

MONTHLY TELESEISMIC BULLETIN of SZGRF-ERLANGEN - November 1998

H. Aichele, K. Klinge, R. Hohl

```

date          distance backazimut
station time   phase   comp per[s] ampl[nm] magn
. . . . .
SZGRF or NEIC-QED LOCATION
-----

```

1998-11-01

```

GRA1 14:56:08.7 e PKPdf Z
GRA1 14:56:17.2 e pPKPdf Z

```

1998-11-02 D 82.1 AZ128

```

GRA1 00:16:49.3 i P c Z mb4.7
ALIGN 00:16:49.3 T1.3 A9
GRA1 00:16:57.1 e pP Z
NEIC: OT 07:06:35.3 22.0N 121.3E dep 33km mb4.8
TAIWAN REGION
-----

```

1998-11-02 D148.1

```

GRA1 04:10:13.7 e PKPdf Z
GRA1 04:10:16.3 e PKPbc Z
GRA1 04:10:20.0 e PKPab Z
GRA1 05:23:00.9 e L Z T19.7 A583 MS5.4
NEIC: OT 03:50:31.7 19.5S 177.9E dep 33km mb5.2
SOUTH OF FIJI ISLANDS
-----

```

1998-11-02

```

GRA1 07:06:21.4 e PKPdf Z

```

1998-11-02 D 22.5 AZ343

```

GRA1 16:44:10.5 e P Z mb3.9
BEAM 16:44:10.5 T1.2 A6
GRA1 16:54:02.1 e L Z T19.1 A163 MS3.5
NEIC: OT 16:38:49.0 71.6N 12.3W dep 10km mb4.3
JAN MAYEN ISLAND REGION
-----

```

1998-11-02 D 79.7 AZ 4

```

GRA1 20:39:56.5 e P Z mb4.5
BEAM 20:39:56.5 T1.1 A7

```

1998-11-02 D 79.7 AZ 2
GRA1 20:50:10.4 e P Z mb4.3
BEAM 20:50:10.4 T0.8 A3

1998-11-02 D 80.7 AZ 28
GRA1 23:23:01.6 i P c Z mb5.7
ALIGN 23:23:01.6 T0.9 A82
GRA1 23:23:16.6 e pP Z
GRA1 23:23:24.1 e sP Z
GRA1 00:02:56.5 e L Z T19.4 A247 MS4.6
SZGRF: OT 23:10:56.2 43.6N 151.2E dep 54km
KURIL ISLANDS REGION

1998-11-03 D 85.8
GRA1 07:19:12.6 e P Z mb4.8
BEAM 07:19:12.6 T0.8 A6
GRA1 08:01:20.8 e L Z T19.0 A155 MS4.4

1998-11-04 D 59.8 AZ229
GRA1 00:32:09.1 e P Z
NEIC: OT 00:22:00.6 .8N 29.2W dep 10km mb4.7
CENTRAL MID-ATLANTIC RIDGE

1998-11-04
GRA1 21:30:28.6 e PKPdf Z

1998-11-04 D 48.3 AZ 77
GRA1 23:48:17.1 i P c Z mb5.4
ALIGN 23:48:17.1 T1.1 A32
GRA1 00:07:46.5 e L Z T21.7 A154 MS3.9
SZGRF: OT 23:39:40.0 38.2N 78.5E dep 33km
SOUTHERN SINKIANG PROV., CHINA

1998-11-05 D 97.5
GRA1 03:59:04.8 e Pdiff Z
GRA1 03:59:45.2 e Z
GRA1 04:40:38.3 e L Z T21.7 A237 MS4.6
NEIC: OT 03:45:15.6 10.3S 78.4W dep 33km mb5.4
NEAR COAST OF PERU

1998-11-05 D 95.1 AZ 64
GRA1 18:18:46.9 e Pdiff Z
GRA1 19:05:48.8 e L Z T18.5 A2778 MS5.8

```

-----
1998-11-05          D145.1
  GRA1 20:29:31.3 e PKPdf Z
  GRA1 20:29:32.4 e PKPbc Z
  GRA1 20:29:38.5 e PKPab Z
  GRA1 21:38:32.0 e L      Z T21.4 A520
-----

1998-11-05
  GRA1 22:26:05.5 e PKPdf Z
-----

1998-11-06          D122.5
  GRA1 08:21:50.0 e PP      Z
  GRA1 09:14:45.8 e L      Z T18.4 A1956 MS5.8
-----

1998-11-06          D 3.6 402km
  GRA1 12:14:18.5 e Pn      Z M14.1
  GRA1 12:15:15.2 e Sg      N
SZGRF: OT 12:13:20.6 51.5N 16.1E dep 1km
POLAND
-----

1998-11-06          D 76.2
  GRA1 20:41:12.0 e P      Z mb4.5
  ALIGN 20:41:12.0          Z T1.2 A5
  GRA1 20:41:18.9 e pP     Z
NEIC: OT 20:29:24.5 11.0N 92.6E dep 33km mb5.2
ANDAMAN ISLANDS, INDIA
-----

1998-11-06          D 75.9
  GRA1 23:03:57.5 e P      Z mb4.8
  BEAM 23:03:57.5          Z T1.5 A11
  GRA1 23:04:03.7 e pP     Z
  GRA1 23:43:19.4 e L      Z T18.7 A222 MS4.5
NEIC: OT 22:52:09.3 11.0N 92.6E dep 33km mb5.2
ANDAMAN ISLANDS, INDIA
-----

1998-11-07          D 79.4
  GRA1 05:47:41.6 e P      Z mb4.9
  ALIGN 05:47:41.6          Z T1.1 A14
  GRA1 05:47:58.7 e PcP    Z
  GRA1 05:48:04.1 e pP     Z
  GRA1 05:48:16.6 e sP     Z
  GRA1 05:49:58.9 e        Z
  GRA1 06:25:47.3 e L      Z T19.9 A328 MS4.7
NEIC: OT 05:35:41.3 41.6N 142.1E dep 79km mb4.7
HOKKAIDO, JAPAN REGION

