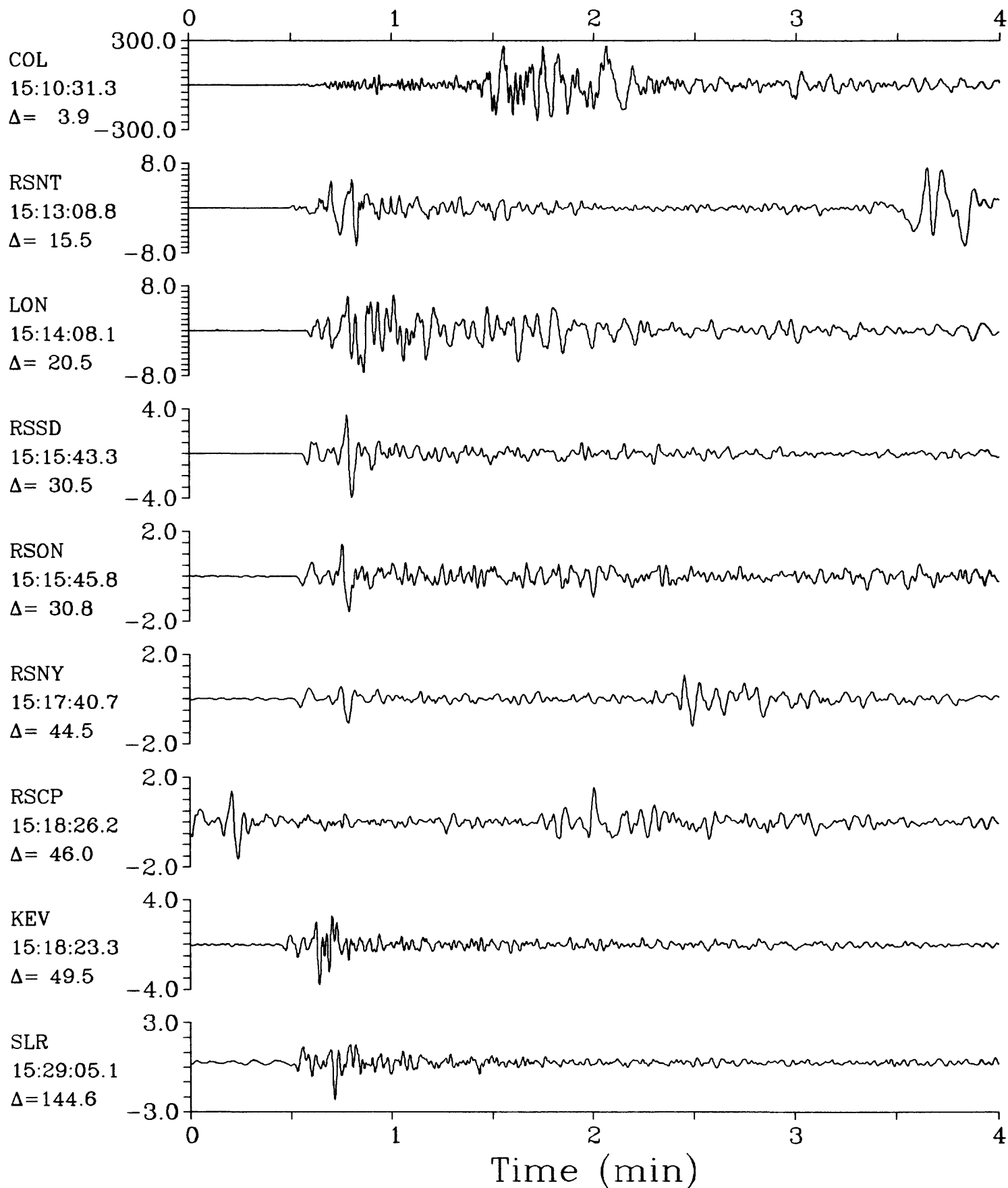
12 July 1983 15:10:03.40

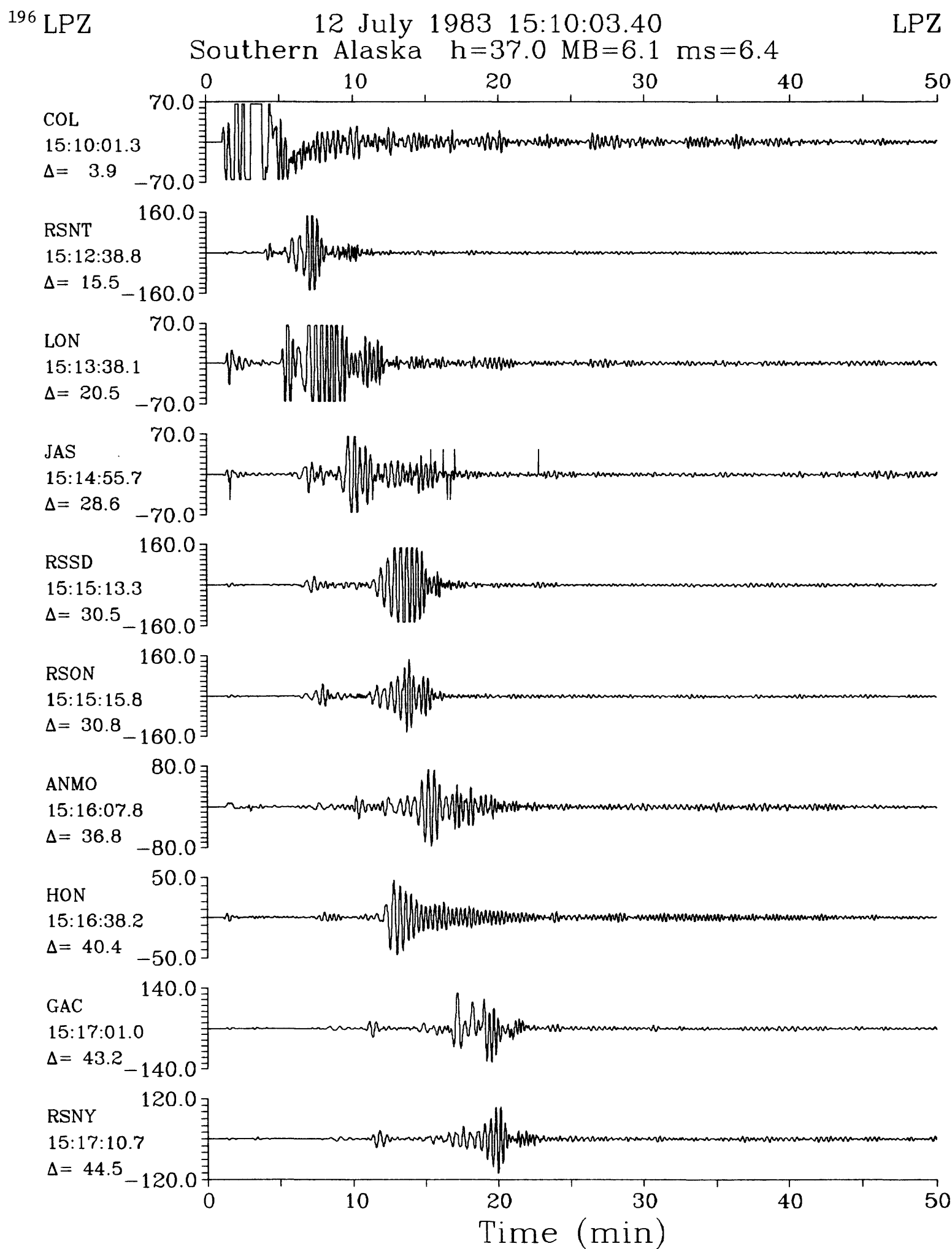
SPZ¹⁹³

Southern Alaska h=37.0 MB=6.1 ms=6.4

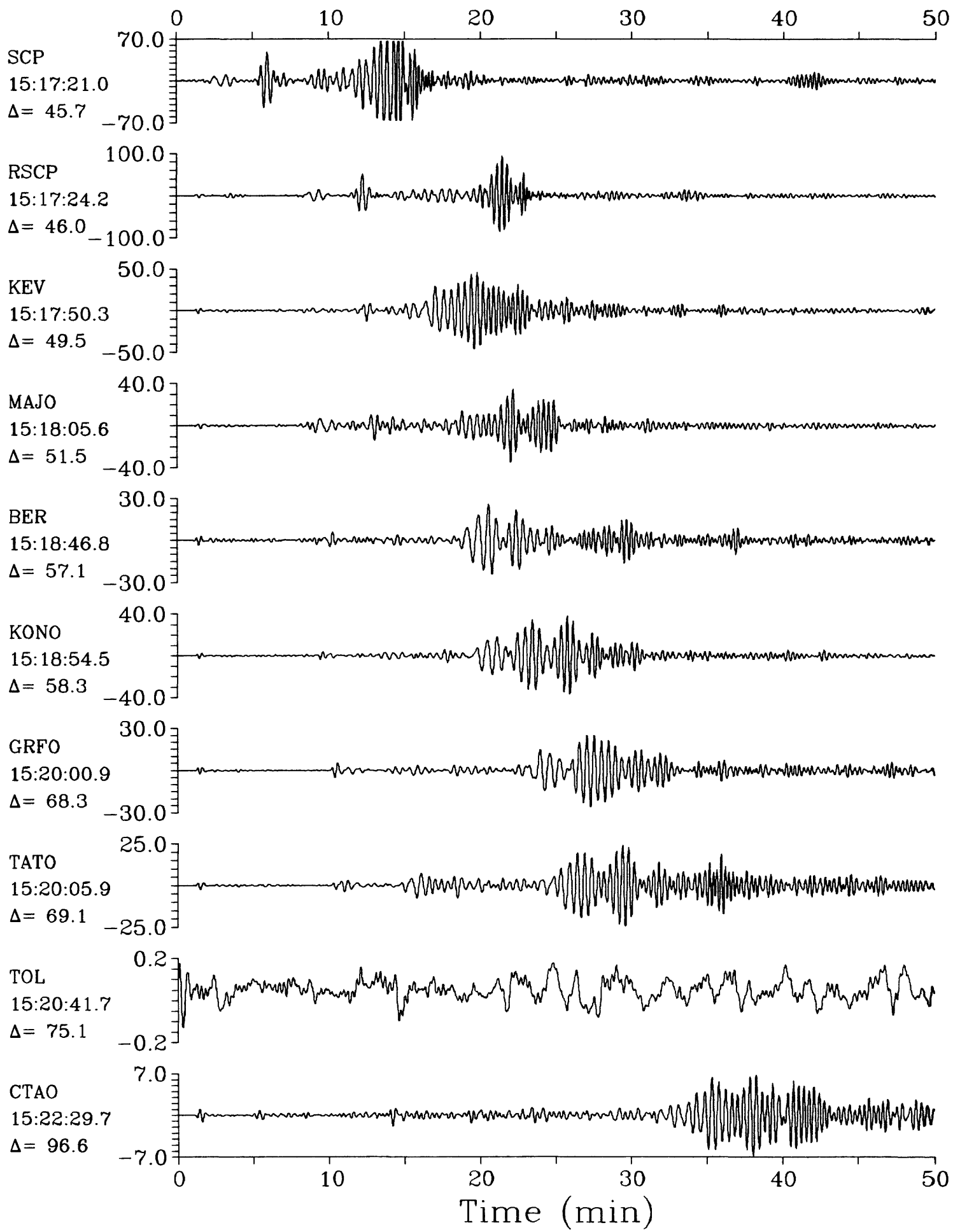


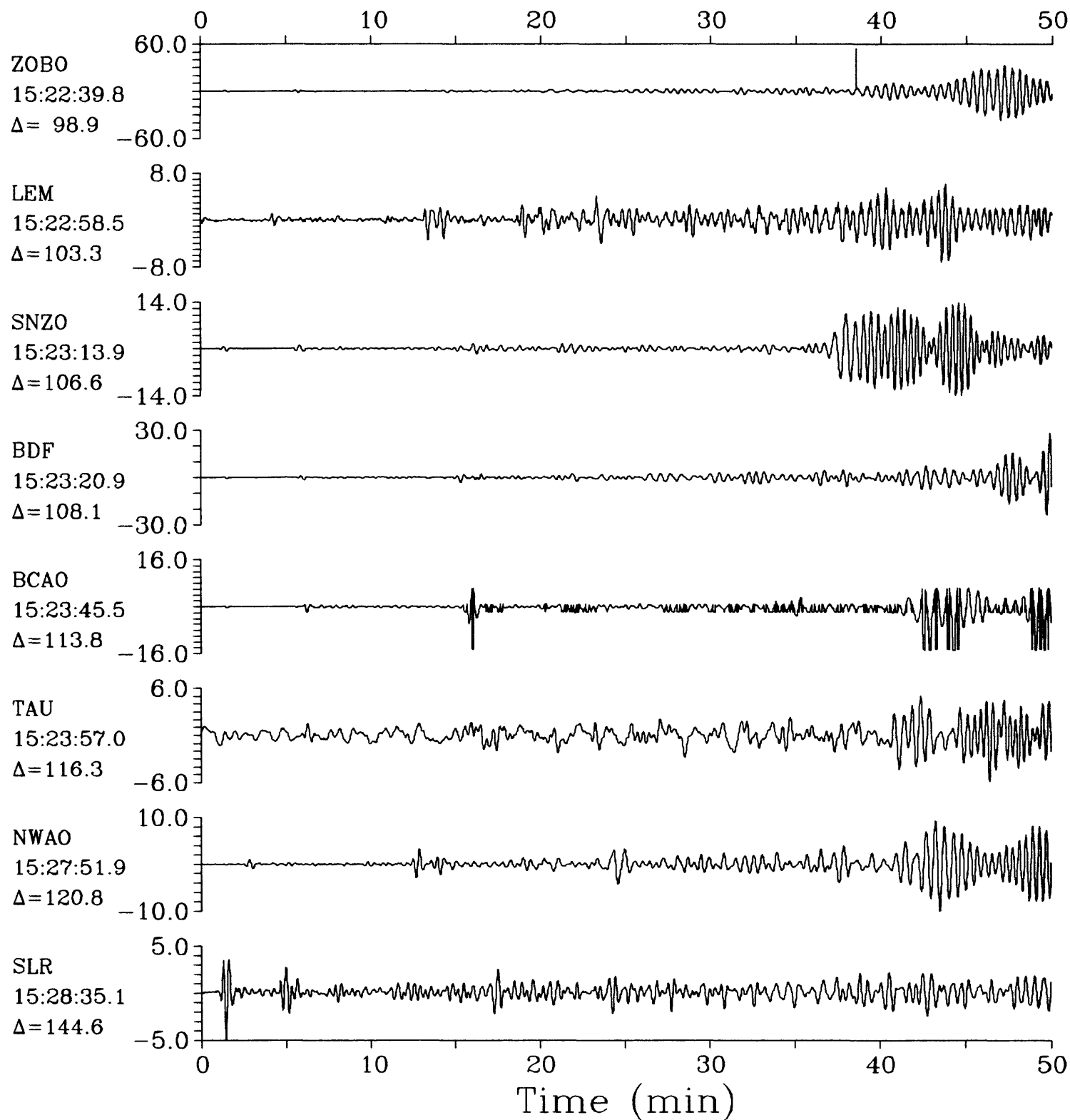
Southern Alaska $h=37.0$ MB=6.1 ms=6.4

Southern Alaska $h=37.0$ MB=6.1 ms=6.4



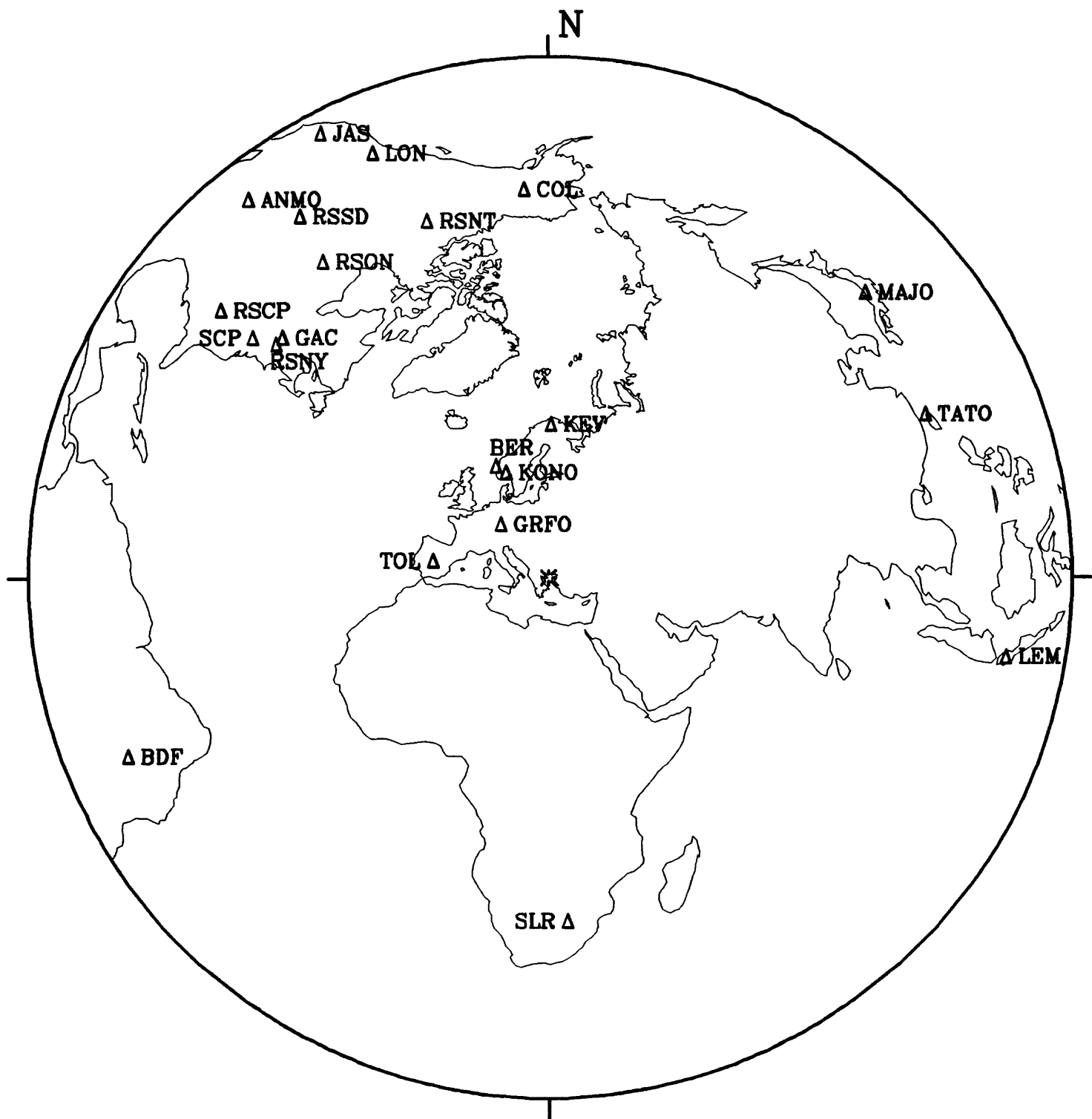
Southern Alaska h=37.0 MB=6.1 ms=6.4

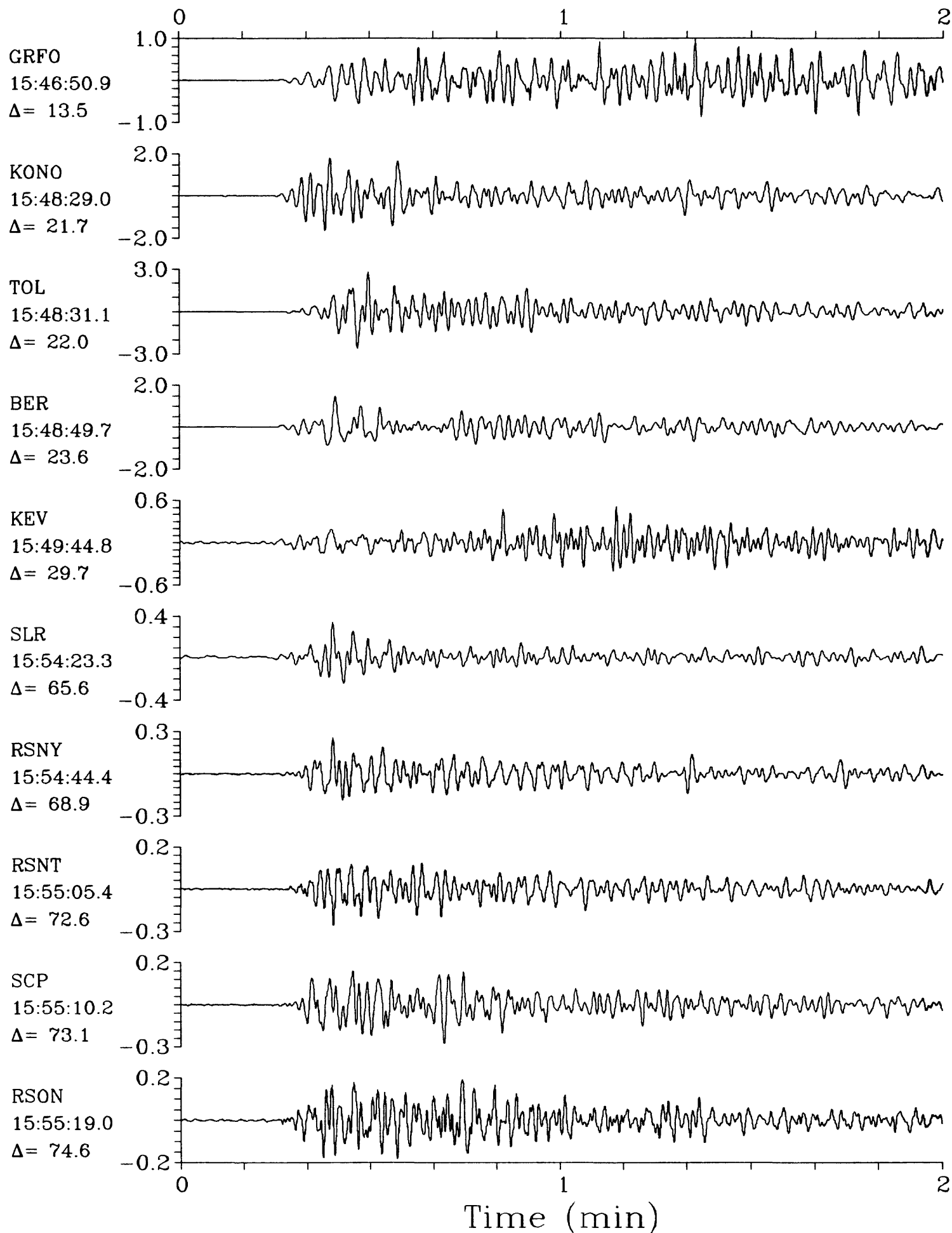


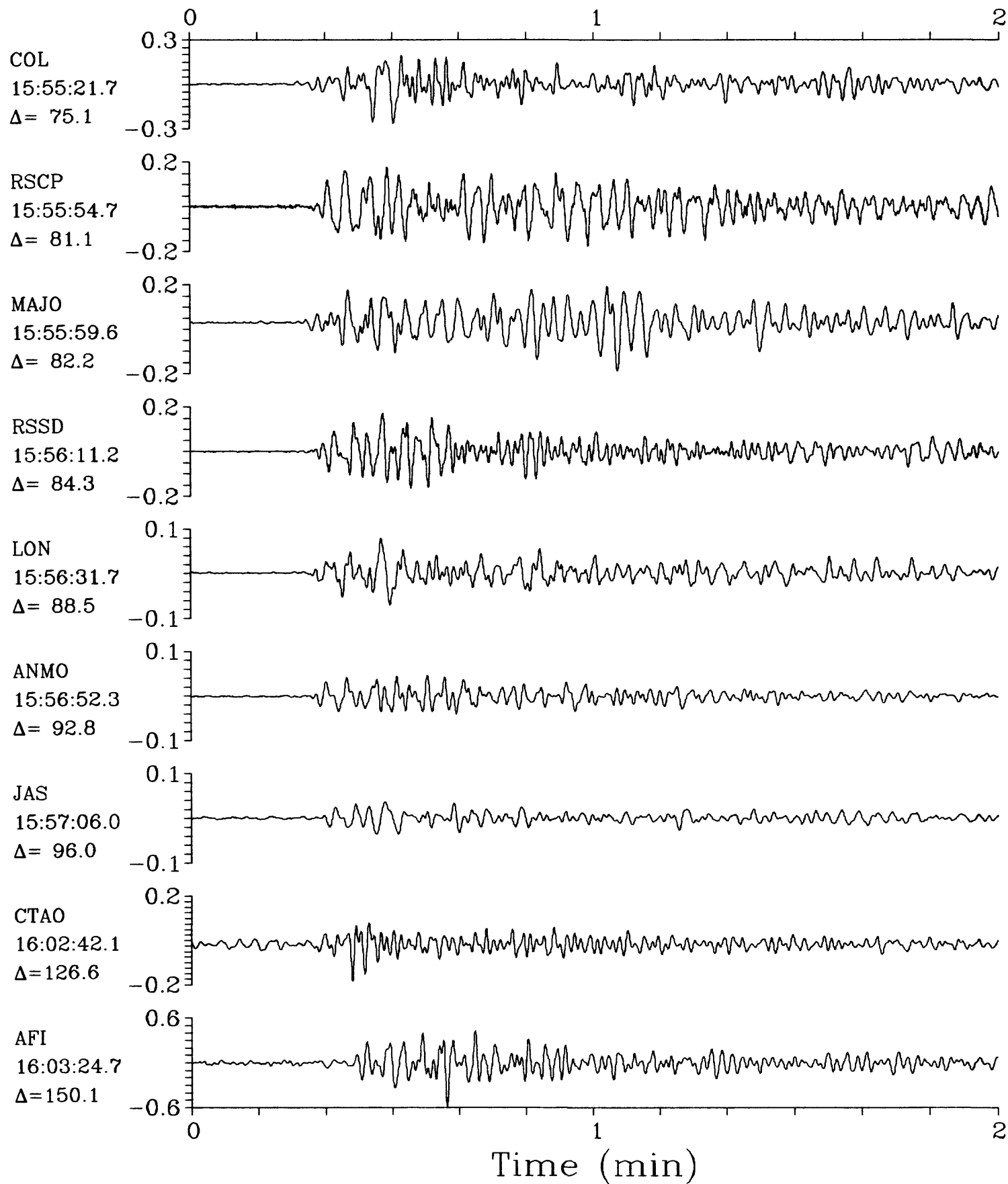
Southern Alaska $h=37.0$ MB=6.1 ms=6.4

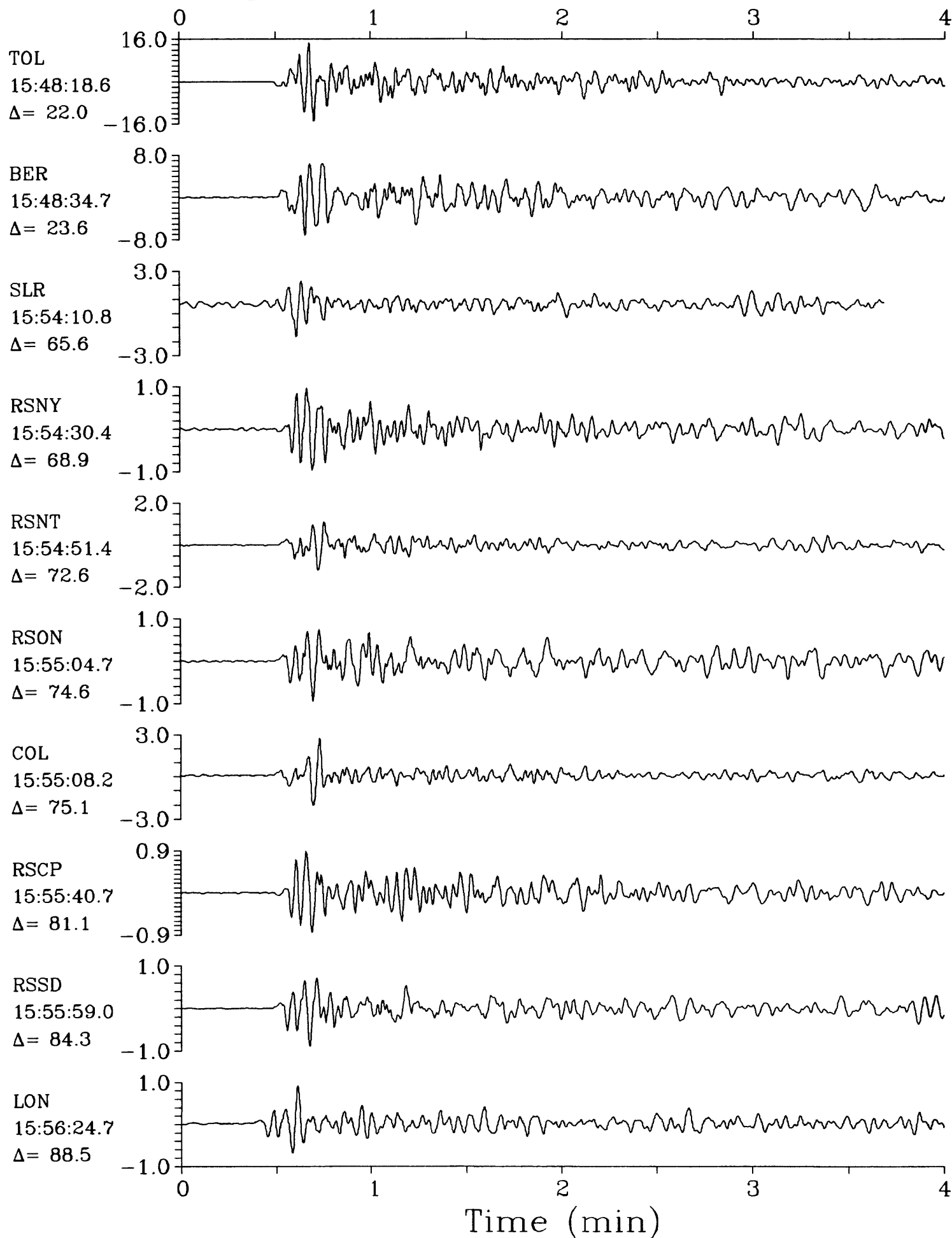
06 August 1983 15:43:51.24

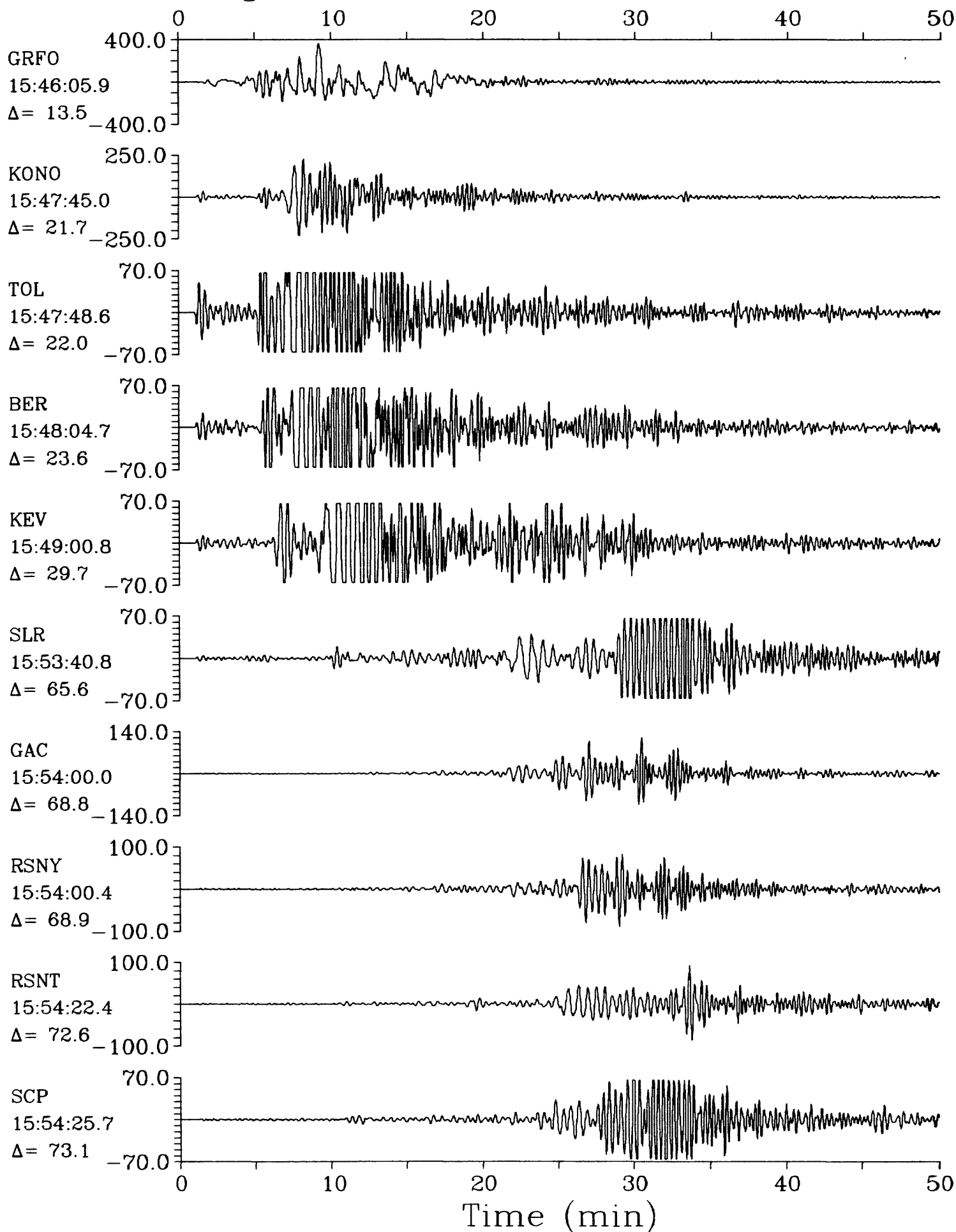
Aegean Sea

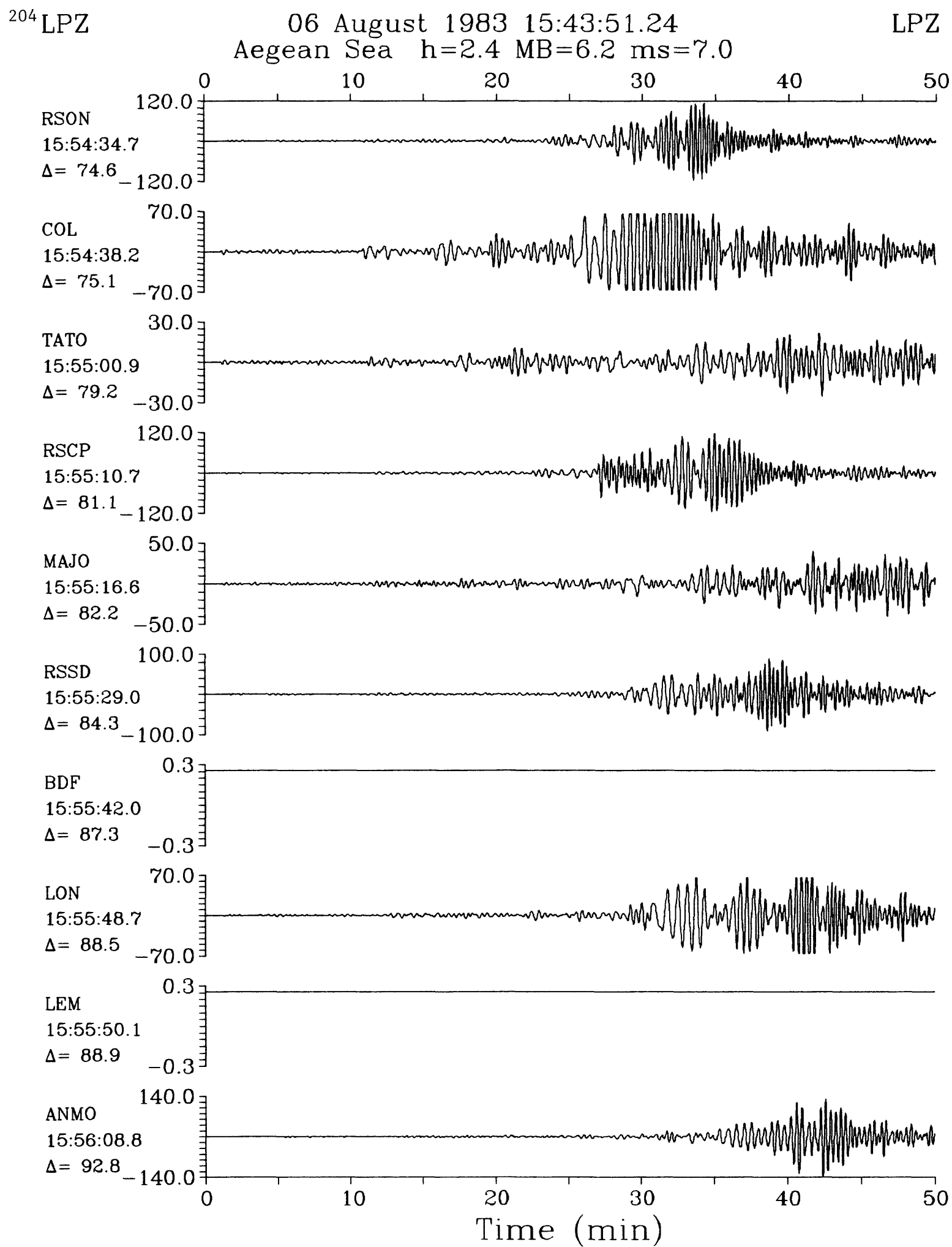


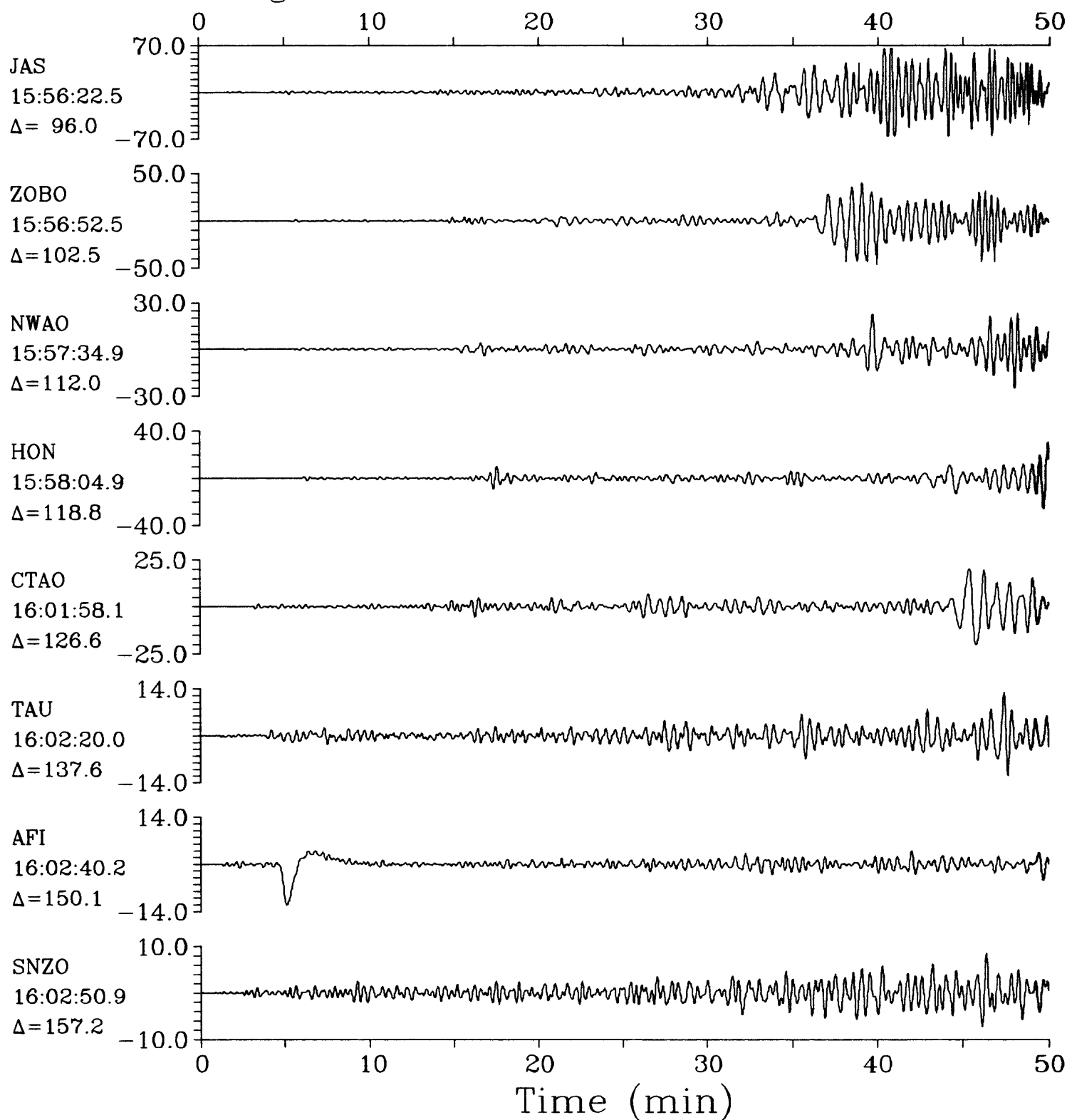






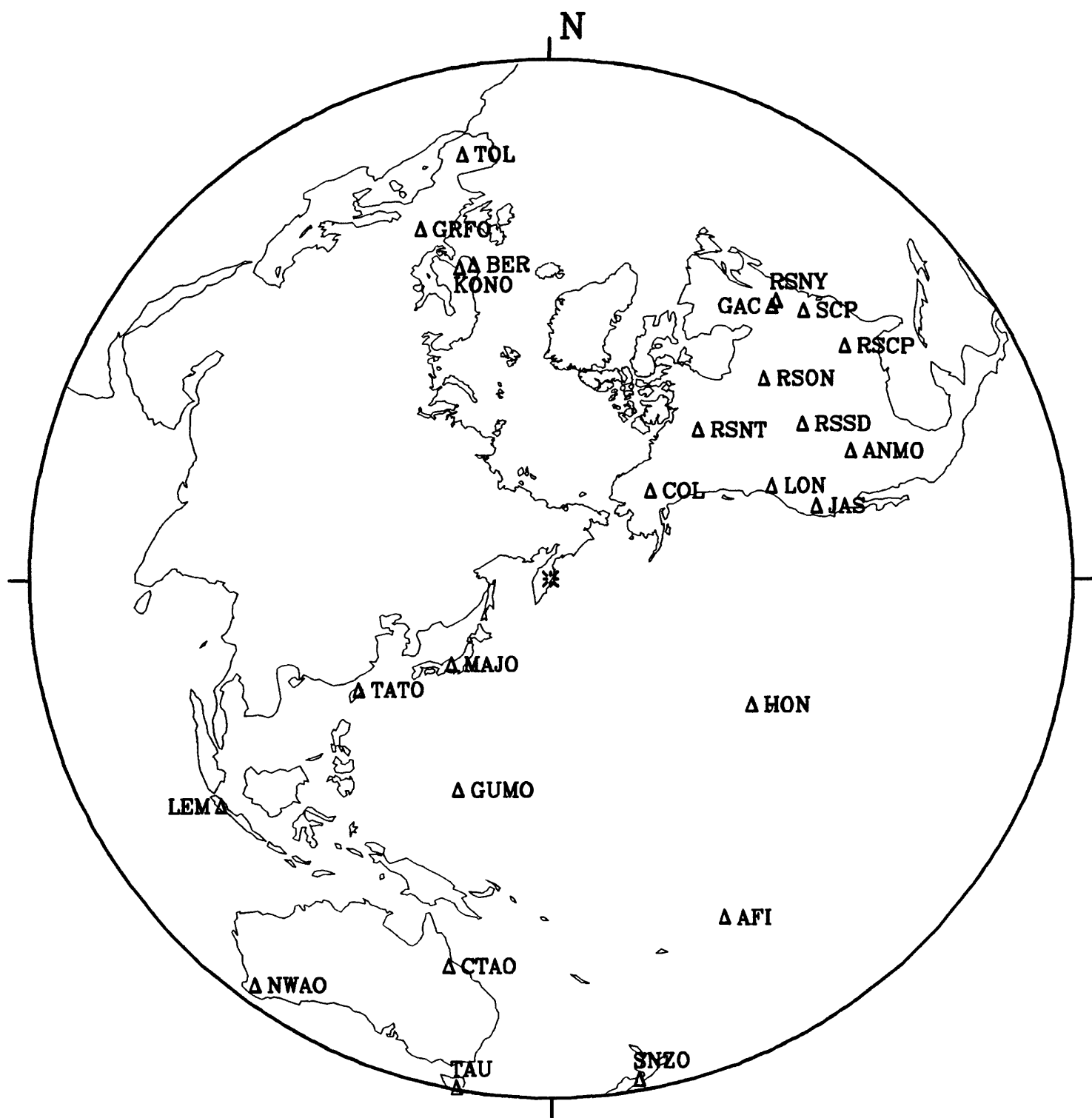




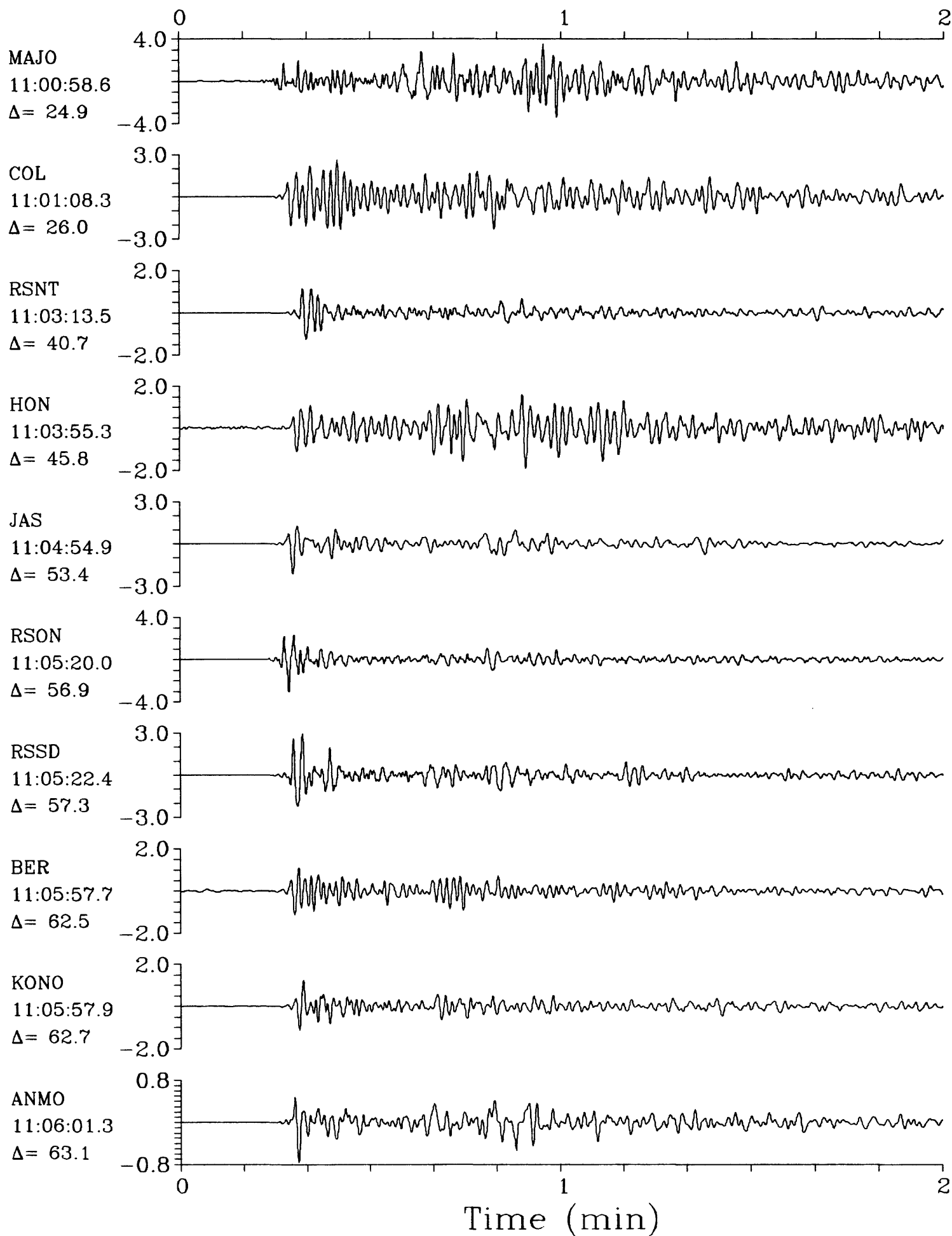


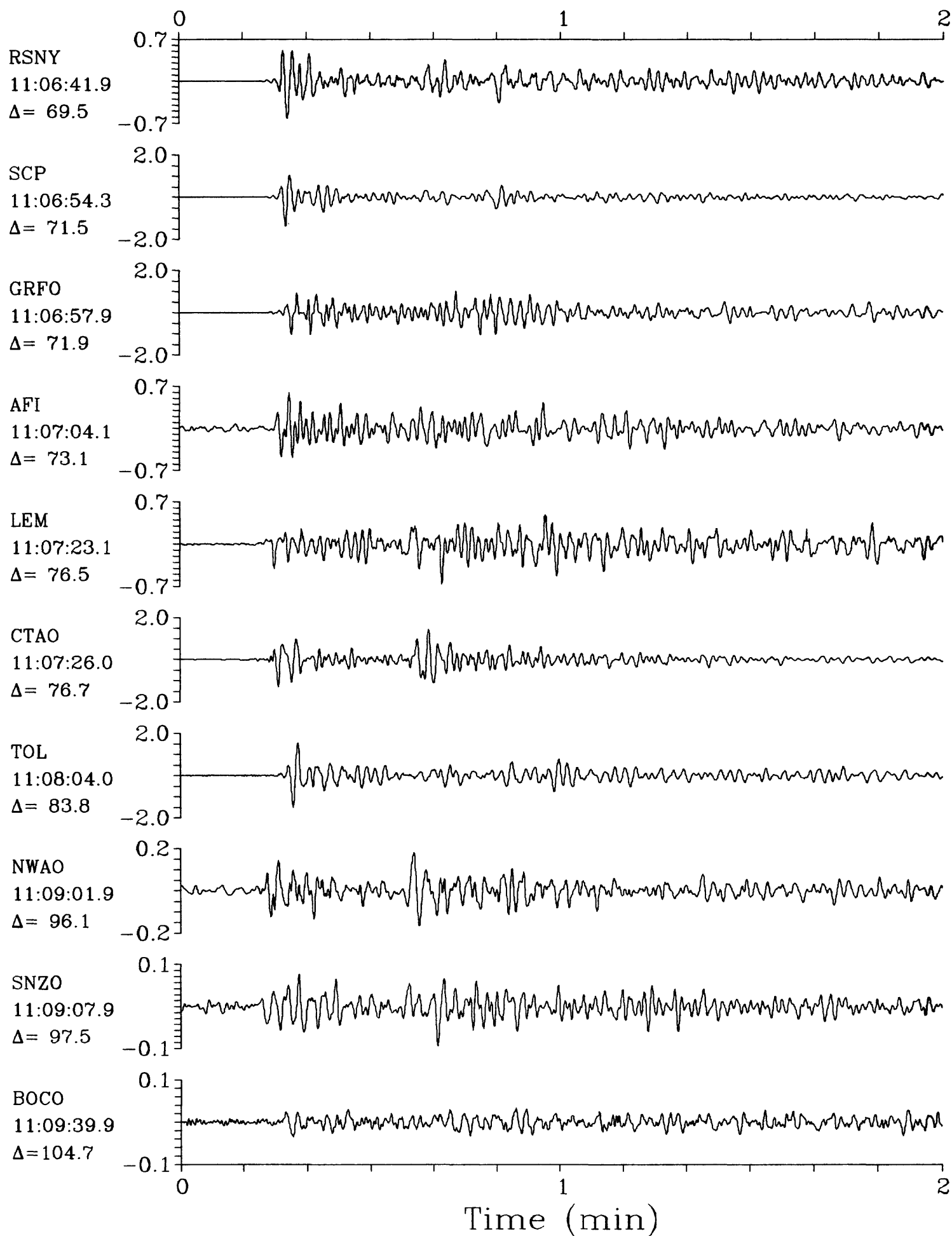
17 August 1983 10:55:54.13

Near East Coast of Kamchatka

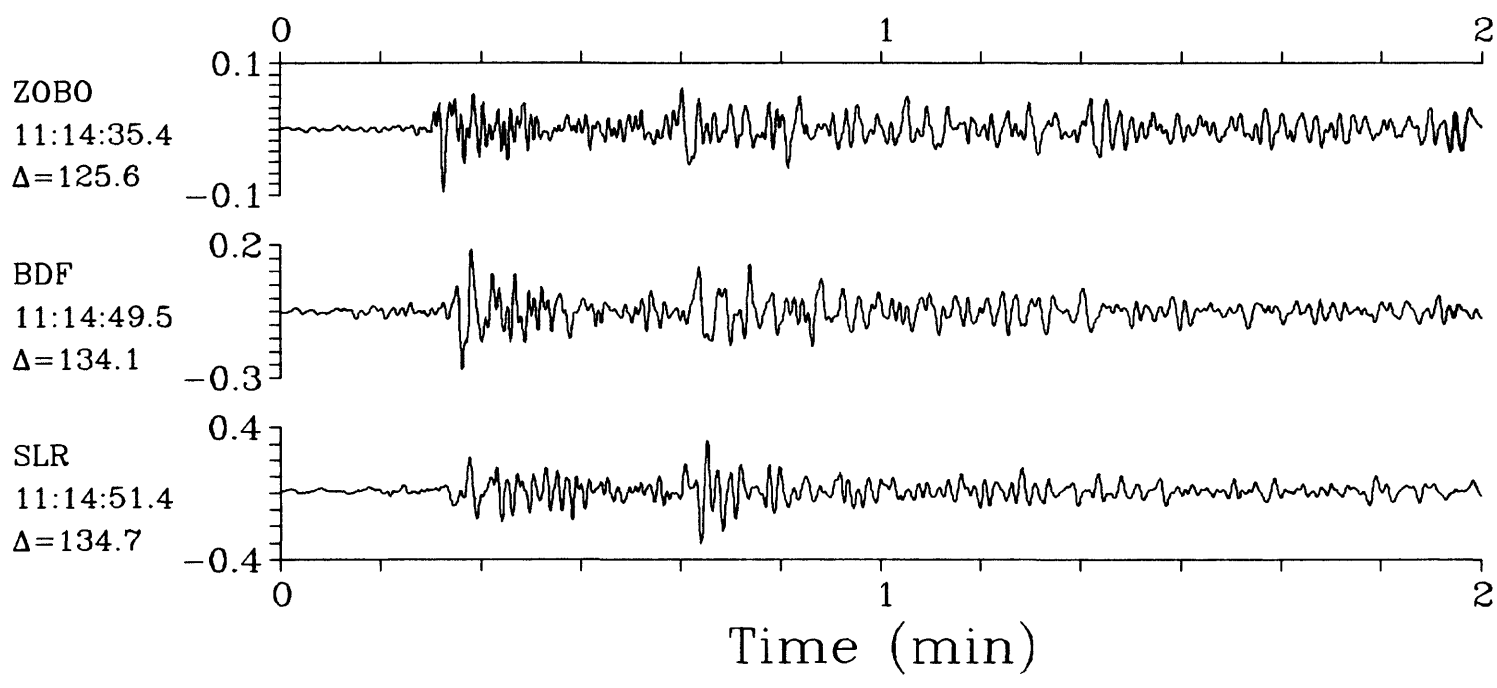


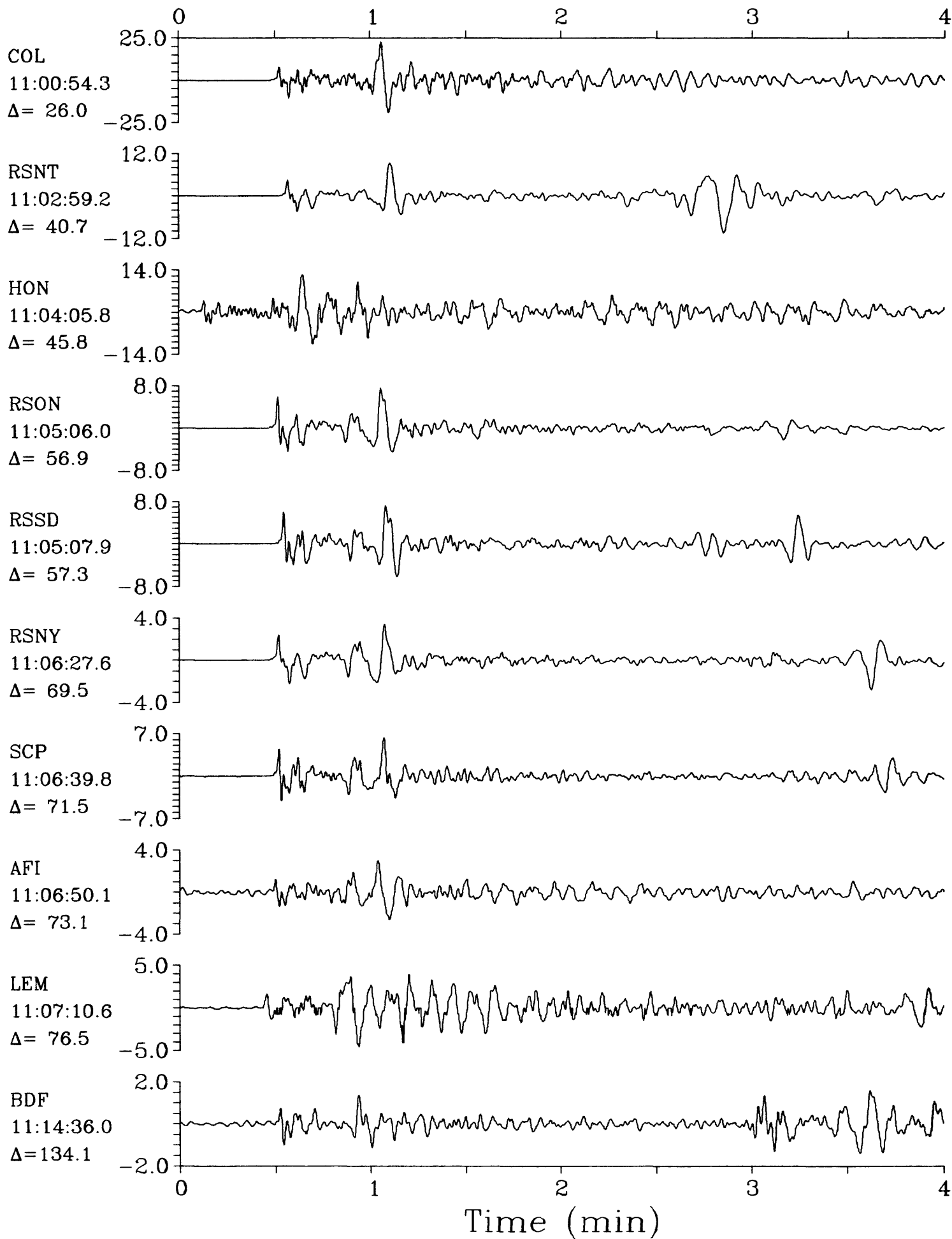
Near East Coast of Kamchatka h=62.6 MB=6.6



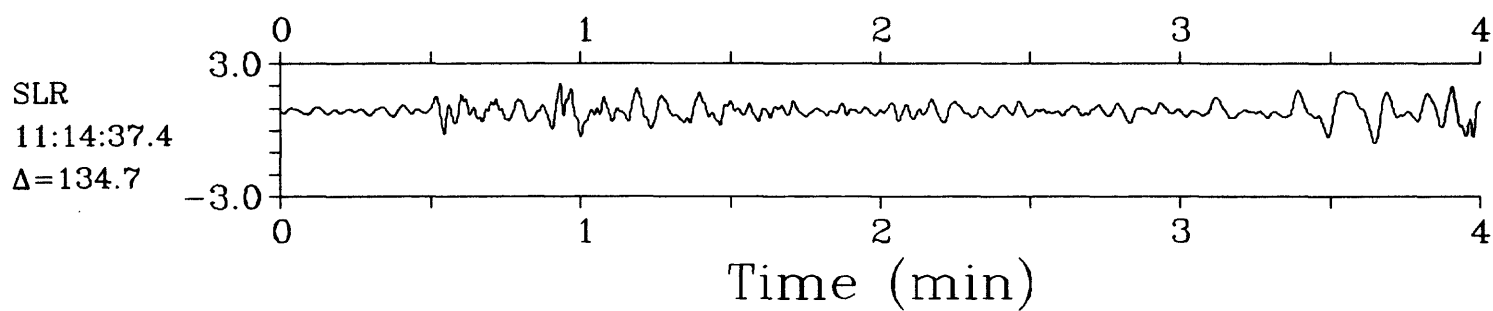
Near East Coast of Kamchatka $h=62.6$ MB=6.6

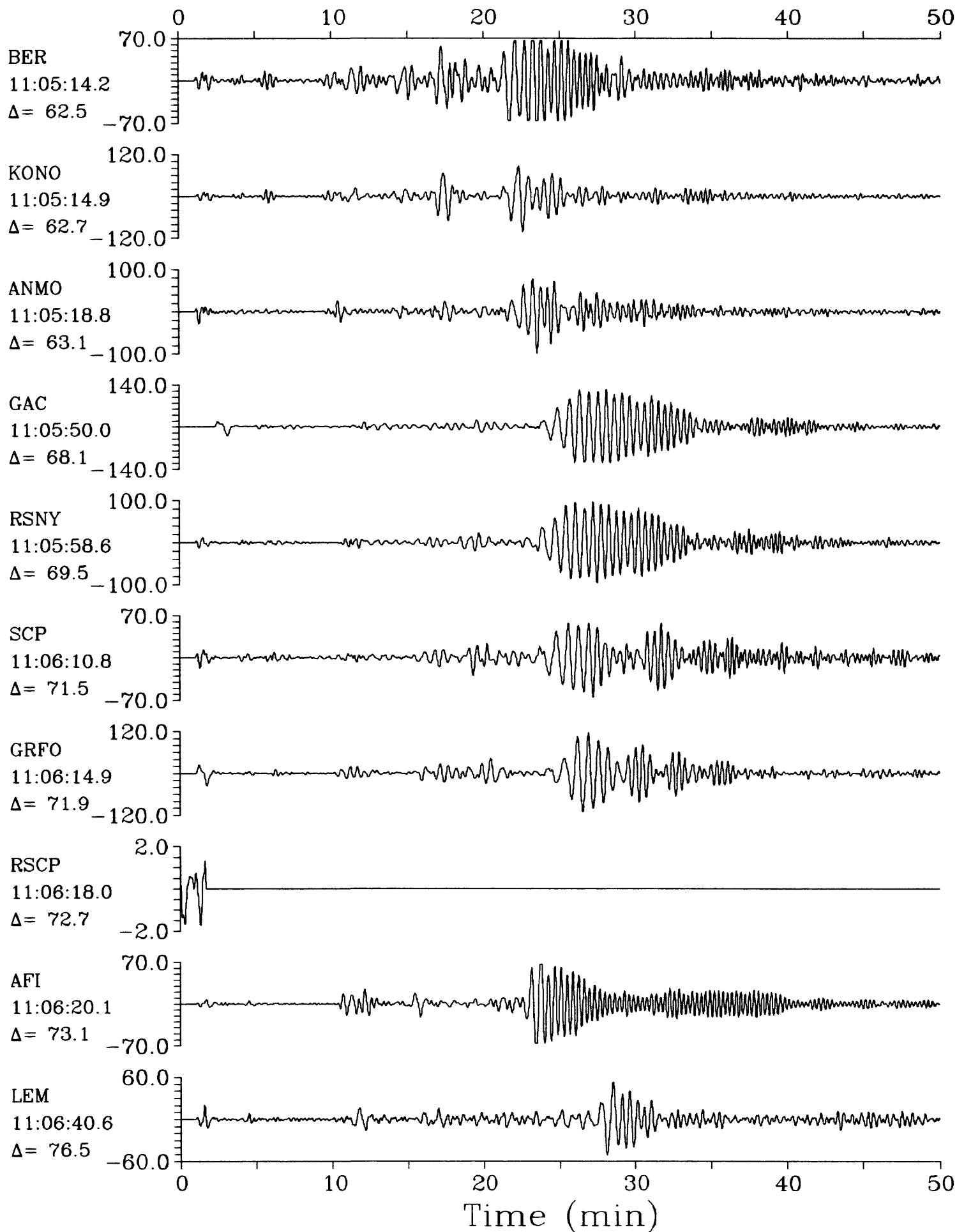
Near East Coast of Kamchatka h=62.6 MB=6.6

