

MONTHLY TELESEISMIC BULLETIN of SZGRF-ERLANGEN - December 1999

H. Aichele, K. Klinge, R. Hohl

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date          distance backazimut
station time   phase   comp per[s] ampl[nm] magn
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SZGRF or NEIC-QED LOCATION
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1999-12-01      D 10.8
  GRA1 18:24:03.5 e P      c Z
  ALIGN 18:24:03.5                T1.0  A24
NEIC: OT 18:21:35.9 39N      16E  dep268km mb4.4
  SOUTHERN ITALY
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1999-12-01
  GRA1 19:35:12.4 i P      c Z                mb5.9
  ALIGN 19:35:12.4                T2.2  A317
  GRA1 19:37:56.5 e PP     Z
  GRA1 20:11:10.1 e L      Z  T18.1  A7842  MS6.1
NEIC: OT 19:23:07.6 18N      82W  dep 10km  mb5.8
  CARIBBEAN SEA
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1999-12-01      D147.8
  GRA1 22:05:06.2 e PKPdf  Z
  GRA1 23:11:47.7 e L      Z  T21.7  A607  MS5.3
NEIC: OT 21:45:22.4 22S     170E  dep 33km  mb5.1
  LOYALTY ISLANDS REGION
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1999-12-02      D 76.7
  GRA1 01:44:52.8 e P      Z                mb5.4
  BEAM 01:44:52.8                T1.6  A54
NEIC: OT 01:33:05.6 11N     70W  dep 33km  mb5.2
  NEAR COAST OF VENEZUELA
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1999-12-02      D135.7
  GRA1 02:13:49.6 e PKPdf  Z
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1999-12-02      D 78.8  AZ288
  GRA1 10:41:51.9 e P      Z                mb4.6
  BEAM 10:41:51.9                T0.9  A6
NEIC: OT 10:29:47.3 18N     82W  dep 10km  mb5.1
  CARIBBEAN SEA

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1999-12-02      D 92.4
  GRA1 12:53:42.6 e P      Z
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1999-12-03      D 23.9 AZ108
  GRA1 17:12:07.2 e P      Z      mb5.4
  BEAM 17:12:07.2          T1.0  A134
  GRA1 17:12:59.1 e (PP)   Z
  GRA1 17:16:29.3 e S      N
  GRA1 17:22:43.7 e L      Z      T20.3 A3804  MS4.9
NEIC:  OT 17:06:54.5 40N    42E  dep 14km  mb5.4
TURKEY
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1999-12-03      D 33.3 AZ101
  GRA1 20:12:07.5 e P      Z      mb5.1
  ALIGN 20:12:07.5          T1.2  A30
NEIC:  OT 20:06:56.7 40N    42E  dep 33km  mb4.6
TURKEY
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1999-12-04      D 26.7 AZ306
  GRA1 02:07:15.7 e P      Z      mb4.6
  BEAM 02:07:15.7          T1.2  A14
  GRA1 02:11:21.0 e (S)    Z
  GRA1 02:16:47.5 e L      Z      T21.8 A4436  MS5.0
NEIC:  OT 02:01:35.0 58N    33W  dep 10km  mb4.9
NORTH ATLANTIC OCEAN
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1999-12-04      D 3.6 403km
  GRA1 04:03:59.0 e Pn     Z      M14.4
  GRA1 04:04:57.6 e Sg     N
SZGRF: OT 04:03:02.1 52N    16E  dep 1km
POLAND
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1999-12-04
  GRA1 05:18:32.9 i P      c Z      mb5.5
  ALIGN 05:18:32.9          T1.0  A33
  GRA1 05:18:49.4 e pP     Z
SZGRF: OT 05:06:16.2 36N    139E  dep 59km
HONSHU, JAPAN
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1999-12-04      D 76.1 AZ 19
  GRA1 06:06:58.7 i P      c Z      mb4.9
  ALIGN 06:06:58.7          T1.0  A10
SZGRF: OT 05:55:16.1
OFF EAST COAST OF KAMCHATKA
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1999-12-04      D104.6
  GRA1 07:59:05.2 e Pdiff  Z

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GRA1 08:03:26.4 e PP Z  
GRA1 08:49:23.8 e L Z T20.6 A513 MS5.0  
NEIC: OT 07:45:01.4 3N 128E dep 33km mb5.8  
NORTH OF HALMAHERA, INDONESIA

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1999-12-04 D 79.2 AZ 1  
GRA1 08:58:59.7 i P c Z mb4.9  
ALIGN 08:58:59.7 T1.1 A16  
NEIC: OT 08:46:56.7 51N 178W dep 33km mb5.3  
ANDREANOF ISLANDS, ALEUTIAN IS.

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1999-12-04 D123.0  
GRA1 15:27:53.1 e PKPdf Z  
GRA1 16:06:19.2 e L Z T20.0 A254 MS4.9  
NEIC: OT 15:08:58.3 3S 151E dep 33km mb4.9  
NEW IRELAND REGION, P.N.G.

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1999-12-04 D106.2  
GRA1 17:25:24.7 e PP Z  
GRA1 17:25:36.5 e (pPP) Z  
GRA1 17:26:02.3 e Z  
GRA1 17:34:46.8 e SKS Z  
GRA1 18:10:28.4 e L Z T19.0 A706 MS5.2  
NEIC: OT 17:06:50.8 28S 71W dep 33km mb5.5  
NEAR COAST OF CENTRAL CHILE

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1999-12-04 D 66.1 AZ148  
GRA1 17:36:39.0 e P Z mb5.1  
BEAM 17:36:39.0 T2.0 A27  
SZGRF: OT 17:25:53.2  
MOZAMBIQUE

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1999-12-04 D112.8  
GRA1 19:04:23.2 e (PP) Z  
SZGRF: OT 18:45:24.6 8S 128E dep213km  
BANDA SEA

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1999-12-05 D 37.8 AZ106  
GRA1 00:13:49.3 e P Z mb4.7  
ALIGN 00:13:49.3 T1.6 A26  
SZGRF: OT 00:06:43.4 29N 52E  
SOUTHERN IRAN

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1999-12-05 D146.1  
GRA1 01:11:26.8 e PKPdf Z  
NEIC: OT 00:52:21.4 16S 177W dep300km mb4.9  
FIJI ISLANDS REGION

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1999-12-05 D 79.5 AZ 9

GRA1 05:09:31.8 e P Z mb4.2  
BEAM 05:09:31.8 T1.0 A3  
SZGRF: OT 04:57:29.8  
RAT ISLANDS, ALEUTIAN ISLANDS

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1999-12-05 D 77.7  
GRA1 07:40:05.4 e P Z mb4.8  
BEAM 07:40:05.4 T0.9 A6  
GRA1 07:40:16.4 e Z  
GRA1 07:40:49.9 e pP Z  
GRA1 07:40:59.9 e Z  
NEIC: OT 07:28:32.9 43N 139E dep217km mb4.8  
EASTERN SEA OF JAPAN

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1999-12-05 D101.9  
GRA1 09:06:09.3 e Pdiff Z  
GRA1 09:56:10.9 e L Z T20.8 A374 MS4.9  
NEIC: OT 08:52:19.8 5N 126E dep 33km mb5.2  
MINDANAO, PHILIPPINE ISLANDS

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1999-12-05 D 39.0 AZ 92  
GRA1 13:19:56.2 i P c Z mb4.6  
ALIGN 13:19:56.2 T1.3 A18  
SZGRF: OT 13:12:33.0 35N 61E dep 33km  
TURKMEN-AFGHANISTAN BORDER REG.

