

4 SEP 1969

Bulletin of the  
Urakawa Seismological Observatory

No. 5

September, 1968 - March, 1969

Urakawa Seismological Observatory  
Faculty of Science, Hokkaido University

Japan

## Urakawa Seismological Observatory

Station: Kamikineusu (KMU)

Location    Latitude:  $42^{\circ}14'19''$  N, Longitude:  $142^{\circ}58'02''$  E,  
                   Hight: 185 m.

### Instruments

	Abbr.	Comp.	$T_s$ (sec)	$h_s$	$T_g$ (sec)	$h_g$	$\sigma^2$	$V_{max}^*$
Film-recording Seismograph	N	N-S	0.94	0.70	0.28	3.1	0.003	15,000
	E	E-W	0.93	0.73	0.25	3.0	0.003	15,000
	Z	U-D	0.91	0.70	0.34	1.8	0.003	19,000
	ZX	U-D	0.89	2.02	0.30	1.4	0.018	120,000
Tape-recording Seismograph	T-1	U-D	1.0	1.4	} Forming a tripartite array			
	T-2	U-D	1.0	1.4				
	T-3	U-D	1.0	1.4				

\* When measured on a film-viewer of magnification 6.

For magnification curves see No.3 of this bulletin.

### Readings

- (1) All earthquakes with maximum trace amplitude 0.5 mm or larger on the Z records measured on the  $\times 6$  film-viewer are interpreted and listed in this bulletin, though many smaller shocks are recorded on the ZX records and the magnetic tapes.
- (2) Times of P and other phases except S are indicated using the Japanese Standard Time (JST).

$$JST = GMT + 9 \text{ hours.}$$

The time of S phase can be obtained by adding P-S to the time of P. A mark i attached to the figures indicating P-S means that the corresponding S phase is iS.

(3) Amplitudes are the trace amplitudes for the maximum waves in the Z, N, and E records measured on the film-viewer. When the maximum waves appear in P or other phases except S, the names of the phases are attached to the figures indicating the periods of the maximum waves.

(4) Figures in the column "Initial motion" indicate the directions and amplitudes of the initial motions of P waves in the ZX records measured on the film-viewer. A Plus sign means upward or compressional motion.

(5) Communications relating to this bulletin should be addressed to the director, Urakawa Seismological Observatory, Kamikineusu, Urakawa, Hokkaido, Japan.

