

Matuyama JAPAN

SEISMIC BULLETIN

of the Matuyama Meteorological Observatory of Japan.

$\varphi = 33^{\circ}55'N$ $\lambda = 132^{\circ}45'E$ $h = 31.4m$

Omori Hor. Pend. Seismograph. [Multiplication—100 Mass—48.8kg. Pendulum Period—8.0s]

Time : all determinations are reduced to green-wich mean civil time.



Matuyama Observatory

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks	
			G. M. C. T.				AE	AN	Az			
			h.	m	s.	s	micron	micron	micron	km.		
1	2nd Jan 1929	ipSen	1	40	34.0	0.5	+9	-34	-	202.5		
		iSen		41	1.3	0.5	-65	+18	-			
		iMen		41	10.6	-	+95	+440	-			
		F		43	54.0	-	-	-	-			
2	4th Jan 1929	ipSen	11	9	30.3	0.4	+5.2	+5.0	-	102.4		
		iSen		9	40.8	0.55	-38	+4.8	-			
		iMen		9	48.5	0.65	-244	+20.0	-			
		F		11	35.5	-	-	-	-			
3	13rd Jan 1929	ipSen	21	16	26.0	-	+2.0	+1.5	-	60.9		
		iMen		16	35.3	-	-7.2	-4.0	-			
		F		17	8.0	-	-	-	-			
4	18th Jan 1929	ipSen	9	58	36.0	0.7	-1.3	-1.3	-	86.8		
		iSen		58	47.7	-	+2.5	-3.8	-			
		iMen		58	50.0	0.7	+5.0	-5.0	-			
		F		59	13.3	-	-	-	-			
5	18th Jan 1929	ipSen	20	23	21.5	0.5	-	-1.3	-	75.7		
		iSen		23	28.2	0.5	+18.8	-18.8	-			
		iMen		25	32.6	0.6	+21.3	+31.3	-			
		F		26	57.0	-	-	-	-			
6	19th Jan 1929	ipSen	1	16	40.2	-	-4.0	-2.0	-	161.0		
		iMen		16	46.0	-	-4.0	+2.0	-			
		F		17	16.0	-	-	-	-			
7	23rd Jan	ipSen	1	23	57.5	-	-	-2.2	-	66.8		
		iMen		23	7.5	-	-14.2	-22.0	-			
		F		23	27.5	-	-	-	-			
8	30th Jan	ipSen	7	15	9.0	-	+4.0	+4.5	+3.8	42.3	Felt some near men	
		iMen		15	15.3	0.6	-35.0	-45.0	+15.8			
		F		16	15.3	-	-	-	-			

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$\varphi = 33^{\circ}55'N$ $\lambda = 132^{\circ}45'E$ $h = 31.4m$

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Matuyama Observatory

No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G. M. C. T.				AE	AN	Az		
			h.	m	s.	s	micron	micron	micron	km.	
9	3rd Feb 1929	iPn	11	45	43.5	-	-	-	-	482.3	
		iPpn		46	11.8	-	-	-3.0	-		
		iMen		46	55.2	2.9	-	-5.0	-5.0		
		F		52	26.0	-	-	-	-		
10	9th Feb	iPsen	21	27	51.3	0.67	+11.0	± 8.0	-7.5	192.9	
		iLen		28	17.3	1.0	-	-22.0	+15.0		
		iMen		28	25.4	1.0	-52.0	-85.0	+15.0		
		F		30	19.0	-	-	-	-		
11	11st Feb	iPsen	6	37	38.0	-	-	-	-	198.1	
		iMen		38	8.0	-	± 4.0	+4.0	-		
		F		38	59.8	-	-	-	-		
12	18th Feb	ePsen	3	34	22.3	-	+2.2	-	-	238	
		eMen		34	26.5	0.69	-4.0	-2.0	-		
		F		34	45.0	-	-	-	-		
13	24th Feb	iPzn	21	19	30.0	0.6	-	-2.5	-57.5?	104.6	
		iMen		19	46.7	AN 0.8	-	-22.5	-98.8?		
		F		21	34.0	EN 1.4	-	-	-		