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1999-12-05  
GRA1 13:22:06.6 e PKPdf Z  
GRA1 13:22:11.4 e pPKPdf Z

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1999-12-05 D 26.1 AZ305  
GRA1 16:27:32.5 e P Z mb4.2  
BEAM 16:27:32.5 T1.3 A9  
GRA1 16:27:36.8 e (pP) Z  
GRA1 16:28:12.8 e Z  
GRA1 16:32:05.4 e S Z  
GRA1 16:37:03.8 e L Z T20.8 A4520 MS5.0  
SZGRF: OT 16:22:00.2 58N 31W dep 17km  
NORTH ATLANTIC OCEAN

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1999-12-05  
GRA1 18:35:26.1 e PKPdf Z

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1999-12-05  
GRA1 22:12:36.9 i P d Z  
GRA1 22:14:18.7 e pP Z  
GRA1 22:16:07.3 e PP Z

GRA1 22:51:58.9 e L Z T19.6 A144 MS4.4  
 SZGRF: OT 22:00:40.9 30N 138E dep451km  
 SOUTH OF HONSHU, JAPAN

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 1999-12-05 D 23.9 AZ 99  
 GRA1 22:19:49.9 e P Z mb4.6  
 BEAM 22:19:49.9 T1.3 A26  
 GRA1 22:19:57.5 e pP Z  
 SZGRF: OT 22:14:46.2 41N 43E dep 30km  
 TURKEY-USSR BORDER REGION

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 1999-12-05 D 44.8 AZ 83  
 GRA1 23:02:03.0 e P Z mb4.7  
 BEAM 23:02:03.0 T1.6 A14  
 SZGRF: OT 22:53:52.1 37N 72E dep 25km  
 AFGHANISTAN-USSR BORDER REGION

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 1999-12-06  
 GRA1 07:41:23.0 i P c Z mb5.4  
 ALIGN 07:41:23.0 T1.1 A54  
 GRA1 07:41:28.9 e pP Z  
 GRA1 07:41:33.2 e sP Z  
 GRA1 07:47:01.3 e PcS N  
 GRA1 07:48:07.0 e S Z  
 GRA1 07:51:24.4 e SS Z  
 GRA1 08:00:51.2 e L Z T18.8 A1330 MS4.9  
 SZGRF: OT 07:33:14.4 44N 77E dep 24km  
 ALMA-ATA REGION

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 1999-12-06 D 73.0 AZ351  
 GRA1 23:23:56.2 i P c Z mb7.0  
 ALIGN 23:23:56.2 T1.0 A1331  
 GRA1 23:24:02.9 e Z  
 GRA1 23:24:12.3 e pP Z  
 GRA1 23:24:24.0 e pX Z  
 GRA1 23:33:22.5 e S T  
 GRA1 23:51:29.5 e PKPPKP Z  
 GRA1 23:55:06.9 e L Z T25.1 A81296 MS6.9  
 NEIC: OT 23:12:30.0 57N 155W dep 33km mb6.5  
 KODIAK ISLAND REGION

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 1999-12-06 D 73.0 AZ350  
 GRA1 23:34:22.1 i P d Z mb5.9  
 ALIGN 23:34:22.1 T0.9 A98  
 GRA1 23:34:34.4 e pP Z  
 GRA1 23:34:39.0 e sP Z  
 SZGRF: OT 23:22:58.6 57N 152W dep 42km  
 KODIAK ISLAND REGION

1999-12-07

GRA1 00:00:40.0 e P Z  
 GRA1 00:00:51.8 e pP Z  
 GRA1 00:00:58.4 e sP Z

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1999-12-07 D 73.0

GRA1 00:31:14.8 i P c Z mb6.8  
 ALIGN 00:31:14.8 T0.9 A778  
 GRA1 00:31:28.3 e pP Z  
 GRA1 00:31:35.7 e sP Z  
 NEIC: OT 00:19:50.1 57N 154W dep 44km mb6.5  
 KODIAK ISLAND REGION

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1999-12-07 D 72.8

GRA1 00:37:54.9 i P c Z mb5.5  
 ALIGN 00:37:54.9 T1.0 A37  
 GRA1 00:40:34.9 e (PP) Z  
 SZGRF: OT 00:26:15.0 57N 155W dep 33km  
 KODIAK ISLAND REGION

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1999-12-07 D 73.0

GRA1 00:53:06.9 e P Z mb5.1  
 ALIGN 00:53:06.9 T0.9 A14  
 GRA1 00:53:13.7 e (pP) Z  
 NEIC: OT 00:41:30.2 57N 154W dep 46km mb4.5  
 KODIAK ISL REGION

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1999-12-07 D 41.8 AZ262

GRA1 02:43:43.1 e P Z mb4.5  
 BEAM 02:43:43.1 T1.6 A17  
 GRA1 02:43:47.3 e (pP) Z  
 GRA1 02:58:19.8 e L Z T21.5 A1426 MS4.8  
 NEIC: OT 02:35:48.0 32N 40W dep 10km mb4.7  
 NORTHERN MID-ATLANTIC RIDGE

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1999-12-07 D 51.5 AZ344

GRA1 05:45:01.2 i P d Z mb5.1  
 ALIGN 05:45:01.2 T1.1 A31  
 GRA1 05:45:10.2 e (pP) Z  
 NEIC: OT 05:35:55.0 76N 121W dep 10km mb4.9  
 QUEEN ELIZABETH ISLANDS, CANADA

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1999-12-07 D 23.9

GRA1 13:14:21.6 e P Z  
 SZGRF: OT 13:09:13.0 40N 42E dep 33km  
 TURKEY

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1999-12-07 D 73.0

GRA1 17:55:10.7 e P Z mb4.8  
BEAM 17:55:10.7 T0.8 A6  
GRA1 17:55:25.5 e pP Z  
GRA1 17:55:32.0 e sP Z  
NEIC: OT 17:43:47.3 58N 154W dep 57km mb4.3  
KODIAK ISLAND REGION

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1999-12-07 D146.2  
GRA1 21:49:09.5 e PKPbc Z  
GRA1 21:49:15.3 e PKPab Z  
GRA1 21:49:52.9 e pPKPab Z  
GRA1 21:53:09.5 e PP Z  
GRA1 21:59:23.4 e (SKKS) Z  
NEIC: OT 21:29:49.3 16S 174W dep137km mb6.2  
TONGA ISLANDS

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1999-12-08 D 44.4 AZ 83  
GRA1 00:52:17.2 i P c Z mb5.0  
ALIGN 00:52:17.2 T0.8 A24  
GRA1 00:53:00.2 e pP Z  
GRA1 00:53:19.3 e (sP) Z  
NEIC: OT 00:44:24.9 36N 71E dep213km mb4.9  
HINDU KUSH REGION, AFGHANISTAN

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1999-12-08 D101.4  
GRA1 10:43:06.6 e Pdiff Z  
GRA1 10:43:16.9 e pPdiff Z  
GRA1 11:33:56.6 e L Z T19.6 A456 MS5.0  
NEIC: OT 10:29:17.2 6N 127E dep 33km mb5.5  
MINDANAO, PHILIPPINE ISLANDS

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1999-12-08 D132.5  
GRA1 13:54:04.2 e PKPdf Z  
GRA1 14:56:22.5 e L Z T19.0 A2524 MS5.9  
NEIC: OT 13:34:44.4 10S 160E dep 33km mb5.6  
SOLOMON ISLANDS

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1999-12-08 D101.4  
GRA1 17:18:58.8 e Pdiff Z  
GRA1 17:19:08.9 e pPdiff Z  
NEIC: OT 17:05:10.9 6N 126E dep 48km mb5.2  
MINDANAO, PHILIPPINE ISLANDS