```

1998-11-07 D 74.5
GRA1 09:18:27.0 i P d Z T0.9 A25 mb5.3
NEIC: OT 09:07:41.9 50.7N 149.8E dep500km mb4.5
SEA OF OKHOTSK

1998-11-07 D 87.4 AZ 50
GRA1 11:26:24.5 i P c Z T2.1 A81 mb5.5
GRA1 11:26:31.6 e pP Z
SZGRF: OT 11:13:40.2 26.9N 131.9E dep 24km
RYUKYU ISLANDS REGION

1998-11-08 D159.7
GRA1 00:25:29.1 e PKPdf Z
GRA1 00:26:09.3 e PKPab Z
GRA1 01:32:15.7 e L Z T21.6 A458 MS5.3
NEIC: OT 00:05:33.3 30.4S 177.4W dep 33km mb5.2
KERMADEC ISLANDS, NEW ZEALAND

1998-11-08 D 79.1 AZ 11
GRA1 03:10:52.8 e P Z mb4.4
BEAM 03:10:52.8 T0.9 A4
GRA1 03:11:05.0 e pP Z
SZGRF: OT 02:58:54.5 50.5N 174.4E dep 42km
ALEUTIAN ISLANDS REGION

1998-11-08
GRA1 04:15:26.2 e PKPab Z
GRA1 04:15:39.2 e pPKPab Z

1998-11-08 D109.8
GRA1 07:44:17.9 e PKiKP Z
GRA1 07:45:54.0 e PP Z
GRA1 07:47:47.8 e SKP Z
GRA1 08:37:52.7 e L Z T21.5 A3233 MS5.9
NEIC: OT 07:25:50.1 8.8S 121.4E dep 33km mb6.3
FLORES REGION, INDONESIA

1998-11-08 D 73.4 AZ354
GRA1 10:41:29.5 i P d Z mb5.6
ALIGN 10:41:29.5 T1.7 A78
GRA1 10:41:48.0 e (pP) Z
GRA1 11:19:19.6 e L Z T18.8 A712 MS5.0
NEIC: OT 10:29:59.7 56.8N 152.2W dep 33km mb4.9
KODIAK ISLAND REGION

1998-11-08 D 84.8 AZ 40
GRA1 12:53:06.4 i P c Z mb5.2

ALIGN 12:53:06.4 T1.0 A17
GRA1 12:53:30.5 e pP Z
SZGRF: OT 12:40:43.6 34.6N 140.5E dep 91km
NEAR EAST COAST OF HONSHU, JAPAN

1998-11-08 AZ135
GRA1 16:37:18.2 e (P) Z

1998-11-08 D 39.8 AZ107
GRA1 19:57:42.7 e P Z mb4.5
BEAM 19:57:42.7 T1.0 A11
SZGRF: OT 19:50:12.8
SOUTHERN IRAN

1998-11-08
GRA1 21:00:18.8 e PKPdf Z

1998-11-09 D 79.5 AZ 8
GRA1 00:00:49.6 e P Z mb5.0
ALIGN 00:00:49.6 T1.2 A19
GRA1 00:32:45.8 e L Z T20.2 A206 MS4.5
NEIC: OT 23:48:49.5 51.6N 180.0W dep 44km mb5.0
ANDREANOF ISLANDS, ALEUTIAN IS.

1998-11-09 D 88.1 AZ 97
GRA1 03:11:44.4 e P Z mb4.6
BEAM 03:11:44.4 T1.0 A3
SZGRF: OT 02:58:56.6
SOUTHWEST OF SUMATERA

1998-11-09 D 79.3
GRA1 03:12:43.4 e P Z mb4.6
ALIGN 03:12:43.4 T0.9 A6
GRA1 03:12:56.5 e (pP) Z
NEIC: OT 03:00:41.0 51.4N 179.9W dep 33km mb4.5
ANDREANOF ISLANDS, ALEUTIAN IS.

