GLACIOLOGICAL DATA COLLECTED BY THE JAPANESE ANTARCTIC RESEARCH EXPEDITION IN 1981

Kazuhide SATOW,
(Nagaoka Technical College, Nagaoka 940)
Hiroshi NISHIMURA
(Institute of Low Temperature Science, Hokkaido Univ., Sapporo 060)
and Jiro INOUE
(Disaster Prevention Research Institute, Kyoto Univ., Uji, Kyoto 611)

1. Introduction

The glaciological and meteorological research of the 22nd Japanese Antarctic Research Expedition (JARE-22) was carried out at Mizuho Station and along the traverse routes in Mizuho Plateau by the station personnel and traverse parties during the period from January 1981 to January 1982. Figure 1 shows the observation region and the traverse routes. The inland traverse trips made in 1981 are the following:

(i) Syowa Station - Mizuho Station

a) January 4-23, 1981

b) May 10-28, 1981

c) August 20 - September 8, 1981

d) November 22 - December 10, 1981

e) January 22-24, 1982

(ii) Mizuho Station - V200

January 20 - February 20, 1981

(iii) Mizuho Station - W'200

March 6-26, 1981

(iv) Mizuho Station - Y100

April 12-16, 1981

(v) Mizuho Station - V142 - V1500 - U348 - W'100 - Mizuho

Station

September 27 - November 20

(vi) Mizuho Station - Yamato Mountains

a) December 2, 1981 - January 8, 1982

b) December 5, 1981 - January 16, 1982

Among the above traverses, (i) were the supply trips to Mizuho Station, (ii), (iii), (iv), (v), and (vi)-b) were the traverses under the POLEX-South project. (vi)-a) was the traverse under the geographical project.

The V, U and Yamato routes made in 1981 by JARE-22 are new routes. The Y and W routes were established in 1970 by JARE-11 (Ishida, ed., 1972). Y route in the present report means the route between Mizuho Station and Y100 traced in 1979 by JARE-20 and the route between Y100 and Y200 traced in 1981 by JARE-22. JARE-22 traced W route to 200 km distant from Mizuho Station and renumbered the new station numbers. W route traced by JARE-22 is called W' route.

The present report contains the following data:

(1) Position and surface elevation of stations along the routes Y, V, U, W' and Yamato route.

(2) Net accumulation of snow at Mizuho Station.

(3) Net accumulation of snow along the routes S, H, Z, Y, V, U and W'.

(4) Surface synoptic observations during oversnow traverses.

2. Surface Elevation

Observer: Jiro INOUE

Elevations of the stations along the traverse routes were

measured by barometric altimetry. Readings of elevation differences of two Paulin MM-1 altimeters at the traverse station and Mizuho Station were averaged with temperature correction after eliminating the instrumental error. Errors due to the horizontal pressure gradient were not corrected.

The elevations of the points are listed in Table 2 with the positions. Introducing the altitude of Mizuho Station of 2230 m (Watanabe, 1977), elevations of 5 traverse stations with more than 10 temperature measurements were decided (Table 1). The elevations of other stations with a few temperature measurements were interpolated between the above stations.

Table 1. Elevation of stations.

Station number	Number of observation	Mean elevation	Standard deviation
Y100	20	2584 m	11 m
Y200	15	2840	15
V142	101	3076	31
U234	19	2644	11
U348	12	2403	9

3. Position of Stations

Observers: Kazuhide SATOW, Yoshio YOSHIDA

Astronomic surveys for determining geodetic positions were conducted at nine stations on the routes of the inland traverses (Fig. 1) of JARE-22 as follows: Y100, Y200, V142, V1500, U234, U348, W'100, W'200, F155(Yamato route). The positions of other stations were interpolated between those of two neighboring

astro-fixed stations and navigation records. The positions of the stations are listed in Table 2 with the surface elevations.

4. Net Accumulation of Snow at Mizuho Station

Observers: Kazuhide SATOW, Hiroshi NISHIMURA

Three kinds of stake farms were used to estimate the net accumulation of snow; a 9-stake farm, a 36-stake farm and a 201-stake farm. Measurement of the 9-stake farm was made once a month on the first or the last day of the month. Other farms were measured about once a month. The positions of the farms are shown in Fig. 2. The data are shown in Tables 3, 4 and 5.

5. Net Accumulation of Snow along the Traverse Routes

Observers: Kazuhide SATOW, Hiroshi NISHIMURA

Snow stakes are situated at intervals of 1-2 km along the routes S, H, Z and Y (Mizuho Station - Y100). New snow stakes were established at intervals of 5 km along the routes W', Y (Y100 - Y200) and V in 1981 by JARE-22. The snow stakes along the routes were measured whenever the traverse party took the routes. The net accumulation data are shown in Table 6.

The existing 36-stake farms at S16, H68, H180, S122 and Z40, and new 36-stake farms which were established at Y100, Y200, V142 and W'100, were also measured. The data are shown in Table 7.

6. Surface Synoptic Observations during Oversnow Traverses

Observers: Jiro INOUE, Kazuhide Satow,
Hiroshi NISHIMURA, Yoshio YOSHIDA

Air temperature, wind speed, wind direction, amount and genus of clouds, weather and visibility were observed during the traverses. The instruments used were a stem thermometer, a 3-cup anemometer and a hand compass. Other elements were observed by eye measurement. The height of the observations of air temperature and wind speed was 1.5 - 2 m above snow surface. The notation for the tables and the collected data are shown in Table 8.

References

Ishida, T. ed. (1972): Glaciological research program in Mizuho Plateau-West Enderby Land, Part 1, 1969-1971. JARE Data Rep., 17 (Glaciol.), 217 p.

Watanabe, O. (1977): Glaciological research program in Mizuho Plateau-West Enderby Land, East Antarctica, Part 4, 1974-1975. JARE Data Rep., 36 (Glaciol.), 9 p.

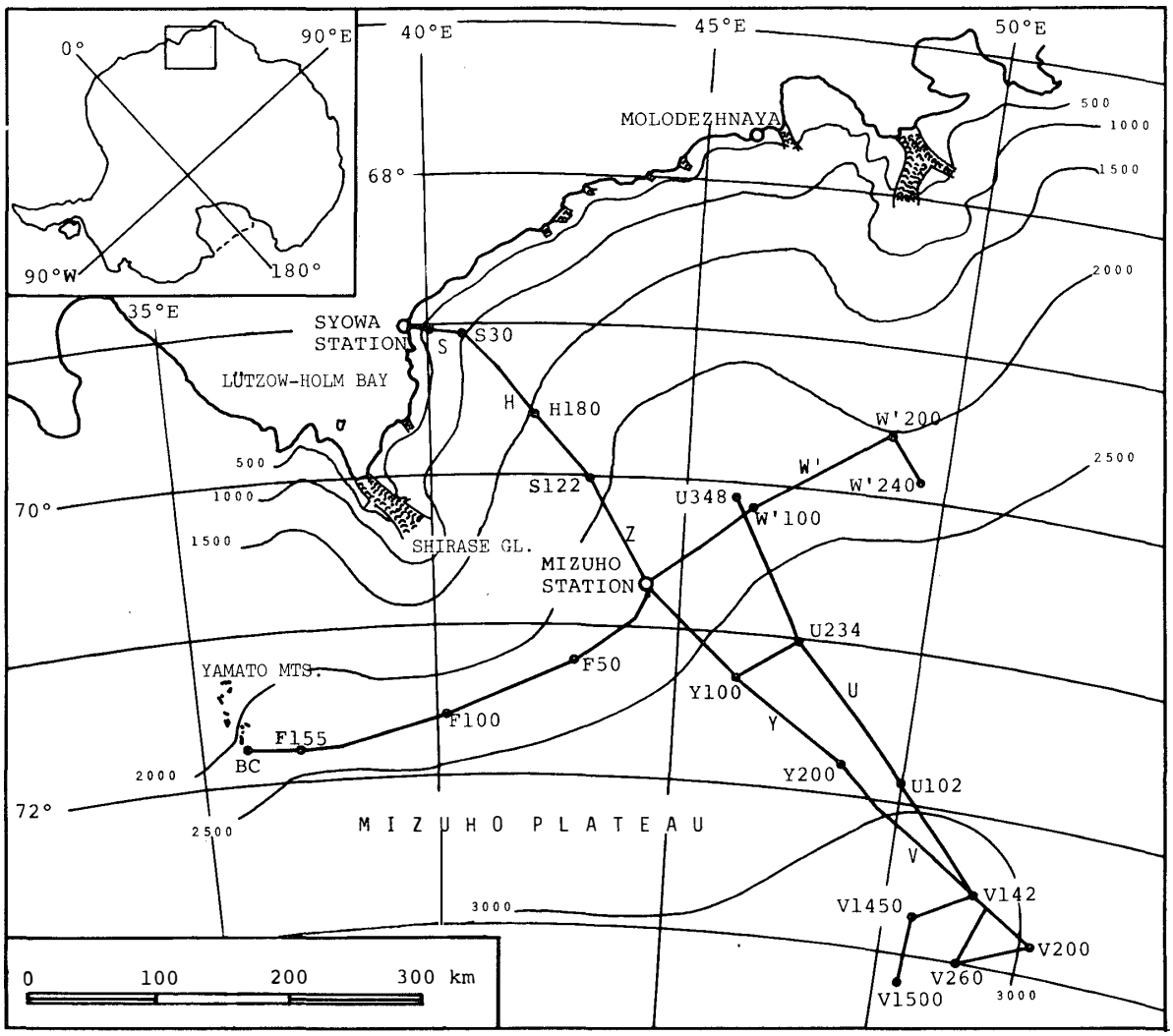

Fig. 1. Location of stations and traverse routes covered in this report.

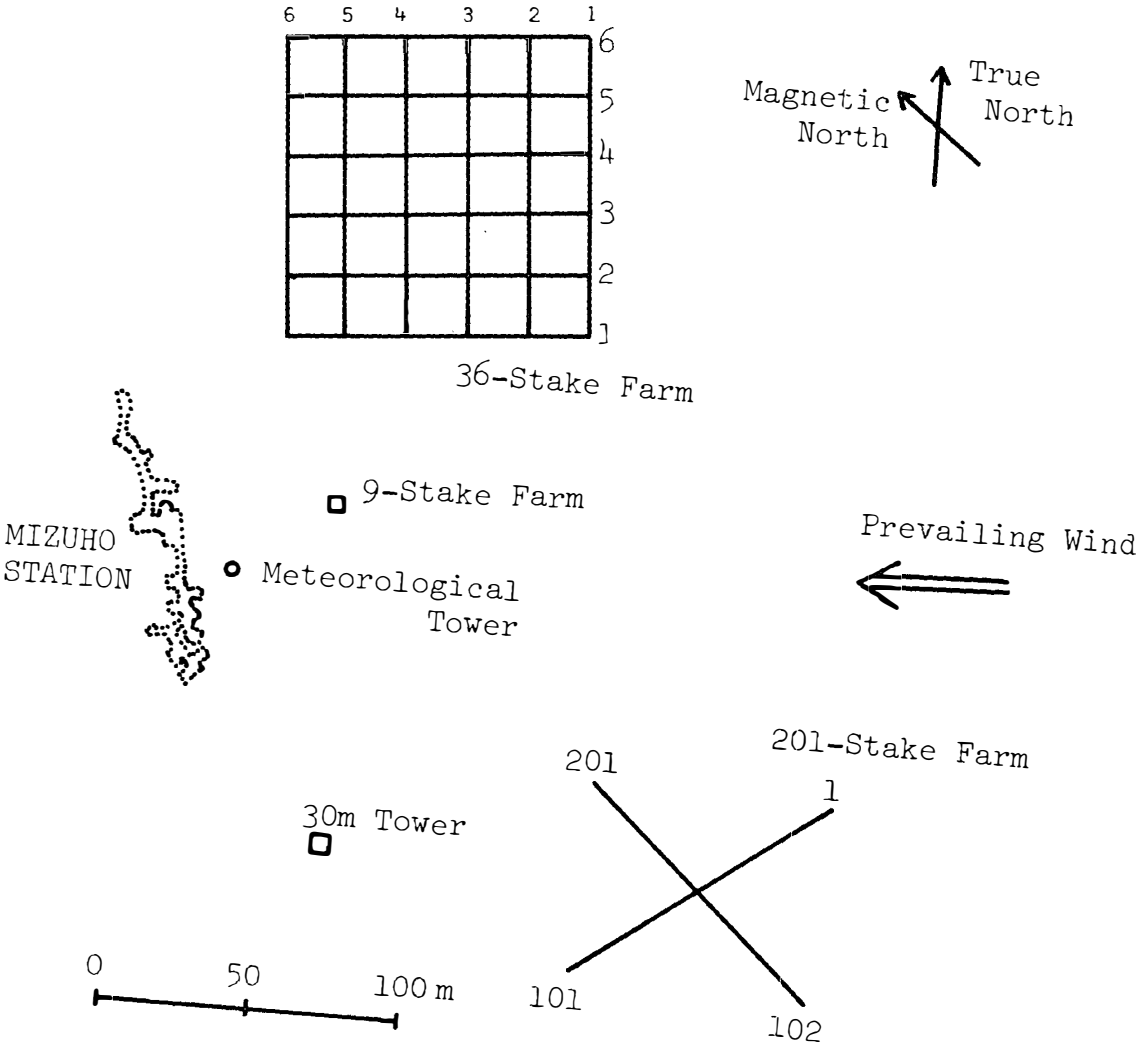

Fig. 2. Position of stake farms at Mizuho Station.

