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Old seismologic reports

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SEISMIC OBSERVATIONS
AT FABRA OBSERVATORY IN 1996

by M^a TERESA SUSAGNA VIDAL
and RAMON SECANELL GALLART

The Observatory has now the following seismographs:

Station FONT (Coordinates 41° 45,7'N, 2° 26,0'E).

— Three short period «Teledyne Geotech» seismographs, vertical and horizontal components, with ink recording.

Station FBR (Coordinates 41° 25,0'N, 2° 07,5'E).

— Three short period «Mark-Lennartz» seismographs, vertical and horizontal components, with ink recording.

— Two long period «Mainka» seismographs, horizontal components, with mechanic recording.

— One short period «Vicentini» seismograph, vertical component, with mechanic recording.

We symbolize by ZT Teledyne Geotech vertical component, by NT and ET the Teledyne Geotech horizontal components, by ZL Mark-Lennartz vertical component, by NL and EL the Mark Lennartz horizontal components, by NM and EM the Mainka horizontal components and by ZV the Vicentini vertical component.

For the most outstanding earthquakes, we describe their epicentral characteristics, calculated by the Seismic Section of this Observatory, together with «Servei Geològic de Catalunya» (SGC) or provided by the United States Geological Survey (GS), by the «Centre Seismologique Europeo-Mediterranean» (CSEM), by the «Instituto Geográfico Nacional» (IGN) or by the «Laboratoire de Détection et de Déophysique» (LDG).

The average instrumental constants have been:

1) Electromagnetic seismograph (electronic and ink recording):

Type	Component	Mass (kg)	Period(s) To	Amplification m/ms ⁻¹	Damping
Teledyne Geotech	Z (ZT)	5	1	7200	0,7
	N-S (NT)	5	1	7200	0,7
	E-W (ET)	5	1	7200	0,7
Mark-Lennartz	Z (ZL)	1	1	510	0,7
	N-S (NL)	1	1	510	0,7
	E-W (EL)	1	1	510	0,7

2) Mechanical seismographs (recording on smoked paper):

Type	Component	Mass (kg)	Period(s) To	Damping	Friction	Amplification
Mainka	N-S (NM)	141	6,7	2	0,044	43,0
	E-W (EM)	144	6,4	2	0,043	59,2
Vicentini	Z (ZV)	56	0,9	—	—	125