1998-11-09 D 83.3 AZ 53
GRA1 04:45:42.5 e P Z mb5.1
BEAM 04:45:42.5 T2.1 A26
NEIC: OT 04:33:06.3 23.7N 123.5E dep 33km mb4.7
SOUTHWESTERN RYUKYU ISLANDS

1998-11-09 D151.2
GRA1 05:17:31.4 e PKPdf Z
GRA1 05:17:39.5 e PKPab Z
GRA1 05:17:55.4 e (pPKPab) Z

NEIC: OT 04:57:41.0 21.2S 174.4W dep 53km mb5.2
TONGA ISLANDS

1998-11-09 D113.0

GRA1 05:48:49.9 e PKPdf Z

GRA1 05:49:01.4 e (pPKPbc)Z

GRA1 05:49:45.6 e PP Z

GRA1 05:52:06.7 e (SKP) Z

NEIC: OT 05:30:14.3 7.0S 129.0E dep 33km mb6.1
BANDA SEA

1998-11-09 D112.8

GRA1 05:57:23.3 e PKPdf Z

GRA1 05:58:16.9 e PP Z

NEIC: OT 05:38:44.0 6.9S 129.0E dep 33km mb6.4
BANDA SEA

1998-11-09

GRA1 18:33:03.6 i PKPdf c Z

NEIC: OT 18:13:21.9 21.4S 169.9E dep 33km mb4.7
LOYALTY ISLANDS REGION

1998-11-09 D112.9

GRA1 21:14:59.7 e PP Z

GRA1 22:07:43.2 e L Z T21.9 A376 MS4.9

NEIC: OT 20:55:33.6 7.1S 128.6E dep 33km mb5.2
BANDA SEA

1998-11-10 D 92.0 AZ 51

GRA1 00:25:11.4 e P Z mb4.9

BEAM 00:25:11.4 T1.2 A8

GRA1 00:28:50.4 e PP Z

GRA1 01:10:28.2 e L Z T20.5 A336 MS4.8

NEIC: OT 00:12:03.1 27.2N 142.8E dep 33km mb5.0
BONIN ISLANDS REGION

1998-11-10 D 23.0 AZ106

GRA1 05:44:40.7 e P Z

GRA1 05:54:34.6 e L Z T20.1 A328 MS3.8

NEIC: OT 05:39:34.3 39.2N 40.4E dep 33km mb4.5
TURKEY

1998-11-10

GRA1 06:06:58.8 e PKPdf Z

GRA1 06:07:12.4 e (pPKPdf)Z

1998-11-10

GRA1 08:19:14.5 e PKPdf Z
GRA1 08:19:22.4 e pPKPdf Z
NEIC: OT 07:59:41.3 15.0S 173.6W dep 65km mb4.7
TONGA ISLANDS

1998-11-10 D 27.9 AZ132
GRA1 08:47:38.9 e P Z mb4.7
BEAM 08:47:38.9 T1.0 A13
NEIC: OT 08:42:36.5 39.1N 39.9E dep 33km mb4.3
TURKEY

1998-11-10 D 25.9 AZ132
GRA1 16:00:00.9 e P Z mb4.4
BEAM 16:00:00.9 T1.4 A14
NEIC: OT 15:54:57.5 39.1N 40.4E dep 33km mb4.2
TURKEY

1998-11-11 D 90.5 AZ136
GRA1 00:01:19.0 e P d Z mb5.1
ALIGN 00:01:19.0 T1.0 A9
GRA1 00:01:26.2 e pP Z
NEIC: OT 23:48:13.7 27.6S 65.5E dep 10km mb4.7
SOUTH INDIAN OCEAN

1998-11-11 D113.1
GRA1 01:28:09.2 e PP Z
GRA1 02:07:45.4 e L Z T19.7 A183 MS4.7
SZGRF: OT 01:08:40.0 7.0S 129.0E dep 33km
BANDA SEA

1998-11-11
GRA1 09:04:46.7 e PKPdf Z
GRA1 09:04:56.0 e (pPKPdf)Z

1998-11-11 D 95.9 AZ142
GRA1 18:12:28.6 e P Z mb5.3
BEAM 18:12:28.6 T1.0 A9
GRA1 18:12:37.7 e pP Z
GRA1 18:54:52.2 e L Z T21.0 A210 MS4.6
NEIC: OT 17:59:13.6 35.9S 53.5E dep 10km mb5.0
SOUTHWEST INDIAN RIDGE

1998-11-11
GRA1 23:40:45.6 e PKPdf Z
GRA1 23:41:08.8 e (pPKPdf)Z

1998-11-11 D 83.7 AZ 37

GRA1 23:41:35.6 e P Z mb4.9
 BEAM 23:41:35.6 T0.9 A8
 SZGRF: OT 23:29:11.1 36.8N 142.6E dep 33km
 OFF EAST COAST OF HONSHU, JAPAN

 1998-11-11 D 79.4 AZ360
 GRA1 23:47:39.2 e P Z T1.7 A45 mb5.2
 GRA1 23:47:51.5 e pP Z
 NEIC: OT 23:35:46.4 53.6N 164.5W dep 33km mb4.8
 UNIMAK ISLAND REGION

 1998-11-12 D 84.6 AZ283
 GRA1 17:56:27.7 i P c Z mb5.1
 ALIGN 17:56:27.7 T1.3 A15
 GRA1 17:57:01.9 i pP Z
 SZGRF: OT 17:44:10.0 12.3N 84.9W dep135km
 NICARAGUA

 1998-11-13 D149.1
 GRA1 07:27:10.8 i PKPdf d Z
 GRA1 07:27:18.1 e PKPab Z
 NEIC: OT 07:08:25.5 20.2S 178.2W dep600km mb4.4
 FIJI ISLANDS REGION