Table 2. Geodetic positions and surface elevations along routes Y, V, U, W' and Yamato route.

Remarks: asterisk in the position column indicates astrofixed positions.

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
(Y-V ROUTE)			
Y 100	*71°17'49"	*46°16'19"	2584
Y 200	*71°48'16"	*48°38'55"	2840
V 5	49.7'	46.0'	2855
10	51.3	52.5	2864
15	53.0	59.1	2870
20	54.5	49 7.0	2896
25	56.1	14.0	2916
30	57.6	21.1	2938
35	59.2	28.1	2956
40	72 0.9	34.9	2972
45	2.5	42.0	2982
50	4.0	49.1	2992
55	5.6	56.1	3010
60	7.3	50 2.6	3020
65	8.9	9.5	3026
70	10.1	16.5	3033
75	11.8	23.3	3050
80	13.3	30.3	3059
85	14.9	37.2	3066
90	16.4	43.9	3076
95	17.9	49.4	3074
100	19.4	56.4	3088
105	21.0	51 3.3	3093
110	22.6	10.4	3098
115	24.2	17.5	3095
120	25.8	24.6	3094
125	27.0	32.3	3086
130	28.6	39.8	3078
135	30.1	47.8	3080

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
V 140	31.7'	54.4'	3076
142	*72°32'18"	*51°57'21"	3076
150	34.4'	52 9.4'	3055
160	37.2	24.3	3041
170	39.8	39.2	3012
180	42.4	57.5	2984
190	45.2	53 12.9	2971
200	47.9	28.0	2965
210	72 50.2	53 12.0	2978
220	52.2	52 55.8	2991
230	54.5	39.2	3021
240	56.8	22.9	3050
250	58.6	5.7	3062
260	73 0.6	51 49.0	3088
270	72 55.5	55.1	3093
280	50.9	52 3.3	3102
290	46.2	9.1	3093
300	40.6	13.3	3092
V 142	*72°32'18"	*51°57'21"	3076
1410	34.9'	42.2'	3080
1420	37.5	26.9	3083
1430	39.6	10.8	3102
1440	41.9	50 54.8	3159
1450	44.3	39.3	3064
1460	49.5	41.6	3058
1470	54.6	39.0	3061
1480	59.8	37.4	3085
1490	73 4.0	36.7	3093
1500	*73°10'21"	*50°35'59"	3092
(U ROUTE)			
V 142	*72°32'18"	*51°57'21"	3076

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
U 6	29.9'	50.3'	3075
12	27.7	42.8	3078
18	25.4	35.3	3078
24	23.1	28.3	3079
30	20.4	22.3	3078
36	18.1	15.3	3072
42	15.7	8.2	3062
48	13.3	1.5	3050
53	11.3	50 55.6	3035
60	8.5	47.5	3055
66	6.0	40.7	3051
72	3.7	33.6	3038
78	72 1.3	50 26.7	3023
84	71 59.0	19.5	3013
90	56.6	12.8	2999
96	54.2	5.9	2984
102	51.8	49 59.3	2963
108	49.4	52.4	2970
114	47.1	45.5	2940
120	44.8	38.5	2907
126	42.5	31.6	2894
132	40.2	24.3	2889
138	38.0	17.3	2873
144	35.7	10.1	2862
150	33.2	3.5	2841
156	31.0	48 56.5	2819
162	28.6	49.7	2815
168	26.3	42.8	2798
174	23.8	36.6	2772
180	21.6	29.6	2762
186	19.5	22.2	2742
192	17.3	15.2	2735
198	14.8	8.8	2708
204	12.4	2.6	2688

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
U 210	9.9'	47 56.1'	2678
216	7.7	49.2	2672
222	5.4	42.2	2663
228	3.0	35.6	2647
234	*71° 0'48"	*47°28'42"	2644
240	70 57.9'	24.2'	2638
246	55.2	19.1	2633
252	52.3	14.5	2626
258	49.4	9.7	2618
264	46.6	5.2	2600
270	43.7	0.6	2584
276	40.9	46 56.0	2580
282	37.9	52.2	2564
288	34.8	48.9	2549
294	32.2	43.6	2532
300	29.4	38.6	2513
306	70 26.7	46 33.1	2507
312	24.0	28.2	2491
318	21.1	23.6	2462
324	18.3	19.1	2456
330	15.3	15.2	2462
336	12.4	10.6	2449
342	9.9	5.0	2438
348	*70° 6'59"	*46° 0'37"	2403
(W' ROUTE)			
Mizuho St.	70°42.1'	44°17.5'	
W' 5	41.5	25.0	
10	39.9	31.4	2291
15	38.2	37.5	
20	36.6	43.7	2291
25	35.0	49.8	
30	33.4	56.1	2321
35	31.8	45 2.4	

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
W' 40	30.1'	8.5'	
45	28.5	14.6	
50	26.9	20.7	2361
55	25.2	26.6	
60	23.6	32.7	2387
65	21.8	38.6	
70	20.2	44.7	2398
75	18.6	51.0	
80	16.8	56.7	2408
85	15.1	46 2.7	
90	13.4	8.5	2423
95	11.7	14.4	
100	*70° 9'59"	*46°20'21"	
105	8.3'	27.9'	
110	6.6	35.5	
115	4.9	43.1	
120	3.0	50.6	
125	1.3	58.1	
130	69 59.5	47 5.5	
135	69 57.9	47 13.3	
140	56.1	20.6	
145	54.4	28.1	
150	52.8	35.9	
155	51.2	43.6	
160	49.4	50.8	
165	47.7	58.4	
170	45.9	48 5.7	
175	44.2	13.2	
180	42.4	20.5	
185	40.7	28.0	
190	38.9	35.5	
195	37.3	43.0	
200	*69°35'26"	*48°50'10"	
210	39.7'	59.4'	

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
W'220	43.9'	49 9.2'	
230	47.8	20.0	
240	52.2	29.2	
(YAMATO ROUTE)			
Mizuho St.	70°42.1'	44°17.5'	
Flag 6	46.8'	25.2'	
9	48.1	15.1	
23	57.5	5.4	
25	58.5	43 59.5	
30	71 1.8	46.4	
35	5.1	33.0	
40	8.5	20.2	
45	12.0	7.3	
50	15.3	42 57.0	
55	18.7	41.4	
60	20.8	25.8	
65	22.4	9.5	
70	23.4	41 52.5	
75	24.8	36.5	
80	26.7	19.9	
85	28.2	1.6	
90	31.1	40 44.7	
95	33.6	29.3	
100	35.4	12.8	
105	37.0	39 56.4	
110	39.1	40.7	
115	39.7	23.3	
120	40.8	6.2	
125	42.3	38 49.3	

Station No.	Latitude (S)	Longitude (E)	Elevation (m)
Flag 130	44.0'	31.8'	
135	45.8	15.3	
140	47.1	37 57.9	
145	47.7	40.3	
150	48.0	22.3	
155	*71°47'34"	*37° 4'14"	
160	47.5'	36 46.2'	
164	47.5	31.8	
Motoi B.C.	46.9	8.0	
POLEX B.C.	46.4	4.6	

Table 3. Net accumulation with 9-stake farm at Mizuho Station (mm in depth).

Month \ No.	1	2	3	4	5	6	7	8	9	Mean
Jan. 1981	-10	30	56	19	52	34	52	101	24	39
Feb.	-29	-31	-19	-25	-19	-19	-31	-25	-23	-25
Mar.	11	-2	-102	3	-97	-2	-4	-5	52	-16
Apr.	142	162	189	157	169	159	156	78	103	147
May	-150	-114	-83	-160	-70	-110	-149	-73	-102	-112
June	230	139	57	121	133	84	79	55	127	114
July	-21	-64	29	64	-17	-19	93	69	-21	13
Aug.	-99	-74	-82	-118	-95	-63	-69	-72	-73	-83
Sep.	11	-99	-4	15	-99	-16	-17	-6	7	-23
Oct.	108	249	155	108	198	80	100	124	72	133
Nov.	35	1	-18	72	21	42	60	-9	9	24
Dec.	58	121	112	6	99	120	50	150	93	90

Table 4. Net accumulation with 36-stake farm at Mizuho Station (mm in depth).

Period / Stake No.	Jan. 19- Feb. 9 1981	Feb. 9- Mar. 1 1981	Mar. 1- Mar. 31 1981	Mar. 31- Apr. 30 1981	Apr. 30- June 1 1981
1-1	-85	-1	36	23	-26
2	-24	-2	6	-3	7
3	-597	-1	588	9	-20
4	-249	-9	218	205	-202
5	-510	-4	504	2	-4
6	-177	-7	164	174	-158
2-1	524	-94	-460	52	-47
2	252	-7	-255	3	7
3	-75	-54	99	113	-94
4	19	-5	-64	4	0
5	-165	-4	219	68	-62
6	-280	-5	255	12	-7
3-1	769	-4	-725	98	-90
2	145	-2	-153	34	-29
3	5	-11	-14	48	-49
4	-453	15	458	23	-20
5	-105	-20	85	-6	-31
6	-145	-4	139	141	-131
4-1	821	-4	-757	114	-197
2	70	4	-64	-17	5
3	342	-4	-358	4	-2
4	56	-7	-49	98	-146
5	-135	-3	128	9	-9
6	-206	-6	182	-8	2
5-1	194	-5	-229	3	1
2	-48	-28	56	41	-31
3	-176	-11	117	89	-29
4	31	-5	-86	14	-9
5	39	-7	-52	67	-58
6	179	-3	-196	6	1
6-1	170	-19	-171	70	-70
2	-162	2	150	11	-13
3	-395	57	328	-2	2
4	-110	0	100	80	-78
5	18	-6	-32	-5	0
6	31	-1	-20	105	-114
Mean	-12	-7	4	47	-47

