

THE  
SEISMOLOGICAL  
BULLETIN

OF

THE HUKUOKA METEOROLOGICAL OBSERVATORY

OF

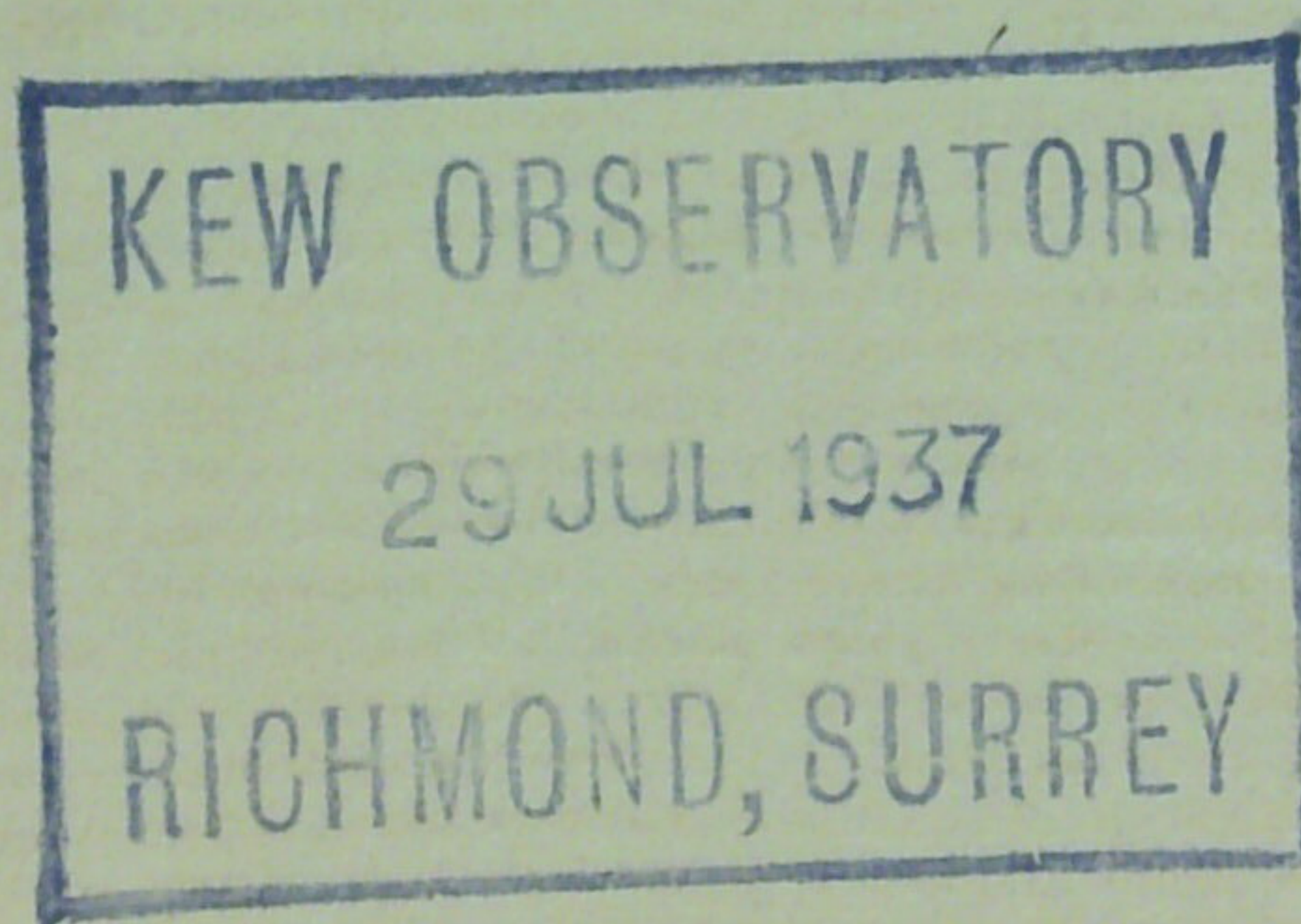
JAPAN

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VOL. VII

---

FROM JANUARY TO DECEMBER, 1936



L3L

PUBLISHED BY

THE HUKUOKA METEOROLOGICAL OBSERVATORY

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March 1937



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# Constants



**Position of Observatory :**

Longitude : ..... 130° 25'4 E  
 Latitude : ..... 33° 34'8 N  
 Height from mean sea level : ..... 4.3 m  
 Underground : ..... Alluvium.