 1998-11-13 D 24.4 AZ325
 GRA1 10:43:36.6 i P d Z mb4.9
 ALIGN 10:43:36.6 T1.1 A43
 GRA1 10:43:39.1 e (pP) Z
 GRA1 10:47:48.4 e S Z
 GRA1 10:52:15.3 e L Z T19.6 A813 MS4.2
 SZGRF: OT 10:38:18.4 66.0N 24.1W dep 10km
 ICELAND REGION

 1998-11-13 D 39.1 AZ108
 GRA1 13:08:35.4 e P Z mb5.3
 ALIGN 13:08:35.4 T1.3 A92
 GRA1 13:08:39.3 e pP Z
 GRA1 13:08:42.2 e sP Z
 GRA1 13:10:08.1 e PP Z
 GRA1 13:14:15.0 e S Z
 GRA1 13:14:36.2 e ScP Z
 GRA1 13:27:21.3 e L Z T19.0 A1202 MS4.7
 NEIC: OT 13:01:10.5 27.8N 53.6E dep 33km mb5.3
 SOUTHERN IRAN

 1998-11-13 D 24.4 AZ107
 GRA1 17:13:57.2 e (P) Z mb4.4
 BEAM 17:13:57.2 T2.1 A24
 GRA1 17:14:12.7 e (pP) Z

NEIC: OT 17:11:27.2 42.6N 3.0E dep 2km
PYRENEES

1998-11-13 D 36.9 AZ132
GRA1 17:21:23.6 e P Z mb4.4
BEAM 17:21:23.6 T1.2 A10
NEIC: OT 17:14:31.8 30.6N 50.3E dep 33km mb4.5
NORTHERN IRAN

1998-11-14 D 78.5 AZ 89
GRA1 04:50:20.9 i P d Z mb5.4
ALIGN 04:50:20.9 T1.1 A34
GRA1 04:50:29.1 e (pP) Z
NEIC: OT 04:38:19.6 8.8N 93.9E dep 33km mb5.1
NICOBAR ISLANDS, INDIA

1998-11-14 D 39.1 AZ109
GRA1 10:44:45.9 e P Z mb4.5
ALIGN 10:44:45.9 T1.1 A15
NEIC: OT 10:37:21.7 27.9N 53.5E dep 33km mb4.7
SOUTHERN IRAN

1998-11-14 D 22.5 AZ322
GRA1 14:29:07.5 e P Z mb4.8
BEAM 14:29:07.5 T1.3 A49
GRA1 14:37:47.0 e L Z T19.3 A665 MS4.1
NEIC: OT 14:24:07.0 64.0N 21.4W dep 10km mb4.8
ICELAND REGION

1998-11-14 D140.3
GRA1 15:22:23.1 e PKPdf Z
GRA1 15:25:50.2 e PP Z
GRA1 16:22:44.5 e L Z T21.5 A362 MS5.1
NEIC: OT 15:03:12.6 14.9S 167.3E dep119km mb5.5
VANUATU ISLANDS

1998-11-14 D 3.3 371km
GRA1 23:45:06.9 e Pg Z
GRA1 23:45:53.9 e Sg N

1998-11-15 D151.2
GRA1 03:03:43.5 i PKPdf d Z
GRA1 03:03:50.2 e PKPbc Z
GRA1 03:03:58.5 e PKPab Z
GRA1 03:04:29.4 e pPKPbc Z
GRA1 03:04:43.0 e pPKPab Z
GRA1 03:07:22.8 e PP Z
GRA1 04:08:28.9 e L Z T21.7 A513 MS5.3

NEIC: OT 02:44:12.4 21.5S 176.5W dep149km mb5.9
FIJI ISLANDS REGION

1998-11-15 D150.9

GRA1 03:12:47.5 e PKPdf d Z
SZGRF: OT 02:52:56.0 20.8S 173.9W dep 33km
TONGA ISLANDS

1998-11-15 D 91.9 AZ255

GRA1 08:35:16.7 i P d Z mb5.3
ALIGN 08:35:16.7 T1.4 A24
GRA1 08:37:31.1 e pP Z
NEIC: OT 08:23:08.7 9.3S 71.3W dep596km mb4.7
PERU-BRAZIL BORDER REGION

1998-11-15 D 73.3 AZ344

GRA1 10:40:09.8 e P Z mb4.5
BEAM 10:40:09.8 T0.9 A4
GRA1 10:40:19.6 e pP Z
NEIC: OT 10:28:36.4 56.4N 153.8W dep 0km mb4.6
KODIAK ISLAND REGION

1998-11-15 D147.4

GRA1 13:50:11.2 e PKPdf Z
GRA1 13:50:15.3 i PKPbc c Z
GRA1 13:50:24.9 e PKPab Z
GRA1 14:30:31.8 e L Z T21.7 A180 MS4.8
NEIC: OT 13:30:33.9 21.5S 169.8E dep 33km mb4.5
LOYALTY ISLANDS REGION

1998-11-15 D 40.3 AZ107

GRA1 20:38:00.7 e P c Z mb4.3
ALIGN 20:38:00.7 T1.2 A11
GRA1 20:38:05.5 e (pP) Z
SZGRF: OT 20:30:24.4 27.4N 55.4E dep 18km
SOUTHERN IRAN

1998-11-15

GRA1 21:51:29.1 e PKPdf Z
NEIC: OT 21:31:47.5 21.6S 169.9E dep 33km mb4.2
LOYALTY ISLANDS REGION