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No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G. M. C. T.				Ae	An	Az		
			h.	m	s.	s	micron	micron	micron	km.	
14	7 mar 1929	ePn	10	31	7.0	-	-	-	-	5938.9	very far
		eSn		38	45.0	-	-	-4.0	-		
		eS		44	25.0	13.3	-	+6.0	-		
		eMen		48	18.0	13.3	-10.0	+16.0	-		
		F	11	56	45.0	-	-	-	-		
15	13 mar	ePn	20	10	8.0	-	-	-	-	200.3	
		iMen		10	46.0	-	+7.5	-8.0	-		
		F		11	23.0	-	-	-	-		
16	15 mar	iPn	19	14	8.0	0.6	-	+2.5	+6.3	72.0	
		iSn		14	17.7	1.2	+2.5	+6.3	-		
		iMen		14	24.9	-	+6.3	+25.0	+18.8		
		F		16	55.0	-	-	-	-		
17	17 mar	ePsn	2	51	33.0	-	-	-	-	55.6	
		eMen		51	44.0	-	-	-	-		
		F		52	19.5	-	-	-	-		
18	21 mar	iPsn	5	4	10.6	0.83	-	+1.25	-	268.6	
		iMen		4	48.9	0.83	-	+8.75	-		
		F		6	38.6	-	-	-	-		
19	25 mar	iPsn	12	20	39.0	0.6	-	+3.5	+2.5	72.7	Felt some men
		iMen		20	50.0	1.2	+8.75	-32.5	+10.0		
		F		21	36.0	-	-	-	-		

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No.	Date	Phase	Time			Period	Amplitude			Δ	Remarks
			G. M. C. T.				AE	AN	Az		
			h.	m	s.		miCron	micron	micron		
20	12 nd apr	ePn	9	51	47.0	-	-	-1.0	-	267.1	
		eSn		52	5.9	-	-	-4.0	-		
		eMn		52	26.5	-	-	-14.0	-		
		F		53	3.0	-	-	-	-		
21	12 nd	eP	22	28	33.0	-	-	-	-	54.9	
		iMn		28	43.0	0.5	-	-7.5	-		
		F		29	23.0	-	-	-	-		
22	14 th	eP	1	16	3.7	-	-	-	-	74.2	
		eMn		16	17.0	-	-	-3.0	±1.3		
		F		16	47.0	-	-	-	-		
23	15 th	iPen	14	59	41.0	0.6	-1.3	+3.8	-	178.1	
		ePen	15	0	9.0	0.8	-2.5	-6.3	-		
		F		0	59.0	-	-	-	-		

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$\phi = 33^{\circ}50'N$ $\lambda = 132^{\circ}45'E$ $h = 31.4m$



Wiechert Seismograph
(Horizontal & Vertical)

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	5.6	1.3	0.1	80
A N:	2.7	1.0	0.03	"
A Z:	4.4	1.2	0.8	"

Omori seismograph
Horizontal Pendulum

	T	ϵ	$\frac{V}{T_0^2}$	V
A E:	7.0	-	19.4	100
A N:	11.0	-	17.4	-

Time : all determinations are reduced to green-wich civil time

Matuyama Observatory

No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ	Remarks
			h	m	s		AE	AN	AZ		
24	May 2nd	ep	1	4	34	-	-	-	-	3728.4	
		eSen		11	14	-	-	-	-		
		eSen		12	14	-	-	-	-		
		eM ₁ n		15	9	10.0	+8.0	-10.0	-		
		eM ₂ n		19	9	10.0	+6.0	-	-		
		F		33	14	-	-	-	-		
25	10th	ep	3	1	2	-	-	-	-	163.2	
		eM ₁ n		1	25	0.8	-	-2.5	-		
		eM ₂ n		1	31	0.8	-	-2.5	-		
		F		2	21	-	-	-	-		
26	20th	iSen	23	35	42.8	0.6	+9.0	± 3.8	-	89.0	
		iM ₁ n		35	55.8	0.9	+13.0	-35.0	-		
		F		36	55.8	-	-	-	-		
27	22nd	iSen	1	36	15	0.8	+3.75	+5.0	+20.0	259.7	Shack every men
		iSen		36	52	0.8	+14.75	+24.0	-		
		iM ₁ Sen		36	59	1.0	+24.25	-612.5	675.0		
		iM ₂ Sen		38	21	1.2	± 62.5	+252.5	-		
		F		51	22	-	-	-	-		
28	22nd	iSen	1	52	36.6	-	-	-	-	222.6	
		iSen		53	6.6	-	-	-3.0	-		
		iM ₁ n		53	18.6	0.8	-	+3.0	-		
		F		54	16.6	-	-	-	-		
29	22nd	ep	1	59	2.6	-	-	-	-	200.3	
		eSen		59	29.6	-	-	+3.0	-		
		eM ₁ n		59	35.6	0.8	-	+3.0	-		
		F	2	1	15.6	-	-	-	-		
30	22nd	eSen	2	11	6.5	0.8	-	+3.0	-	230.0	
		iM ₁ n		11	38.5	1.2	-	+24.0	-		
		F		14	8.5	-	-	-	-		
31	22nd	Pn	2	21	52.0	0.8	-	± 3.0	-	237.4	
		iM ₁ n		22	25.0	1.2	-	+13.0	-		
		F		22	55.0	-	-	-	-		
32	23rd	ep	13	10	58.3	-	-	-	-	2	
		eM ₁ n		11	9.2	0.6	+3.0	+42.2	-		
		F		12	4.0	-	-	-	-		