Period / Stake No.	June 1-June30 1981	June30-July30 1981	July30-Aug. 31 1981	Aug. 31-Sep. 29 1981	Sep. 29-Nov. 2 1981
1-1	2	-162	166	-1	8
2	-99	101	-1	-6	1
3	0	-467	469	-1	0
4	0	3	2	-133	130
5	6	-550	598	3	97
6	20	114	-1	-7	75
2-1	4	-84	80	-8	3
2	5	13	-5	-19	91
3	-7	26	-20	-8	83
4	1	71	-70	190	-144
5	1	-227	342	-2	-14
6	2	68	-68	0	11
3-1	0	38	52	-2	59
2	-1	0	1	-4	148
3	1	-358	359	1	90
4	2	0	0	-2	0
5	-1	210	-206	4	106
6	3	16	-17	-3	71
4-1	103	122	-217	6	204
2	-1	4	-1	-2	3
3	3	357	-360	-11	1
4	1	154	-152	10	177
5	1	-195	195	-97	101
6	41	-40	2	-2	-5
5-1	1	80	-78	-6	3
2	-8	7	0	-5	0
3	7	30	-33	11	10
4	42	3	-45	7	1
5	-10	402	-397	10	-11
6	6	33	-38	1	-4
6-1	6	216	-208	-2	8
2	176	-178	-2	2	5
3	0	471	-470	98	-98
4	41	53	-36	-21	11
5	0	739	-717	11	117
6	46	93	-136	9	72
Mean	11	32	-28	1	39

Period / Stake No.	Nov. 2-Nov. 30 1981	Nov. 30-Dec. 31 1981	Dec. 31-Jan. 31 1982	Jan. 19, 1981-Jan. 31, 1982
1-1	30	-42	-22	-74
2	0	-21	-10	-51
3	1	-21	-13	-53
4	39	294	-14	284
5	3	-44	-7	94
6	-87	237	-22	325
2-1	3	27	-7	-7
2	-22	1	-13	51
3	-35	363	-27	364
4	-7	-43	-15	-63
5	14	-13	-19	138
6	57	-31	85	99
3-1	75	-80	6	196
2	-26	12	-23	102
3	-55	20	24	61
4	5	60	-12	76
5	-11	-125	74	-26
6	2	85	-22	135
4-1	-100	51	-33	113
2	-3	-19	-13	-34
3	8	-39	-18	-77
4	8	78	-13	215
5	30	41	-36	30
6	5	38	-43	-40
5-1	26	-2	-10	-22
2	-4	221	-16	185
3	-13	-6	18	14
4	37	113	-16	87
5	-2	91	-12	60
6	25	-45	-13	-48
6-1	-8	-9	-7	-24
2	155	-71	-11	64
3	-2	15	-20	-16
4	0	-46	-15	-21
5	-25	-102	-14	-16
6	137	-39	-22	161
Mean	7	26	-9	63

Table 5. Net accumulation with 201-stake farm at Mizuho Station (mm in depth).

Period / Stake No.	Jan. 19-Jan. 31 1981	Jan. 31-Mar. 1 1981	Mar. 1-Mar. 31 1981	Mar. 31-Apr. 30 1981	Apr. 30-May 31 1981
1	-	-6	5	31	-36
2	-	-22	3	68	-66
3	-	-2	2	56	-52
4	-	-12	-4	6	-3
5	-	77	-2	0	0
6	-	-7	-2	5	-3
7	-	-17	3	30	-31
8	-	-22	-3	29	-27
9	-	-60	25	49	-77
10	-	62	-12	44	-40
11	-	10	-35	26	-119
12	-	46	6	-5	1
13	-	-10	9	-11	4
14	-	-11	-5	5	1
15	-	-11	-1	-2	-2
16	-	-16	0	-4	6
17	-	-8	-2	2	13
18	-	-10	-4	1	3
19	-	-5	-8	1	22
20	-	-9	0	-2	-43
21	-	-8	-10	7	57
22	-	-10	-5	6	-83
23	-	-9	-6	3	6
24	-	-9	-3	1	99
25	-	-26	-2	2	-32
26	-	-26	-8	15	38
27	-	-24	2	-4	-25
28	-	-16	5	-11	228
29	-	-17	5	-8	25
30	-	-23	4	-6	-37
31	-	-15	-6	5	-66
32	-	-25	-1	1	11
33	-	-14	1	9	-29
34	-	-15	-6	67	-39
35	-	-10	-8	60	-43
36	-	-8	-4	76	-31
37	-	-15	-4	107	-97
38	-	-19	2	86	-57
39	-	-15	7	110	-94
40	-	-12	3	119	-61

Period / Stake No.	May 31-June30 1981	June30-July31 1981	July31-Aug.31 1981	Aug.31-Sep.30 1981	Sep.30-Nov. 2 1981
1	1	180	-179	-2	4
2	0	191	-191	-2	-1
3	19	182	-200	-4	-1
4	2	171	-270	100	3
5	0	195	-193	-2	2
6	2	178	-177	100	-100
7	1	156	-154	-2	-1
8	0	125	-122	-2	2
9	62	110	-183	1	1
10	173	-33	-139	2	-2
11	103	82	-76	-101	102
12	0	47	-46	0	0
13	1	5	-3	-4	0
14	-2	5	0	-6	0
15	7	1	-2	0	3
16	8	-7	-1	-1	0
17	-5	-7	0	-2	-3
18	6	-5	0	-3	5
19	-11	-6	1	1	-3
20	50	-4	0	-4	2
21	-51	2	0	-6	0
22	87	0	1	-2	1
23	0	-6	4	-8	-4
24	-98	1	1	-2	-2
25	35	9	-9	2	-7
26	-50	11	-9	3	0
27	29	7	-5	-1	-6
28	-220	1	1	-8	4
29	-19	2	-1	-100	101
30	45	-3	0	0	0
31	62	5	1	-98	98
32	-13	2	0	-1	0
33	9	1	0	0	-1
34	2	-25	4	-3	-1
35	-11	3	1	-2	2
36	-17	-22	0	-1	-2
37	-7	3	0	0	1
38	-21	-7	2	-2	-1
39	-15	-2	1	-1	-1
40	-63	3	1	0	-1

Period / Stake No.	Nov. 2-Nov. 30 1981	Nov. 30-Dec. 31 1981	Jan. 19, 1981-Dec. 31, 1981
1	283	-59	-
2	249	-36	-
3	226	-61	-
4	123	-18	-
5	97	-17	-
6	65	-18	-
7	70	-13	-
8	67	-70	-
9	154	-55	-
10	120	-29	-
11	58	-37	-
12	4	-18	-
13	-2	-40	-
14	-6	-29	-
15	-5	-34	-
16	-4	-23	-
17	-2	-24	-
18	-6	-31	-
19	-4	-31	-
20	-4	-23	-
21	2	-38	-
22	-3	-30	-
23	8	-31	-
24	0	-31	-
25	2	-32	-
26	-6	-27	-
27	3	-33	-
28	-2	-33	-
29	-3	-30	-
30	1	-37	-
31	-4	-33	-
32	-2	-32	-
33	-4	-29	-
34	0	-30	-
35	-4	-31	-
36	0	-30	-
37	29	-65	-
38	28	-54	-
39	-3	-15	-
40	-3	-22	-

Period / Stake No.	Jan. 19–Jan. 31 1981	Jan. 31–Mar. 1 1981	Mar. 1–Mar. 31 1981	Mar. 31–Apr. 30 1981	Apr. 30–May 31 1981
41	–	-12	4	119	-145
42	–	-16	1	128	-125
43	–	-10	0	122	-108
44	–	-10	-2	80	-76
45	–	-14	0	37	-46
46	–	-15	2	0	3
47	–	-24	0	5	1
48	–	-15	-1	2	0
49	–	-25	5	35	-37
50	–	-22	10	-33	33
51	–	-42	12	105	102
52	–	-23	2	130	-126
53	–	-38	0	106	-105
54	–	-37	-3	112	-110
55	–	-26	-6	93	-94
56	–	-27	1	65	-71
57	–	-34	3	75	-62
58	–	-29	4	90	-87
59	–	-38	2	133	-129
60	–	-41	8	123	-127
61	–	-15	0	117	-114
62	–	-16	1	82	-81
63	–	-14	8	68	-76
64	–	-18	2	74	-73
65	–	-17	-1	97	-98
66	–	-16	2	76	-80
67	–	-16	2	67	-74
68	–	-22	2	118	-121
69	–	-19	-1	115	-115
70	–	-23	1	109	-112
71	–	-10	5	130	-130
72	–	-13	1	125	-128
73	–	-59	1	139	-139
74	–	-74	2	160	-162
75	–	-52	0	151	-151
76	–	-57	-4	130	-128
77	–	-79	2	178	-179
78	–	-12	-4	210	-207
79	–	-63	1	220	-218
80	–	-41	5	185	-186

Period / Stake No.	May 31-June30 1981	June30-July31 1981	July31-Aug.31 1981	Aug.31-Sep.30 1981	Sep.30-Nov. 2 1981
41	29	-2	2	-3	0
42	-2	0	5	-5	0
43	-4	5	2	-2	2
44	-1	2	1	-3	34
45	35	-8	24	4	4
46	102	-101	1	0	-1
47	111	-101	-10	0	0
48	68	-58	93	-2	-99
49	1	16	-16	2	1
50	1	32	-31	-5	0
51	3	55	-56	-13	12
52	0	60	-64	0	-5
53	1	28	-26	-2	0
54	5	70	-72	-1	2
55	4	95	-96	8	0
56	8	105	-109	3	-4
57	4	98	-100	-5	-60
58	57	35	-91	-4	0
59	141	-63	-76	-5	-1
60	119	-66	-49	-4	-1
61	42	-33	-7	-7	-3
62	3	-2	2	-3	-1
63	0	4	-1	2	0
64	2	-4	4	-5	-3
65	2	1	-2	1	30
66	1	0	-2	4	23
67	5	-1	-1	3	41
68	55	-24	-26	-5	73
69	61	-36	-27	2	74
70	103	-78	-23	2	65
71	-3	33	-30	-2	54
72	5	48	-50	1	103
73	0	53	-51	6	-8
74	2	79	-79	-3	58
75	20	64	-82	0	180
76	86	-3	-79	2	8
77	103	-4	-96	0	24
78	60	55	-114	3	17
79	1	169	-167	-1	44
80	30	119	-148	-1	33

Stake No. \ Period	Nov. 2-Nov. 30 1981	Nov. 30-Dec. 31 1981	Jan. 19, 1981-Dec. 31, 1981
41	-80	63	-
42	19	-30	-
43	-1	-23	-
44	-31	-9	-
45	48	-47	-
46	1	33	-
47	-1	35	-
48	22	-26	-
49	21	-21	-
50	29	-30	-
51	25	10	-
52	7	13	-
53	-2	-17	-
54	-4	-6	-
55	21	-13	-
56	25	-20	-
57	86	-26	-
58	3	11	-
59	3	-23	-
60	2	-20	-
61	5	-39	-
62	0	-22	-
63	6	-29	-
64	44	-45	-
65	-5	-29	-
66	-26	-21	-
67	-34	-27	-
68	-20	-60	-
69	-30	-46	-
70	-16	-58	-
71	25	-84	-
72	22	-126	-
73	164	-88	-
74	143	-130	-
75	-12	-42	-
76	92	-104	-
77	106	-133	-
78	241	-176	-
79	230	-70	-
80	148	-25	-

Period / Stake No.	Jan. 19-Jan. 31 1981	Jan. 31-Mar. 1 1981	Mar. 1-Mar. 31 1981	Mar. 31-Apr. 30 1981	Apr. 30-May 31 1981
81	-	-94	8	137	-135
82	-	-48	6	144	-144
83	-	-47	5	188	-190
84	-	-72	-2	188	-186
85	-	-56	-3	173	-168
86	-	-54	12	165	-173
87	-	-17	7	134	-138
88	-	-23	8	142	-157
89	-	-8	5	133	-140
90	-	-12	2	115	-112
91	-	-13	-7	116	-109
92	-	-6	1	98	-104
93	-	-10	4	118	-120
94	-	-10	0	82	-80
95	-	-4	2	98	-99
96	-	54	-1	70	-69
97	-	-17	0	125	-125
98	-	-5	-106	126	-121
99	-	-26	4	61	-63
100	-	-19	-7	74	-74
101	-	-7	-15	66	-64
102	12	-6	4	-4	-3
103	2	-10	8	-5	-7
104	3	-14	11	-10	1
105	19	-5	-4	5	-16
106	-1	-3	-6	5	-10
107	-5	-31	-4	2	4
108	15	-13	-2	2	0
109	5	-10	-5	53	-54
110	-7	-13	0	17	-19
111	9	-10	1	0	5
112	10	-24	14	15	-26
113	-5	4	-9	2	2
114	-2	53	-1	1	3
115	1	-6	5	3	2
116	10	-15	5	1	-1
117	-1	11	0	0	6
118	-3	-7	0	0	3
119	7	-1	14	-18	25
120	4	-2	8	-10	9