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1999-12-08 D 79.1 AZ111  
GRA1 21:20:12.4 e P Z mb4.6  
BEAM 21:20:12.4 T1.5 A8  
SZGRF: OT 21:08:10.4  
SOUTH INDIAN OCEAN

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1999-12-08 D 91.7 AZ301  
GRA1 22:14:18.8 e P c Z mb5.2  
BEAM 22:14:18.8 T1.5 A18  
GRA1 22:14:25.0 e pP Z  
NEIC: OT 22:01:13.1 19N 104W dep 33km mb4.6  
NEAR COAST OF JALISCO, MEXICO

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1999-12-08 D 73.0  
GRA1 23:22:47.6 e P Z mb4.6  
BEAM 23:22:47.6 T0.9 A4  
GRA1 23:23:00.3 e pP Z  
GRA1 23:23:05.9 e sP Z  
NEIC: OT 23:11:22.3 57N 154W dep 33km mb4.5  
KODIAK ISLAND REGION

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1999-12-09 D 28.5  
GRA1 03:06:30.2 e P Z mb4.5  
ALIGN 03:06:30.2 T1.1 A8  
GRA1 03:06:35.9 e (pP) Z  
GRA1 03:14:31.8 e L Z T21.3 A244 MS3.8  
NEIC: OT 03:00:33.7 37N 24W dep 10km mb5.0  
AZORES ISLANDS REGION

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1999-12-09 D123.2  
GRA1 06:48:55.2 e PKPdf Z  
NEIC: OT 06:29:56.2 7S 149E dep 33km mb4.8  
EASTERN NEW GUINEA REG., P.N.G.

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1999-12-09 D123.6  
GRA1 10:37:09.8 e PKPdf Z  
GRA1 10:37:24.7 e (pPKPdf) Z  
GRA1 11:33:45.2 e L Z T19.8 A3030 MS6.0  
NEIC: OT 10:18:17.1 6S 148E dep 58km mb5.7  
NEW BRITAIN REGION, P.N.G.

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1999-12-09 D 73.7 AZ 5  
GRA1 13:46:57.4 e P Z mb4.6  
BEAM 13:46:57.4 T1.0 A6  
NEIC: OT 13:35:24.5 55N 166E dep 33km mb4.7  
KOMANDORSKY ISLANDS REGION

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1999-12-09 D 33.2  
GRA1 22:27:14.5 e P Z mb4.5  
BEAM 22:27:14.5 T1.3 A8  
NEIC: OT 22:20:29.7 37N 55E dep 33km mb4.8  
NORTHERN IRAN

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1999-12-10 D 68.2 AZ202  
GRA1 00:04:33.5 e P Z mb4.9



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BEAM 00:04:33.5          T1.1  A10
GRA1 00:04:41.1 e pP      Z
SZGRF: OT 23:53:28.0 16S 10W dep 27km
SOUTH ATLANTIC RIDGE
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1999-12-10      D 44.8  AZ 83
GRA1 02:19:51.8 e P      Z          mb5.4
ALIGN 02:19:51.8          T1.5  A69
GRA1 02:20:18.1 e pP      Z
GRA1 02:20:26.8 e sP      Z
GRA1 02:21:38.1 e PP      Z
NEIC: OT 02:11:46.7 36N 71E dep114km mb5.3
AFGHANISTAN-TAJIKISTAN BORD REG.
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1999-12-10      D151.1
GRA1 03:53:25.9 e PKPdf d Z
GRA1 03:53:32.9 i PKPbc d Z
GRA1 03:53:43.6 e PKPab  Z
NEIC: OT 03:34:45.4 22S 180E dep599km mb5.2
SOUTH OF FIJI ISLANDS
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1999-12-10      D127.6
GRA1 18:57:39.5 e PKPdf  Z
GRA1 18:57:54.3 e pPKPdf Z
GRA1 19:46:21.8 e L      Z  T21.5  A3997  MS6.1
NEIC: OT 18:38:29.3 36S 97W dep 10km mb5.7
WEST CHILE RISE
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1999-12-10      D125.8
GRA1 20:26:01.0 e PKPdf  Z
NEIC: OT 20:07:00.5 36S 97W dep 10km mb5.2
WEST CHILE RISE
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1999-12-11      D121.3
GRA1 00:59:32.0 e PKPdf  Z
NEIC: OT 00:40:36.5 31S 93W dep 10km mb5.2
SOUTHEAST CENTRAL PACIFIC OCEAN
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1999-12-11      D 79.8  AZ 5
GRA1 03:07:20.0 e P      Z          mb4.8
ALIGN 03:07:20.0          T1.2  A15
NEIC: OT 02:55:20.0 51N 179W dep 58km mb5.0
ANDREANOF ISLANDS, ALEUTIAN IS.
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1999-12-11      D 86.7  AZ280
GRA1 05:14:46.3 e P      Z          mb4.8
BEAM 05:14:46.3          T1.5  A13
NEIC: OT 05:02:05.0 9N 84W dep 33km mb4.4
OFF COAST OF COSTA RICA

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 1999-12-11 D139.4  
 GRA1 07:37:46.1 e PKPdf Z  
 NEIC: OT 07:18:41.4 14S 167E dep200km mb5.0  
 VANUATU ISLANDS  
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1999-12-11  
 GRA1 09:22:51.7 e PKPdf Z

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 1999-12-11 D147.0  
 GRA1 14:56:44.9 e PKPdf Z  
 GRA1 14:56:49.0 i PKPbc c Z  
 GRA1 14:56:52.5 e PKPab Z  
 GRA1 14:58:57.4 e (pPKPbc)Z  
 NEIC: OT 14:38:06.6 18S 179W dep558km mb5.2  
 FIJI ISLANDS REGION  
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 1999-12-11 D 90.0 AZ 65  
 GRA1 18:16:32.9 i P d Z mb7.1  
 ALIGN 18:16:32.9 T2.6 A3012  
 GRA1 18:16:46.2 e pP Z  
 GRA1 18:16:52.4 e (sP) Z  
 GRA1 18:17:00.4 e Z  
 GRA1 18:17:08.1 e Z  
 GRA1 18:19:58.6 e PP Z  
 GRA1 18:34:06.8 e PKKPdf Z  
 GRA1 18:34:10.6 e PKKPbc Z  
 GRA1 18:42:16.4 e PKPPKPdfZ  
 GRA1 18:59:07.7 e L Z T20.6 A101329 MS7.2  
 SZGRF: OT 18:03:38.9 16N 121E dep 47km  
 LUZON, PHILIPPINE ISLANDS  
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 1999-12-12 D130.6  
 GRA1 00:02:13.8 e PKPdf Z  
 GRA1 00:02:21.5 e pPKPdf Z  
 SZGRF: OT 23:42:33.6 S 172W dep 25km  
 PHOENIX ISLANDS REGION  
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 1999-12-12 D 89.7 AZ 64  
 GRA1 01:24:23.4 e P Z mb5.1  
 BEAM 01:24:23.4 T1.1 A15  
 GRA1 02:07:12.9 e L Z T18.7 A518  
 NEIC: OT 01:11:24.8 16N 120E dep 33km mb5.1  
 LUZON, PHILIPPINE ISLANDS  
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 1999-12-12 D 73.0  
 GRA1 07:43:01.5 e P Z mb4.9  
 ALIGN 07:43:01.5 T0.8 A9

NEIC: OT 07:31:35.8 57N 154W dep 33km mb4.5  
KODIAK ISLAND REGION

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1999-12-12 D 74.5 AZ205  
GRA1 17:39:49.7 e P Z mb5.2  
BEAM 17:39:49.7 T1.9 A54  
GRA1 17:39:55.9 e pP Z  
GRA1 18:11:10.5 e L Z T21.8 A808 MS5.0  
NEIC: OT 17:28:07.4 23S 13W dep 10km mb5.2  
SOUTHERN MID-ATLANTIC RIDGE