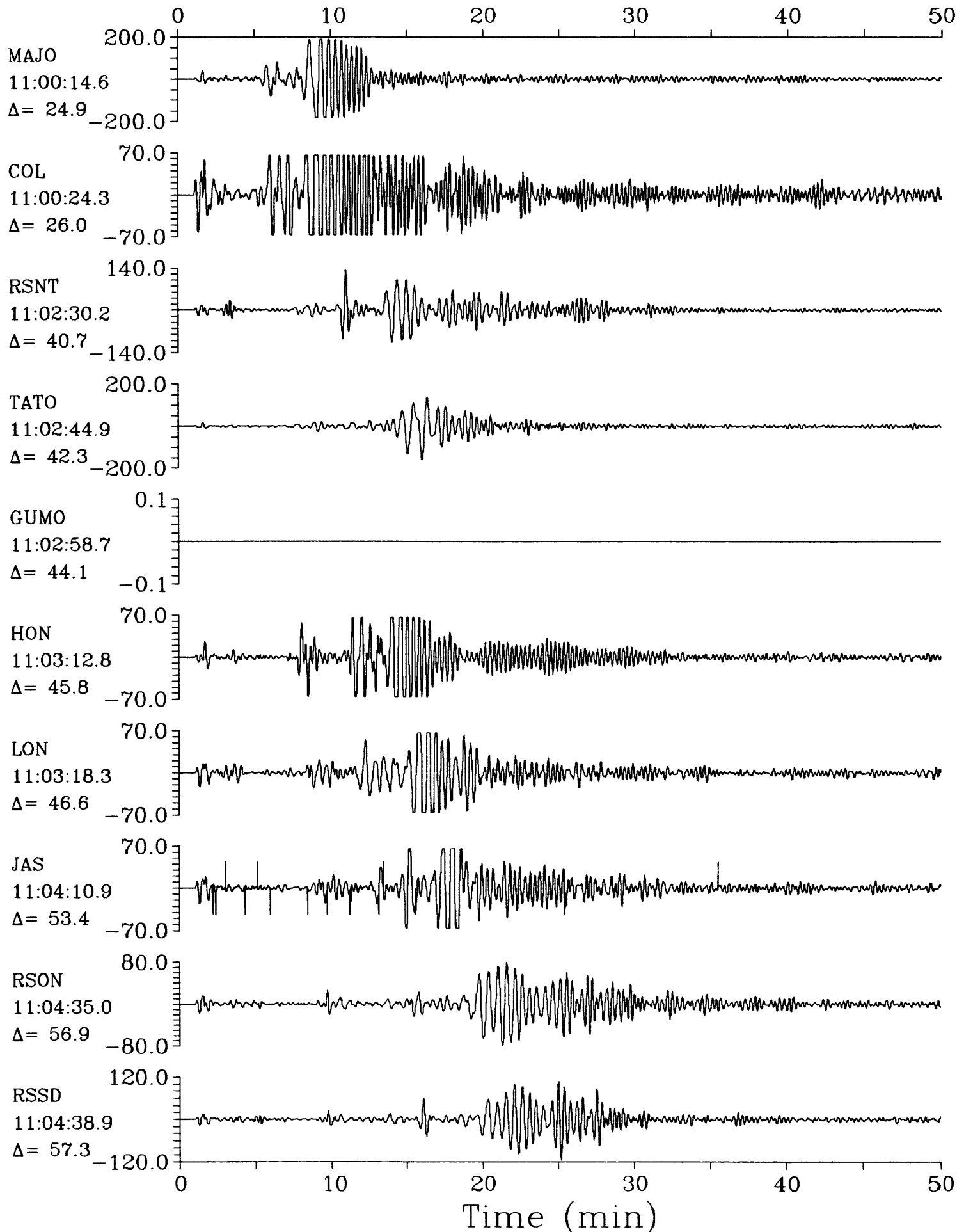


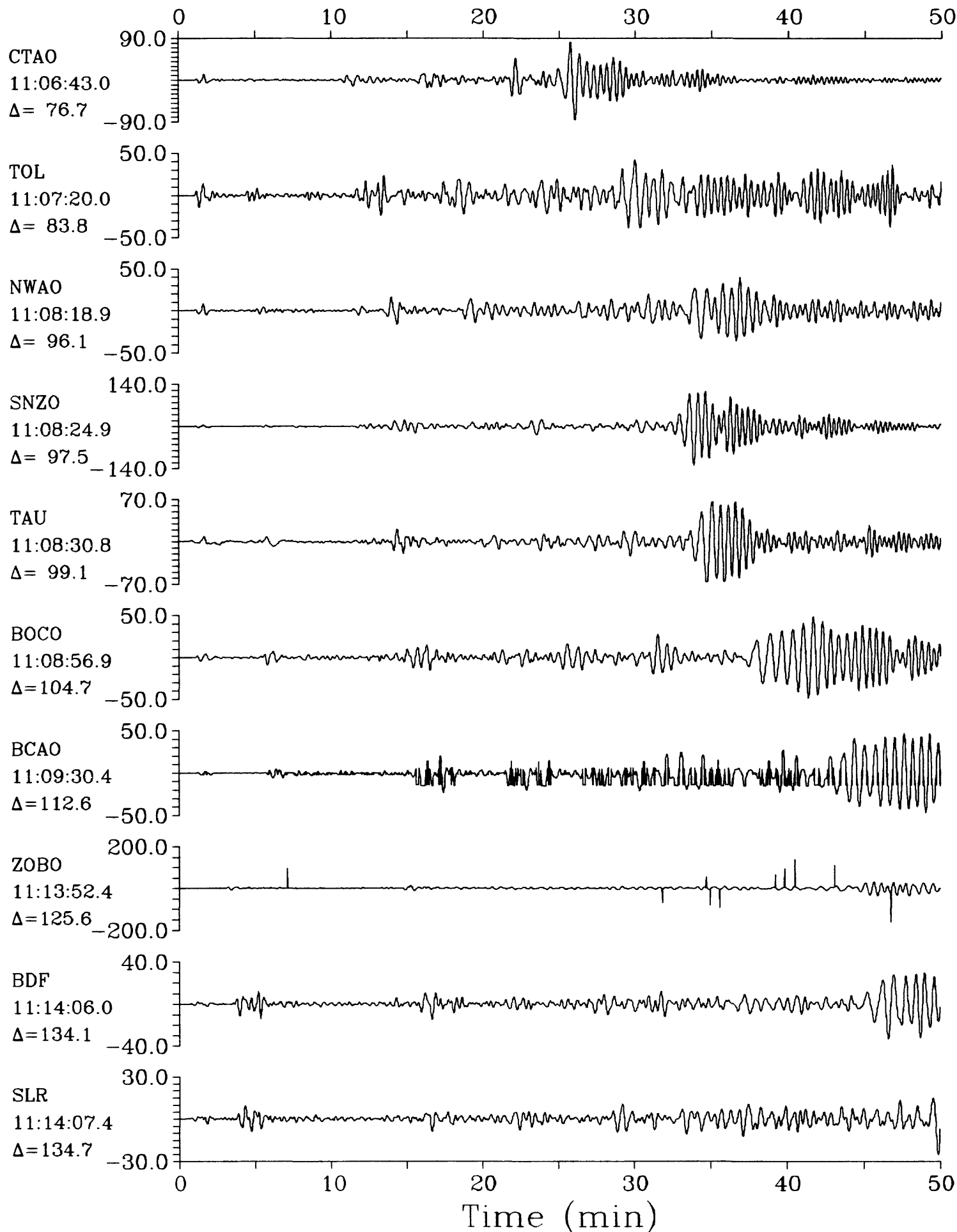
17 August 1983 10:55:54.13
Near East Coast of Kamchatka h=62.6 MB=6.6

Near East Coast of Kamchatka h=62.6 MB=6.6



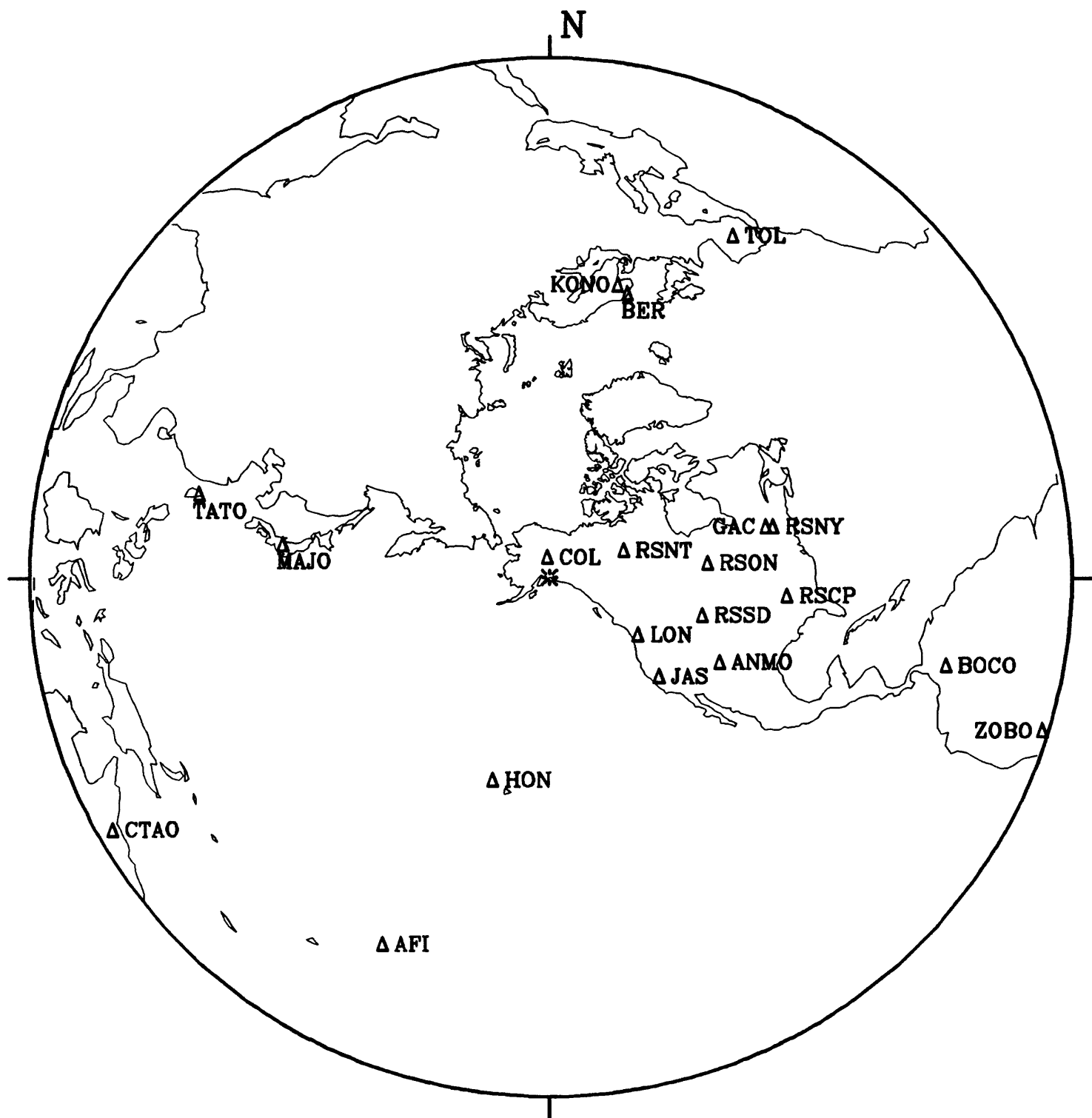
Near East Coast of Kamchatka $h=62.6$ MB=6.6

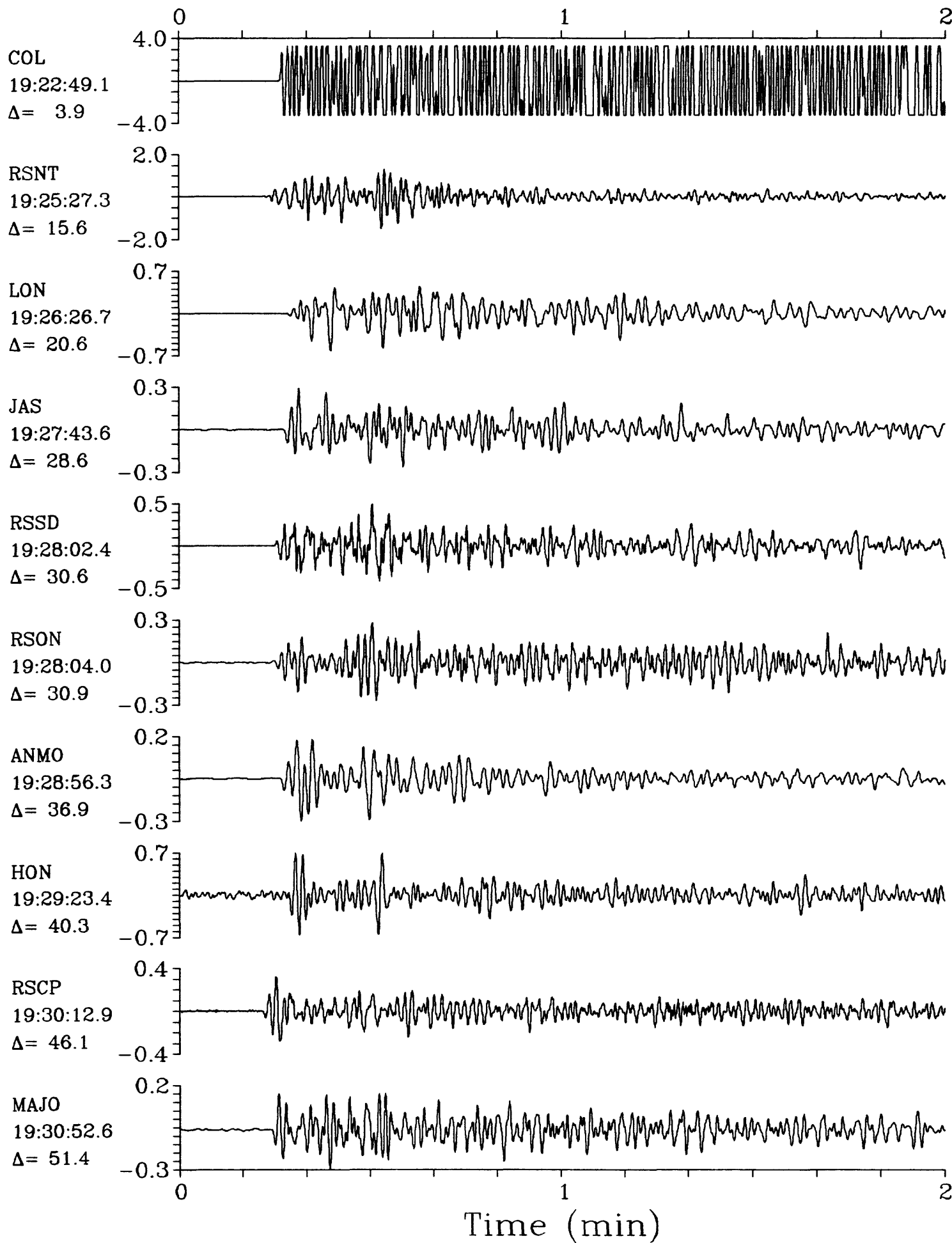


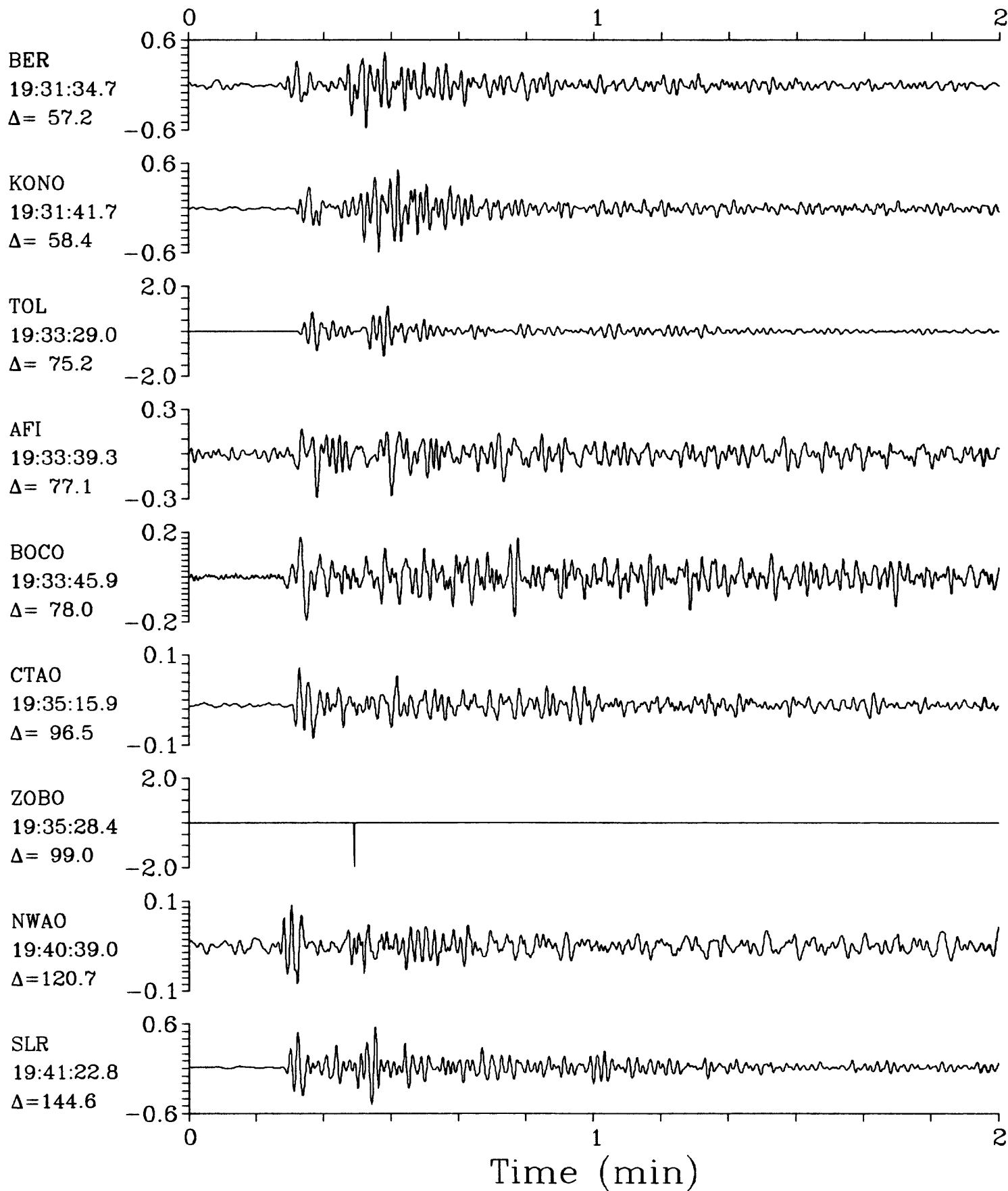
Near East Coast of Kamchatka $h=62.6$ MB=6.6

07 September 1983 19:22:05.15

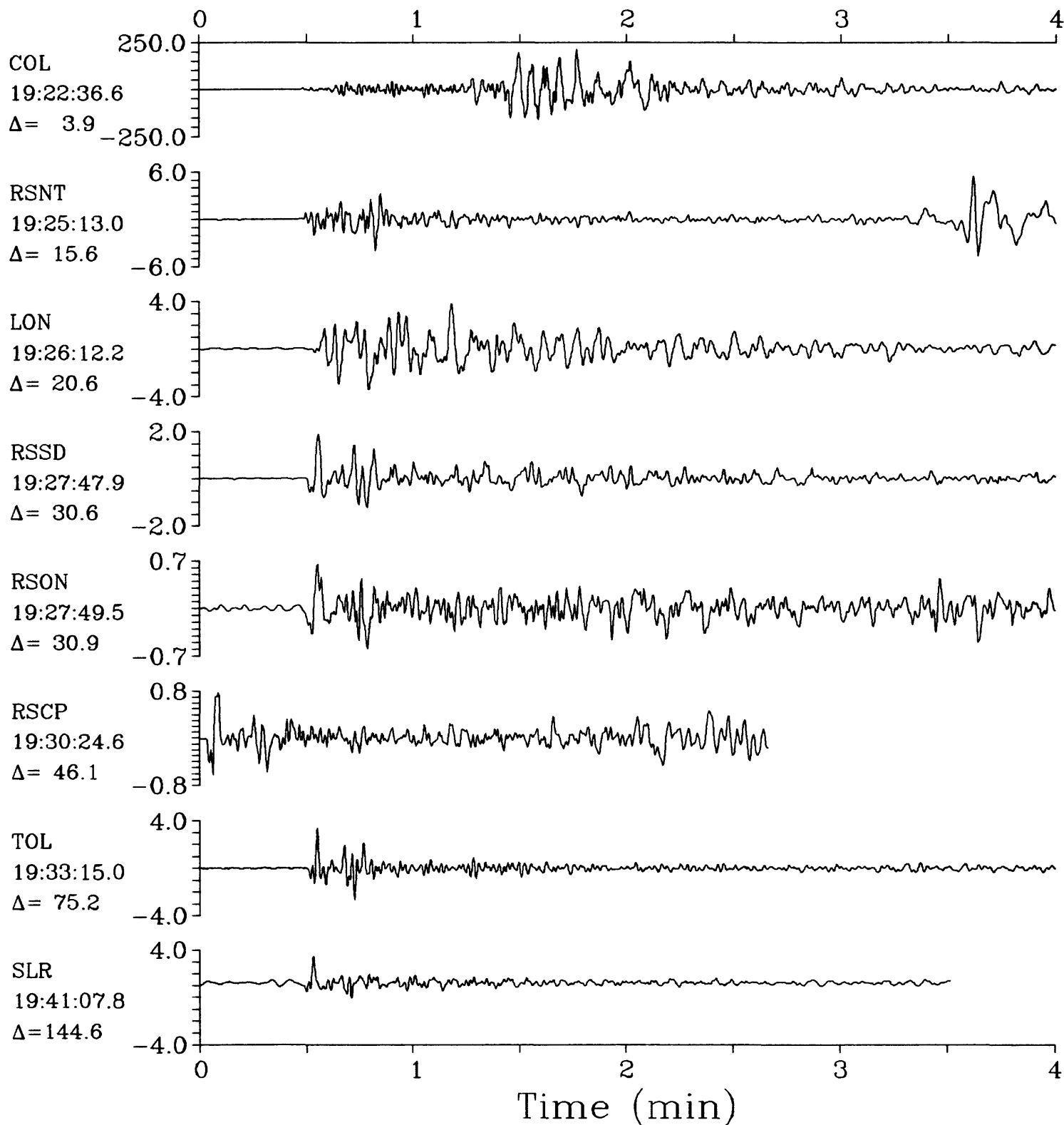
Southern Alaska



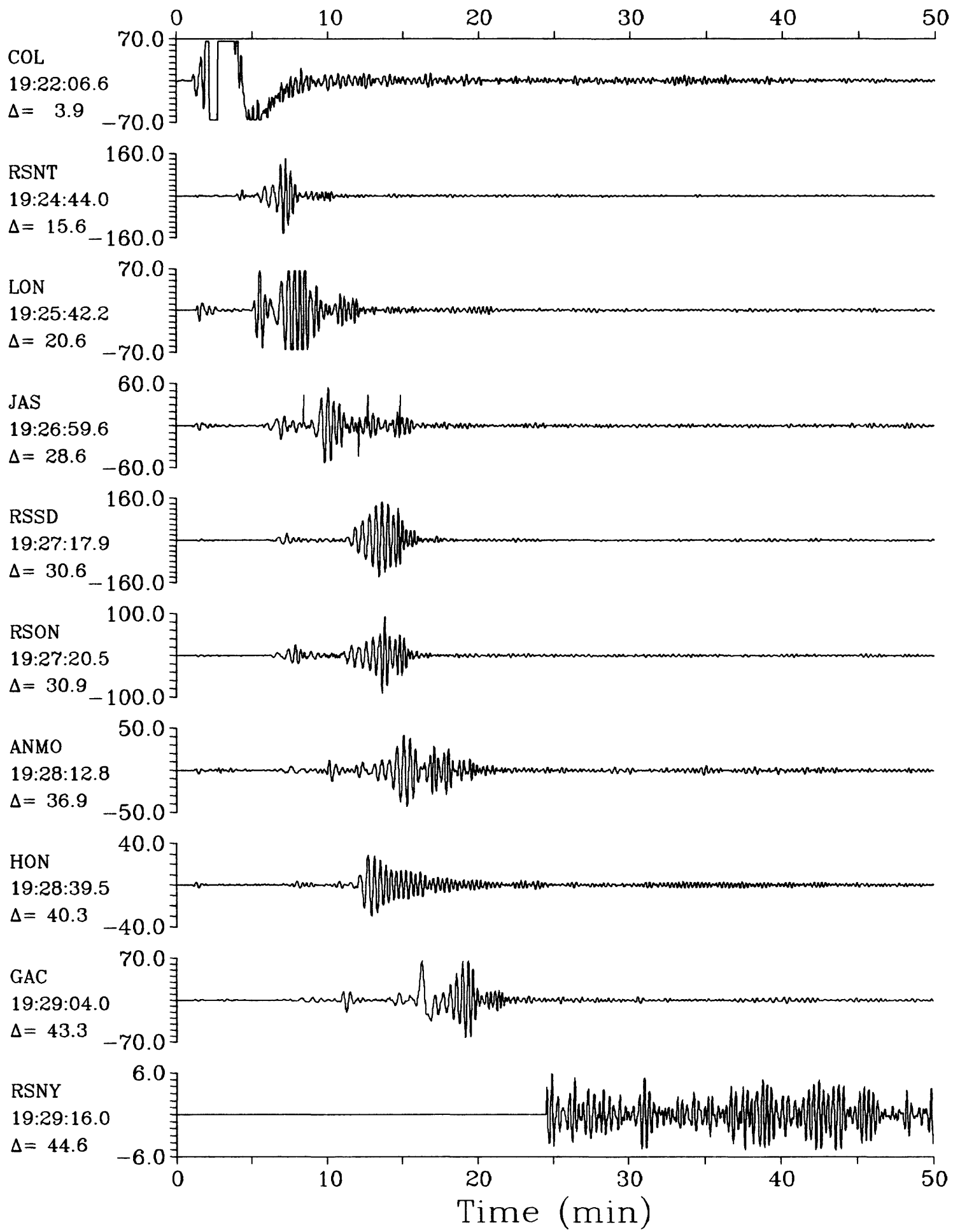


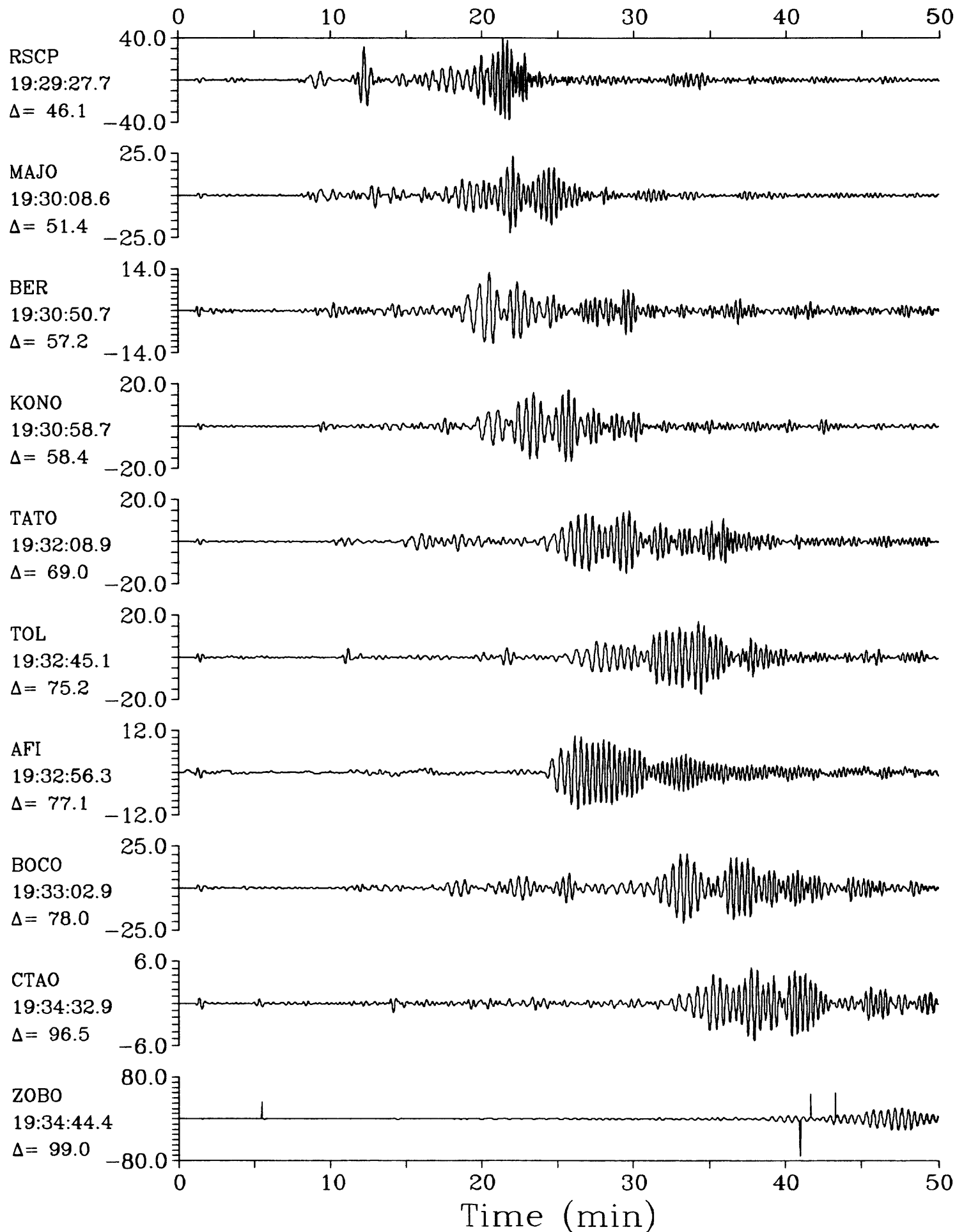


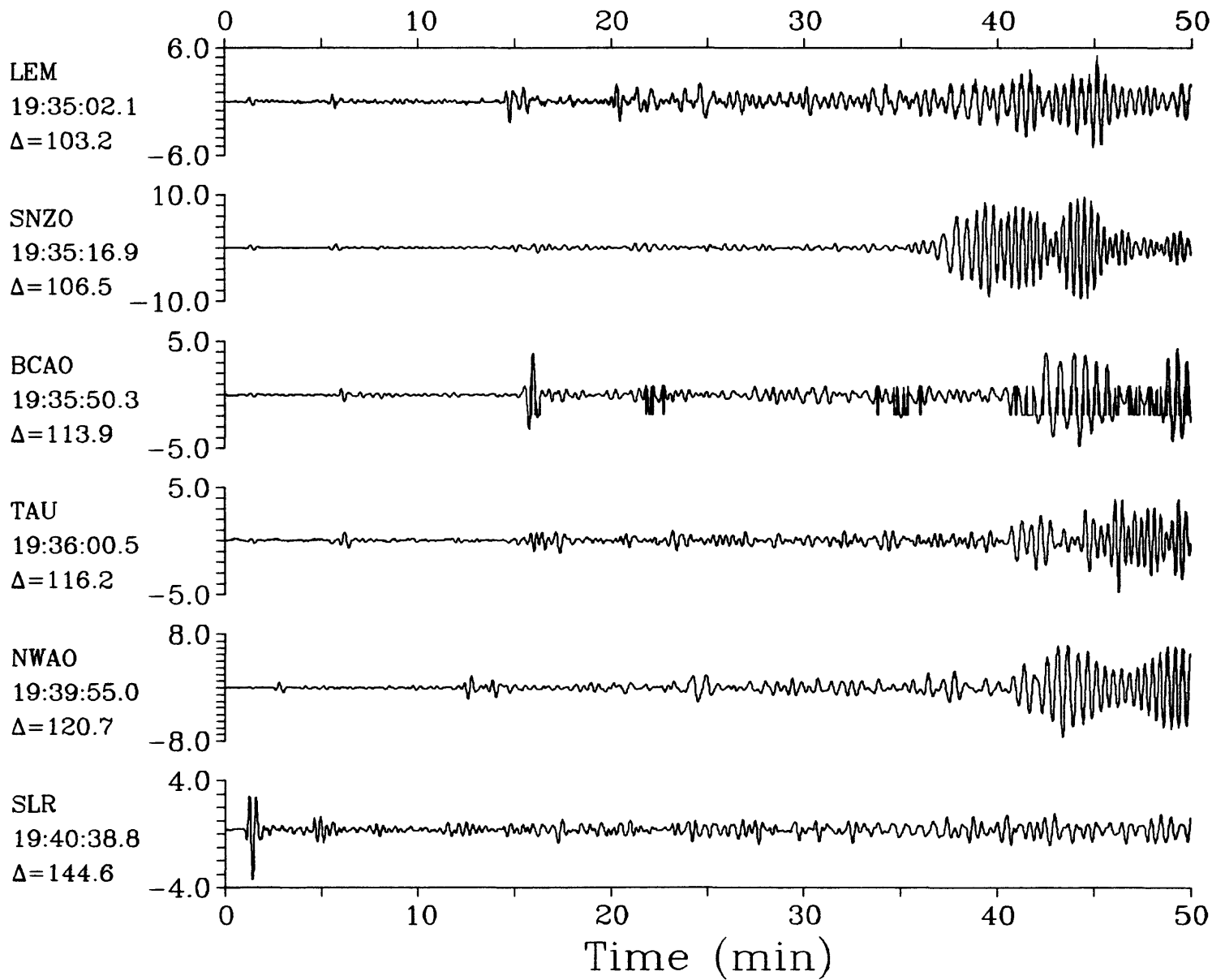
07 September 1983 19:22:05.15
Southern Alaska h=45.0 MB=6.2 ms=6.2



Southern Alaska h=45.0 MB=6.2 ms=6.2

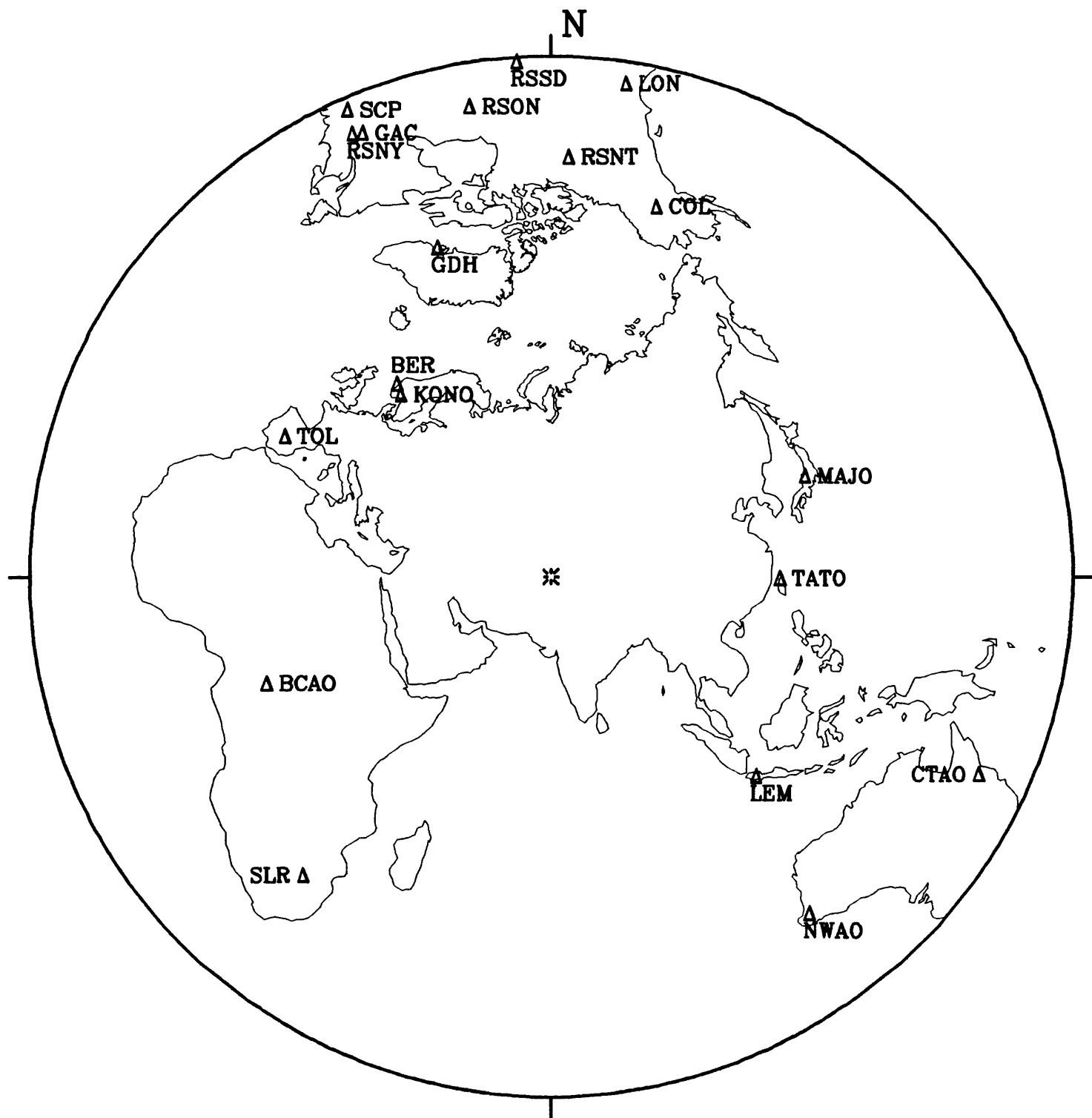


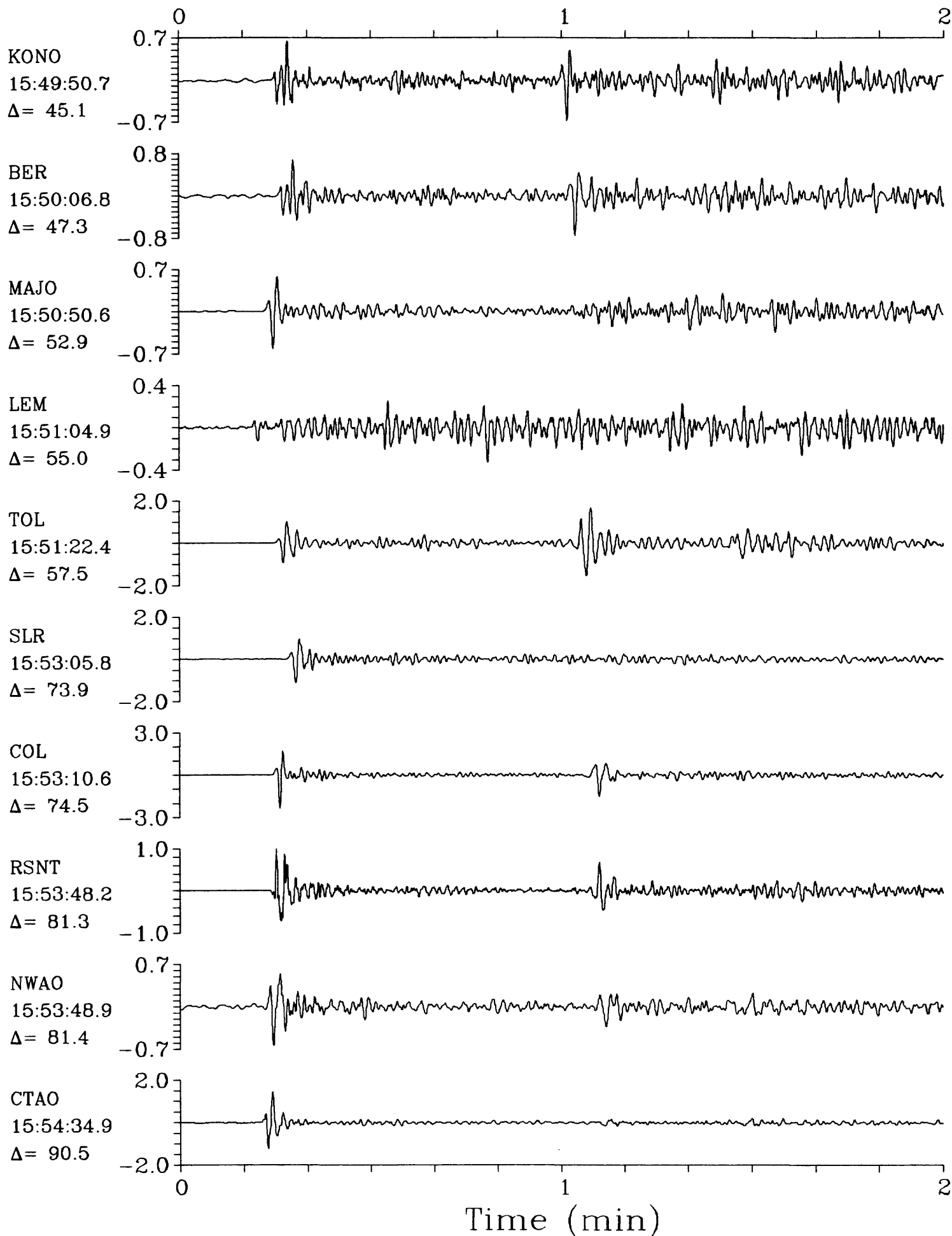
07 September 1983 19:22:05.15
Southern Alaska h=45.0 MB=6.2 ms=6.2

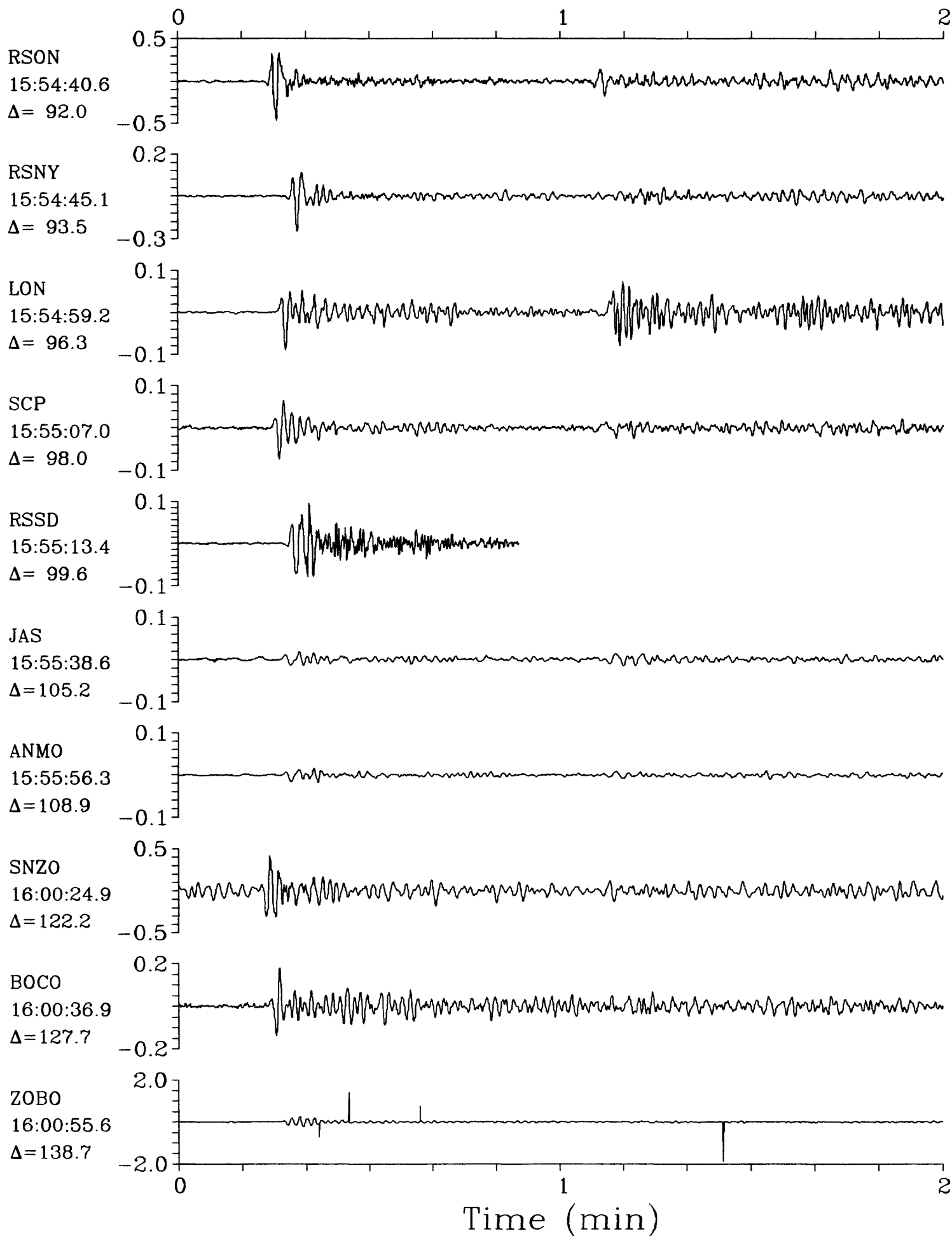
Southern Alaska $h=45.0$ MB=6.2 ms=6.2

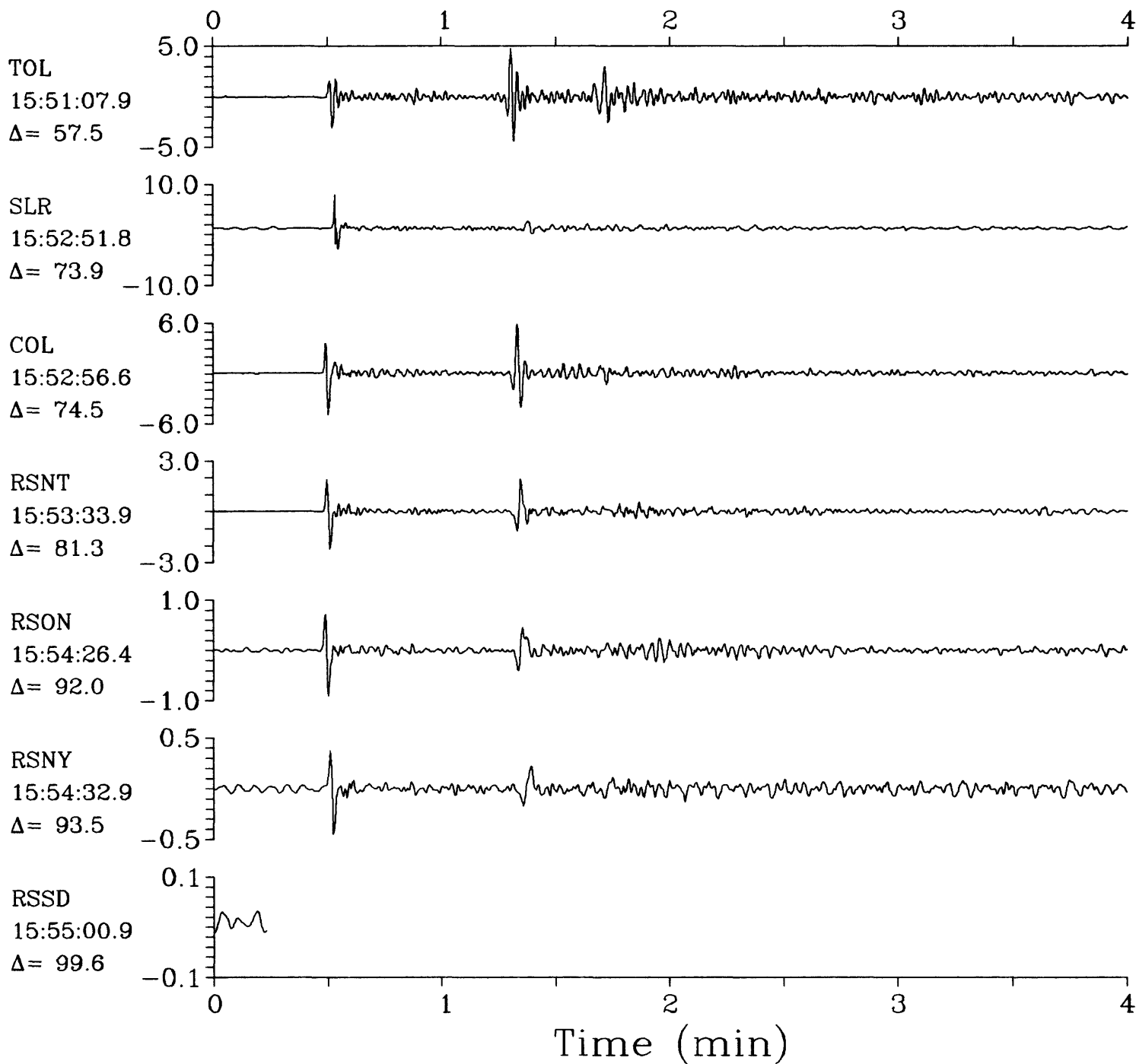
12 September 1983 15:42:08.55

Afghanistan-USSR Border Region

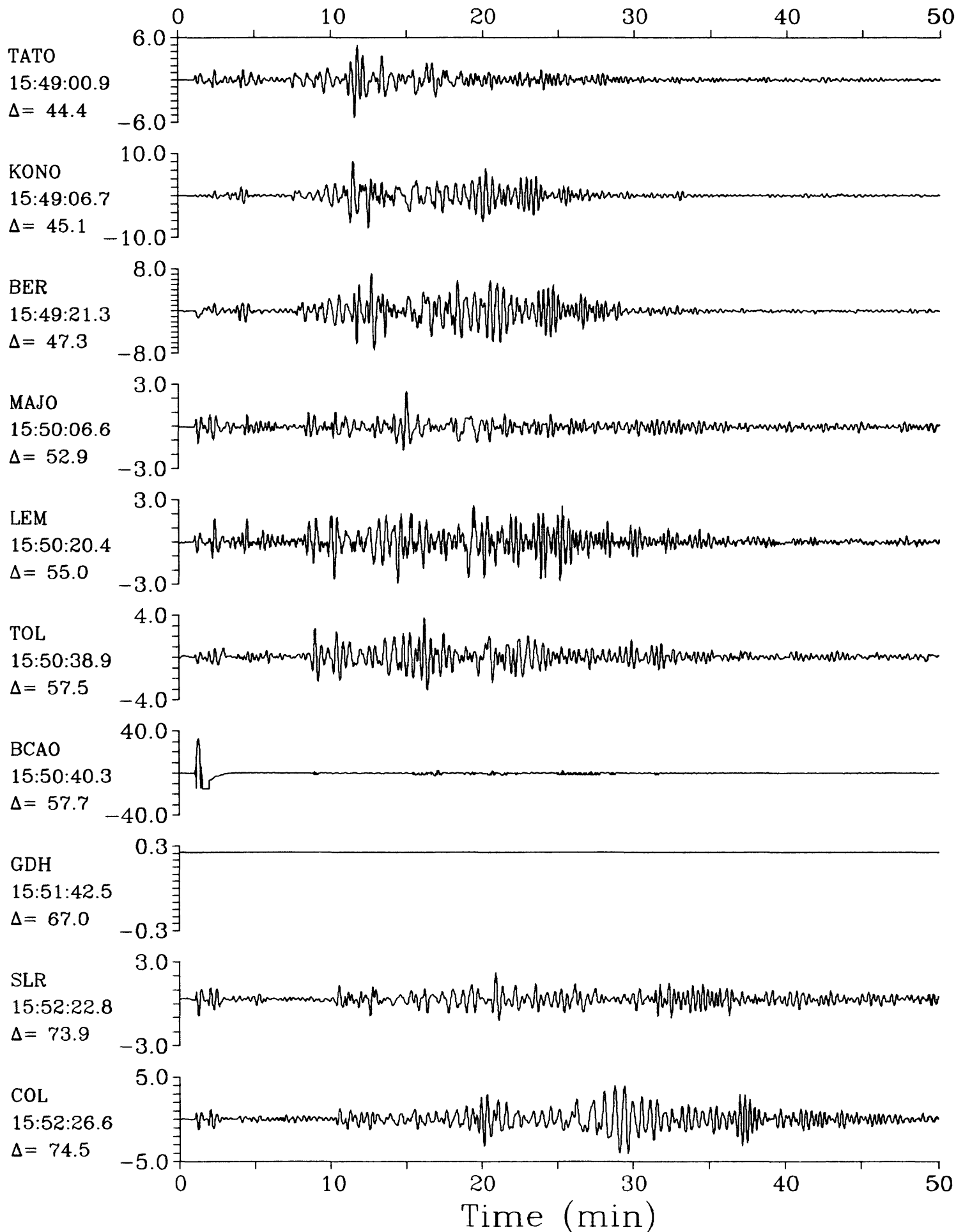


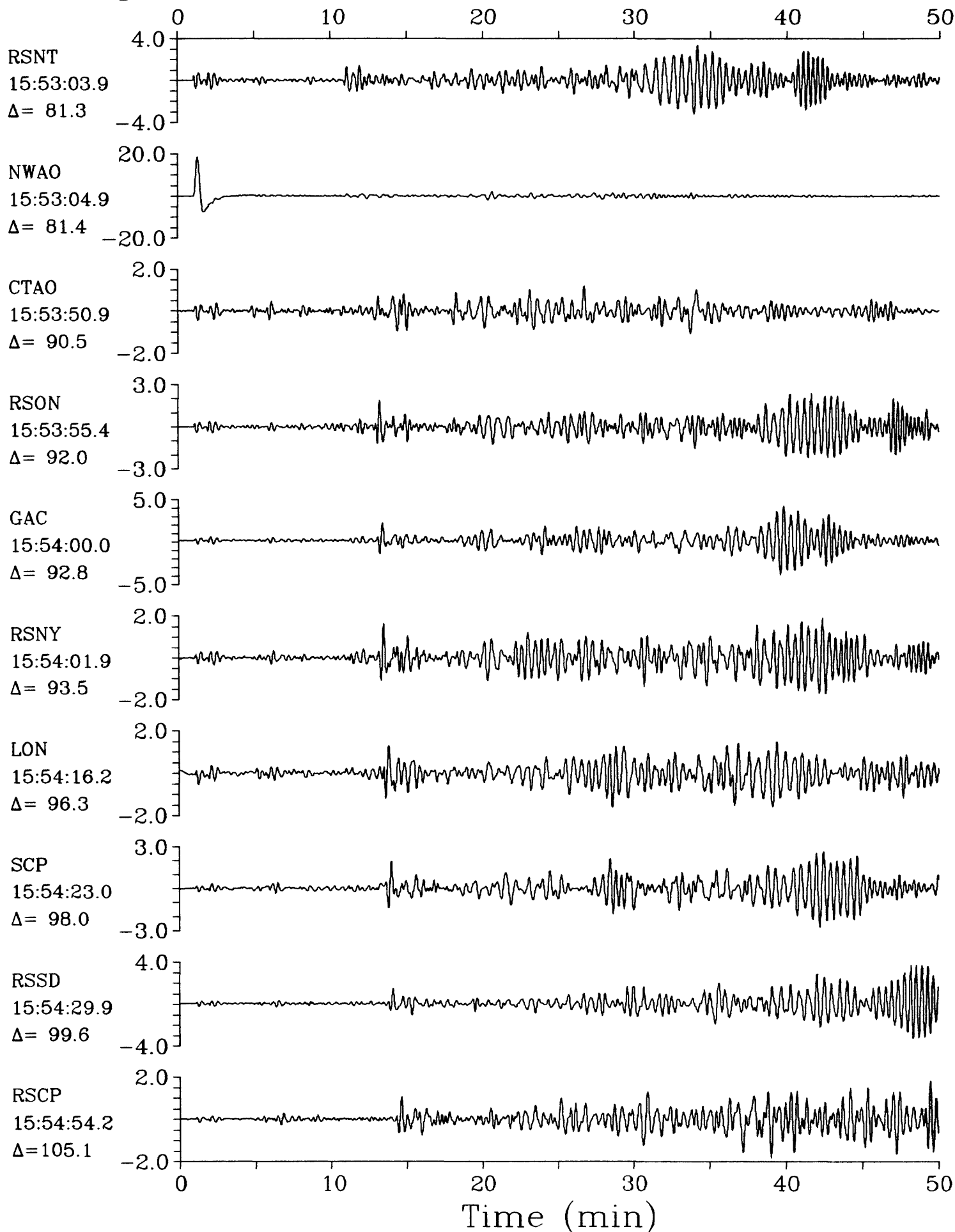


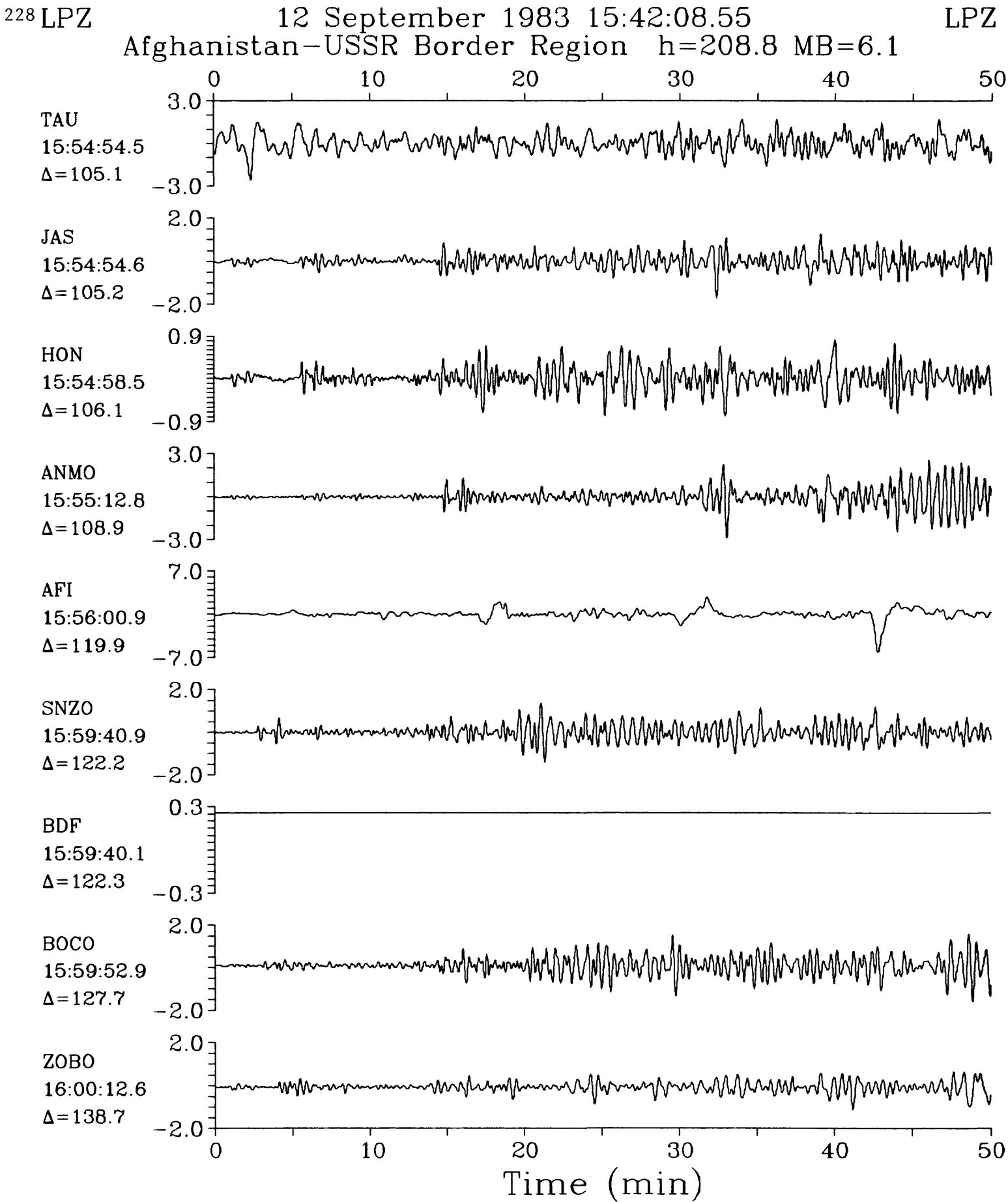




12 September 1983 15:42:08.55

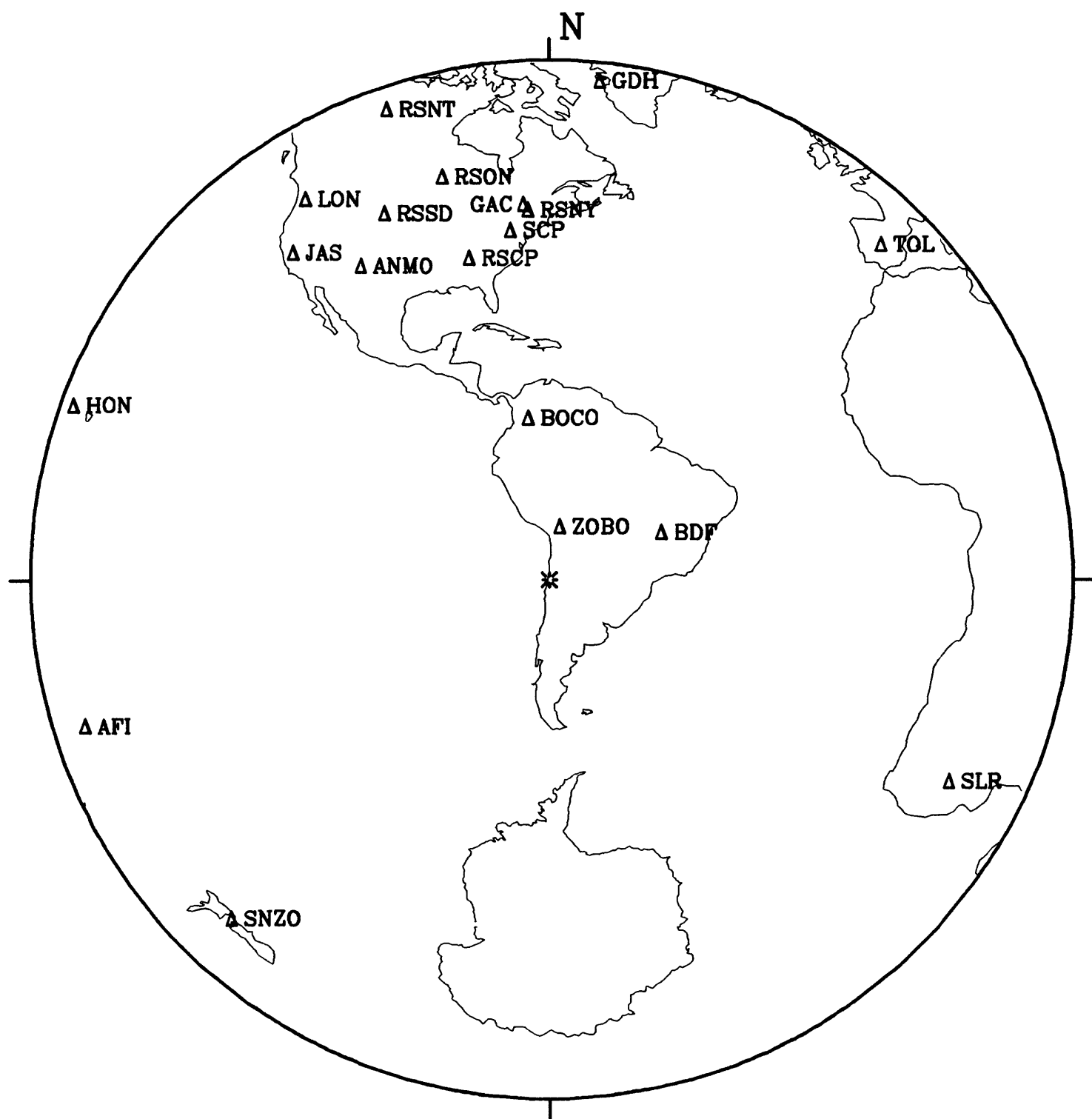
Afghanistan-USSR Border Region $h=208.8$ MB=6.1