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Wiechert Seismograph
(Horizontal & Vertical)

	T ₀	ε	$\frac{V}{T_0^2}$	V
A E:	5.6	1.3	0.1	80
A N:	2.7	1.0	0.03	"
A Z:	4.4	1.2	0.8	"

Omori seismograph
Horizontal Pendulum

	T ₀	ε	$\frac{V}{T_0^2}$	V
A E:	7.0	-	19.4	100
A N:	11.0	-	17.4	"

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Matuyama Observatory

No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ	Remarks
			h	m	s		AE	AN	AZ		
							micron	micron	micron	k.m	
33	3 rd June	iPen	6	39	43	0.7	+133	+50	-	400.7	Felt some men slightly middle valley of Kumano Oki
		iMen		40	43	3.8	-1420	-240	-		
		F		48	23	-	-	-	-		
34	8 th "	iPen	4	52	27	-	-25	+73	-	118.7	
		iLen		52	43	0.8	-73	+100	-		
		iMen		52	48	0.6	+100	+313	-		
		iMen		52	56	0.6	+50	+150	-		
		F		54	42	-	-	-	-		
35	12 nd "	iPen	4	33	00	0.7	-	-2.5	-	200.3	
		iPen		33	19	1.0	±1.3	-4.4	-		
		iMen		33	30	1.0	+3.8	+15.0	-		
		F		35	26	-	-	-	-		
36	12 nd "	?p	14	19	35.2	-	-	-	-	?	
		eMe		20	3.0	-	-5.0	-	-		
		F		20	41.0	-	-	-	-		
37	26 th "	iPen	17	46	32.7	0.8	-	±2.5	-	178.1	
		iMen		47	0.7	1.0	-	-15.0	-		
		iMen		47	6.7	1.2	-	-12.5	-		
		iMen		47	9.7	1.2	-	-11.3	-		
		F		48	23.7	-	-	-	-		
38	28 th "	?ep	22	12	35	-	-	-	-	?	
		eM		12	57.5	-	-	-	-		
		F		13	23	-	-	-	-		
39	29 th "	?p	-	-	-	-	-	-	-	?	
		M	0	37	4.0	-	-	-	-		
		F	-	-	-	-	-	-	-		

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Wiechert Seismograph
(Horizontal & Vertical)

Omori seismograph
Horizontal Pendulum

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	5.6	1.3	0.1	80
A N:	2.7	1.0	0.03	"
A Z:	4.4	1.2	0.8	"

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	7.0	-	19.4	100
A N:	11.0	-	17.4	100

Time : all determinations are reduced to green-wich civil time

Matuyama Observatory

No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ	Remarks
			h	m	s		AE	AN	AZ		
40	7th July	ep	5	3	4	0.8	-	-3.8	-	282.0	
		eSp		3	20	0.7	+32.0	-8.8	-40.0		
		el		3	39	1.5	+11.0	+16.3	-40.0		
		eM		3	46	0.8	+28.0	+46.3	-		
		F		5	54	-	-	-	-		
41	8th July	? ep	22	21	9.5	-	-	-	54.1		
		M		21	12.8	0.3	± 2	-3		-	
		F		21	29.5	-	-	-		-	
42	10th "	eps	3	50	25	0.3	-	-15	+10	54.1	slight shock every man
		M		50	39	0.5	+55	+80	+18.8		
		F		51	29	-	-	-	-		
43	11st "	? p	2	0	30	-	-	-	-	54.1	
		M		0	38.0	0.7	-2	-5	-		
		F		0	46.5	-	-	-	-		
44	27 "	ip	7	49	43.7	0.9	-	+2.5	-	477.1	
		ipp		50	28.0	0.9	-	+6.3	-		
		iS		50	58.0	0.9	-	+16.3	-		
		iM		51	32.3	1.5	-	+25.0	-		
		F		54	2.3	-	-	-	-		
45	4th Aug	eps	1	0	33.0	0.6	+2.5	+15.0	-	182.6	
		iM		0	58.7	0.8	+68.8	+218.8	-		
		F		3	41.0	-	-	-	-		
46	6th "	ep	19	23	46.7	-	-	-	-	261.0	
		eM		24	7.1	0.6	+2.0	-6.3	-		
		F		24	52.1	-	-	-	-		
47	8th "	ep	22	30	50	-	-	-	-	169.1	
		eM		30	30.7	1.0	-	-2.5	-		
		F		30	58.0	-	-	-	-		