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1999-12-12 D 86.4 AZ290  
GRA1 18:09:55.1 i P c Z mb5.3  
BEAM 18:09:55.1 T1.7 A43  
GRA1 18:10:35.4 e pP Z  
GRA1 18:10:51.0 e sP Z  
GRA1 18:20:20.5 e S E  
GRA1 18:43:29.7 e L Z T19.9 A361 MS4.8  
NEIC: OT 17:57:21.0 15N 91W dep 33km mb5.0  
MEXICO-GUATEMALA BORDER REGION

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1999-12-12 D 12.8  
GRA1 19:28:59.6 e P Z  
BEAM 19:28:59.6 T1.4 A5  
GRA1 19:29:07.5 e Z  
GRA1 19:34:19.8 e L Z T12.9 A916 MS4.0  
NEIC: OT 19:25:56.6 41N 24E dep 10km mb4.5  
GREECE

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1999-12-13 D105.0  
GRA1 09:44:42.3 e Pdiff Z  
GRA1 09:48:56.5 e PP Z  
GRA1 10:36:08.9 e L Z T20.4 A726 MS5.2  
NEIC: OT 09:30:38.9 2N 127E dep 79km mb5.9  
NORTHERN MOLUCCA SEA

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1999-12-13 D105.4  
GRA1 22:54:29.9 e Pdiff Z  
GRA1 22:58:39.0 e PP Z  
GRA1 23:41:25.2 e L Z T27.0 A527 MS4.9  
NEIC: OT 22:40:13.5 S 125E dep 64km mb5.5  
SOUTHERN MOLUCCA SEA

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1999-12-14 D 84.1 AZ 57  
GRA1 11:33:40.7 i P d Z mb5.3  
ALIGN 11:33:40.7 T0.8 A15  
NEIC: OT 11:21:26.6 25N 124E dep171km mb4.8  
NORTHEAST OF TAIWAN  
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1999-12-14 D 73.1 AZ349  
GRA1 13:46:38.8 e P Z mb4.8  
BEAM 13:46:38.8 T1.0 A7  
GRA1 13:46:51.5 e pP Z  
GRA1 13:46:57.2 e sP Z  
NEIC: OT 13:35:12.4 57N 155W dep 33km mb4.7  
KODIAK ISLAND REGION

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1999-12-15 D 81.3  
GRA1 00:13:01.7 e P Z mb5.2  
ALIGN 00:13:01.7 T1.7 A44  
GRA1 00:13:07.2 e Z  
GRA1 00:13:12.6 e pP Z  
GRA1 00:13:16.1 e (sP) Z  
GRA1 00:23:08.5 e (S) Z  
GRA1 00:47:47.6 e L Z T19.0 A856 MS5.1  
NEIC: OT 00:00:44.6 17N 85W dep 10km mb5.4  
CARIBBEAN SEA

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1999-12-15 D124.8  
GRA1 04:56:50.1 e Pdiff Z  
GRA1 05:00:09.6 e PKPpdf c Z  
GRA1 05:01:59.5 e PP Z  
GRA1 05:54:33.0 e L Z T21.9 A8020  
NEIC: OT 04:41:12.3 6S 151E dep 33km mb5.6  
NEW BRITAIN REGION, P.N.G.

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1999-12-15 D 96.1  
GRA1 05:26:05.9 e Pdiff Z  
NEIC: OT 05:12:29.7 11N 124E dep 33km mb4.8  
LEYTE, PHILIPPINE ISLANDS

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1999-12-15 D 76.4 AZ356  
GRA1 23:58:59.9 i P c Z mb5.3  
ALIGN 23:58:59.9 T0.9 A22  
GRA1 23:59:15.5 e pP Z  
GRA1 23:59:20.7 e sP Z  
SZGRF: OT 23:47:18.5 54N 162W dep 54km  
ALASKA PENINSULA

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1999-12-16 D 66.1 AZ279  
GRA1 03:33:48.6 e P Z mb4.8  
BEAM 03:33:48.6 T0.9 A6  
GRA1 03:33:57.8 e (pP) Z  
GRA1 03:34:01.9 e (sP) Z  
NEIC: OT 03:22:14.7 20N 76W dep 10km mb4.4  
CUBA REGION

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1999-12-16

GRA1 03:37:19.0 e PKPdf Z

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1999-12-16 D124.9

GRA1 07:52:53.4 i PKPdf d Z  
NEIC: OT 07:33:54.8 6S 151E dep 33km mb5.3  
NEW BRITAIN REGION, P.N.G.

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1999-12-16 D 84.8 AZ 52

GRA1 08:31:58.6 i P c Z mb5.0  
ALIGN 08:31:58.6 T1.0 A9  
NEIC: OT 08:19:38.7 25N 124E dep140km mb4.9  
NORTHEAST OF TAIWAN

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1999-12-16 D 81.9 AZ202

GRA1 10:48:35.7 i P c Z mb5.7  
ALIGN 10:48:35.7 T1.6 A103  
GRA1 10:48:42.0 e Z  
GRA1 10:48:48.8 e pP Z  
GRA1 10:48:52.2 e (sP) Z  
GRA1 10:51:39.8 e PP Z  
GRA1 11:21:21.3 e L Z T21.6 A821 MS5.1  
SZGRF: OT 10:36:18.6 30S 14W dep 43km  
SOUTH ATLANTIC RIDGE

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1999-12-16 D146.7

GRA1 14:37:40.4 e PKPdf Z  
GRA1 15:49:54.2 e L Z T21.9 A1806 MS5.8  
NEIC: OT 14:17:53.3 50S 140E dep 10km mb5.4  
SOUTH OF AUSTRALIA

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1999-12-16 D146.8

GRA1 15:03:16.0 e PKPdf Z  
SZGRF: OT 14:43:30.2 50S 139E dep 33km  
SOUTH OF AUSTRALIA

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1999-12-17 D 77.3 AZ355

GRA1 00:03:12.4 e P Z mb5.8  
ALIGN 00:03:12.4 T1.1 A84  
GRA1 00:03:18.0 e Z  
GRA1 00:03:22.9 e pP Z  
GRA1 00:03:25.8 e sP Z  
GRA1 00:46:06.8 e L Z T18.8 A754 MS5.0  
SZGRF: OT 23:51:23.2 53N 161W dep 35km  
SOUTH OF ALASKA

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1999-12-17 D146.9

GRA1 00:47:12.6 e PKPdf Z  
GRA1 00:47:14.2 e PKPbc Z

GRA1 00:47:17.6 e PKPab Z  
 GRA1 00:47:24.9 e pPKPbc Z  
 GRA1 00:47:28.6 e pPKPab Z  
 GRA1 01:59:41.4 e L Z T21.7 A1841 MS5.8  
 NEIC: OT 00:27:28.4 50S 140E dep 10km mb5.5  
 SOUTH OF AUSTRALIA

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1999-12-17 D 58.4 AZ241  
 GRA1 04:10:22.0 e P Z mb5.5  
 ALIGN 04:10:22.0 T1.8 A86  
 SZGRF: OT 04:00:28.9 8N 37W dep 33km  
 CENTRAL MID-ATLANTIC RIDGE

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1999-12-17 D 58.2 AZ240  
 GRA1 04:13:24.9 i P d Z mb5.5  
 ALIGN 04:13:24.9 T1.8 A83  
 GRA1 04:13:28.2 e Z  
 GRA1 04:13:34.9 e pP Z  
 GRA1 04:13:39.8 e (pX) Z  
 GRA1 04:34:04.8 e L Z T19.6 A1156 MS5.0  
 NEIC: OT 04:03:27.4 8N 38W dep 10km mb5.6  
 CENTRAL MID-ATLANTIC RIDGE