1998-11-15 D 81.0 AZ 38

GRA1 23:20:48.5 i P c Z mb4.9
ALIGN 23:20:48.5 T1.1 A16
GRA1 23:57:19.0 e L Z T19.4 A104 MS4.2
NEIC: OT 23:08:35.5 37.6N 137.3E dep 33km mb4.9
NEAR WEST COAST OF HONSHU, JAPAN

1998-11-16

GRA1 21:19:49.4 e P Z

1998-11-16AZ 67
GRA1 22:30:29.0 e P Z-----
1998-11-17D131.3
GRA1 03:35:26.0 e PKPdf Z
GRA1 04:28:29.3 e L Z T20.3 A1092 MS5.5
NEIC: OT 03:16:12.5 26.8S 113.2W dep 33km mb5.4
EASTER ISLAND REGION-----
1998-11-17D 86.6
GRA1 04:10:44.7 i P d Z mb5.2
BEAM 04:10:44.7 T1.9 A38
GRA1 04:10:50.6 e Z
GRA1 04:11:03.0 e Z
GRA1 04:43:59.5 e L Z T21.1 A4021 MS5.8
NEIC: OT 03:57:57.8 7.7N 82.8W dep 10km mb5.2
SOUTH OF PANAMA-----
1998-11-17D150.4
GRA1 17:26:42.2 e PKPdf Z
GRA1 17:26:49.4 e PKPbc Z
GRA1 17:26:59.3 e PKPab Z
GRA1 17:29:05.1 e (pPKPbc)Z
GRA1 17:53:33.5 e L Z T21.4 A79 MS4.5
NEIC: OT 17:08:02.5 21.5S 179.2W dep600km mb5.0
FIJI ISLANDS REGION-----
1998-11-17D 23.8 AZ357
GRA1 17:45:05.5 e P Z mb4.1
BEAM 17:45:05.5 T1.7 A12
NEIC: OT 11:40:39.5 20.9S 168.6E dep 33km mb4.9
LOYALTY ISLANDS-----
1998-11-17D 85.0 AZ 58
GRA1 22:40:06.3 e P Z mb5.5
BEAM 22:40:06.3 T1.6 A47
GRA1 22:40:13.4 e pP Z
GRA1 22:40:21.4 e sP Z
GRA1 22:43:23.5 e PP Z
GRA1 23:23:17.3 e L Z T18.1 A917 MS5.2
NEIC: OT 22:27:32.3 22.7N 120.9E dep 33km mb5.2
TAIWAN-----
1998-11-18

D 39.7 AZ 94

GRA1 07:46:56.4 e P d Z mb4.8
BEAM 07:46:56.4 T2.4 A59
GRA1 07:47:00.4 e Z
GRA1 07:47:09.0 e Z
GRA1 08:05:27.2 e L Z T21.8 A813 MS4.5
NEIC: OT 07:39:23.6 30.3N 57.4E dep 33km mb5.2
NORTHERN IRAN

1998-11-18 D 26.8 AZ105
GRA1 11:43:00.1 e P Z
GRA1 11:43:06.1 e Z
GRA1 11:43:14.6 e Z
GRA1 11:48:02.7 e S Z
GRA1 11:57:05.7 e L Z T18.3 A402 MS4.0
SZGRF: OT 11:37:20.0 37.2N 44.2E dep 33km
TURKEY-IRAN BORDER REGION

1998-11-18
GRA1 11:57:50.8 i PKPdf d Z

1998-11-18
GRA1 12:00:18.0 i PKPdf d Z

1998-11-18
GRA1 21:52:36.7 e (PKPab) Z

1998-11-18
GRA1 23:22:08.6 e PKPdf Z

1998-11-18
GRA1 23:40:00.0 e PKPdf Z

1998-11-18 D 3.6 398km
GRA1 23:55:17.0 e Pn Z M14.4
GRA1 23:56:14.2 e Sg E
SZGRF: OT 23:54:20.2 51.4N 16.1E dep 1km
POLAND

1998-11-19 D 23.2 AZ351
GRA1 10:22:53.4 e P Z mb4.4
BEAM 10:22:53.4 T1.8 A23
GRA1 10:23:00.0 e (pP) Z
GRA1 10:31:34.8 e L Z T21.6 A452 MS3.9
SZGRF: OT 10:17:48.8
JAN MAYEN ISLAND REGION

 1998-11-19 D 69.3 AZ 72
 GRA1 11:49:23.5 i P d Z mb5.4
 ALIGN 11:49:23.5 T1.2 A30
 GRA1 11:49:28.3 e (pP) Z
 GRA1 11:58:39.0 e S Z
 GRA1 12:23:05.9 e L Z T20.4 A2486 MS5.4
 SZGRF: OT 11:38:18.1 27.3N 100.5E dep 17km
 YUNNAN PROVINCE, CHINA

1998-11-19 D 3.6 400km
 GRA1 12:18:51.4 e Pn Z M13.6
 GRA1 12:19:49.2 e Sg E
 SZGRF: OT 12:17:54.4 51.5N 16.1E dep 1km
 POLAND