Period / Stake No.	May 31-June30 1981	June30-July31 1981	July31-Aug.31 1981	Aug.31-Sep.30 1981	Sep.30-Nov. 2 1981
81	94	97	-189	-2	27
82	133	107	-242	-2	29
83	113	128	-239	-2	15
84	127	142	-268	2	0
85	75	194	-267	-1	1
86	52	235	-283	-4	5
87	2	268	-269	1	-4
88	13	290	-303	12	-9
89	72	197	-366	100	-99
90	107	162	-267	-4	0
91	138	108	-243	0	-1
92	104	135	-237	5	-1
93	2	194	-195	1	-2
94	38	103	-138	1	-2
95	36	53	-87	0	1
96	-98	130	-29	-2	1
97	1	35	-35	0	-1
98	1	41	-40	101	-1
99	4	25	-28	1	99
100	1	22	-19	5	0
101	4	7	-8	7	2
102	0	37	-27	-6	5
103	1	51	-39	-1	-2
104	9	9	-9	-3	48
105	6	10	1	-1	5
106	2	7	0	4	18
107	9	-7	-1	-2	23
108	1	3	-1	0	-2
109	-1	4	-3	16	48
110	1	12	-1	30	123
111	1	63	1	-1	133
112	14	59	0	-1	189
113	146	-119	-26	40	117
114	123	-32	-8	-5	176
115	23	-18	0	-5	297
116	0	47	-45	0	183
117	-1	62	-59	114	134
118	2	32	-32	56	245
119	1	110	-43	-15	274
120	0	118	-67	55	114

Period / Stake No.	Nov. 2-Nov. 30 1981	Nov. 30-Dec. 31 1981	Jan. 19, 1981-Dec. 31, 1981
81	142	-22	-
82	155	-20	-
83	172	53	-
84	152	65	-
85	293	-173	-
86	290	-121	-
87	221	-89	-
88	224	-116	-
89	249	-112	-
90	187	-188	-
91	146	-25	-
92	247	-112	-
93	205	-82	-
94	156	-26	-
95	175	-177	-
96	151	-154	-
97	70	-74	-
98	-3	-8	-
99	-1	-6	-
100	-9	-5	-
101	-11	-1	-
102	-2	-18	-8
103	-2	-15	-19
104	-29	-23	-7
105	74	-35	59
106	189	58	263
107	223	-81	130
108	232	-30	205
109	185	-28	210
110	83	19	245
111	29	9	240
112	19	22	291
113	152	-13	291
114	57	-75	290
115	10	-157	155
116	146	-41	290
117	64	-30	300
118	-46	41	291
119	-42	-29	283
120	120	-39	310

Stake No. \ Period	Jan. 19-Jan. 31 1981	Jan. 31-Mar. 1 1981	Mar. 1-Mar. 31 1981	Mar. 31-Apr. 30 1981	Apr. 30-May 31 1981
121	-7	-9	-4	9	-4
122	-12	-10	2	4	2
123	3	-19	2	-2	6
124	5	-35	0	5	-6
125	-15	-21	46	-28	-15
126	-8	-26	4	-11	11
127	-26	-5	1	5	-1
128	-22	-34	6	6	-44
129	-33	-75	-2	-1	7
130	3	-29	16	4	-6
131	-11	19	2	-1	2
132	-6	75	1	68	-71
133	16	33	1	136	-136
134	4	-24	0	146	-144
135	-16	13	-7	127	-127
136	7	-16	-1	125	-123
137	7	-24	-3	201	-201
138	-8	-24	12	145	-143
139	-8	-5	-7	178	-185
140	8	-44	6	207	-210
141	-17	-22	9	132	-144
142	-38	-21	-21	156	-159
143	-12	7	-5	150	-151
144	-6	-9	5	143	-146
145	4	-31	37	102	-149
146	-1	-9	0	96	-101
147	15	-26	51	62	-94
148	12	-45	21	65	-75
149	18	-34	6	50	-50
150	0	-16	6	104	-106
151	-1	-10	1	154	-154
152	8	-9	1	-1	1
153	7	-14	7	-102	102
154	-13	-9	12	11	-10
155	0	-27	27	27	-43
156	0	-25	15	119	-119
157	0	-19	-1	53	-52
158	1	-8	7	12	-18
159	-2	79	3	-2	-1
160	-2	94	-2	7	0

Period / Stake No.	May 31-June30 1981	June30-July31 1981	July31-Aug.31 1981	Aug.31-Sep.30 1981	Sep.30-Nov. 2 1981
121	0	3	-1	42	246
122	-1	2	-1	4	220
123	6	-4	0	-1	145
124	6	1	-1	0	104
125	0	2	-1	3	81
126	5	-7	-1	-5	137
127	70	-69	1	2	96
128	56	0	-51	11	162
129	63	-43	-20	-4	190
130	7	-5	5	-23	171
131	-5	11	-3	-2	158
132	18	27	-43	1	180
133	90	-42	-45	1	181
134	102	-72	-29	1	204
135	1	1	2	5	209
136	0	34	-34	4	144
137	5	65	-69	3	66
138	1	42	-43	-20	55
139	12	107	-120	11	97
140	1	170	-169	-2	147
141	7	142	-178	4	142
142	0	245	-244	2	238
143	15	232	-246	-3	84
144	28	228	-254	101	102
145	30	206	-224	0	229
146	5	154	-150	1	124
147	48	109	-122	-10	97
148	18	61	-76	6	118
149	6	10	-12	-7	11
150	1	44	-40	-1	-2
151	0	30	-13	2	-4
152	48	-26	-20	0	1
153	-75	79	-100	102	-2
154	71	-67	0	12	37
155	1	3	-2	5	-1
156	10	7	-14	0	17
157	46	-43	0	-3	-2
158	17	-9	-1	4	-3
159	1	13	-11	-101	98
160	3	3	-2	-1	-4

Period / Stake No.	Nov. 2-Nov. 30 1981	Nov. 30-Dec. 31 1981	Jan. 19, 1981-Dec. 31, 1981
121	5	-90	190
122	90	-21	279
123	196	-28	304
124	295	-60	314
125	265	-35	282
126	207	-44	262
127	168	-49	193
128	64	-9	145
129	83	-23	142
130	137	-28	252
131	-5	-48	117
132	30	-49	231
133	62	-57	240
134	52	-70	170
135	4	-22	190
136	118	-38	220
137	213	-33	230
138	142	-22	137
139	180	-30	230
140	84	7	205
141	5	58	138
142	-22	34	170
143	16	7	94
144	-11	9	190
145	-52	222	374
146	-19	130	230
147	18	20	168
148	2	41	148
149	46	-4	40
150	6	74	70
151	-11	-4	-10
152	-2	-21	-20
153	-2	-22	-20
154	-38	-22	-16
155	-7	-13	-30
156	69	-7	72
157	1	-25	-45
158	-2	-19	-19
159	-1	-118	-42
160	2	-123	-25

Period / Stake No.	Jan. 19-Jan. 31 1981	Jan. 31-Mar. 1 1981	Mar. 1-Mar. 31 1981	Mar. 31-Apr. 30 1981	Apr. 30-May 31 1981
161	10	-26	-14	48	-46
162	2	88	-100	103	-1
163	-8	-30	-2	4	2
164	-2	-18	20	-18	4
165	-6	-10	6	-5	5
166	14	-11	-3	33	-22
167	-16	-5	51	59	-112
168	10	-15	36	-33	-4
169	-1	-29	-2	5	-4
170	-11	-13	5	-2	3
171	14	-36	2	18	-11
172	9	-72	-7	8	-12
173	7	-31	-6	5	0
174	13	-14	1	14	-5
175	-10	-24	4	44	-46
176	-11	-11	2	60	-62
177	-11	-14	-5	17	-7
178	-9	-7	6	3	-1
179	-9	-16	-5	7	-5
180	-3	-11	4	24	-11
181	0	-8	-2	3	-2
182	-26	-17	123	-120	-5
183	2	-9	37	60	-100
184	9	-3	-6	3	-6
185	12	-11	9	-3	-3
186	-7	-26	3	0	7
187	6	-69	3	-1	-3
188	-23	-35	-2	4	0
189	-8	-46	4	-1	0
190	-38	-48	6	2	-6
191	-19	-97	-4	91	-89
192	-59	-47	-4	64	-61
193	-42	-26	-2	5	7
194	-18	-16	-6	6	0
195	-3	-63	6	-1	3
196	3	-10	7	2	-22
197	85	-48	-97	104	-1
198	86	-48	12	107	-4
199	-15	-47	2	-2	3
200	-9	-19	40	44	-38
201	3	-36	23	2	0
Mean	-	-18	2	55	-53

Period / Stake No.	May 31-June30 1981	June30-July31 1981	July31-Aug.31 1981	Aug.31-Sep.30 1981	Sep.30-Nov. 2 1981
161	65	-36	-24	3	9
162	58	-54	-1	-97	98
163	114	-111	-1	2	-4
164	0	1	1	-1	-7
165	38	-35	0	1	-2
166	103	-54	-48	1	-1
167	61	37	-90	-4	-1
168	4	19	-17	0	-3
169	5	3	-2	1	0
170	-1	6	-3	6	-6
171	-1	17	-8	7	-2
172	19	45	-58	8	0
173	3	24	-24	1	0
174	-17	41	-28	-2	-5
175	5	63	-62	-3	-2
176	0	50	-50	3	-1
177	1	46	-44	0	-2
178	2	47	-45	-5	4
179	4	17	-17	-4	-2
180	0	29	-23	2	-18
181	16	3	-18	4	-1
182	74	0	-72	3	46
183	133	-33	-98	-1	25
184	-2	55	-50	2	0
185	-1	8	-4	0	0
186	2	-1	0	-3	-5
187	4	0	-1	3	-2
188	1	3	-2	3	-1
189	2	0	2	-2	-1
190	14	-8	-2	11	-9
191	45	-29	-12	2	-1
192	77	-48	-26	2	-3
193	10	-5	-3	-6	-2
194	4	-2	0	2	-2
195	-1	1	1	-2	-1
196	9	2	0	49	-6
197	1	2	0	-1	-16
198	-4	0	7	-8	-1
199	1	8	-7	-1	-1
200	1	1	1	2	-1
201	1	2	0	0	0
Mean	21	35	-54	2	37

Period / Stake No.	Nov. 2-Nov. 30 1981	Nov. 30-Dec. 31 1981	Jan. 19, 1981-Dec. 31, 1981
161	-14	-8	-33
162	54	-200	-50
163	16	-42	-60
164	4	-29	-45
165	0	-32	-40
166	-3	-17	-8
167	3	-8	-25
168	1	-27	-29
169	-3	-27	-54
170	-4	-21	-41
171	-8	-11	-19
172	-10	3	-67
173	-4	-10	-35
174	57	-12	43
175	72	-1	40
176	78	53	111
177	107	-97	-9
178	108	-31	72
179	134	-32	72
180	67	-26	34
181	-85	-28	-118
182	-1	35	40
183	-22	126	120
184	-4	-18	-20
185	-3	-34	-30
186	7	-37	-60
187	-3	-23	-86
188	-4	-21	-77
189	-1	-21	-72
190	-5	-27	-110
191	-3	-6	-122
192	23	22	-60
193	3	87	26
194	-3	-7	-42
195	-20	-90	-170
196	19	-63	-10
197	34	-158	-95
198	23	-140	30
199	-1	-10	-70
200	-3	-37	-18
201	-2	-27	-34
Mean	52	-31	-

Table 6. Net accumulation along routes S, H, Z, Y, V and W'

(cm in depth).