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
1 Jan	ZT	P	08	24		12.200	Ep.: 0,7 N; 119,9 E; H = 08:05:11,9 h = 33 km; M = 6,2 (GS) Minahassa Peninsula, Sulawesi
2	ZT	Pg	15	09	09,6		Ep.: Local
	ZT	Sg	15	09	21,3		
2	ZT	Pg	15	23	33,6		Ep.: Local
	ZT	Sg	15	23	44,0		
2	ZT	Pg	16	41	21,0		Ep.: Local
	ZT	Sg	16	41	32,3		
5	ZT	Pg	09	04	31,6		Ep.: See pag. 106
	ZT	Sg	09	04	43,3		
	ZL	Pg	09	04	23,0		
	ZL	Sg	09	04	25,7		
5	ZT	Pn	11	54	21,6		Ep.: See pag. 106
	ZT	Pn	11	54	56,6		
6	ZT	Pn	02	37	34,0		Ep.: See pag. 106
	ZT	Sn	02	38	10,0		
	ZL	Pn	02	37	39,0		
	ZL	Sn	02	38	09,0		
6	ZT	Pn	03	15	06,0		Ep.: See pag. 106
	ZT	Sn	03	15	42,6		
9	ZT	Pn	08	10	02,0		Ep.: See pag. 106
	ZT	Sn	08	10	33,3		
13	ZT	Pg	10	50	23,0		Ep.: See pag. 106
	ZT	Sg	10	50	40,0		
14	ZT	Pn	02	56	18,3		Ep.: 43,1 N; 0,3 W; H = 02:55:32,5 h = — km; M = 2,8 (LDG) Argeles-Gazost
	ZT	Sn	02	56	48,6		
14	ZT	Pn	11	13	12,3		Ep.: 43,51 N; 0,6 W; H = 12:23:01,1 h = — km; M = — (IGN) N Oloron-Ste-Marie, France
	ZT	Sn	11	13	42,0		
14	ZT	Pn	12	20	03,3		Ep.: 43,4 N; 0,7 W; H = 12:19:17,1 h = 2 km; M = 3,9 (LDG) NW Pau, France
	ZT	Sn	12	20	47,9		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
14 Jan	ZT	Pn	12	23	47,3		Ep.: Local
	ZT	Sn	12	24	22,6		
14	ZT	Pn	15	49	51,3		Ep.: 43,4 N; 0,6 W; H = 15:49:05,2 h = 14 km; M = 3,5 (LDG) NW Pau, France
	ZT	Sn	15	50	35,3		
14	ZT	Pn	17	12	41,0		Ep.: 43,4 N; 0,7 W; H = 17:11:54,7 h = 5 km; M = 3,9 (LDG) NW Oloron-Ste-Marie, France
	ZT	Sn	17	13	26,6		
17	ZT	Pn	14	32	33,3		Ep.: 43,4 N; 0,7 W; H = 14:31:47,0 h = 2 km; M = 3,9 (LDG) Oloron-Ste-Marie, France
	ZT	Sn	14	33	17,6		
22	ZT	Pg	12	15	59,3		Ep.: Local
	ZT	Sg	12	16	12,3		
23	ZL	Pg	16	14	18,0		Ep.: Local
24	ZT	Pg	15	54	43,6		Ep.: Local
	ZT	Sg	15	54	54,0		
26	ZT	Pg	15	45	18,6		Ep.: Local
	ZT	Sg	15	45	34,6		
1 Feb	ZT	Pn	05	01	32,6		Ep.: See pag. 107
	ZT	Sn	05	02	04,0		
2	ZT	Pn	04	17	23,3		Ep.: 43,1 N; 0,6 W; H = 04:16:40,0 h = 14 km; M = 2,8 (LDG) Oloron-Ste-Marie, France
	ZT	Sn	04	18	03,3		
3	ZT	P	11	26		8.625	Ep.: 27,3 N; 100,3 E; H = 11:14:19,8 h = 10 km; M = 6,3 (GS) Yunnan, China
	ZL	P	11	26			
5	ZT	Pg	10	40	25,5		Ep.: Local
	ZT	Sg	10	40	36,0		
7	ZT	Pg	22	54	47,0		Ep.: See pag. 107
	ZT	Sg	22	55	00,0		
9	ZT	Pg	07	34	20,6		Ep.: See pag. 107
	ZT	Sg	07	34	27,3		
	ZL	Pg	07	34	39,0		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
9 Feb	ZT	Pg	08	16	35,7	Ep.: See pag. 107	
	ZT	Sg	08	16	50,0		
16	ZT	Pg	14	06	14,0	Ep.: Local	
	ZT	Sg	14	06	27,8		
18	ZL	Pg	01	46	10,5	Ep.: See pag. 107	
	ZL	Sg	01	46	30,0		
18	ZL	Pg	02	02	58,5	Ep.: See pag.	
	ZL	Sg	02	03	17,0		
18	ZL	Pg	02	27	23,2	Ep.: See pag. 107	
	ZL	Sg	02	27	47,5		
18	ZL	Pg	04	29	22,5	Ep.: See pag. 108	
	ZL	Sg	04	29	41,7		
18	ZT	Pg	15	26	23,1	Ep.: See pag. 108	
	ZT	Sg	15	26	36,0		
18	ZT	Pg	15	42	03,6	Ep.: Local	
	ZT	Sg	15	42	17,3		
18	ZT	Pg	15	58	15,3	Ep.: See pag. 108	
	ZT	Sg	15	58	30,0		
18	ZT	Pg	16	00	18,0	Ep.: Local	
	ZT	Sg	16	00	32,3		
18	ZT	Pg	18	36	56,4	Ep.: Local	
	ZT	Sg	18	37	10,8		
18	ZT	Pg	19	17	08,6	Ep.: 42,8 N; 2,5 E; H = 19:16:49,6 h = — km; M = 2,3 (LDG) North-West of Spain	
	ZT	Sg	19	17	22,3		
18	ZT	Pg	20	10	48,6	Ep.: Local	
	ZT	Sg	20	11	03,0		
18	ZT	Pg	21	31	11,3	Ep.: Local	
	ZT	Sg	21	31	25,3		
18	ZT	Pg	21	36	08,5	Ep.: Local	
	ZT	Sg	21	36	22,3		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
18 Feb	ZT	Pg	22	09	27,6		Ep.: Local
	ZT	Sg	22	09	42,0		
18	ZT	P	23	57		5.070	Ep.: 1,3 S; 14,3 W; H = 23:49:28,0 h = 10 km; M = 6,3 (GS) North of Ascension Island
	ZL	P	23	59			
19	ZT	Pg	01	39	15,3		Ep.: See pag. 108
	ZT	Sg	01	39	30,0		
19	ZT	Pg	03	13	27,3		Ep.: See pag. 108
	ZT	Sg	03	13	42,0		
19	ZT	Pg	03	26	07,3		Ep.: Local
	ZT	Sg	03	26	32,0		
19	ZT	Pg	03	41	11,3		Ep.: See pag. 108
	ZT	Sg	03	41	26,0		
19	ZT	Pg	04	10	52,6		Ep.: Local
	ZT	Sg	04	11	10,0		
19	ZT	Pg	04	25	10,2		Ep.: See pag. 108
	ZT	Sg	04	25	25,0		
	ZT	Pg	04	25	26,7		
	ZT	Sg	04	25	45,0		
19	ZT	Pg	13	11	11,3		Ep.: 42,8 N; 2,5 E; H = 13:10:51,9 h = — km; M = 2,5 (LDG) North-West of Spain
	ZT	Sg	13	11	24,6		
19	ZT	Pg	16	04	42,6		Ep.: Local
	ZT	Sg	16	04	56,6		
19	ZT	Pg	20	25	38,3		Ep.: Local
	ZT	Sg	20	25	51,6		
19	ZT	Pg	21	14	46,6		Ep.: Local
	ZT	Sg	21	15	00,6		
19	ZT	Pg	22	14	52,0		Ep.: Local
	ZT	Sg	22	15	05,6		
20	ZT	Pg	00	06	27,3		Ep.: Local
	ZT	Sg	00	06	41,3		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
20 Feb	ZT	Pg	06	31	41,3		Ep.: Local
	ZT	Sg	06	31	55,6		
20	ZT	Pg	11	21	41,3		Ep.: See pag. 108
	ZT	Sg	11	21	55,0		
20	ZT	Pg	12	58	49,4		Ep.: See pag. 108
	ZT	Sg	12	59	04,4		
	ZT	Pg	12	59	56,2		
	ZT	Sg	13	00	15,0		
21	ZT	Pg	06	50	32,0		Ep.: 42,9 N; 0,6 E; H = 06:50:14,1 h = — km; M = 3,8 (LDG) Saint-Gaudens
	ZT	Sg	06	50	46,0		
21	ZT	Pg	19	35	05,3		Ep.: 42,8 N; 2,5 E; H = 19:34:44,6 h = — km; M = 2,5 (LDG) North-West of Spain
	ZT	Sg	19	35	19,0		
22	ZT	Pg	02	53	57,0		Ep.: Local
	ZT	Sg	02	54	11,3		
23	ZT	Pg	00	06	52,6		Ep.: See pag. 108
	ZT	Sg	00	07	06,3		
23	ZT	Pg	17	40	32,6		Ep.: 42,9 N; 2,5 E; H = 17:40:16,1 h = — km; M = 2,3 (LDG) North-West of Spain
	ZT	Sg	17	40	47,3		
24	ZT	Pg	15	03	08,0		Ep.: See pag. 109
	ZT	Sg	15	03	20,0		
25	ZT	P	03	21		9.640	Ep.: 16,2 N; 97,9 W; H = 03:08:18,8 h = 33 km; M = 5,9 (GS) Oaxaca, Mexico
25	ZT	Pg	07	24	08,3		Ep.: See pag. 109
	ZT	Sg	07	24	22,6		
	ZL	Pg	07	24	34,5		
25	ZT	Pn	10	11	41,5		Ep.: 42,7 N; 1,9 W; H = 10:10:52,0 h = 2 km; M = 4,4 (LDG) North-West of Spain (IGN)
	ZT	Sn	10	12	30,5		
	ZL	Pn	10	11	42,3		
	ZL	Sn	10	12	33,3		
25	ZT	Pg	16	34	51,9		Ep.: Local
	ZT	Sg	16	35	06,3		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
25 Feb	ZT	Pg	19	17	18,0		Ep.: Local
	ZT	Sg	19	17	32,0		
26	ZT	Pg	18	01	38,0		Ep.: Local
	ZT	Sg	18	01	52,6		
27	ZT	Pg	02	18	32,0		Ep.: See pag. 109
	ZT	Sg	02	18	46,6		
27	ZT	Pg	21	31	40,0		Ep.: See pag. 109
	ZT	Sg	21	31	54,6		
27	ZT	Pg	23	09	14,3		Ep.: See pag. 109
	ZT	Sg	23	09	29,0		
28	ZT	Pg	00	41	41,0		Ep.: See pag. 109
	ZT	Sg	00	41	55,6		
28	ZT	Pg	04	35	50,0		Ep.: See pag. 109
	ZT	Sg	04	36	04,6		
28	ZT	Pg	05	43	03,6		Ep.: 42,8 N; 2,5 E; H = 05:42:46,1 h = — km; M = 2,4 (LDG) Prades, Spain
	ZT	Sg	05	43	18,3		
28	ZT	Pg	05	45	08,6		Ep.: 42,8 N; 2,5 E; H = 05:44:49,8 h = — km; M = 2,3 (LDG) Prades, Spain
	ZT	Sg	05	45	23,6		
28	ZT	Pg	13	44	33,3		Ep.: Local
	ZT	Sg	13	44	47,3		
28	ZT	Pg	20	04	12,0		Ep.: See pag. 109
	ZT	Sg	20	04	25,0		
29	ZT	Pg	02	28	32,0		Ep.: See pag. 109
	ZT	Sg	02	28	45,3		
29	ZT	Pg	02	32	43,5		Ep.: Local
	ZT	Sg	02	32	58,3		
29	ZT	Pg	15	26	02,6		Ep.: Local
	ZT	Sg	15	26	17,0		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
1 Mar	ZT	P	06	53		2.240	Ep.: 34,2 N; 26,2 W; H = 06:48:53,1 h = 33 km; M = 4,9 (GS) Crete
1	ZT	Pg	07	32	57,6		Ep.: 42,8 N; 2,5 E; H = 07:32:39,4 h = — km; M = 2,5 (LDG) Prades, Spain
	ZT	Sg	07	32	12,3		
2	ZT	Pg	08	47	07,3		Ep.: Local
	ZT	Sg	08	47	21,0		
4	ZT	Pg	13	19	50,3		Ep.: See pag. 109
	ZT	Sg	13	20	05,0		
	ZL	Pg	13	19	57,5		
	ZL	Sg	13	20	16,0		
4	ZT	Pg	20	35	35,0		Ep.: 42,9 N; 2,5 E; H = 20:35:19,6 h = — km; M = 2,1 (LDG) Prades, Spain
	ZT	Sg	20	35	48,6		
4	ZT	Pg	22	29	08,6		Ep.: Local
	ZT	Sg	22	29	23,0		
4	ZT	Pg	22	29	38,6		Ep.: Local
	ZT	Sg	22	29	53,0		
5	ZT	Pg	04	59	32,6		Ep.: 42,8 N; 2,5 E; H = 04:59:13,6 h = — km; M = 2,4 (LDG) Prades, Spain
	ZT	Sg	04	59	46,8		
5	ZT	Pg	12	40	07,3		Ep.: Local
	ZT	Sg	12	40	16,3		
6	ZT	Pg	01	46	02,6		Ep.: Local
	ZT	Sg	01	46	26,6		
6	ZT	Pg	13	14	45,0		Ep.: Local
	ZT	Sg	13	15	00,0		
6	ZT	Pg	16	48	33,6		Ep.: 42,8 N; 2,6 E; H = 16:48:13,5 h = — km; M = 2,1 (LDG) Prades, Spain
	ZT	Sg	16	48	47,6		
6	ZT	Pg	21	55	08,3		Ep.: 42,8 N; 2,5 E; H = 21:54:49,4 h = — km; M = 2,1 (LDG) Prades, Spain
	ZT	Sg	21	55	22,4		
7	ZT	Pg	07	01	43,3		Ep.: See pag. 110
	ZT	Sg	07	01	58,0		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
7 Mar	ZT	Pg	23	34	38,0		Ep.: Local
	ZT	Sg	23	34	52,3		
7	ZT	Pg	00	52	38,6		Ep.: Local
	ZT	Sg	00	52	53,0		
9	ZT	Pn	20	29	25,0		Ep.: See pag. 110
	ZT	Sn	20	29	49,6		
9	ZT	Pg	21	30	18,0		Ep.: See pag. 110
	ZT	Sg	21	30	25,3		
9	ZT	P	22	40		2.350	Ep.: 37,0 N; 24,4 W; H = 22:35:38,4 h = 10 km; M = 5,2 (GS) Azores Islands Region
10	ZT	Pg	18	46	15,3		Ep.: Local
	ZT	Sg	18	46	29,0		
12	ZT	Pg	18	13	34,0		Ep.: Local
	ZT	Sg	18	13	48,0		
12	ZT	P	18	53		6.400	Ep.: 48,4 N; 88,1 E; H = 18:43:42,8 h = 17 km; M = 5,6 (GS) Mongolia
13	ZT	Pg	04	18	10,3		Ep.: Local
	ZT	Sg	04	18	14,6		
13	ZT	Pg	04	40	16,6		Ep.: See pag. 110
	ZT	Sg	04	40	21,3		
13	ZT	Pg	15	24	44,5		Ep.: See pag. 110
	ZT	Sg	15	24	58,0		
13	ZT	Pg	23	09	58,3		Ep.: Local
	ZT	Sg	23	10	12,8		
14	ZT	Pn	05	13	00,6		Ep.: 43,1 N; 0,7 W; H = 05:12:16,2 h = 6 km; M = 3,6 (LDG) Oloron-Ste-Marie, France
	ZT	Pn	05	13	39,6		
14	ZT	Pg	11	48	14,0		Ep.: Local
	ZT	Sg	11	48	28,0		
14	ZT	Pg	15	52	28,0		Ep.: Local