1998-11-19 D 87.6 AZ 59
 GRA1 15:52:10.2 e P c Z mb5.8
 ALIGN 15:52:10.2 T1.5 A71
 GRA1 15:52:16.0 e pP Z
 GRA1 15:52:22.6 e sP Z
 GRA1 15:55:35.8 e PP Z
 GRA1 16:35:46.0 e L Z T19.6 A9705 MS6.2
 NEIC: OT 15:39:22.5 22.6N 125.8E dep 33km mb5.8
 SOUTHEAST OF TAIWAN

1998-11-19
 GRA1 20:41:46.3 e PKPab Z

1998-11-19 D104.8
 GRA1 21:09:05.5 e PP Z
 GRA1 21:56:51.0 e L Z T20.7 A580 MS5.1
 NEIC: OT 20:50:31.6 1.6N 126.6E dep 33km mb5.5
 NORTHERN MOLUCCA SEA

1998-11-20 D 86.4 AZ 35
 GRA1 16:52:46.1 e P Z mb4.8
 ALIGN 16:52:46.1 T1.1 A9
 GRA1 16:52:58.6 e pP Z
 GRA1 17:30:16.9 e L Z T19.7 A145 MS4.4
 SZGRF: OT 16:40:09.5 35.6N 146.9E dep 43km
 OFF EAST COAST OF HONSHU, JAPAN

1998-11-20 D 58.4 AZ252
 GRA1 20:24:37.9 e P Z mb4.4
 BEAM 20:24:37.9 T1.1 A5
 GRA1 20:44:54.2 e L Z T21.2 A248 MS4.3
 NEIC: OT 20:14:39.2 12.7N 44.5W dep 10km mb4.6

NORTHERN MID-ATLANTIC RIDGE

 1998-11-20 D145.7
 GRA1 21:42:25.7 e PKPbc Z
 GRA1 21:42:29.3 e PKPab Z
 GRA1 21:44:16.2 e pPKPbc Z
 GRA1 21:44:20.3 e pPKPab Z
 NEIC: OT 21:23:35.3 16.1S 178.2W dep406km mb5.3
 FIJI ISLANDS REGION

1998-11-21 D 42.0 AZ 74
 GRA1 11:54:17.6 i P Z
 ALIGN 11:54:17.6 T1.2 A12
 NEIC: OT 11:46:07.2 42.2N 74.0E dep 10km mb4.6
 KYRGYZSTAN

1998-11-21 D 48.7 AZ 56
 GRA1 17:08:33.3 i P c Z mb5.3
 ALIGN 17:08:33.3 T1.1 A39
 GRA1 17:29:44.8 e L Z T20.6 A272 MS4.2

1998-11-21 D 69.0 AZ269
 GRA1 23:29:58.8 e P Z mb4.7
 BEAM 23:29:58.8 T1.0 A5
 SZGRF: OT 23:18:56.8
 CARIBBEAN SEA

1998-11-22 D124.0
 GRA1 06:03:50.4 e PKPdf Z
 GRA1 06:04:10.4 e pPKPdf Z
 GRA1 06:59:43.2 e L Z T21.4 A240 MS4.8
 NEIC: OT 05:44:57.9 4.9S 152.3E dep 75km mb5.0
 NEW BRITAIN REGION, P.N.G.

1998-11-22 D 3.6 402km
 GRA1 06:11:18.1 e Pn Z M13.4
 GRA1 06:12:16.9 e Sg E
 SZGRF: OT 06:10:21.3 51.4N 16.2E dep 1km
 POLAND

1998-11-22 D 84.3 AZ 58
 GRA1 19:13:14.1 i P d Z mb5.1
 ALIGN 19:13:14.1 T1.0 A12
 SZGRF: OT 19:00:46.4 24.8N 122.9E dep 33km
 TAIWAN REGION

1998-11-22 D 11.7
 GRA1 21:55:59.6 e Pn Z

GRA1 21:58:11.5 e (SnI) Z
NEIC: OT 21:52:49.7 38.2N 20.3E dep 5km mb4.9
GREECE

1998-11-23 D 92.3 AZ 65
GRA1 05:12:03.2 i P d Z mb5.3
ALIGN 05:12:03.2 T1.1 A17
GRA1 05:12:13.1 e pP Z
GRA1 05:12:16.4 e sP Z
GRA1 05:55:45.0 e L Z T19.8 A410 MS4.9
NEIC: OT 04:58:54.7 13.0N 120.4E dep 33km mb5.1
MINDORO, PHILIPPINE ISLANDS

1998-11-23 D 27.0 AZ104
GRA1 11:17:18.9 e P Z mb4.0
BEAM 11:17:18.9 T0.7 A2
GRA1 11:17:24.7 e Z
NEIC: OT 11:11:37.8 38.3N 45.1E dep 21km mb4.6
ARMENIA-AZERBAIJAN-IRAN BORD REG

1998-11-23 D148.1
GRA1 12:35:10.5 i PKPdf c Z
GRA1 12:35:14.4 i PKPbc c Z
GRA1 12:35:17.7 i PKPab d Z
GRA1 12:36:08.7 e pPKPbc Z
GRA1 12:36:13.3 e (pPKPab)Z
NEIC: OT 12:15:50.0 18.1S 175.0W dep208km mb5.1
TONGA ISLANDS