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1999-12-17 D145.1  
 GRA1 11:19:09.7 e PKPbc Z  
 GRA1 11:19:13.8 e pPKPdf Z  
 SZGRF: OT 10:59:39.6 17S 177E dep 45km  
 FIJI ISLANDS REGION

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1999-12-18 D 79.6  
 GRA1 01:02:45.7 e P Z mb4.8  
 BEAM 01:02:45.7 T1.2 A14  
 GRA1 01:38:03.0 e L Z T18.2 A142 MS4.3  
 NEIC: OT 00:50:34.7 7N 94E dep 33km mb5.0  
 NICOBAR ISLANDS, INDIA

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1999-12-18 D 8.2  
 GRA1 01:14:52.1 e Pn Z  
 GRA1 01:16:25.8 e (Sn) N  
 NEIC: OT 01:12:51.9 43N 18E dep 10km  
 ADRIATIC SEA

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1999-12-18 D 78.9 AZ 31  
 GRA1 13:42:46.6 i P c Z mb5.0  
 ALIGN 13:42:46.6 T1.1 A18  
 GRA1 13:42:50.0 e Z  
 NEIC: OT 13:30:54.7 43N 144E dep113km mb4.7  
 HOKKAIDO, JAPAN REGION

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1999-12-18 D115.9  
 GRA1 18:03:38.2 e PKPdf Z  
 GRA1 18:04:36.5 e PP Z  
 GRA1 18:13:55.6 e PKKPbc Z  
 GRA1 18:14:15.4 e PKKPab Z  
 GRA1 18:56:56.0 e L Z T19.7 A5233 MS6.2  
 NEIC: OT 17:44:57.6 2S 140E dep 33km mb5.9  
 NEAR NORTH COAST OF IRIAN JAYA

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1999-12-19 D105.5  
 GRA1 01:02:41.7 i Pdiff c Z  
 GRA1 01:07:00.8 e PP Z  
 GRA1 01:18:34.7 e PKKPbc Z  
 GRA1 01:18:48.6 e PKKPab Z  
 GRA1 01:52:33.9 e L Z T21.6 A3069 MS5.8  
 NEIC: OT 00:48:40.1 13N 145E dep 70km mb6.1  
 MARIANA ISLANDS

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1999-12-19 D 3.7 412km  
 GRA1 05:20:41.0 e Pn Z M14.6  
 GRA1 05:21:39.3 e Sg E  
 SZGRF: OT 05:19:42.8 52N 16E dep 1km  
 POLAND

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1999-12-19 D124.0  
 GRA1 12:38:23.1 e PKPdf Z  
 NEIC: OT 12:19:26.0 5S 151E dep 33km mb5.3  
 NEW BRITAIN REGION, P.N.G.

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1999-12-19 D 78.3 AZ358  
 GRA1 20:24:29.9 i P c Z mb5.0  
 ALIGN 20:24:29.9 T1.2 A15  
 NEIC: OT 20:12:46.8 53N 175W dep152km mb4.4  
 ANDREANOF ISLANDS, ALEUTIAN IS.

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1999-12-20  
 GRA1 02:16:02.8 e PKPbc Z  
 GRA1 02:16:08.4 e PKPab Z

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1999-12-20 D 16.5  
 GRA1 03:31:12.1 e P Z  
 NEIC: OT 03:27:19.9 41N 31E dep 10km mb4.3  
 TURKEY

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1999-12-20 D 66.2 AZ270  
 GRA1 10:53:43.0 i P c Z mb5.0  
 BEAM 10:53:43.0 T1.1 A13  
 GRA1 10:53:49.8 e pP Z

GRA1 10:53:53.4 e (sP) Z  
 GRA1 11:16:08.5 e L Z T21.8 A399 MS4.6  
 NEIC: OT 10:42:58.6 17N 62W dep 33km mb5.4  
 LEEWARD ISLANDS

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 1999-12-20 D 70.1  
 GRA1 11:58:03.0 e P Z mb4.7  
 BEAM 11:58:03.0 T1.7 A12  
 SZGRF: OT 11:46:59.5 24N 98E dep 67km  
 BURMA-CHINA BORDER REGION

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 1999-12-20 D 21.4  
 GRA1 23:42:30.9 e Pn Z  
 GRA1 23:44:28.1 e (Sn) N

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 1999-12-21 D 67.5 AZ 69  
 GRA1 00:17:26.1 e P Z mb4.9  
 BEAM 00:17:26.1 T2.1 A15

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 1999-12-21  
 GRA1 03:24:53.5 e Pn Z  
 GRA1 03:26:42.7 e Sn E  
 NEIC: OT 03:22:37.5 45N 23E dep 33km mb4.1  
 ROMANIA

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 1999-12-21 D 55.5 AZ 41  
 GRA1 11:10:23.5 e P Z mb5.7  
 ALIGN 11:10:23.5 T1.0 A78  
 GRA1 11:12:22.7 e PP Z  
 GRA1 11:18:09.1 e S Z  
 GRA1 11:21:53.2 e SS Z  
 GRA1 11:36:05.6 e L Z T18.6 A2275 MS5.3  
 NEIC: OT 11:00:48.8 56N 110E dep 10km mb5.6  
 LAKE BAYKAL REGION, RUSSIA

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 1999-12-21 D 92.8  
 GRA1 14:28:29.2 e P Z mb5.7  
 ALIGN 14:28:29.2 T1.1 A34  
 GRA1 14:28:44.9 e pP Z  
 GRA1 14:28:52.8 e (sP) Z  
 GRA1 14:31:51.2 e Z  
 GRA1 14:32:26.5 e PP Z  
 GRA1 15:22:39.2 e L Z T21.0 A9408 MS6.2  
 NEIC: OT 14:14:57.0 7S 106E dep 56km mb6.1  
 SUNDA STRAIT

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 1999-12-21 D 78.6 AZ 27



GRA1 15:06:49.4 i P d Z mb4.5  
BEAM 15:06:49.4 T0.8 A4  
SZGRF: OT 14:55:11.8 46N 151E dep213km  
KURIL ISLANDS

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1999-12-21 D 18.4 AZ134  
GRA1 23:01:18.9 e P Z  
NEIC: OT 22:57:00.5 35N 27E dep 33km mb4.1  
DODECANESE ISLANDS

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1999-12-22 D145.1  
GRA1 03:11:28.0 e PKPdf Z  
GRA1 03:11:37.0 e pPKPdf Z  
NEIC: OT 02:51:52.0 15S 174W dep 33km mb4.8  
TONGA ISLANDS

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1999-12-22 D 88.7  
GRA1 04:54:50.2 e P Z mb4.8  
BEAM 04:54:50.2 T1.0 A7  
GRA1 04:55:02.9 e pP Z  
GRA1 04:55:07.1 e sP Z  
GRA1 05:36:55.6 e L Z T19.8 A95 MS4.2  
NEIC: OT 04:41:59.2 17N 119E dep 33km mb4.6  
LUZON, PHILIPPINE ISLANDS

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1999-12-22  
GRA1 05:40:56.3 e PKPdf Z

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1999-12-22 D 44.5 AZ 81  
GRA1 06:53:18.5 i P d Z mb5.2  
ALIGN 06:53:18.5 T1.1 A37  
SZGRF: OT 06:45:10.7 38N 73E dep 33km  
TAJIK SSR

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1999-12-22 D 11.0  
GRA1 08:42:50.3 e Pn Z  
NEIC: OT 08:40:25.5 41N 21E dep 10km mb3.9  
ALBANIA