Kamikineusu, October 1968

Date	Phase	Time(JST)			P-S	Amplitude(mm)		Period(sec)			Initial motion(mm)	
		h	m	s		Z	N	E				
1	iPZX	04	16	19.7	12.3	5.4	0.5	9.6	0.5	3.9	0.5	-2.0
1	ePZX	04	53	08.8	26.8	2.0	0.5	2.7	0.5	2.6	0.6	
1	iPZX	05	33	11.2								+1.5
	iXZX		33	26.8	15.6	1.0	0.6	1.8	0.4	1.0	0.5	
1	ePZX	05	48	35.2	12.1	2.0	0.6	4.6	0.2	2.4	0.3	
1	ePZX	12	01	48.0	43.8	0.7	0.8	0.7	1.0	0.6	0.7	
1	iPZX	14	33	20.7	10.8i	0.5	0.6	0.9	0.4	0.7	0.2	+0.5
1	iPZX	14	34	53.9	07.6i	0.6	0.5	0.9	0.3	0.7	0.4	-1.6
1	ePZX	15	19	01.6	12.2i	1.0	0.6	1.3	0.4	1.1	0.6	
1	ePZX	16	23	40.3	11.2	0.5	0.5	0.6	0.6	0.4	0.3	
1	iPZX	16	40	35.1	12.4i	6.4	0.7	7.5	0.4	6.5	0.6	-SO
1	iPZX	17	53	22.7	09.1	1.1	0.6	1.9	0.4	0.9	0.6	-3.2
1	ePZX	18	05	03.6	20.1	0.6	0.6	0.8	0.6	0.8	0.6	
1	iPZX	18	12	49.1	08.7	0.9	0.5	1.4	0.3	0.9	0.3	-3.1
1	iPZX	18	56	16.4	17.1	2.5	0.6	2.6	0.2	1.9	0.5	+0.5
1	ePZX	19	41	52.2	32.0	0.6	0.7	0.8	0.5	0.5	0.7	
2	ePZX	03	46	01.7	27.5	0.8	0.5	1.1	0.4	0.8	0.7	
2	ePZX	03	50	29.4	27.5	1.2	0.5	1.3	0.9	1.2	0.9	
2	iPZX	13	36	17.1	11.8	0.8	0.6	1.4	0.3	1.0	0.4	+1.1
2	ePZX	18	13	06.9								
	eXZ		13	17.5	2 46.6	0.8	0.5P	1.0	0.6S	0.6	0.6S	
2	ePZX	19	35	52.3	1 13.7	0.5	0.8	0.7	1.1	0.7	0.8	
3	ePZX	06	40	53.8	20.5	0.5	0.5	0.7	0.5	0.6	0.5	
3	ePZX	11	57	18.3	19.3i	1.0	0.5	1.9	0.4	1.6	0.4	
3	ePZX	16	05	39.9	11.9	1.8	0.3	2.3	0.3	1.7	0.5	
3	ePZX	17	13	24.2								
	epPZX		13	50.2		0.6	1.3P	0.3	1.0P	0.4	1.1P	
3	iPZX	18	52	17.2	08.5i	2.4	0.5	7.4	0.3	3.9	0.5	+3.5
3	iPZX	22	18	07.3	18.7i	1.3	0.4	1.6	0.4	1.4	0.5	+1.1
4	iPZX	03	53	06.3	11.8	11.0		22.8	0.5	12.5	0.4	+3.7
4	iPZX	04	00	12.4	10.9	0.6	0.5	1.3	0.6	0.6	0.5	+1.0
4	iPZ	09	40	12.4		SO		SO		SO		+0.6
4	ePZX	09	46	38.0	08.3i	0.8	0.3	2.0	0.4	1.9	0.4	
4	iPZX	09	53	49.7	08.6i	0.6	0.5	2.2	0.3	1.3	0.6	+3.2
4	iPZX	10	29	19.0								+1.4
	iXZX		29	25.0	08.4i	1.3	0.3	5.4	0.2	4.5	0.4	
4	ePZX	10	38	06.4	08.4i	2.3	0.5	8.5	0.3	6.5	0.5	
4	iPZX	10	59	26.2	08.5i	4.2	0.5	22.8	0.4	10.5	0.5	-1.6
4	ePZX	11	21	46.6	1 24.5	0.7	0.8	1.2	0.8	1.5	0.7	
4	ePZX	13	16	33.1								
	iXZX		16	35.5	17.1	0.5	0.5	0.9	0.4	0.5	0.3	
4	iPZX	13	24	40.9	22.1	26.5	1.0	35.5	1.1	25.3	1.2	+1.4
4	iPZX	13	31	52.2	08.2i	1.1	0.5	5.5	0.3	2.3	0.4	-1.6
4	ePZX	15	20	21.1	13.5i	1.4	0.6	2.6	0.6	1.9	0.6	
4	iPZX	17	20	50.2	17.5	5.2	0.5	8.6	0.5	7.4	0.4	+1.0
4	iPZX	17	35	18.2	08.7	1.3	0.5	2.9	0.3	1.9	0.5	-3.7
4	iPZX	19	02	36.7	08.4i	3.1	0.6	8.5	0.5	7.3	0.4	+2.0
4	ePZX	21	41	47.1	12.7	0.9	0.4	1.3	0.5	0.9	0.4	
4	ePZX	22	17	58.9								
	iXZX		18	08.5	11.7	0.5	0.5	1.5	0.3	0.9	0.4	
5	ePZX	02	41	36.2	11.0	0.5	0.6	1.0	0.2	0.6	0.7	
5	ePZX	04	10	52.0	38.5	1.1	0.8	2.0	0.6	1.0	0.8	
5	iPZX	09	06	01.1	07.5i	1.2	0.5	2.6	0.2	1.7	0.4	+0.8
5	iPZX	10	38	02.9								+2.6
	iXZX		38	09.2	08.9i	3.6	0.4	5.8	0.4	5.8	0.3	
5	ePZX	10	56	27.2	11.3	0.6	0.5	0.9	0.4	0.6	0.6	
5	iPZX	11	55	41.1	13.2	0.9	0.4	1.7	0.5	0.8	0.4	+0.2
5	iPZX	17	52	48.0	14.0i	2.1	0.9	2.9	0.6	2.0	0.8	-1.0
5	iPZX	19	10	31.1	08.4i	0.5	0.5	2.4	0.3	1.1	0.3	+0.2
5	ePZX	23	21	33.3	13.9i	0.8	0.6	1.2	0.2	0.6	0.2	
6	ePZX	03	44	45.7	16.4i	0.6	0.5	0.8	0.5	0.5	0.4	
6	ePZX	04	28	30.5								
	eXN		28	45.0	24.3	8.2	0.5	8.8	0.6	8.0	0.5	
6	ePZX	05	23	10.7	1 00.0	0.5	1.0	0.9	0.6	0.6	1.0	
6	iPZX	09	50	37.1								+2.1
	eXZX		50	46.0	19.6i	13.8	1.0	13.2	1.0	12.4	1.2	