1998-11-23 D 48.0 AZ126
GRA1 19:25:23.2 e P Z mb5.1
BEAM 19:25:23.2 T2.2 A39
GRA1 19:25:29.4 e (pP) Z
GRA1 19:55:53.6 e L Z T22.0 A271 MS4.2
NEIC: OT 19:16:45.5 12.4N 47.5E dep 10km mb5.0
EASTERN GULF OF ADEN

1998-11-23 D 81.5 AZ 37
GRA1 20:00:24.9 i P d Z mb5.8
ALIGN 20:00:24.9 T1.2 A99
GRA1 20:00:46.0 i pP Z
SZGRF: OT 19:48:17.7 38.8N 141.4E dep 79km
NEAR EAST COAST OF HONSHU, JAPAN

1998-11-23 D 25.1 AZ 96
GRA1 20:09:48.3 e (P) Z

1998-11-23 D 78.6 AZ 24

GRA1 20:10:10.5 e P Z mb5.1
BEAM 20:10:10.5 T1.2 A22
NEIC: OT 19:58:26.1 45.1N 147.1E dep142km mb4.8
KURIL ISLANDS

1998-11-23 D146.6
GRA1 21:41:04.0 e PKPdf Z
GRA1 21:41:06.8 i PKPbc c Z
GRA1 21:41:10.2 e PKPab Z

1998-11-24 D100.7
GRA1 01:19:55.3 e Pdiff Z
GRA1 01:20:13.6 e (pPdiff)Z
GRA1 02:02:02.2 e L Z T20.8 A149 MS4.5
NEIC: OT 01:06:11.9 22.5S 69.2W dep 80km mb5.3
NORTHERN CHILE

1998-11-24
GRA1 15:39:20.6 e (Pdiff) Z

1998-11-24 D 82.8 AZ 37
GRA1 17:48:45.3 i P c Z T1.0 A38 mb5.6
GRA1 17:48:57.4 e pP Z
SZGRF: OT 17:36:26.6 37.7N 142.4E dep 42km
OFF EAST COAST OF HONSHU, JAPAN

1998-11-24 D146.1
GRA1 21:44:12.3 e PKPdf Z
GRA1 22:52:18.8 e L Z T19.3 A539 MS5.3
NEIC: OT 21:24:31.6 16.0S 172.7W dep 33km mb5.2
SAMOA ISLANDS REGION

1998-11-24 D 15.0 AZ151
GRA1 21:54:10.6 e P Z

1998-11-25 D146.4
GRA1 00:14:00.6 e PKPdf Z
GRA1 00:14:03.0 e PKPbc Z
GRA1 00:14:05.3 e PKPab Z
GRA1 00:15:01.1 e pPKPbc Z
GRA1 00:15:03.1 e pPKPab Z
GRA1 00:17:28.0 e PP Z
NEIC: OT 23:54:46.1 16.5S 174.8W dep223km mb5.3
TONGA ISLANDS

1998-11-25 D 49.1 AZ 62
GRA1 02:46:38.6 e P Z mb4.6
BEAM 02:46:38.6 T1.2 A7
NEIC: OT 02:37:48.9 47.6N 89.3E dep 33km mb4.6
NORTHERN XINJIANG, CHINA

1998-11-25 D 18.1 AZ150
GRA1 13:00:54.2 e P Z mb4.3
BEAM 13:00:54.2 T1.2 A28
GRA1 13:07:59.2 e L Z T18.8 A382 MS3.7
NEIC: OT 12:57:24.8 37.3N 21.1E dep 33km
SOUTHERN GREECE

1998-11-25
GRA1 18:02:37.0 e PKPdf Z
GRA1 18:02:47.1 e pPKPdf Z
NEIC: OT 17:42:45.5 20.5S 174.4W dep 33km mb4.6
TONGA ISLANDS

1998-11-25 D130.1
GRA1 18:24:32.4 e PKPdf Z
GRA1 18:24:45.1 e pPKPdf Z
GRA1 18:26:23.5 e Z
GRA1 18:26:46.0 e PP Z
GRA1 18:27:53.4 e (SKP) Z
GRA1 19:25:59.5 e L Z T20.4 A6492 MS6.3
NEIC: OT 18:05:25.8 7.8S 158.6E dep 47km mb5.9
SOLOMON ISLANDS

1998-11-26 D151.2
GRA1 00:03:20.1 i PKPdf d Z
GRA1 00:03:32.5 e PKPab Z
NEIC: OT 23:44:30.3 23.0S 179.6W dep600km mb4.6
SOUTH OF FIJI ISLANDS

1998-11-26 D 88.0 AZ 43
GRA1 10:23:03.0 e P Z mb5.1
BEAM 10:23:03.0 T1.8 A17
GRA1 10:23:11.4 e pP Z
GRA1 10:23:16.8 e sP Z
NEIC: OT 10:10:15.6 31.3N 141.0E dep 52km mb5.0
SOUTH OF HONSHU, JAPAN

1998-11-26 D 61.1 AZ 83
GRA1 10:24:36.4 i P d Z mb4.9
ALIGN 10:24:36.4 T0.7 A15
GRA1 10:24:44.4 e pP Z
NEIC: OT 10:14:23.0 27.7N 87.9E dep 33km mb5.2
NEPAL