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1999-12-22 D 10.1  
GRA1 09:08:43.2 e Pn Z  
GRA1 09:10:29.8 e Sn Z  
GRA1 09:13:09.0 e L Z T16.8 A2445 MS4.1  
NEIC: OT 09:06:12.6 42N 21E dep 10km mb4.9  
ALBANIA

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1999-12-22 D 10.1  
GRA1 09:43:35.6 e Pn Z

GRA1 09:45:31.3 e Sn Z  
 GRA1 09:47:48.2 e L Z T15.4 A685  
 NEIC: OT 09:41:05.3 42N 21E dep 10km mb4.8  
 ALBANIA

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 1999-12-22 D 83.6  
 GRA1 11:29:50.1 i P c Z mb5.2  
 ALIGN 11:29:50.1 T1.2 A20  
 GRA1 11:30:00.9 e pP Z  
 GRA1 11:30:07.5 e sP Z  
 GRA1 12:10:47.9 e L Z T19.9 A690 MS5.0  
 NEIC: OT 11:17:27.1 32N 132E dep 43km mb5.1  
 KYUSHU, JAPAN

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 1999-12-22 D105.6  
 GRA1 12:29:56.3 e PP Z  
 GRA1 12:35:59.1 e SKS N  
 GRA1 12:38:47.1 e S N  
 GRA1 12:44:49.0 e SS N  
 GRA1 13:11:59.9 e L Z T20.3 A681 MS5.2  
 NEIC: OT 12:11:27.1 54S 2E dep 10km mb5.1  
 BOUVET ISLAND REGION

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 1999-12-22 D136.0  
 GRA1 13:52:01.0 e PKPdf Z  
 GRA1 13:52:12.6 e (pPKPdf) Z  
 GRA1 13:54:33.1 e PP Z  
 GRA1 14:53:01.0 e L Z T21.4 A2094 MS5.8  
 NEIC: OT 13:32:37.3 11S 165E dep 33km mb5.6  
 SANTA CRUZ ISLANDS

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 1999-12-22 D 17.1 AZ214  
 GRA1 17:40:55.9 i P c Z mb4.9  
 ALIGN 17:40:55.9 T1.8 A162  
 GRA1 17:41:05.2 e (pP) Z  
 GRA1 17:44:08.9 e S E  
 GRA1 17:47:30.9 e L Z T17.0 A10271 MS5.1  
 NEIC: OT 17:36:56.0 35N 1W dep 10km mb5.5  
 NORTHERN ALGERIA

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 1999-12-22 D147.2  
 GRA1 19:17:27.3 i PKPdf d Z  
 NEIC: OT 18:58:49.3 17S 179W dep600km mb4.3  
 FIJI ISLANDS REGION

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 1999-12-22 D 89.0 AZ 61  
 GRA1 21:55:12.6 e P Z mb5.0  
 BEAM 21:55:12.6 T1.1 A11  
 GRA1 22:37:18.8 e L Z T19.3 A431 MS4.9

NEIC: OT 21:42:20.7 16N 119E dep 33km mb5.0  
LUZON, PHILIPPINE ISLANDS

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1999-12-23 D 33.3 AZ108  
GRA1 03:14:34.8 i P c Z mb4.7  
ALIGN 03:14:34.8 T1.0 A11  
NEIC: OT 03:07:29.8 30N 52E dep 33km mb4.9  
SOUTHERN IRAN

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1999-12-23 D144.2  
GRA1 05:25:15.7 i PKPdf c Z  
NEIC: OT 05:05:45.6 18S 169E dep 33km mb5.0  
VANUATU ISLANDS

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1999-12-23 D148.7  
GRA1 06:20:53.1 e PKPbc Z  
GRA1 06:20:58.1 e PKPab Z  
GRA1 06:21:20.4 e pPKPbc Z  
GRA1 07:15:37.5 e L Z T19.3 A83 MS4.5  
NEIC: OT 06:01:17.8 22S 172E dep107km mb5.2  
LOYALTY ISLANDS REGION

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1999-12-23 D 79.6 AZ 26  
GRA1 08:56:38.7 i P c Z mb5.0  
ALIGN 08:56:38.7 T0.9 A20  
NEIC: OT 08:44:41.2 47N 153E dep 51km mb4.6  
KURIL ISLANDS

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1999-12-23 D 24.6 AZ281  
GRA1 09:42:54.6 i P c Z mb4.4  
ALIGN 09:42:54.6 T1.0 A8  
GRA1 09:43:00.7 e (pP) Z  
SZGRF: OT 09:37:37.1 48N 26W dep 24km  
NORTH ATLANTIC RIDGE

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1999-12-23 D 3.7 410km  
GRA1 19:13:46.2 e Pn Z M13.6  
GRA1 19:14:45.4 e Sg E  
SZGRF: OT 19:12:47.9 52N 16E dep 1km  
POLAND

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1999-12-23 D 13.7  
GRA1 23:13:01.3 e Pn Z  
GRA1 23:15:29.7 e (Sg) N  
GRA1 23:19:04.2 e L Z T17.1 A164 MS3.2  
NEIC: OT 23:09:48.9 38N 21E dep 10km mb4.7  
IONIAN SEA

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1999-12-24 D160.6

GRA1 10:36:59.5 i PKPbc c Z  
 GRA1 10:37:49.0 e PKPab Z  
 GRA1 10:40:40.9 e (PP) Z  
 NEIC: OT 10:16:39.4 32S 180W dep186km mb4.8  
 KERMADEC ISLANDS REGION

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1999-12-24 D152.6  
 GRA1 19:45:56.6 e PKPdf Z  
 GRA1 19:45:58.4 e PKPbc Z  
 GRA1 19:46:06.5 e pPKPbc Z  
 GRA1 21:02:05.1 e L Z T21.8 A3101 MS6.1  
 NEIC: OT 19:26:04.5 56S 147E dep 10km mb5.7  
 WEST OF MACQUARIE ISLAND

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1999-12-24 D153.0  
 GRA1 20:37:22.5 e PKPdf Z  
 GRA1 20:37:25.1 e PKPbc Z  
 GRA1 20:37:29.8 e pPKPbc Z  
 GRA1 20:37:33.3 e PKPab Z  
 GRA1 21:20:37.7 e L Z T18.6 A1755 MS5.9

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1999-12-24 D152.7  
 GRA1 22:55:31.3 e PKPdf Z  
 GRA1 22:55:37.6 e PKPbc Z  
 GRA1 00:06:40.0 e L Z T21.9 A2448 MS6.0  
 NEIC: OT 22:35:38.7 56S 147E dep 10km mb5.5  
 WEST OF MACQUARIE ISLAND

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1999-12-24 D 88.9 AZ 61  
 GRA1 23:06:48.0 e P Z mb5.3  
 BEAM 23:06:48.0 T1.9 A40  
 NEIC: OT 22:53:55.3 17N 119E dep 33km mb5.1  
 LUZON, PHILIPPINE ISLANDS

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1999-12-25 D 22.9 AZ348  
 GRA1 01:33:10.0 e P Z mb4.3  
 BEAM 01:33:10.0 T1.6 A14  
 NEIC: OT 01:28:04.6 72N 3W dep 10km mb4.4  
 JAN MAYEN ISLAND REGION

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1999-12-25 D 31.2  
 GRA1 03:14:07.9 e P Z mb4.5  
 BEAM 03:14:07.9 T1.2 A8  
 NEIC: OT 03:07:49.7 33N 47E dep 33km mb4.7  
 WESTERN IRAN

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1999-12-25 D 66.3 AZ210  
 GRA1 08:03:18.4 e P Z mb5.2