Kamikineusu, October 1968

Table of seismic data for Kamikineusu, October 1968. Columns include Date, Phase, Time (JST) in h m s, P-S, Amplitude (mm) with Z, N, E components, Period (sec), and Initial motion (mm). Entries range from 6 to 11 October.

Kamikineusu, October 1968

Table of seismic data for Kamikineusu, October 1968. Columns include Date, Phase, Time (JST) in h m s, P-S, Amplitude (mm) with Z, N, E components, Period (sec), and Initial motion (mm). Entries range from 11 to 15 October.





























Kamikineusu, December 1968

Appendix 1

A large earthquake with magnitude 5.6 occurred off Urakawa on December 25, 1968 and many aftershocks were recorded. From December 25 to 28 all earthquakes on the ZX record were interpreted and listed.

Table with columns: Date, Phase, Time(JST), P-S, A(mm)T(sec), Remarks. Contains earthquake data for December 25 and 26, including a main shock of M 5.6 off Urakawa.

Kamikineusu, December 1968

Table with columns: Date, Phase, Time(JST), P-S, A(mm)T(sec), Remarks. Contains earthquake data for December 27, including teleseismic events.

The mark "A" indicates that the earthquake is included in this Bulletin formally.

Appendix 2

Aftershocks of a deep shock were observed as follow.

Main shock : January 19, 1969, SW of Okhotsk Sea 44° 35' N, 143° 29' E, H 260km(JMA), M = 6.4(CGS)

Table with columns: Arrival Time, Ap(mm), As(mm), ratio Ap/As, P-S(sec), M. Shows arrival times for a deep shock at 19d 16h 02m 56.0s and 20 05 31 03.0.

Appendix 3

From March 29 to May 16, 1968 all earthquakes on the ZX record were interpreted and listed. In this table there is a foreshock series of a large earthquake with magnitude 7.9 which occurred off the south coast of Hokkaido on May 16, 1968.

Table with columns: Date, Phase, Time(JST), P-S, A(mm)T(sec), Remarks. Contains earthquake data for March 29, including a foreshock series.