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
15 Mar	ZT	Pg	01	25	56,3		Ep.: 42,8 N; 2,5 E; H = 01:25:37,7 h = — km; M = 2,1 (LDG) Prades, Spain
	ZT	Pg	01	26	10,3		
15	ZT	Pg	21	39	29,7		Ep.: Local
	ZT	Sg	21	39	44,3		
15	ZT	Pg	22	57	21,8		Ep.: 42,8 N; 2,5 E; H = 22:57:03,9 h = — km; M = 2,3 (LDG) Prades, Spain
	ZT	Pg	22	57	36,1		
17	ZT	Pg	02	26	36,6		Ep.: Local
	ZT	Sg	02	26	50,3		
17	ZT	Pn	05	41	08,3		Ep.: See pag. 111
	ZT	Sn	05	41	27,5		
17	ZT	Pg	21	43	00,6		Ep.: Local
	ZT	Sg	21	43	15,0		
19	ZT	Pg	12	01	52,8		Ep.: Local
	ZT	Sg	12	02	07,3		
19	ZT	P	15	09		6.040	Ep.: 40,0 N; 76,7 E; H = 15:00:26,0 h = 28 km; M = 5,7 (GS) Southern Xinjiang, China
19	ZT	Pg	20	58	43,0		Ep.: Local
	ZT	Sg	20	58	57,3		
19	ZT	Pg	22	39	49,0		Ep.: Local
	ZT	Sg	22	40	03,3		
22	ZT	Pn	15	09	34,6		Ep.: See pag. 111
	ZT	Sn	15	09	54,3		
22	ZT	Pg	18	55	58,0		Ep.: See pag. 111
	ZT	Sg	18	56	12,3		
23	ZT	Pg	04	57	23,3		Ep.: Local
	ZT	Sg	04	57	27,3		
23	ZT	Pg	05	06	54,1		Ep.: See pag. 111
	ZT	Sg	05	06	55,3		
	ZL	Sg	05	07	05,5		
29	ZT	Pn	11	45	42,9		Ep.: See pag. 112
	ZT	Sn	11	46	06,2		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
7 Apr	ZL	Pn	22	33	26,0	2.280	Ep.: See pag. 112
	ZL	Sn	22	33	28,0		
14	ZL	Pg	01	28	45,2	15.240	Ep.: See pag. 113
	ZL	Sg	01	28	55,7		
22	ZL	Pg	15	46	01,7	9.890	Ep.: Local
	ZL	Sg	15	46	09,5		
26	ZT	P	07	06			Ep.: 36,3 N; 28,0 E; H = 07:01:27,5 h = 75 km; M = 5,2 (GS) Dodecanese Islands
29	ZT	P	14	59			Ep.: 6,518 S; 155,0 E; H = 14:40:41,0 h = 44 km; M = 6,3 (GS) Solomon Islands
30	ZT	Pg	12	27	23,6		Ep.: Local
	ZT	Sg	12	27	28,0		
4 May	ZT	Pg	23	27	33,5		Ep.: See pag. 114
	ZT	Sg	23	27	47,6		
7	ZT	P	23	32			Ep.: 43,7 N; 147,6 E; H = 23:20:00,6 h = 54 km; M = 6,2 (GS) Kuril Islands
9	ZT	Pg	08	02	41,6		Ep.: Local
	ZT	Sg	08	02	52,3		
11	ZT	Pg	12	19	02,0		Ep.: See pag. 114
	ZT	Sg	12	19	15,6		
14	ZT	Pg	02	10	57,3		Ep.: Local
	ZT	Sg	02	11	10,0		
17	ZT	Pn	19	18	54,0		Ep.: See pag. 114
	ZT	Sn	19	19	12,0		
	ZL	Pg	19	18	53,7		
	ZL	Sg	19	19	15,5		
18	ZT	Pg	12	59	24,0		Ep.: See pag. 114
	ZT	Sg	12	59	32,0		
21	ZT	Pg	02	05	56,0		Ep.: See pag. 114
	ZT	Sg	02	06	10,3		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
23 May	ZT	Pg	08	49	24,0	Ep.: Local	
	ZT	Sg	08	49	35,0		
7 Jun	ZT	Pg	03	13	29,0	Ep.: See pag. 114	
	ZT	Sg	03	13	43,3		
7	ZT	Pg	07	03	27,0	Ep.: Local	
	ZT	Sg	07	03	37,6		
8	ZT	P	03	06	6.820	Ep.: 41,6 N; 88,6 E; H = 02:55:57,9 h = — km; M = 5,9 (GS) Southern Xinjiang, China	
8	ZT	P	23	01	9.815	Ep.: 15,3 S; 70,9 W; H = 22:47:17,8 h = 180 km; M = 4,1 (GS) Southern Peru	
10	ZT	P	01	24	16.550	Ep.: 13,4 S; 167,1 E; H = 01:04:46,9 h = 200 km; M = 5,8 (GS) Vanuatu Islands	
	ZL	P	01	24			
10	ZT	P	04	16	9.650	Ep.: 51,5 N; 177,6 W; H = 04:03:35,4 h = 33 km; M = 6,6 (GS) Andreanof Islands, Aleu- tian	
	ZL	P	04	16			
11	ZT	Pg	14	03	03,4	Ep.: See pag. 115	
	ZT	Sg	14	03	15,6		
13	ZT	Pg	01	54	47,3	Ep.: See pag. 115	
	ZT	Sg	01	55	00,0		
13	ZT	Pg	10	33	51,6	Ep.: Local	
	ZT	Sg	10	34	02,6		
16	ZT	Pn	10	31	41,3	Ep.: See pag. 115	
	ZT	Sn	10	31	58,0		
16	ZT	Pg	13	23	58,3	Ep.: See pag. 115	
	ZT	Sg	13	24	11,3		
17	ZT	P	11	39	13.040	Ep.: 7,1 S; 122,6 E; H = 11:22:18,5 h = 587 km; M = 6,6 (GS) Flores Sea	
	ZL	P	11	40			
20	ZT	Pn	14	51	22,3	Ep.: See pag. 115	
	ZT	Sn	14	51	52,6		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
21 Jun	ZT	Pn	10	47	05,3		Ep.: 43,1 N; 0,6 W; H = 10:46:22,2 h = 3 km; M = 2,9 (LDG) Oloron-Ste-Marie, France
	ZL	Sn	10	47	43,3		
27	ZT	Pg	06	20	54,6		Ep.: Local
	ZT	Sg	06	20	58,0		
28	ZT	Pg	20	12	10,3		Ep.: Local
	ZT	Sg	20	12	25,6		
30	ZT	Pn	07	11	44,0		Ep.: See pag. 115
	ZT	Sn	07	12	06,7		
	ZL	Pn	07	11	43,0		
	ZL	Sn	07	12	04,5		
30	ZT	Pg	08	06	47,6		Ep.: See pag. 115
	ZT	Sg	08	07	01,6		
2 Jul	ZT	Pg	11	08	13,6		Ep.: Local
	ZT	Sg	11	08	24,2		
2	ZT	Pg	17	13	52,6		Ep.: Local
	ZT	Sg	17	13	54,6		
3	ZT	Pn	11	38	55,6		Ep.: 41,8 N; 0,2 E; H = 11:38:25,4 h = 3 km; M = 2,7 (LDG) Huesca, Spain
	ZL	Sn	11	38	20,0		
4	ZT	Pn	14	41	08,0		Ep.: 42,1 N; 0,2 E; H = 14:40:39,6 h = — km; M = 2,7 (LDG) Huesca, Spain
	ZL	Sn	14	41	31,0		
11	ZT	Pn	19	10	57,6		Ep.: 44,0 N; 10,0 E; H = 19:09:29,9 h = — km; M = 4,0 (LDG) SE Genes
	ZL	Sn	19	12	06,0		
14	ZT	Pg	15	43	49,0		Ep.: Local
	ZT	Sg	15	44	02,5		
15	ZT	Pn	00	14	45,0		Ep.: 45,9 N; 6,1 E; H = 00:13:31,0 h = — km; M = 5,3 (LDG) NW Annecy
	ZL	Sn	00	15	40,3		
	ZL	Pn	00	14	51,5		
	ZL	Sn	00	15	51,0		
15	ZT	P	17	09		12.300	Ep.: 18,7 N; 145,6 E; H = 16:51:22,0 h = 177 km; M = 5,9 (GS) Mariana Islands