BEAM 08:03:18.4 T1.5 A22  
 GRA1 08:03:24.1 e (pP) Z  
 GRA1 08:31:50.6 e L Z T19.8 A221 MS4.4  
 NEIC: OT 07:52:27.2 13S 14W dep 10km mb5.1  
 SOUTHERN MID-ATLANTIC RIDGE

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1999-12-25

GRA1 08:48:35.5 e PKP Z

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1999-12-25 D 40.1 AZ 82

GRA1 13:35:46.5 e P Z mb4.4  
 BEAM 13:35:46.5 T1.5 A15  
 NEIC: OT 13:28:10.2 39N 66E dep 33km mb4.9  
 SOUTHEASTERN UZBEKISTAN

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1999-12-25 D 92.3 AZ261

GRA1 18:32:40.5 i P c Z mb5.6  
 ALIGN 18:32:40.5 T1.4 A43  
 GRA1 18:32:48.9 e pP Z  
 GRA1 18:32:54.5 e (sP) Z  
 GRA1 19:09:47.5 e L Z T21.1 A894 MS5.2  
 NEIC: OT 18:19:30.3 6S 75W dep 27km mb5.8  
 NORTHERN PERU

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1999-12-25

GRA1 18:50:02.8 e PKPdf Z

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1999-12-25 D157.5

GRA1 18:58:44.2 e PKPdf Z  
 GRA1 18:58:58.0 e pPKPdf Z  
 GRA1 18:59:17.2 e PKPab Z  
 GRA1 18:59:31.0 e pPKPab Z  
 GRA1 19:02:59.4 e PP Z  
 GRA1 20:13:45.7 e L Z T19.0 A1388 MS5.8  
 NEIC: OT 18:38:50.4 28S 177W dep 33km mb5.8  
 KERMADEC ISLANDS REGION

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1999-12-25

GRA1 20:06:51.5 e PKPdf Z  
 GRA1 20:06:54.9 e pPKPdf Z  
 GRA1 20:06:58.9 e PKPab Z  
 GRA1 20:07:03.7 e pPKPab Z

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1999-12-25 D 91.9 AZ 61

GRA1 22:54:26.3 i P c Z mb5.6  
 ALIGN 22:54:26.3 T1.0 A30

GRA1 23:37:00.2 e L Z T21.9 A239 MS4.6  
 NEIC: OT 22:41:37.4 18N 120E dep 47km mb5.5  
 LUZON, PHILIPPINE ISLANDS

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 1999-12-25 D 80.2 AZ 29  
 GRA1 23:03:49.6 i P c Z mb4.9  
 ALIGN 23:03:49.6 T1.0 A18  
 GRA1 23:04:05.0 e pP Z  
 SZGRF: OT 22:51:46.8 44N 150E dep 54km  
 KURIL ISLANDS REGION

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 1999-12-25 D 2.4 264km  
 GRC1 23:36:47.7 e Pg Z M12.8  
 SZGRF: OT 23:36:03.3 47N 13E dep 10km  
 NORTHERN ITALY

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 1999-12-26 D 47.6 AZ 13  
 GRA1 08:48:02.6 e P Z mb5.1  
 BEAM 08:48:02.6 T1.4 A20  
 NEIC: OT 08:39:48.3 81N 122E dep 10km mb4.7  
 EAST OF SEVERNAYA ZEMLYA,

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 1999-12-27 D160.4  
 GRA1 16:07:57.6 e PKPab Z  
 NEIC: OT 15:47:18.6 31S 179W dep 33km mb5.3  
 KERMADEC ISLANDS REGION

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 1999-12-28 D150.5  
 GRA1 10:24:49.6 e (PKPdf) Z  
 GRA1 10:24:55.3 i PKPbc d Z  
 GRA1 10:25:04.7 e PKPab Z  
 SZGRF: OT 10:05:14.0 21S 178W dep 33km  
 FIJI ISLANDS REGION

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 1999-12-28 D 24.6 AZ139  
 GRA1 12:10:27.1 e P Z mb4.0  
 BEAM 12:10:27.1 T0.8 A3  
 NEIC: OT 12:05:06.7 30N 31E dep 10km mb3.9  
 EGYPT

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 1999-12-28 D 88.2 AZ278  
 GRA1 12:59:53.2 e P Z mb5.5  
 BEAM 12:59:53.2 T1.6 A40  
 GRA1 12:59:58.4 e pP Z  
 GRA1 13:34:06.1 e L Z T21.6 A3030 MS5.7  
 NEIC: OT 12:46:57.8 6N 83W dep 10km mb5.4  
 SOUTH OF PANAMA

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 1999-12-28 D106.0

GRA1 17:05:35.4 e Pdiff Z  
 GRA1 17:09:57.0 e PP Z  
 GRA1 18:00:18.7 e L Z T19.4 A322 MS4.9  
 NEIC: OT 16:51:24.4 2N 128E dep 67km mb5.6  
 HALMAHERA, INDONESIA

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 1999-12-28 D159.4  
 GRA1 19:36:11.4 e PKPab Z  
 GRA1 19:36:15.9 e pPKPab Z  
 NEIC: OT 19:15:36.9 30S 178W dep 33km mb5.0  
 KERMADEC ISLANDS, NEW ZEALAND

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 1999-12-28 D 77.2  
 GRA1 20:36:57.1 e P Z mb5.1  
 ALIGN 20:36:57.1 T0.8 A12  
 GRA1 20:37:02.6 e pP Z  
 GRA1 21:12:40.2 e L Z T18.1 A210 MS4.5  
 NEIC: OT 20:25:07.1 49N 156E dep 33km mb5.1  
 KURIL ISLANDS

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 1999-12-29 D136.2  
 GRA1 00:15:26.2 e PKPdf Z  
 GRA1 01:19:27.0 e L Z T18.8 A1373 MS5.7  
 NEIC: OT 23:56:06.7 11S 166E dep 33km mb5.4  
 SANTA CRUZ ISLANDS

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 1999-12-29 D 89.7 AZ299  
 GRA1 05:32:41.8 i P d Z mb6.3  
 ALIGN 05:32:41.8 T1.6 A321  
 GRA1 05:33:00.9 e pP Z  
 GRA1 05:36:10.3 e PP Z  
 GRA1 06:07:23.3 e L Z T30.7 A3103 MS5.5  
 SZGRF: OT 05:19:52.5 18N 101W dep 69km  
 GUERRERO, MEXICO

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 1999-12-29 D146.4  
 GRA1 07:15:00.5 e PKP Z  
 SZGRF: OT 06:55:57.4 49S 139E dep286km  
 SOUTH OF AUSTRALIA

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 1999-12-29 D 4.2 467km  
 GRC1 09:30:32.7 e Pn Z M13.7  
 GRA1 09:30:55.7 e Pg Z M13.7  
 GRA1 09:31:56.0 e Sg N  
 SZGRF: OT 09:29:31.4 46N 7E dep 10km  
 SWITZERLAND

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 1999-12-29 D100.6 AZ247  
 GRA1 13:11:44.4 i P c Z mb5.6