Kamikineusu, May 1968

Phase	Time(JST)	P-S	A(mm)T(sec)	remarks	Phase	Time(JST)	P-S	A(mm)T(sec)	remarks
	h m s	s	ZX			h m s	s	ZX	
eP	14 05 23.5	27	0.4 0.4		eX	09 14 11.5		0.5 0.7X	Teleseism
eP	15 29 31	31.0	1.1 0.4		eP	10 20 24.5			
eP	15 31 57.7	05.5	2.2 0.2		eS	22 18.0		2.0 0.3P	
eP	16 18 03.5		0.4 0.2X		eP	11 30 34.2	20.2	0.5 0.3	
-iP	17 35 22.7	05.9	0.9 0.1P		eP	12 00 54.0		0.3 0.7P	Teleseism
eP	19 04 15.5	46.5	0.3 0.2		eP	16 34 22.5	09.0	1.7 0.2	
eP	20 16 55.0		0.3 0.2		eP	17 01 17.5	17.6	0.2 0.2	
eP	21 27 31.8A		4.8 2.2P	Teleseism	eP	18 28 54.0		0.7 0.5P	Teleseism
eP	22 46 17.5		0.5 0.3P		eP	19 20 16.4A	43.9	12.7 0.7	off Nemuro
eP	23 30 54.0	09.2	1.0 0.4		eP	21 09 50.0	46.5	0.7 0.3P	
-iP	23 58 14.1	07.2	1.0 0.3						
May 9					May 11				
eP	00 30 33.1				eP	00 14 42.5		0.8 1.4P	Teleseism
iX	30 37.2	11.6	2.1 0.2		eP	02 15 57.5	43.0	1.3 0.6	
eP	01 52 31.1	11.1	0.5 0.5		eP	05 38 34.5		0.9 0.6P	Teleseism
eP	04 30 20.8	20.8	0.8 0.6		eP	07 59 48.5		0.6 0.7P	Teleseism
eP	04 53 29.3		0.4 0.3P		eP	11 33 34.0	41.5	0.7 0.3	
eP	05 50 31.0	19.5	0.6 0.4		eX	13 19 33		0.3 0.4X	Teleseism?
eP	05 58 13.6	21.5	1.4 0.6		eP	14 05 04.0	26.0	0.3 0.3	
eP	06 14 33.5	21.6	1.4 0.7		eP	15 20 00.2			
eP	06 16 37.5	16.8	0.2 0.3		eX	20 01.8	10.0	1.2 0.3X	
eP	06 28 37.3	19.8	0.9 0.5		eP	16 25 09.3	62	0.3 0.5P	
eP	06 35 54.2	21.5	1.3 0.5		eP	18 10 34.2	15.0	0.3 0.3	
eP	06 44 23.1	18.9	2.3 0.6		eP	21 23 51.7A	17.5	6.7 0.4	T-K=54.7
eP	07 53 07.1	17.8	0.3 0.3		eP	22 14 05.1	19.5	0.5 0.3	
eP	07 54 14.3	34	0.6 0.3P		eP	22 49 02			
eP	08 26 54.5		2.5 0.7	off Miyagi	eX	49 21		0.6 0.7X	Teleseism
iP	08 53 57.6A	12.5	3.3 0.4		May 12				
eS	09 18 00		0.3 0.2		eP	00 42 19.4A		2.4 2.7P	Teleseism
eP	10 23 21.3	36.0	2.7 0.5	M of Iwate	eP	00 49 02.0A			
iP	11 59 51.5A	11.5	10.8 0.2		eS	51 02.0		14.2 0.2P	
eP	12 13 29.5		1.0 0.7P	Teleseism?	eP	01 09 48.2		0.2 0.2	
eP	12 18		0.3 0.3		eP	02 20 28	31.3	0.4 0.3	
eP	13 07 49.8	41.5	0.7 0.6		eP	02 50 05.0	35	0.4 0.5	
eP	13 24 24.5	13.5	0.3 0.3		eP	04 03 02.5	32.5	0.5 0.5	
eP	13 29 33.0	57.5	0.7 0.5		eP	04 49 26.0	40.5	0.8 0.4	
eP	13 44 11		0.3 0.3X		eP	04 54 44.0	10.5	0.4 0.1	
eP	13 54 42		0.3 0.2		eP	06 30 36.0		0.3 0.3P	Teleseism?
eP	13 56 44.5	31	0.4 0.4P		eP	08 00 49.0A	54	5.5 0.6	T-K=73.1
eP	14 37 29	70	0.4 0.4		+iP	12 12 30.5A	10.3	SO	Hidaka range
eP	15 07 26.6	38	0.3 0.3X		eP	15 34 21.0	63	0.6 0.5	near Choshi
eP	15 14 31.6	09.5	0.4 0.3P		eP	17 12 03.3	27.5	0.3 0.4	
eP	16 24 34.8	19.5	0.4 0.3		eP	17 48 44.3		2.0 0.8P	Teleseism
iP	18 20 15.0	07.5	0.4 0.2		eX	19 40 02.2		0.3 0.3 ?	
eP	20 30 11.8	17.7	0.9 0.2		eX	20 12 46.0		0.2 0.3	
+iP	21 24 29.9A	11.9	5.3 0.4		eP	20 38 04.0	47.0	0.6 0.4	
eP	21 40 15.8	15.8	0.9 0.5		eP	20 54 31.0		0.3 0.2P	
-iP	22 02 41.6	04.5	1.5 0.1P		eP	21 23 10.8		0.2 0.4X	
eP	22 26 53.2	41.8	0.6 0.5		eX	22 56 42.0		0.3 0.3	
eP	23 17 01.2	27.3	0.9 0.5		eP	23 09 21.5	21.0	0.2 0.4	
eP	23 24 23.5		1.2 0.7P	off Shima pen	eP	23 17 56.8	11.5	0.3 0.5	
eP	23 50 06.4	24.8	0.9 0.1P		eP	23 33 06.5	95	0.4 0.3	
May 10					May 13				
eP	01 28 55.5	10.0	0.4 0.3		eP	01 21 49.5	12.5	0.2 0.2	
eP	02 45 34.3	09.7	0.2 0.1		eP	01 59 45.3	17.0	0.2 0.4	
eP	03 23 14.0	31.0	0.9 0.4		eX	02 03 02.0		0.5 0.3	
-eP	04 23 14.1A	72.5	15.9 0.2P	deep?	eP	02 05 17.0	38	0.5 0.3	
eP	04 33 55.2	06.2	0.9 0.3		eP	02 54 58		0.2 0.2	
eP	04 36 54.0	18	0.4 0.3		eP	02 58 58.5	32.5	1.2 0.3	off Iwate
eP	04 38 29.3	24.0	0.6 0.4		eP	03 28 32.3			
eP	06 01 40.3	20.5	0.4 0.3		eX	28 34.9	57.2	1.9 0.2X	
eP	07 32 38.3	27	0.5 0.1		eP	04 29 44		0.7 0.3P	Teleseism
eP	07 53 08.8	21.5	0.3 0.2		eP	05 02 11.5		0.4 0.4	noise?
eP	08 02 26.5	27.5	0.5 0.3		eP	07 16 16		0.3 0.4	
eP	08 30 30.6	47	0.3 0.5		eX	10 32 21.5		0.2 0.2	
					eX	11 09 41.0		0.2 0.2	