**Seismographs :**

Apparatus	Component	T <sub>0</sub>	r T <sub>0</sub> <sup>2</sup>	V
Omori's Horizontal Seismograph 15kg.	E—W	22	0.014	20
Omori's Tromometer 47kg.	N—S	15	0.090	120

## Symbols and Notations

**1. Phases of the seismogram.**

P = First Preliminary tremors (longitudinal).

$\bar{P}$  = Individual, or upper first preliminary tremors.

PR<sub>n</sub> = Longitudinal waves n times reflected at the earth's surface.

S = Second preliminary tremors (transverse).

$\bar{S}$  = Individual, or upper second preliminary tremors.

SR<sub>n</sub> = Transverse waves n times reflected at the earth's surface.

PS = Waves changed from longitudinal to transverse oscillation, or vice versa, through reflection at the earth's surface.

L = Long waves at the beginning of the surface phase.

M = Maximum Amplitude in principal phase.

C = Waves of the tail or end portion.

F = End of discernible movements.

**2. Nature of the motion.**

i = Sudden beginning of the motion.

e = Gradual beginning of the motion.

A = Amplitude of the earth's motion in microns.

A<sub>E</sub> = E—W component of A.

A<sub>N</sub> = N—S component of A.

Period = Time of one complete oscillation.

**3. Distance of epicenter.**

$\Delta$  = Distance of epicenter; for the near earthquakes calculated by the Omori's formula  $\Delta = 7.42t$ , and for the distant earthquakes by the Wiechert's, Zoeppritz's and Zeissig's time distance curve.

**4. Time used. Greenwich mean civil time is adopted for all determinations**



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>		
			h	m	s	s	$\mu$	$\mu$	km.	
1	Jan. 2	e	22	58	36.8				—	Distant earthquake. All phases could not be distinguished.
		F	23	16	—					
2	Jan. 18	P	17	23	15.2		(+)?	- 4	107	Neighbourhood of Ooyano Is., Kumamoto Prefecture.
		S	17	23	29.6					
		M <sub>N</sub>	17	23	33.4	0.6		- 8		
		F	17	25	05.—					
3	Jan. 20	eP	17	02	42.8				2660	SE off Mindanao Is. Felt at Palau.
		eS	17	07	00.2					
		F	17	28	—					
4	Feb. -7	eP	9	01	05.5				2910	Eern part of Tibet.
		S	9	05	41.9					
		eL	9	08	22.0					
		M <sub>E</sub>	9	11	13.9	11.1	+125			
		M <sub>N</sub>	9	10	—	14.—		- 275		
		F	9	51	—					
5	Feb. 15	P	12	54	16.9		(+)?	+ 8	3970	Distant earthquake.
		S	13	00	02.4					
		M <sub>E</sub>	13	06	03.8	18.7	- 185			
		F	13	48	—					
6	Feb. 21	P	1	09	05.4		+ 5		508	Near Mt. Nizyô, Nara prefecture. 135°40.5'E, 34°31'N. Focal depth about 10km. 9 lives were lost. Felt in the greater parts of the Central Japan, Eern half of Tyûgoku and Sikoku districts.
		S	1	10	13.8			- 44		
		$\bar{S}$ or L	1	10	25.9			+135		
		M <sub>E</sub>	1	10	37.5	2.3	+98			
		M <sub>N</sub>	1	10	34.4	3.3		- 151		
		F	1	29	—					
7	Feb. 21	eP <sub>N</sub>	17	04	39.0				4230	Distant earthquake.
		eS <sub>E</sub>	17	10	39.4					
		F	17	34	—					
8	Feb. 27	eP	10	11	35.3			4360	Distant earthquake.	