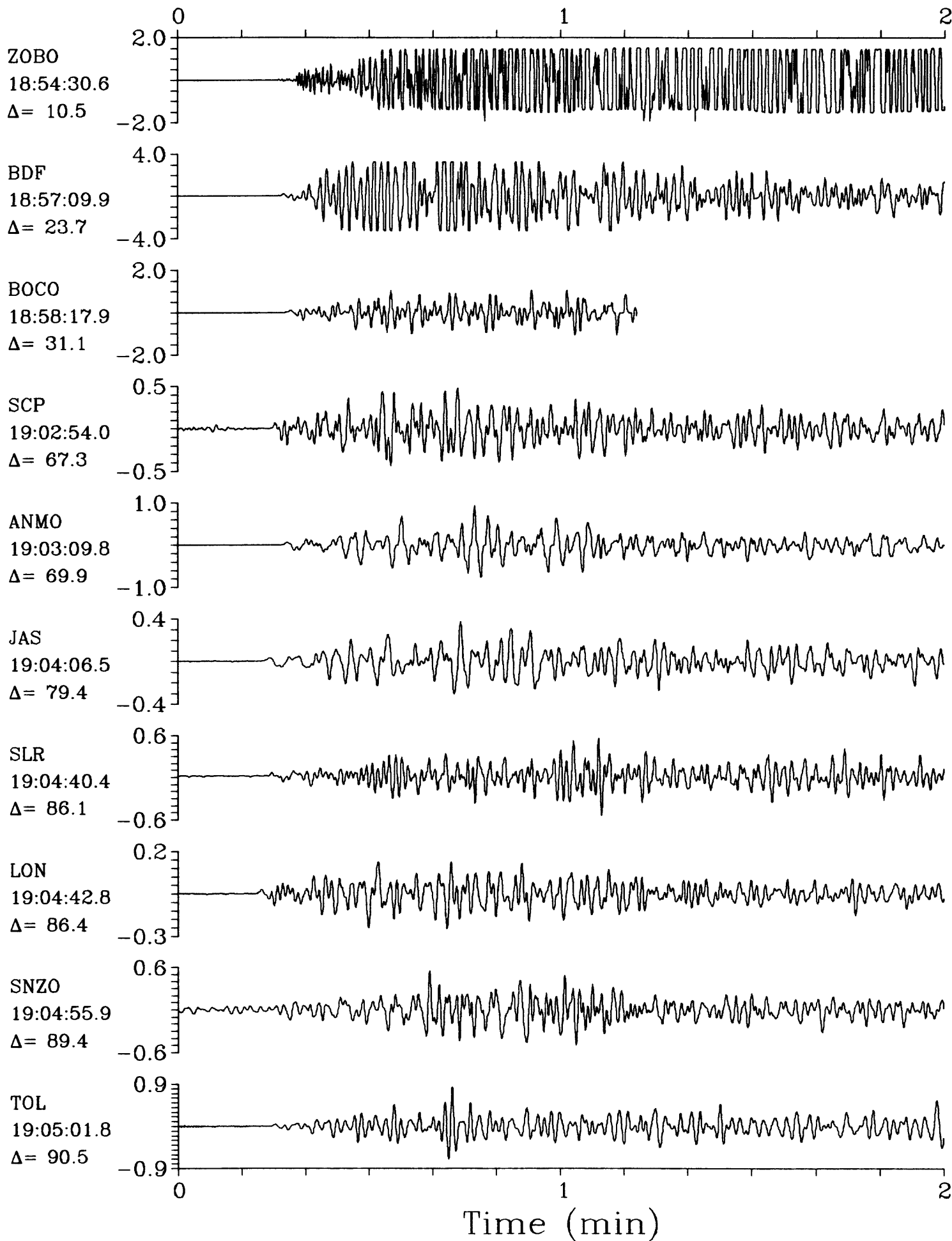


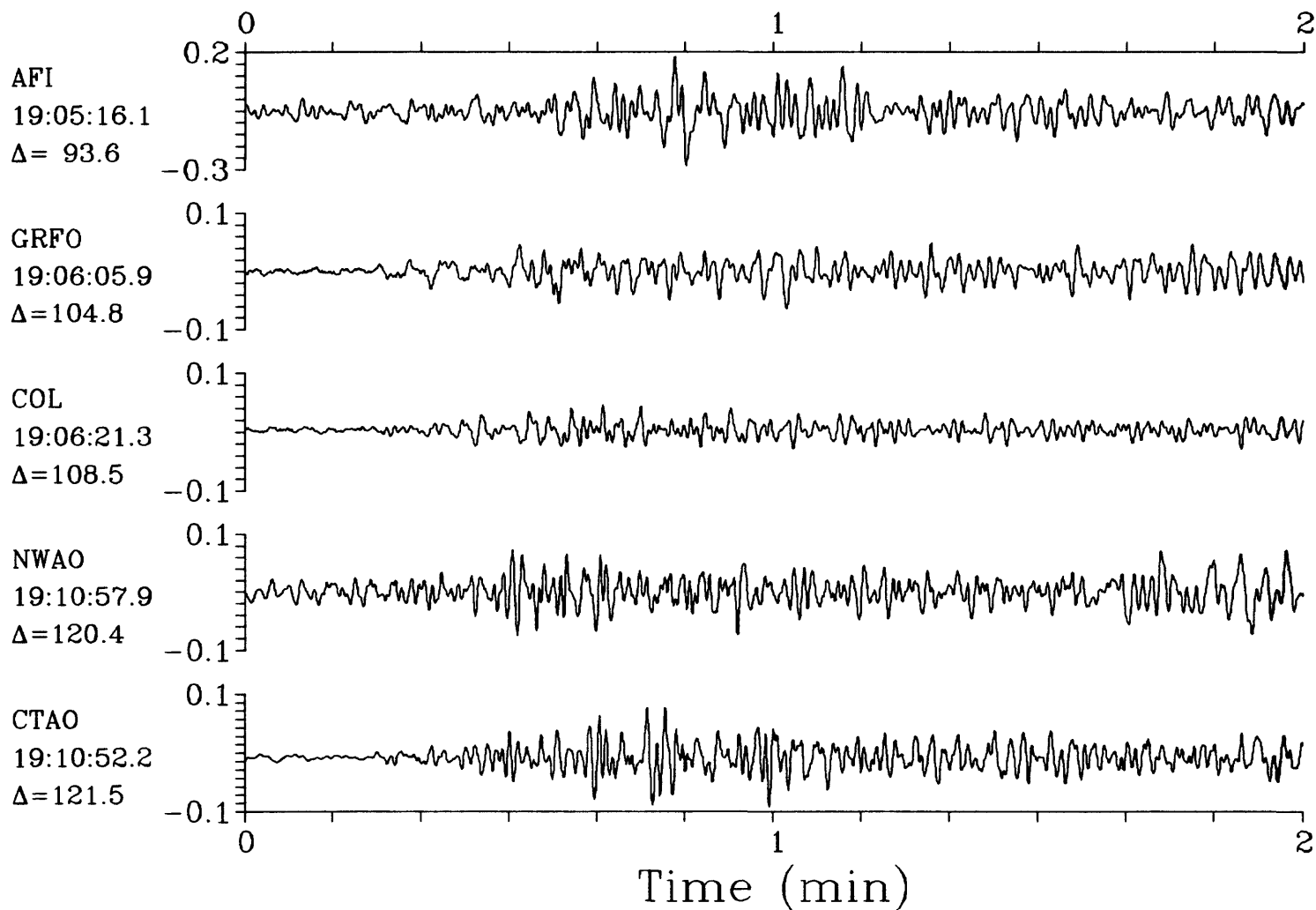


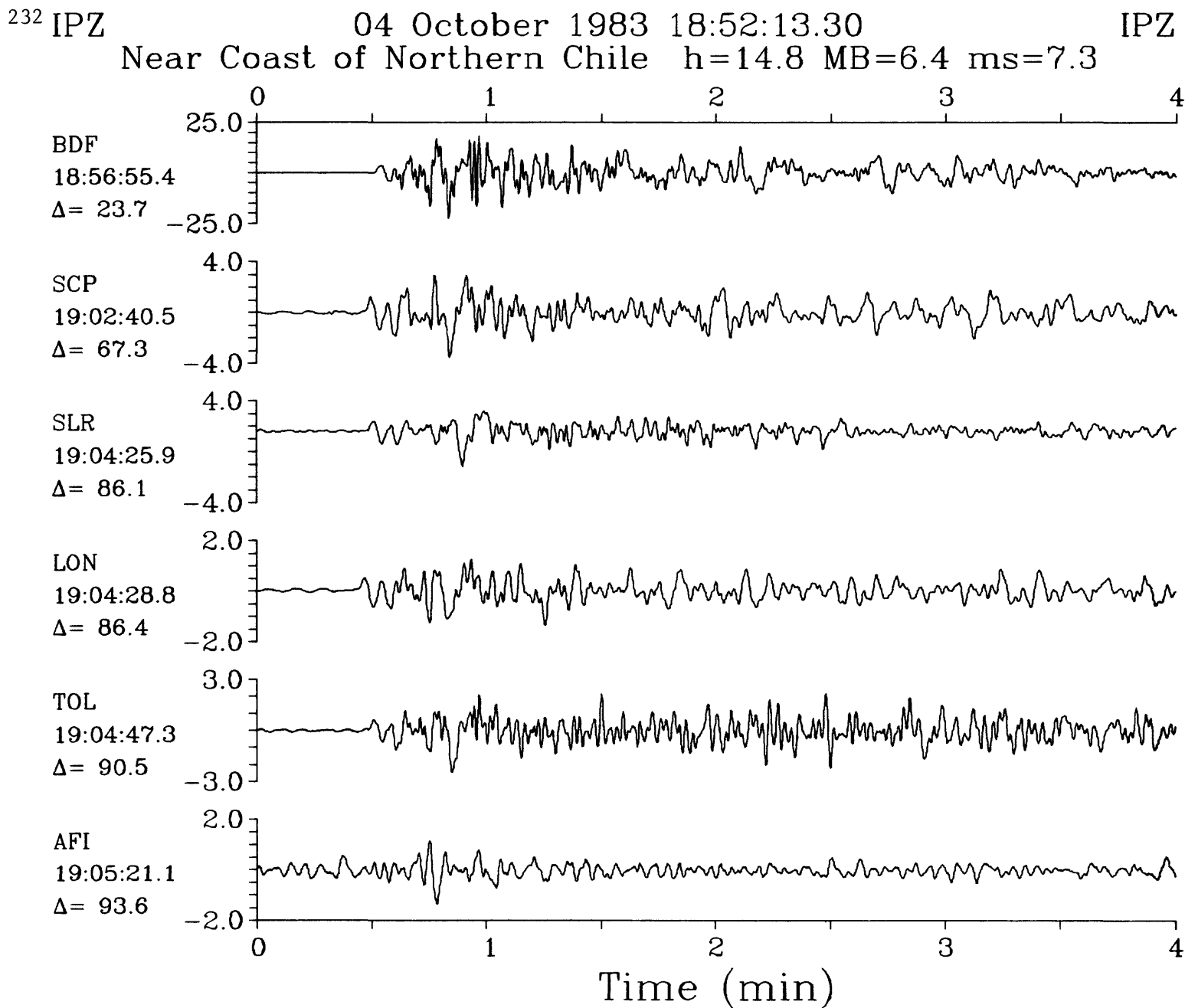
04 October 1983 18:52:13.30

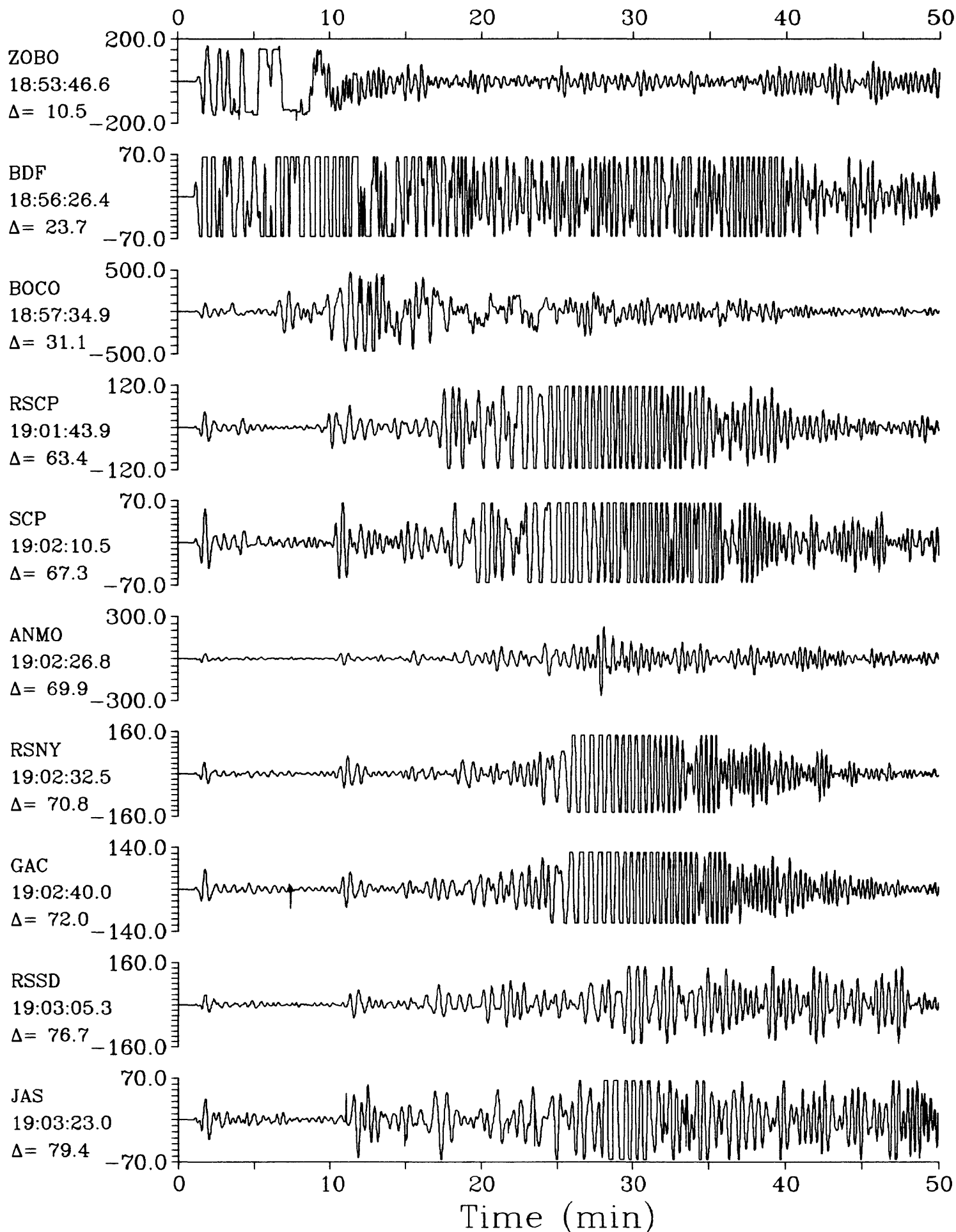
Near Coast of Northern Chile

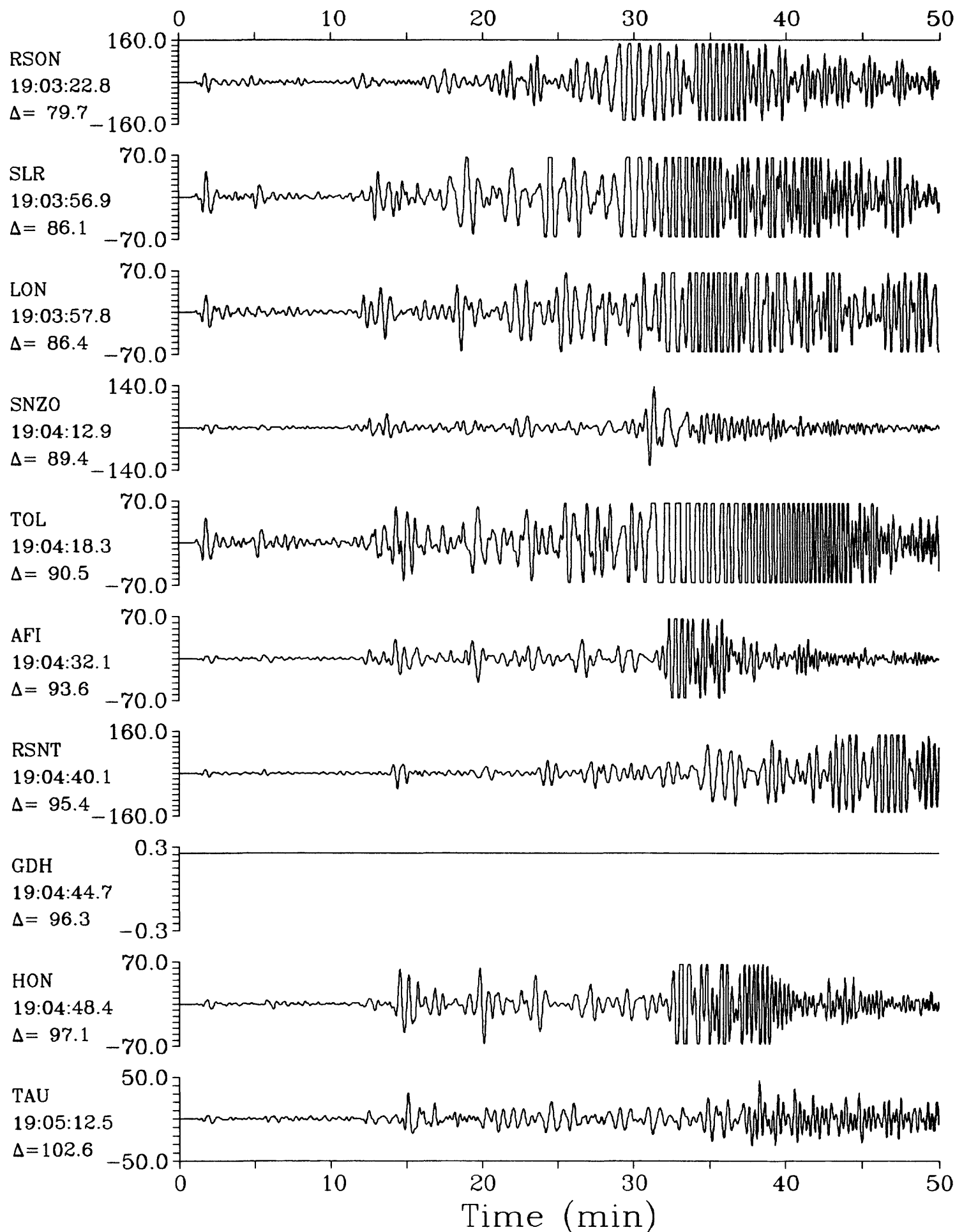


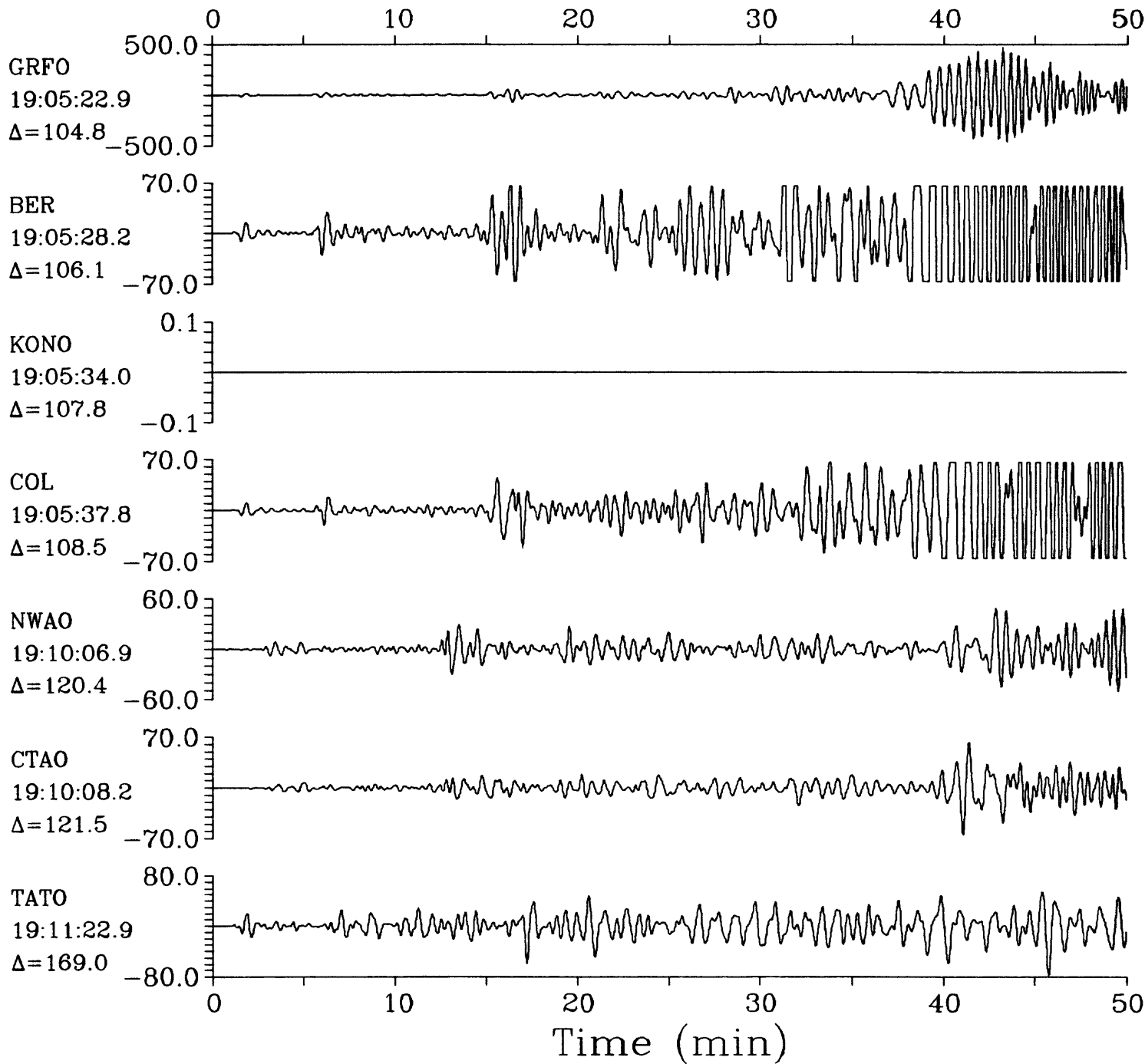






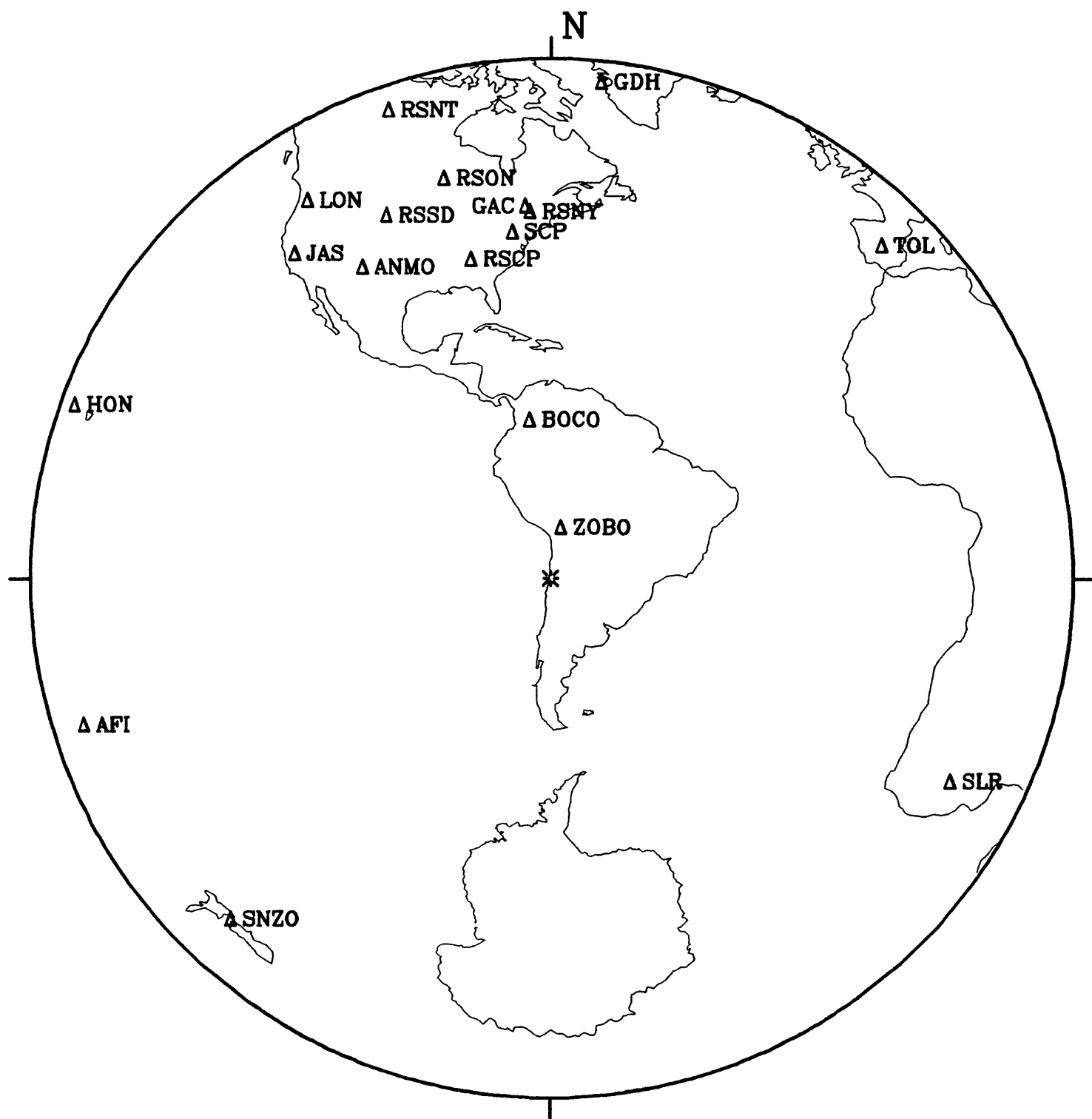


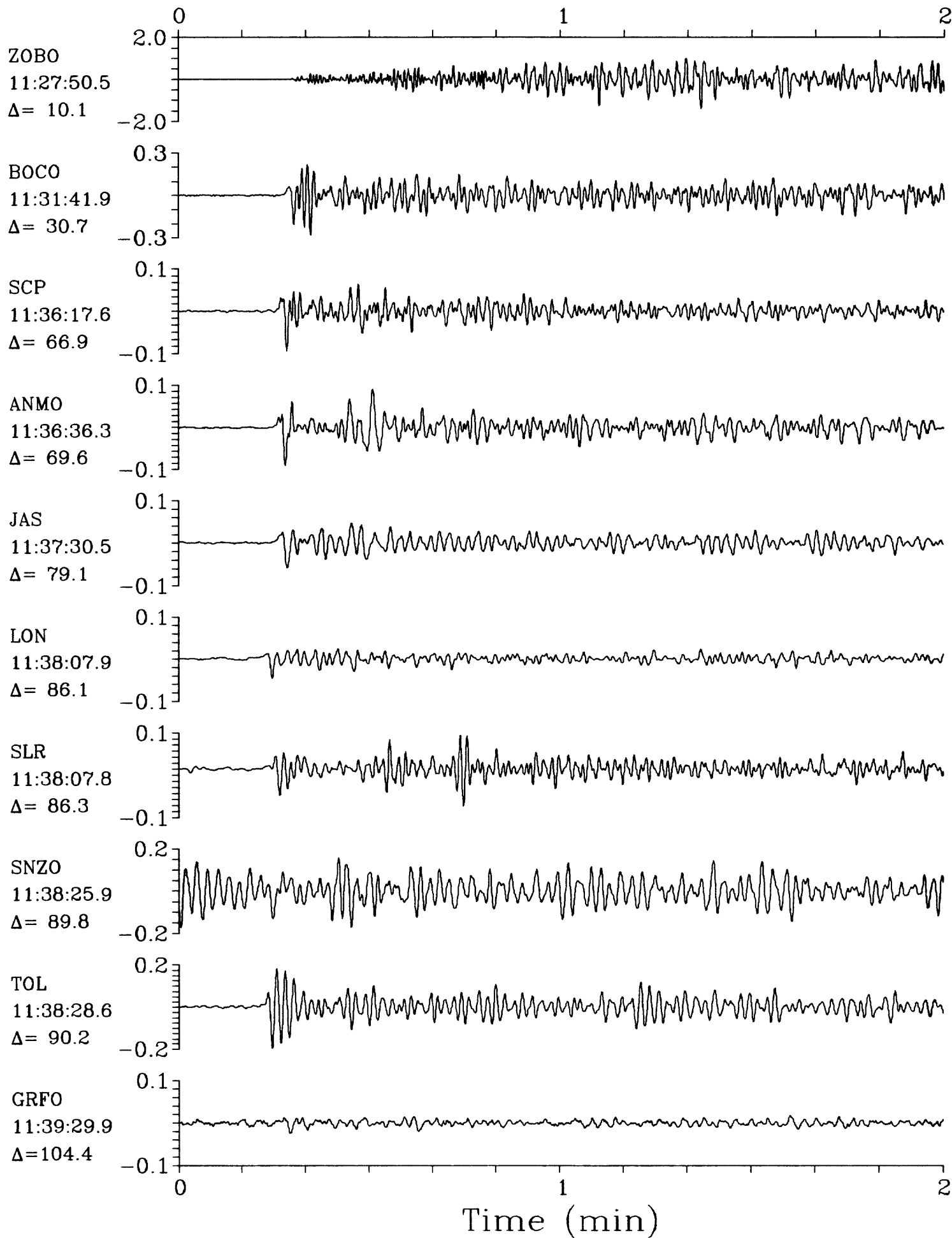
Near Coast of Northern Chile $h=14.8$ MB=6.4 ms=7.3

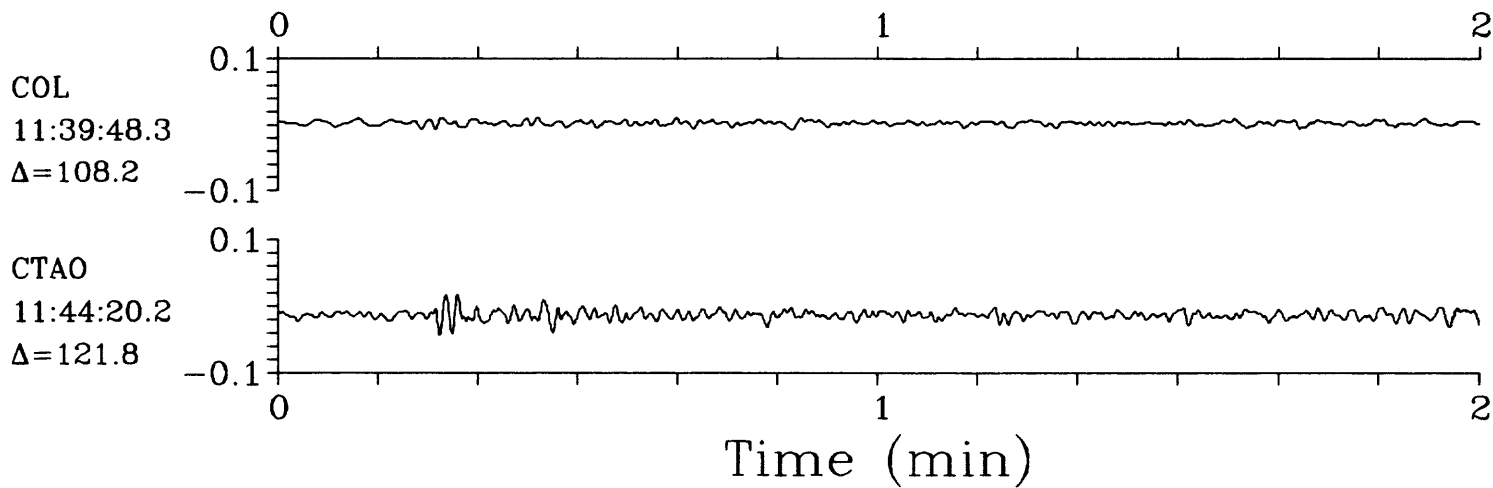


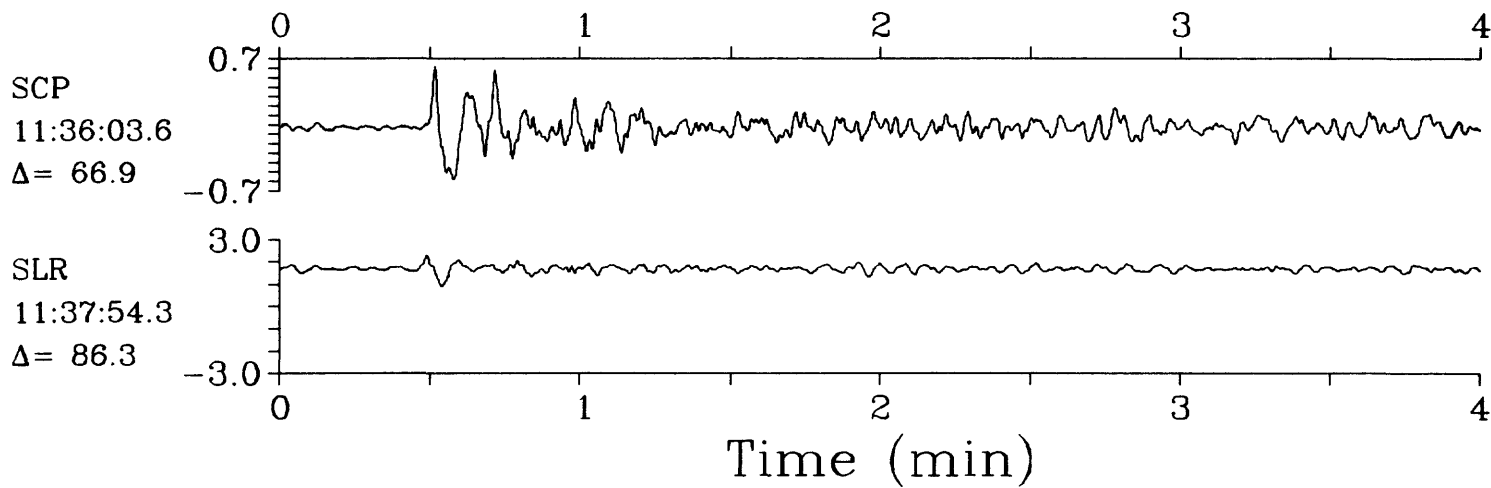
09 October 1983 11:25:40.58

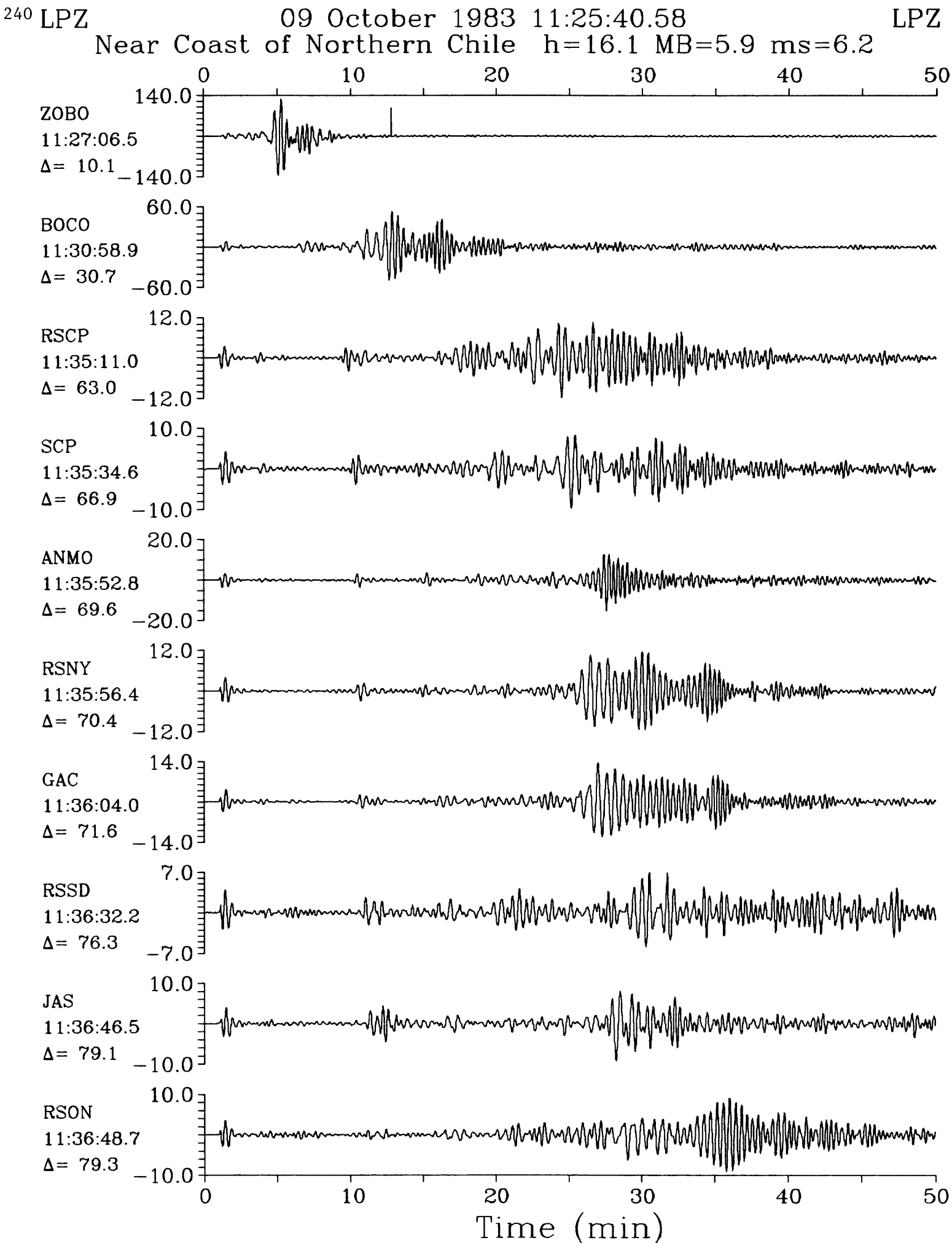
Near Coast of Northern Chile

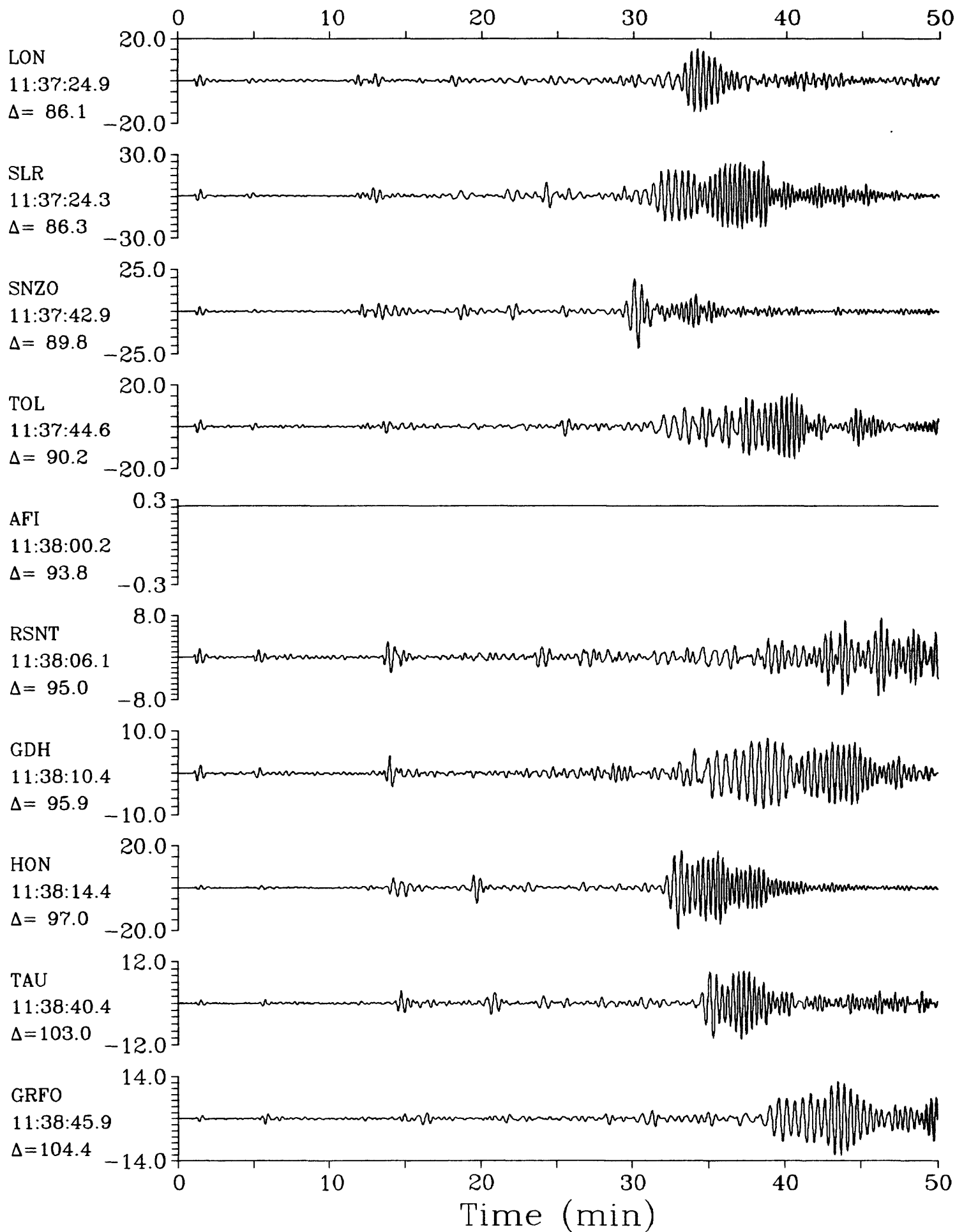


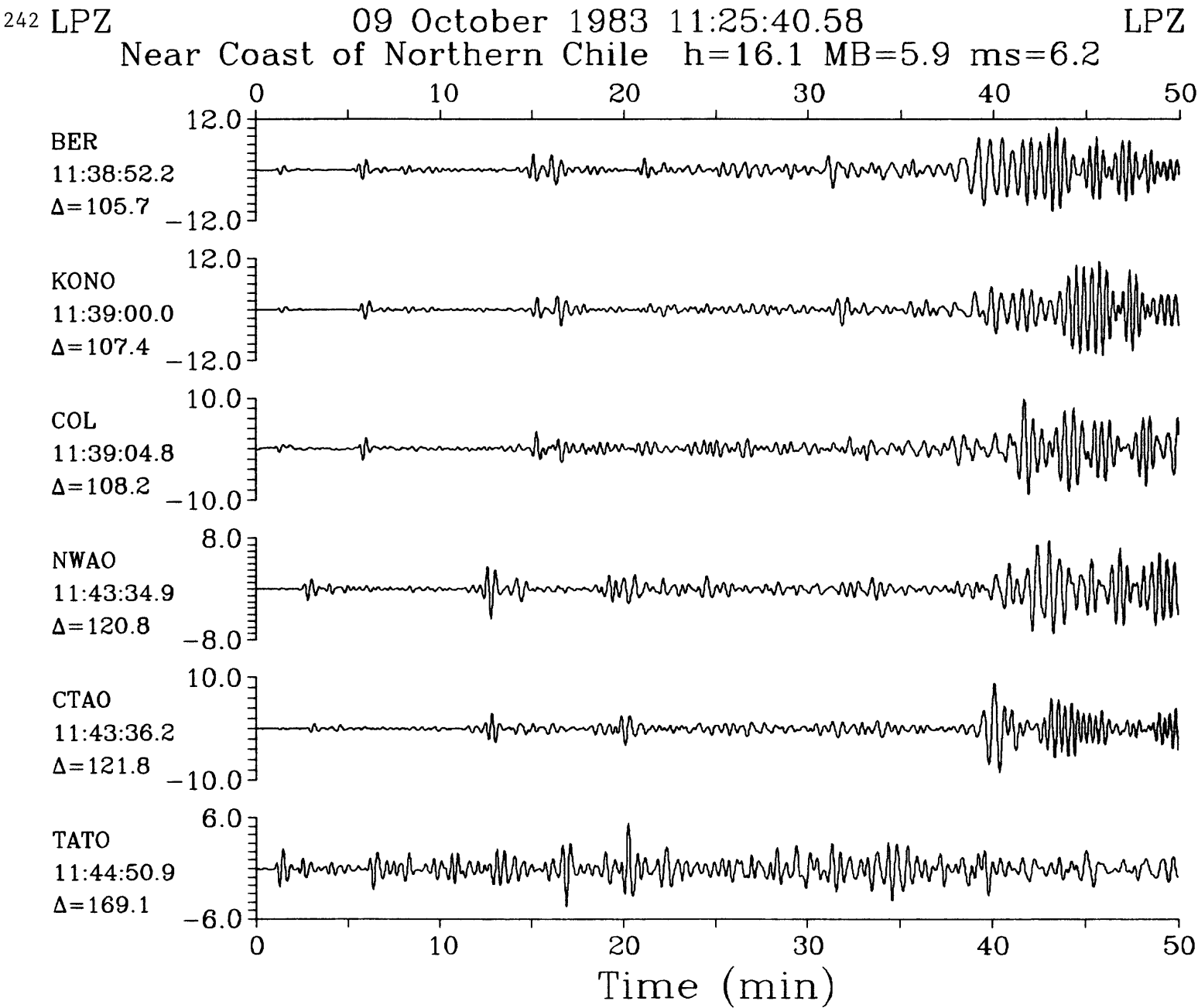






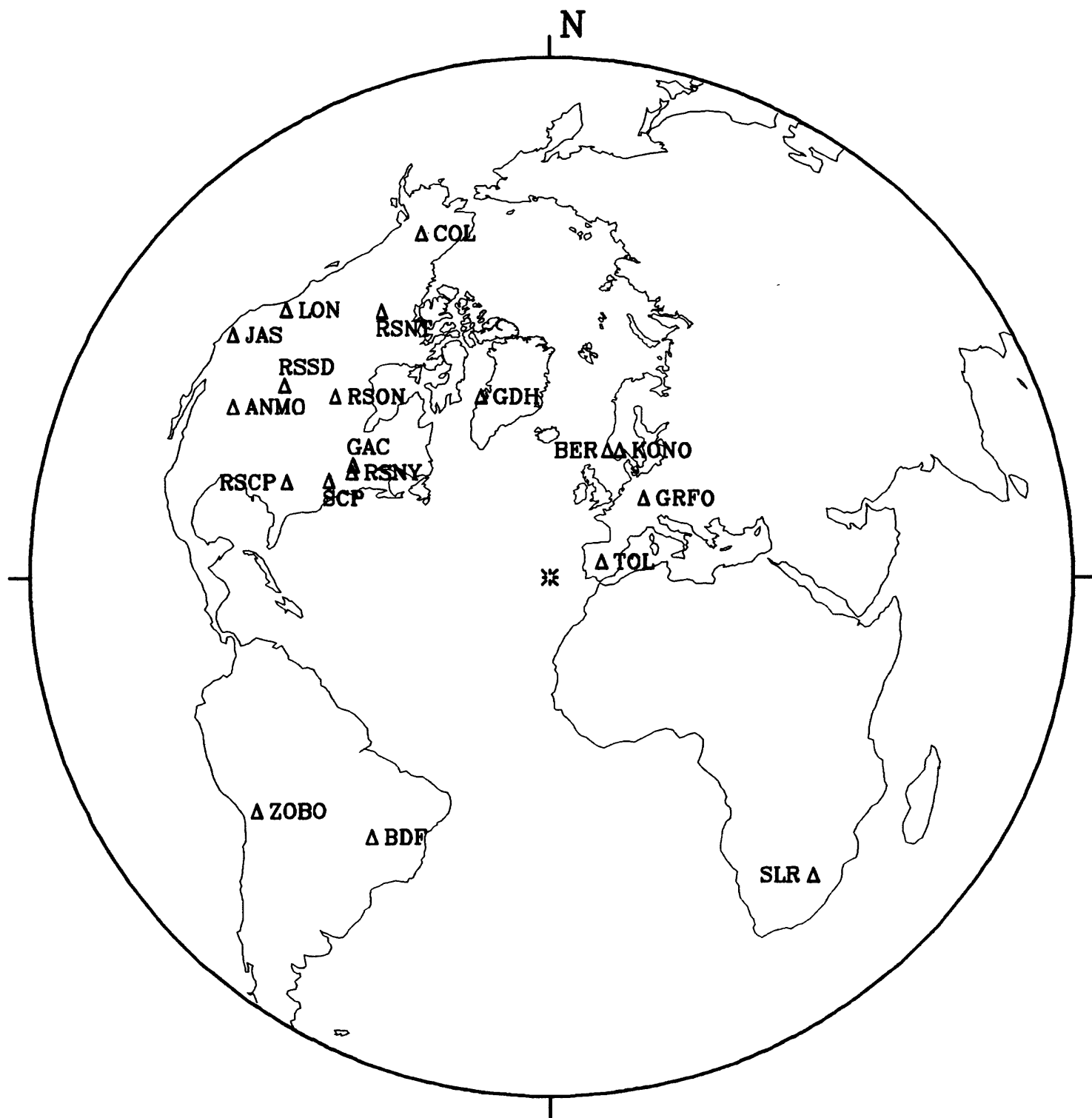


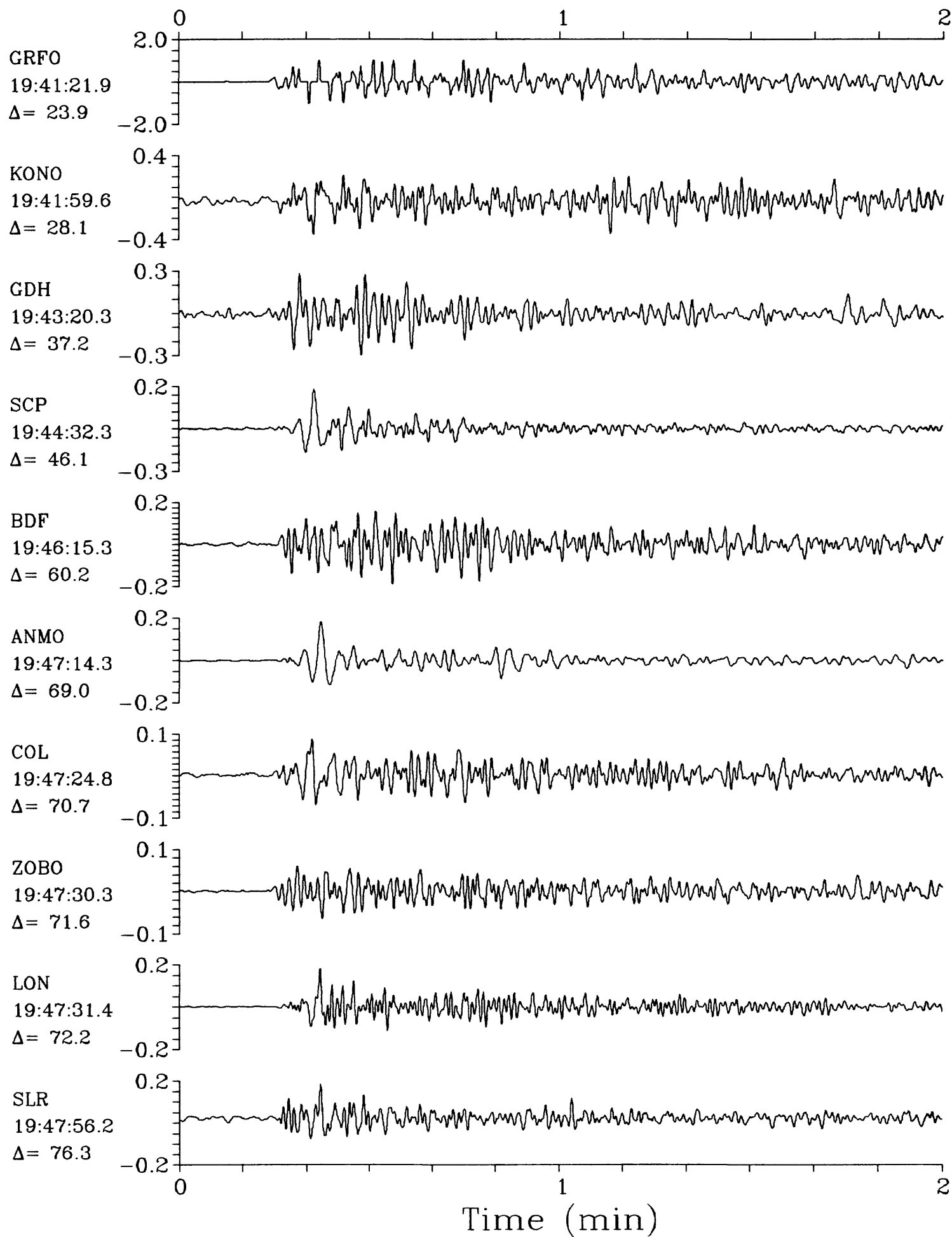
Near Coast of Northern Chile $h=16.1$ MB=5.9 ms=6.2