Stake No. \ Period	Jan.–May 1981	May–Aug. 1981	Aug.–Nov.Dec. 1981	Nov.Dec.–Jan. 1982	Jan.,1981–Jan.,1982
	107–141days	84–103days	94–107days	40–54days	356–373days
S 17	30	28	16	−2	72
18	16	43	27	5	91
19	33	2	27	−48	14
20	68	67	51	−6	180
21	41	21	9	1	72
22	66	40	39	2	147
23	–	22	48	10	–
24	48	24	48	−2	118
25	26	25	25	9	85
26	30	40	26	9	105
27	41	23	26	10	100
28	46	20	18	9	93
29	34	21	27	–	–
30	52	–	46	−2	–
H 3	41	25	42	3	111
9	36	32	29	−9	88
15	34	48	29	−3	108
21	20	25	33	−7	71
27	14	54	15	−1	82
35	87	4	33	−15	109
42	18	18	17	9	62
48	31	26	← 35(149days) →		92
54	38	−2	← 27(150days) →		63
60	15	38	← 21(150days) →		74
64	24	41	18	−8	75
68	12	11	← −6(150days) →		17
72	22	47	34	−9	94
76	31	16	20	−1	66
80	3	33	8	−5	39
84	15	20	29	−12	52
88	24	22	14	12	72
92	15	28	20	−3	60
96	20	34	29	−10	73
100	14	15	17	7	53
104	3	27	15	0	45
108	14	21	9	−1	43
112	14	10	19	−7	36
116	3	23	31	−7	50
120	32	0	16	−9	39
124	−5	32	12	−2	37
128	−36	11	16	3	−6
132	25	20	5	3	53

Period / Stake No.	Jan.-May 1981	May-Aug. 1981	Aug.-Nov. Dec. 1981	Nov. Dec. Jan. 1982	Jan., 1981-Jan., 1982
	107-141days	84-103days	94-107days	40-54days	356-373days
136	3	-2	19	0	20
140	9	24	10	-2	41
144	10	20	29	-14	45
148	14	-1	24	3	40
152	18	5	32	-13	42
156	9	11	1	-5	16
160	8	-87	0	1	-78
164	8	25	10	-90	47
168	22	23	7	1	53
172	1	-1	16	-1	14
176	20	15	8	5	48
180	7	20	-	-	-
184	4	21	16	10	51
188	31	5	4	20	60
192	4	34	10	56	104
196	6	14	21	-43	-2
200	3	-1	0	13	42
204	4	17	5	5	31
208	7	13	0	14	34
212	-5	15	9	7	26
216	11	14	11	-3	33
220	11	7	18	2	38
224	-2	16	7	2	23
228	2	16	2	-1	19
232	8	23	7	9	47
236	3	17	6	-1	25
240	23	15	23	-9	52
244	17	1	13	-9	22
248	6	9	14	3	32
252	7	7	11	-6	19
256	40	-5	15	-9	41
260	11	1	17	-2	27
264	10	40	4	-7	47
268	18	33	7	-6	52
272	18	← 24 (198days) →		-4	38
276	3	8	18	-9	20
280	11	25	4	4	44
284	8	← 27 (203days) →		-5	30
288	2	26	11	-5	34
293	25	-20	8	-10	3
297	-12	1	0	6	-5
301	7	23	3	-8	25

Stake No. \ Period	Jan. – May 1981	May – Aug. 1981	Aug. – Nov. Dec. 1981	Nov. Dec. Jan. 1982	Jan., 1981 – Jan., 1982
	107–141days	84–103days	94–107days	40–54days	356–373days
S122	←	3(360days)		→	3
Z 2	1	3	-3	0	1
4	-6	1	-1	-5	-11
6	-5	1	0	7	3
8	13	0	7	-2	18
10	0	1	12	2	15
12	8	-1	5	-4	8
14	45	24	-13	-6	50
16	1	24	-10	-3	12
18	-4	0	0	4	0
20	3	22	8	-4	29
22	5	8	2	-7	8
24	-5	1	0	-3	-7
26	← -7(224days) →		13	-5	1
28	← 22(224days) →		0	-5	17
30	45	-50	4	-5	-6
32	-4	-1	5	-6	-6
34	3	0	5	-7	1
36	9	18	-8	-8	11
38	-1	0	-1	-1	-3
40	-1	-1	1	6	5
42	-6	1	0	-7	-12
46	2	← 0(248days)		→	2
50	13	33	-7	6	45
54	-5	-1	5	-6	-7
58	0	2	0	-11	-9
62	4	1	10	-3	12
66	1	0	16	-7	10
70	1	36	8	-8	37
72	4	-1	0	-3	0
74	4	0	9	0	13
76	6	3	6	5	20
78	-5	7	2	3	7
80	-4	-30	42	-3	5
82	6	7	11	-5	19
84	18	0	1	7	26
86	2	17	44	5	68
88	-3	2	7	-5	1
90	3	4	2	1	10
92	-3	-1	11	5	12
94	7	2	-1	2	10
96	32	0	0	26	58

Period / Stake No.	Jan.- Feb. 1981	Feb.- Apr. 1981	Apr.- Sep. 1981	Jan., 1981- Sep., 1981
	30- 31days	54- 55days	164- 166days	249- 252days
Y1802	-1	2	-1	0
1804	-2	2	11	11
1806	-9	11	23	25
1808	1	5	12	18
1810	-4	3	33	32
1812	← 2(86days) →		21	23
1814	-2	0	1	-1
1816	3	0	32	35
1818	0	27	-4	23
1820	-5	0	15	10
1822	-2	-2	5	1
1824	4	21	-14	11
1826	-8	8	-4	-4
1828	-1	1	-1	-1
1830	-7	4	7	4
1832	-2	16	-6	8
1834	5	0	24	29
1836	-1	1	25	25
1838	7	1	41	49
1840	16	1	25	42
1842	-2	6	1	5
28	4	3	9	16
30	-2	1	-1	-2
32	1	0	127	128
34	0	6	0	6
36	11	0	17	28
38	12	1	-1	12
40	-6	0	1	-5
42	1	2	-3	0
44	1	0	1	2
46	-2	2	19	19
48	-1	-1	16	14
50	0	-1	13	12
52	-2	2	-1	-1
54	9	0	29	38
56	-1	← 1(221days) →		0
58	0	-11	31	20
60	11	0	9	20
62	-2	-2	4	0
64	5	-2	37	40
66	5	2	37	44
68	0	0	0	0

Period / Stake No.	Jan.–Feb. 1981	Feb.–Apr. 1981	Apr.–Sep. 1981	Jan., 1981–Sep., 1981
	30–31days	54–55days	164–166days	249–252days
70	1	2	2	5
72	−1	0	21	20
74	−3	← 0(221days) →		−3
76	8	0	16	24
78	5	−1	1	5
80	1	−1	3	3
82	−1	← 23(221days) →		22
84	9	0	−1	8
86	−1	← 20(221days) →		19
88	−4	6	6	8
90	−1	1	6	6
92	4	0	1	5
94	−1	4	−1	2
96	6	5	0	11
98	−5	1	0	−4
100	5	1	50	56

Period / Stake No.	Jan.- Feb. 1981	Feb.- Oct. 1981	Jan., 1981- Oct., 1981
	20- 28days	228- 238days	255- 259days
Y 105	-5	34	29
110	-	42	-
115	-4	17	13
120	-1	1	0
125	-1	12	11
130	3	28	31
135	-1	17	16
140	3	29	32
145	-1	3	2
150	4	10	14
155	2	46	48
160	-10	33	23
165	-1	34	33
170	-1	0	-1
175	-	24	-
180	10	0	10
185	2	0	2
190	-1	34	33
195	8	5	13
200	-	34	-
V 5	-	32	-
10	0	32	32
15	0	17	17
20	-2	-1	-3
25	-2	6	4
30	-3	0	-3
35	-1	0	-1
40	-1	0	-1
45	-1	12	11
50	-2	0	-2
55	-1	0	-1
60	-1	1	0
65	0	16	16
70	10	4	14
75	-1	9	8
80	0	8	8
85	-1	1	0
90	0	-1	-1
95	5	10	15
100	-1	1	0
105	0	51	51
110	-1	12	11

Period / Stake No.	Jan.- Feb. 1981	Feb.- Oct. 1981	Jan., 1981- Oct., 1981
	20- 28days	228- 238days	255- 259days
115	19	-1	18
120	-1	7	6
125	0	8	8
130	-	11	-
135	0	8	8
140	-3	15	12

Period / Stake No.	Mar.- Nov. 1981
	256 - 259 Days
W' 5	13
10	36
15	39
20	17
25	7
30	15
35	3
40	1
45	7
50	35
55	-1
60	17
65	31
70	-
75	43
80	67
85	21
90	31
95	12
100	58

Table 7. Net accumulation with 36-stake farms at S16, H68, H180, S122, Z40, Y100, Y200, V142 and W'100 (cm in depth).

S16

Period / Stake No.	Jan. 7-May 28 1981	May 28-Aug. 20 1981	Aug. 20-Dec. 8 1981	Dec. 8-Jan. 13 1982	Jan. 7, 1981-Jan. 13, 1982
1-1	18	24	-	-	-
2	19	29	21	-	-
3	25	12	-	-	-
4	32	17	21	-2	68
5	32	13	27	-8	64
6	41	14	19	-7	67
2-1	26	9	27	-9	53
2	31	32	15	-8	70
3	34	16	18	-11	57
4	31	9	30	-10	60
5	34	9	26	-9	60
6	35	18	20	-9	64
3-1	22	9	38	-8	61
2	10	15	38	-10	53
3	12	18	36	-11	55
4	18	27	31	5	81
5	14	25	25	-8	56
6	29	14	28	-4	67
4-1	30	4	-	-	-
2	32	5	41	-7	71
3	23	7	0	-3	27
4	28	3	27	2	60
5	20	19	18	-4	53
6	24	12	21	-6	51
5-1	20	57	-	-	-
2	17	21	26	-6	58
3	6	19	27	1	53
4	25	-	-	-	-
5	23	11	22	-2	54
6	27	10	20	-4	53
6-1	17	21	26	-2	62
2	15	38	18	1	72
3	20	19	26	-5	60
4	27	14	20	3	64
5	22	10	20	5	57
6	19	17	26	0	62
Mean	24	-	-	-	-

H68

Period / Stake No.	Jan. 8-May 28 1981	May 28-Aug. 21 1981	Aug. 21-Nov. 23 1981	Nov. 23-Jan. 16 1982	Jan. 8, 1981-Jan. 16, 1982
1-1	39	2	6	-4	43
2	10	11	3	3	27
3	2	4	18	7	31
4	-4	19	-4	9	20
5	0	26	9	-8	27
6	2	18	14	-5	29
2-1	12	1	-1	15	27
2	5	6	1	11	23
3	4	20	16	-11	39
4	16	25	-4	-2	35
5	8	7	6	-7	14
6	4	7	1	1	13
3-1	33	4	0	-4	33
2	-3	11	10	5	23
3	16	3	19	0	38
4	18	-1	2	5	24
5	6	21	1	-6	22
6	29	18	5	-7	45
4-1	5	14	6	0	25
2	15	8	4	7	34
3	17	10	2	5	34
4	12	6	12	1	31
5	21	3	14	3	41
6	13	-1	1	8	21
5-1	6	6	3	16	31
2	15	15	1	1	32
3	13	2	12	0	27
4	9	5	6	-5	15
5	2	0	16	-2	16
6	16	1	0	-4	13
6-1	14	11	11	-3	33
2	8	11	20	1	40
3	14	11	28	-10	43
4	18	4	2	2	26
5	16	0	2	9	27
6	27	0	9	1	37
Mean	12	9	7	1	29