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		AE	AN		
			h	m	s	s	$\mu$	$\mu$	km.	
	Feb. 27	S	10	17	43.0					
		eL	10	20	59.8					
		F	10	43	—					
9	Mar. 1	P	10	25	47.2				1890	N off the cape of Siretoko, Hokkaidō. 145°.0 E, 44°.8 N.
		S	10	29	00.3		+10	- 8		Deep focus earthquake. Felt in Pacific coasts of Hokkaidō and Tōhoku district.
		MN	10	29	04.0	7.8		+28		
		F	10	46	—					
10	Mar. 2	P	3	22	19.1				—	SE off the cape of Erimo, Hokkaidō. 144°.0 E, 41°.6 N.
		L	3	25	52.1					Felt in Sern half of Hokkaidō and NEern part of Tōhoku district.
		ME	3	28	50.6	15.7	$\pm 40$			
		MN <sub>1</sub>	3	27	32.2	20.7		- 56		
		MN <sub>2</sub>	3	31	42.0	14.4		+66		
		F	4	13	—					
11	Mar. 31	P	3	36	46.4				1700	S off Titi-zima Is.
		S	3	39	42.1					Deep focus earthquake.
		F	3	52	—					
12	Apr. 1	P	2	15	31.1				3070	Distant earthquake.
		S	2	20	19.5					
		ME	2	26	24.1	23.8	+1250			
		MN <sub>1</sub>	2	26	24.1	22.0		+245		
		MN <sub>2</sub>	2	31	17.8	21.2		$\pm 266$		
		F	3	55	—					
13	Apr. 1	eP	20	17	02.5				—	Distant earthquake.
		eS?	20	21	54.9					S phase not distinct.
		F	20	52	—					
14	Apr. 2	eP	6	24	35.3				4240	Distant eathquake.
		eS	6	30	35.8					
		F	7	03	—					
15	Apr. 6	eP	4	12	49.0				156	E off the mouth of River



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>		
			h	m	s	s	"	"	km.	
	Apr. 6	S	4	13	10.0					Simando, Kôti prefecture.
		F	4	15	20.-					
16	Apr. 12	P	20	56	36.5				2750	Distant earthquake.
		S	21	01	00.9					The end part overlapped by the following earthquake.
17	Apr. 12	P	21	24	28.3				844	Near Naha, Okinawa prefecture.
		S	21	26	22.0					
		F	21	55	—					
18	Apr. 14	P	1	20	15.1				142	Upper valley of River Oono, Ooita prefecture.
		iS	1	20	34.2		+15	+ 8		
		F	1	22	15.-					
19	Apr. 19	eP	5	14	23.9				6900	Distant earthquake.
		S	5	22	47.7					
		L	5	33	45.5					
		ME	5	36	40.2	16.5	$\pm 30$			
		MN	5	36	02.7	15.4		- 25		
		F	6	27	—					
20	Apr. 19	e	9	14	56.5				—	Distant earthquake. All phases could not be distinguished.
		F	9	52	—					
21	Apr. 27	P	0	04	03.3				2820	Distant earthquake.
		S	0	08	32.7					
		L	0	11	36.5					
		ME	0	14	21.6	11.1	+125			
		MN	0	13	38.4	12.1		+330		
		F	0	38	—					
22	May 13	P	11	09	57.0				240	Neighbourhood of Okino-sima Is., Kôti prefecture.
		S	11	10	29.3					
		ME	11	10	35.3	2.2	- 45			
		MN	11	10	34.5	2.4		+35		
		F	11	16	—					