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
15 Jul	ZT	P	21	36		9.770	Ep.: 17,6 N; 101,0 W; H = 21:23:34,0 h = 18 km; M = 5,7 (GS) Guerrero, Mexico
16	ZT	P	04	00		9.000	Ep.: 56,1 N; 165,0 E; H = 03:48:28,3 h = — km; M = 5,4 (GS) Komandorsky Islands Region
16	ZT	P	10	26		12.200	Ep.: 1,0 N; 120,2 E; H = 10:07:36,6 h = 33 km; M = 6,0 (GS) Minahassa Peninsula, Sulawesi
16	ZT	Pg	18	52	15,0		Ep.: Local
	ZT	Sg	18	52	29,3		
18	ZT	Pg	01	59	05,0		Ep.: 42,8 N; 2,5 E; H = 01:58:45,0 h = 4 km; M = 2,4 (LDG) NE Prades, Spain
	ZL	Sg	01	59	15,0		
20	ZT	P	00	05		2.225	Ep.: 36,1 N; 27,1 E; H = 00:00:41,8 h = 33 km; M = 5,7 (GS) Dodecanese Islands
	ZL	P	00	05			
28	ZT	Pn	01	15	13,0		Ep.: 43,1 N; 0,7 W; H = 01:14:38,9 h = — km; M = 2,8 (LDG) Oloron-Ste-Marie, France
	ZL	Sn	01	16	03,0		
2 Aug	ZT	P	13	15		16.000	Ep.: 10,7 S; 161,4 E; H = 12:55:29,3
3	ZT	Pn	02	54	20,0		Ep.: 40,4 N; 1,4 W; H = 02:53:29,6 h = — km; M = 3,6 (IGN) Teruel, Spain
	ZL	Sn	02	55	08,6		
	ZL	Pn	02	54	24,0		
	ZL	Sn	02	55	01,0		
3	ZT	Pn	10	07	19,0		Ep.: 40,1 N; 1,4 W; H = 10:06:28,9 h = 4 km; M = 4,1 (IGN) Teruel, Spain
	ZL	Sn	10	08	11,3		
	ZL	Pn	10	07	21,5		
	ZL	Sn	10	08	00,5		
4	ZT	Pg	12	05	54,6		Ep.: See pag. 116
	ZT	Sg	12	06	08,0		
4	ZT	Pg	13	03	18,0		Ep.: See pag. 116
	ZT	Sg	13	03	32,0		
5	ZT	P	02	18		17.025	Ep.: 15,3 S; 173,1 W; H = 02:08:58,2 h = 41 km; M = 6,0 (GS) Tonga Island