1998-11-26

GRA1 13:31:43.3 e PKPdf Z

1998-11-26 D 81.6 AZ329

GRA1 20:02:10.0 e P Z mb4.6

BEAM 20:02:10.0 T1.1 A6

GRA1 20:37:31.7 e L Z T20.7 A438 MS4.8

NEIC: OT 19:49:53.0 40.6N 122.4W dep 26km mb5.0

NORTHERN CALIFORNIA

1998-11-26 D 84.0 AZ 59

GRA1 22:24:29.2 i P d Z mb4.9

BEAM 22:24:29.2 T0.9 A6

NEIC: OT 22:12:18.3 25.1N 122.5E dep182km mb4.7

TAIWAN REGION

1998-11-26 D 3.2 357km

GRA1 22:26:09.1 e Pn Z M13.6

GRA1 22:26:18.3 e Pg Z

GRA1 22:27:01.6 e Sg N

SZGRF: OT 22:25:19.0 46.6N 12.3E dep 10km

NORTHERN ITALY

1998-11-27 D 82.2 AZ328

GRA1 00:56:13.0 i P d Z mb5.6

ALIGN 00:56:13.0 T2.2 A115

GRA1 00:56:24.6 e Z

GRA1 00:56:31.1 e Z

GRA1 00:56:39.3 e Z

GRA1 00:59:18.3 e PP Z

GRA1 01:32:35.1 e L Z T20.7 A1162 MS5.2

SZGRF: OT 00:43:52.5 40.6N 125.1W dep 5km

OFF COAST OF NORTHERN CALIFORNIA

1998-11-27 D166.4

GRA1 09:14:04.7 e PKPab Z

GRA1 09:14:16.6 e pPKPab Z

GRA1 09:17:52.7 e PP Z

NEIC: OT 08:53:34.0 29.1S 177.2W dep 33km mb5.4

KERMADEC ISLANDS, NEW ZEALAND

1998-11-27

GRA1 14:43:01.3 e (PKPab) Z

1998-11-28 D 92.7 AZ260

GRA1 10:11:07.8 i P d Z mb5.5

ALIGN 10:11:07.8 T1.5 A32
NEIC: OT 09:58:09.9 7.6S 74.4W dep149km mb5.3
PERU-BRAZIL BORDER REGION

1998-11-28 D142.8
GRA1 15:40:35.2 e PKPdf Z
GRA1 16:40:57.6 e L Z T19.8 A1742 MS5.8
NEIC: OT 15:21:05.1 15.4S 173.0E dep 33km mb5.5
VANUATU ISLANDS REGION

1998-11-28 D 39.4 AZ 96
GRA1 18:24:32.4 e P Z
NEIC: OT 18:16:58.7 32.9N 60.4E dep 33km
NORTHERN IRAN

1998-11-28 D 3.7 410km
GRA1 20:15:17.5 e Pn Z M13.9
GRA1 20:16:16.6 e Sg N
SZGRF: OT 20:14:19.2 51.5N 16.2E dep 1km
POLAND

1998-11-28
GRA1 21:47:32.7 e (PKPab) Z

1998-11-28 D 76.7 AZ357
GRA1 21:57:42.6 i P c Z mb5.3
ALIGN 21:57:42.6 T1.0 A25
NEIC: OT 21:45:55.3 54.3N 163.0W dep 33km mb5.0
UNIMAK ISLAND REGION

1998-11-29 D106.5
GRA1 14:24:49.3 e Pdiff Z
GRA1 14:29:10.5 e PP Z
GRA1 15:22:06.3 e L Z T18.3 A178084 MS7.7
NEIC: OT 14:10:31.4 2.1S 124.9E dep 33km mb6.5
CERAM SEA

1998-11-29 D 76.2 AZ 23
GRA1 17:25:05.8 i P c Z mb5.4
ALIGN 17:25:05.8 T0.9 A29
NEIC: OT 17:13:59.8 48.1N 148.4E dep389km mb4.9
NORTHWEST OF KURIL ISLANDS

1998-11-29 D106.5
GRA1 17:46:44.8 e Pdiff Z
NEIC: OT 17:32:32.3 1.9S 124.8E dep 33km mb5.7
SOUTHERN MOLUCCA SEA

1998-11-29 D 97.5

GRA1 22:31:30.9 e Pdiff Z

NEIC: OT 22:18:00.4 6.0S 105.6E dep 52km mb5.2

SUNDA STRAIT

1998-11-30 D 78.2 AZ 3

GRA1 02:22:40.1 i P d Z mb5.1

ALIGN 02:22:40.1 T1.1 A16

GRA1 02:23:32.0 e pP Z

NEIC: OT 02:11:00.4 52.6N 176.5W dep175km mb4.7

ANDREANOF ISLANDS, ALEUTIAN IS.

1998-11-30 D 20.1 AZ128

GRA1 09:49:05.1 i P d Z mb4.4

ALIGN 09:49:05.1 T0.8 A20

SZGRF: OT 09:44:33.5 35.3N 30.5E dep 33km

EASTERN MEDITERRANEAN SEA

1998-11-30 D125.1

GRA1 21:17:34.6 e PKPdf Z

GRA1 21:17:45.9 e (pPKPdf)Z

NEIC: OT 20:58:36.0 5.9S 151.3E dep 33km mb5.4

NEW BRITAIN REGION, P.N.G.