No.	Date	Phase	Time			Period	Amplitude		△	Epicenter and Remarks
			G.	M.	T.		AE	AN		
			h	m	s	s	μ	μ	km.	
23	May 16	P	7	10	52.9		to w		2580	Distant earthquake.
		S	7	15	04.4		+35	+ 5		
		L	7	17	35.4			+27		
		ME	7	21	02.1	17.1	-640			
		MN	7	20	07.9	10.4		+658		
		F	7	53	—					
24	May 20	e	3	14	18.5				—	Distant earthquake. All phases could not be distinguished.
		e	3	21	33.0					
		F	3	54	—					
25	May 24	P	11	08	38.2				114	In the mouth of River Kuma, Kumamoto prefecture. Felt at Wakatu, Hukuoka prefecture slightly.
		S	11	08	53.6					
		MN	11	08	58.0	0.6		+10		
		F	11	11	40.—					
26	May 27	P	6	26	54.6				4365	Distant earthquake.
		S	6	33	02.6					
		i	6	41	04.2			+17		
		ME	6	45	12.9	12.9	-45			
		MN	6	44	12.6	11.0		-46		
		F	7	27	—					
27	June 10	P	8	30	59.8				4280	Distant earthquake.
		eS	8	37	02.7					
		F	9	07	—					
28	June 12	eP	5	10	30.4				269	Upper valley of River Ooyadori, Miyazaki prefecture.
		S	5	11	06.6					
		MN	5	11	14.6	1.1		- 8		
		F	5	15	00.—					
29	June 14	P	13	29	48.0				18	In the Itosima province, Hukuoka prefecture. Felt at places in Itosima and Sawara provinces.
		S	13	29	50.4		+80			
		MN	13	29	50.6	0.2		+22		
		F	13	31	—					



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No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>		
			h	m	s	s	$\mu$	$\mu$	km.	
30	June 25	P	16	53	28.6		+ 4		562	SW off Hatizyô Is. 137°.9 E, 32°.5 N. Record is deep focus type. Focal depth about 320 km. Felt in SEern parts of Kwantô and Tôhoku districts.
		iS	16	54	44.4		+30	+ 6		
		ME	16	54	48.3	4.8	-70			
		MN	16	54	47.2	2.6		-32		
		F	17	06	—					
31	June 28	P	8	12	50.6				1930	SE off Hatizyô Is.
		eS	8	16	07.5					
		F	8	55	—					
32	June 30	iP	15	12	33.0		-13	- 4	3015	In the Okhotsk sea.
		S	15	17	16.9					
		eL	15	20	36.9					
		ME	15	21	37.6	30.2	+240			
		MN	15	21	10.0	25.9		+97		
		F	16	43	—					
33	July 3	P	21	03	05.2			- 1	324	Sern foot of Mt. Tii, Keisyô-nandô, Korea. 127°.65 E, 35°.2 N. Felt in Sern part of Korea. Epicentral regions suffered slightly.
		S	21	03	48.9			+67		
		F	21	13	—					
34	July 5	eP	19	01	00.1				2885	Off Palau Is.
		eS	19	05	34.7					
		F	19	50	—					
35	July 13	eP?	11	31	17.5				—	Distant earthquake.
		PR <sub>1</sub>	11	36	47.5					
		S	11	46	13.1					
		eSR <sub>1</sub>	11	57	03.5					
		L	12	26	20.1					
		ME	12	40	14.0	18.2	+40			
		F	13	47	—					
36	July 26	P	5	44	33.9				118	In the Bungo channel.
		S	5	44	49.8					
		MN	5	44	50.6	0.5		-16		



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		AE	AN		
			h	m	s	s	$\mu$	$\mu$	km.	
	July 26	F	5	47	00.—					
37	Aug. 1	e	6	35	17.0				—	Distant earthquake. All phases could not be distinguished.
		F	6	54	—					
38	Aug. 13	P	20	08	02.5				2220	Distant earthquake.
		eS	20	11	44.6					
		F	20	44	—					
39	Aug. 22	P	6	54	55.6		— 7	— 3	1550	S off Taitô City, Formosa.
		S	6	57	37.8					121°.2 E, 22°.1 N. Felt over
		ME	7	02	47.1	14.2	+560			Formosa. Considerable damage
		MN	7	00	25.1	18.9		—415		has been done to Sern part
		CN	7	12	15.8					of Takao province, Formosa.
		F	8	00	—					
40	Aug. 23	P	21	20	16.5				4795	Neighbourhood of Sumatra.
		eS	21	26	47.4					
		L	21	34	16.4					
		F	22	06	—					
41	Sept. 4	P	8	12	07.5				885	SE off Hatizyô Is.
		S	8	14	06.8					
		ME	8	16	32.7	15.9	+ 40			
		F	8	55	—					
42	Sept. 18	P	18	40	59.0				—	Ditto.
		S?	18	44	19.3					S phase not distinct.
		F	19	17	—					
43	Sept. 19	eP	1	10	02.6				4240	Neighbourhood of Sumatra.
		eS	1	16	03.3					
		L	1	19	33.3					
		ME	1	26	39.2	21.0	+1315			
		MN	1	25	56.9	20.7		> 525		
		F	2	28	—					