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
5 Aug	ZT	P	22	54		1.550	Ep.: 40,1 N; 20,6 E; H = 22:46:42,4 h = 10 km; M = 5,1 (GS) Greece-Albania Border Region
5	ZT	P	22	57		17.700	Ep.: 20,7 S; 178,3 W; H = 22:38:22,0 h = 550 km; M = — (GS) Fiji Islands Region
	ZL	P	22	58			
7	ZT	Pg	15	42	42,6		Ep.: Local
	ZT	Sg	15	42	57,2		
8	ZT	P	17	23		9.420	Ep.: 53,0 N; 167,1 W; H = 17:10:52,7 h = 44 km; M = 5,4 (GS) Fox Islands. Aleutian Islands
9	ZT	Pg	01	27	20,3		Ep.: See pag. 116
	ZT	Sg	01	27	32,6		
13	ZT	P	19	43		6.600	Ep.: 15,7 S; 13,2 W; H = 19:33:40,4 h = 10 km; M = 5,6 (GS) Southern Mid-Atlantic Ridge
14	ZT	P	02	00		2.750	Ep.: 40,7 N; 35,3 E; H = 01:55:02,5 h = 10 km; M = 5,3 (GS) Turkey
14	ZT	P	03	05		2.750	Ep.: 40,8 N; 35,4 E; H = 02:59:41,1 h = 10 km; M = 5,2 (GS) Turkey
15	ZT	Pg	17	39	34,5		Ep.: See pag. 116
	ZT	Sg	17	39	48,6		
	ZL	Pg	17	39	41,5		
	ZL	Sg	17	40	00,5		
21	ZT	Pg	08	11	14,6		Ep.: Local
	ZT	Sg	08	11	25,6		
23	ZT	Pg	02	32	22,3		Ep.: Local
	ZT	Sg	02	32	23,6		
24	ZT	Pn	14	34	12,6		Ep.: 43,3 N; 1,6 W; H = 14:33:22,1 h = 29 km; M = 3,9 (IGN) SW Bayona
	ZL	Sn	14	35	07,0		
	ZL	Pn	14	34	12,2		
	ZL	Sn	14	35	05,5		
25	ZL	Pg	08	33	47,0		Ep.: See pag. 116
	ZL	Sg	08	34	01,3		