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Wiechert Seismograph
(Horizontal & Vertical)

Omori seismograph
Horizontal Pendulum

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	5.6	13	0.1	80
A N:	2.7	10	0.03	"
A Z:	4.4	12	0.8	"

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	7.0	-	19.4	100
A N:	11.0	-	17.4	"

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No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ	Remarks
			h	m	s		AE	AN	AZ		
48	8th aug	ep	22	33	52.6	0.6	-1.3	-3.8	-3.8	261.0	
		epp		34	0.8	0.6	-1.3	+6.3	-		
		el		34	14.2	8.2	-1.3	+3.8	-3.8		
		eM		34	19.4	8.2	-15.0	+53.0	+21.3		
		F		37	6.0	-	-	-	-		
49	10th aug	eps	12	48	12	-	-	-	-	121.7	
		eM		48	31	0.8	+4.0	-5.0	-		
		F		49	20	-	-	-	-		
50	23rd "	p2	-	-	-	-	-	-	-	?	
		eM	16	1	30.0	-	-	-	-		
		F		1	50.0	-	-	-	-		
51	25th "	ep	11	57	55.6	-	-1	-1	-	111.3	
		eM		58	13.9	0.5	-11	-7.2	-		
		F		59	7.0	-	-	-	-		
52	31st "	ep	12	3	24.6	0.4	-	-1.3	+1.3	113.5	
		eM		3	45.3	0.8	-1.5	-5.3	+2.5		
		F		4	51.0	-	-	-	-		
53	31st "	ip	12	7	50.7	0.6	-1.3	-2.5	+1.3	123.2	
		iM		8	11.4	0.4	-2.5	-18.8	-2.5		
		F		10	5.2	-	-	-	-		

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Wiechert Seismograph
(Horizontal & Vertical)

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	2.0	2.6	0.13	80
A N:	2.0	2.6	0.3	4
A Z:	5.6	1.3	0.09	11

Omori seismograph
Horizontal Pendulum

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	7.0	-	0.2	100
A N:	12.0	-	0.2	11

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No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ	Remarks
			h	m	s		AE	AN	AZ		
							micron	micron	micron	k.m	
54	5th Sep 1929	ep _m	21	55	47.3	0.7	-2.5	-0.8	-	56.4	Felt every man.
		ep _Z		55	46.3	-	-	-	-6.3		
		iM		55	56.0	0.8	-13.8	-43.8	-22.5		
		F		57	13.5	-	-	-	-		
55	20th Sep 1929	ep	13	10	33.2	0.64	-	-1.3	-	413.3	
		ep _Z	13	10	32.2	0.83	-	-	1.9		
		ipp		10	50.3	0.75	-	-3.8	-		
		iM ₁		11	23.2	0.83	-5.0	+11.3	-		
		iM ₂		11	31.8	0.83	-3.8	-10.0	-		
		iM _Z		11	39.7	0.96	-	-	+13.8		
		F		13	25.5	-	-	-	-		
		F _Z		13	5.4	-	-	-	-		
56	21st Sep 1929	ip	16	22	24.7	0.6	-	+2.5	-	93.5	Felt some men.
		M		22	42.6	AN 0.7 AZ 0.6	-3.8	+18.8	+13.8		
		F		23	29.0	-	-	-	-		

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Wiccherit Seismograph
(Horizontal & Vertical)

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	2.0	2.6	0.5	80
A N:	"	"	1.3	"
A Z:	5.6	1.3	2.9	"

Omori seismograph
Horizontal Pendulum

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:				
A N:				