ALIGN 13:11:44.4 T1.3 A25  
GRA1 13:15:40.8 e Z  
GRA1 13:15:49.7 e PP Z  
NEIC: OT 12:58:08.5 24S 68W dep130km mb5.6  
CHILE-ARGENTINA BORDER REGION  
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1999-12-29 D126.0  
GRA1 13:48:35.1 e PKPdf Z  
GRA1 13:51:36.3 e PP Z  
GRA1 14:53:06.9 e L Z T19.2 A26605 MS6.9  
NEIC: OT 13:29:19.5 11S 165E dep 33km mb5.7  
SANTA CRUZ ISLANDS  
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1999-12-29 D136.1  
GRA1 14:30:27.3 e PKP Z  
NEIC: OT 14:11:06.0 11S 165E dep 33km mb4.8  
SANTA CRUZ ISLANDS  
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1999-12-29 D 88.8 AZ 93  
GRA1 15:30:11.3 e P Z mb4.8  
BEAM 15:30:11.3 T1.6 A10  
GRA1 15:30:24.8 e Z  
GRA1 15:30:27.9 e Z  
NEIC: OT 15:17:18.9 S 100E dep 50km mb5.4  
SOUTHERN SUMATERA, INDONESIA  
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1999-12-29 D135.8  
GRA1 19:35:12.3 e PKPdf Z  
GRA1 20:36:12.3 e L Z T21.6 A2606 MS5.9  
NEIC: OT 19:15:51.3 11S 165E dep 33km mb5.4  
SANTA CRUZ ISLANDS  
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1999-12-29 D 3.2 359km  
GRA1 20:43:25.5 e Pn Z M15.3  
GRA1 20:43:37.1 e Pg Z  
GRA1 20:44:18.7 e Sg N  
GRA1 20:44:48.4 e L Z T19.3 A4414 MS3.5  
NEIC: OT 20:42:36.8 47N 10E dep 10km mb4.8  
NORTHERN ITALY  
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1999-12-29 D136.2  
GRA1 21:18:51.7 e PKPdf Z  
GRA1 22:22:45.9 e L Z T20.5 A612 MS5.3  
NEIC: OT 20:59:31.1 11S 165E dep 33km mb5.2  
SANTA CRUZ ISLANDS  
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1999-12-29 D135.8  
GRA1 21:55:57.3 e PKPdf Z  
GRA1 21:56:06.1 e pPKPdf Z



GRA1 22:56:57.4 e L Z T21.9 A910 MS5.5  
NEIC: OT 21:36:37.0 11S 165E dep 33km mb5.3  
SANTA CRUZ ISLANDS

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1999-12-29 D136.1  
GRA1 23:13:17.1 e PKPdf Z  
GRA1 23:15:57.0 e PP Z  
GRA1 00:12:55.1 e L Z T20.6 A3249 MS6.0  
NEIC: OT 22:53:57.1 11S 165E dep 33km mb5.5  
SANTA CRUZ ISLANDS

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1999-12-30 D 74.8 AZ 19  
GRA1 00:23:25.5 i P c Z mb5.3  
ALIGN 00:23:25.5 T1.0 A30  
GRA1 00:23:41.2 e pP Z  
GRA1 00:23:45.4 e sP Z  
GRA1 01:02:41.0 e L Z T18.9 A491  
SZGRF: OT 00:11:52.9 53N 160E dep 53km  
OFF EAST COAST OF KAMCHATKA

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1999-12-30 D149.1  
GRA1 02:41:48.6 i PKPdf d Z  
GRA1 02:41:55.9 e PKPab Z

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1999-12-30 D 15.1  
GRA1 04:54:38.2 e Pn Z  
GRA1 04:58:39.1 e S N  
GRA1 05:01:11.2 e L Z T13.4 A527 MS3.9  
NEIC: OT 04:51:10.0 39N 26E dep 33km mb4.4  
AEGEAN SEA

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1999-12-30 D 44.7 AZ 13  
GRA1 06:55:10.1 i P d Z  
GRA1 06:55:19.1 e pP Z  
GRA1 06:55:24.2 e sP Z  
GRA1 06:56:50.8 e PcP Z  
GRA1 06:56:57.7 e PP Z  
GRA1 07:01:44.6 e S Z  
GRA1 07:18:14.7 e L Z T18.2 A302 MS4.3  
NEIC: OT 06:46:55.3 81N 122E dep 10km mb4.7  
EAST OF SEVERNAYA ZEMLYA,

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1999-12-30 D136.0  
GRA1 08:58:33.4 e PKPdf Z  
GRA1 08:58:42.7 e pPKPdf Z  
NEIC: OT 08:39:13.0 11S 165E dep 33km mb5.0  
SANTA CRUZ ISLANDS

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1999-12-30      D136.2
  GRA1 12:18:30.5 e PKPdf Z
  GRA1 12:18:41.9 e pPKPdf Z
NEIC: OT 11:59:09.1 11S 165E dep 33km mb4.9
  SANTA CRUZ ISLANDS
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1999-12-30      D 77.7 AZ 24
  GRA1 13:33:33.8 e P Z mb5.3
  BEAM 13:33:33.8 T0.7 A18
  GRA1 13:33:48.3 e pP Z
  GRA1 14:11:16.9 e L Z T21.2 A2604
SZGRF: OT 13:21:44.2 48N 154E dep 50km
  KURIL ISLANDS
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1999-12-30      D 90.3 AZ 43
  GRA1 14:24:29.8 i P c Z mb5.0
  ALIGN 14:24:29.8 T1.4 A15
  GRA1 14:24:43.4 e pP Z
  GRA1 14:24:48.1 e sP Z
  GRA1 14:28:01.2 e PP Z
  GRA1 15:10:25.6 e L Z T18.8 A514 MS5.0
NEIC: OT 14:11:31.7 29N 142E dep 33km mb5.0
  SOUTH OF HONSHU, JAPAN
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1999-12-30      D 99.0
  GRA1 15:03:37.1 e Pdiff Z
  GRA1 15:07:44.0 e PP Z
  GRA1 15:46:55.4 e L Z T21.1 A686 MS5.1
NEIC: OT 14:49:56.8 24S 65W dep 21km mb5.5
  JUJUY PROVINCE, ARGENTINA
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1999-12-30      D 11.5 AZ177
  GRA1 18:37:22.8 i P d Z
  ALIGN 18:37:22.8 T1.2 A15
  GRA1 18:41:51.3 e L Z T22.2 A658 MS3.5
NEIC: OT 18:34:42.2 38N 12E dep 33km mb5.0
  SICILY
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1999-12-31      D 2.6 287km
  GRC1 04:56:36.7 e Pn Z M14.4
  GRA1 04:56:44.8 e Pn Z M14.7
  GRA1 04:57:37.0 e Sg N
SZGRF: OT 04:55:55.5 47N 10E dep 10km
  NORTHERN ITALY
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1999-12-31      D 3.6 403km
  GRA1 12:14:36.8 e Pn Z M14.1
  GRA1 12:14:46.0 e Pg Z
  GRA1 12:15:34.8 e Sg N

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SZGRF: OT 12:13:39.8 51N 16E dep 1km  
POLAND

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1999-12-31 D 80.3  
GRA1 13:20:42.3 i P d Z mb5.0  
ALIGN 13:20:42.3 T0.9 A19  
GRA1 13:20:58.9 e Z  
GRA1 13:21:41.7 e Z  
GRA1 13:22:07.1 i pP c Z  
GRA1 13:22:48.2 e sP Z  
GRA1 13:22:59.3 e Z  
NEIC: OT 13:09:13.1 37N 135E dep389km mb5.1  
SEA OF JAPAN

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1999-12-31 D 74.6 AZ 20  
GRA1 18:58:51.5 i P c Z mb5.2  
ALIGN 18:58:51.5 T1.0 A25  
NEIC: OT 18:47:17.9 53N 160E dep 60km mb4.6  
OFF EAST COAST OF KAMCHATKA

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1999-12-31 D 97.8  
GRA1 20:39:19.8 e Pdiff Z  
GRA1 21:25:47.3 e L Z T18.7 A342 MS4.9  
NEIC: OT 20:25:45.7 10N 126E dep 33km mb5.1  
PHILIPPINE ISLANDS REGION

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