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
26 Aug	ZL	Pg	11	06	40,0	Ep.: Local	
	ZL	Sg	11	06	44,6		
5 Sep	ZT	P	20	46		1.275	Ep.: 42,8 N; 17,9 E; H = 20:44:09,2 h = 10 km; M = 5,6 (GS) Adriatic Sea
6	ZT	P	00	05		10.575	Ep.: 21,4 N; 121,1 E; H = 23:55:13,8 h = 20 km; M = 4,6 (GS) Taiwan region
6	ZT	P	00	37		10.575	Ep.: 21,6 N; 121,4 E; H = 00:26:01,1 h = 20 km; M = 5,2 (GS) Taiwan region
11	ZT	P	02	50		10.450	Ep.: 35,5 N; 140,9 E; H = 02:37:14,9 h = 55 km; M = 6,1 (GS) Near East Coast of Honsu, Japan
11	ZT	P	03	43		9.375	Ep.: 10,0 N; 93,8 E; H = 03:41:26,6 h = 33 km; M = 4,8 (GS) Adaman Islands, Japan
14	ZT	Pn	02	25	31,6	Ep.: See pag. 117	
	ZT	Sn	02	25	50,0		
14	ZT	P	08	10		5.780	Ep.: 36,046 N; 70,7 E; H = 08:01:03,7 h = 120 km; M = 5,1 (GS) Hindu Kush Region, Afghanistan
14	ZT	P	13	30		16.250	Ep.: 10,8 S; 165,9 E; H = 13:10:53,9 h = 73 km; M = 6,0 (GS) Santa Cruz Islands
	ZL	P	13	30			
16	ZT	Pg	21	58	28,6	Ep.: See pag. 117	
	ZL	Sg	21	58	46,0		
	ZL	Sg	21	58	57,0		
16	ZT	Pg	22	02	17,0	Ep.: See pag. 117	
	ZT	Sg	22	02	31,0		
16	ZT	Pg	22	07	51,0	Ep.: See pag. 117	
	ZT	Sg	22	08	05,6		
	ZL	Pg	22	07	53,0		
	ZL	Sg	22	08	10,2		
17	ZT	P	13	48		1.270	Ep.: 42,8 N; 17,8 E; H = 13:45:22,8 h = 10 km; M = 5,4 (GS) Adriatic Sea