Time : all determinations are reduced to green-wich civil time

Matuyama Observatory

No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ k.m	Remarks
			h	m	s		A E micron	A N micron	A Z micron		
57	1st octo 129	iPS	0	59	7.0	AN 0.6 AZ 0.4	-3.8	-13.8	-11.3	115.8	
		iM		59	24.1	AN 0.6 AZ 0.4	+12.5	-47.5	-31.3		
		F	1	1	26.0	-	-	-	-		
58	10th	iPS	4	45	53.1	0.6	-	-3.8	-	141.0	shocked every man
		iPS ₂		45	53.3	-	-	-	-		
		iM		46	14.8	0.5	+23.8	-97.5	-		
		iM ₂		46	17.7	0.4	-	-	+32.5		
		F		48	23.3	-	-	-	-		
		F ₂		47	47.7	-	-	-	-		
59	25th	iP	3	57	52.6	0.6	-	-3.8	-	244.1	
		iS		57	58.0	0.6	-2.5	-8.8	-		
		iSS		58	4.3	0.6	-1.3	-8.8	-		
		iSSS		58	9.7	0.6	-1.3	-8.8	-		
		iL		58	25.5	0.6	-2.5	+7.5	-		
		iM ₁		58	29.7	0.8	-6.3	-25.0	-		
		iM ₂		58	36.0	0.8	-5.0	-18.8	-		
		iM ₃		58	41.3	0.8	-6.3	-25.0	-		
		iM ₄		58	51.8	0.6	-3.8	-16.3	-		
		F	4	0	25.5	-	-	-	-		

Matuyama JAPAN

SEISMIC BULLETIN

of the Matuyama Meteorological Observatory of Japan.

$\varphi = 33^{\circ}50'N$ $\lambda = 132^{\circ}45'E$ $h = 31.4m$



Wiechert Seismograph
(Horizontal & Vertical)

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:	2.0	2.6	0.5	80
A N:	"	"	1.3	"
A Z:	5.6	1.3	2.9	"

Omori seismograph
Horizontal Pendulum

	T_0	ϵ	$\frac{V}{T_0^2}$	V
A E:				
A N:				

Time : all determinations are reduced to green-wich civil time

Matuyama Observatory

No.	Date	Phase	Time G.M.C.T.			Period	Amplitude			Δ k.m	Remarks	
			h	m	s		AE micron	AN micron	AZ micron			
60	2nd Nov '29	ep	1	3	32.0	0.6	-	-1.3	-	207.0		
		ipp		3	41.3	0.6	-	-1.3	-			
		iM		4	1.0	0.6	+2.3	+0.8	+2.3			
		F		5	21.0	-	-	-	-			
61	10th	ep	5	56	19.0	-	-	-	-	74.2		
		iM		56	31.2	0.8	-2.5	-7.5	-			
		F		57	11.2	-	-	-	-			
62	12nd	ip	7	5	49.8	-	-	± 2.5	-	46.0		
		iM		5	57.0	0.6	-5.0	-16.3	-			
		F		6	28.0	-	-	-	-			
63	12nd	p2	-	-	-	-	-	-	-	2		
		iM		11	58	31.5	-	-	+5.0			-
		F		-	-	-	-	-	-			-
64	12nd	ip	17	39	25.0	0.6	-	± 1.3	-	55.6		
		iM		39	33.6	0.9	-	± 3.8	-			
		F		39	56.0	-	-	-	-			
65	20th	ep	14	55	5.8	-	-	+2.5	-	190.0	Shocked every man Original at Kitan bay	
		ep2		55	5.8	-	-	-	-5.0			
		iS		55	8.0	0.8	+17.5	-150.0	-			
		iS2		55	10.2	0.7	-	-	-90.0			
		iM _m		55	38.0	0.9	-	-21.3	-			
		iMe		55	40.2	0.9	-50.0	-	-			
		iM2		55	48.0	0.7	-	-	-75.0			
		eC		57	23.5	0.8	-	± 0.8	-			
		F _m		58	53.5	-	-	-	-			
		F2	15	0	3.5	-	-	-	-			

SEISMIC BULLETIN

of the Matuyama Meteorological Observatory of Japan.

$\phi = 33^{\circ}50'N$ $\lambda = 132^{\circ}45'E$ $h = 31.4m$

Wiechert Seismograph
(Horizontal & Vertical)

	T ₀	ϵ	$\frac{V}{T_0^2}$	V
A E:	2.0	2.6	0.1	8.0
A N:	2.0	2.6	0.3	8.0
A Z:	5.6	1.3	0.09	8.0

Omori seismograph
Horizontal Pendulum

	T ₀	ϵ	$\frac{V}{T_0^2}$	V
A E:	7.0	-	0.15	100
A N:	12.0	-	0.19	100



International
Seismological
Centre

Time: all determinations are reduced to green-wich civil time

From September 1, 1929 to December 21, 1929.