H180

Stake No. \ Period	Jan. 8-May 27 1981	May 27-Aug. 21 1981	Aug. 21-Nov. 24 1981	Nov. 24-Jan. 16 1982	Jan. 8, 1981-Jan. 16, 1982
1-1	0	23	7	0	30
2	30	10	10	-4	46
3	5	30	7	4	46
4	4	22	5	6	37
5	3	18	14	0	35
6	-3	22	25	-7	37
2-1	52	0	0	22	54
2	21	13	8	23	44
3	23	18	14	18	57
4	13	6	14	17	35
5	4	18	10	-1	31
6	25	19	6	-5	45
3-1	14	10	21	-5	40
2	22	2	14	4	42
3	8	11	15	9	43
4	13	11	16	5	45
5	-2	11	17	-3	23
6	28	-15	27	-2	38
4-1	13	19	8	-2	38
2	16	8	10	4	38
3	14	6	9	6	35
4	7	9	11	8	35
5	16	27	2	-2	43
6	4	19	9	8	40
5-1	6	23	14	8	51
2	-4	13	15	1	44
3	26	6	12	-3	41
4	12	18	14	-6	38
5	7	3	21	-4	35
6	2	13	12	-9	36
6-1	-3	29	9	4	39
2	0	25	13	-2	36
3	6	19	4	-2	26
4	6	14	11	-3	34
5	3	14	13	9	39
6	16	10	14	3	43
Mean	11	14	12	3	39

S122

Period / Stake No.	Jan. 11–May 26 1981	May 26–Aug. 23 1981	Aug. 23–Nov. 25 1981	Nov. 25–Jan. 17 1982	Jan. 11, 1981–Jan. 17, 1982
1-1	-1	-1	2	-4	-4
2	1	0	0	-3	-2
3	1	-3	14	4	16
4	-3	12	17	-2	24
5	-2	10	20	-3	25
6	0	1	24	-9	16
2-1	-8	5	22	-6	13
2	4	21	0	-11	14
3	0	3	19	-20	2
4	-1	16	4	-6	13
5	4	4	5	-9	4
6	-3	5	17	3	22
3-1	-5	3	27	-6	19
2	-1	13	2	2	16
3	-4	11	21	-4	24
4	-6	4	18	-6	10
5	20	0	8	-6	22
6	-2	1	18	-1	16
4-1	17	0	6	3	25
2	6	16	9	-4	27
3	-2	1	0	2	1
4	-4	1	20	7	24
5	-2	11	4	8	21
6	3	0	13	14	30
5-1	2	5	7	-7	7
2	4	4	7	2	13
3	4	4	14	2	24
4	-3	2	13	-11	1
5	-5	0	2	-5	-8
6	-1	0	0	-2	-3
6-1	-3	26	4	13	40
2	3	30	1	0	34
3	5	10	16	0	31
4	4	13	1	-11	7
5	-2	2	7	-4	3
6	2	7	6	5	20
Mean	1	7	10	-2	15

Z40

Stake No. \ Period	Jan. 12-May 25 1981	May 25-Aug. 23 1981	Aug. 23-Nov. 25 1981	Nov. 25-Jan. 18 1982	Jan. 12, 1981-Jan. 18, 1982
1-1	9	0	1	8	18
2	-3	1	0	-3	-5
3	5	0	1	-9	-3
4	-5	4	5	2	6
5	2	-1	1	-5	-3
6	-2	0	1	-5	-6
2-1	-3	0	13	-13	-3
2	22	-20	3	5	10
3	-3	1	-1	-1	-4
4	11	-1	3	-4	9
5	11	0	0	-3	8
6	8	3	0	-4	7
3-1	0	0	0	-4	-4
2	-2	0	1	7	6
3	13	-4	0	-5	4
4	1	-1	1	-3	-2
5	-6	11	-2	-2	1
6	9	0	1	-3	7
4-1	-1	-1	-1	17	14
2	6	1	23	-4	26
3	2	5	9	-11	5
4	8	2	11	-2	19
5	-2	3	24	-14	11
6	9	-1	0	-9	-1
5-1	9	11	-7	13	26
2	5	6	17	-16	14
3	3	2	1	-4	2
4	-1	0	6	-2	3
5	23	-5	3	-4	17
6	19	-4	1	-6	10
6-1	6	2	-2	4	10
2	-12	0	1	11	0
3	3	1	18	-19	3
4	-3	0	13	-15	-5
5	-9	1	6	-9	-11
6	-1	1	0	-3	-3
Mean	4	0	4	-3	5

Y100

Stake No. \ Period	Feb. 20–Apr. 14 1981	Apr. 14–Sep. 30 1981	Feb. 20, 1981–Sep. 30, 1981
1-1	10	7	17
2	0	2	2
3	6	-1	5
4	3	25	28
5	3	21	24
6	0	29	29
2-1	9	13	22
2	1	36	37
3	1	58	59
4	10	26	36
5	7	26	33
6	24	29	53
3-1	0	5	5
2	3	27	30
3	1	59	60
4	-2	57	55
5	-2	56	54
6	3	38	41
4-1	4	24	28
2	-1	23	22
3	0	29	29
4	-1	35	34
5	0	19	19
6	12	26	38
5-1	-2	16	14
2	0	21	21
3	0	26	26
4	3	15	18
5	13	39	52
6	5	19	24
6-1	5	9	14
2	0	1	1
3	3	11	14
4	0	8	8
5	-1	11	10
6	-1	13	12
Mean	3	24	27

Y200

Period / Stake No.	Feb. 17-Oct. 5 1981
1-1	2
2	-1
3	4
4	28
5	34
6	11
2-1	44
2	-1
3	0
4	16
5	9
6	8
3-1	14
2	8
3	1
4	12
5	0
6	21
4-1	8
2	7
3	5
4	18
5	28
6	14
5-1	17
2	-1
3	10
4	7
5	9
6	26
6-1	15
2	28
3	18
4	18
5	2
6	16
Mean	13

V142

Period / Stake No.	Feb. 1-Oct. 16 1981	Oct. 16-Nov. 2 1981	Feb. 1, 1981-Nov. 2, 1981
1-1	18	-2	16
2	2	0	2
3	16	1	17
4	28	2	30
5	21	0	21
6	27	1	28
2-1	16	-1	15
2	3	2	5
3	12	1	13
4	11	1	12
5	5	0	5
6	16	4	20
3-1	14	1	15
2	13	0	13
3	34	2	36
4	3	1	4
5	6	0	6
6	4	3	7
4-1	20	6	26
2	8	2	10
3	34	-1	33
4	30	-3	27
5	17	1	18
6	16	-1	15
5-1	10	2	12
2	6	0	6
3	20	0	20
4	10	2	12
5	0	1	1
6	19	1	20
6-1	16	6	22
2	16	10	26
3	13	-1	12
4	5	0	5
5	11	1	12
6	8	1	9
Mean	14	1	15

W'100

Stake No. \ Period	Mar. 23-Nov. 19 1981
1-1	14
2	14
3	31
4	19
5	24
6	22
2-1	60
2	38
3	43
4	15
5	19
6	22
3-1	18
2	39
3	24
4	27
5	21
6	17
4-1	33
2	27
3	39
4	44
5	26
6	23
5-1	51
2	40
3	29
4	39
5	72
6	106
6-1	17
2	40
3	62
4	48
5	31
6	47
Mean	34

Table 8. Surface meteorological data along routes S, H, Z, Y, V, W', and Yamato route.

Notations for the table

Lt : Local standard time (at 45°E, GMT + 3h)

St. No. : Station number

V : Wind speed

D : Wind direction

T : Air temperature

N : Amount of cloud

C_L : Genus of low cloud

C_M : Genus of middle cloud

C_H : Genus of high cloud

Nc : Amount and genus of an individual cloud

Vi : Visibility

W : Present weather

- ○ Clear
- ◐ Fine
- ◍ Cloudy (upper clouds are predominant)
- ◎ Cloudy
- ⸸ Drifting snow
- ↑ Blowing snow
- ≡ Fog
- ✕ Snow
- ✱↑ Snowstorm

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
1981									
Jan. 20	12	Y 12	8.0	E	-16.0	2	0	-	○ ⊹
20	15	Y 32	7.5	E	-16.0	-	0	-	○
20	18	Y 97	5.0	ESE	-19.5	-	0	-	○
21	09	Y100	3.0	-	-25.0	-	0	-	○
21	12	Y100	4.0	ESE	-20.3	-	0	-	○
21	15	Y100	3.8	SE	-19.8	20	0	-	○
21	18	Y113	1.0	-	-20.3	-	0+	Ci	○
22	09	Y140	1.5	-	-	-	1	Ci	○
22	12	Y140	4.5	E	-22.2	20	1	Ci	○
22	15	Y164	4.5	ESE	-20.0	20	1	Ac	○
22	18	Y182	5.0	E	-24.5	20	1	Ac	⊖ ⊹
23	12	Y200	3.0	E	-25.0	20	7	Ac	⊖ ⊹
23	15	Y200	2.5	ESE	-25.8	20	2	Ac	○
23	18	Y200	1.0	-	-26.2	20	4	Ac	⊖
24	09	Y200	3.0	ESE	-30.0	20	2	Ci	○
24	12	V 3	4.5	ESE	-26.9	4	1	Ci	○
24	15	V 26	7.0	SE	-24.5	6	1	Ci	○
24	18	V 44	6.5	SE	-28.2	10	4	Ci	⊖ ⊹
24	21	V 58	4.5	ESE	-32.4	-	7	Ac	⊖
25	12	V 64	3.0	SE	-28.8	20	0+	Ci	○
25	15	V 89	3.0	SE	-25.3	20	0	-	○
25	18	V106	1.5	SSE	-30.1	20	0	-	○
25	21	V120	1.0	-	-36.5	20	0	-	○
26	09	V120	3.5	SSE	-34.8	1	0	-	○
26	12	V122	3.5	SSE	-30.5	0.8	5	Ac	⊖ ⊹
26	15	V142	6.5	SSE	-28.5	1.5	1	Ac	⊖ ⊹
26	18	V155	4.0	SSE	-31.1	3	1	Ci	⊖ ⊹
26	21	V165	3.0	SE	-36.5	20	4	Ac	⊖

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Jan. 27	09	V165	1.0	ESE	-28.0	2	9	As	◎
27	12	V165	4.5	E	-22.5	0.5	10	As	◎ ☂
27	15	V142	4.0	SSE	-22.3	0.3	10	As	◎
27	18	V142	4.0	E	-26.5	0.3	5	Ac, St	◎
28	09	V142	3.0	E	-24.0	-	10	As	◎ ☂
28	12	V142	6.0	E	-22.2	-	10	As	◎ ☂
28	15	V142	7.0	-	-21.6	-	10	As	◎ ☂
28	18	V142	8.0	-	-23.8	-	-	-	☂
29	09	V142	4.0	S	-27.5	20	3	Ci	⊖
29	12	V142	4.5	S	-24.5	-	2	Ci	○
29	18	V142	5.0	SSW	-26.6	-	3	Ac	
30	09	V142	8.0	SW	-32.0	-	3	Cs	○ ☂
30	12	V142	-	-	-	-	4	Cs	⊖ ☂
30	15	V142	-	-	-	-	10	Cs	◎
30	21	V142	-	-	-23.8	-	10	As	◎
31	09	V142	5.0	-	-30.7	-	2	Cs	○
31	12	V142	5.0	S	-27.5	-	0	-	○ ☂
31	15	V142	4.8	SSE	-26.5	-	0	-	○
31	18	V142	-	-	-27.7	-	-	-	
31	21	V142	-	-	-29.1	-	-	-	
Feb. 1	09	V142	6.8	S	-28.8	-	1	Ac	○ ☂
1	12	V142	6.2	S	-26.1	-	9	Cs	◎
1	18	V142	-	-	-36.8	-	-	-	
1	21	V142	-	-	-32.2	-	-	-	
2	09	V142	5.5	SSW	-29.7	-	-	-	
2	12	V142	6.2	S	-26.0	1	9	Cs	◎
2	15	V142	4.9	S	-25.1	1	8	Ci	◎ ☂
2	18	V142	5.0	S	-26.1	2	10	Cs	◎