Kamikineusu, May 1968

Phase	Time(JST)	P-S	A(mm)T(sec)	remarks	Phase	Time(JST)	P-S	A(mm)T(sec)	remarks
	h m s	s	ZX			h m s	s	ZX	
eP	12 12 41.5		0.2 0.4		May 15				
eP	15 17 41.6	38.3	1.0 0.1P		eP	00 44 22.5		0.5 0.5	
eP	17 25 13.5	21.5	0.6 0.5		eP	00 50		0.3 0.4	
eP	19 36 36.0A	54.0	2.6 0.6		eP	02 38 47.0	05.1	0.7 0.3	
eP	22 45 37.6		0.4 0.3		-iP	03 19 08.2A	11.0	SO	T-K=77
May 14					+iP	04 58 02.0A	06.5	13.8 0.2	
eP	01 53 41.7	13.2	0.2 0.2		eP	05 31 37.0	28.6	0.4 0.3	
eP	03 31 33.2	32.7	0.4 0.2		eP	07 57 43.2	15.7		
eP	04 42 06.5	36.0	0.9 0.3		eP	08 24 47.0A	60.3	5.5 0.8	
eP	05 27 16.5		1.1 0.2P		eP	09 20 49.0		0.3 0.2	
eP	06 24 22.2	12.3	2.3 0.2		eP	09 48 47.2		0.4 0.2	
eP	09 08 08.5		1.2 0.3P		eP	11 21 08.0	07.2	1.0 0.3	
eP	09 33 17.0	19.5	0.3 0.3		eP	16 14 54.5	29.2	0.3 0.2	
eP	10 04 16.2	06.5	1.2 0.2		eP	18 35 58.5	30	0.3 0.2	
eP	10 11 00		0.5 0.2		eP	19 55 10.0	31.5	0.2 0.3	
eP	12 16 45		0.5 0.3		May 16				
eP	14 12 45.7	26	1.7 0.2P		eP	00 12 45 A		1.9 2.0P	Teleseism
eP	14 18 33.0		0.4 0.5P		eP	05 09 41.9	59	1.7 0.3	
eP	15 01 51.5	11.8	2.7 0.1		eP	06 42 11.5		0.2 0.2	
eP	15 19 29		0.4 0.2		eP	07 41 46.2		0.6 0.2	
eP	15 24 22.5	21.5	1.1 0.3		eP	08 52 52.9	07.9	1.2 0.2	
eP	19 30 03.2A	10.4	2		eP	09 34 04.0	16.0	1.5 0.2	
eP	20 30 23 A	20.0	6	T-K=72	+iP	09 49 23.6		SO	E off N Honshu, M 7.9
eP	22 34 39.2A	22.2	3.7 0.3	T-K=50.3					T-K indicates the difference of the arrival time between Tsukuba(TSK) and Kamikineusu(KMU).
eP	22 58 28.5	20.3	1.0 0.2						
iP	23 08 46.8A		21.0 0.6P	Yakushima					

Comments on NO.4 of this bulletin:

- April 26 Observation was interrupted from 09h 26m to 45m.
- May 21 Observation was interrupted from 23h 11m to 53m.
- June 2 03h 12m; The reading contains next two earthquakes.  
arrival time at Urakawa(URA) 12m 15.6s  
12 37.2 M 4.9(JMA)
- August 4 10h 17m; The reading contains next two earthquakes.  
arrival time at URA 17m 45.8s P-S 09.4s  
17 34.2 P-S 09.0