17 October 1983 19:36:21.47

North Atlantic Ocean



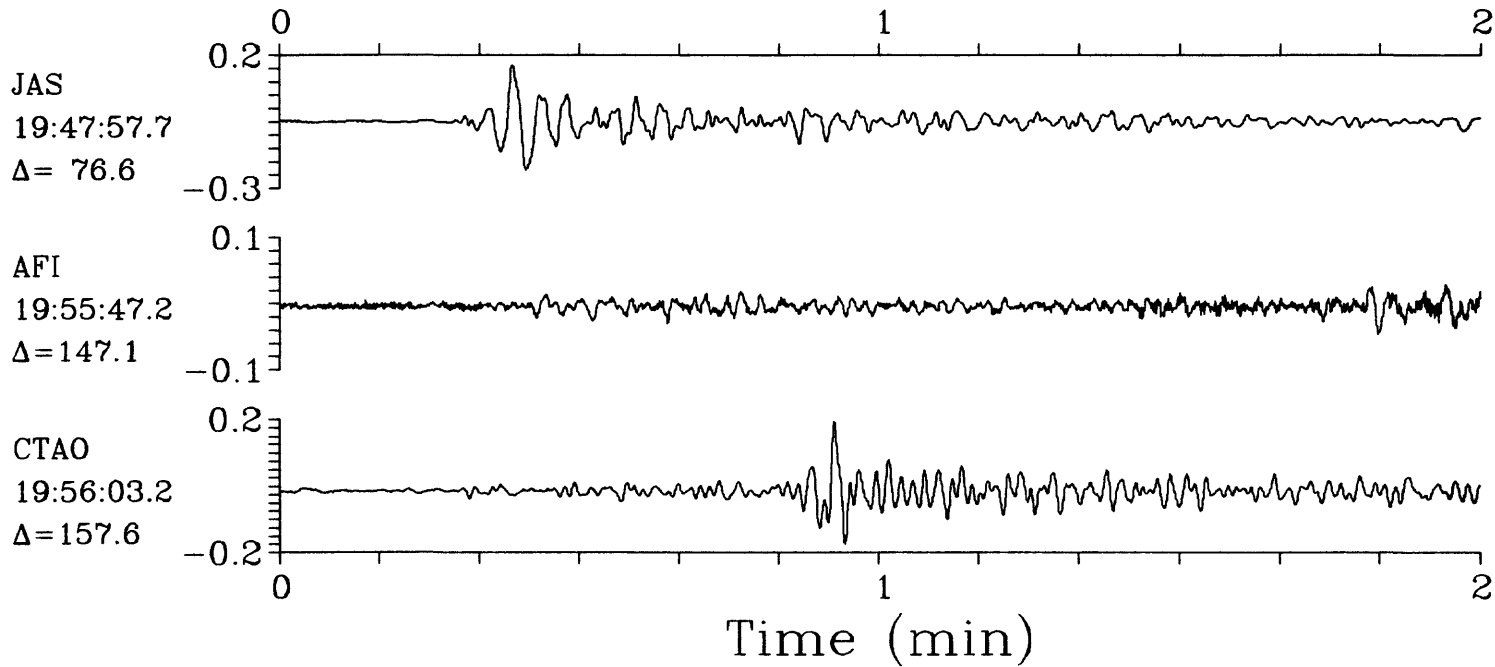


SPZ

17 October 1983 19:36:21.47

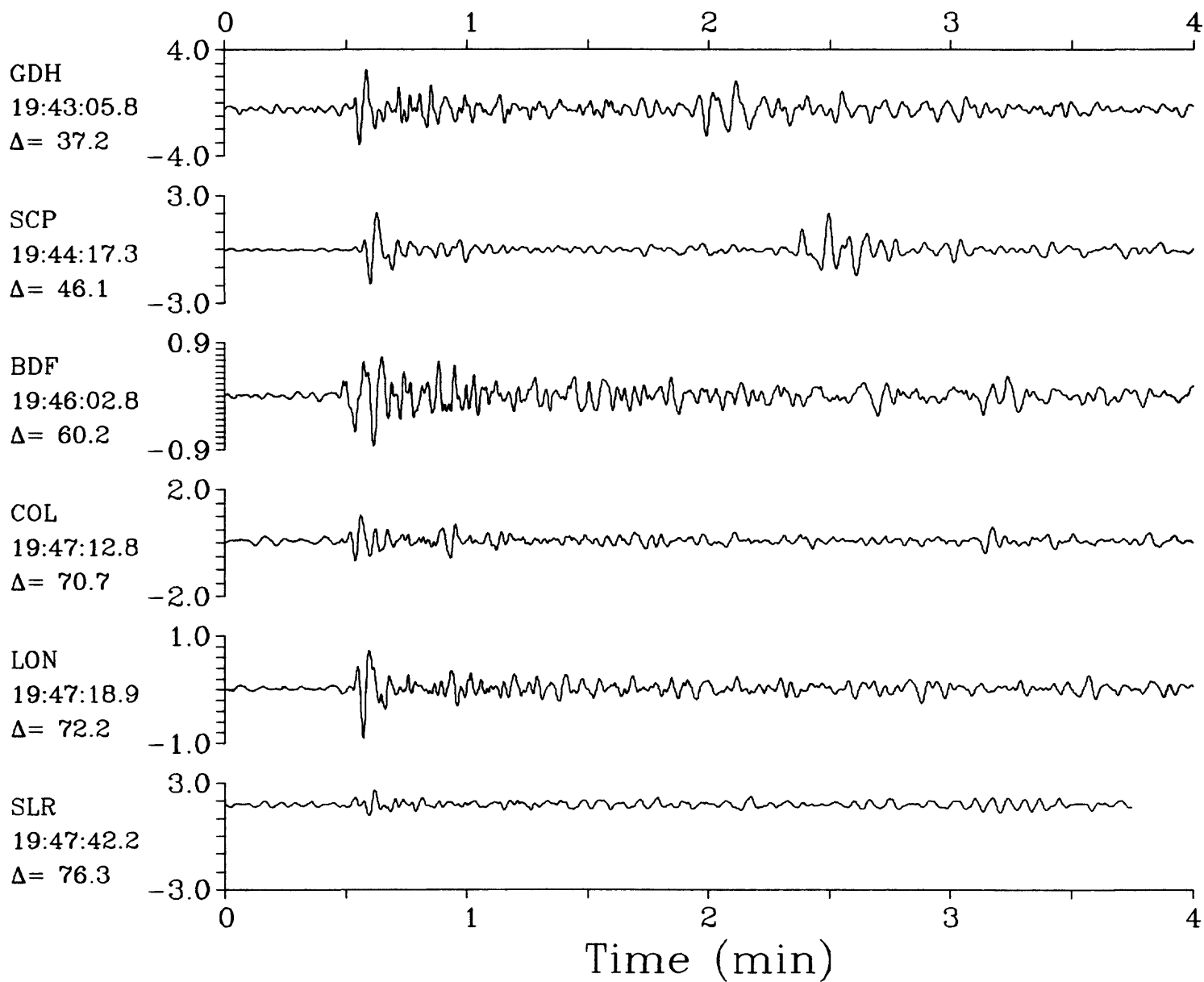
SPZ²⁴⁵

North Atlantic Ocean h=10.0 MB=6.0 ms=6.3

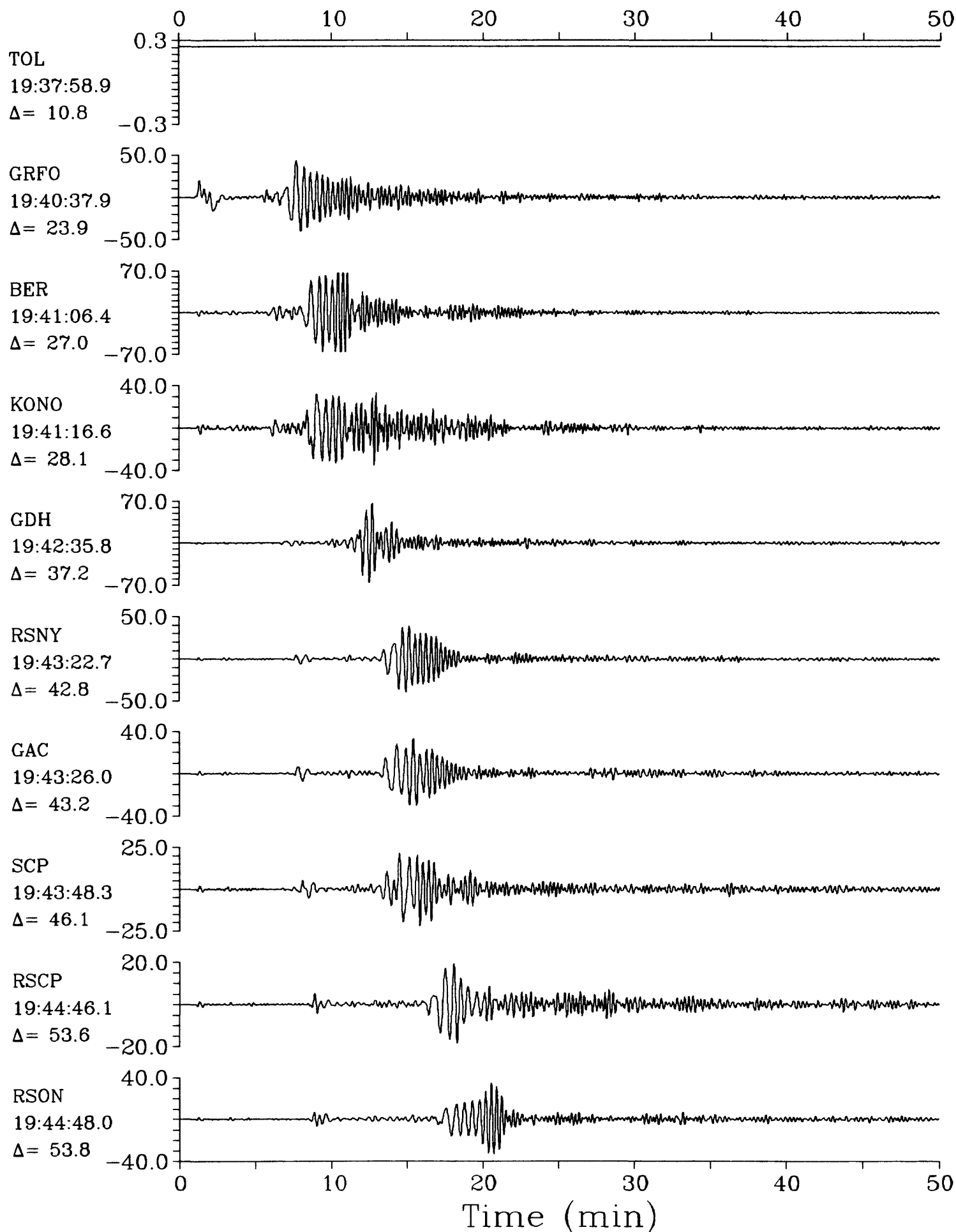


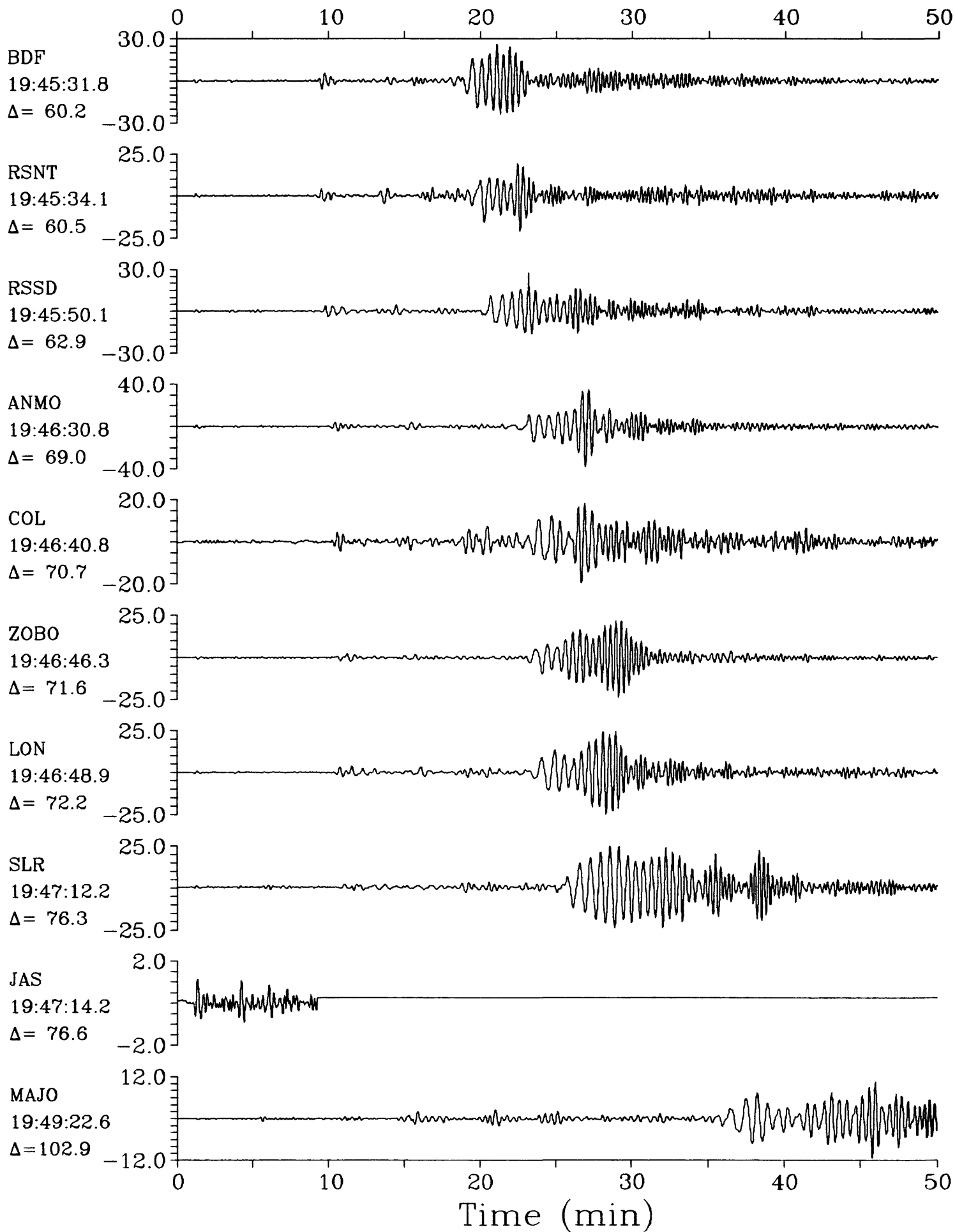
17 October 1983 19:36:21.47

North Atlantic Ocean h=10.0 MB=6.0 ms=6.3



North Atlantic Ocean h=10.0 MB=6.0 ms=6.3

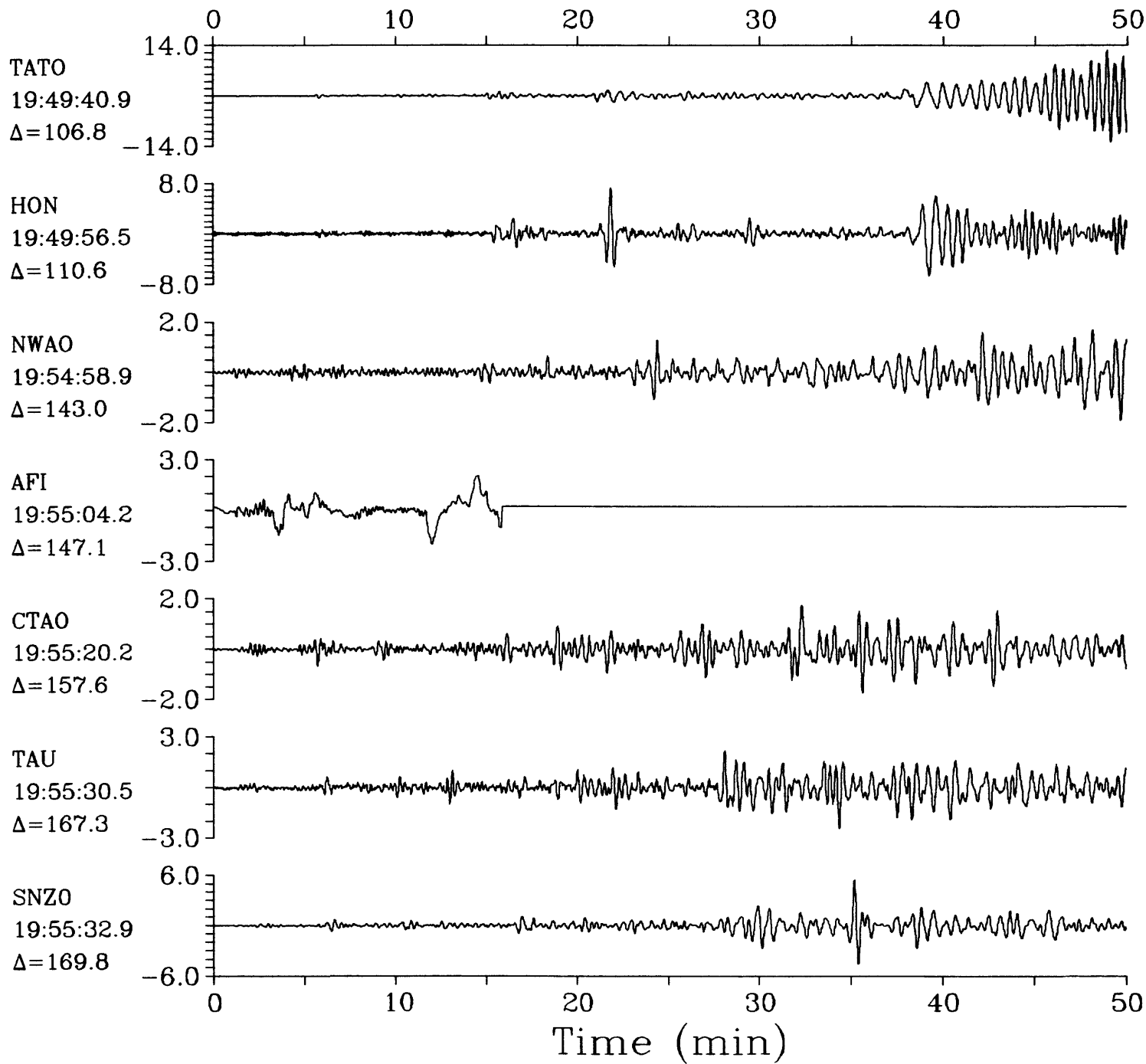


North Atlantic Ocean $h=10.0$ MB=6.0 ms=6.3

LPZ

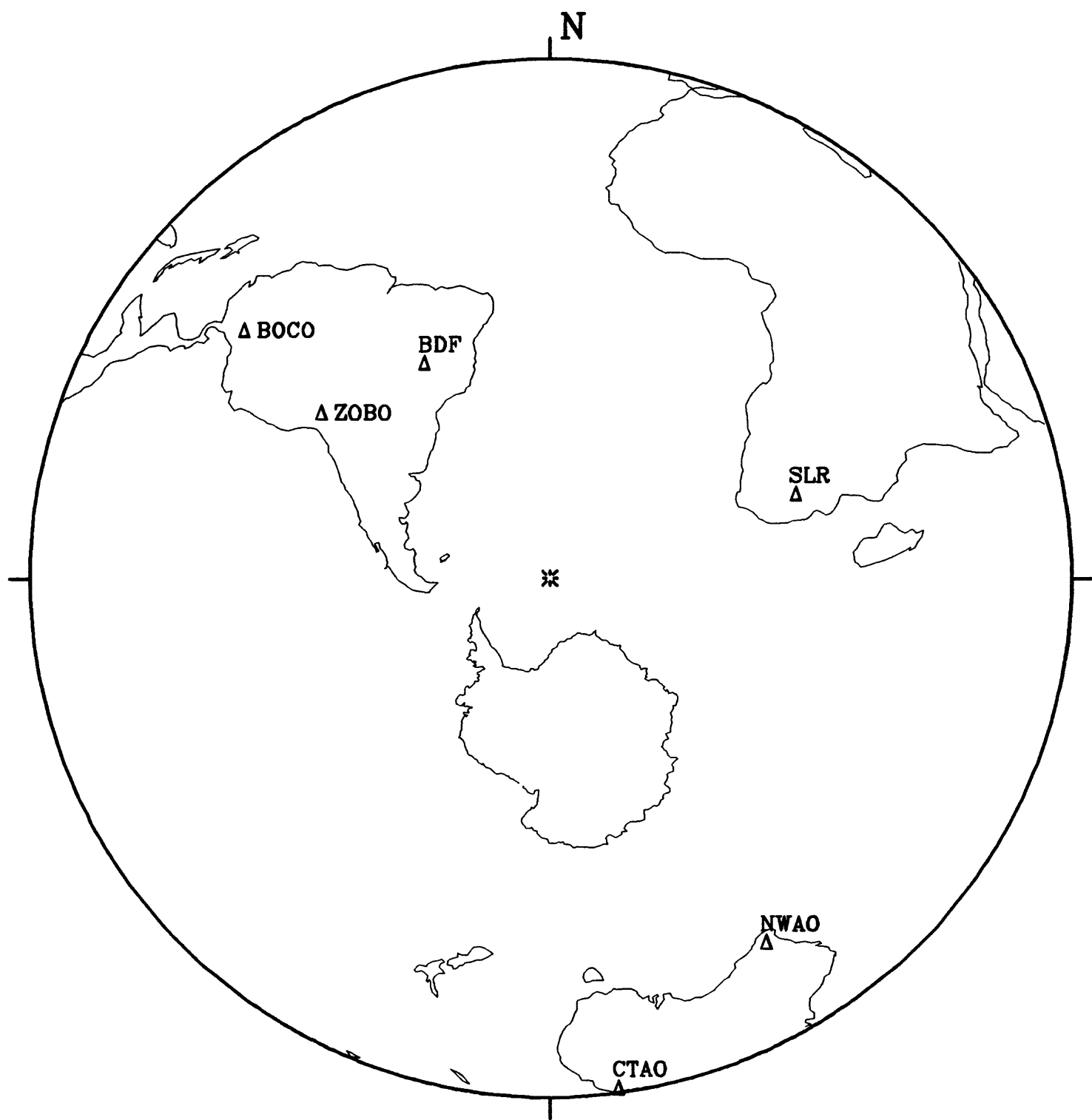
17 October 1983 19:36:21.47

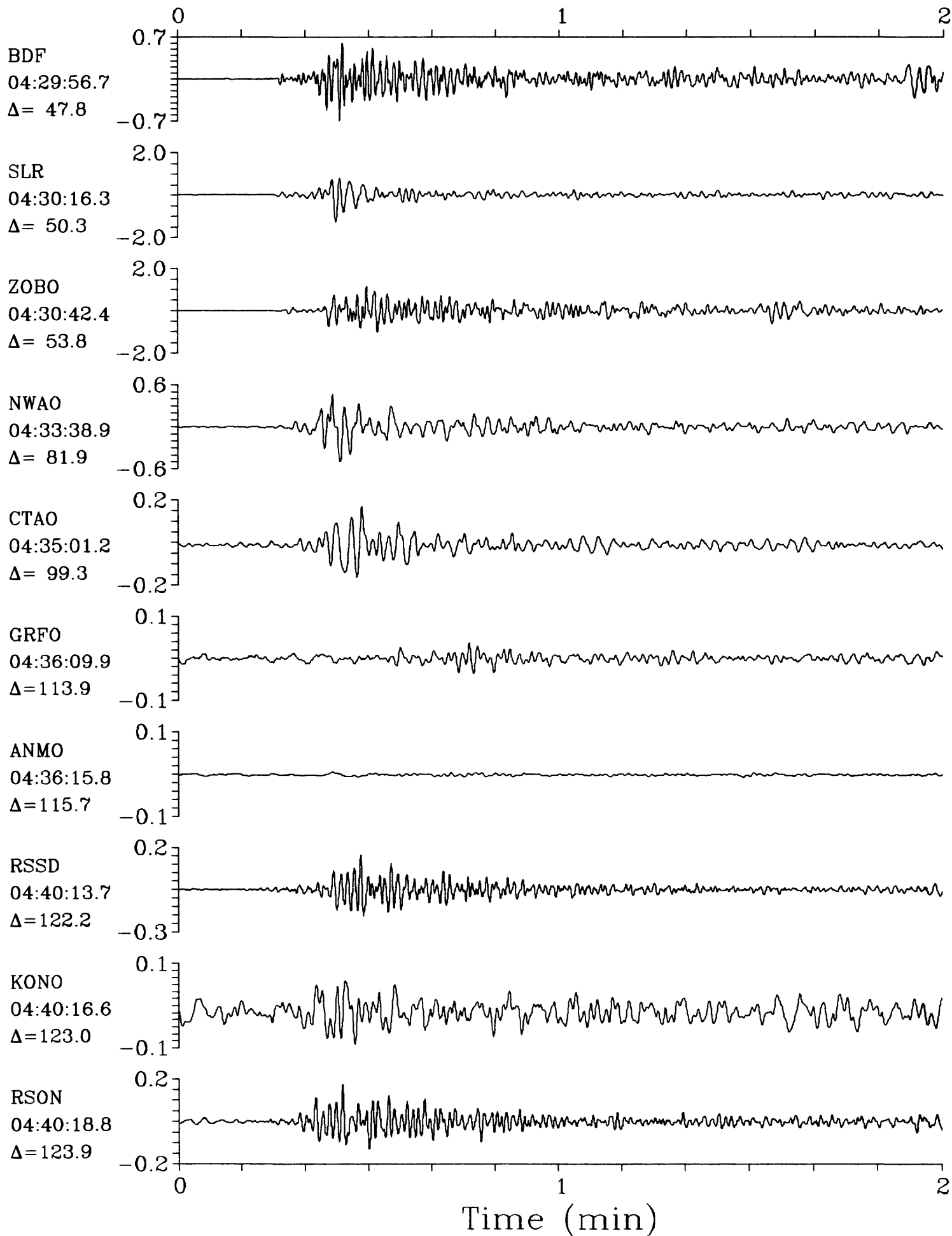
LPZ 249

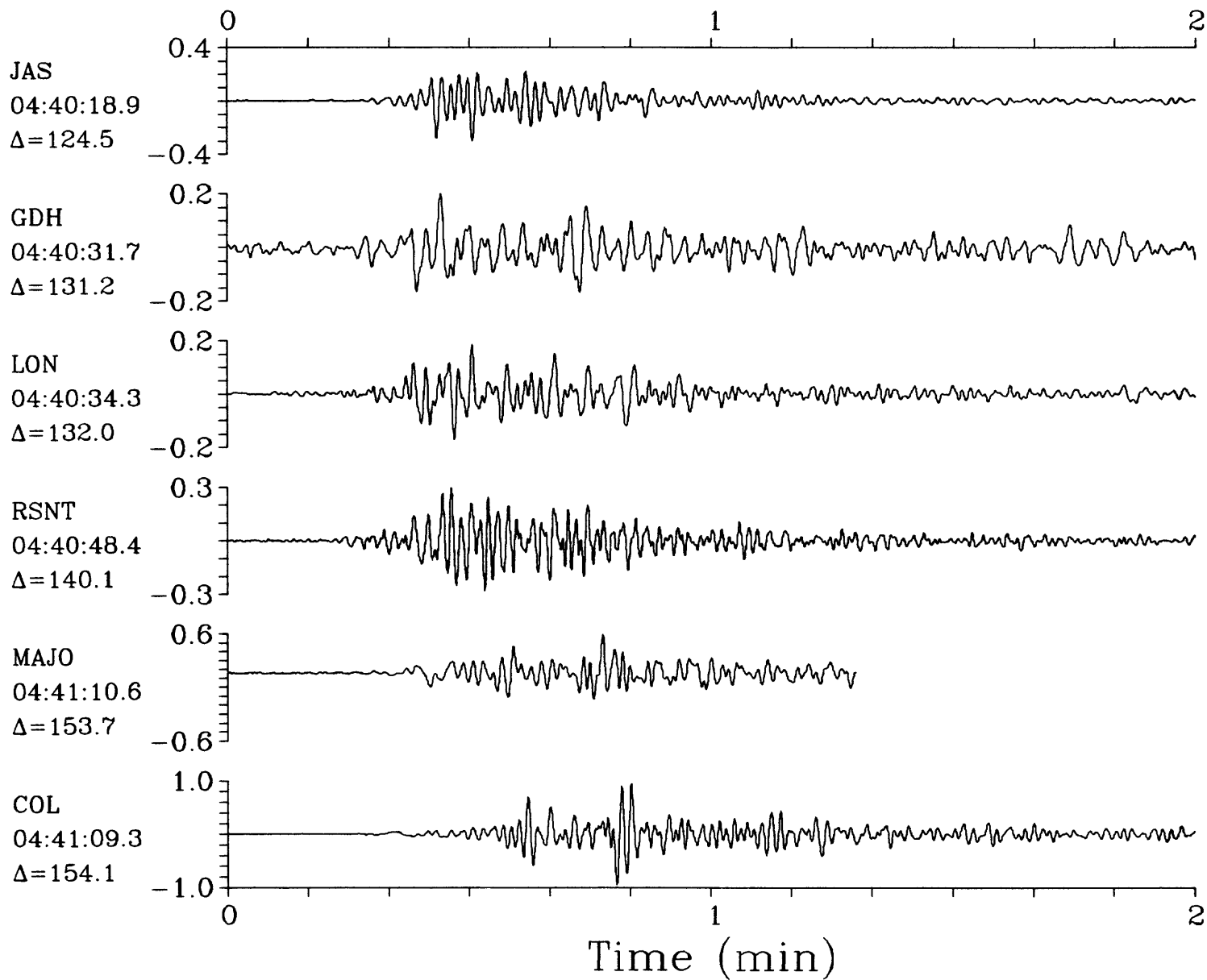
North Atlantic Ocean $h=10.0$ MB=6.0 ms=6.3

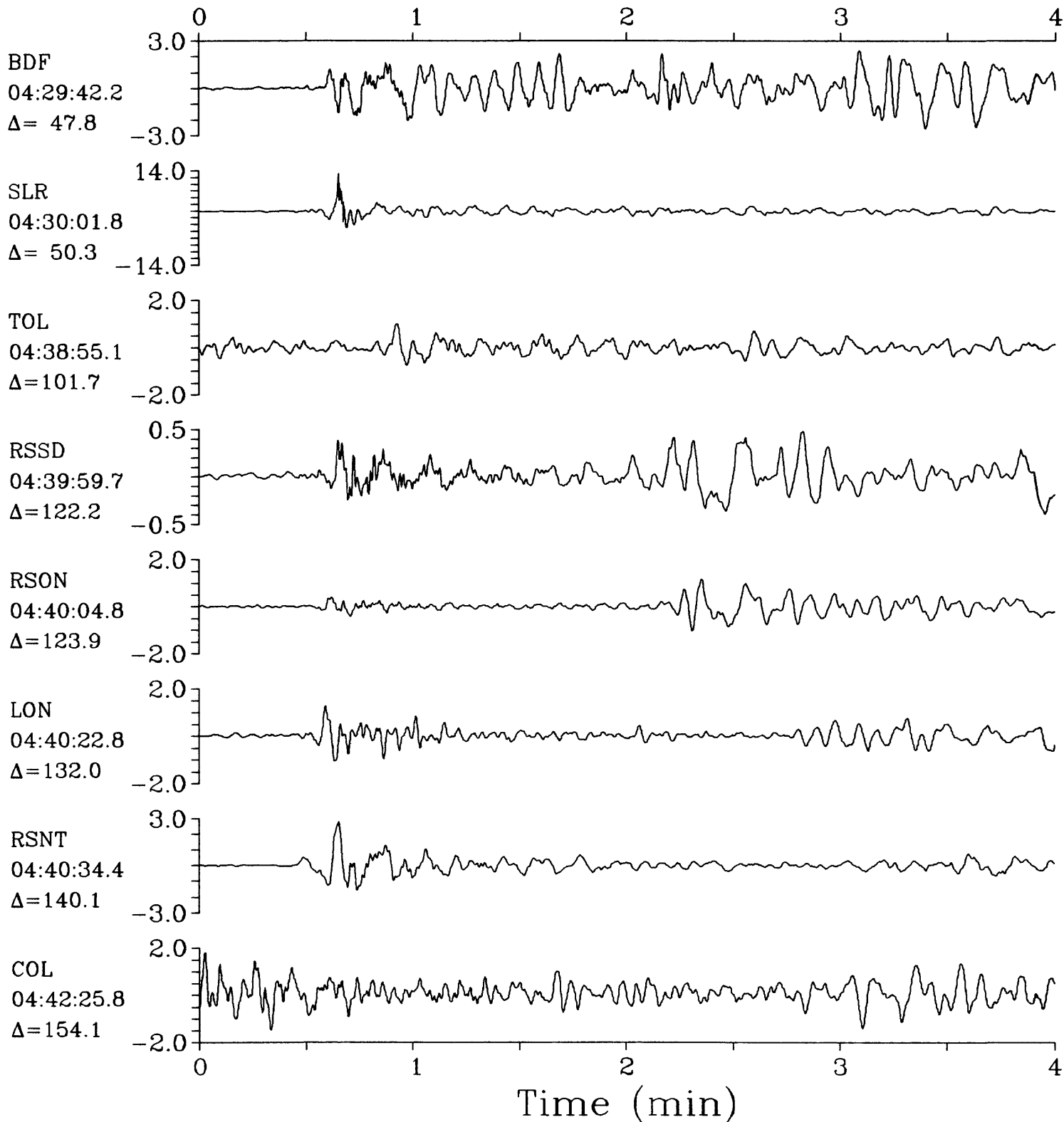
22 October 1983 04:21:35.01

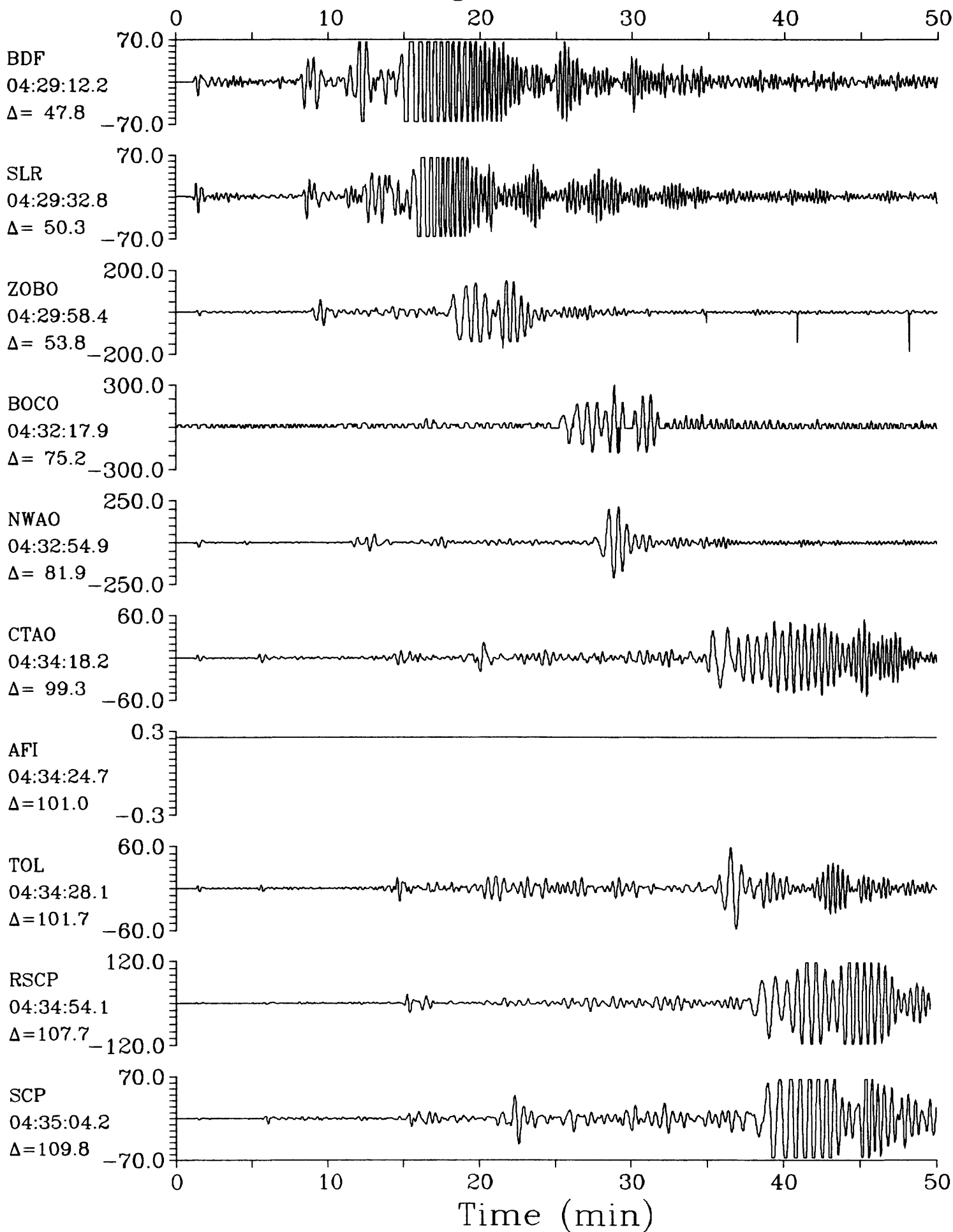
South Sandwich Islands Region

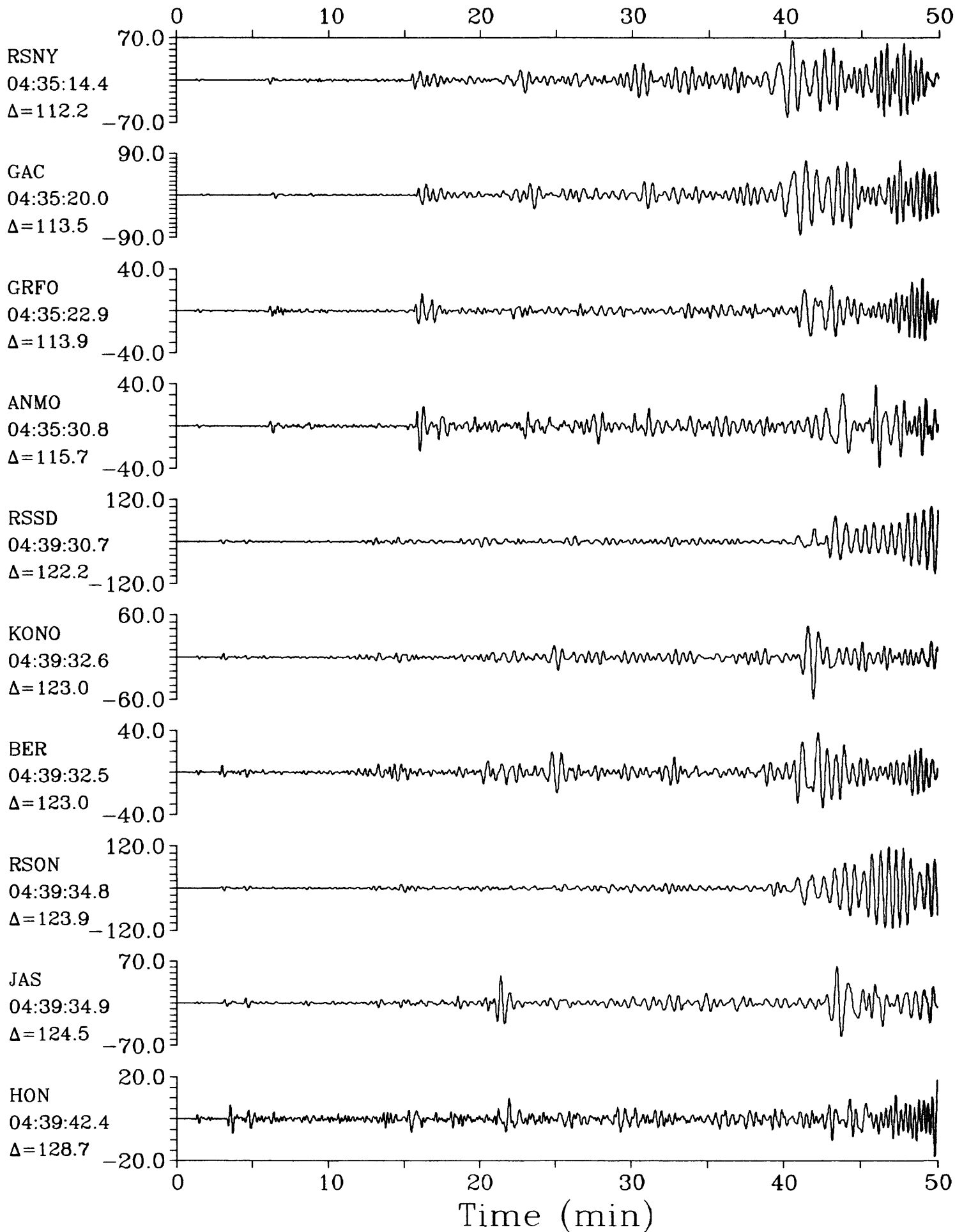


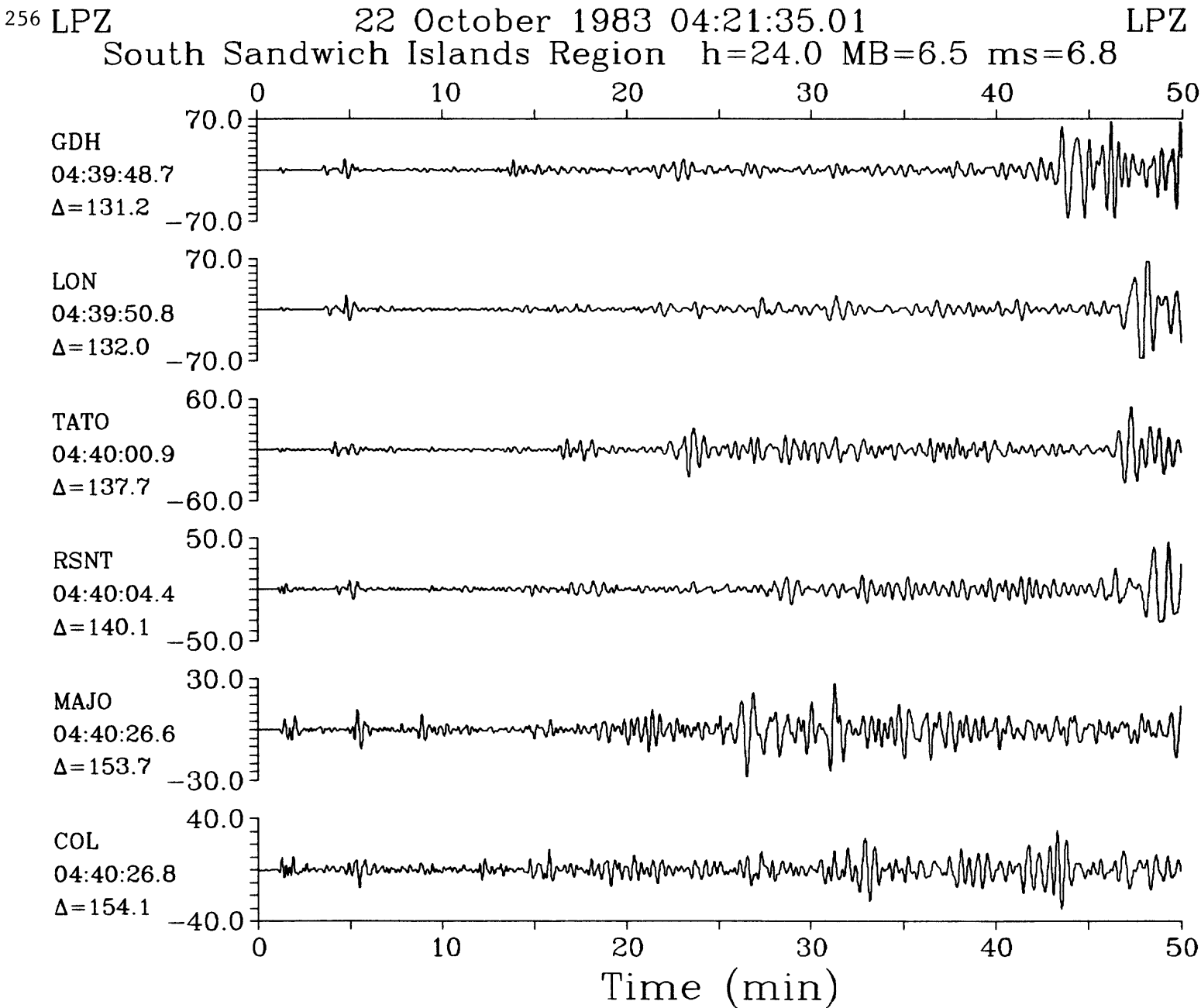






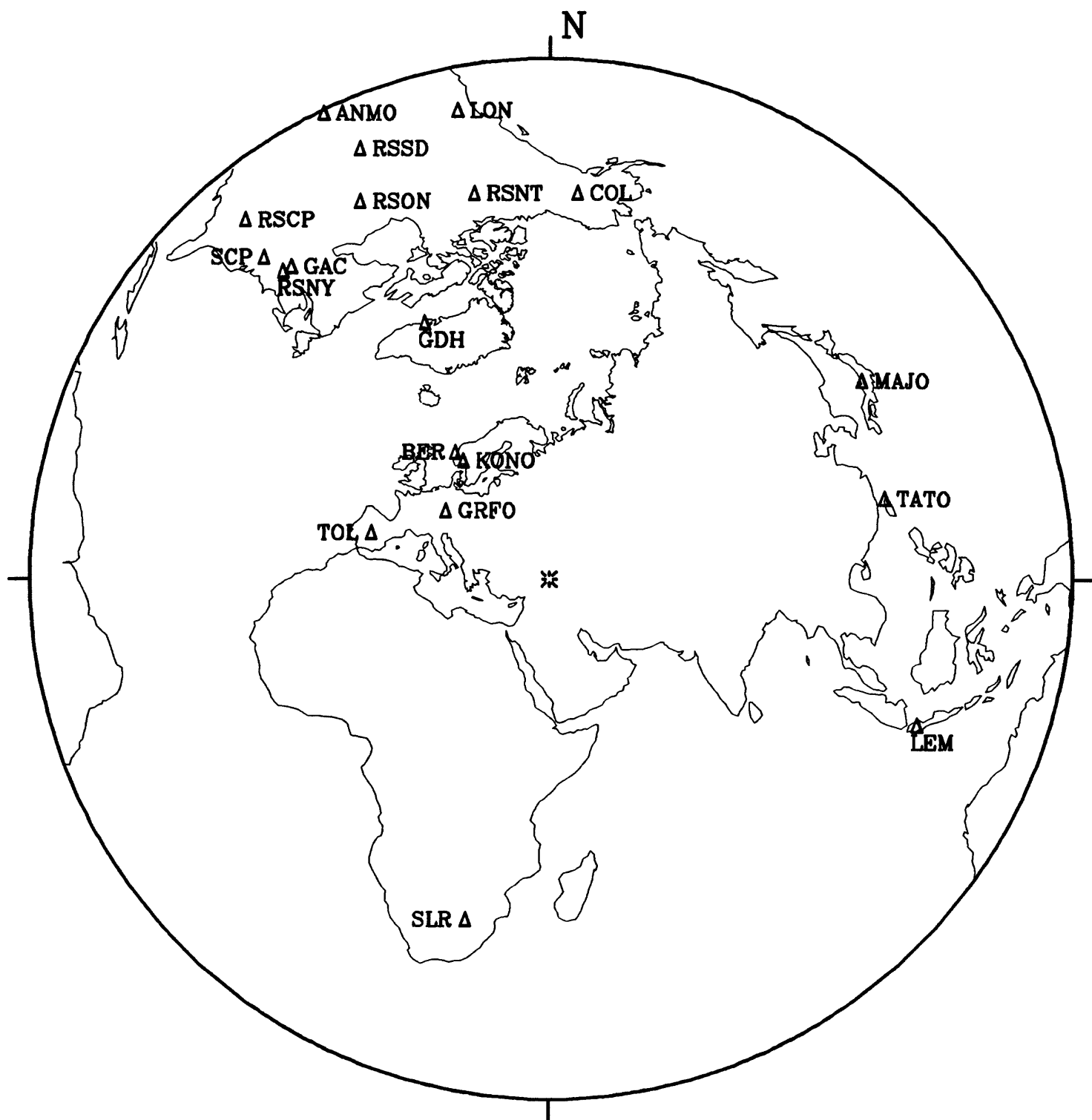
South Sandwich Islands Region $h=24.0$ MB=6.5 ms=6.8

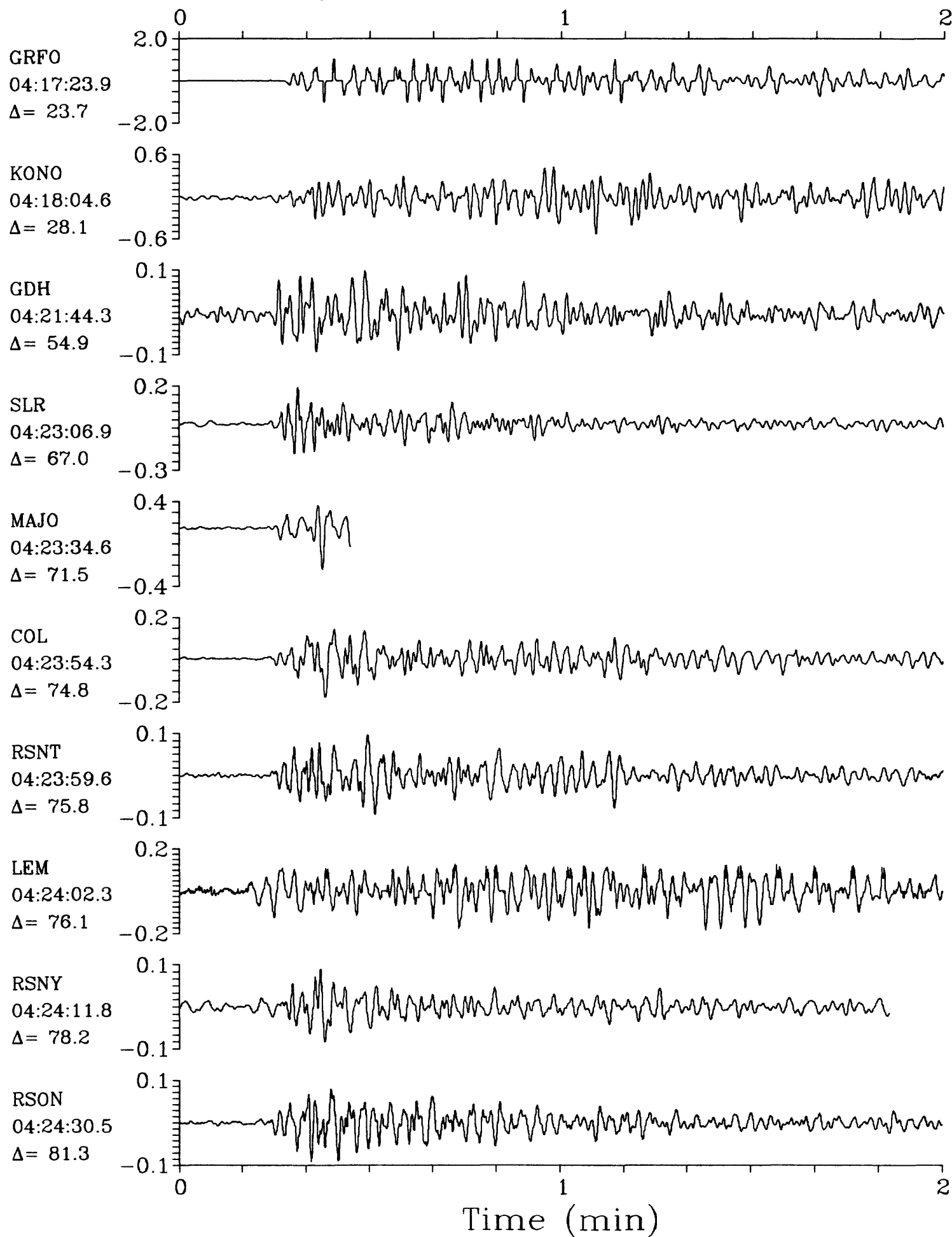




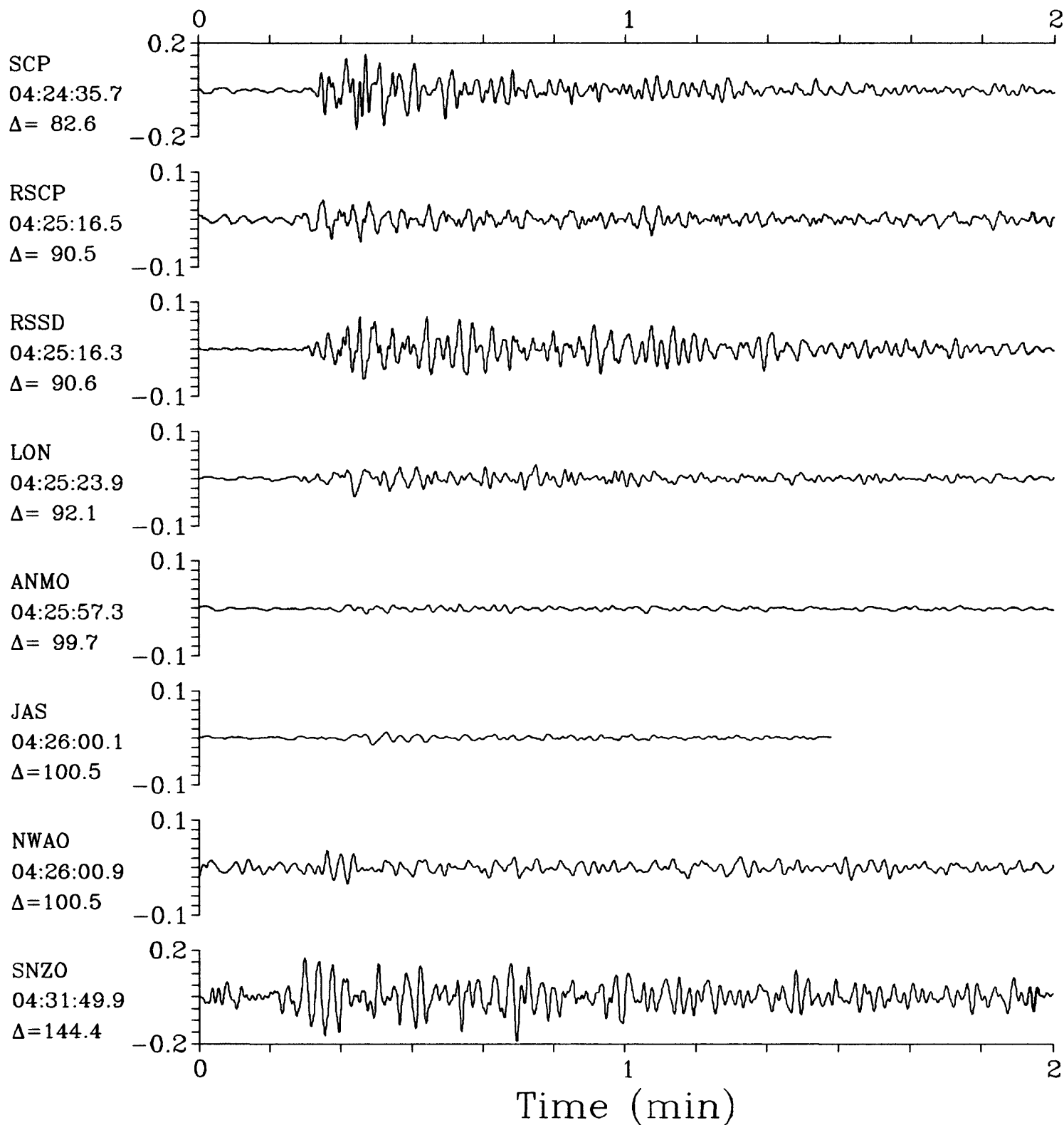
30 October 1983 04:12:27.13

Turkey

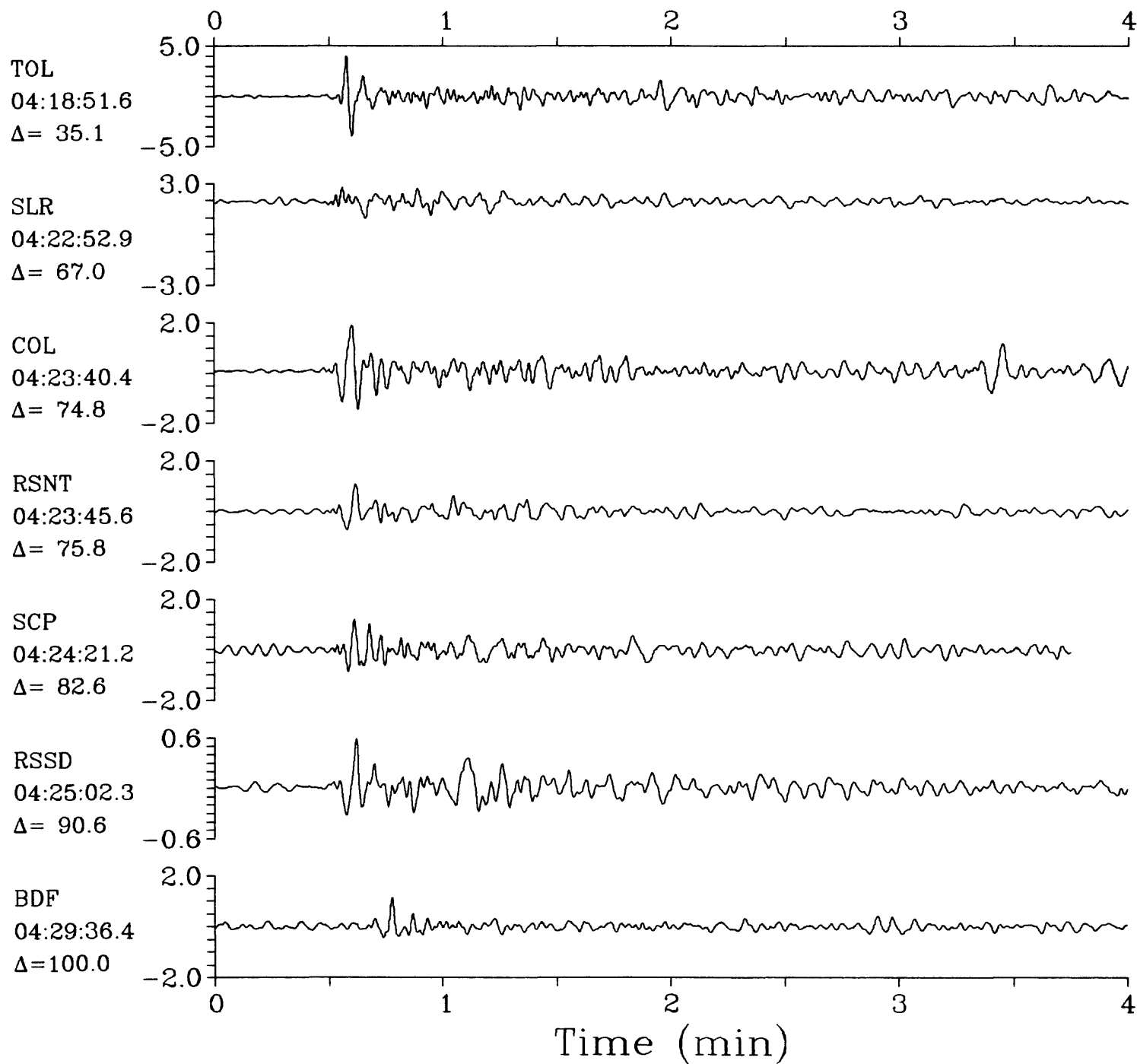


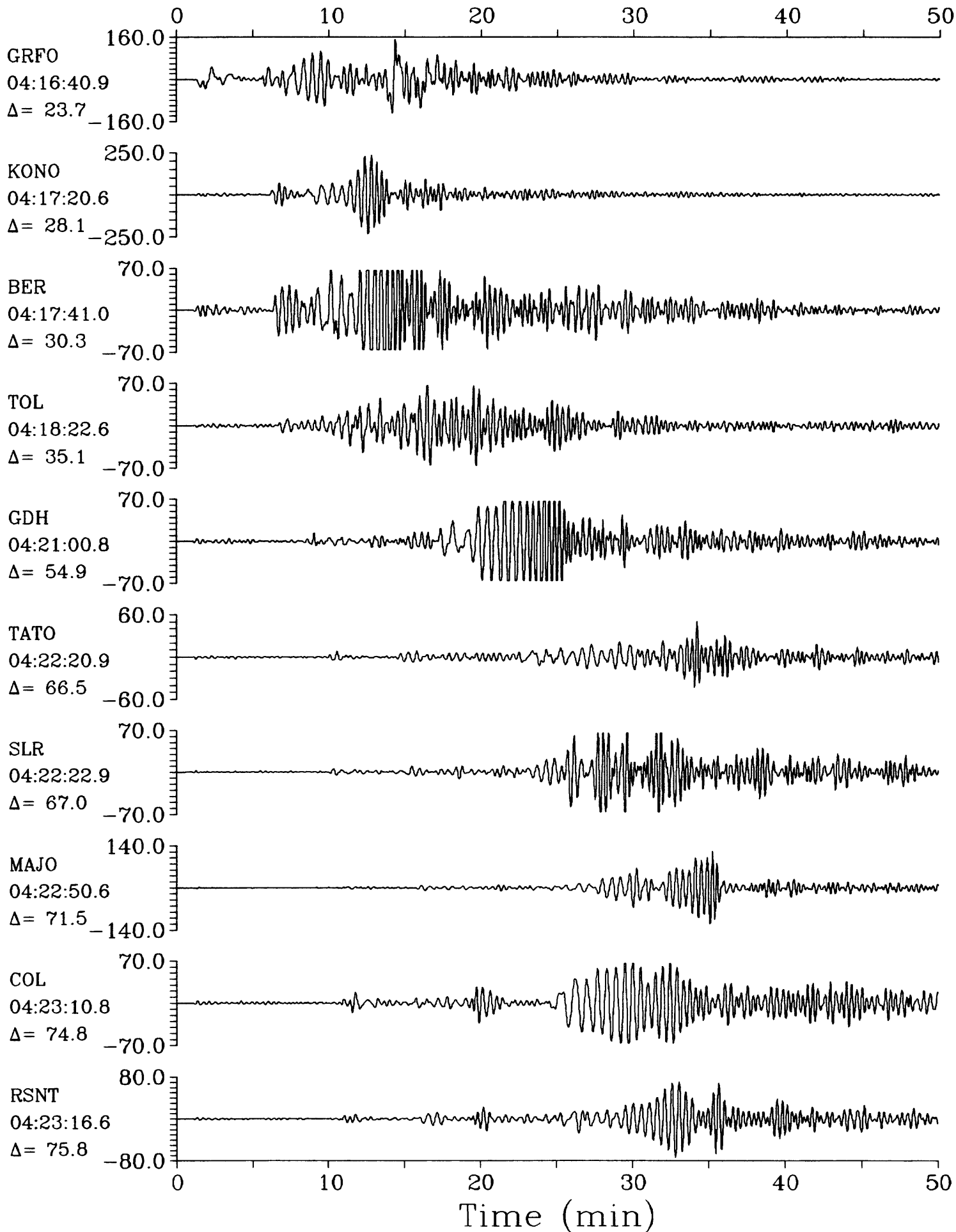


SPZ

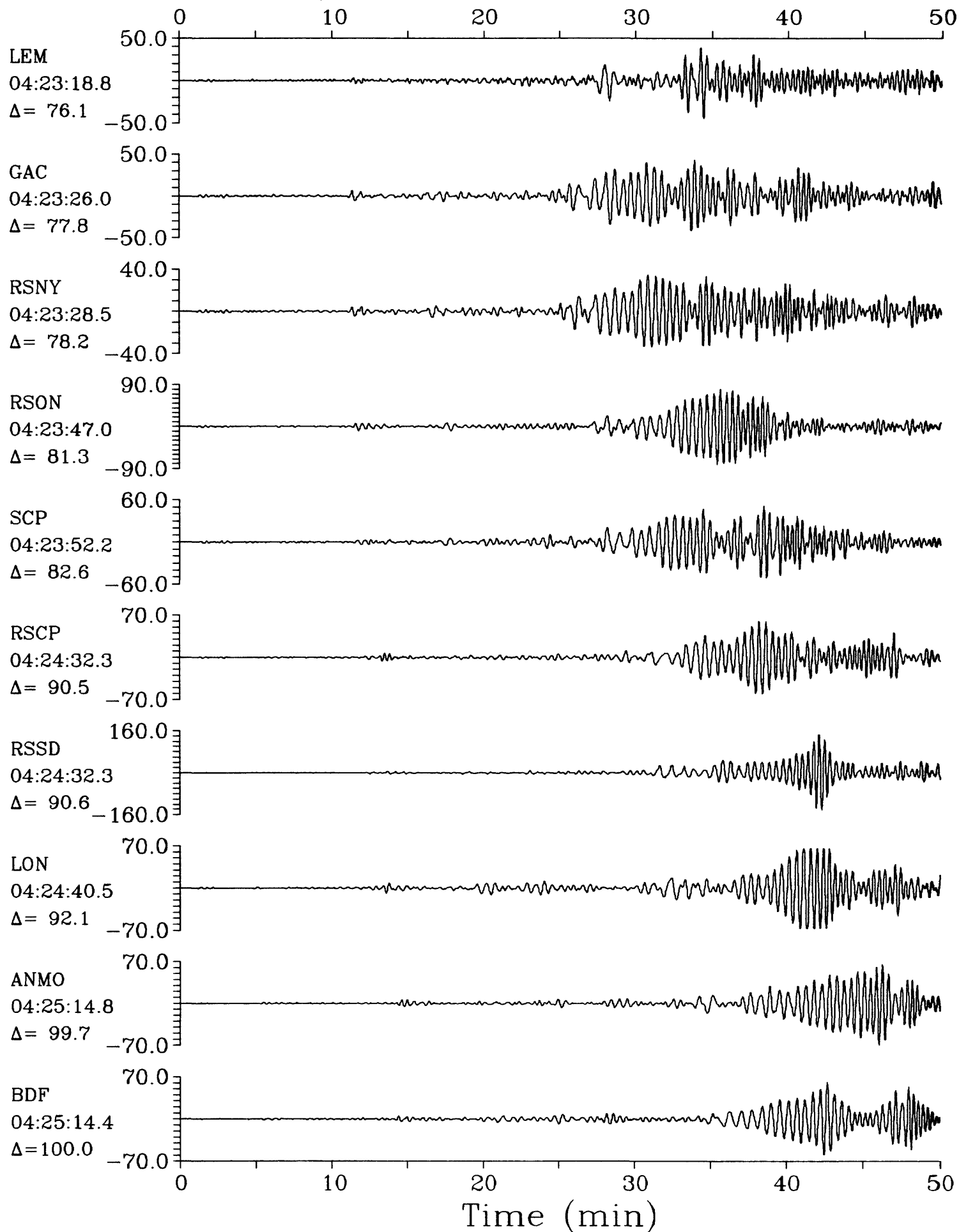
30 October 1983 04:12:27.13
Turkey h=11.6 MB=6.1 ms=6.9SPZ²⁵⁹

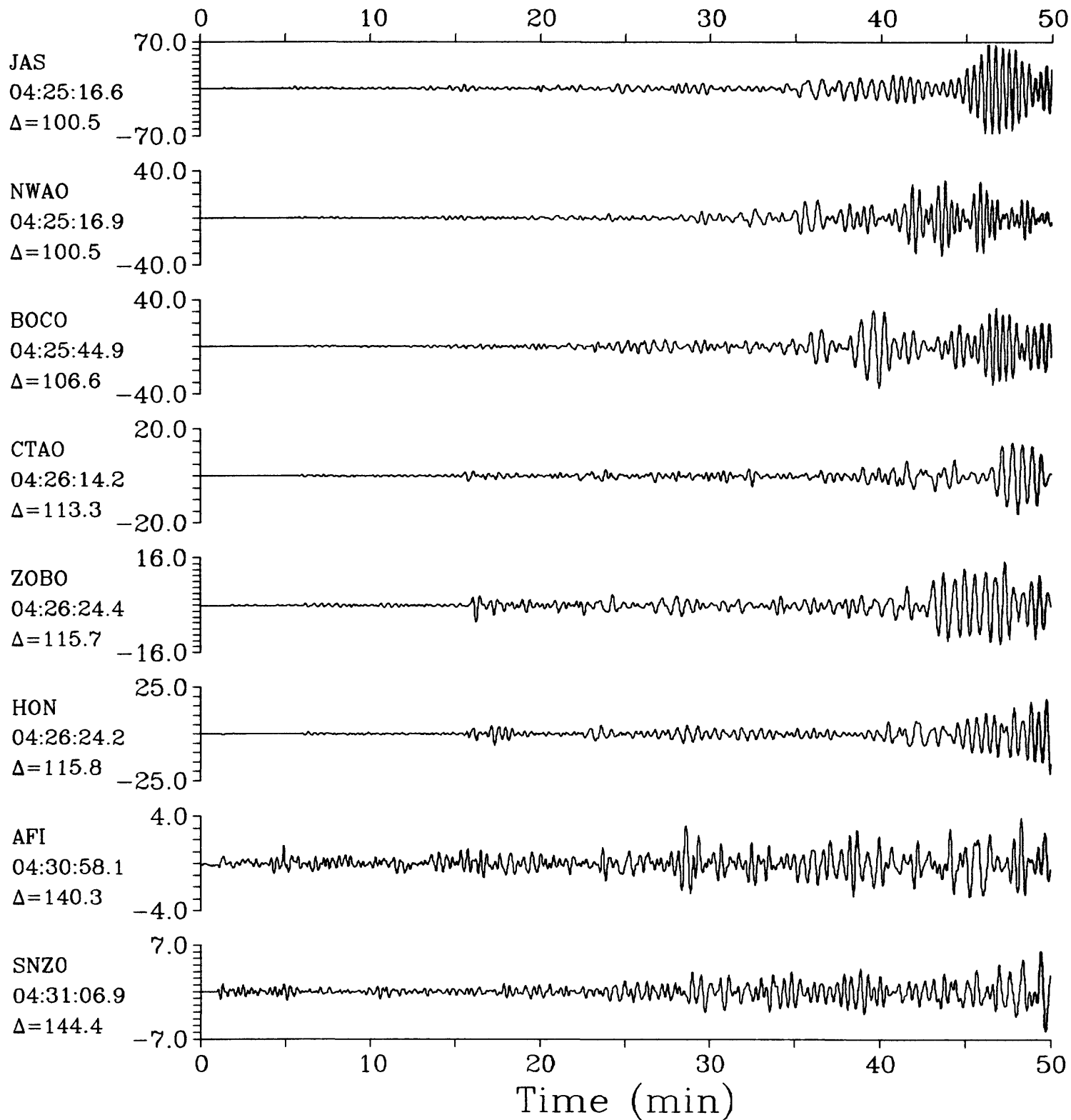
30 October 1983 04:12:27.13
Turkey h=11.6 MB=6.1 ms=6.9





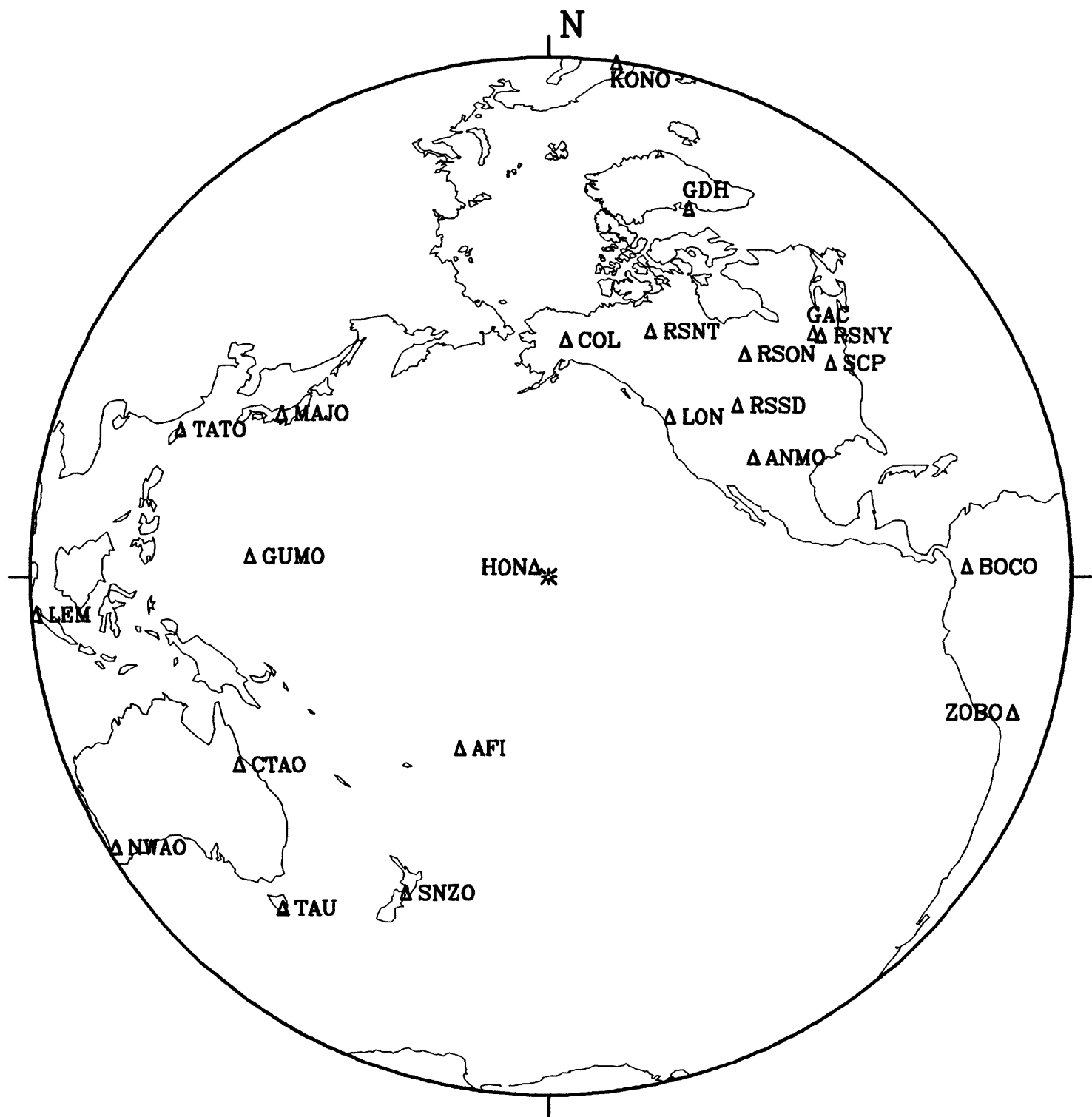
30 October 1983 04:12:27.13
Turkey h=11.6 MB=6.1 ms=6.9