Matuyama Observatory

No.	Date	Phase	Time G.M.C.T.				Period	Amplitude			Δ k.m	Remarks
			h	m	s	s		AE micron	AN micron	AZ micron		
58	Sept 10	\tilde{P}	4	45	53.1	0.6		-3.8		141.0	houses moved.	
		$\tilde{P}Z$	4	45	53.3	?						
		\tilde{M}	4	46	14.8	0.5	+23.8	-97.5	?			
		$\tilde{M}Z$	4	46	17.7	0.4			+32.5			
		F	4	48	23.3							
59	" 25	\tilde{P}	3	57	52.6	0.6		-3.8		244.1		
		\tilde{S}	3	57	58.0	0.6	-2.5	-8.8				
		\tilde{SS}	3	58	4.3	0.6	-1.3	-8.8				
		\tilde{SSS}	3	58	9.7	0.6	-1.3	-8.8				
		$\tilde{L}EV$	3	58	25.5	0.6	-2.5	+7.5				
		\tilde{M}_1	3	58	29.7	0.8	-6.3	-25.0				
		\tilde{M}_2	3	58	36.0	0.8	-5.0	-18.8				
		\tilde{M}_3	3	58	41.3	0.8	-6.3	-25.0				
		\tilde{M}_4	3	58	57.8	0.6	-3.8	-16.3				
		F	4	0	25.5							
60	Nov. 2	\tilde{P}	1	03	32.0	0.6		-1.3		207.0		
		$\tilde{M}Z$	1	04	1.0	0.6	+2.3	+8.8	+2.3			
		F	1	05	21.0							
61	" 10	\tilde{P}	5	56	19.0					74.2	local shock.	
		\tilde{M}	5	56	31.2	0.6	-2.5	-7.5				
62	" 12	\tilde{P}	7	05	49.8	?				46.0	local shock.	
		\tilde{M}	7	05	57.0	0.6	-5.0	$\pm 25?$				
		F	7	06	28.0			-16.3				
63	" 12	\tilde{M}	11	58	31.5	?		+5.0			local shock.	
64	" 12	\tilde{P}	17	39	25.0	0.6		$\pm 1.3?$		55.6	local shock.	
		\tilde{M}	17	39	33.6	0.9		$\pm 3.8?$				
		F	17	39	56.0							
65	" 20	\tilde{P}	14	55	5.8			+2.5		190.0	in the Kitan channel.	
		$\tilde{P}Z$	14	55	5.8				-5.0			
		\tilde{S}	14	55	8.0	0.8	+17.5	-150.0				
		$\tilde{S}Z$	14	55	10.2	0.7			-90.0			
		$\tilde{M}V$	14	55	38.0	0.9		-21.3				
		$\tilde{M}E$	14	55	40.2	0.9	-50.0					
		EC	14	57	23.5	0.8		± 8.8				
		F	14	58	53.5							
		FZ	15	0	3.5							
66	Dec. 17	\tilde{P}	20	05	24.0	?		-2.0	-10.0	-5.1	4224.9	distant shock.
		ESSE	20	11	6.4			± 5.0				
		ESZ	20	12	8.5	?				+6.4		
		ESSSE	20	12	9.0	?		± 2.0				
		ESSSSE	20	13	37.7	?		+10.0				
		$\tilde{L}E$	20	13	53.4	18.3		+10.0				
		$\tilde{L}Z$	20	14	54.6	?				+19.2		
		M_1	20	15	52.8	19.8		+14.0				
		M_2	20	18	36.7	18.3		± 6.0				
		M_3	20	19	50.2	?		± 6.0				
		M_4	20	21	39.5	18.8		+9.0				
		M_5	20	22	35.2			± 5.0				
		M_6	20	23	53.5	15.6		± 6.0				
		FZ	20	46	38.6							
		F	21	31	53.5							
		67	" 21	\tilde{P}	10	47	44.1	?		+2.7		
$\tilde{L}N$	10			47	53.7	0.7		+16.0				
$\tilde{L}E$	10			47	54.0	0.7	+10.0					
M_1N	10			47	54.8	0.7		+26.6				
M_1E	10			47	55.1	0.7	+16.0					
M_2N	10			47	56.8			+13.3				
68	sept. 1	F	10	48	39.0							
		$\tilde{P}S$	0	59	7.0	0.6						
		\tilde{M}			24.0	0.6		-13.8				
F	0	1	26.0			+12.5	-47.5		115.8			