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Feb. 3	09	V142	6.3	SW	-31.8	0.5	2	Ac	⊖
3	12	V142	-	-	-	-	0	-	○
3	15	V142	-	-	-26.8	-	-	-	
3	18	V142	5.0	SW	-28.7	-	0	-	○
3	21	V142	4.0	WSW	-35.9	-	0	-	○
4	09	V142	6.0	SSE	-32.9	-	0	-	○
4	21	V142	-	-	-	-	-	-	⸸
5	09	V142	8.0	-	-34.3	-	0	-	○
5	12	V142	8.0	WSW	-30.9	-	0	-	○
5	15	V142	6.0	SW	-29.9	-	0	-	○
5	18	V142	3.0	WSW	-29.5	-	0	-	○
5	21	V142	3.5	W	-36.5	-	0	-	○
6	09	V142	2.8	WNW	-27.9	-	0	-	○
6	12	V142	4.5	WSW	-25.2	-	1	Ac	○
6	15	V142	5.1	SW	-25.3	-	1	As	○
6	18	V142	6.0	SSW	-29.3	-	1	As, Ci	○
6	21	V142	6.8	SSW	-35.6	-	2	Ci	○
7	09	V142	-	-	-	-	-	-	⸸
7	12	V142	-	-	-	-	-	-	⸸
7	15	V142	11.4	S	-28.8	0.1	-	-	⸸
7	18	V142	-	-	-	0.2	-	-	
8	09	V142	-	-	-	0.4	-	-	⸸
8	15	V142	6.8	SSW	-27.9	-	7	Ci	⸸
9	09	V142	4.0	SW	-31.7	-	0	-	○
9	15	V142	6.7	SW	-27.9	-	2	Ci	
9	18	V142	5.9	SW	-30.1	-	0	-	
10	12	V142	8.1	SW	-31.8	0.2	-	-	⸸
10	15	V142	2.0	-	-28.5	-	10	As	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Feb. 10	18	V142	–	–	–	–	0	–	○
11	09	V142	–	–	–	0.2	10	Cs	
11	12	V142	–	–	-28.8	0.3	7	Cs	
11	15	V142	4.0	SSW	-26.2	2	10	As	
12	12	V142	1.0	–	-30.2	–	2	Ci	
12	15	V142	0.5	–	-28.8	–	0+	Ci	
12	18	V142	0.5	SSE	-32.6	–	0+	Ci	
13	09	V142	6.5	SE	-30.7	0.3	10	As	⊹
13	12	V142	4.5	SE	-27.3	0.2	10	As	⊹
13	15	V172	4.5	SSE	-27.3	0.5	6	Cs	
13	18	V200	2.5	SW	-29.2	0.7	10	As	
14	09	V200	0.7	NW	-32.6	–	7	Ci	
14	12	V200	0.7	NNW	-30.2	20	4	Ci	
14	15	V242	0.7	WSW	-30.1	20	0+	As	
14	18	V260	1.5	W	-33.4	20	0+	Ci	
15	09	V158	2.5	ESE	-33.0	–	0	–	
15	12	V150	3.5	SSE	-32.0	–	0	–	⊹
15	15	V130	3.5	SSE	-30.8	–	0+	Ci	
15	18	V110	–	–	-33.4	–	–	–	
16	09	V100	3.5	S	-33.6	–	0	–	
16	12	V 80	2.5	S	-32.3	–	3	Ci	
16	15	V 45	2.5	E	-29.5	–	1	Ci	
16	18	V 25	2.5	S	-31.5	–	0+	Ci	
17	09	Y200	–	–	-32.0	–	–	–	
17	15	Y180	3.5	ESE	-29.3	–	0+	Ac	
17	18	Y155	3.5	S	-30.9	–	0	–	
18	09	Y125	–	–	-32.0	20	0	–	
18	12	Y110	0.5	E	-31.1	–	0	–	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Feb.19	09	Y100	-	-	-35.5	0.05	-	-	✢
19	15	Y100	-	-	-35.0	-	-	-	
20	09	Y100	5.5	-	-31.5	-	0	-	✢
20	12	Y100	7.5	-	-28.0	-	0+	Ac	✢
20	15	Y 64	-	-	-24.6	-	1	As, Ci	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
1981									
Mar. 6	21	W' 35	11.0	SE	-29.0	1	6	6Ci	⊖ ⸸
7	09	W' 35	10.0	E	-27.5	1	7	7Ci	⊖ ⸸
7	12	W' 42	13.0	E	-26.3	0.5	2	2Ci	○ ⸸
7	15	W' 60	10.0	E	-25.7	1	1	1Ci	○ ⸸
7	18	W' 74	12.0	E	-28.5	1	1	1Ci	○ ⸸
7	21	W' 93	10.0	E	-29.8	-	-	-	
8	09	W' 93	14.0	E	-30.1	1	4	4Ci	⊖ ⸸
8	12	W' 97	9.0	E	-28.5	2	2	2Ci	⊖ ⸸
8	15	W'121	8.0	ESE	-28.0	3	2	2Ci	○ ⸸
8	18	W'136	7.0	ESE	-31.5	4	0+	0+Ci	○ ⸸
8	21	W'150	9.0	ESE	-33.0	4	0	-	○ ⸸
9	09	W'150	11.0	ESE	-34.0	0.5	0	-	○ ⸸
9	12	W'159	8.5	ESE	-29.0	2	0	-	○ ⸸
9	15	W'178	5.0	ESE	-26.0	20	0	-	○ ⸸
9	18	W'191	4.0	ESE	-23.2	10	10-	10-Ac	⊕
10	09	W'200	5.5	SE	-24.5	5	10-	10-Ac	⊕ *
10	15	W'200	4.0	ESE	-24.7	4	8	4Ac, 5Cc	⊜
10	18	W'200	2.8	ESE	-25.1	5	9	9Ac, 0+Ci	⊕ *
10	21	W'200	4.5	ESE	-25.2	-	-	-	*
11	09	W'200	4.0	SE	-26.7	2	10-	10-Ac	⊕ *
11	12	W'200	6.0	ESE	-22.4	2	10	10Ac	⊕ *
11	15	W'200	4.0	ESE	-	2	10	10Ac	⊕
11	18	W'200	4.0	SSE	-27.0	3	8	8Ac	⊕
11	21	W'200	3.0	SSE	-26.3	-	-	-	*
12	09	W'200	6.0	S	-33.0	10	0+	0+Ac	○
12	12	W'200	6.5	S	-29.7	20	1	1Ac	○
12	15	W'200	6.7	S	-29.5	20	1	1Ac	○
12	18	W'200	6.0	SSW	-33.3	20	0	-	○

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Mar. 12	21	W'200	7.0	S	-35.4	20	0	-	○
13	09	W'200	8.5	SE	-33.0	1	0	-	○ ☩
13	12	W'200	10.0	SE	-31.4	0.7	0	-	○ ☩
13	15	W'200	9.0	SE	-29.5	3	0	-	○ ☩
13	18	W'200	7.0	SE	-32.1	4	2	2Ci	○ ☩
13	21	W'200	7.0	SE	-34.0	-	1	1Ci	○
14	09	W'200	7.5	ESE	-27.0	2	10-	7As, 2Cs, 1Ci	⊕
14	12	W'200	7.0	ESE	-23.0	0.2	10	10As	⊕ ✳
14	15	W'200	7.0	ESE	-21.8	0.2	10	-	◎
14	18	W'200	6.0	SE	-22.5	0.2	10	-	◎
15	09	W'200	10.0	SE	-29.5	0.2	10	10As	⊕ ☩
15	12	W'200	8.5	SE	-27.8	0.2	10-	10-Ac	⊕ ☩
15	15	W'200	9.0	SE	-27.5	0.05	10	-	◎ ☩
15	18	W'200	8.5	SE	-28.0	0.2	10	-	◎ ☩
15	21	W'200	8.5	SE	-34.0	-	2	-	◎ ☩
16	09	W'200	8.5	SE	-33.0	2	3	3Ci	⊖ ☩
16	12	W'200	7.0	SE	-27.5	5	9	9As	⊕
16	15	W'200	7.0	ESE	-26.0	2	9	9As	⊕ ☩
16	18	W'200	8.0	SE	-27.5	0.2	10-	10-As	⊕ ☩
16	21	W'200	7.0	SE	-33.0	-	2	-	○
17	09	W'200	7.0	SE	-34.0	10	2	2Ci	○ ☩
17	12	W'200	5.5	SE	-30.2	20	7	7Ci	⊖
17	15	W'200	5.2	SE	-30.0	20	3	3Ci	⊖
17	18	W'200	4.7	SSE	-35.0	20	1	1Ci	○
18	09	W'200	5.0	SE	-32.0	10	10-	10-As	⊕
18	15	W'200	4.0	ESE	-26.4	3	10	10As	⊕
18	21	W'200	4.0	ESE	-25.0	-	10	-	⊕ ✳
19	09	W'200	8.0	SE	-27.2	2	3	3Ci	⊖ ☩

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Mar. 19	12	W'200	10.5	ESE	-24.0	0.05	10	10Ac	⊕ ⁎
19	15	W'200	8.0	ESE	-22.0	0.05	10	-	◎ ⁜
19	18	W'200	8.5	ESE	-23.0	0.03	10	-	◎ ⁜
19	21	W'200	8.0	ESE	-24.0	-	10	-	◎ ⁜
20	09	W'200	7.0	ESE	-22.0	2	10-	10-As	⊕
20	12	W'200	7.0	ESE	-24.0	-	10	10As	⊕ ⁜
20	15	W'200	3.5	ESE	-25.0	5	5	4As, 1Cc, 1Ci	⊖
20	18	W'200	5.0	ESE	-26.0	0.5	10-	10-As	⊕
20	24	W'200	4.0	SSE	-31.0	-	10	Ci	⊜ ⁎
21	09	W'200	5.5	SSE	-30.2	2	10	Cs	⊜ ⁎
21	15	W'220	4.5	ESE	-29.5	10	3	3Ci	⊖
21	18	W'240	4.7	SE	-33.1	5	2	0+Ci, 2Cs	○ ⁜
22	09	W'200	6.0	SSE	-37.6	3	8	8Ci	⊖ ⁜
22	12	W'196	3.5	SSW	-35.9	20	2	1As, 2Ci	○
22	15	W'198	6.0	SSW	-36.2	20	0	-	○ ⁜
22	18	W'170	1.5	S	-42.5	20	1	1As	○
22	21	W'145	5.5	ESE	-44.0	-	-	-	○
22	24	W'145	5.5	SE	-46.0	-	-	-	
23	07	W'145	-	-	-47.0	-	-	-	
23	09	W'145	4.0	SE	-43.2	4	10-	10-As	⊕
23	12	W'129	3.5	SE	-38.5	0.5	10	-	◎
23	15	W'100	0.5	E	-34.5	1.2	10	-	◎
23	18	W'100	2.5	ESE	-36.0	0.1	10	-	◎
23	21	W'100	0.5	-	-36.5	-	10	-	◎
23	24	W'100	3.0	ESE	-38.0	-	10	-	◎ ⁎
24	09	W'100	4.2	ESE	-41.6	-	2	1As, 1Ci	○
24	15	W'100	3.5	ESE	-40.2	20	0+	0+As	○
24	18	W'100	5.0	ENE	-44.0	-	1	1Ci	○