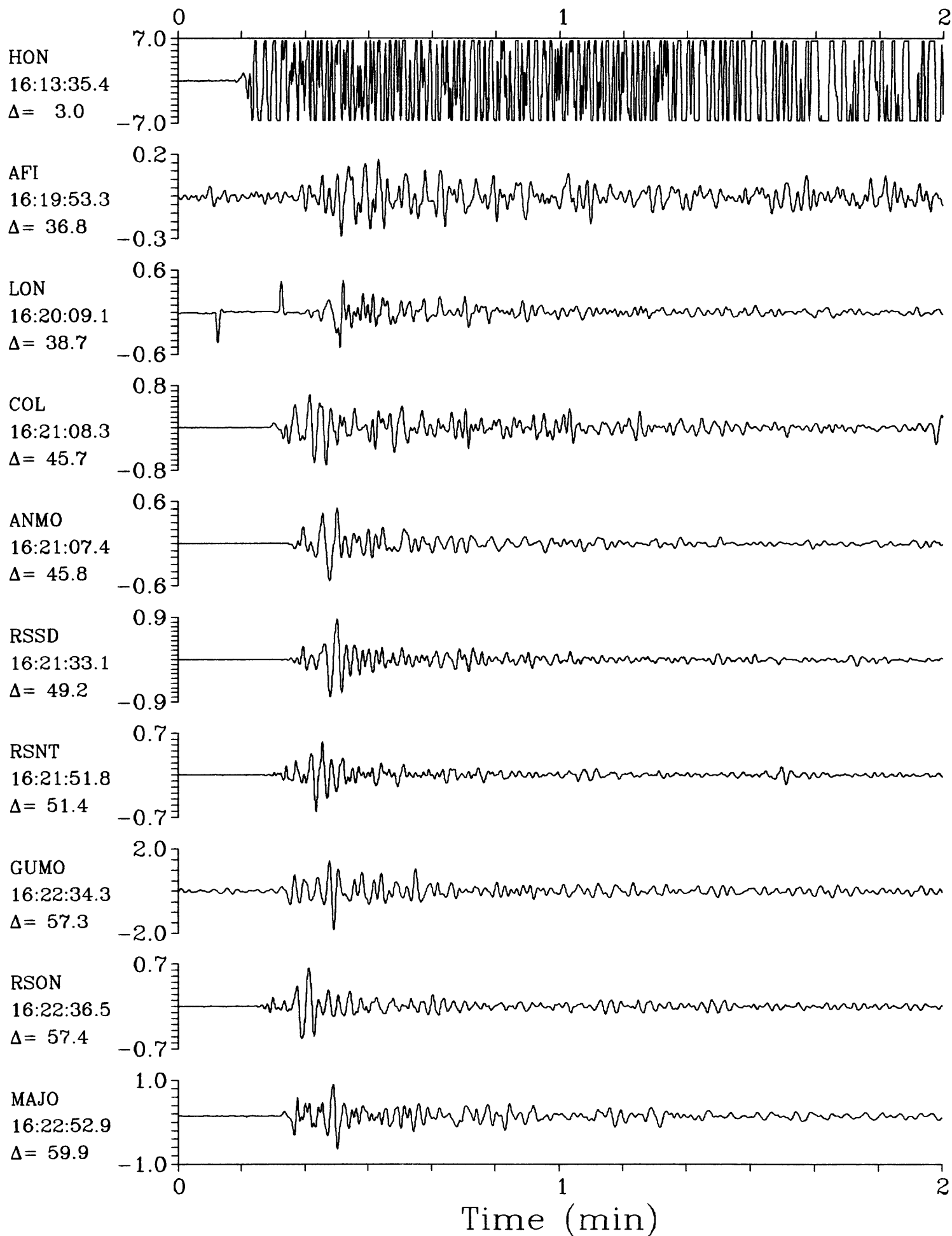


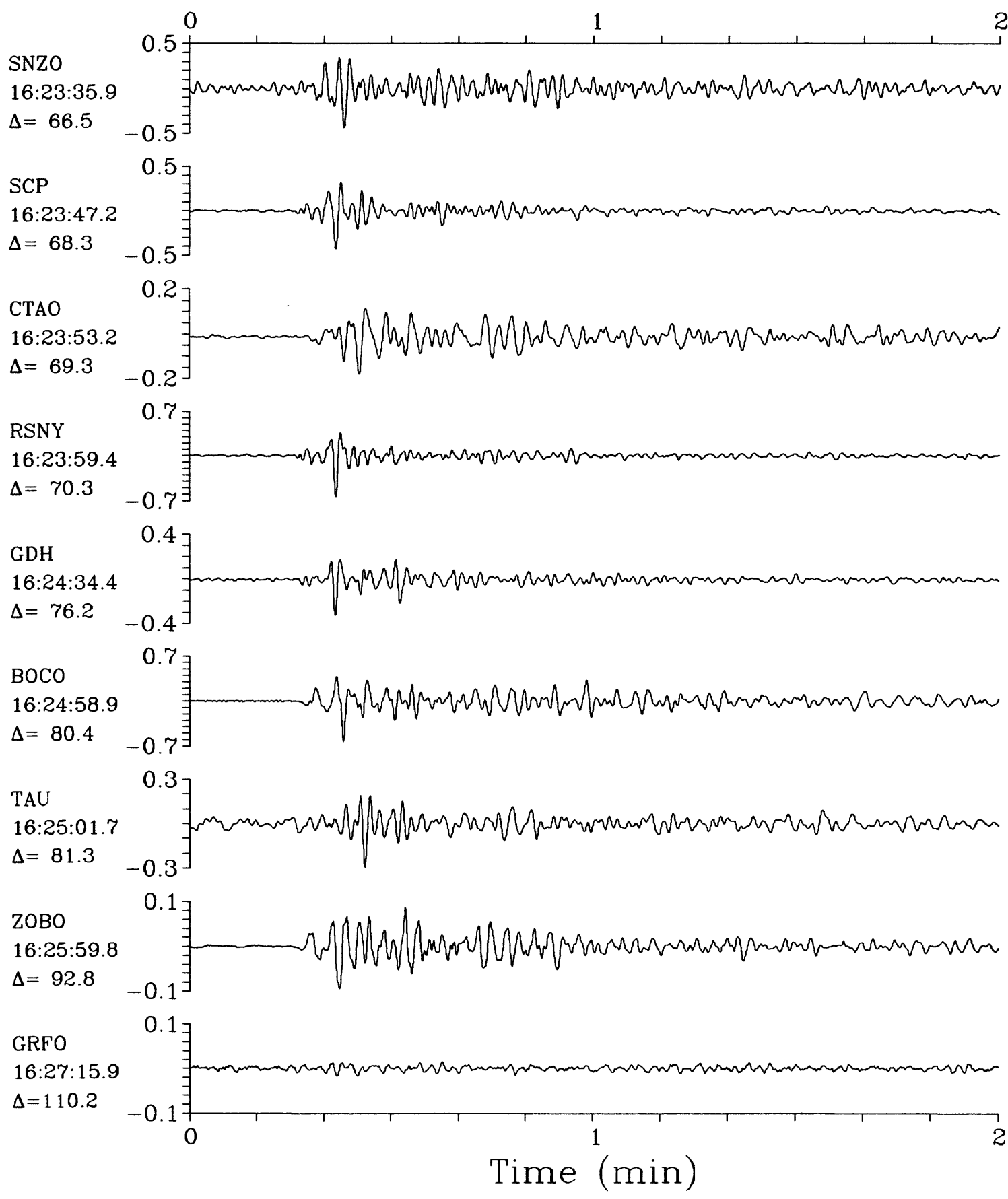


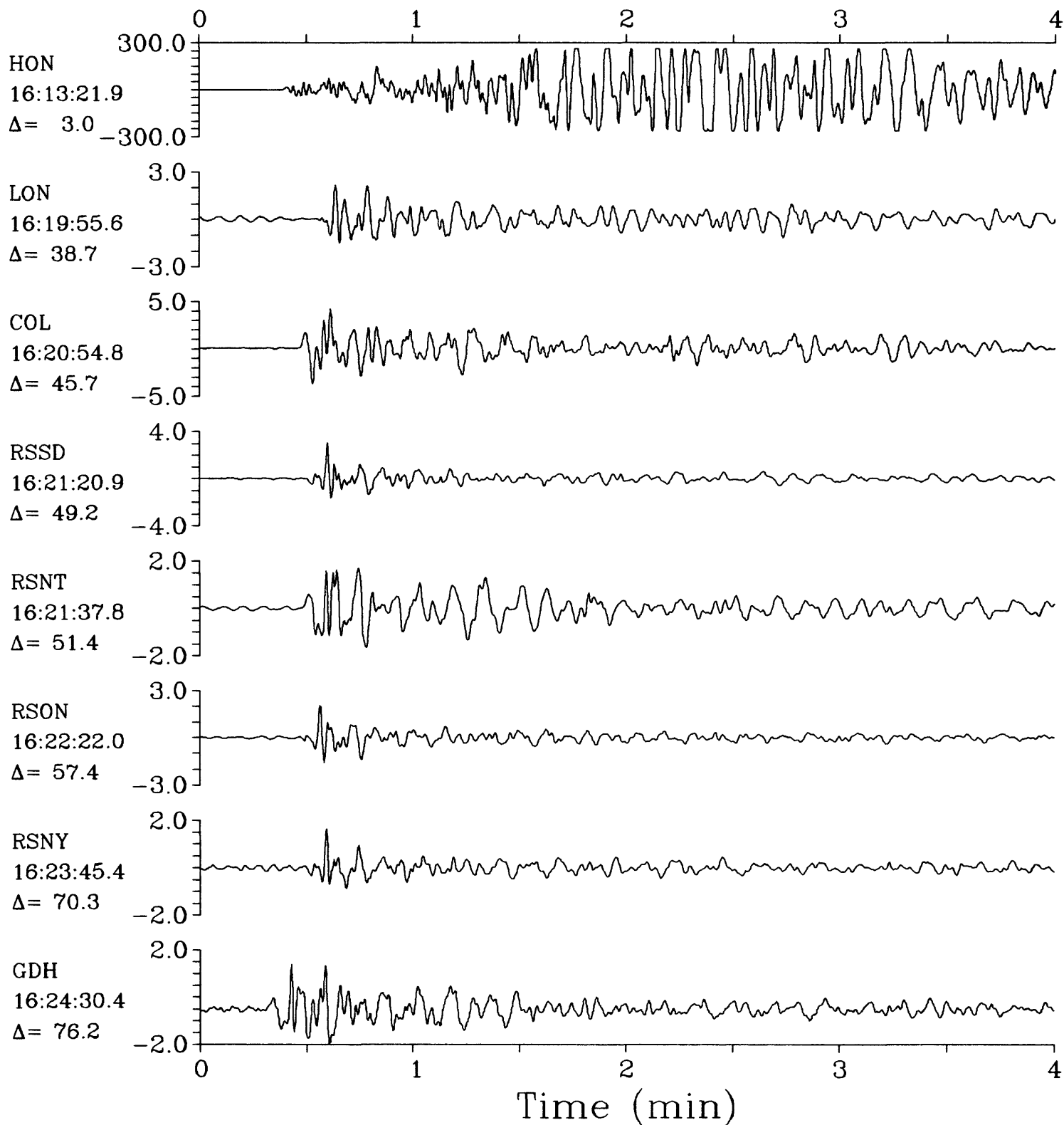
16 November 1983 16:13:00.07

Hawaii

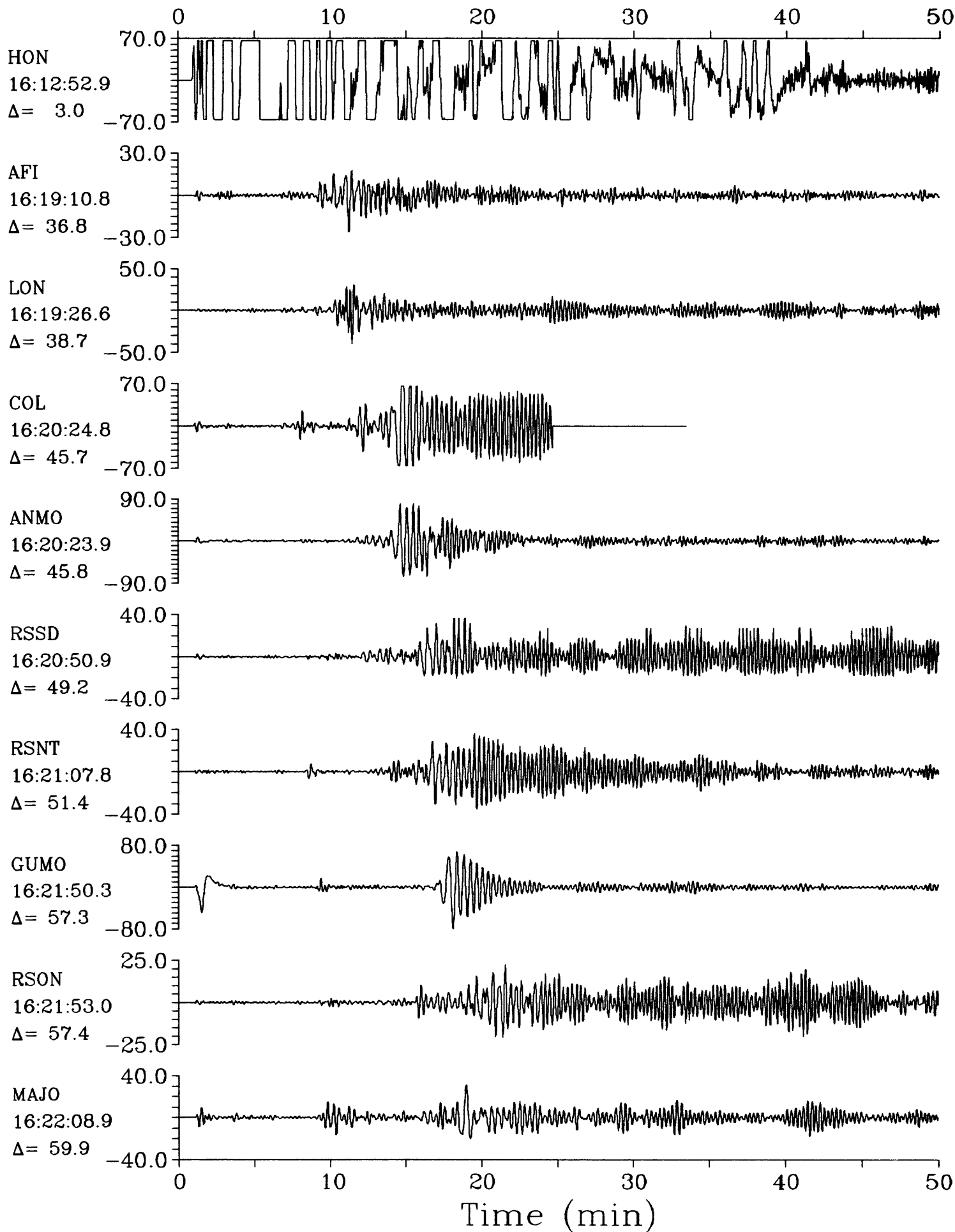


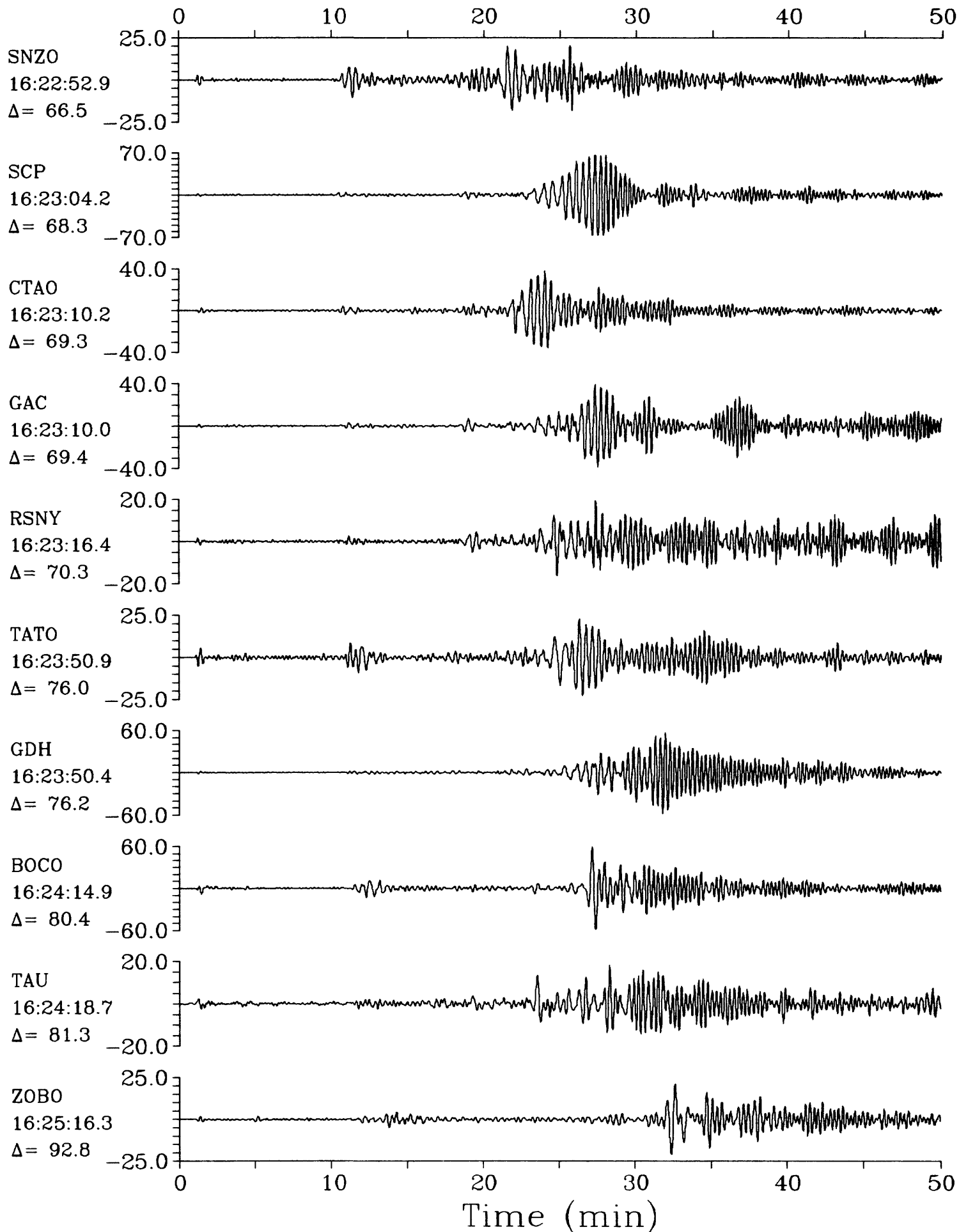




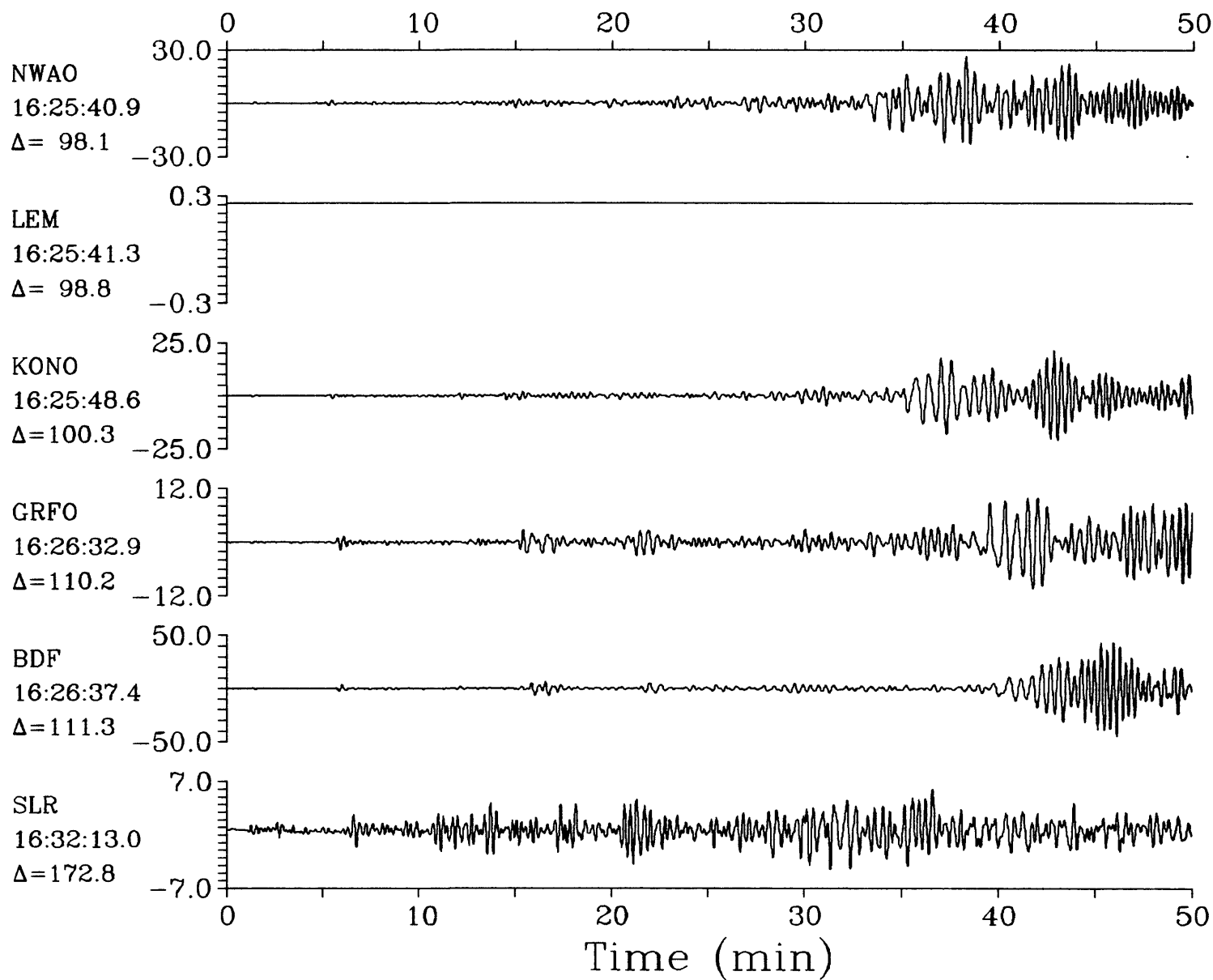


16 November 1983 16:13:00.07
Hawaii h=12.0 MB=6.4 ms=6.7



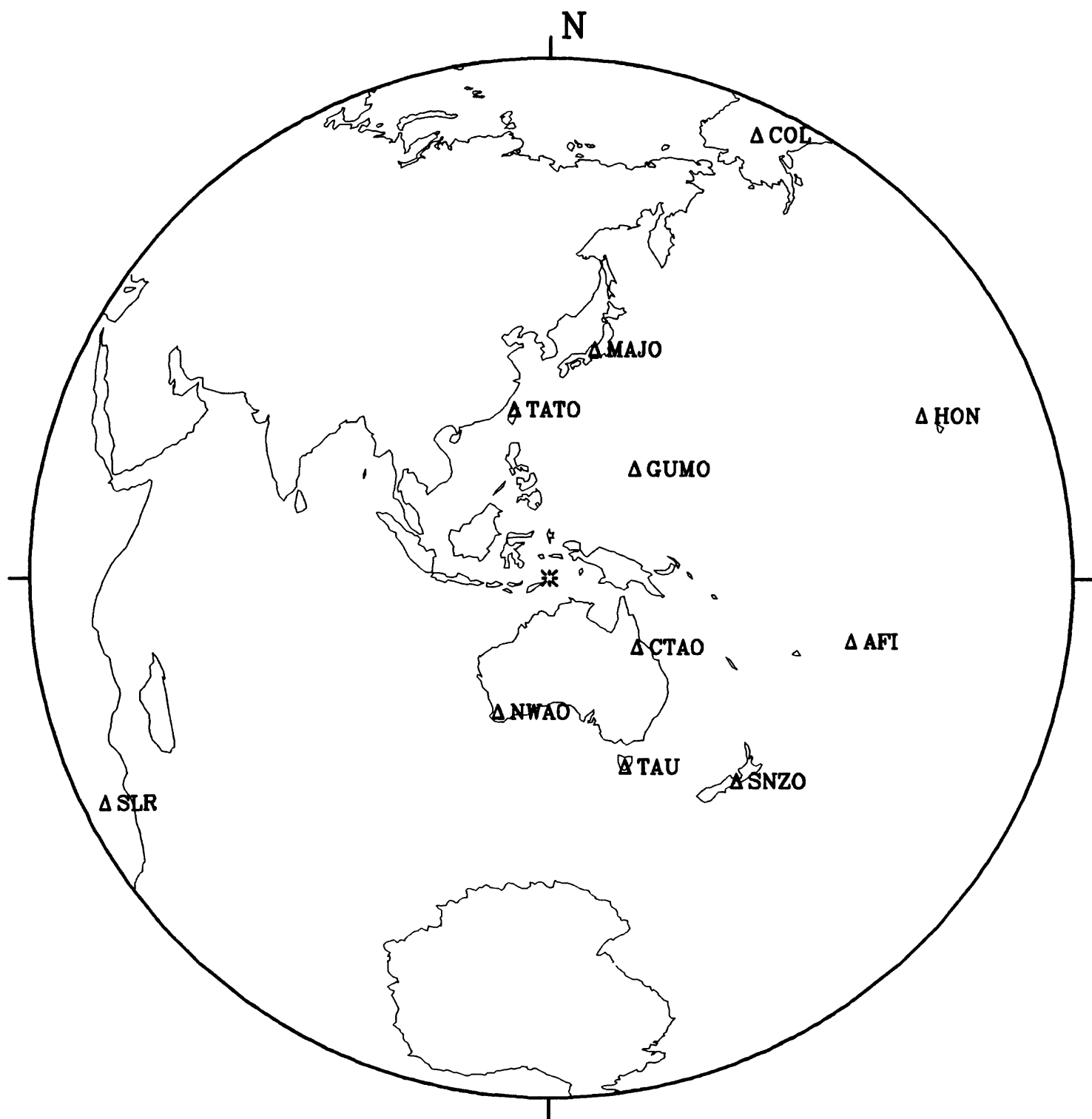


16 November 1983 16:13:00.07
Hawaii h=12.0 MB=6.4 ms=6.7



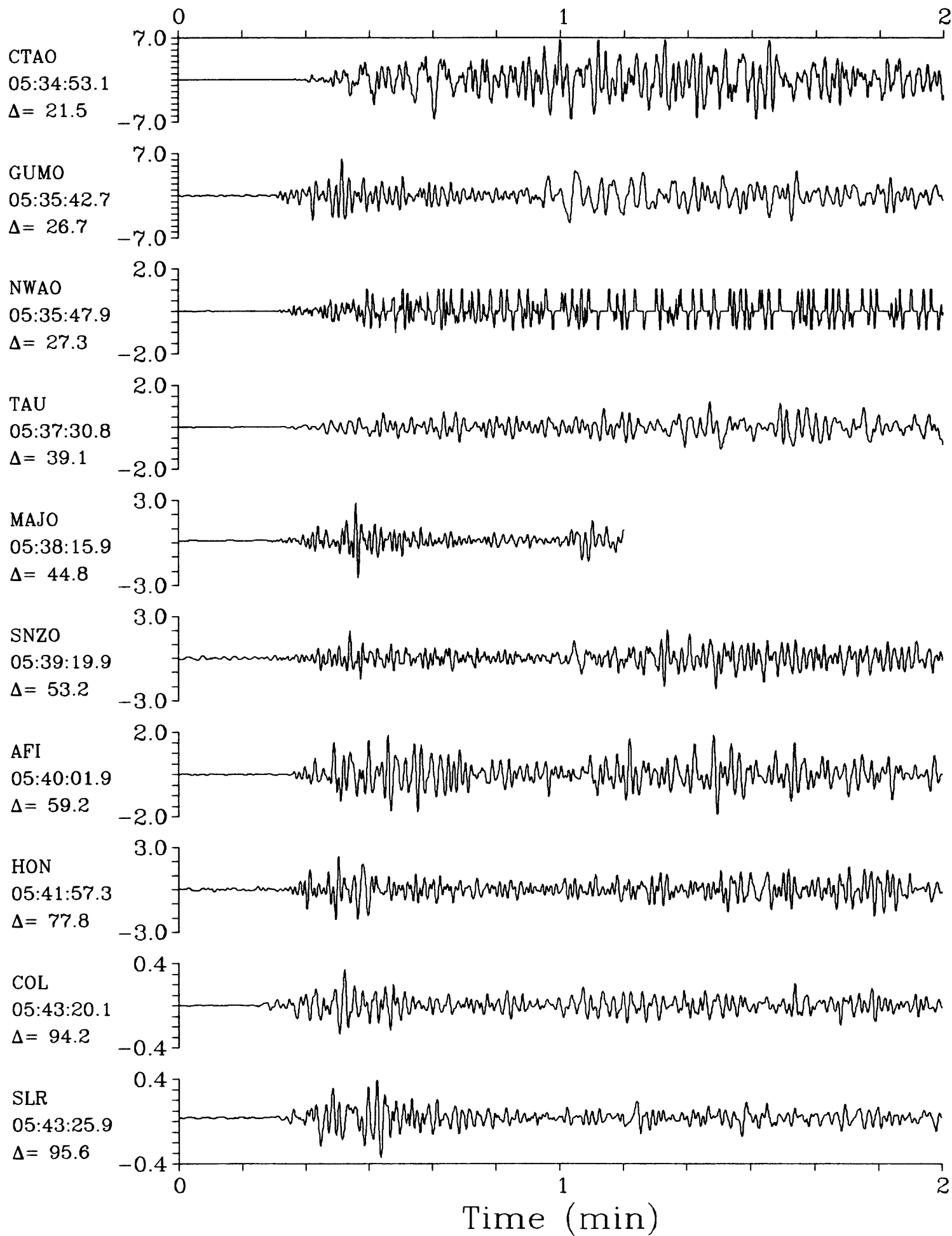
24 November 1983 05:30:34.23

Banda Sea

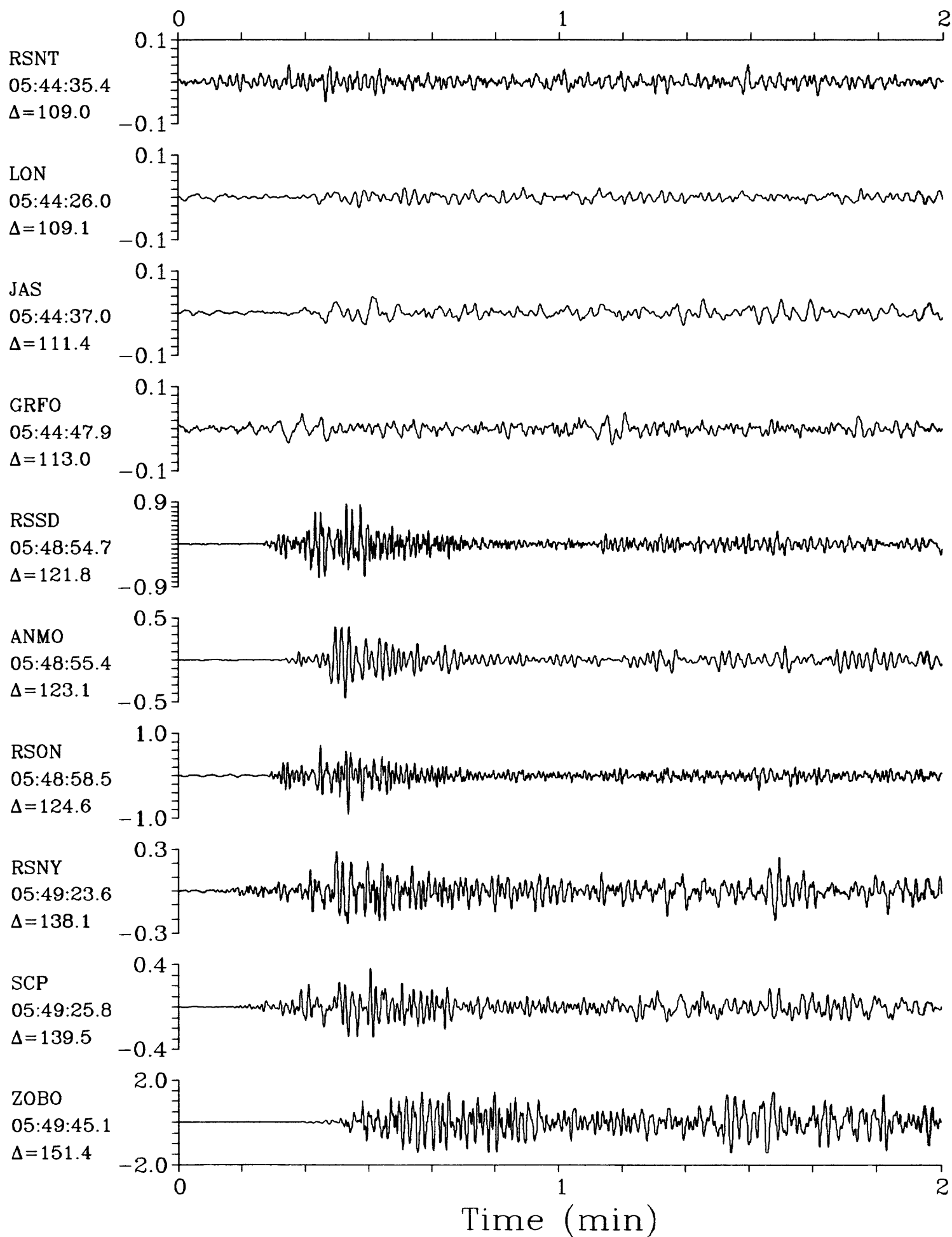


24 November 1983 05:30:34.23

Banda Sea h=178.5 MB=6.4



Banda Sea h=178.5 MB=6.4

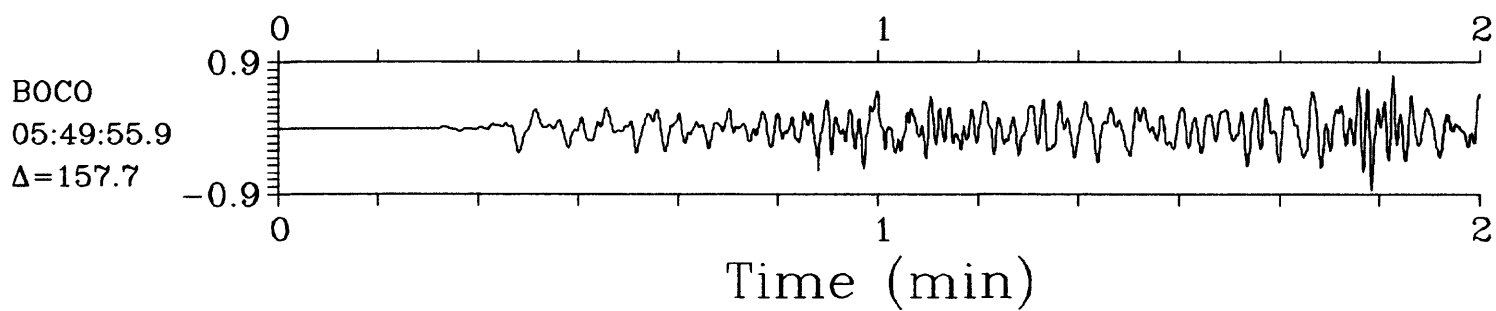


274 SPZ

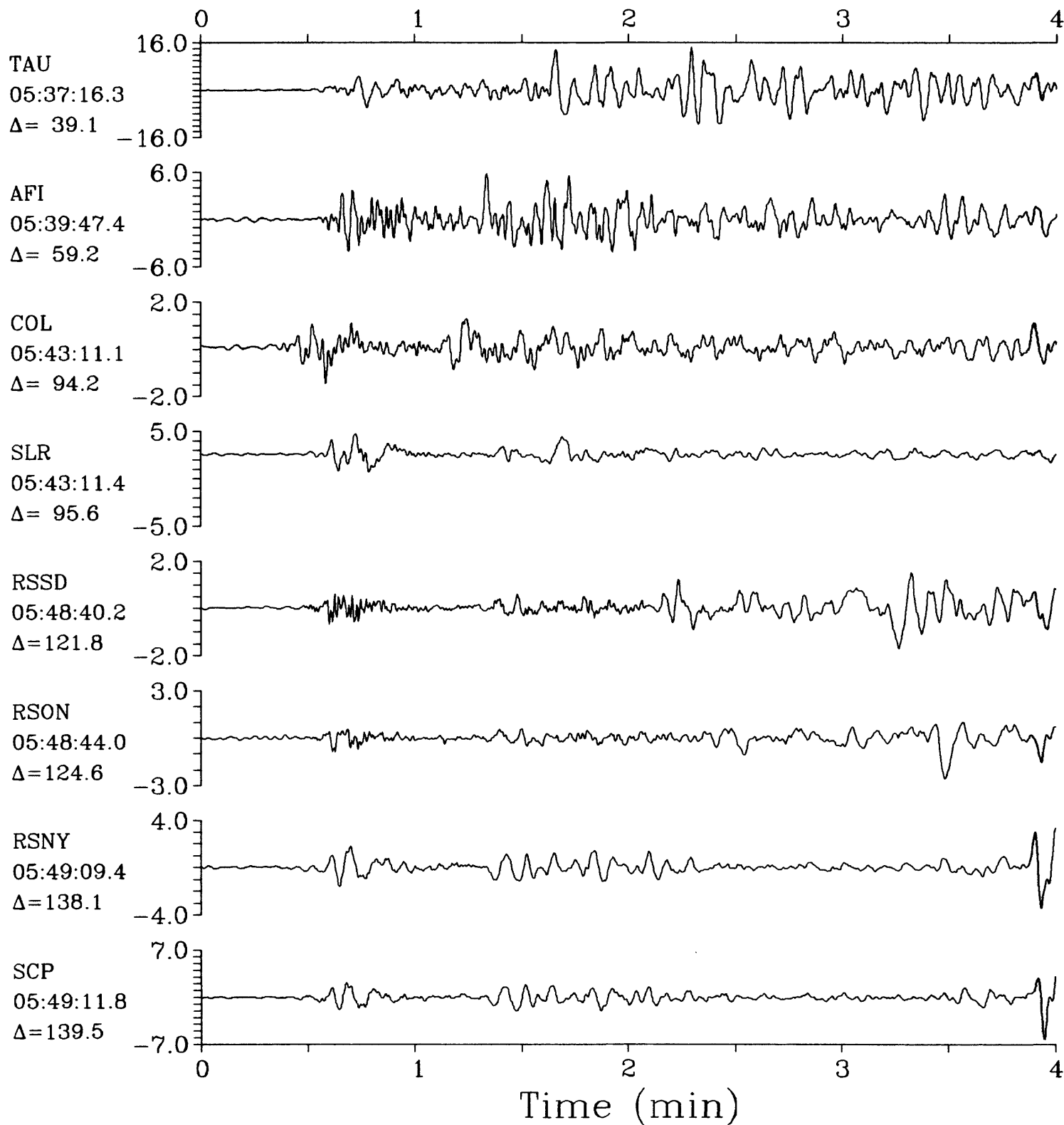
24 November 1983 05:30:34.23

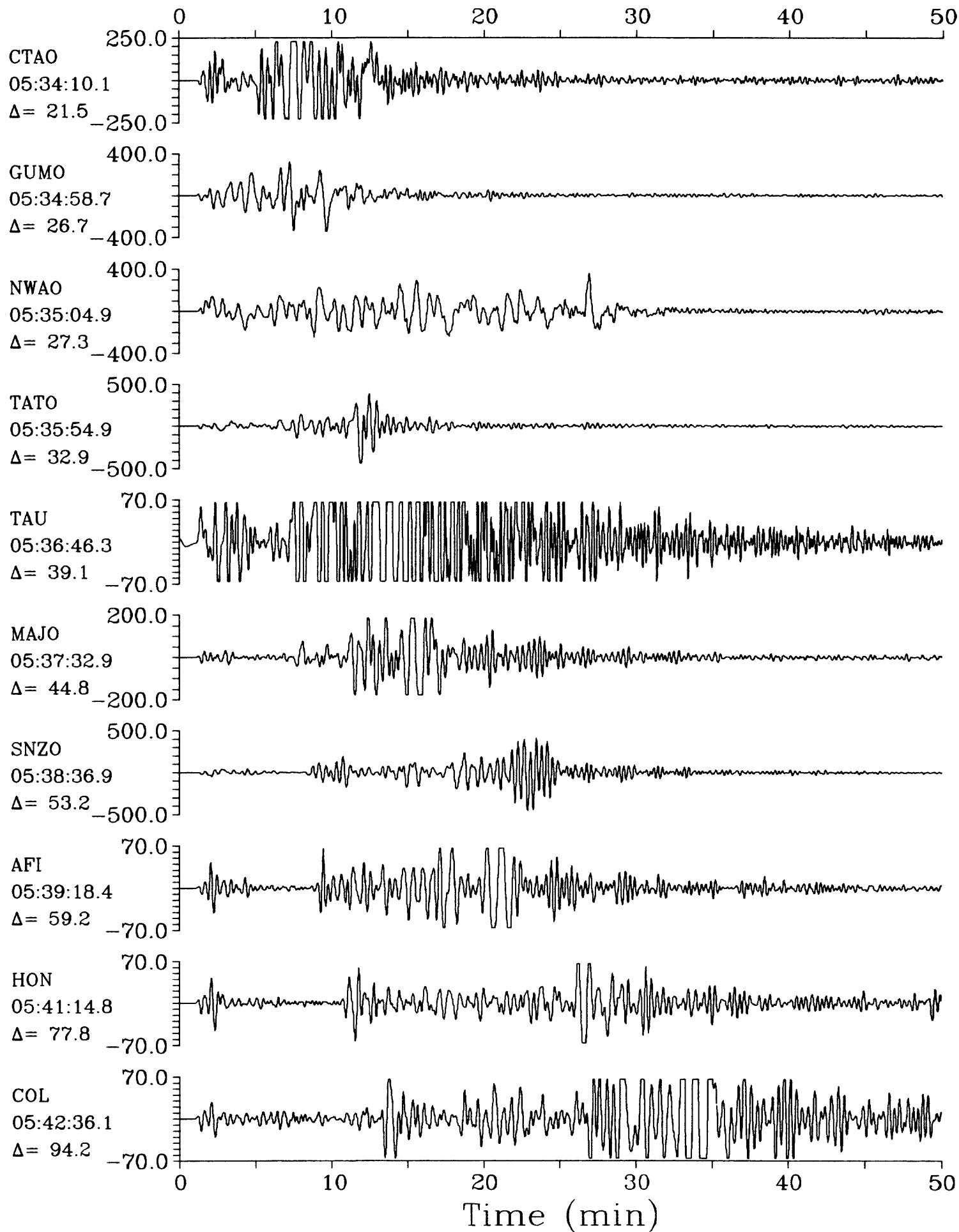
SPZ

Banda Sea h=178.5 MB=6.4

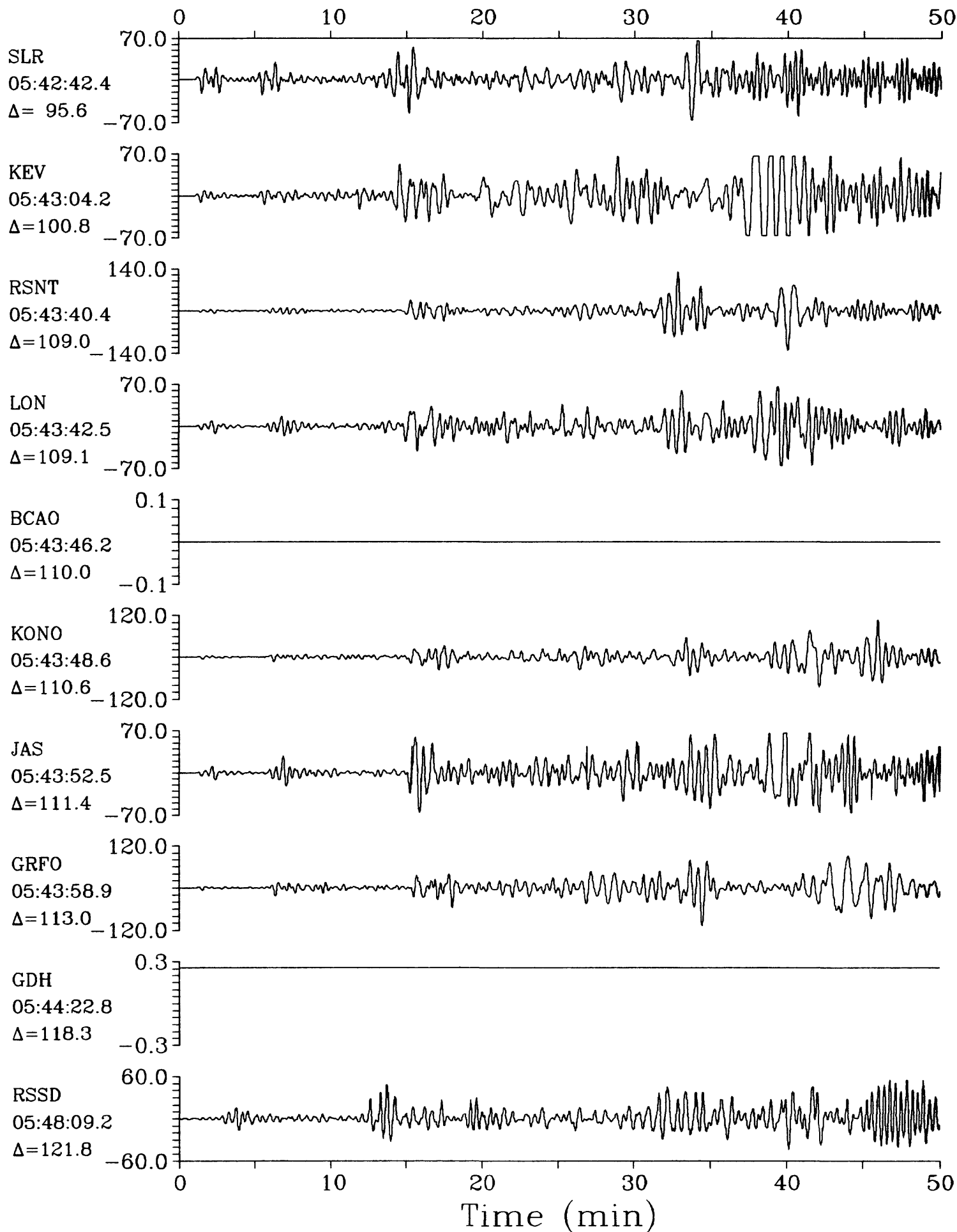


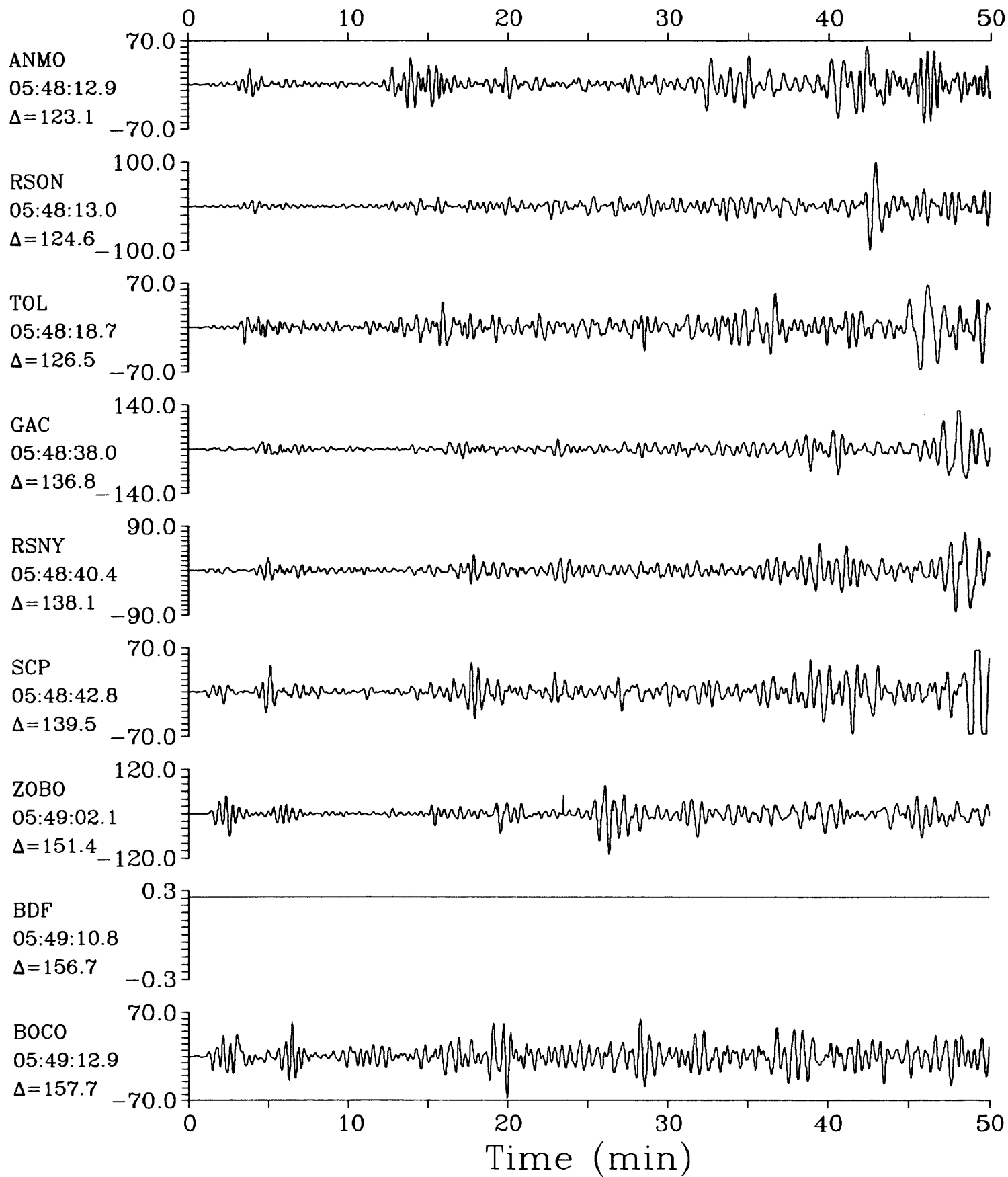
Banda Sea h=178.5 MB=6.4



Banda Sea $h=178.5$ MB=6.4

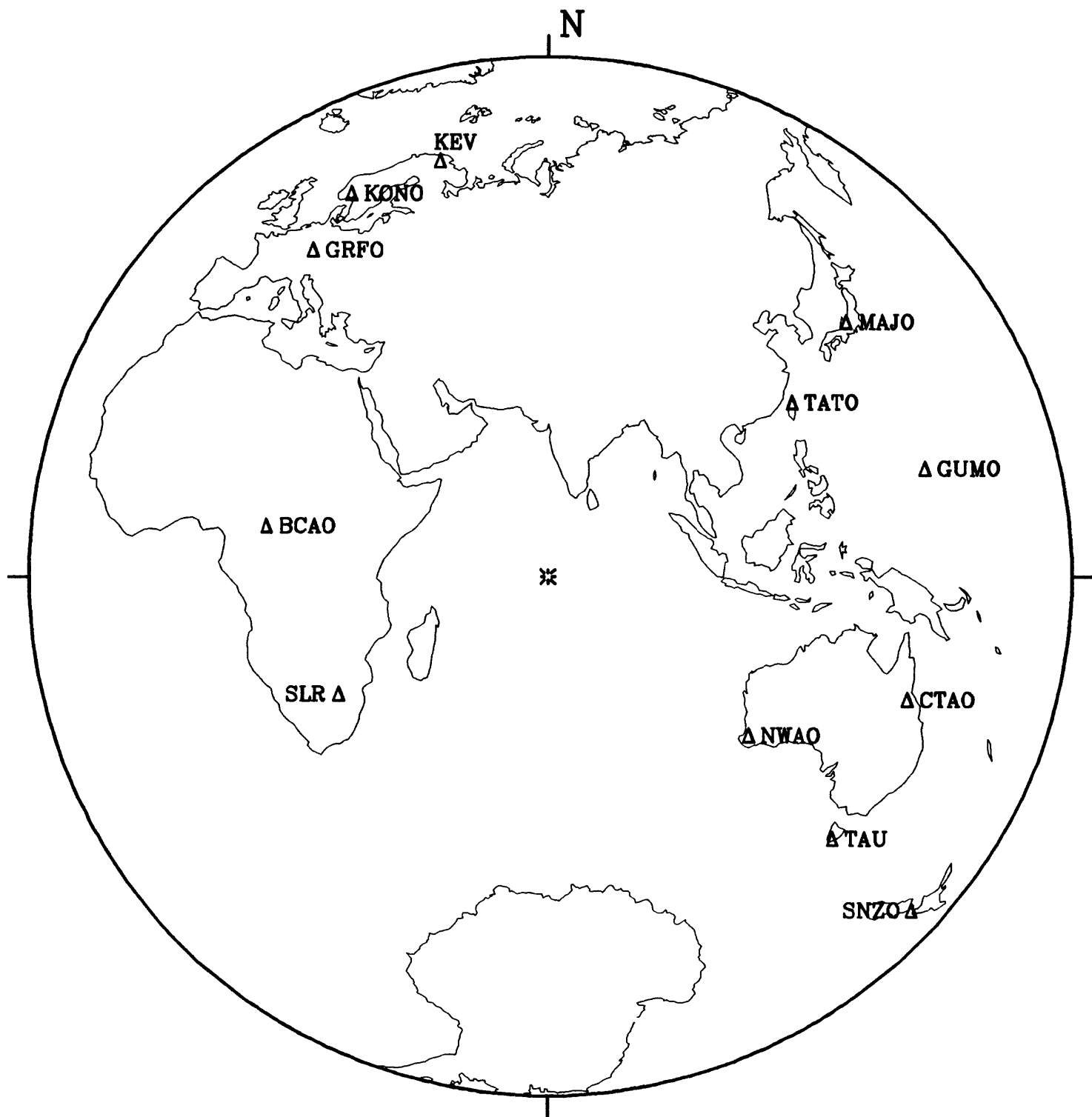
Banda Sea h=178.5 MB=6.4

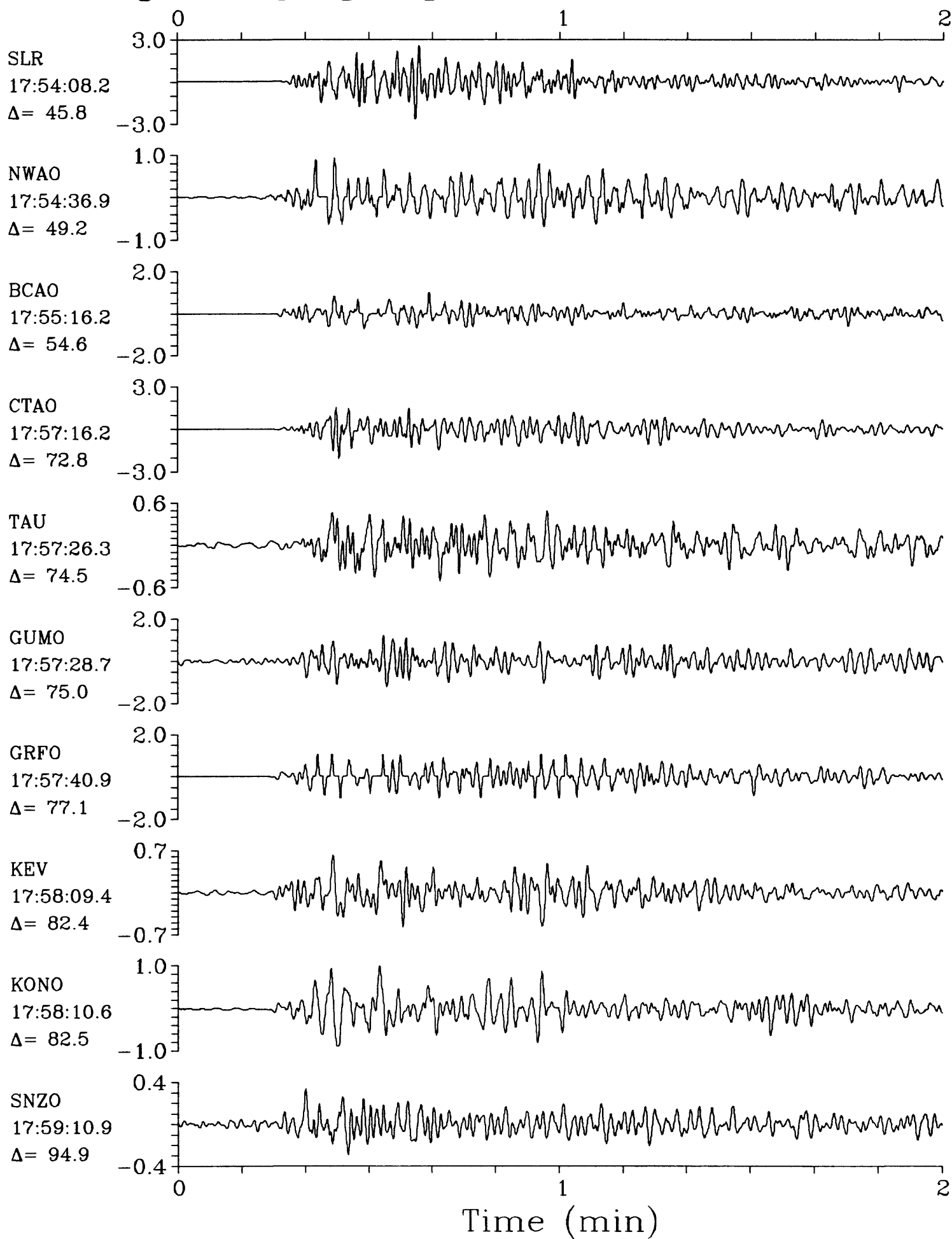


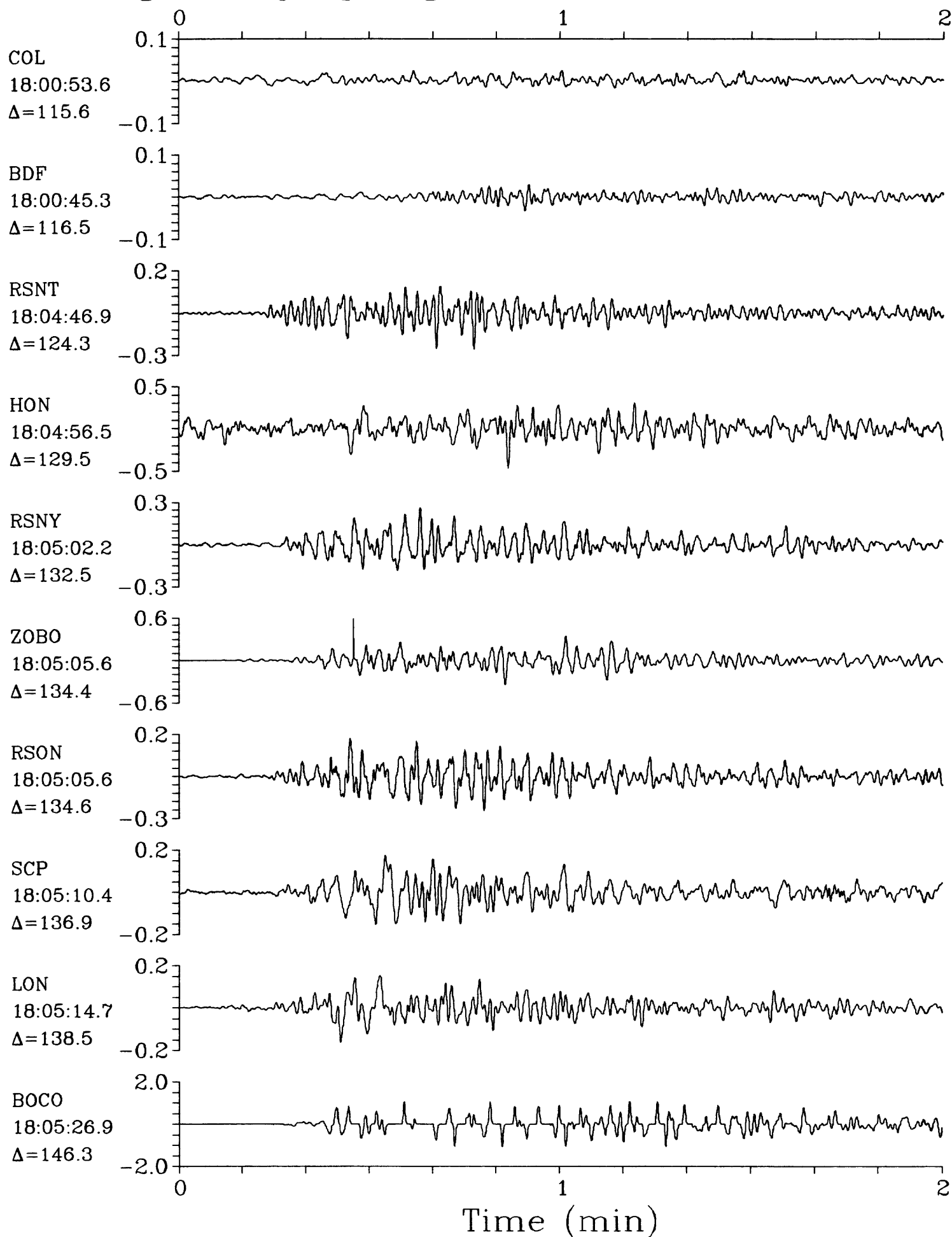
Banda Sea $h=178.5$ MB=6.4

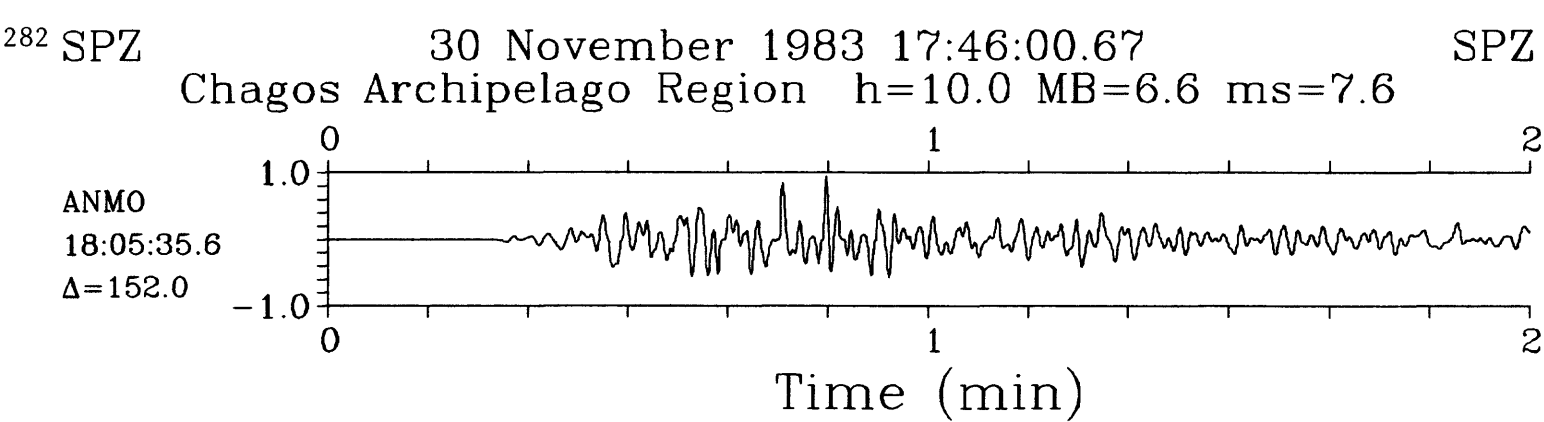
30 November 1983 17:46:00.67

Chagos Archipelago Region

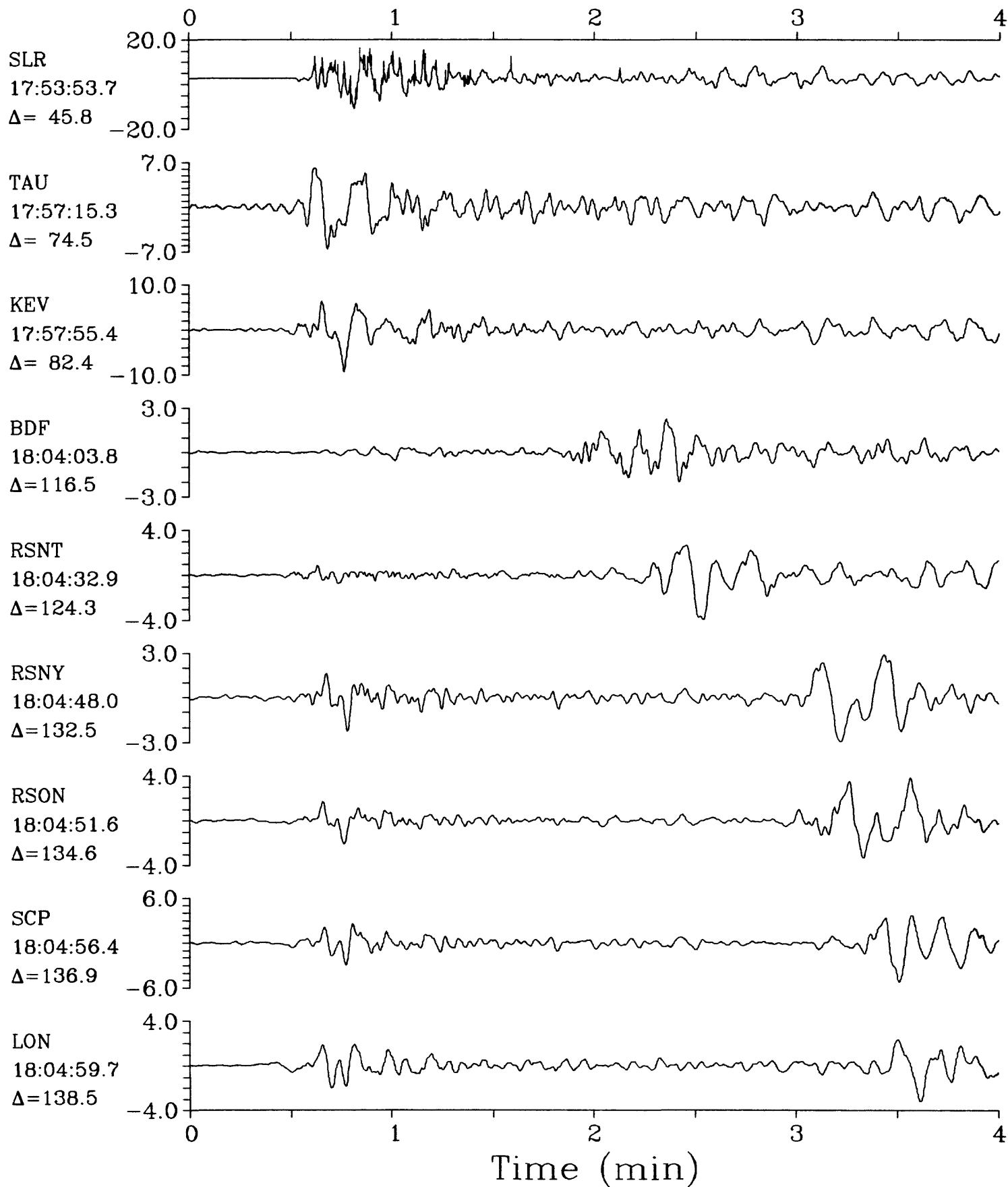


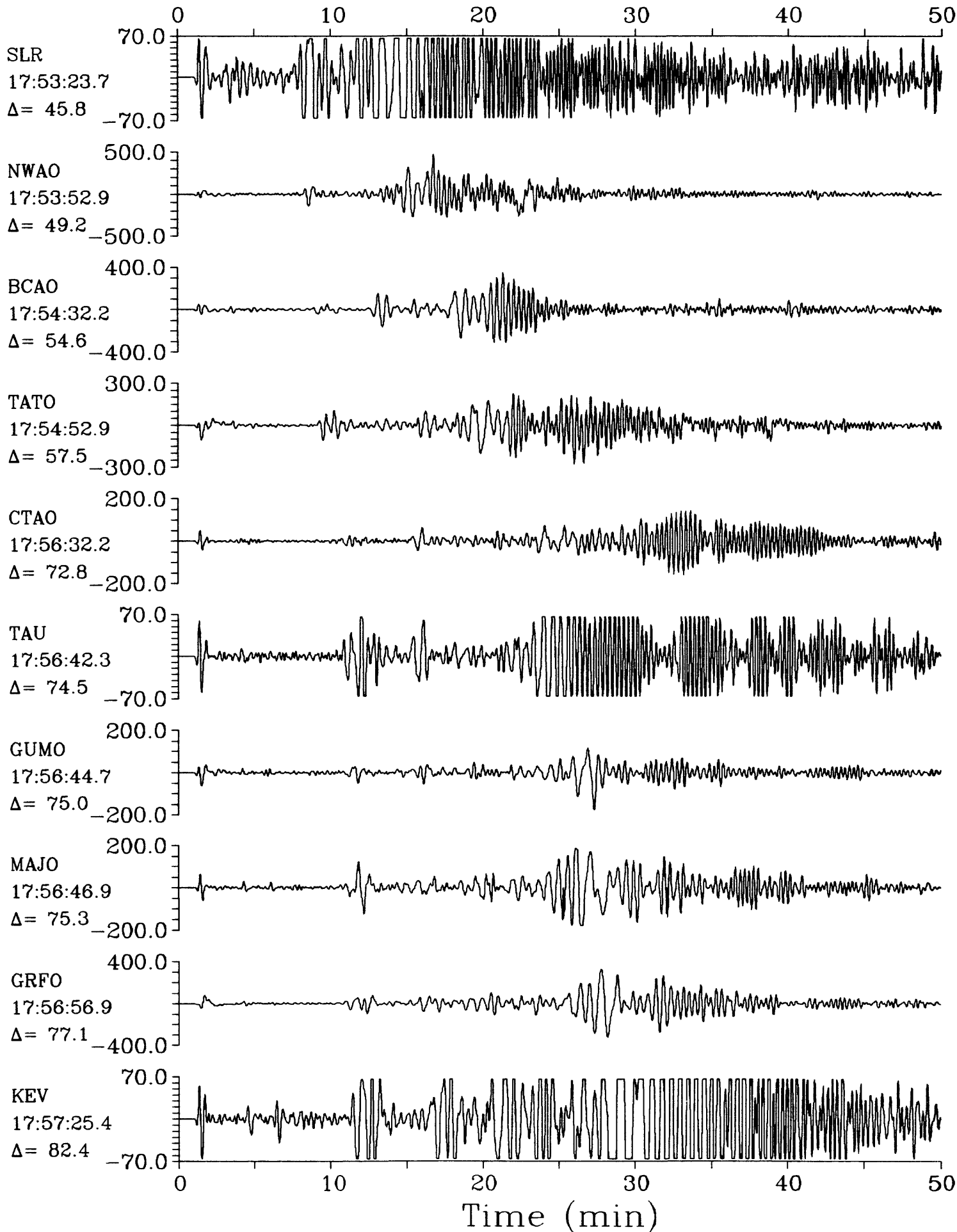


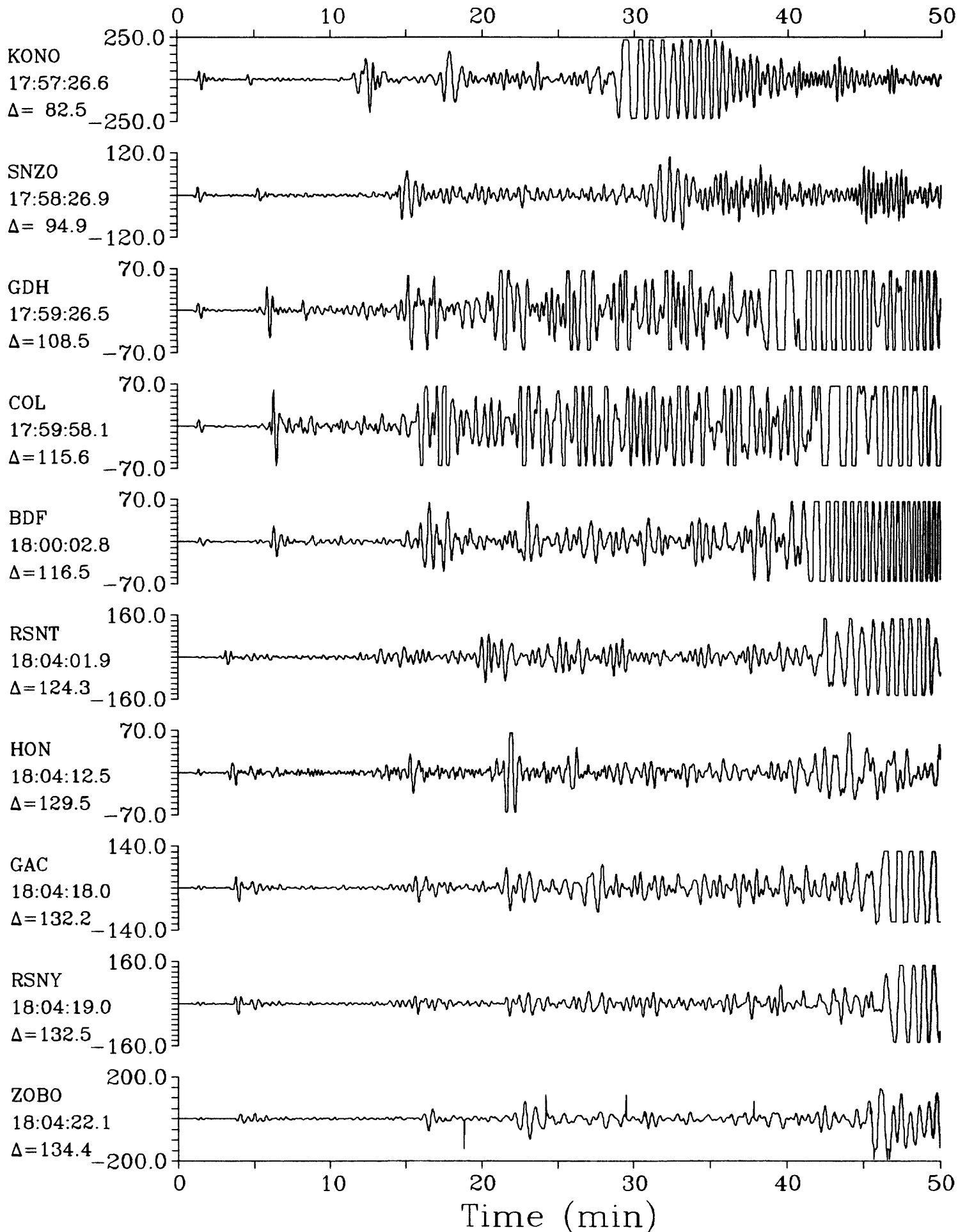


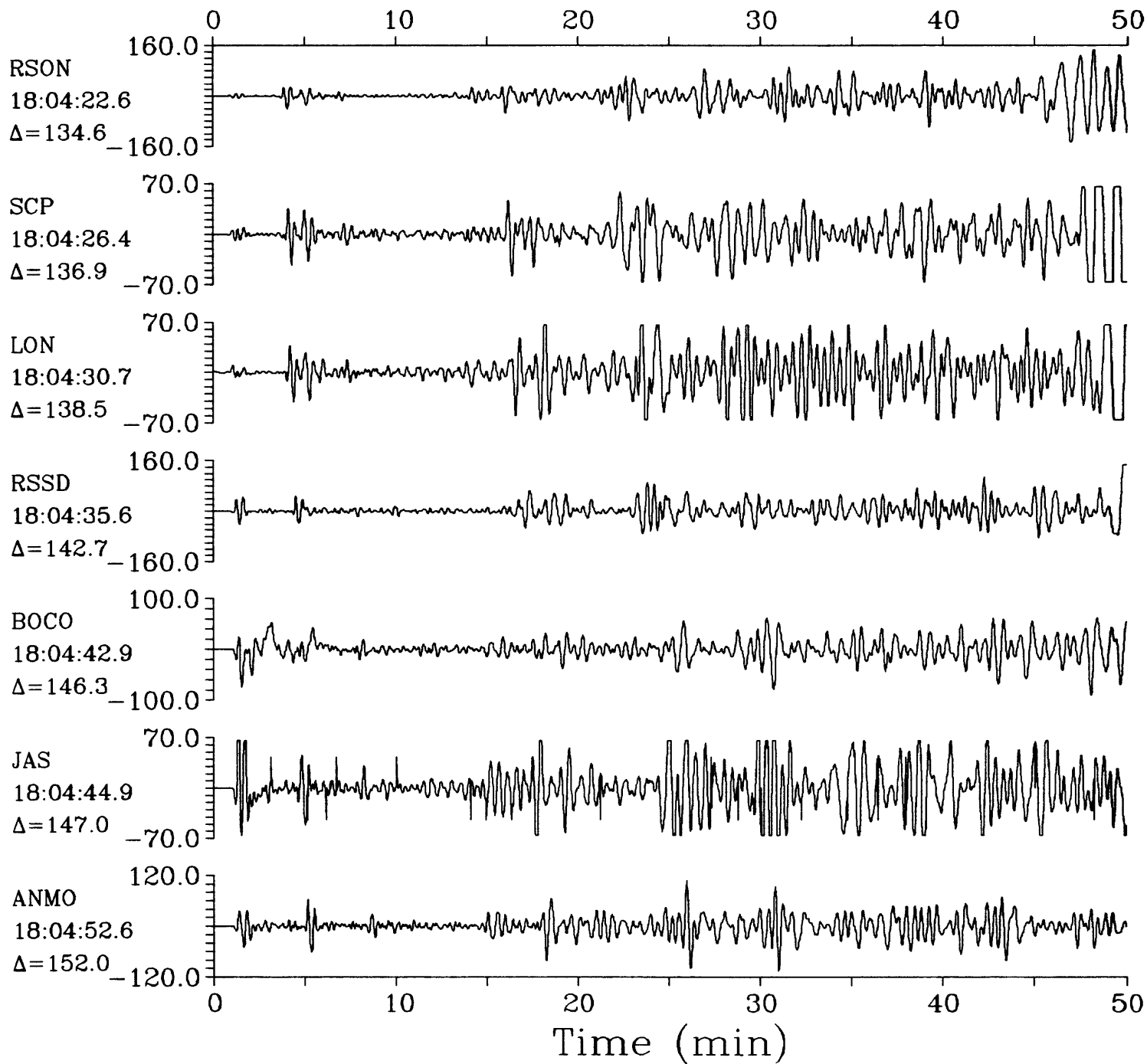


Chagos Archipelago Region h=10.0 MB=6.6 ms=7.6



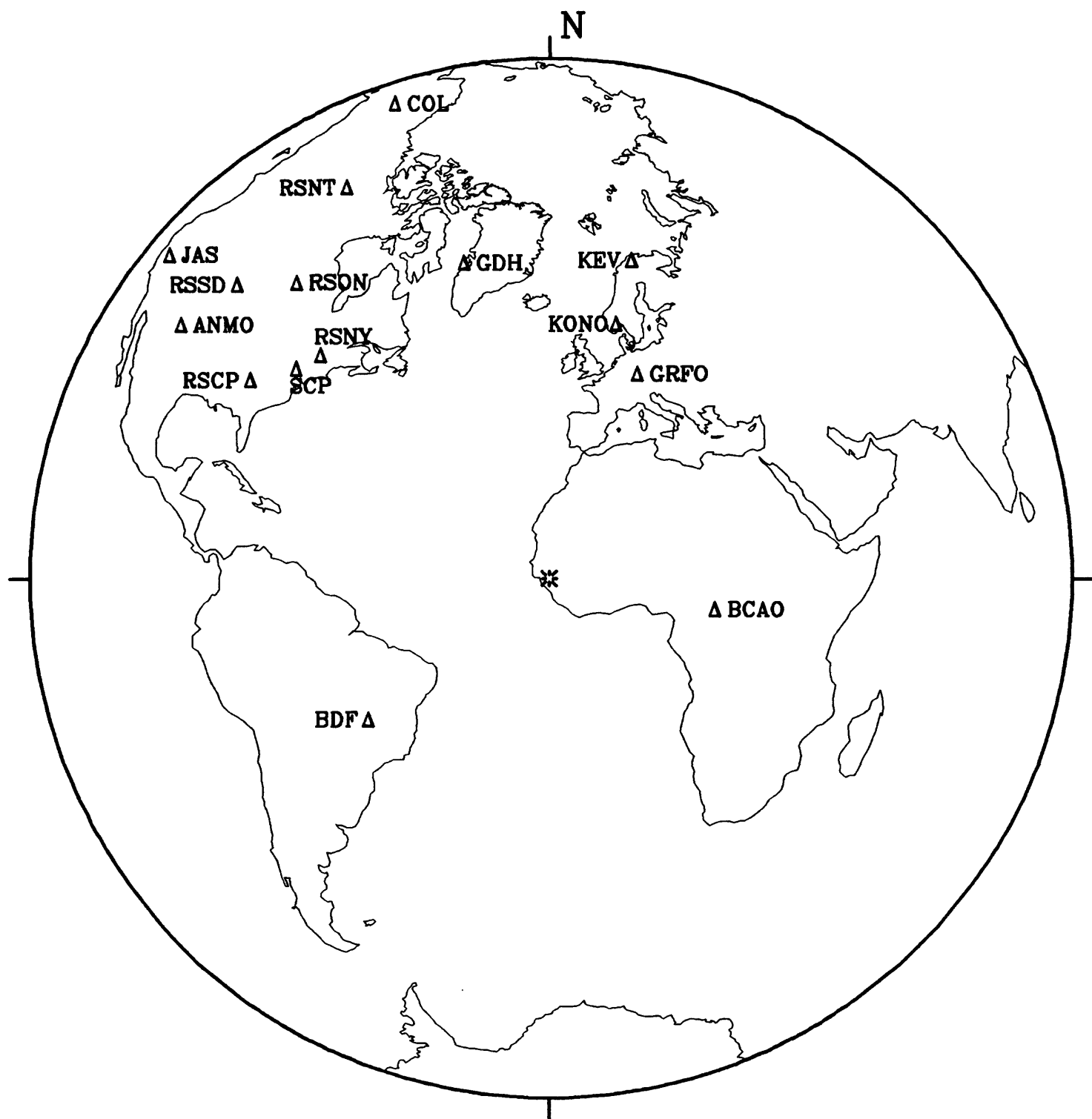
Chagos Archipelago Region $h=10.0$ MB=6.6 ms=7.6

Chagos Archipelago Region $h=10.0$ MB=6.6 ms=7.6

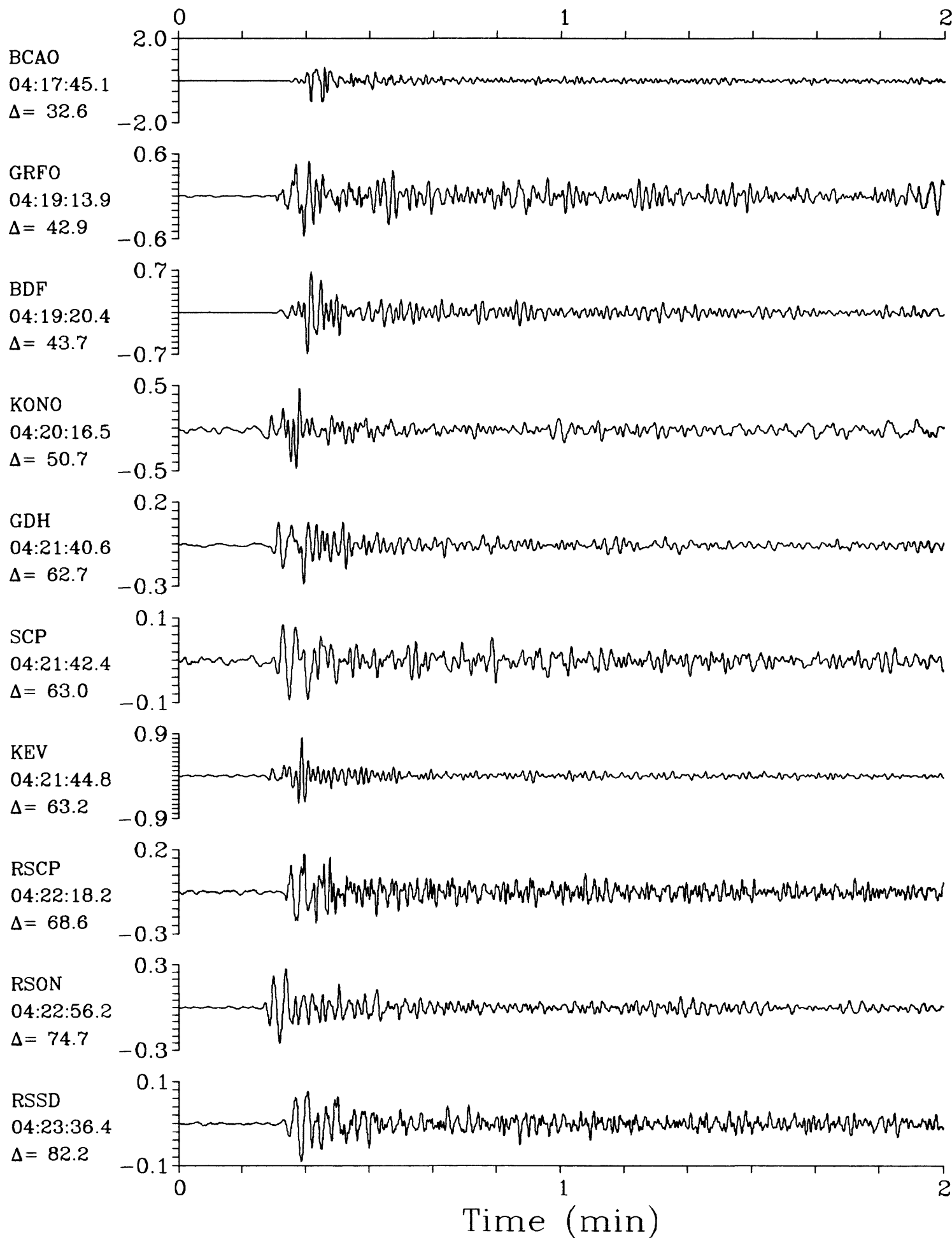
Chagos Archipelago Region $h=10.0$ MB=6.6 ms=7.6