Errata

- May 19, 08h 35m read 36m 40.7s for 35m.40.7s
- 21, 05h 18m read ePZX for eXZX, The maximum waves are P.
- 26, 08h 12m P-S is 09.7s.
- 26 delete the last earthquake on page 37.
- 27, 01h 02m The amplitude of Z is 0.9mm.
- 28, 17h 42m read 43m 29.5s for 42m 29.5s, The maximum waves are X.
- 30, 18h 26m read 27m 10.5s for 26m 10.5s
- June 7, 21h 36m read 06m 12.8s for 36m 12.8s
- 8, 21h 33m read the amplitude Z 9.3 for 0.3
- 11, 01h 05m read 35m 54.7s for 05m 54.7s
- 24, 17h 58m read 28m 56.6s for 58m 56.6s
- 26, 19h 42m read P-S 06.1i for 16.1i
- July 1, 03h 42m P-S is 37.6s.
- 4, 04h 34m The maximum waves are X.
- 7, 11h 40m The maximum waves are X.
- August 26, 12h 33m read 34m 49.5s for 33m 49.5s

6 AUG 1969

# Bulletin of the Urakawa Seismological Observatory

No. 6

April — December

1969

Urakawa Seismological Observatory  
Faculty of Science, Hokkaido University

Japan

## Urakawa Seismological Observatory

Station: Kamikineusu (KMU)

Location Latitude:  $42^{\circ}14'19''$  N, Longitude:  $142^{\circ}58'02''$  E,  
 Hight: 185 m.

Instruments

	Abbr.	Comp.	$T_s$ (sec)	$h_s$	$T_g$ (sec)	$h_g$	$\sigma^2$	Vmax
Film-recording Seismograph	N	N-S	0.94	0.70	0.28	3.1	0.003	15,000*
	E	E-W	0.93	0.73	0.25	3.0	0.003	15,000*
	Z	U-D	0.91	0.70	0.34	1.8	0.003	19,000*
	ZX	U-D	0.89	2.02	0.30	1.4	0.018	120,000*
Ink-recording Seismograph	I	U-D	1.0	1.4	0.02	1.0		300,000
Tape-recording Seismograph	T-1	U-D	1.0	1.4	} Forming a tripartite array			
	T-2	U-D	1.0	1.4				
	T-3	U-D	1.0	1.4				

\* When measured on a film-viewer of magnification 6.

For magnification curves see No. 3 of this bulletin.

Readings

(1) All earthquakes with maximum trace amplitude 0.5 mm or larger on the Z records measured on the X 6 film-viewer are interpreted and listed in this bulletin. Smaller shocks recorded on the ZX records and the magnetic tapes are interpreted in special cases.

(2) Times of P and other phases except S are indicated using the Japanese Standard Time (JST).

JST = GMT + 9 hours.

The time of S phase can be obtained by adding P-S to the time of P. A mark i attached to the figures indicating P-S means that the corresponding S phase is iS.

(3) Amplitudes are the trace amplitudes for the maximum waves in the Z, N, and E records measured on the film-viewer. When the maximum waves appear in P or other phases except S, the names of the phases are attached to the figures indicating the periods of the maximum waves.

(4) Figures in the column "Initial motion" indicate the directions and amplitudes of the initial motions of P waves in the ZX records measured on the film-viewer. A plus sign means upward or compressional motion.

(5) Communications relating to this bulletin should be addressed to the director, Urakawa Seismological Observatory, Kamikineusu, Urakawa, Hokkaido, Japan.