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
18 Sep	ZT	Pg	13	41	48,0		Ep.: Local
	ZT	Sg	13	41	52,0		
19	ZT	Pg	05	44	47,6		Ep.: See pag. 117
	ZT	Sg	05	45	01,6		
20	ZT	Pn	20	00	26,6		Ep.: 43,1 N; 1,5 E; H = 19:59:37,4 h = — km; M = 2,9 (IGN) Navarra, Spain
	ZL	Sn	20	01	16,6		
23	ZT	Pg	05	31	47,0		Ep.: See pag. 117
	ZT	Sg	05	31	50,3		
24	ZT	P	11	52		6.730	Ep.: 15,2 N; 61,4 W; H = 11:42:18,8 h = 147 km; M = 6,0 (GS) Leeward Islands
30	ZT	P	06	02		9.150	Ep.: 54,0 N; 160,0 E; H = 05:49:50,5 h = 102 km; M = 5,5 (GS) Near Coast of Kamchatka
2 Oct	ZT	P	11	37		9.850	Ep.: 45,1 N; 151,1 W; H = 11:24:48,4 h = 33 km; M = 6,1 (GS) Kuril Islands
3	ZT	Pn	06	07	01,0		Ep.: See pag. 118
	ZT	Sn	06	07	34,3		
3	ZT	Pn	06	41	45,6		Ep.: See pag. 118
	ZT	Sn	06	42	16,0		
3	ZT	Pg	13	06	55,0		Ep.: Local
	ZT	Sg	13	07	01,6		
5	ZT	Pn	05	16	00,0		Ep.: See pag. 118
	ZT	Sn	05	16	30,3		
6	ZT	Pg	00	22	19,6		Ep.: See pag. 118
	ZT	Sg	00	22	33,6		
6	ZT	Pg	21	13	10,0		Ep.: See pag. 118
	ZT	Sg	21	13	24,5		
7	ZT	Pn	04	04	01,6		Ep.: Local
	ZT	Sn	04	04	36,6		
9	ZT	P	13	16		2.700	Ep.: 34,5 N; 32,1 E; H = 13:10:52,1 h = 33 km; M = 6,4 (GS) Cyprus Region
	ZL	P	13	16			