22 December 1983 04:11:29.23

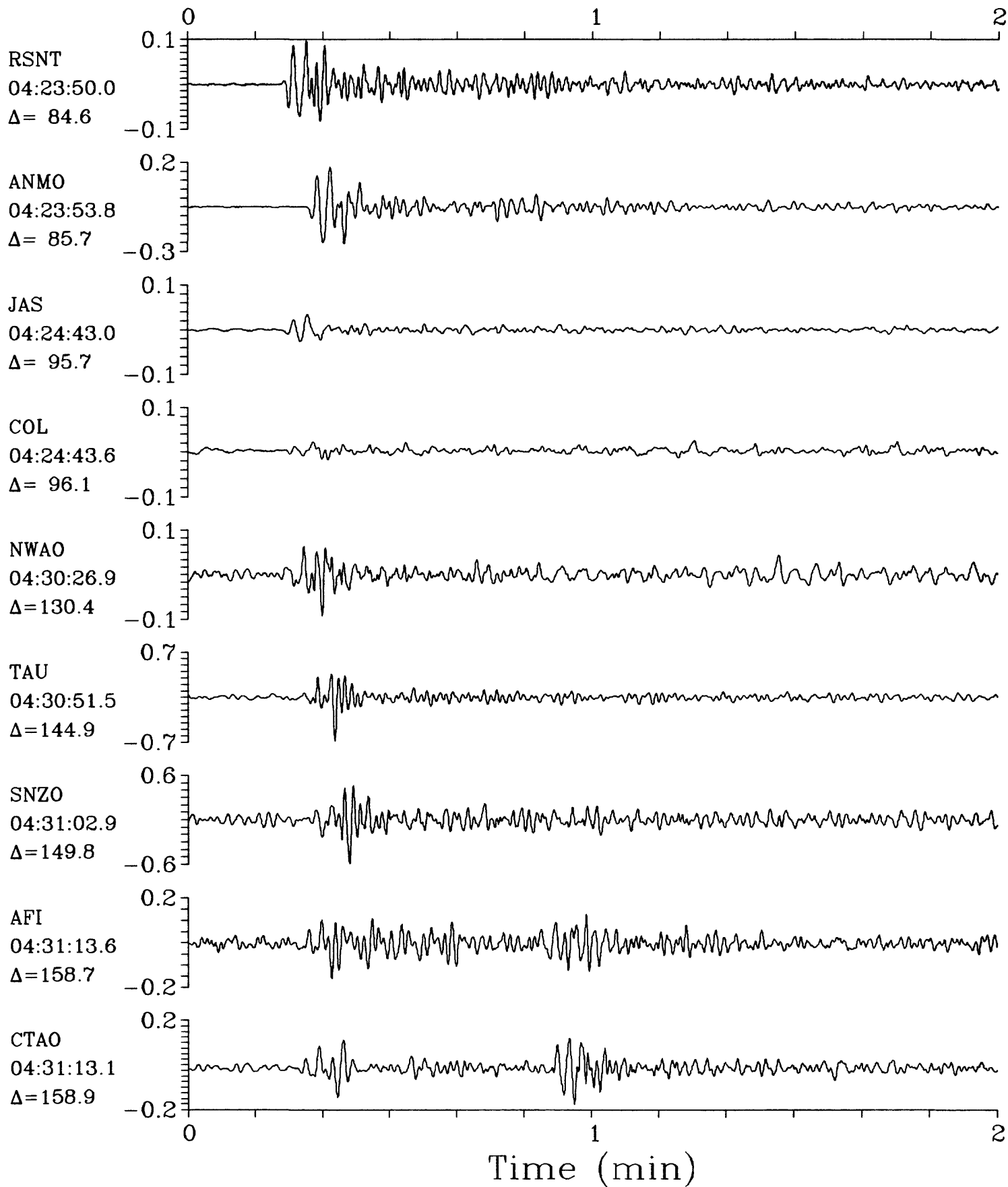
Northwest Africa



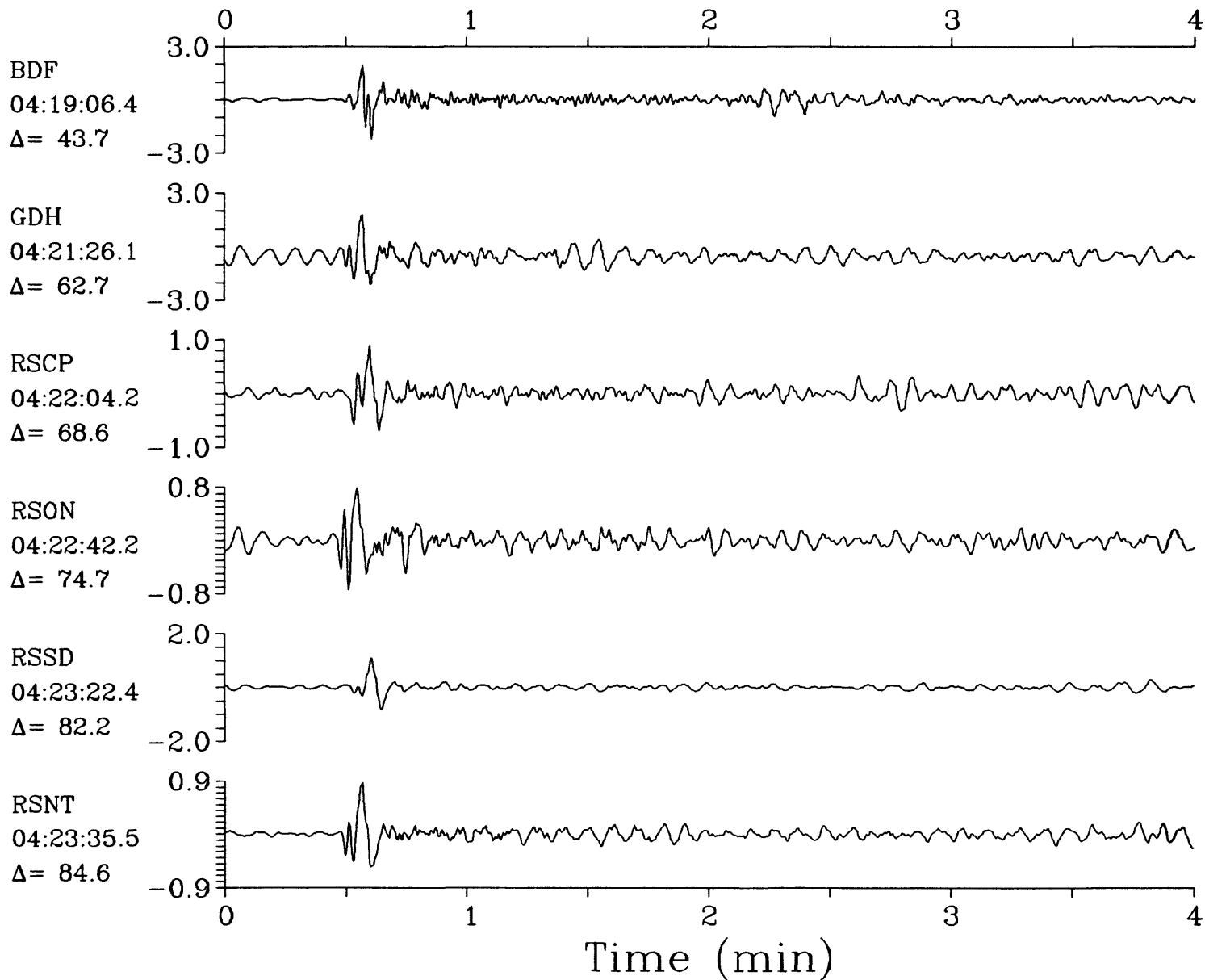
Northwest Africa h=11.3 MB=6.4 ms=6.2

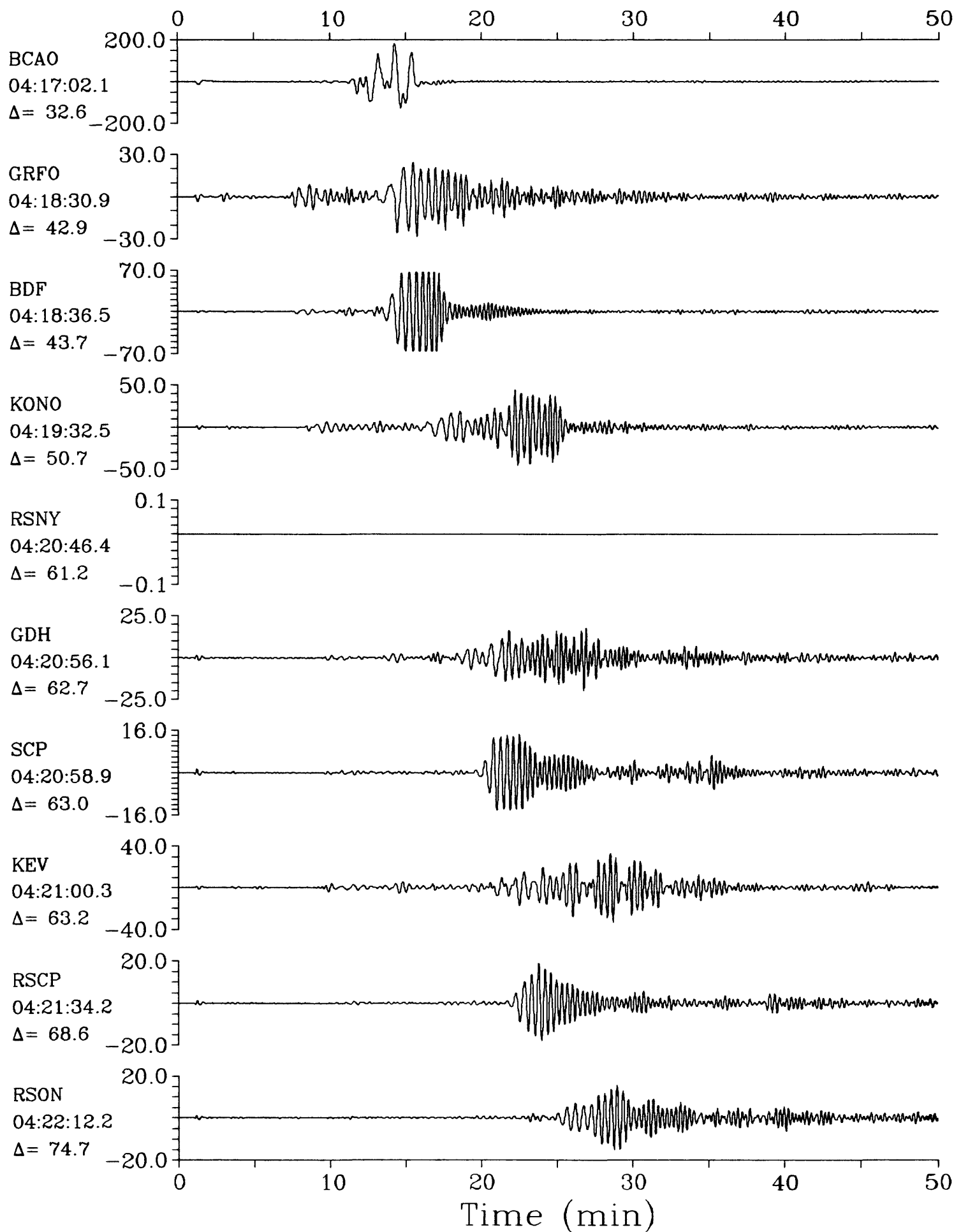


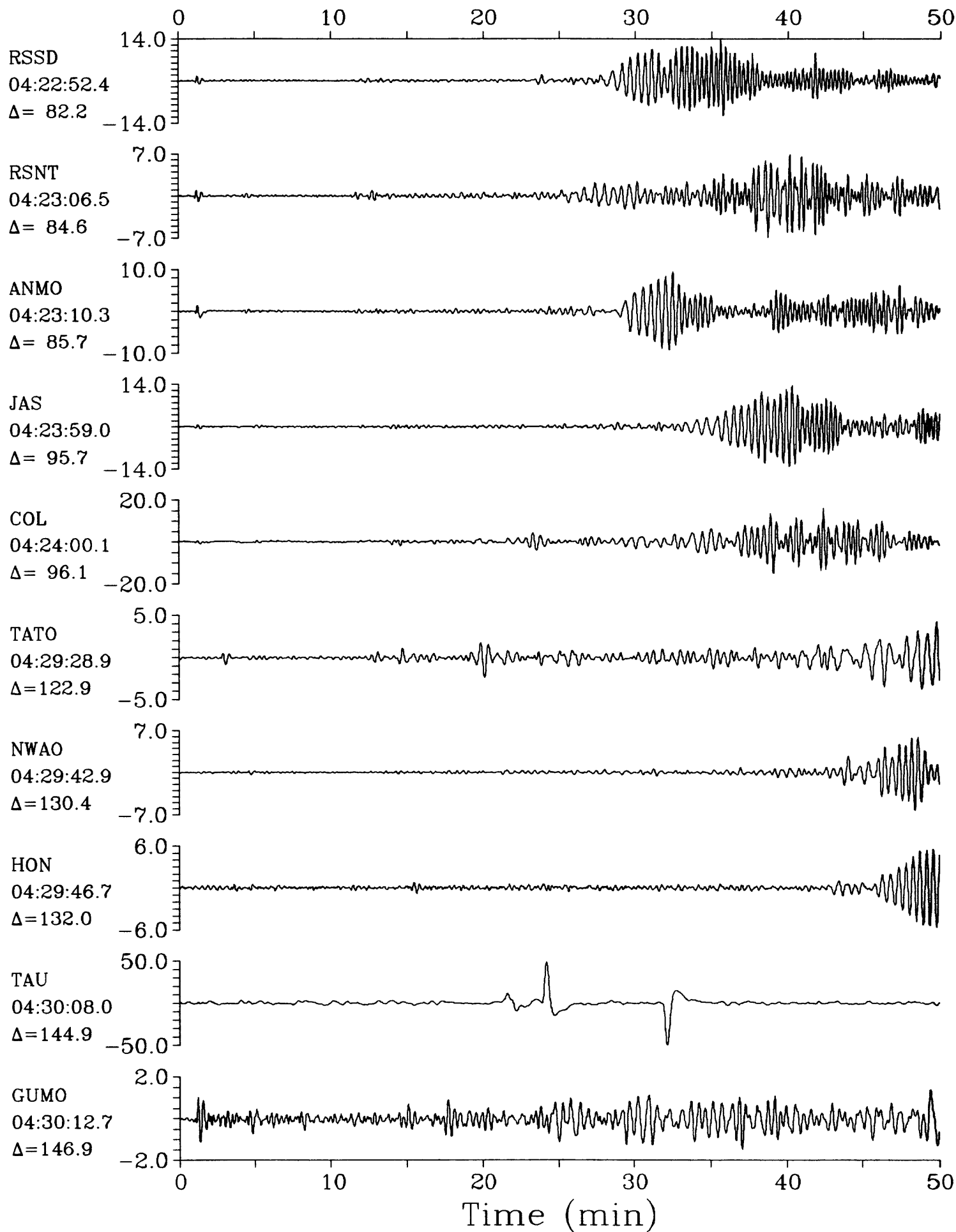
Northwest Africa h=11.3 MB=6.4 ms=6.2



Northwest Africa h=11.3 MB=6.4 ms=6.2

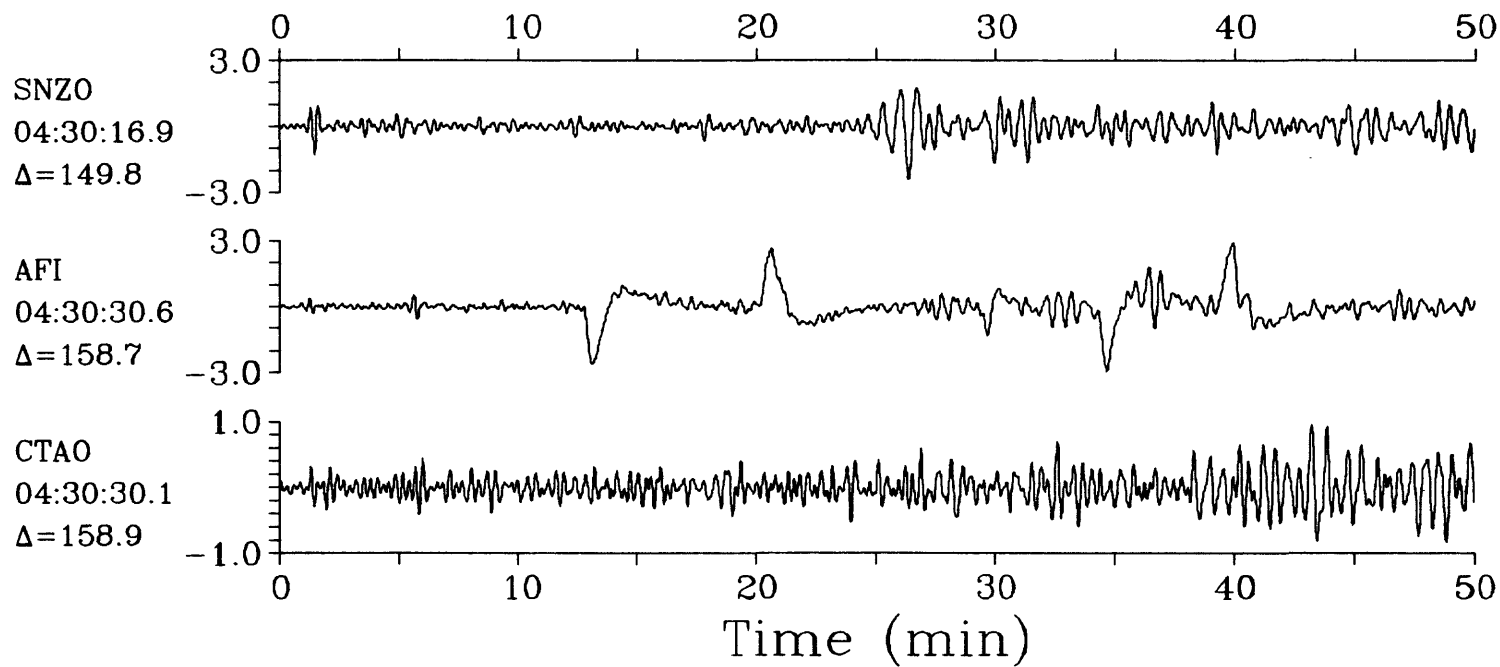




Northwest Africa $h=11.3$ MB=6.4 ms=6.2

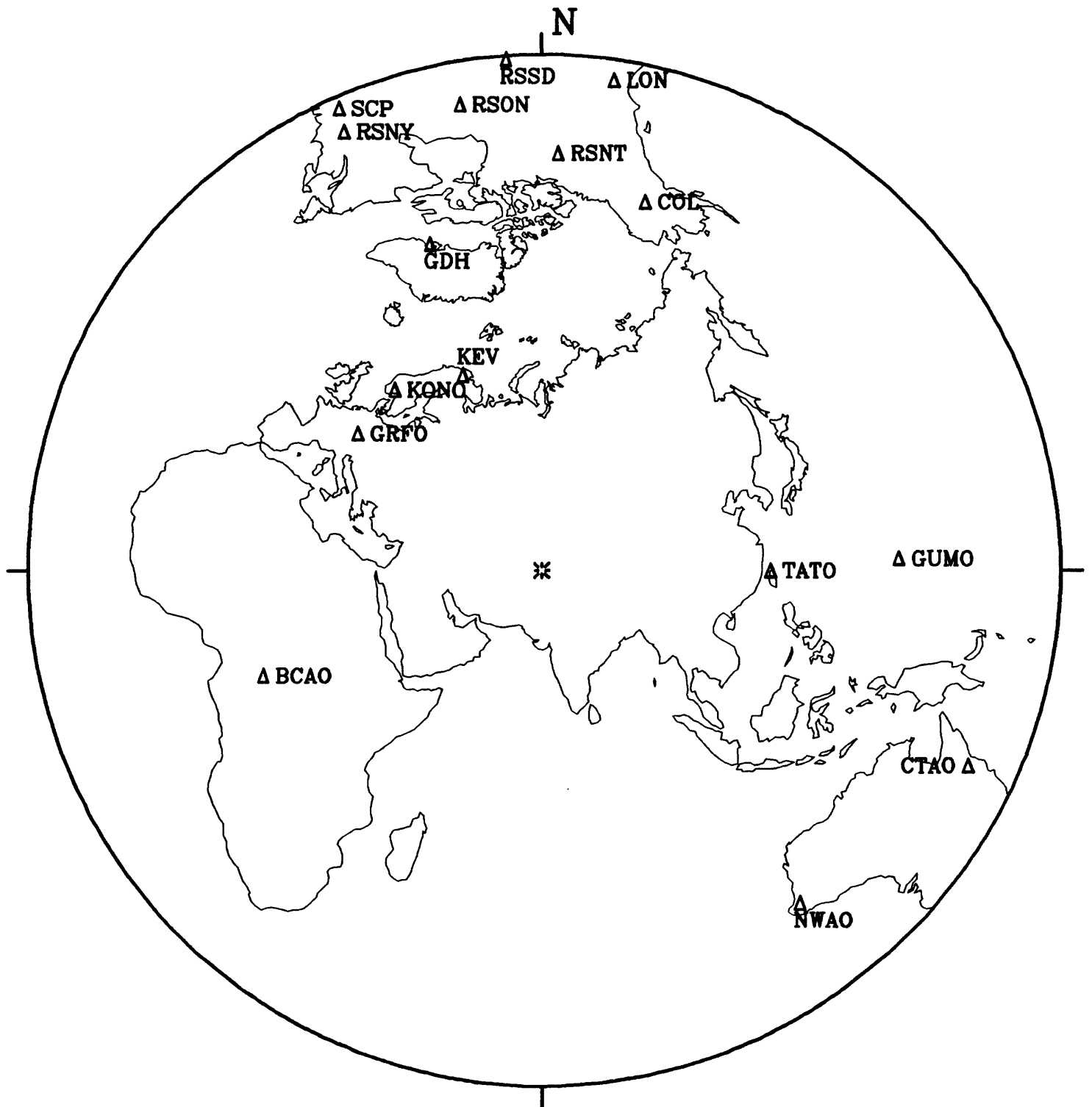
LPZ

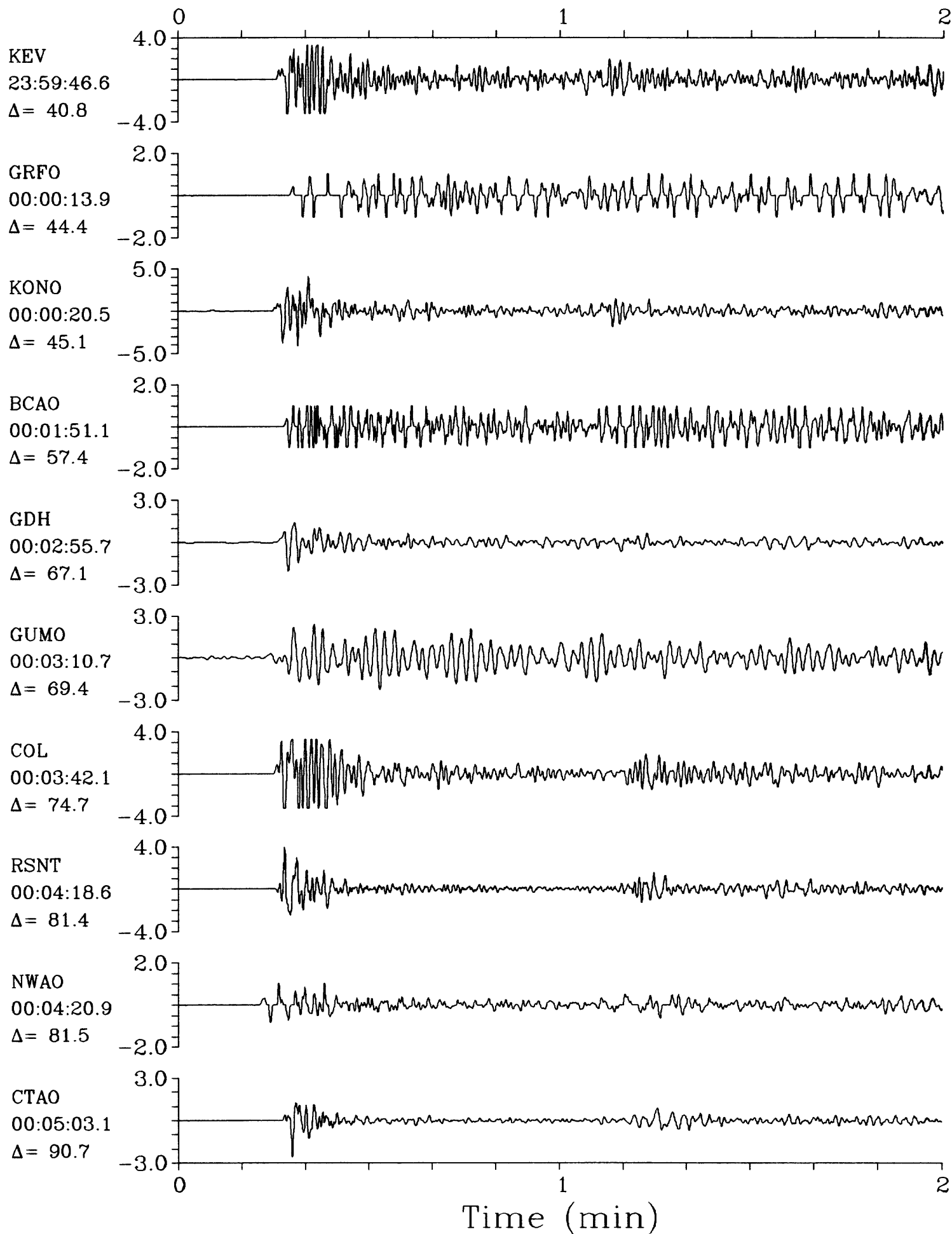
22 December 1983 04:11:29.23

LPZ²⁹³Northwest Africa $h=11.3$ MB=6.4 ms=6.2

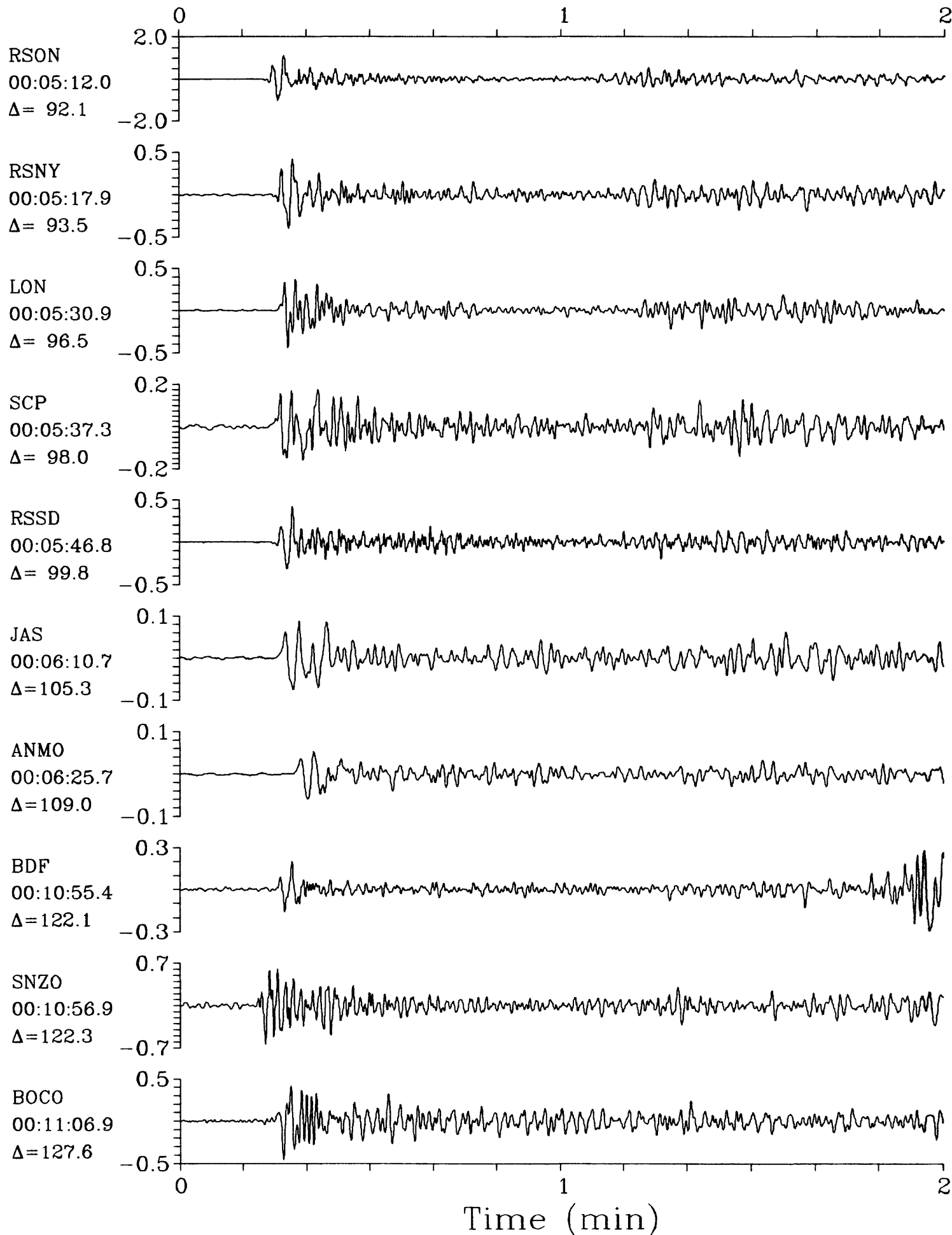
30 December 1983 23:52:39.93

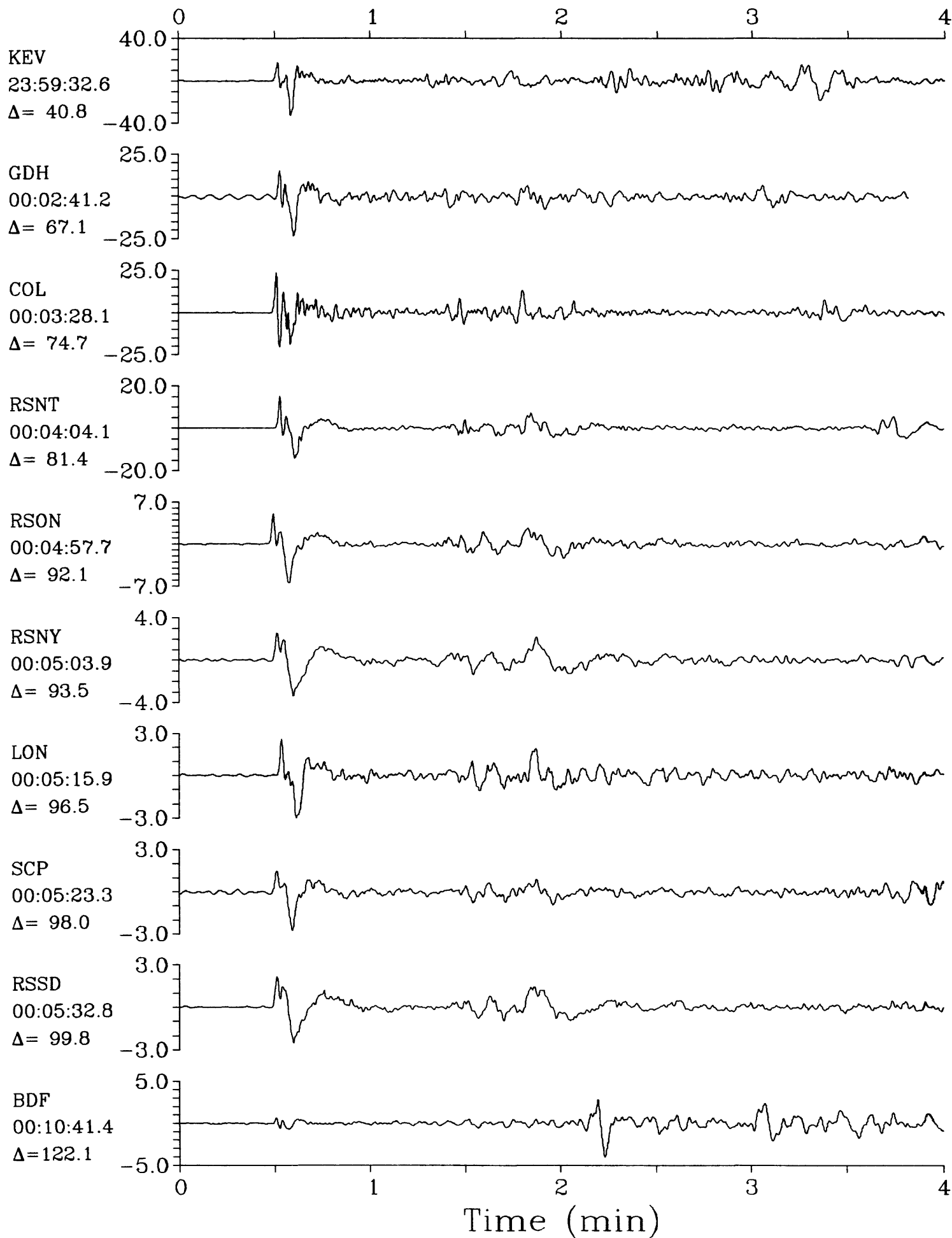
Hindu Kush Region

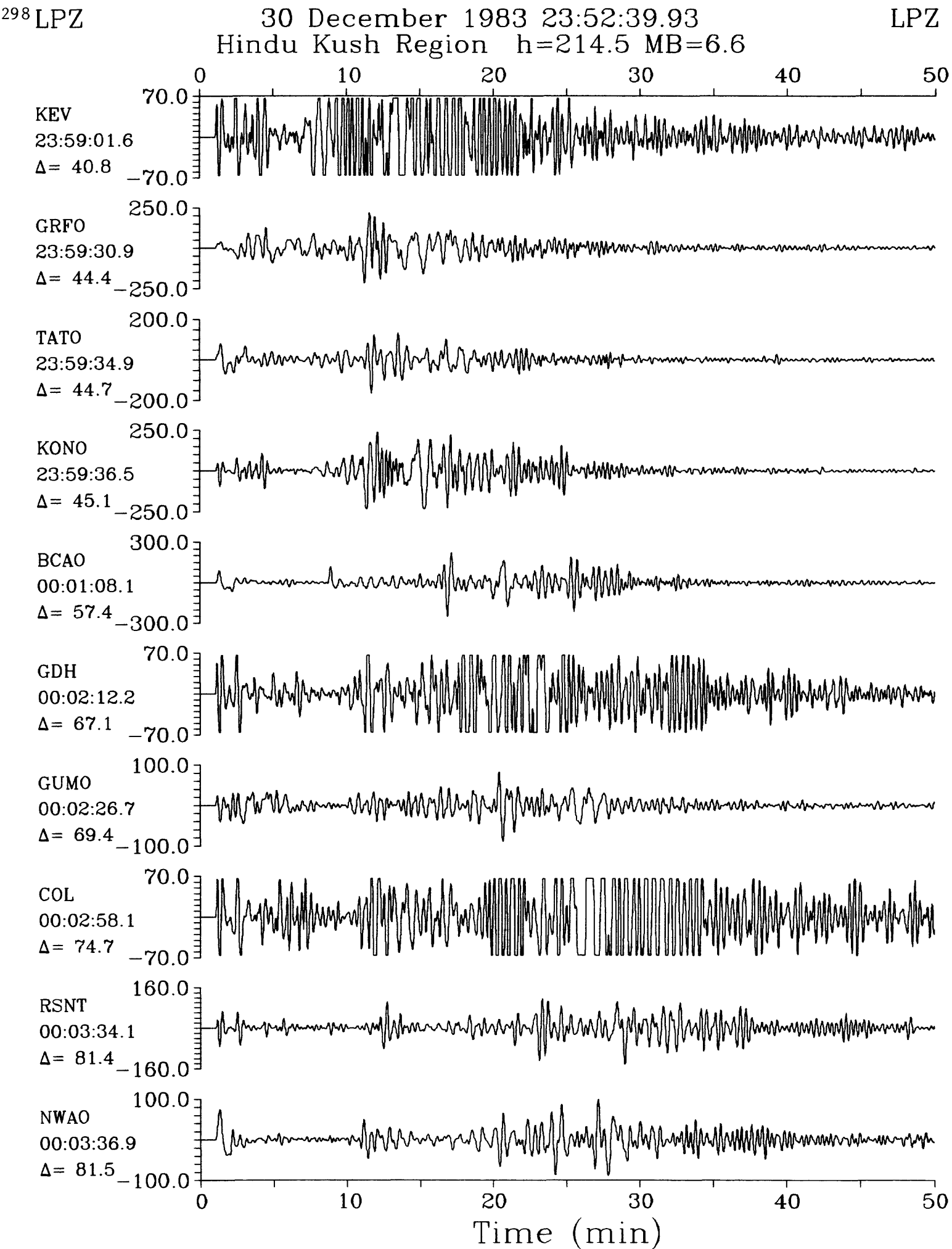


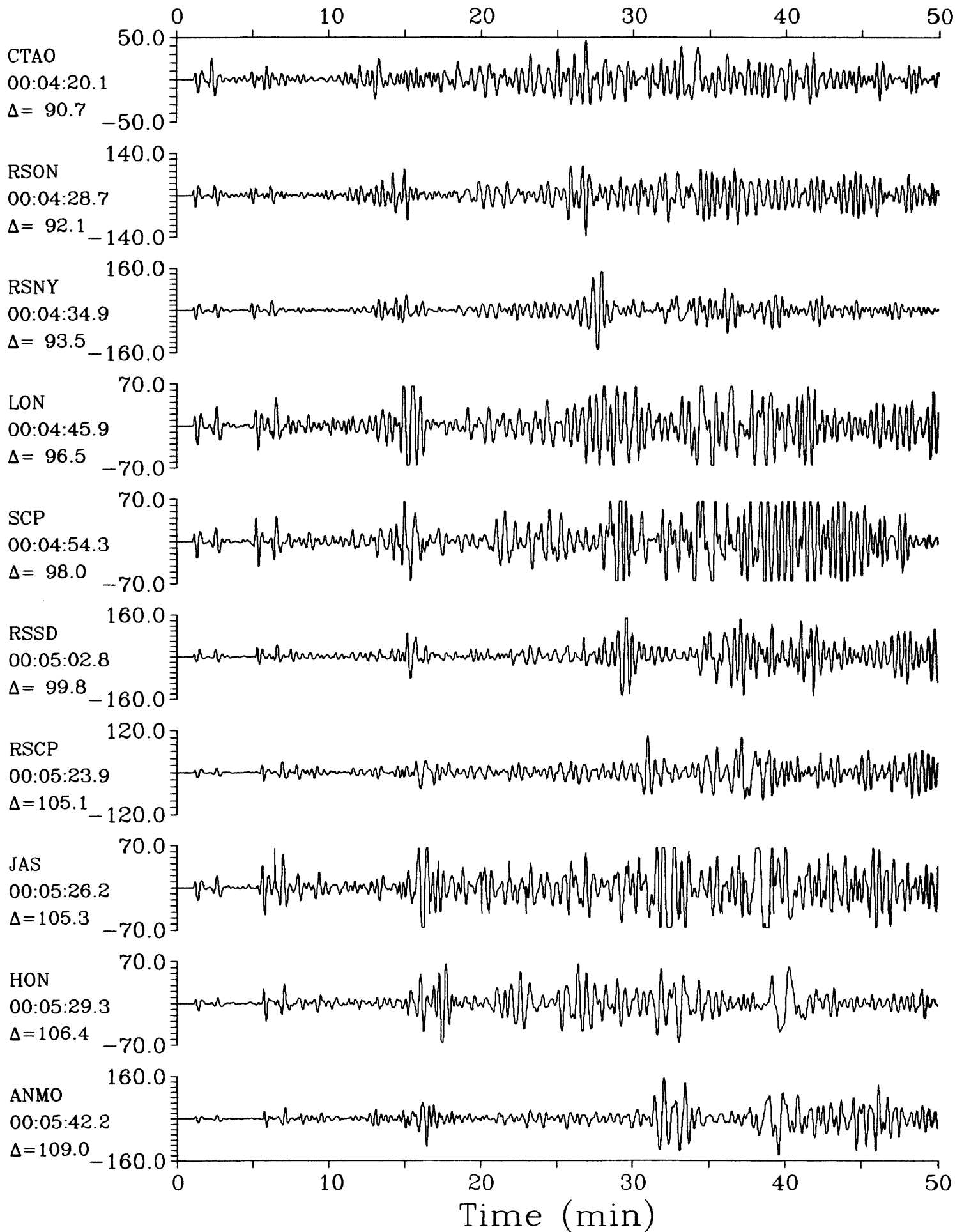


30 December 1983 23:52:39.93
Hindu Kush Region h=214.5 MB=6.6

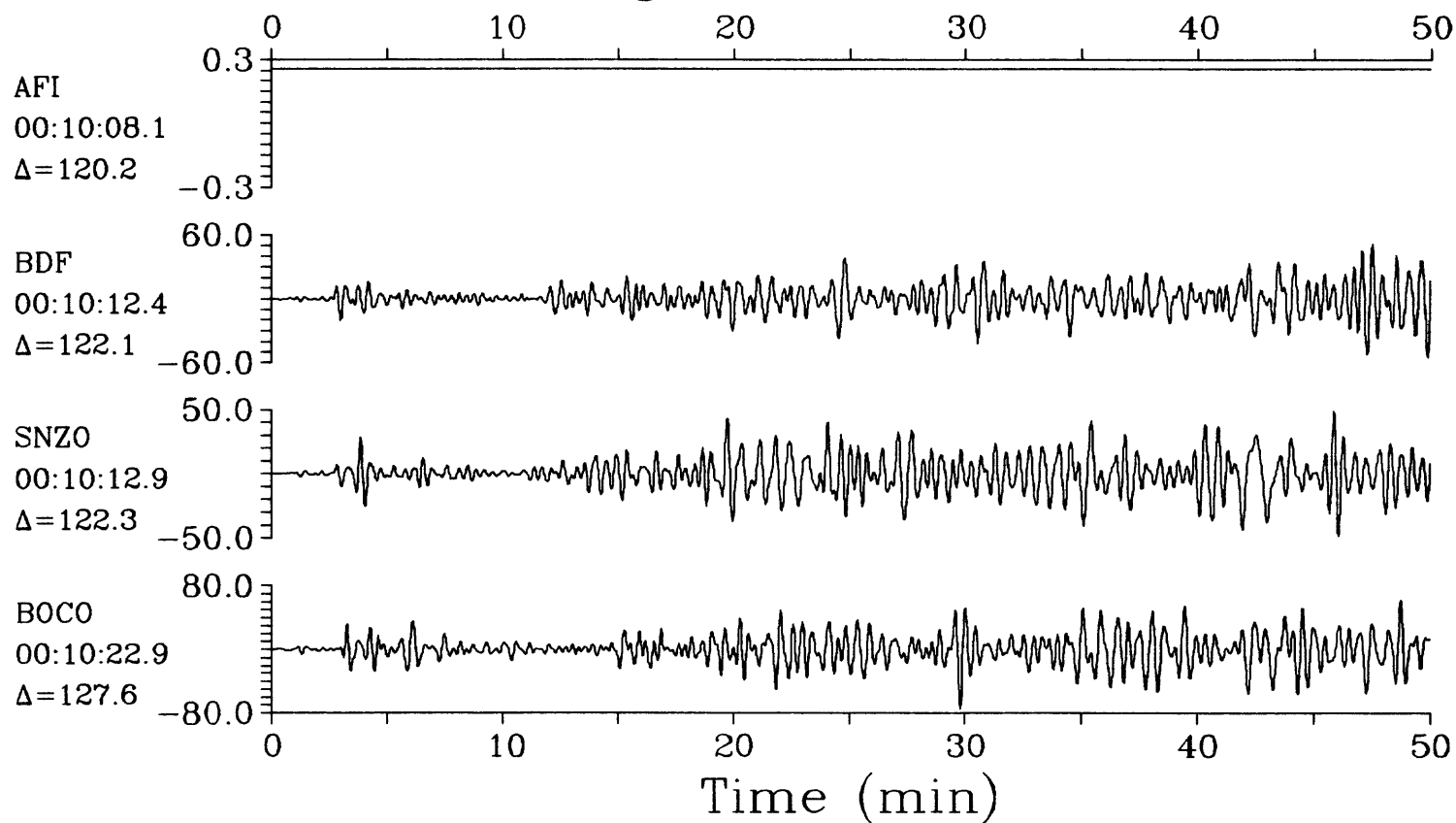






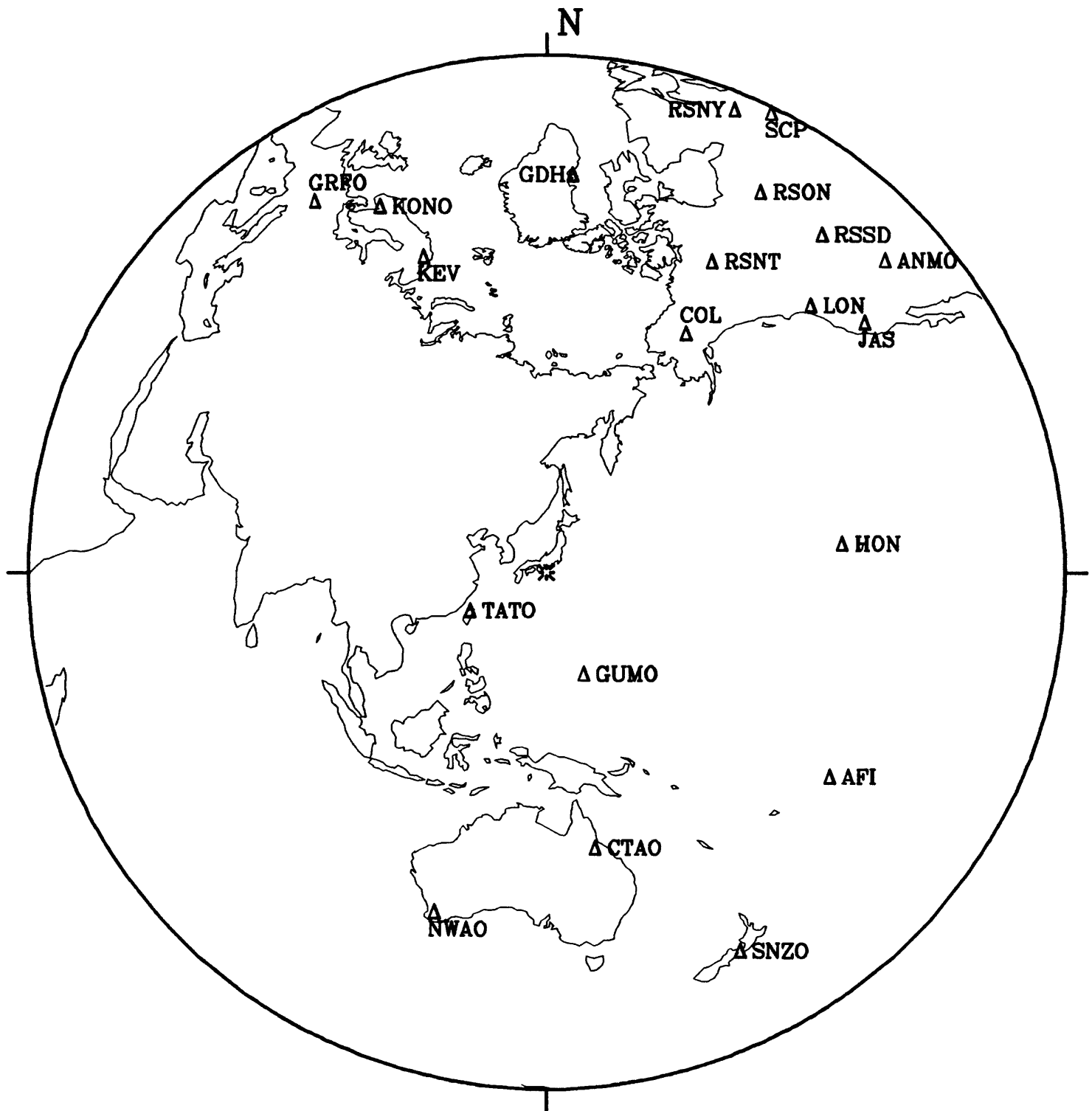


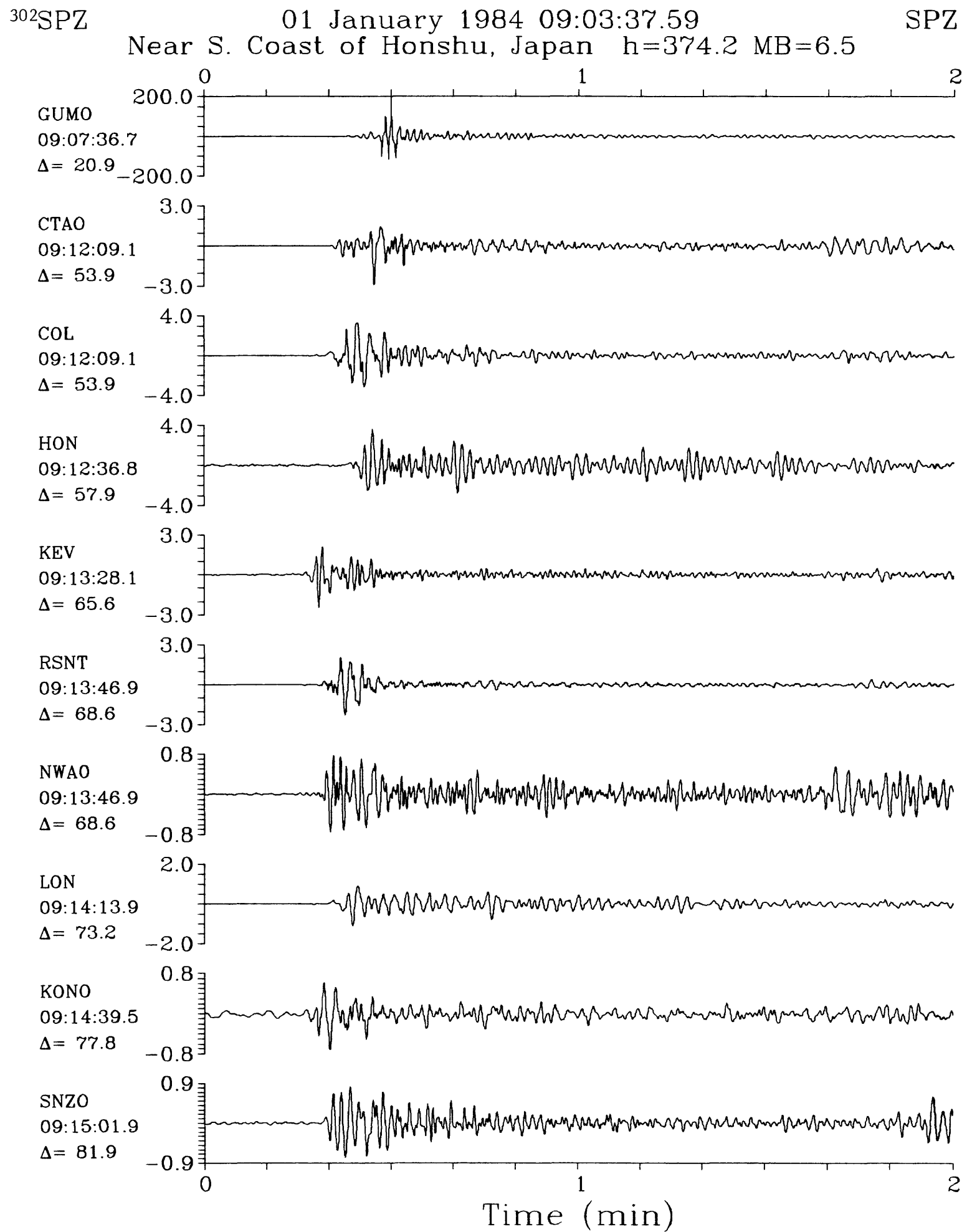
30 December 1983 23:52:39.93
Hindu Kush Region h=214.5 MB=6.6