Kamikineusu, April 1969

Date	Phase	Time(JST)			P-S	Amplitude(mm)						Initial motion(mm)	
		h	m	s		m		s		Z			N
1	iPZX	00	47	17.2	05.7i	3.1	0.4	5		5.6	0.6		+2.0
1	ePZX	03	42	25.5	12.6	1.6	0.4	2.4	0.3	2.0	0.6		
1	iPZ	04	27	14.7									
	eXZX		39	36									
1	ePZX	05	28	08.5	2 08.0	1.0	0.6	1.2	0.5	0.7	0.7		-11.2
1	ePZX	14	03	52.4	1 00.8	0.8	0.8	0.8	0.9	0.7	1.0		
1	ePZX	21	24	11.4	09.1i	1.0	0.2	3.9	0.2	2.7	0.2		
1	ePZX	23	06	17.8	11.5	0.5	0.6	0.7	0.4	0.4	0.6		
2	ePZX	01	53	21.4	1 00.4	0.5	0.4	1.1	0.4	0.7	0.5		
2	ePZX	03	51	34.5	06.9	1.9	0.6	2.5	0.5	2.1	0.5		
2	ePZX	04	48	23.5	05.1	0.5	0.6	0.9	0.6	0.7	0.4		
2	ePZX	05	39	38.1		0.5	0.6P	0.4	0.8P	0.2	0.5P		
2	iPZX	06	15	38.9	05.9i	1.5	0.5	2.5	0.3	2.4	0.2		+2.5
2	ePZX	06	48	44.0	14.2i	2.1	0.6	3.3	0.6	3.4	0.6		
2	ePZX	07	06	16.5	13.3	0.5	0.5	1.1	0.3	0.6	0.5		
2	ePZX	10	37	30.4	16.0	0.8	0.6	0.7	0.5	0.6	0.4		
2	ePZX	14	41	21.8	14.6	0.8	0.5	1.5	0.3	0.7	0.2		
2	ePZX	15	01	12.5	14.1	1.1	0.5	2.2	0.5	1.0	0.4		
2	iPZX	15	23	44.2	08.0i	0.9	0.8	1.2	0.5	1.5	0.3		+0.8
2	ePZX	15	32	43	1 12	0.5	0.5	1.0	0.5	0.5	0.7		
2	ePZX	16	31	41.9	12.0	0.8	0.5	1.1	0.5	0.8	0.5		
2	iPZX	23	30	03.5									+0.4
	iXZX		30	05.0	11.3	2.4	0.6	3.4	0.5	2.0	0.5		
3	ePZX	01	59	32.3	13.4	0.6	0.6	0.8	0.5	0.8	0.5		
3	ePZX	02	10	35.4	12.5	1.0	0.5	1.5	0.6	0.6	0.6		
3	ePZX	02	25	31.7	25.3	0.5	0.8	0.7	0.7	0.5	0.6		
3	ePZX	09	30	42.7	1 35.8	1.1	0.7	1.3	0.9	1.6	0.6		
3	ePZX	14	56	45.3	09.9i	11.4	0.5	20		10			
3	iPZX	22	10	16.2	07.0	0.5	0.3P	1.4	0.4S	0.5	0.4S		-1.8
4	iPZX	00	55	26.9	18.6i	51.5	1.0	50		40			+3.8
4	ePZX	01	02	16.3	17.6	1.8	0.7	3.6	0.5	1.2	0.4		
4	ePZX	01	33	20.9									
	eXZX		34	00.6	22.6	4.4	1.1X	4.0	1.2X	2.4	1.0X		
4	ePZX	02	41	47.0									
	iXZX		41	48.9	18.9i	24.5	0.9	31.0	1.0	18.2	1.1		
4	iPZX	12	47	48.2	12.5i	8.7	0.6	10		11.8	0.6		-2.0
4	ePZX	14	56	46.4	13.3	1.0	0.5	1.4	0.4	1.0	0.5		
4	ePZX	16	27	19.6	53.6	0.9	0.5	2.3	0.8	1.0	0.7		
4	ePZX	17	50	19.5		1.1	1.5P	1.2	1.7P	0.6	1.1P		
4	ePZX	22	38	10.1	43.2	0.9	0.4P	1.1	0.5S	0.9	0.5S		
5	ePZX	04	25	05.4									
	iXZX		25	06.1	17.1	1.1	0.6	2.4	0.5	1.6	0.6		
5	ePZX	08	02	01.5		2.3	0.7P	1.6	1.2P	1.0	0.8P		
5	ePZX	10	53	47.7									
	iXZX		53	48.5	17.1	1.1	0.9	1.6	0.6	1.4	0.5		
6	iPZX	12	18	13.1									-0.8
	iX1ZX		18	15.5									
	eX2N		19	27.4	57.4	4.1	0.7X2	6.0	0.7X2	4.9	0.7X2		
6	ePZX	17	28	41	17	0.5	0.5	1.0	0.7	0.9	0.6		
6	ePZX	18	22	56.7									
	iX1ZX		22	57.2									
	iX2N		23	03.7	08.9i	6.4	0.4	13.0	0.4	9.0	0.4		
6	iPZX	18	28	34.4	08.4i	1.2	0.4	2.2	0.3	1.1	0.3		-4.4
7	iPZX	03	07	57.9	08.0i	4.5	0.6	5.2	0.3	5.0	0.5		+2.0
7	ePZX	07	15	05.9	13.0i	0.6	0.5	1.3	0.3	0.7	0.3		
7	ePZX	22	42	42.6	12.0	0.5	0.5	1.0	0.3	0.6	0.5		
8	ePZX	00	51	08	41	2.1	0.8	4.5	0.7	1.8	0.7		
8	ePZX	03	01	32.0	22.8	0.7	0.5	1.5	0.4	1.0	0.4		
8	iPZ	03	40	34.5									+15.2
	iPN			34.5									-0.5
	iPE			34.5	08.3			SO		SO			+7.0
8	iPZX	04	38	46.9	11.1	0.6	0.4	1.1	0.3	0.7	0.5		(-)
8	ePZX	13	02	48.5	12.0	0.5	0.5	1.0	0.3	0.6	0.3		

































