SEISMIC OBSERVATIONS

1996

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
9 Oct	ZT	P	14	25		2.700	Ep.: 34,5 N; 32,2 E; H = 14:19:37,5 h = — km; M = 5,7 (GS) Cyprus Region
11	ZT	Pg	03	14	05,6		Ep.: See pag. 119
	ZT	Sg	03	14	20,0		
15	ZT	P	09	57		755	Ep.: 44,7 N; 10,7 E; H = 09:55:59,6 h = 10 km; M = 5,3 (GS) Northern Italy
	ZL	P	09	57			
16	ZT	Pg	17	32	28,6		Ep.: 41,4 N; 2,2 E; H = 17:32:18,0 h = — km; M = 2,4 (IGN) NW Barcelona, Spain
	ZL	Sg	17	32	34,3		
19	ZT	P	15	12		17.625	Ep.: 20,4 S; 178,5 W; H = 14:53:48,7 h = 591 km; M = 6,1 (GS) Fiji Islands Region
19	ZT	Pn	22	35	18,0		Ep.: See pag. 119
	ZT	Sn	22	35	28,0		
20	ZT	Pg	19	48	51,6		Ep.: Local
	ZT	Sg	19	48	54,6		
20	ZT	Pg	21	26	34,6		Ep.: Local
	ZT	Sg	21	26	37,9		
22	ZT	Pg	15	21	24,6		Ep.: See pag. 119
	ZT	Sg	15	21	44,0		
24	ZT	P	19	43		7.920	Ep.: 67,0 N; 173,2 W; H = 19:31:53,9 h = 20 km; M = 6,0 (GS) Near N. Coast of Eastern Siberia
26	ZT	Pn	12	26	07,3		Ep.: See pag. 120
	ZT	Sn	12	26	34,6		
	ZL	Pn	12	26	08,8		
	ZL	Sn	12	26	33,5		
29	ZT	Pg	23	00	24,6		Ep.: See pag. 120
	ZT	Sg	23	00	38,6		
4 Nov	ZT	Pg	12	32	26,3		Ep.: Local
	ZT	Sg	12	32	28,3		



SEISMIC OBSERVATIONS

1993

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
4 Nov	ZT	P	17	36		8.620	Ep.: 7,3 N; 77,4 W; H = 17:24:57,4 h = 14 km; M = 6,0 (GS) Panama-Colombia Border Reg.
5	ZT	P	10	02		18.800	Ep.: 31,1 S; 179,9 E; H = 09:41:34,7 h = 369 km; M = 5,9 (GS) Kermadec Islands Region
6	ZT	P	20	48		11.300	Ep.: 28,0 N; 143,6 E; H = 20:37:00,6 h = 10 km; M = 5,9 (GS) Bonin Islands Region
9	ZT	Pn	03	45	25,3		Ep.: See pag. 120
	ZT	Sn	03	46	08,6		
12	ZT	P	17	12		10.150	Ep.: 15,0 S; 75,6 W; H = 16:59:44,0 h = 33 km; M = 6,5 (GS) Near Coast of Peru
13	ZT	Pn	08	54	21,6		Ep.: See pag. 120
	ZT	Sn	08	54	52,0		
	ZL	Pn	08	54	21,6		
	ZL	Sn	08	54	52,0		
14	ZT	Pg	22	37	58,6		Ep.: Local
	ZT	Sg	22	38	00,3		
16	ZT	Pg	01	27	48,7		Ep.: Local
	ZT	Sg	01	27	51,7		
22	ZT	Pg	12	32	34,0		Ep.: Local
	ZT	Sg	12	32	36,0		
25	ZT	Pg	15	46	15,0		Ep.: Local
	ZT	Sg	15	46	19,7		
27	ZT	Pn	15	24	37,5		Ep.: 43,1 N; 0,5 W; H = 15:23:49,6 h = — km; M = 3,0 (LDG) SE Oloron-Ste-Marie, France
	ZL	Sn	15	25	10,0		
29	ZT	Pn	01	33	17,0		Ep.: See pag. 120
	ZT	Sn	01	33	51,0		
1 Dec	ZT	Pn	11	54	09,0		Ep.: 45,9 N; 0,0 E; H = 11:52:46,2 h = 12 km; M = 3,8 (IGN) Angouleme
	ZL	Sn	11	55	05,7		



SEISMIC OBSERVATIONS

1993

Date	Comp.	Phase	Time TU			Δ Km	Remarks
			h	m	s		
2 Dec	ZT	Pg	12	57	08,3		Ep.: Local
	ZT	Sg	12	57	13,7		
2	ZT	Pg	14	11	24,6		Ep.: Local
	ZT	Sg	14	11	37,0		
2	ZT	Pg	14	58	31,7		Ep.: Local
	ZT	Sg	14	58	33,3		
3	ZT	Pg	12	05	42,0		Ep.: Local
	ZT	Sg	12	05	57,6		
7	ZT	Pg	18	02	00,0		Ep.: Local
	ZT	Sg	18	02	02,3		
12	ZT	Pn	14	33	02,7		Ep.: See pag. 120
	ZT	Pn	14	33	32,7		
16	ZT	Pn	11	36	06,2		Ep.: See pag. 121
	ZT	Pn	11	36	25,7		
21	ZT	P	08	48		8.325	Ep.: 30,7 N; 99,6 E; H = 08:39:39,7 h = 10 km; M = 5,2 (GS) Sinchuan, China
22	ZT	P	15	05		9.600	Ep.: 43,2 N; 138,9 E; H = 14:53:27,6 h = 227 km; M = — (GS) Eastern Sea of Japan
24	ZT	Pg	15	12	07,3		Ep.: See pag. 121
	ZT	Sg	15	12	19,0		
	ZL	Pg	15	12	10,5		
	ZL	Sg	15	12	16,5		
24	ZL	Pg	15	12	34,0		Ep.: Local
	ZL	Pg	15	12	39,8		
25	ZT	Pg	13	20	24,6		Ep.: See pag. 121
	ZT	Sg	13	20	36,3		
	ZL	Pg	13	20	16,8		
	ZL	Sg	13	20	24,0		
28	ZT	P	07	32		730	Ep.: 37,2 N; 3,7 W; H = 07:30:35,7 h = 10 km; M = 3,5 (GS) Spain