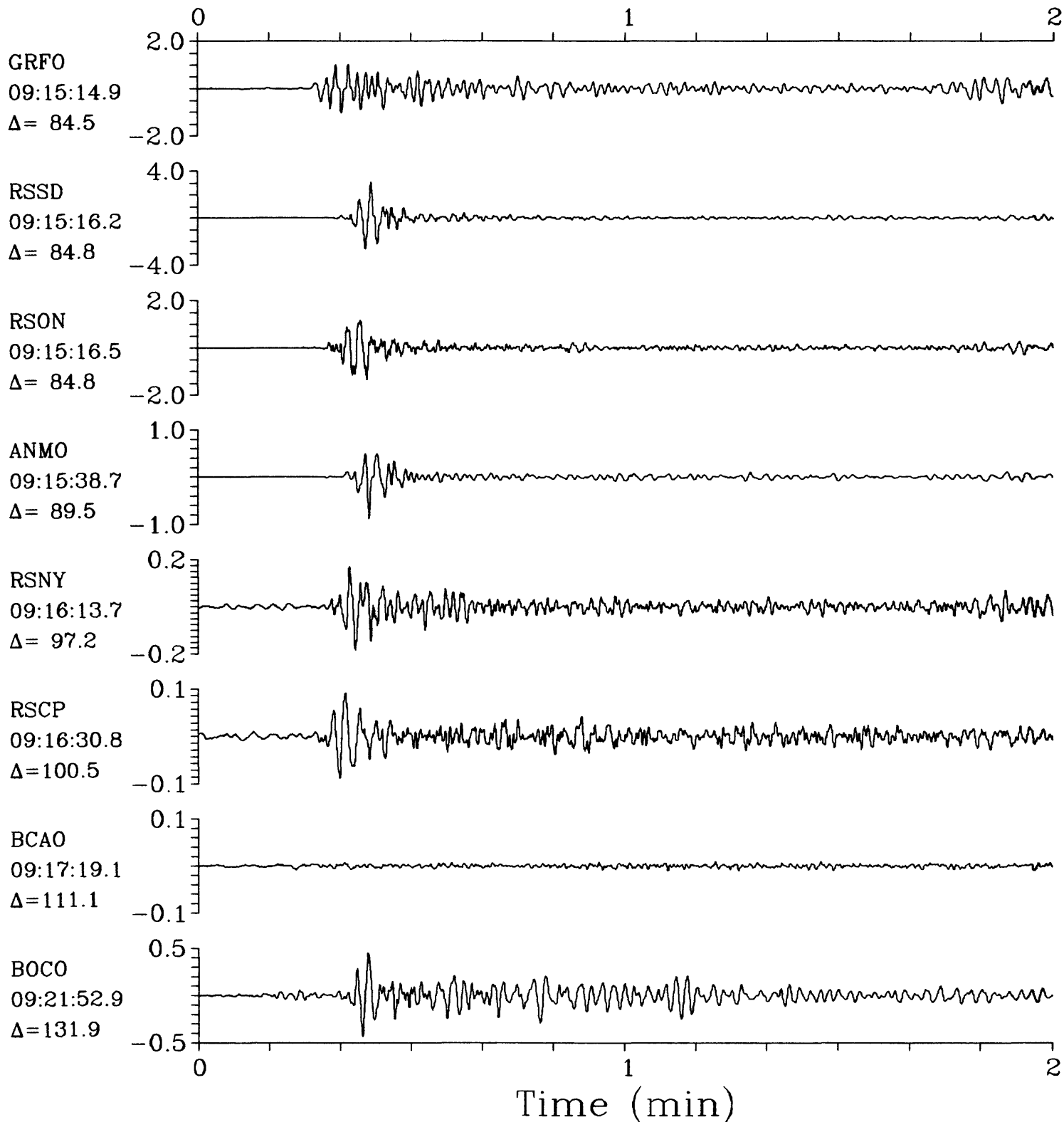


01 January 1984 09:03:37.59

Near S. Coast of Honshu, Japan



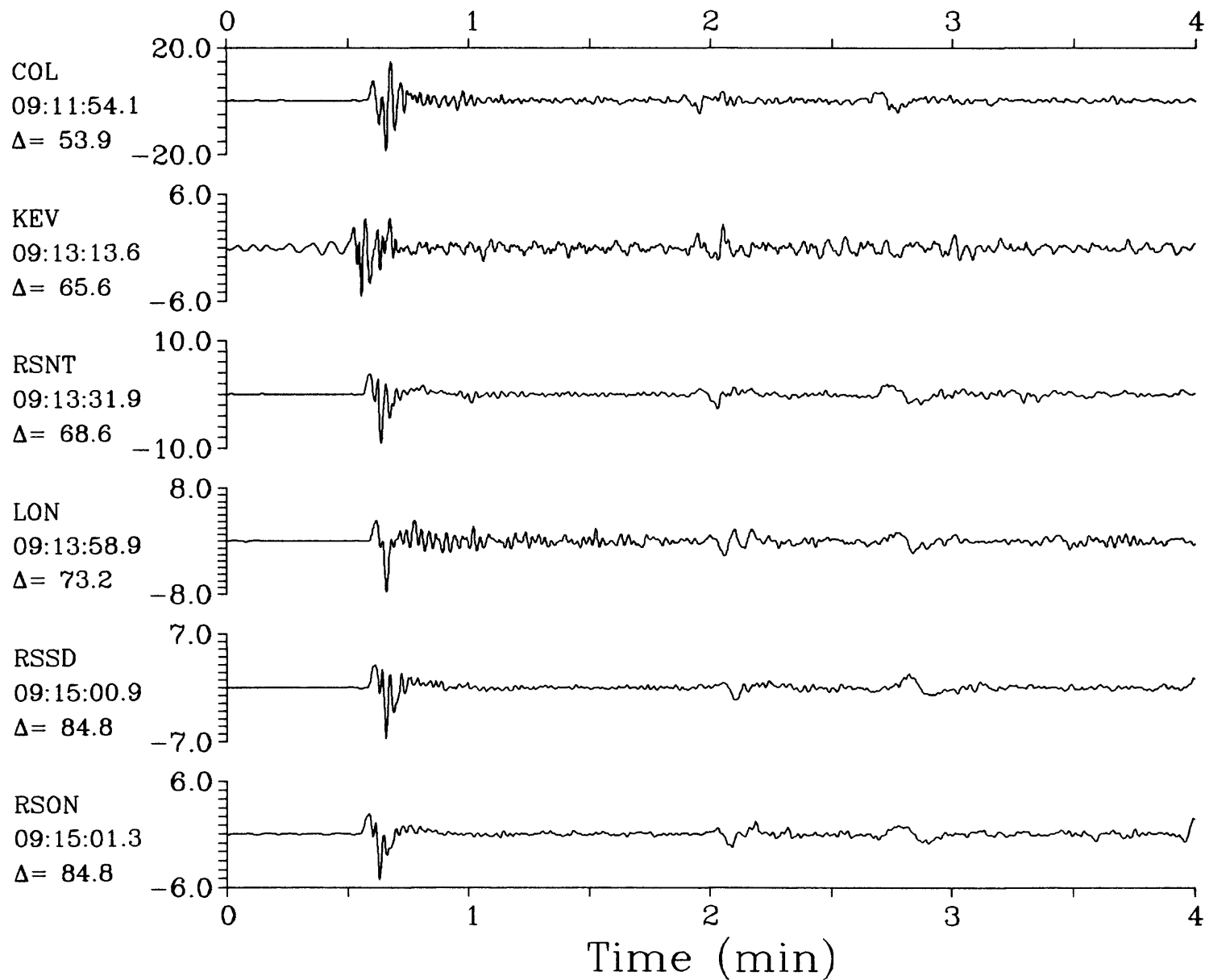


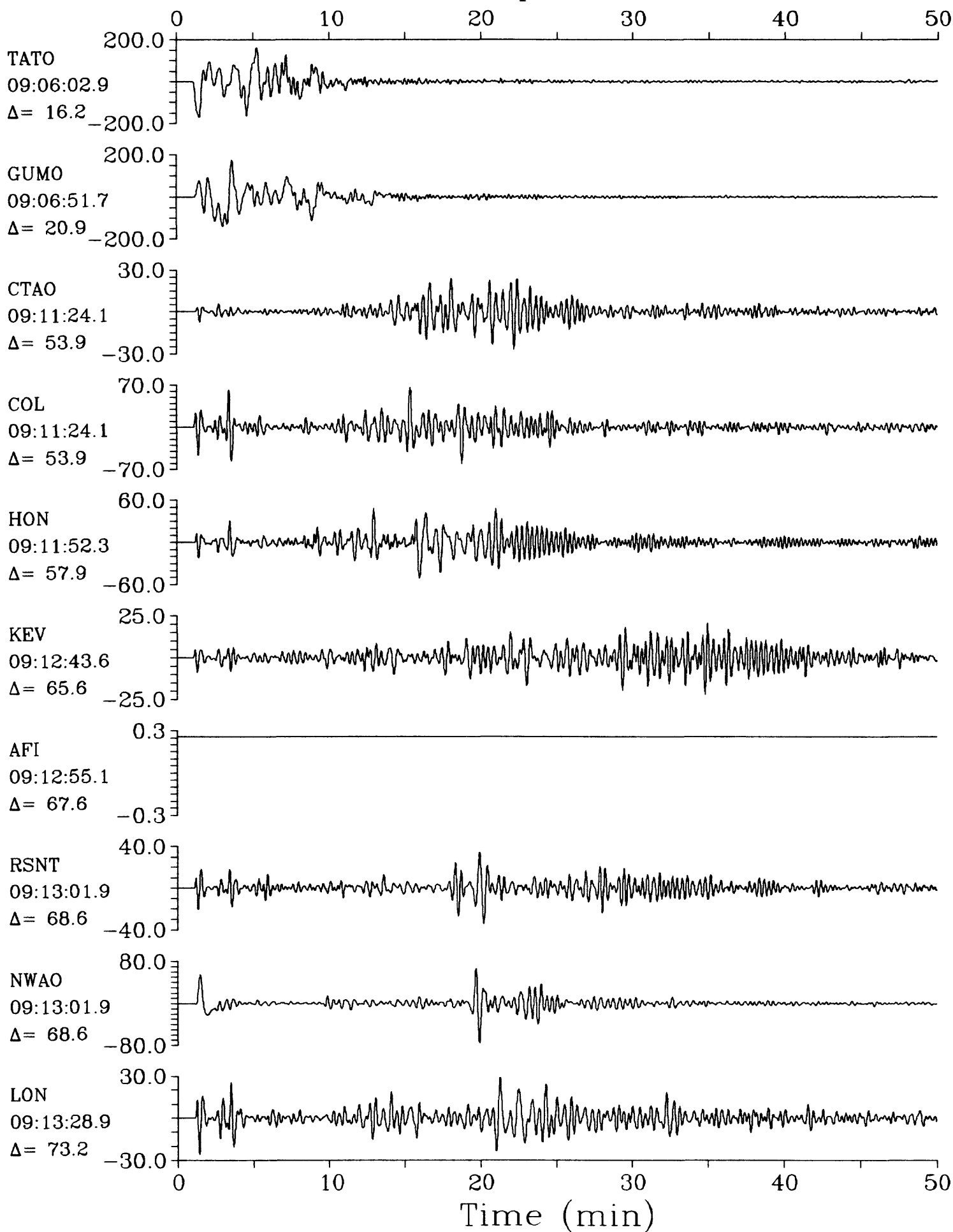


01 January 1984 09:03:37.59

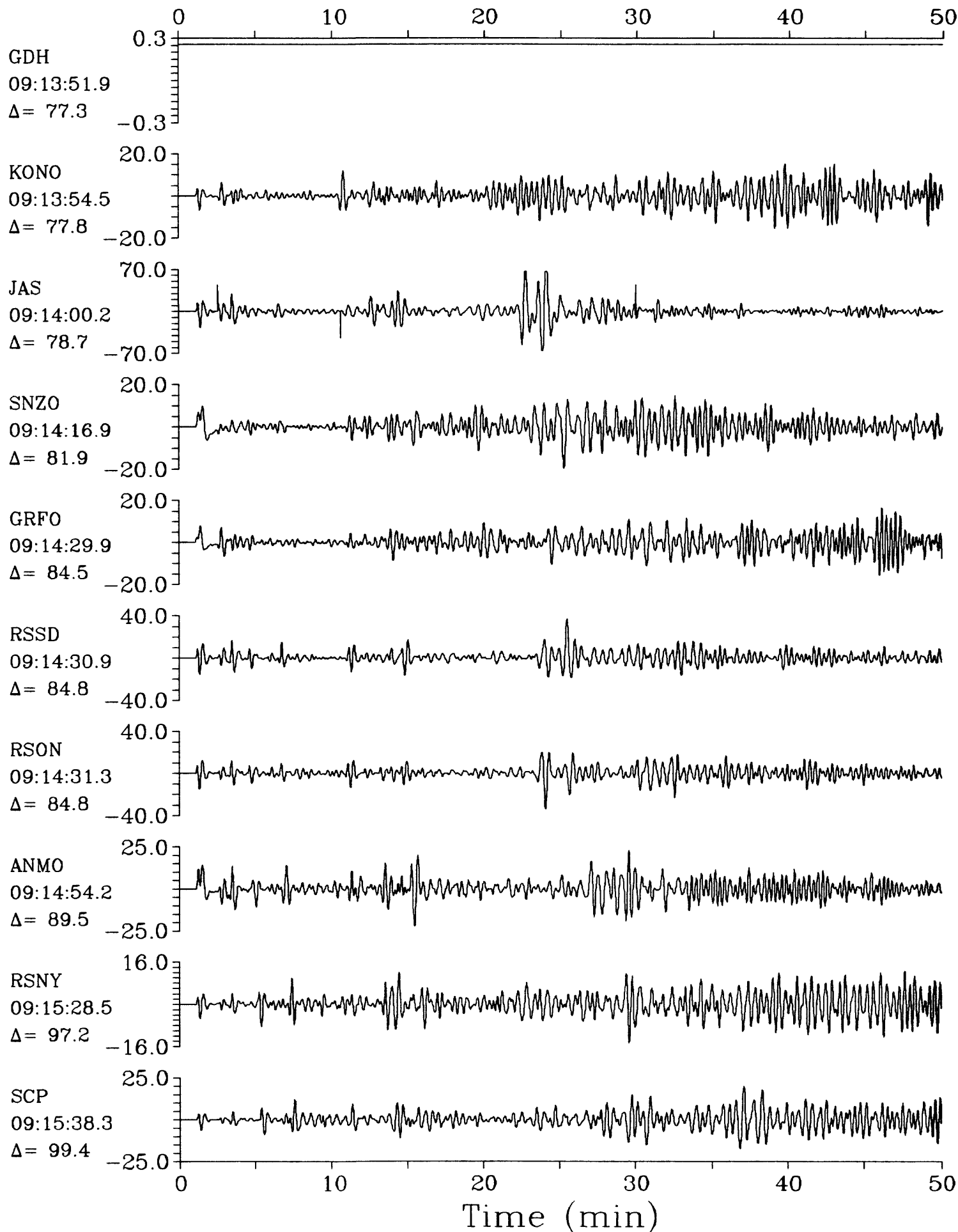
IPZ

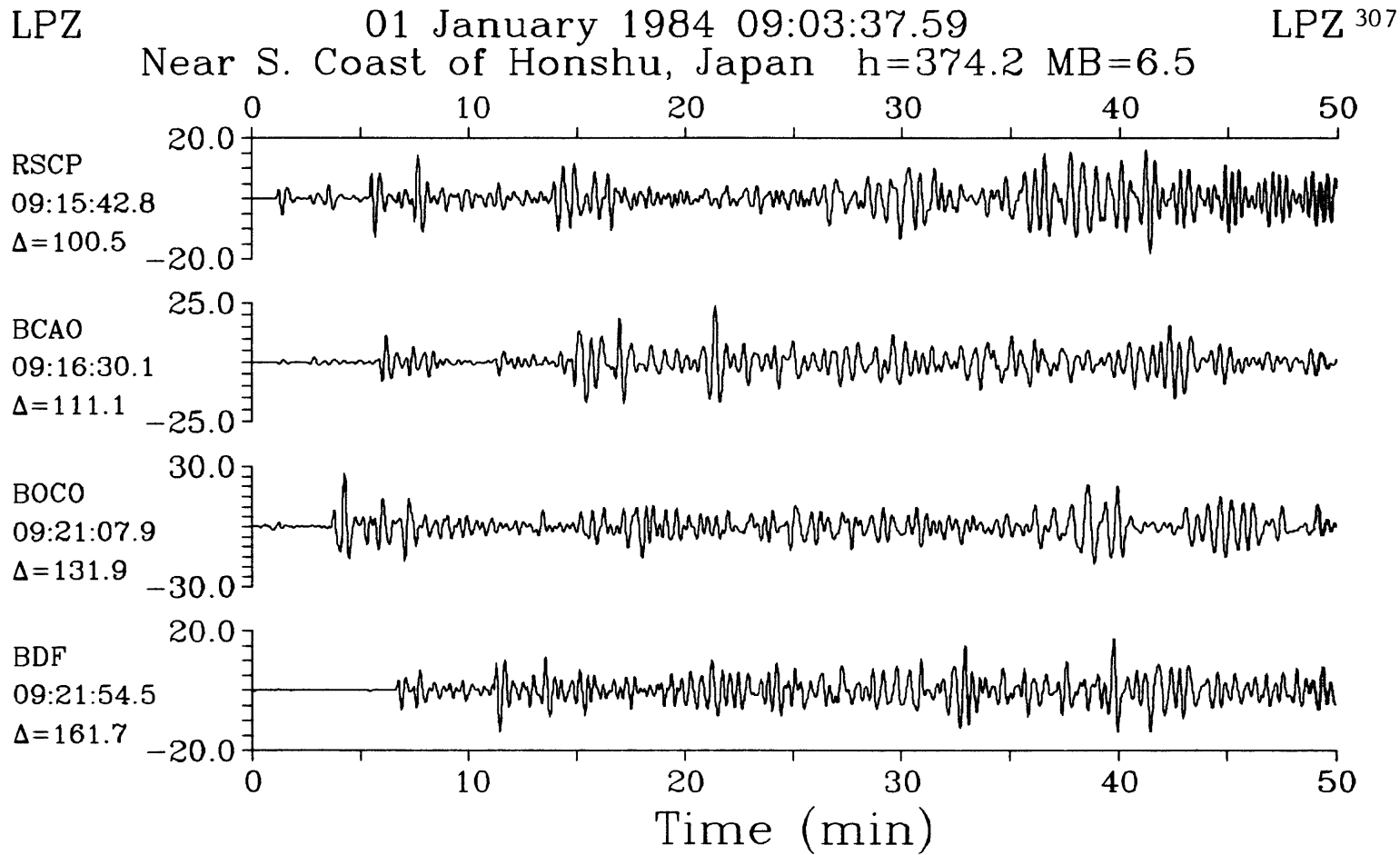
Near S. Coast of Honshu, Japan h=374.2 MB=6.5





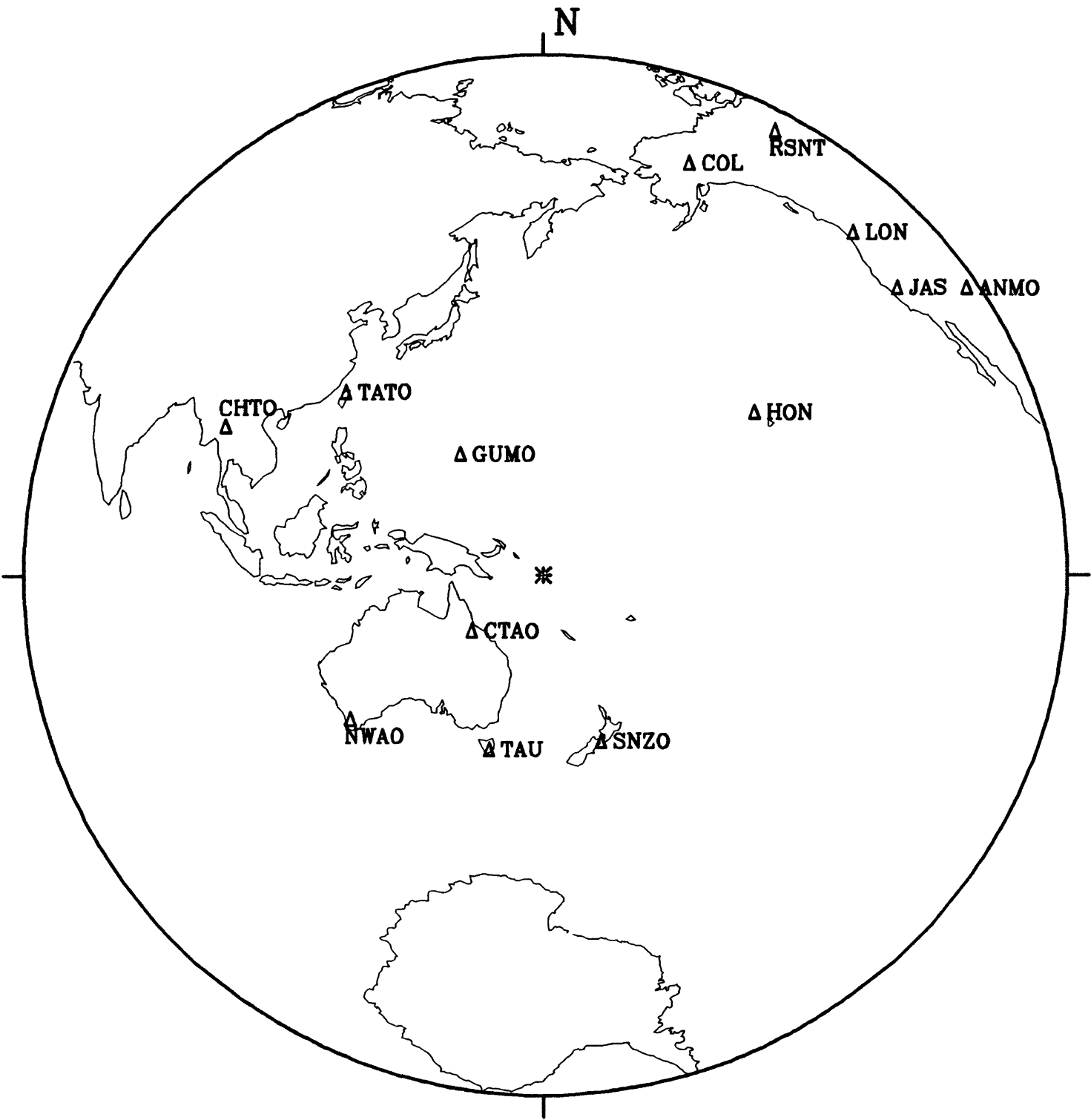
Near S. Coast of Honshu, Japan h=374.2 MB=6.5

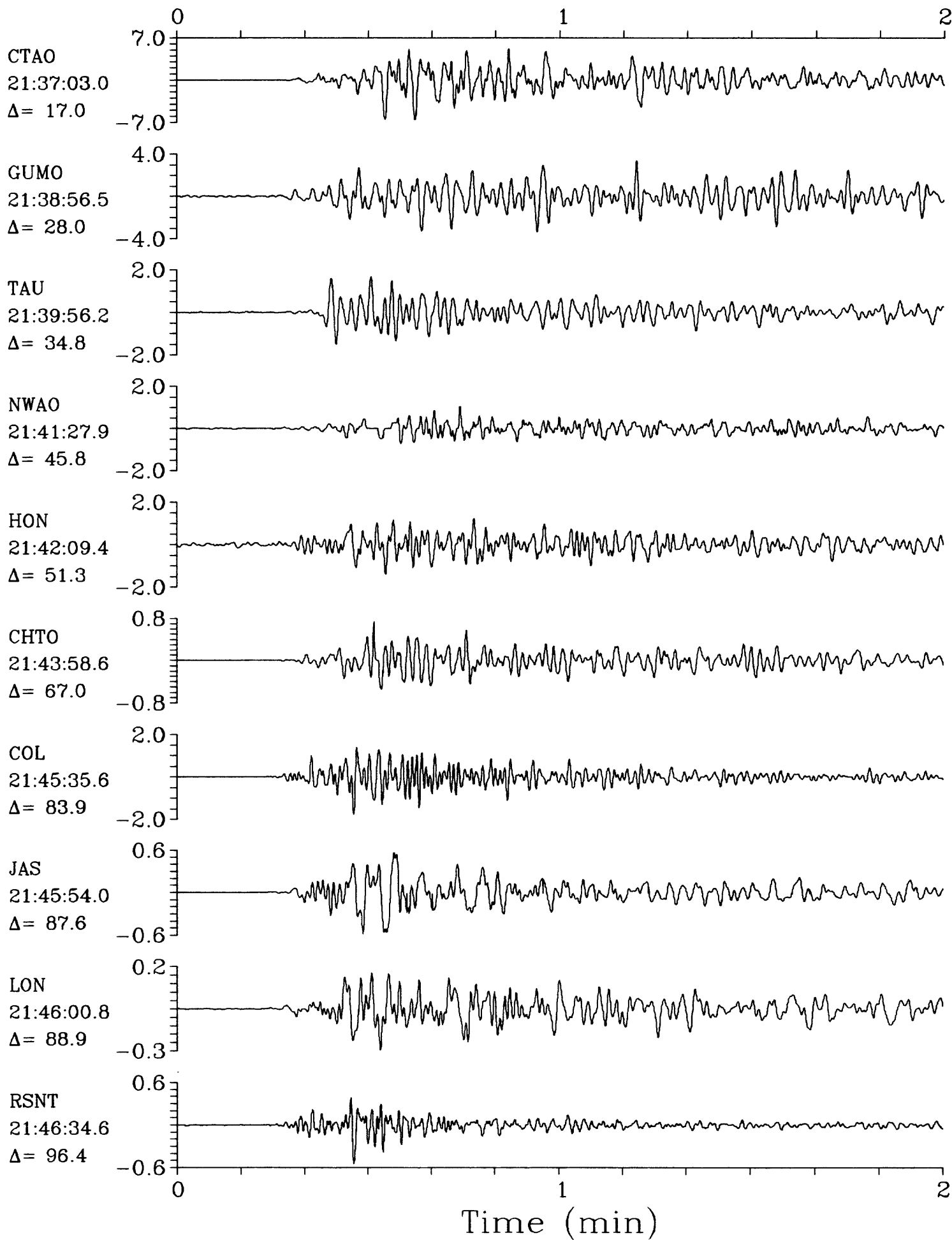


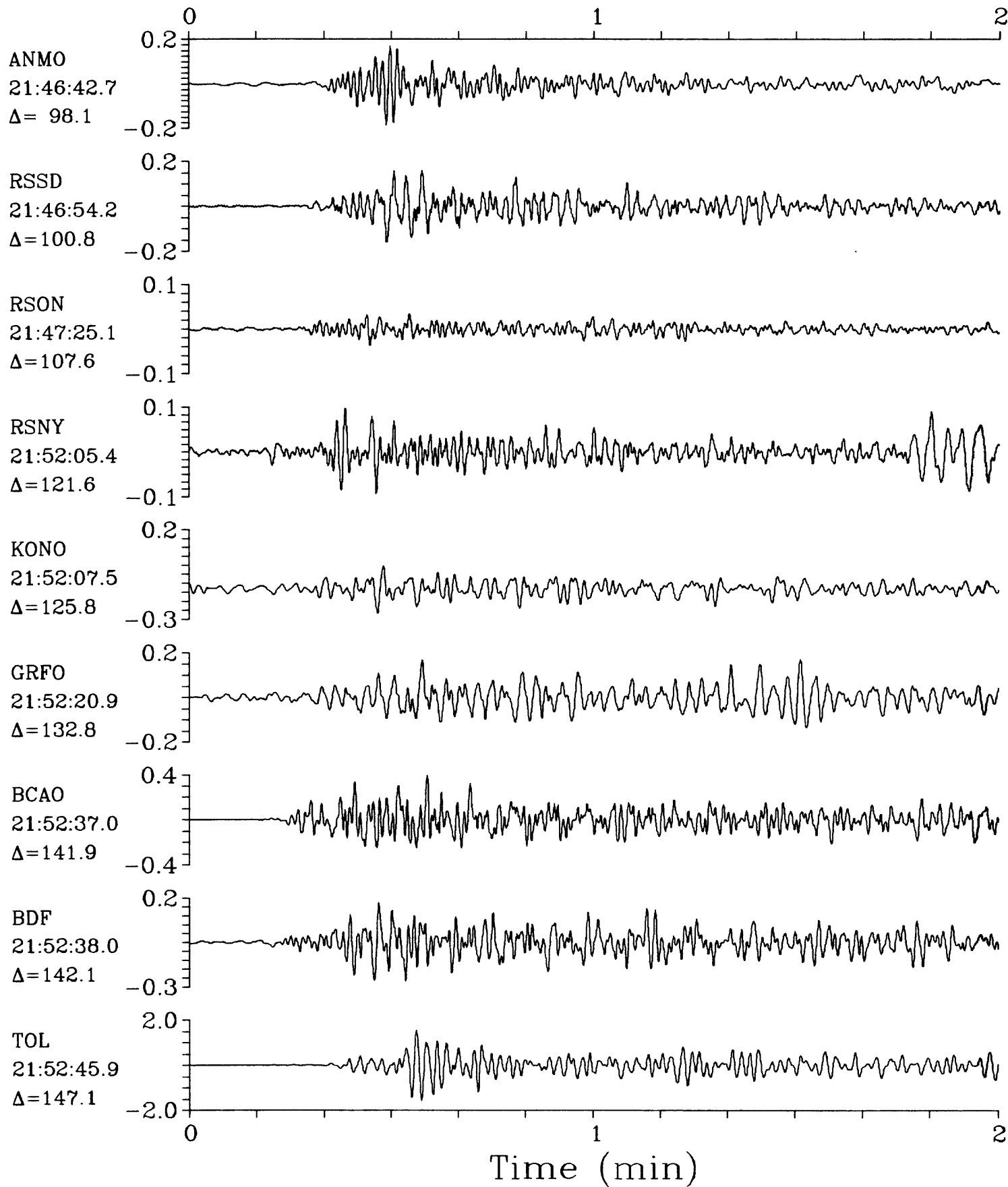


07 February 1984 21:33:20.50

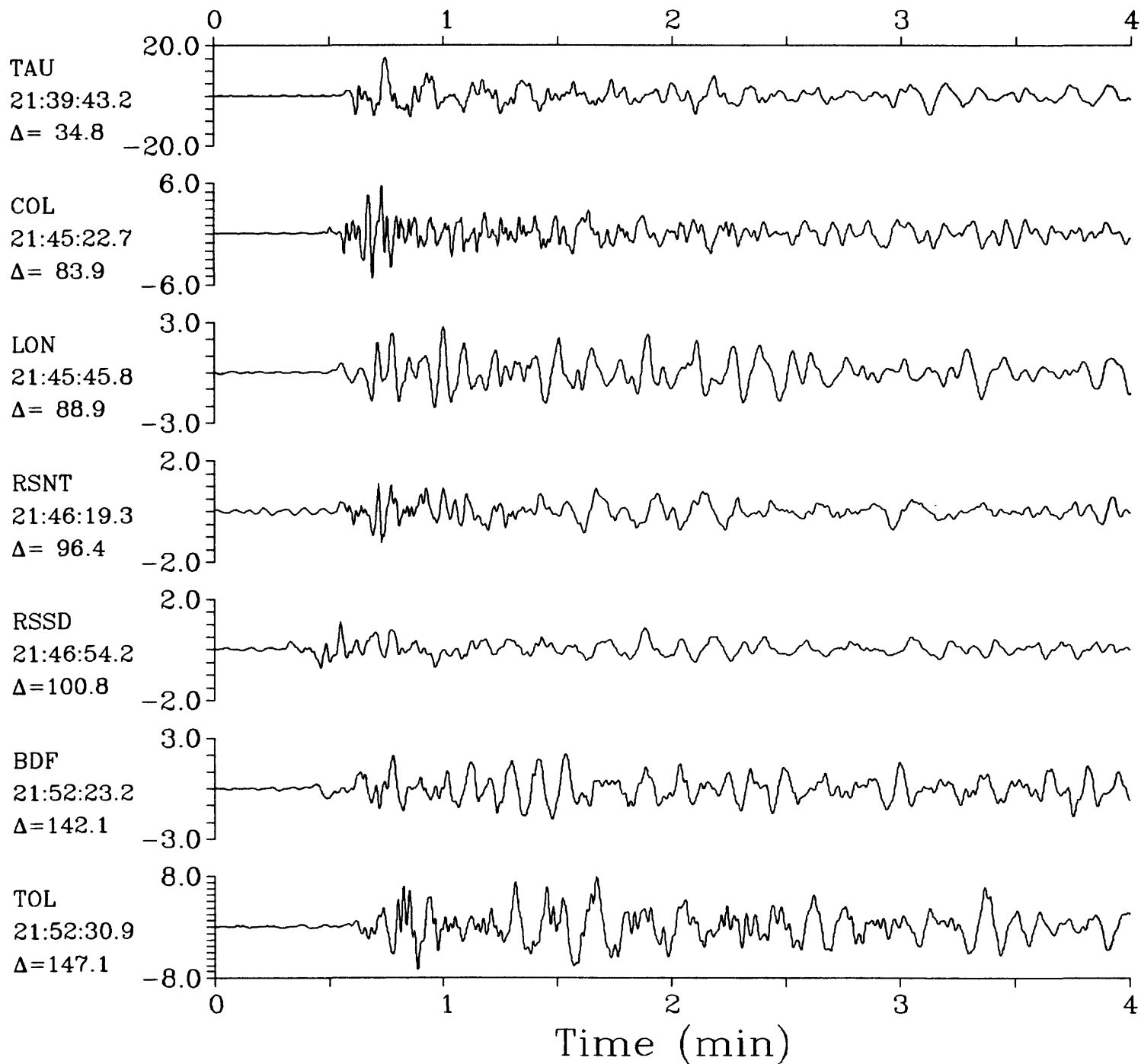
Solomon Islands

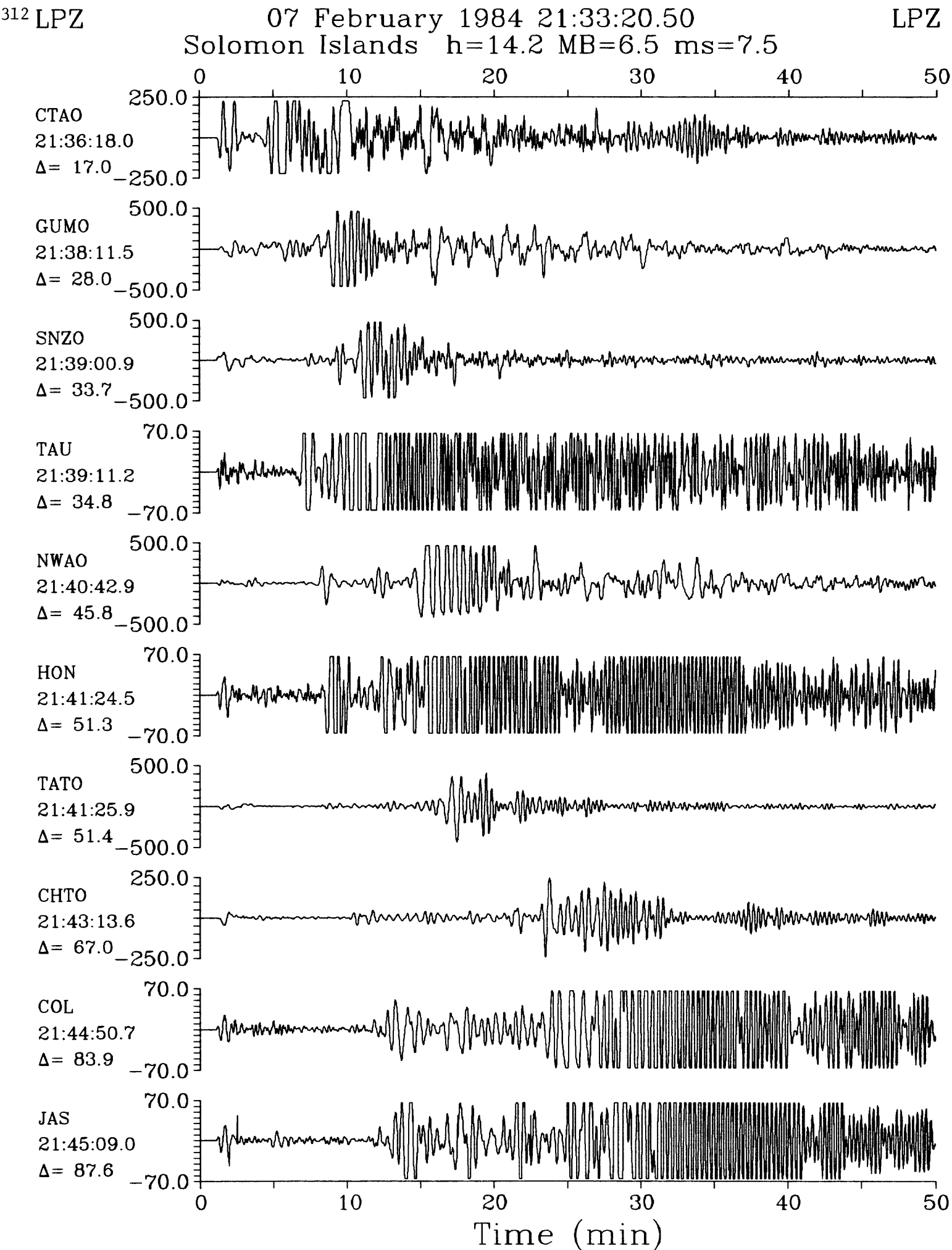


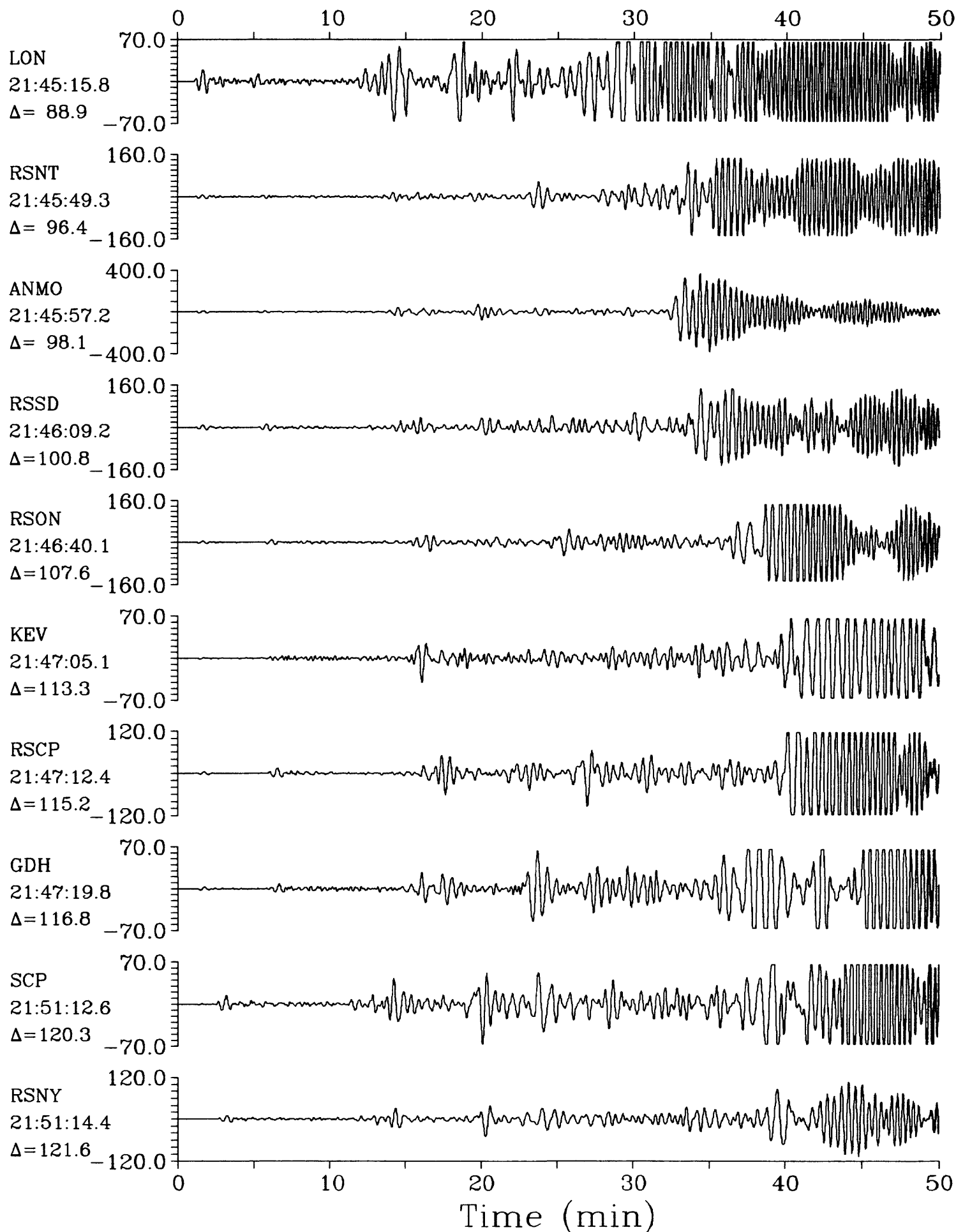


07 February 1984 21:33:20.50
Solomon Islands h=14.2 MB=6.5 ms=7.5

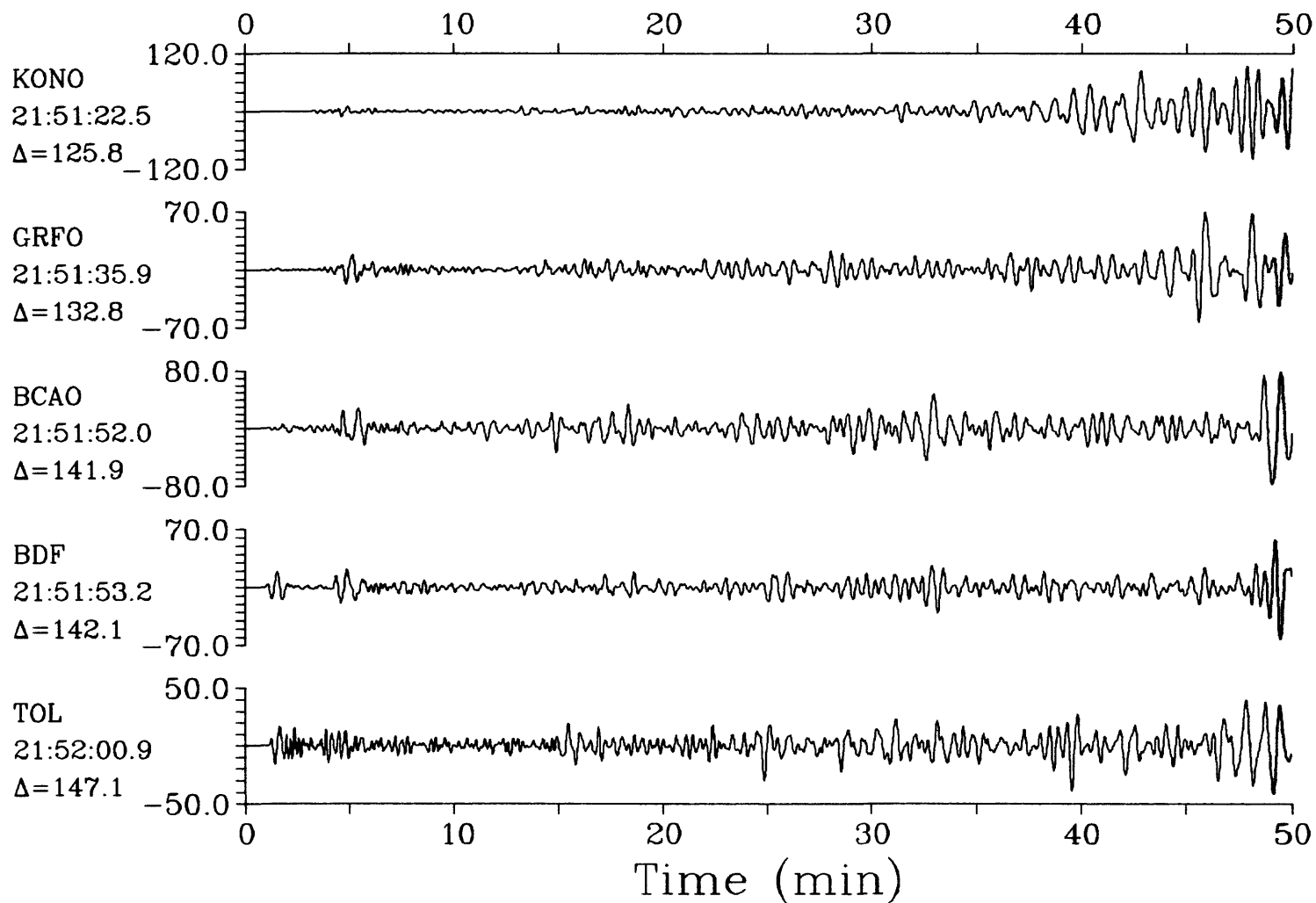
IPZ

07 February 1984 21:33:20.50
Solomon Islands h=14.2 MB=6.5 ms=7.5IPZ³¹¹



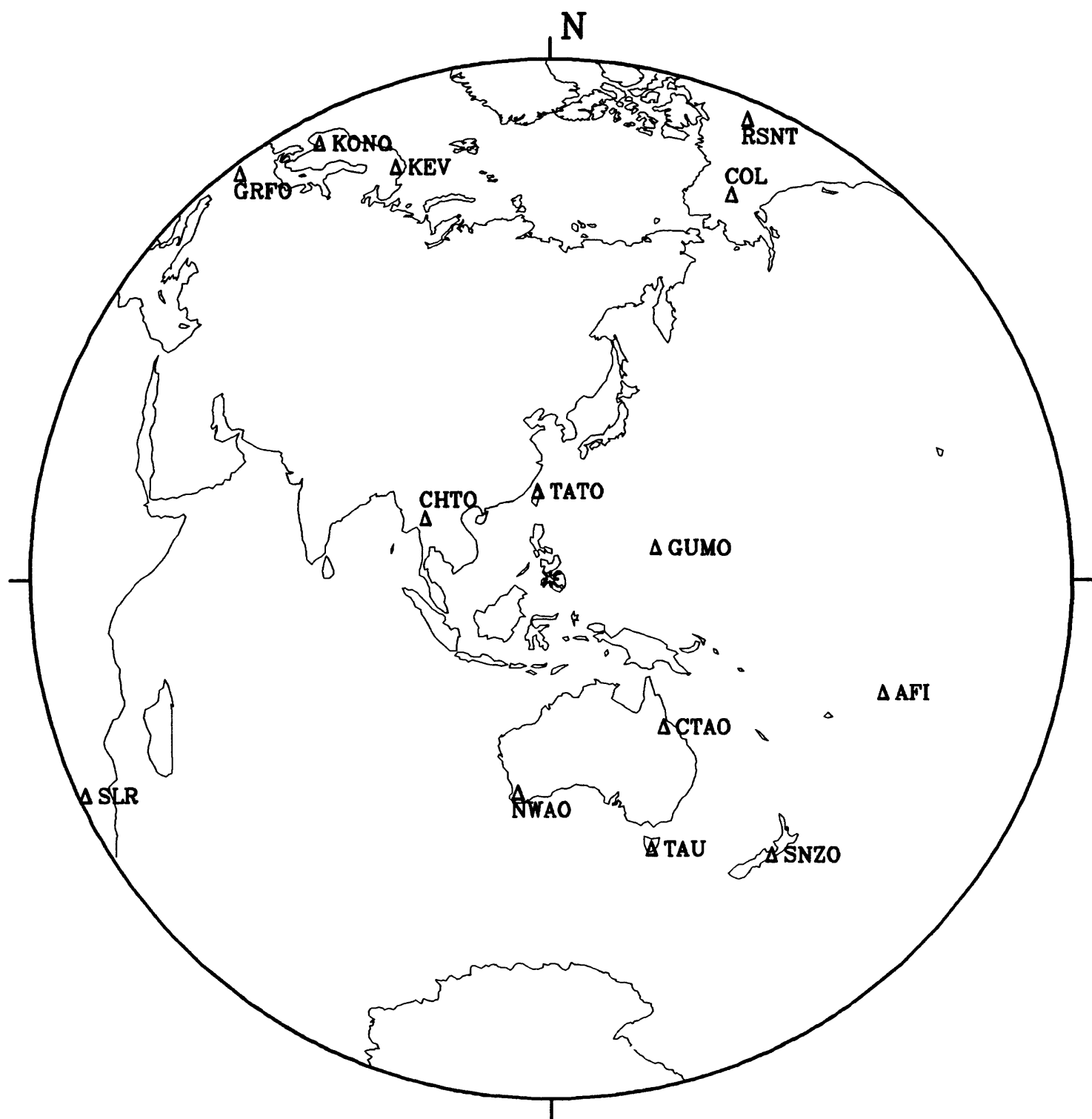


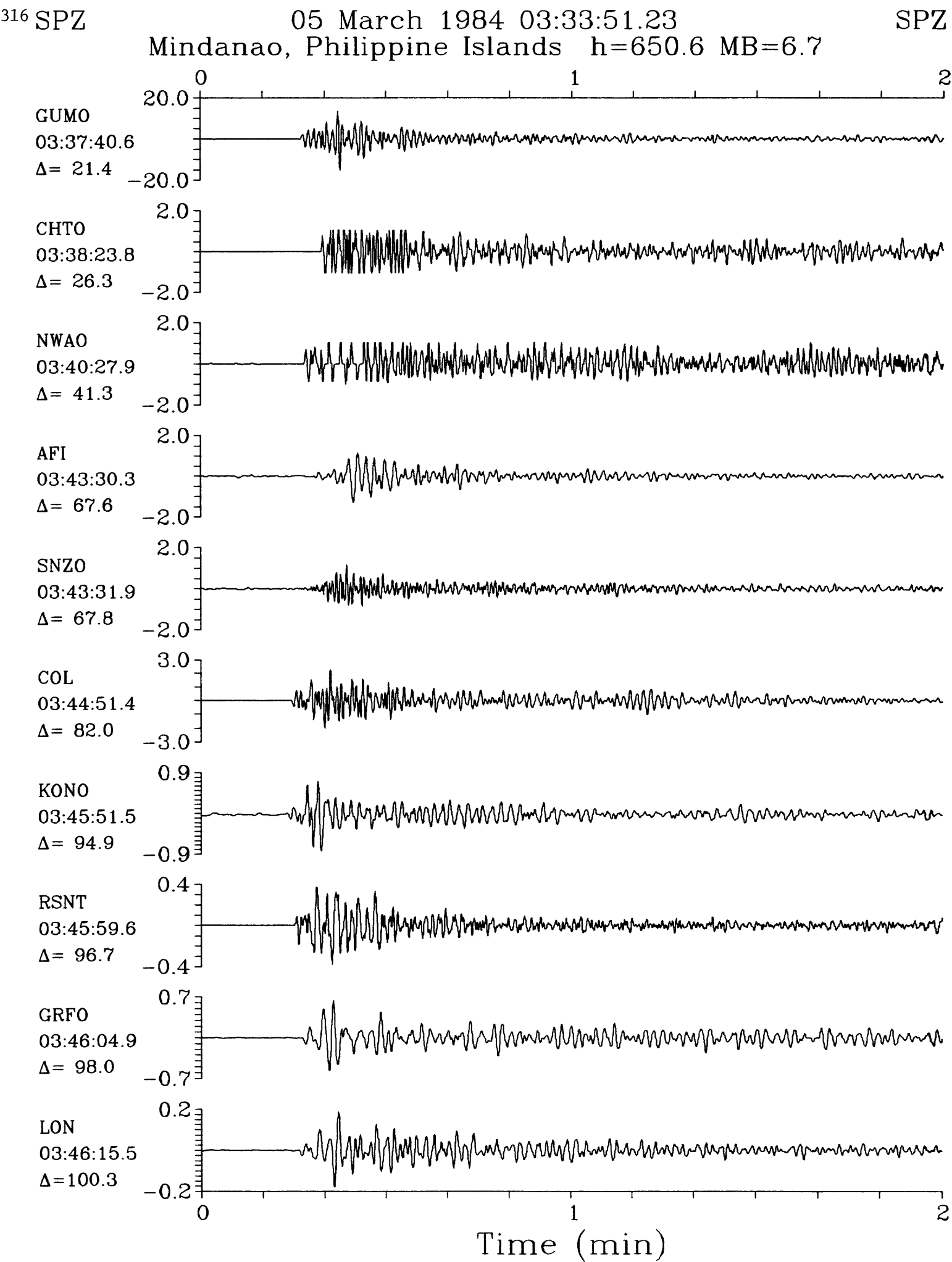
07 February 1984 21:33:20.50
Solomon Islands h=14.2 MB=6.5 ms=7.5