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>		
			h	m	s	s	$\mu$	$\mu$	km.	
44	Oct. 5	P	9	50	50.2				3320	Distant earthquake.
		S	9	55	55.9					
		eL	9	58	32.0					
		F	10	54	—					
45	Oct. 15	eP	4	20	32.7				188	Near Matuyama City. 132°.8E, 33°.8N. Felt at places in Tyûgoku and Sikoku districts.
		eS	4	20	58.0					
		F	4	24	30.—					
46	Oct. 17	eP	20	32	59.3				202	Off Imabari City. 133°.0E, 34°.1N. Felt at places in Tyûgoku and Sikoku districts.
		S	20	33	26.5					
		F	20	36	30.—					
47	Oct. 19	P	19	57	19.5				485	Off the mouth of River Kuduryû, Hukui prefecture. 135°.8E, 36°.5N. Record is deep focus type. Focal depth about 350km. Felt at Utunomiya and Kusiro abnormally.
		S	19	58	24.9					
		M <sub>E</sub>	19	58	29.3	2.5	-20			
		M <sub>N</sub>	19	58	26.8	2.6	+24			
		F	20	09	—					
48	Oct. 23	eP	6	33	59.6				5900	Distant earthquake.
		eS	6	41	30.4					
		eL	6	50	45.2					
		F	7	31	—					
49	Oct. 24	P	19	31	33.0				82	NWern foot of Volcano Aso, Kumamoto prefecture.
		S	19	31	44.0					
		F	19	32	20.—					
50	Oct. 25	P	15	32	18.7				812	SE off the cape of Nozima, Tiba prefecture. 140°.1E, 34°.4N. Focal depth about 80km. Felt in the greater part of Kwantô and Eern part of Tyûbu district.
		S	15	34	08.1					
		F	15	42	—					
51	Oct. 26	eP	9	08	49.7				303	Near Kutinoerabu Is., Kagosima prefecture.
		eS	9	09	30.5					
		F	9	16	—					



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks
			G.	M.	T.		AE	AN		
			h	m	s	s	$\mu$	$\mu$	km.	
52	Oct. 26	iP	9	34	52.0		-12	+5	468	Central part of Mie. prefecture. Record is deep focus type. Focal depth about 340km. Abnormal felt area in Kwantô and Tôhoku districts.
		iS	9	35	55.1		+65	-28		
		ME	9	36	00.4	7.4	-150			
		MN	9	35	58.0	4.7		+30		
		F	9	48	—					
53	Oct. 26	P	10	03	30.2				306	S off the cape of Sada, Kagosima prefecture.
		S	10	04	11.4					
		F	10	13	—					
54	Oct. 29	P	18	44	05.5		+2	-1	2640	Distant earthquake.
		S	18	48	21.5					
		F	19	41	—					
55	Nov. 2	P	9	37	19.2				79	Lower valley of River Kikuti, Kumamoto prefecture.
		S	9	37	29.9					
		MN	9	37	30.2	0.3		-7		
		F	9	38	30. —					
56	Nov. 2	P	15	02	50.6				2470	In the Okhotsk Sea.
		S	15	06	53.4					
		L	15	09	12.3					
		F	15	52	—					
57	Nov. 2	iP	20	48	30.0		-23	-1	1140	E off Kinkwazan, Miyagi prefecture. 142'.0E, 38'.4N. Felt area over 900km. of radius from the epicenter. Very strong shock was felt in the Pacific coasts of Miyagi and Hokusima prefectures. Considerable damage has been done to Miyagi prefecture.
		iS	20	50	32.1		-220	+68		
		ME	20	52	40. —	22. —	>6000			
		MN	20	51	03. —	12.5		>830		
		CN	20	56	52.3					
		CE	20	57	28.9					
		F	22	11	—					
58	Nov. 5	P	11	15	35.7				113	Sern part of Kumamoto prefecture. Felt at Ginsui and Wakatu, Hukuoka prefecture slightly.
		S	11	15	50.9					
		MN	11	15	51.6	0.5		+7		
		F	11	18	30. —					