Kamikineusu, August 12, 1969

	Time(JST)	Rank	Amplitude	Remark		Time(JST)	Rank	Amplitude	Remark
13 <sup>h</sup>	33 <sup>m</sup> 19 <sup>s</sup>	C	12mm		15 <sup>h</sup>	27 <sup>m</sup> 11 <sup>s</sup>	D	10mm	
	36 00	D	6			30 29	C	11	
	37 24	D	6			31 41	C	12	m 4.1
	38 01	C	7			38 44	C	7	
	38 24	C	8			eP 39 46.1	A	SO	m 5.3
	38 36	C	8			42 06	C	7	doubt
	39 33	D	8			42 41	D	9	
	43 03	C	7			iP 43 51.8	B	21	m 4.6
	43 43	C	7			47 20	C	6	
	45 01	C	9			48 24	C	11	
	iP 45 58.4	B	16			eP 50 19.7	A	SO	m 4.6
	46 54	C	19			53 12	C	10	
	47 09	C	13			56 55	C	7	
	48 44	C	8			eP 57 36.-	B	21	
	iP 49 24.8	A	SO	m 5.0		58 11	C	23	
	51 06	C	22			eS 58 48.5	D	15	
53 43	C	7		16	00 23	D	6		
iP 54 32.1	A	SO	m 5.7		02 15	C	7		
57 41	C	13			03 43	C	8		
14	eP 00 26.2	C	11			iP 04 44.8	C	18	m 4.8
	02 42	C	9			iP 07 54.0	B	19	
	iP 04 30.5	A	SO		m 6.0	iP 11 46.8	A	SO	m 5.3
	09 13	D	5			15 58	D	6	
	eP 09 51.0	A	SO		m 5.4	17 18	D	4	
	14 19	C	10			22 26	C	6	
	14 47	D	6			22 52	C	16	
	15 28	B	17			27 47	C	10	
	iP 18 41.7	C	12			iP 29 50.7	C	13	
	iP 20 51.0	C	15			31 30	C	9	
	22 54	C	8			35 10	B	13	
	24 45	D	6			eP 39 13.4	A	SO	m 4.9
	eP 25 19.6	B	22		not aftershock?	41 52	C	10	m 4.7
	28 05	C	8		45 21	D	7		
	30 47	C	7		46 40	C	8		
	33 00	C	11		48 00	C	7	doubt?	
35 35	D	6		49 35	C	14			
iP 35 54.8	C	10		eP 52 28.1	D	5			
38 32	B	13		54 41	D	5			
41 49	C	7		55 30	C	12			
43 00	C	8		eP 55 36.5	C	SO	m 4.7		
44 38	C	8		17	01 45	C	7		
46 05	B	13			03 00	C	12		
47 05	C	13			04 03	C	15		
48 05	C	10	m 4.3		04 30	C	16		
50 51	D	7			eP 06 07.0	B	18	m 4.6	
52 05	C	7			09 10	D	6		
53 09	C	10			10 21	C	14		
53 33	D	5			eP 14 07.-	B	14	doubt?	
eP 54 35.0	A	SO	m 5.4		16 40	C	4	doubt?	
58 01	D	9			eP 20 03.0	D	6		
59 21	D	8			eP 21 45.3	C	13		
15	eP 00 04.-	D	8			24 05	C	6	doubt?
	01 13	C	11			24 43	C	8	doubt?
	01 23	D	13			27 47	C	7	
	06 41	D	5			iP 39 01.8	C	8	
	08 56	D	7			eP 42 58.6	C	14	m 4.5
	10 01	D	5		44 55	C	16		
	11 43	D	7		45 22	B	17		
	17 12	D	6		47 00	C	6		
	19 51	D	7		49 17	C	12		
	20 36	C	10		eP 55 02.8	C	11		
	22 44	C	13		eP 57 13.3	C	16		
	24 31	C	7		eP 59 22.9	C	11		
	eP 26 49.8	D	8						

Smaller aftershocks must still be obscured by larger ones within 5 hours from the main shock.