05 March 1984 03:33:51.23

Mindanao, Philippine Islands



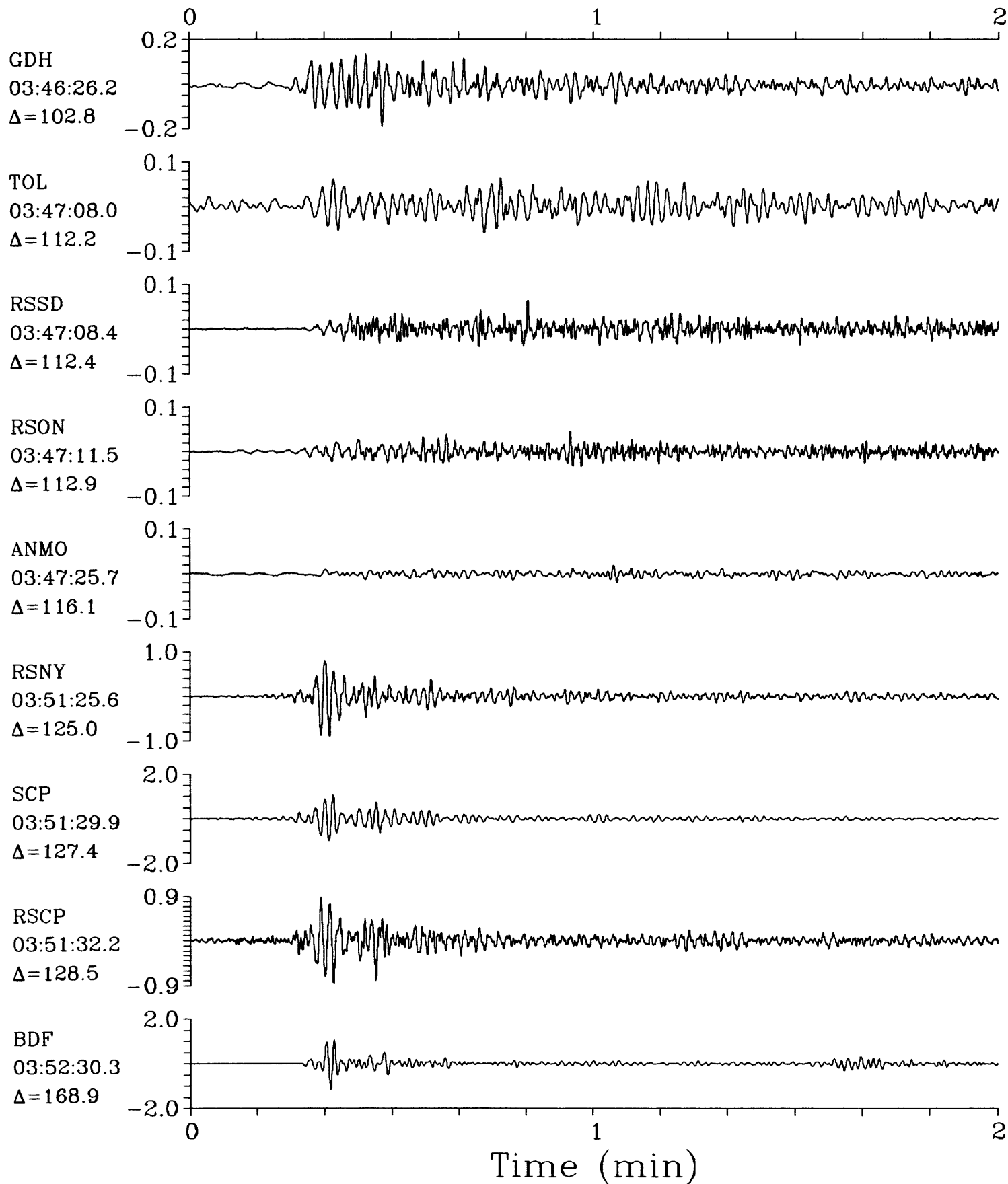


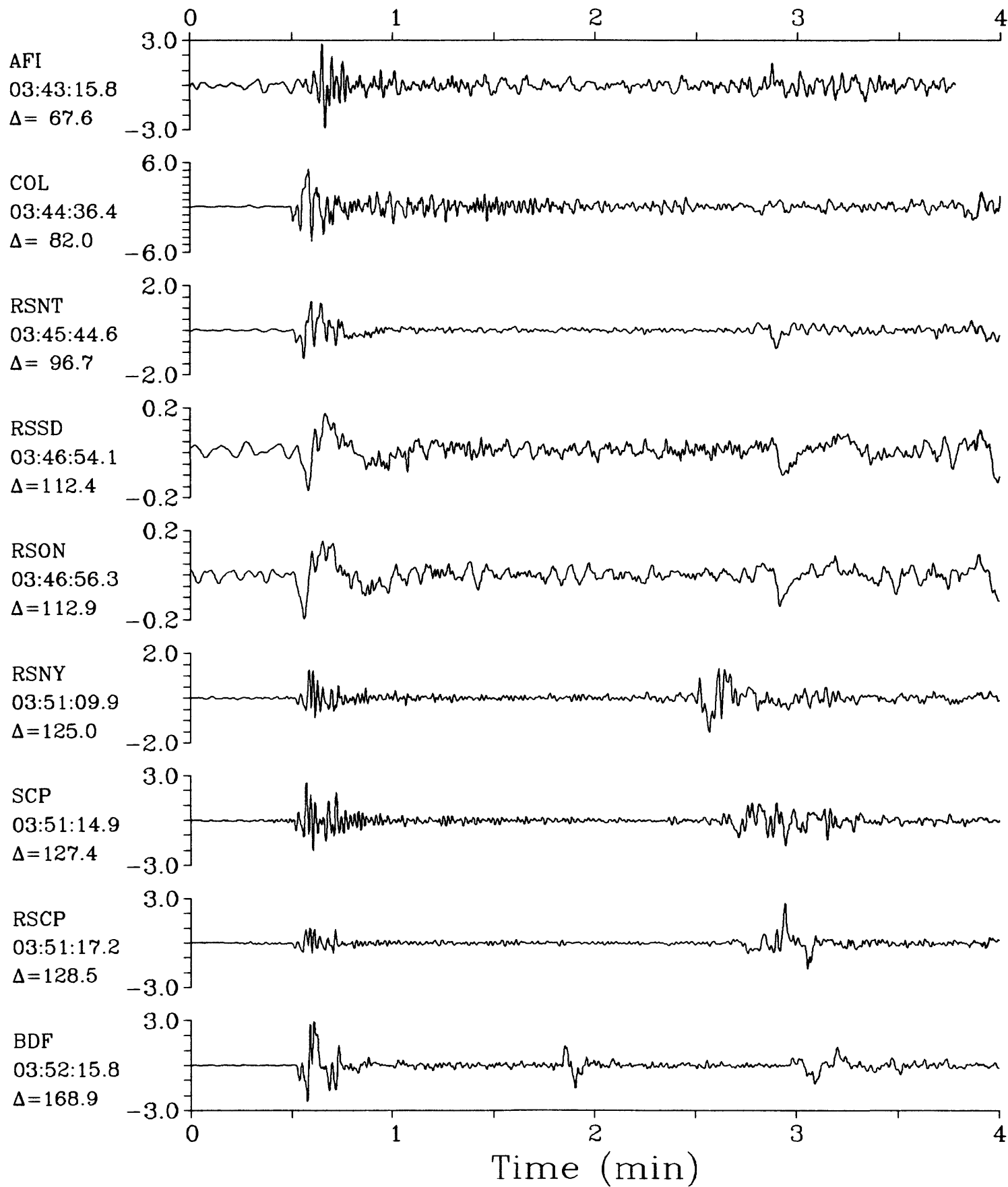
SPZ

05 March 1984 03:33:51.23

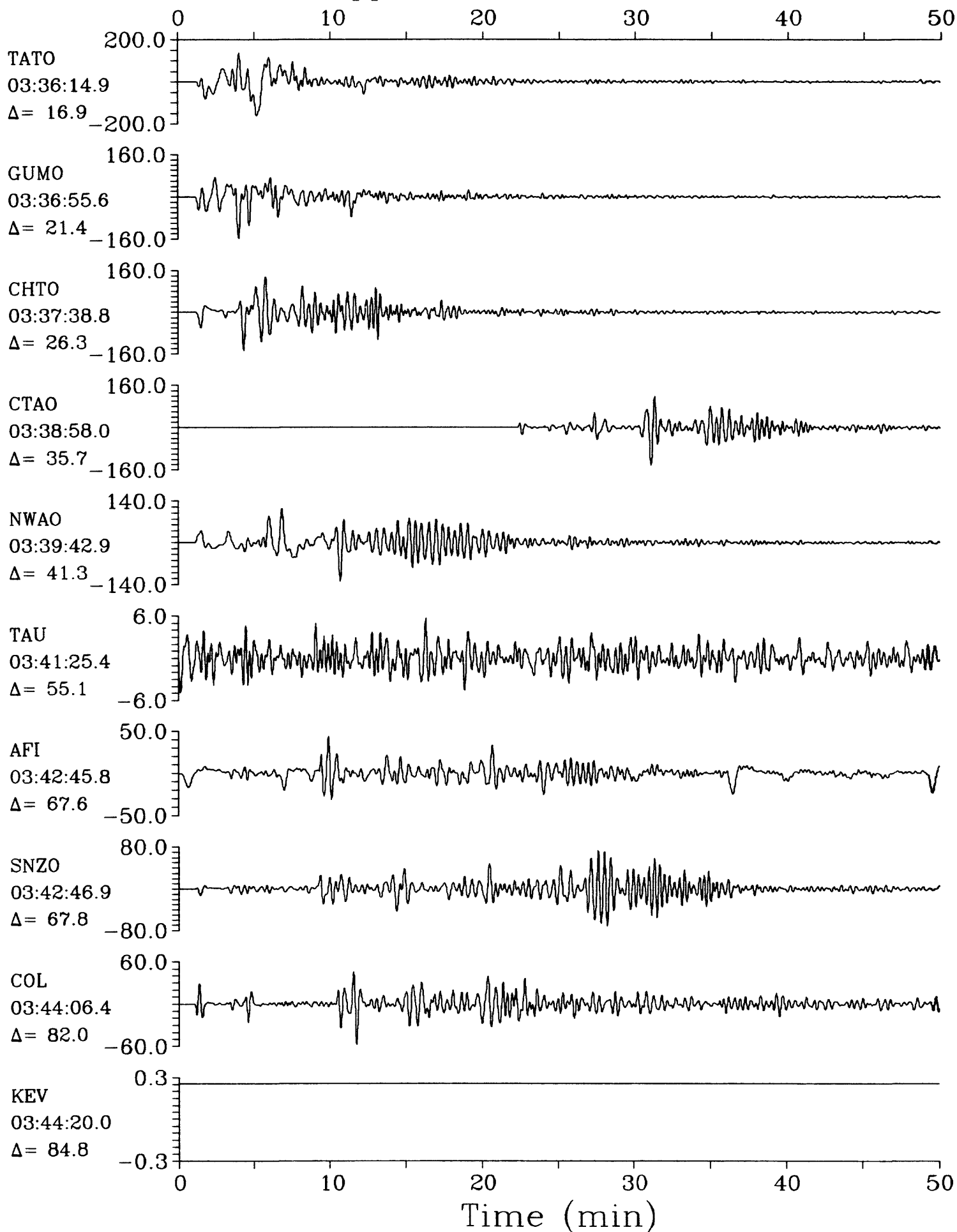
SPZ³¹⁷

Mindanao, Philippine Islands h=650.6 MB=6.7

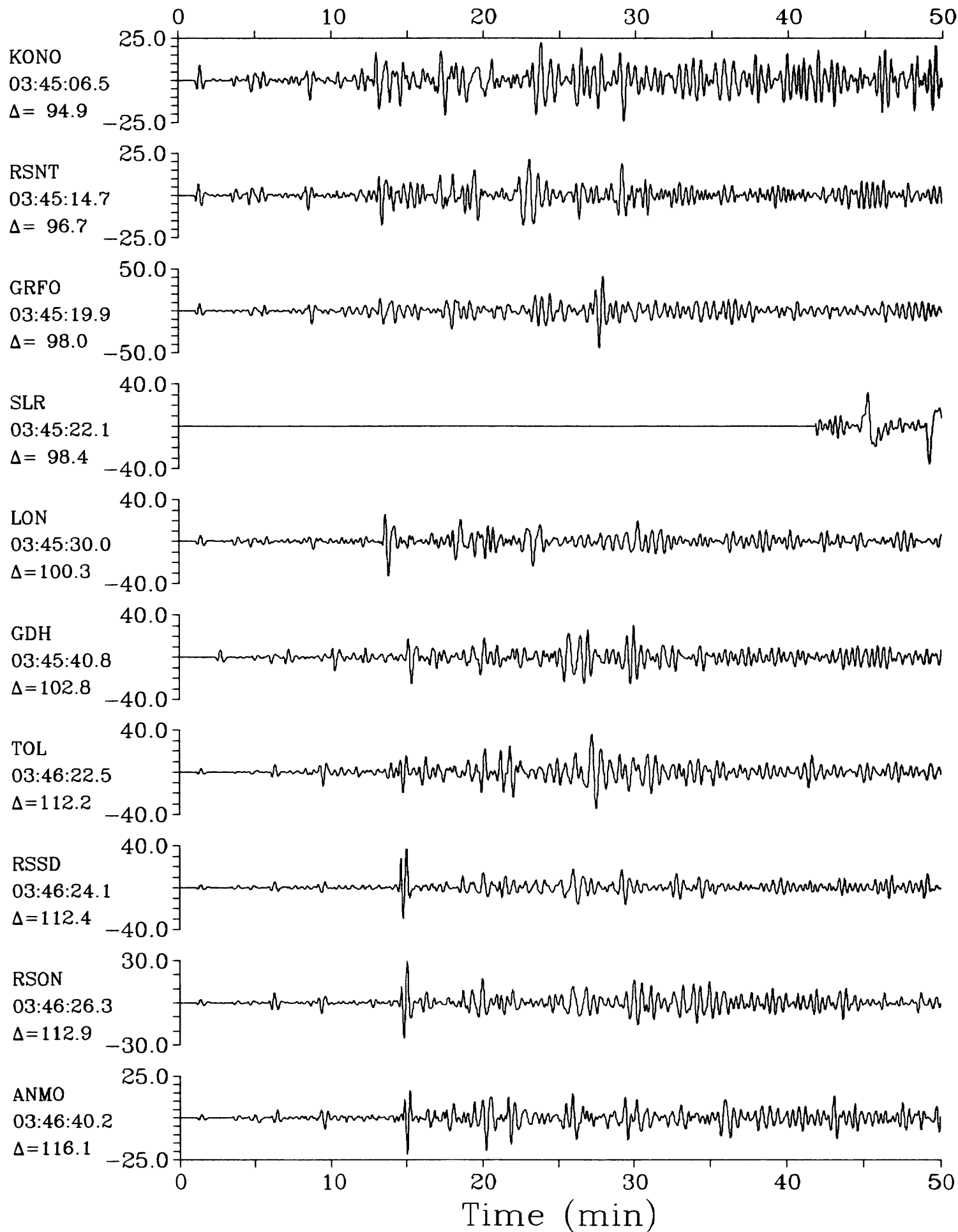


Mindanao, Philippine Islands $h=650.6$ MB=6.7

Mindanao, Philippine Islands h=650.6 MB=6.7



Mindanao, Philippine Islands h=650.6 MB=6.7

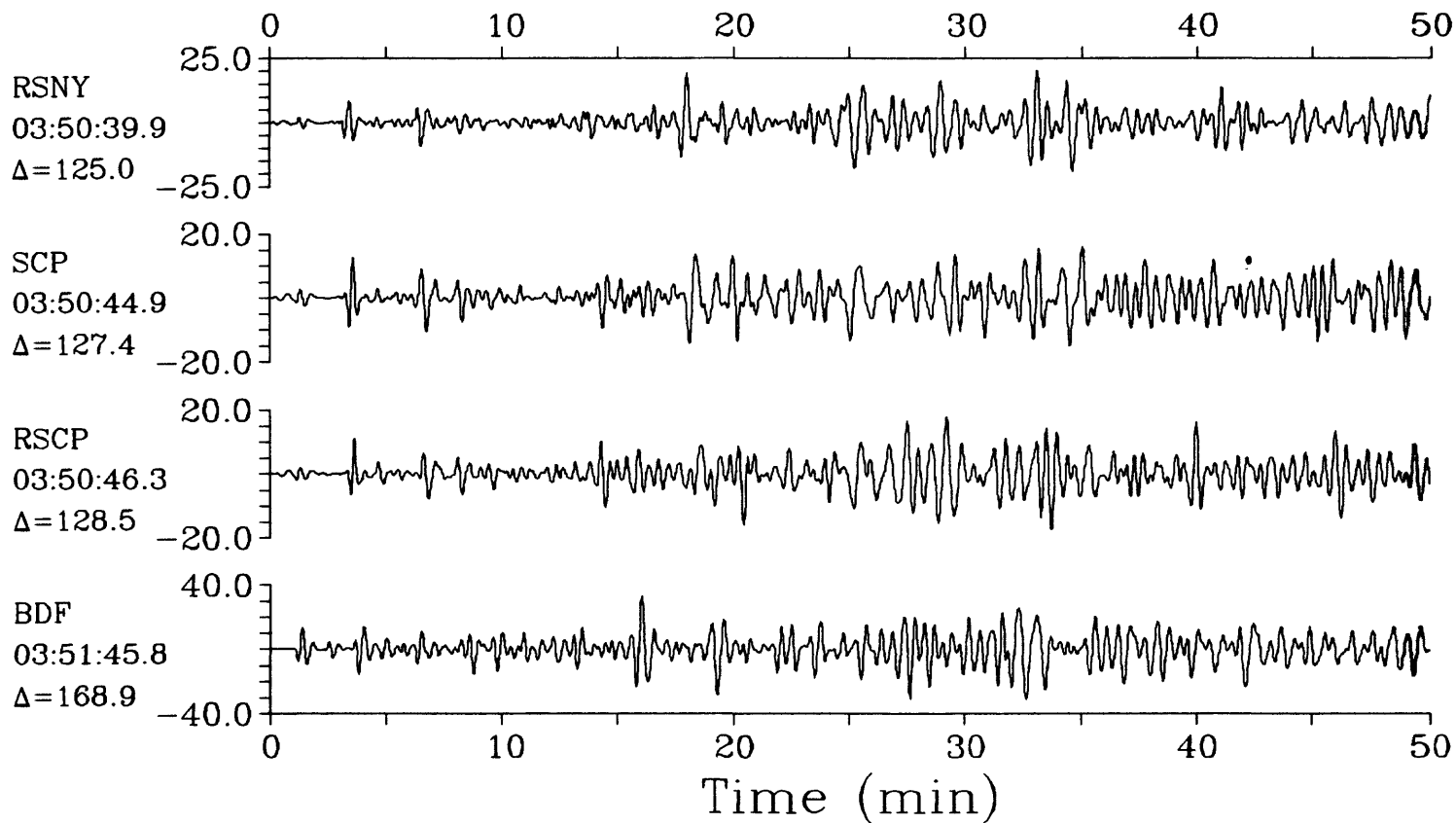


LPZ

05 March 1984 03:33:51.23

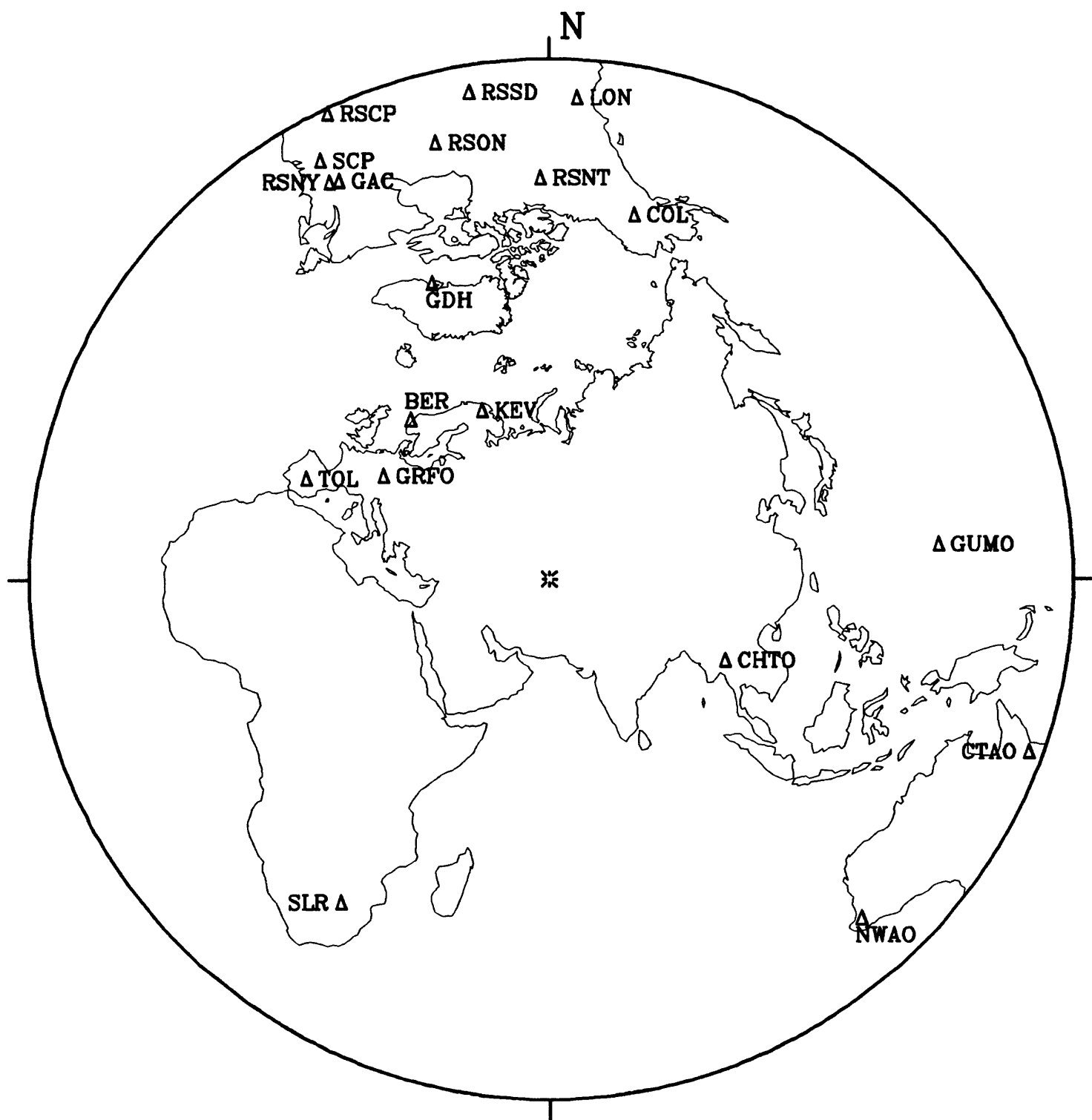
LPZ 321

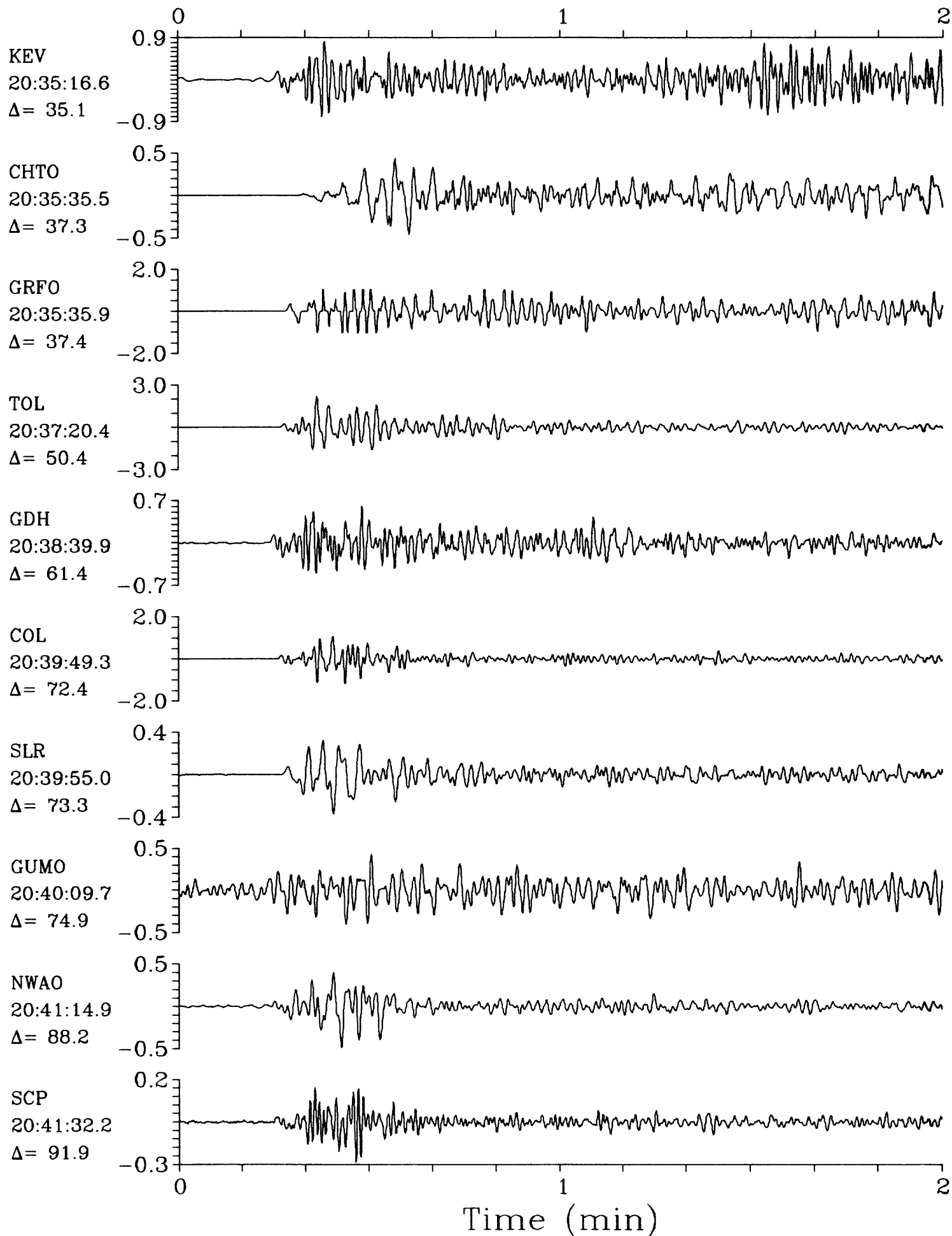
Mindanao, Philippine Islands h=650.6 MB=6.7

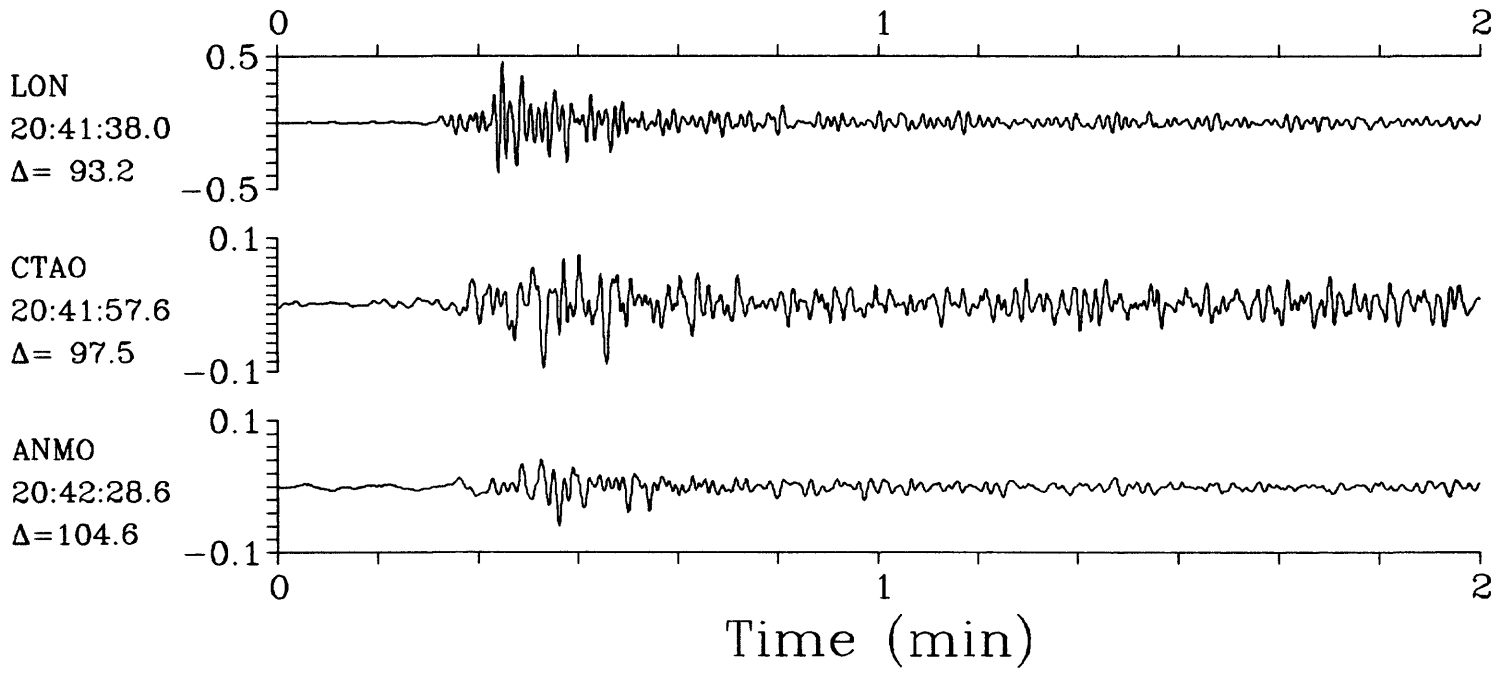


19 March 1984 20:28:39.80

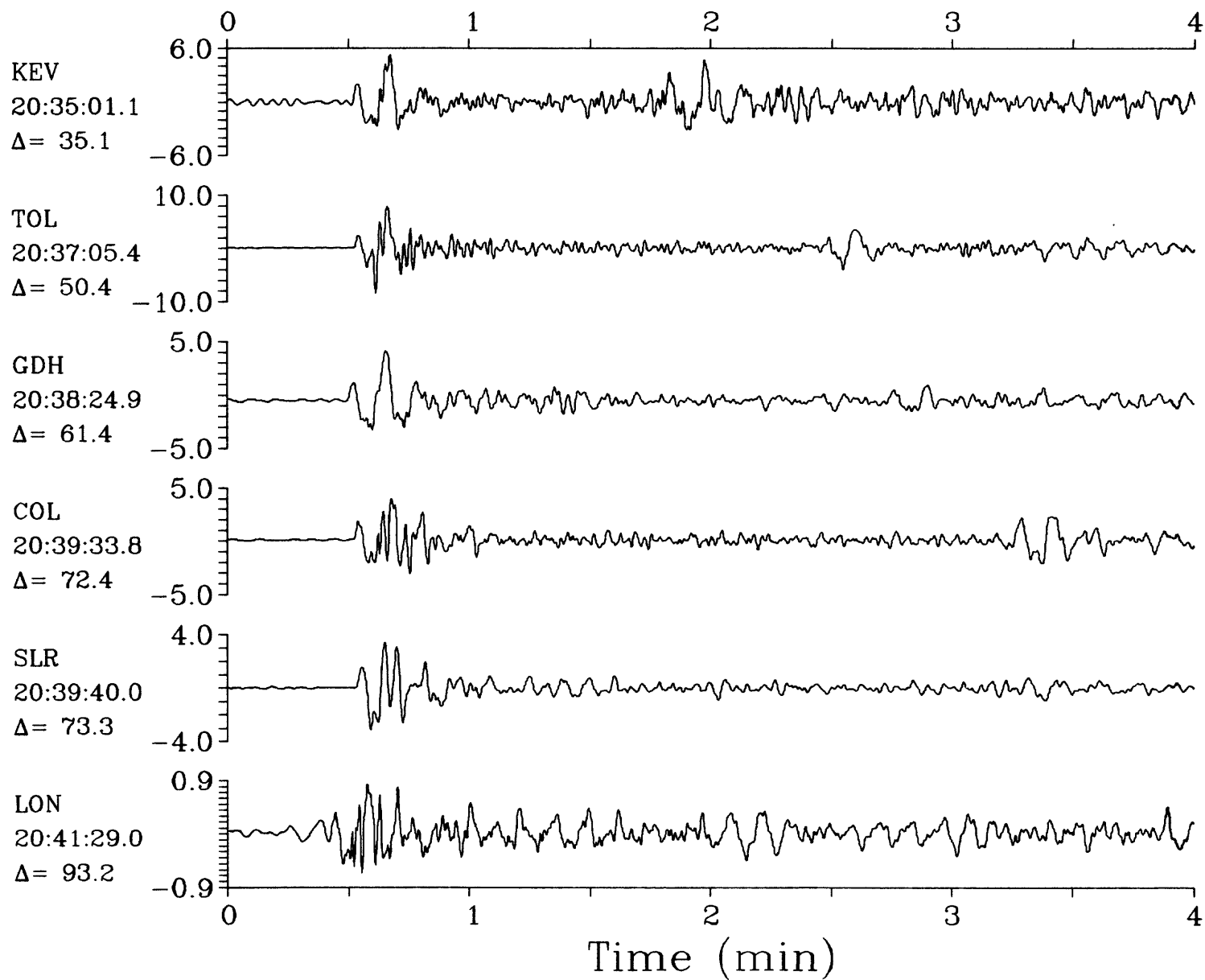
Uzbek SSR

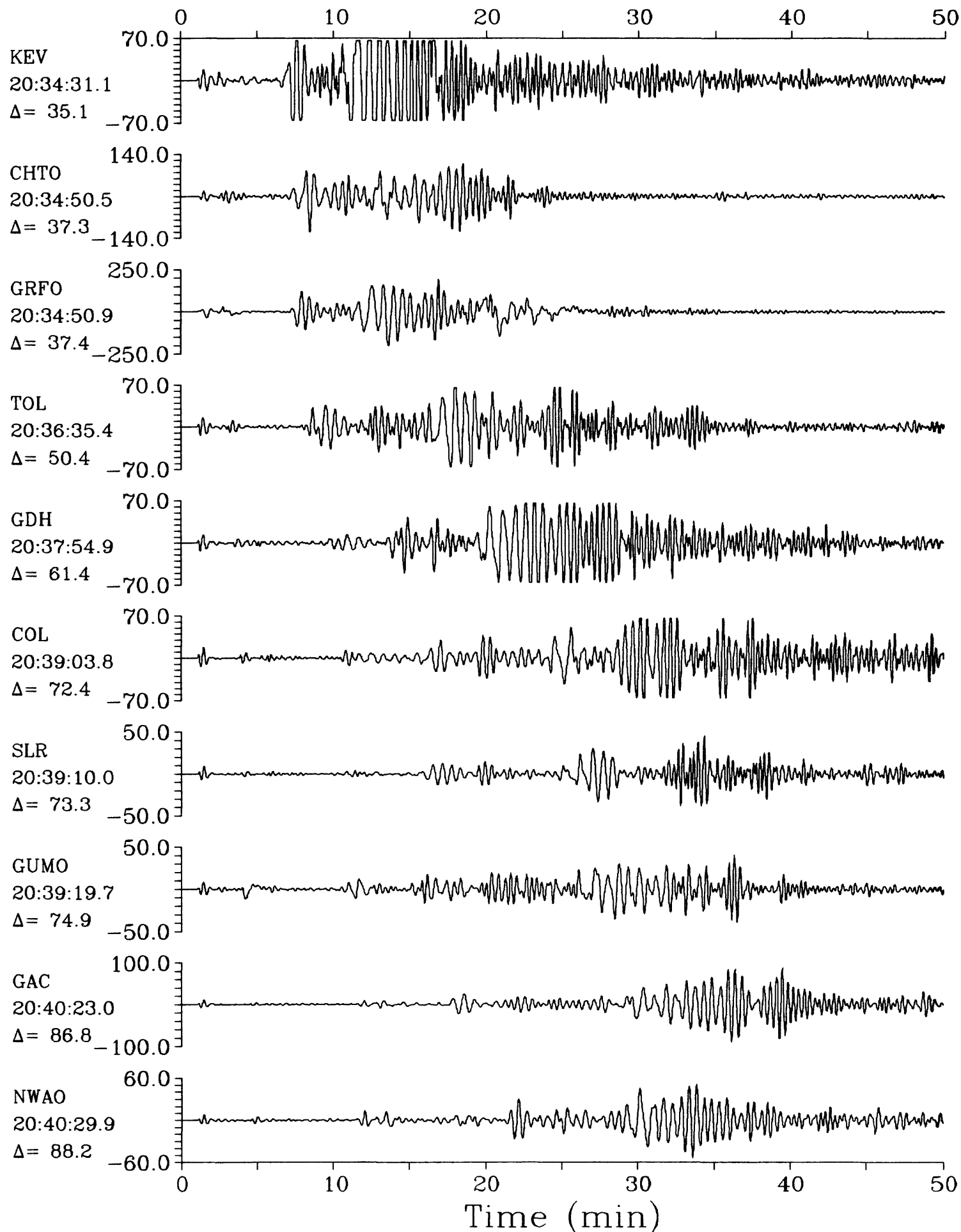


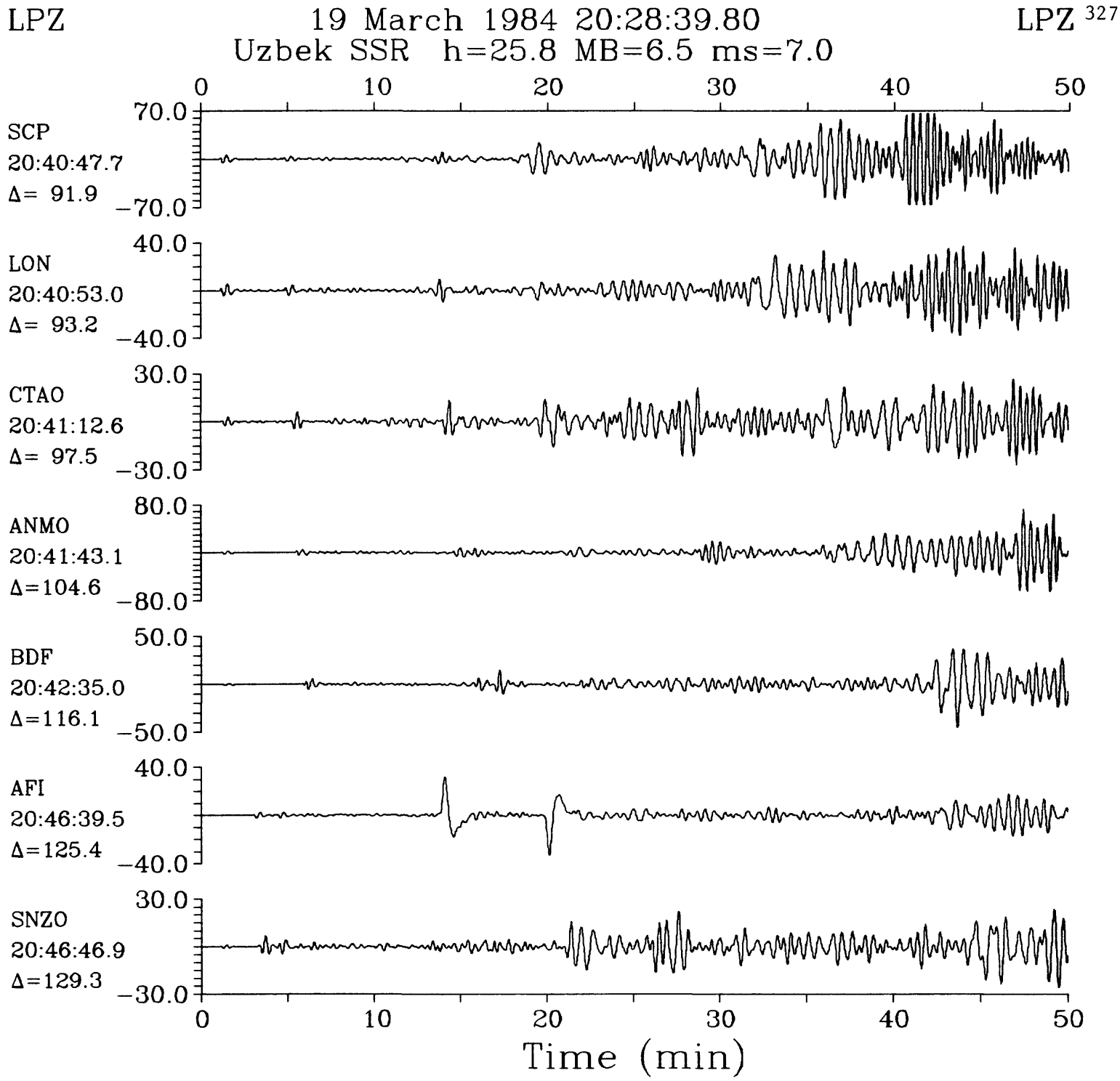




IPZ

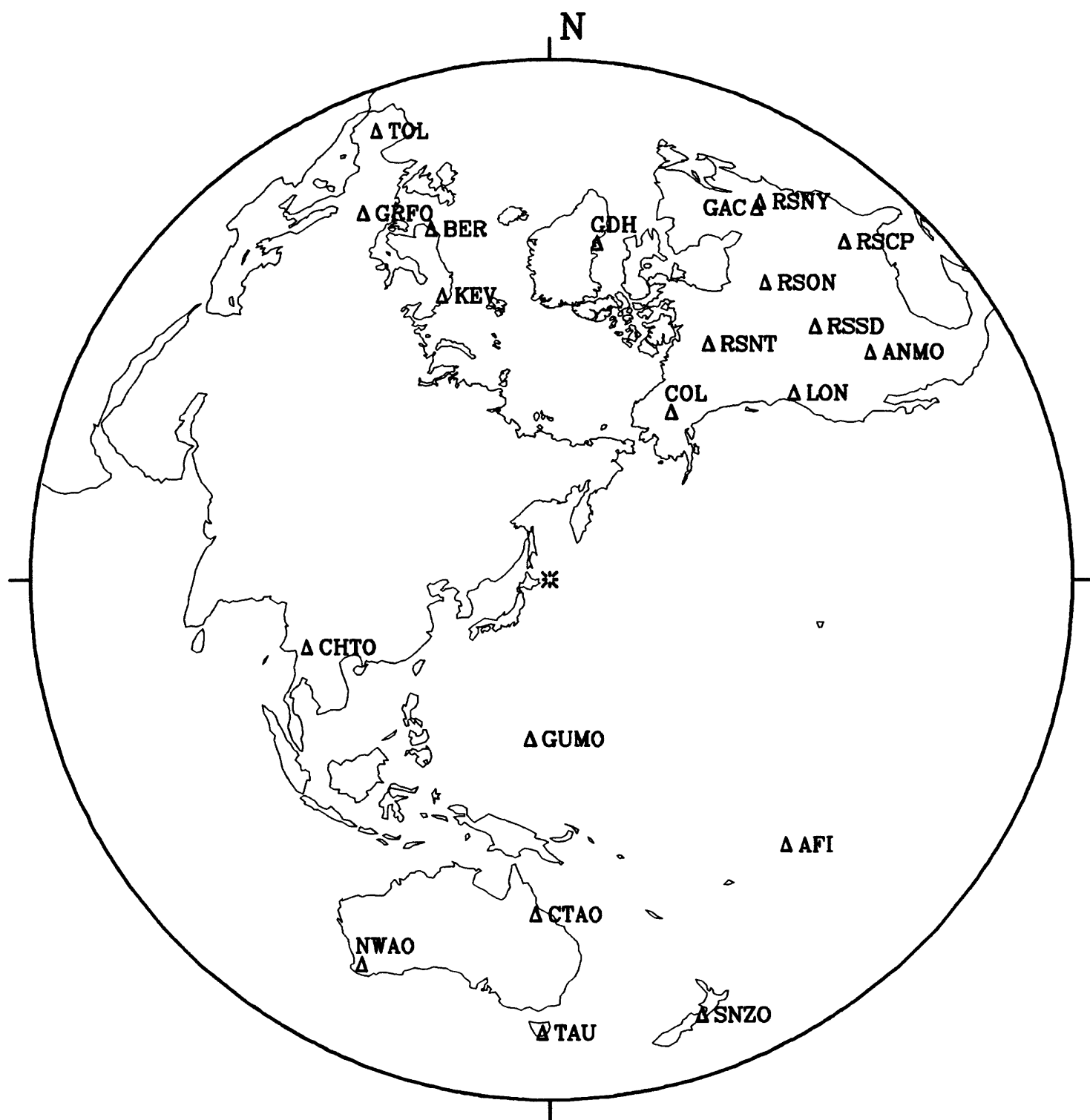
19 March 1984 20:28:39.80
Uzbek SSR h=25.8 MB=6.5 ms=7.0IPZ³²⁵

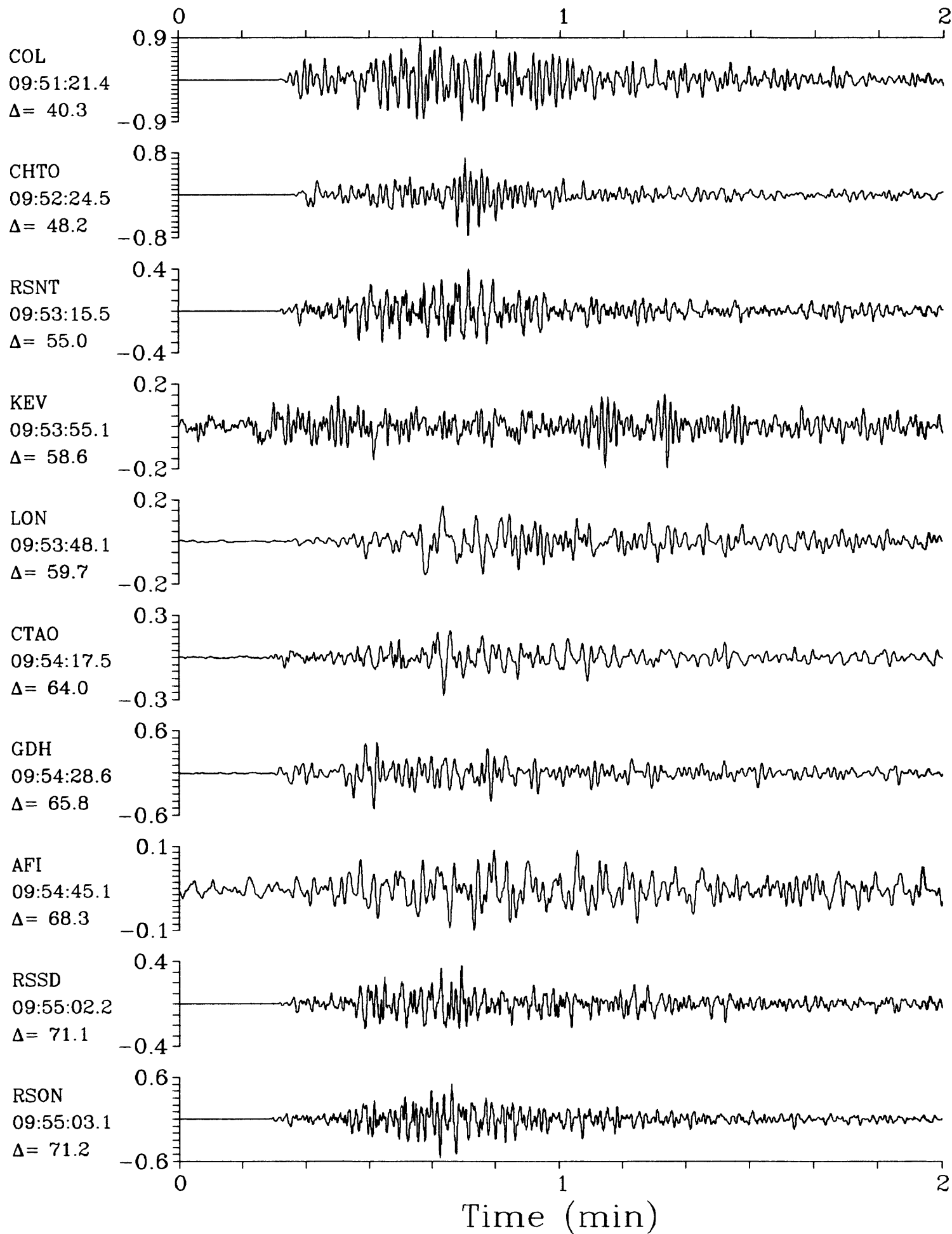




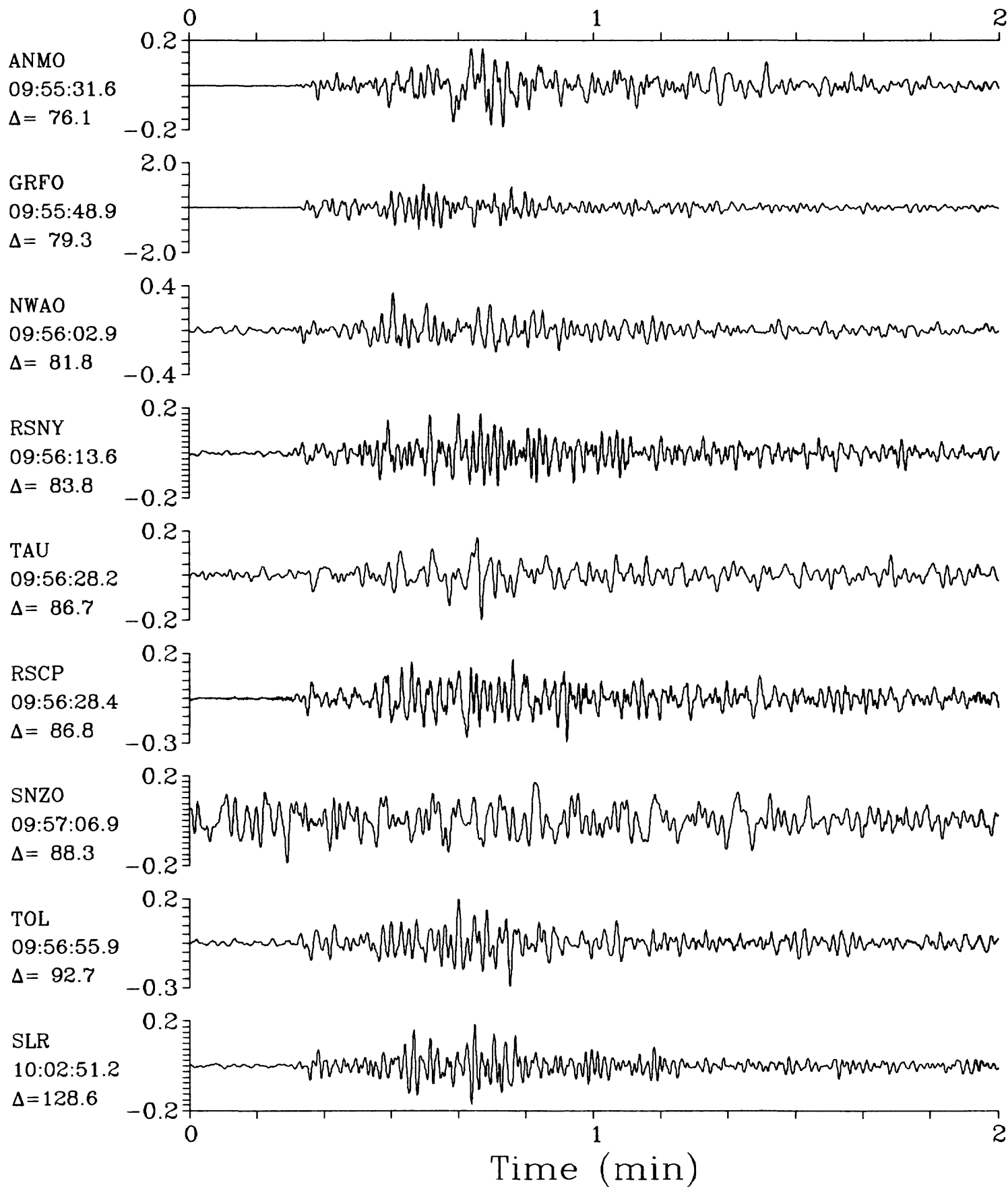
24 March 1984 09:44:02.61

Kuril Islands

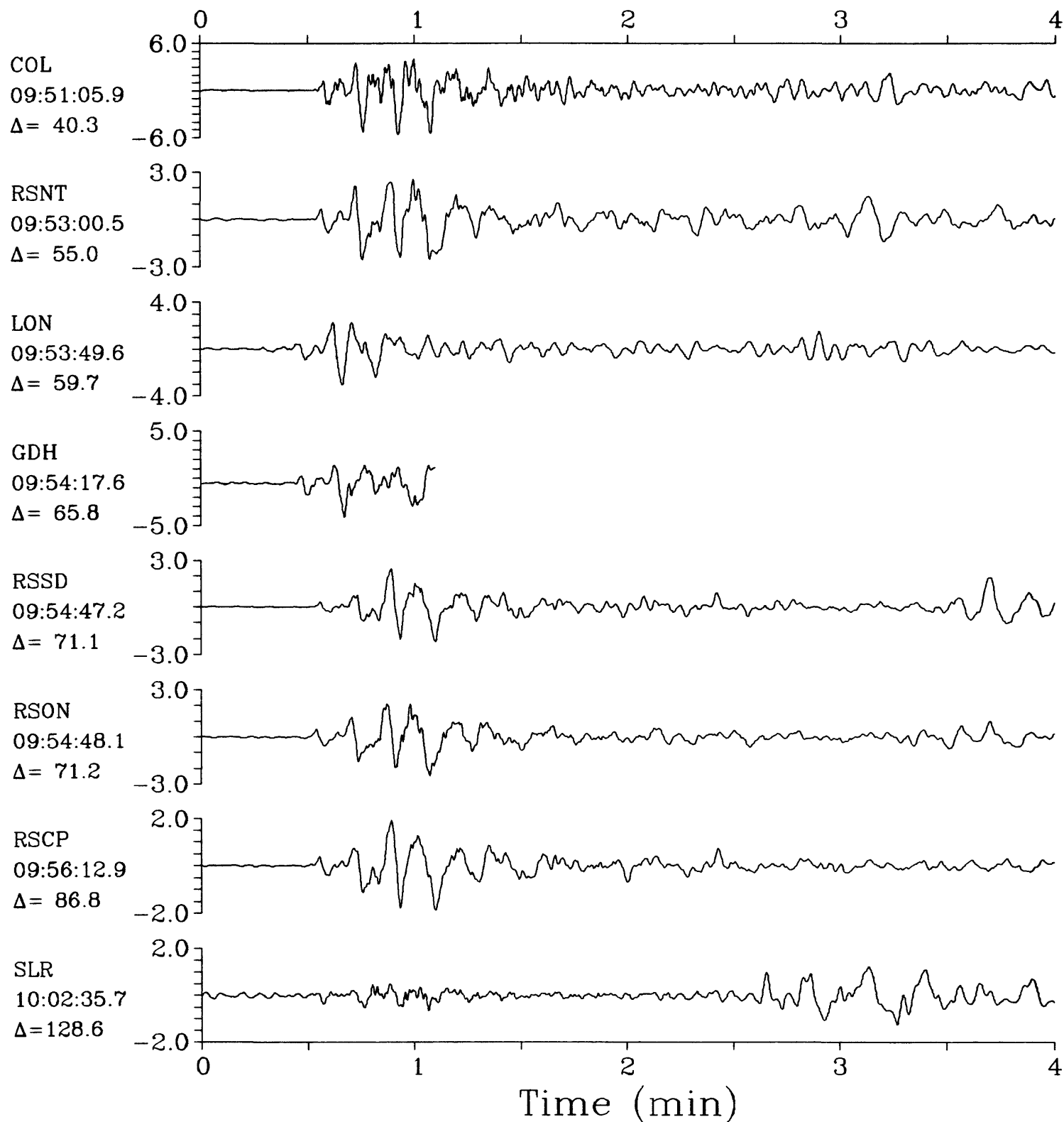




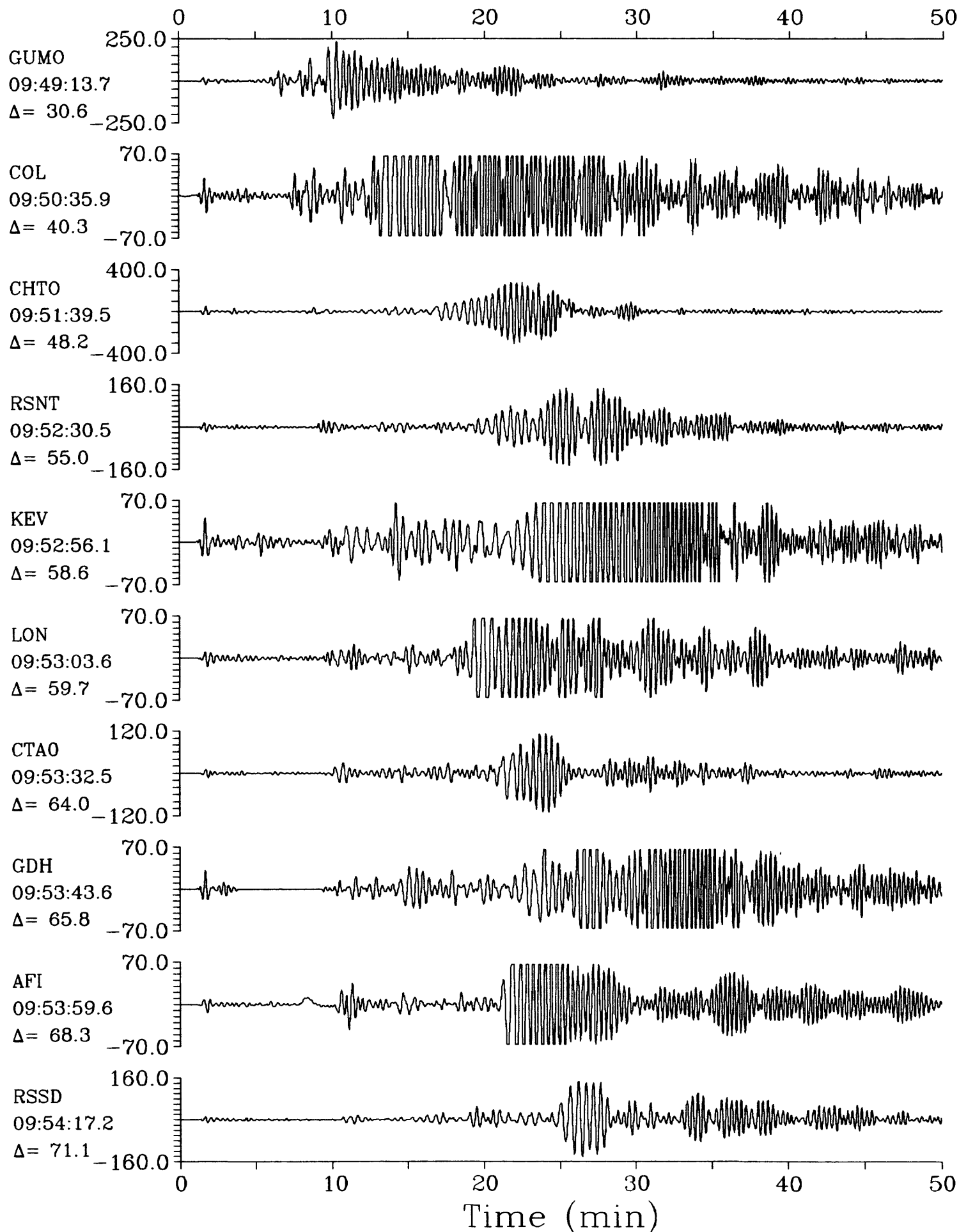
24 March 1984 09:44:02.61
Kuril Islands h=43.0 MB=6.1 ms=7.1



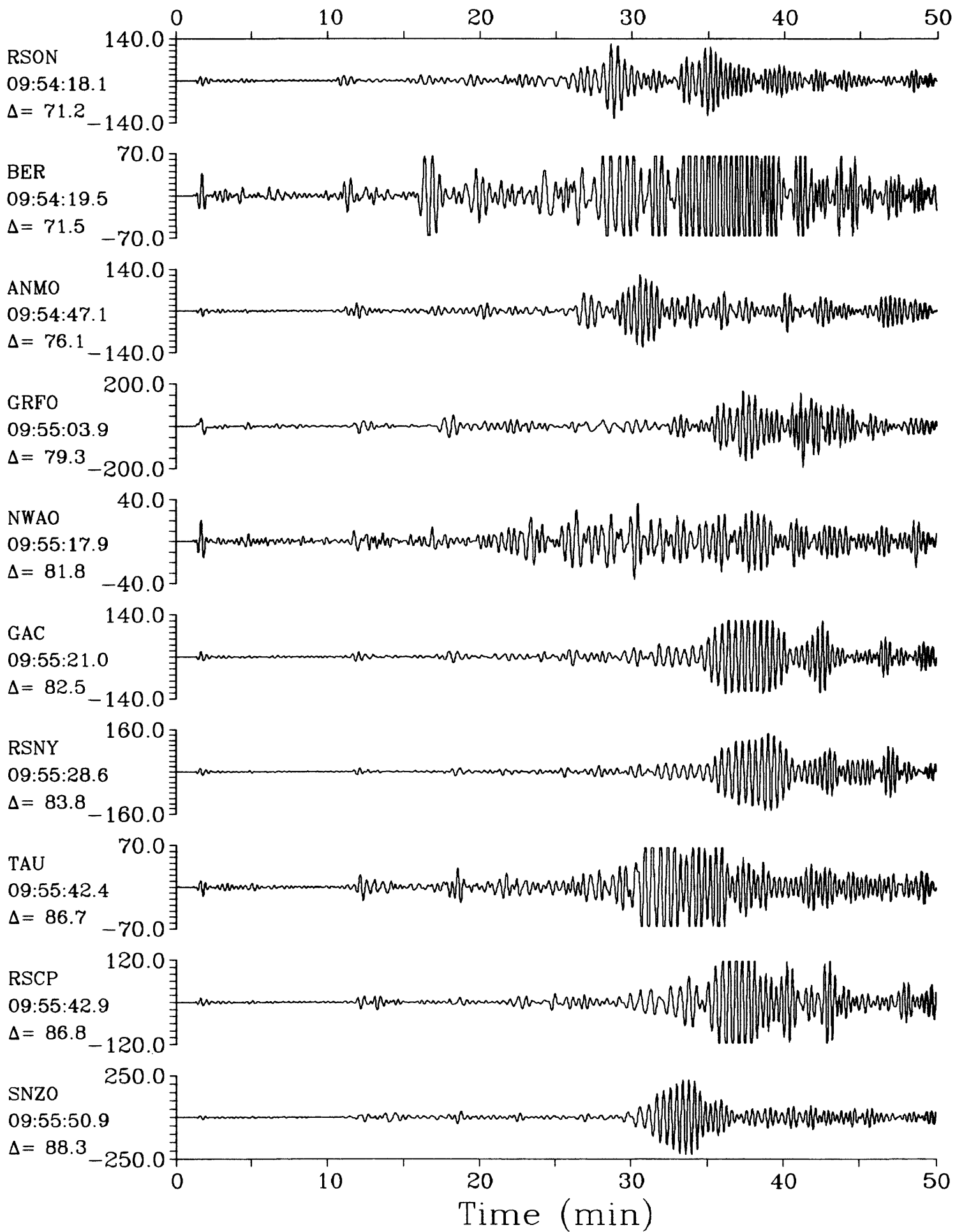
IPZ

24 March 1984 09:44:02.61
Kuril Islands h=43.0 MB=6.1 ms=7.1IPZ³³¹

24 March 1984 09:44:02.61
Kuril Islands h=43.0 MB=6.1 ms=7.1



Kuril Islands h=43.0 MB=6.1 ms=7.1



24 March 1984 09:44:02.61

LPZ

Kuril Islands h=43.0 MB=6.1 ms=7.1