No.	Date	Phase	Time			Period	Amplitude		$\Delta$	Epicenter and Remarks		
			G.	M.	T.		A <sub>E</sub>	A <sub>N</sub>				
			h	m	s	s	$\mu$	$\mu$	km.			
59	Nov. 9	eP	6	09	06.9	3.8			522	SE off Yaku-sima Is., Kagosima prefecture.		
		S	6	10	17.2							
		M <sub>N</sub>	6	10	44.3							
		F	6	17	—							
60	Nov. 12	P	6	28	40.9				249	Near Onomiti City. 133°.3E, 34°.5N. Felt at places in Tyûgoku and Sikoku districts.		
		S	6	29	14.5							
		F	6	33	—							
61	Nov. 12	P	20	08	49.0				1940	Neighbourhood of Iturup Is. 149°E, 45°N. Deep focus earthquake. Focal depth about 200km.?		
		S	20	12	06.6							
		F	20	53	—							
62	Nov. 13	eP	12	37	23.1	16.6	+600		3930	Neighbourhood of Kamtchatka.		
		S	12	43	06.3							
		eL <sub>E</sub> ?	12	46	03.1							
		eL <sub>N</sub> ?	12	47	00.6							
		M <sub>E</sub>	12	54	59.6							
		M <sub>N</sub>	12	55	34.9						13.4	+90
63	Nov. 14	eP?	1	25	13.3				—	Neighbouring sea of Tane-ga-sima Is., Kagosima prefecture.		
		eS?	1	26	01.7							
		F	1	33	—							
64	Dec. 1	iP	6	10	12.7	10.3	+500		330	WNW off Yaku-sima Is., Kagosima prefecture. 129°.0E, 30°.7N. Record is deep focus type. Focal depth about 270km. Felt at places in Kyûsyû, Sikoku and Tyûgoku.		
		iS <sub>E</sub>	6	10	56.1							
		iS <sub>N</sub>	6	10	57.2						4.9	-176
		M <sub>E</sub>	6	11	06.4						20.0	-1030
		M <sub>N</sub>	6	11	06.8						9.6	-475
		F	6	30	—							
65	Dec. 13	P	21	36	02.9				2310	Distant earthquake.		
		S	21	39	52.2							
		F	22	06	—							



No.	Date	Phase	Time			Period	Amplitude		△	Epicenter and Remarks
			G.	M.	T.		AE	AN		
			h	m	s	s	μ	μ	km.	
66	Dec. 27	P	0	16	30.7				781	Off Nii-zima Is., Idu-sititô. 139°10'E, 34°25'N. 3 lives were lost. Felt in the greater part of Kwantô, Sern part of Tyûbu and a part of Kinki districts.
		S	0	18	16.0					
		ME	0	19	39.9	12.7	+105			
		MN	0	19	13.7	13.9		-96		
		F	1	08	—					
67	Dec. 27	eP	2	14	33.1				751	After shock of No. 66.
		S	2	16	14.3					
		F	2	30	—					
68	Dec. 28	eP	17	22	10.5				758	Ditto.
		eS	17	23	52.7					
		F	17	35	—					
69	Dec. 30	eP	4	09	57.1				413	Neighbourhood of Tane-ga-sima Is., Kagosima prefecture.
		eS	4	10	52.7					
		F	4	26	—					



昭和十二年三月二十五日印刷

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