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Mar. 24	21	W' 100	5.0	E	-45.2	-	0	-	○
24	24	W' 100	6.5	E	-44.6	-	9	9Ac	⊕
25	03	W' 100	-	-	-43.3	-	-	-	
25	09	W' 100	9.0	ENE	-36.5	0.3	10-	10-Ci	◍ ☩
25	12	W' 90	11.0	E	-34.2	0.05	10-	10As, 1Ci	⊕ ☩
25	15	W' 70	9.0	ENE	-33.0	0.05	10	10Ci	◍ ☩
25	18	W' 42	10.0	ENE	-32.6	0.02	10	-	◎ ☩
25	24	W' 42	11.5	E	-32.0	-	-	-	☩
26	09	W' 42	11.0	ENE	-27.5	0.03	10	-	◎ ☩
26	12	W' 25	10.5	ENE	-25.5	0.2	10	9As, 2Ci	⊕ ☩

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
1981									
Apr. 12	12	Y 14	3.5	S	-28.5	0.5	10	As	
12	15	Y 58	1.5	SE	-35.1	-	8	As	✳
12	21	Y 84	1.5	-	-51.5	-	-	-	⊕
13	09	Y 84	10.0	-	-50.0	-	-	-	⊕ ⛆
13	12	Y 84	-	-	-48.1	0.3	-	-	⛆
13	15	Y100	-	-	-50.0	-	-	-	⛆
13	18	Y100	-	-	-49.0	-	-	-	⛆
13	21	Y100	-	-	-51.0	-	-	-	
14	09	Y100	-	-	-52.0	-	-	-	
14	12	Y100	-	-	-51.0	-	-	-	
15	09	Y100	10.0	-	-55.5	-	-	-	○ ⛆
15	15	Y 75	-	-	-47.5	-	-	-	
15	18	Y 50	-	-	-47.0	-	-	-	⛆
15	21	Y 50	-	-	-42.0	-	-	-	
16	09	Y 50	5.5	-	-	0.5	10	As	

Date	Lt	St. No.	V (m/s)	D	T	Vi (km)	N	CLCMCH	Nc	W
1981										
May 7	09	S 16	5.0	ESE	-23.2	50	4	0 1 2	2As, 2Ci, 2Cc	⊖
7	21	S 16	4.5	ESE	-25.0	50	1	0 0 1	1Ci	○
8	09	S 16	0.0	-	-22.5	40	10	0 7 X	10Ac	◎
8	21	S 16	1.0	W	-19.2	-	10	0 2 X	10Ns	✳
9	09	S 16	2.0	SE	-26.5	30	1	0 3 1	1Ac, 0+Ci	○
9	21	S 16	3.5	E	-27.5	-	3	0 1 2	2As, 2Ci	⊖
10	09	S 16	1.0	NE	-18.7	10	10	0 2 X	10As	◎
10	12	S 29	0.5	NE	-18.2	10	10	0 2 X	10As	✳
10	15	H 54	0.0	-	-19.8	0.5	10	0 2 X	10As	◎
10	18	H110	0.0	-	-20.2	0.5	10	5 X X	10Sc	✳
10	24	H150	0.0	-	-20.2	-	10	5 X X	10Sc	✳
11	06	H150	2.0	E	-24.2	-	10	7 X X	10St	✳
11	09	H150	4.0	NE	-22.2	1.0	10	7 X X	10St	✳
11	12	H180	1.0	ENE	-23.0	30	10	7 X X	10St	✳
11	15	H225	4.5	ENE	-25.2	20	10	0 2 X	10As	◎
11	18	H270	6.0	E	-33.0	0.5	10	0 2 X	10As	✳
11	21	H272	8.5	E	-37.0	0.3	4	0 2 X	4As	✢
11	24	H272	8.0	E	-36.2	0.3	5	0 2 X	5As	✢
12	06	H272	10.0	E	-41.0	0.3	0	0 0 0	-	✢
12	09	H272	-	-	-43.6	-	-	- - -	-	✢
12	12	H272	10.0	E	-41.5	0.1	0	0 0 0	-	✢
12	15	H272	11.0	E	-39.5	0.1	0+	0 0 1	0+Ci	✢
12	18	H272	14.5	E	-41.0	0.1	0+	0 0 1	0+Ci	✢
12	21	H272	15.5	E	-38.5	0.1	0	0 0 0	-	✢
12	24	H272	15.5	E	-35.5	0.05	-	- - -	-	✢
13	06	H272	17.0	E	-28.5	0.05	-	- - -	-	✢
13	09	H272	18.0	E	-29.0	0.05	10	7 X X	10St	✳
13	12	H272	18.5	E	-30.5	0.05	5	0 2 X	5As	✢

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	CLCMCH	Nc	W
May 13	15	H272	18.0	E	-31.0	0.01	10	0 2 X	10As	✢
13	18	H272	17.5	E	-31.0	0.05	3	0 2 X	3As	✢
13	21	H272	20.0	E	-30.5	0.05	-	- - -	-	✢
13	24	H272	17.5	E	-31.0	0.05	5	0 2 X	5As	✢
14	06	H272	17.0	E	-21.0	0.05	3	0 2 X	3As	✢
14	09	H272	17.0	E	-19.5	0.05	3	0 0 5	3Cs	✢
14	12	H272	13.0	E	-19.0	0.1	3	0 2 5	2As, 3Cs	✢
14	15	H278	11.0	NE	-32.0	0.1	-	- - -	-	✢
14	18	H292	10.0	E	-35.0	0.5	3	0 0 5	3Cs	✢
14	21	H298	10.0	E	-34.5	0.5	3	0 0 5	3Cs	✢
14	24	Z 15	9.0	E	-35.0	0.5	10	0 2 7	5As, 10Cs	✢
15	06	Z 30	10.0	E	-36.5	0.3	5	0 0 5	5Cs	✢
15	09	Z 30	11.0	E	-37.0	0.5	7	0 2 1	7As, 4Ci	✢
15	12	Z 54	11.0	E	-37.5	0.3	6	0 2 1	6As, 4Ci	✢
15	15	Z 56	10.0	E	-37.5	0.3	9	0 7 1	7As, 1Ac, 9Ci	✢
15	18	Z 85	12.0	E	-37.5	0.3	1	0 0 1	1Ci	✢
24	18	Z 88	15.0	ENE	-34.5	0.05	0	0 0 0	-	✢
24	21	Z 85	13.5	E	-35.0	0.02	0	0 0 0	-	✢
24	24	Z 75	13.0	ENE	-35.5	0.02	0	0 0 0	-	✢
25	06	Z 75	6.0	E	-37.5	0.03	0	0 0 0	-	✢
25	09	Z 75	7.0	E	-38.5	0.03	1	0 0 1	1Ci	✢
25	12	Z 67	11.0	E	-39.0	0.02	2	0 0 1	2Ci	✢
25	15	Z 40	12.5	E	-39.0	0.03	3	0 0 1	3Ci	✢
25	18	Z 20	7.5	ENE	-38.5	0.5	0	0 0 0	-	○
25	21	S122	10.5	E	-37.5	0.5	0	0 0 0	-	✢
25	24	S122	9.5	E	-37.5	0.5	0	0 0 0	-	✢
26	06	S122	10.0	E	-38.0	0.01	0	0 0 0	-	✢
26	09	S122	10.0	E	-38.0	0.05	0	0 0 0	-	✢

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	CLCMCH	Nc	W
May 26	12	H297	10.0	E	-38.5	0.05	0	0 0 0	-	⫩
26	15	H272	11.0	E	-37.5	0.03	0	0 0 0	-	⫩
26	18	H253	10.0	E	-37.0	0.2	0	0 0 0	-	⫩
26	21	H220	7.5	E	-36.5	0.5	0	0 0 0	-	⫩
26	24	H194	7.0	E	-35.5	0.5	0	0 0 0	-	⫩
27	09	H180	8.5	E	-34.5	5	0	0 0 0	-	○
27	12	H180	7.5	E	-34.5	50	0+	0 0 1	0+Ci	○
27	15	H160	8.5	ENE	-34.5	30	0	0 0 0	-	○
27	18	H138	9.5	ENE	-34.0	30	0	0 0 0	-	○
27	21	H105	9.0	ENE	-33.8	1	0	0 0 0	-	⫩
27	24	H 68	8.5	ENE	-30.0	1	1	0 3 0	1Ac	⫩
28	03	H 7	7.5	E	-24.5	10	3	0 3 0	3Ac	⊖
28	06	S 16	10.0	E	-22.0	10	3	0 3 0	3Ac	⊖
28	10	S 16	9.0	E	-18.4	10	10	0 7 X	10As, 0+Ac	◎

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	CLCMCH	Nc	W
1981										
Aug. 20	15	S 26	5.5	SE	-26.2	10	0	0 0 0	-	○
20	18	H 50	5.0	ENE	-29.9	30	0	0 0 0	-	○
20	21	H 50	5.0	ENE	-31.0	30	0	0 0 0	-	○
21	06	H 50	3.0	ENE	-31.0	30	1	0 0 1	1Ci	○
21	09	H 50	4.0	ESE	-27.5	20	10-	0 3 7	0+Ac, 9Cs	⊖
21	12	H100	8.0	ESE	-32.0	30	10-	0 0 6	8Cs, 1Ci	⊖
21	15	H148	7.0	E	-33.1	30	10-	0 0 7	10-Cs	⊖
21	18	H180	6.0	E	-34.2	30	6	0 0 6	4Cs, 2Ci	⊖
21	21	H180	7.0	E	-33.2	30	0	0 0 0	-	○
21	24	H180	7.0	E	-28.5	5	10	0 2 X	10As	✳
22	09	H180	11.0	E	-26.0	0.5	10	0 2 X	10As	✢
22	12	H228	13.0	ENE	-25.0	0.2	10	0 1 X	10As	✢
22	15	H271	11.0	E	-26.8	0.1	10	X X X	-	✢
22	18	H302	13.0	E	-27.9	0.08	10	X X X	-	✢
22	21	S122	14.0	E	-28.0	0.08	10	X X X	-	✢
23	09	S122	10.0	E	-27.9	0.08	10	X X X	-	✢
23	12	S122	11.0	E	-28.2	0.2	10-	0 4 2	1Ac, 10-Ci	✢
23	15	Z 24	9.0	ESE	-31.0	10	10	0 1 7	2As, 10Cs	⊖
23	18	Z 40	10.0	ESE	-34.1	3	7	0 0 1	7Ci	⊖
23	21	Z 40	10.0	ESE	-35.0	3	3	0 0 1	3Ci	⊖
24	09	Z 40	4.0	E	-30.9	20	10	0 1 7	2As, 10Cs	⊖
24	12	Z 80	9.0	ESE	-30.1	1	10	0 1 X	10As	✢
Sep. 4	15	Z 90	12.0	E	-34.0	0.15	10	- - -	10As	✢
4	18	Z 81	13.5	ENE	-29.0	0.05	10	- - -	-	✢
4	21	Z 59	18.0	ENE	-28.5	0.02	10	- - -	10As	✳✢
5	09	Z 59	11.0	ENE	-25.0	0.02	10	- - -	-	✳✢
5	12	Z 59	15.0	ENE	-24.0	0.02	10	- - -	10As	✳✢
5	15	Z 59	14.8	E	-25.2	0.05	10	- - -	As, Ac	✳✢

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	CL CM CH	Nc	W
Sep. 5	18	Z 59	12.0	E	-30.0	0.06	4	- - -	2As, 2Ac	⊹
5	21	Z 50	11.0	E	-31.5	-	4	- - -	-	⊹
5	24	Z 34	10.0	E	-30.5	-	6	- - -	6As	⊹
6	03	H302	9.5	E	-30.8	-	10-	- - -	-	⊹
6	06	H288	10.0	E	-31.0	-	2	- - -	2As	⊹
6	09	H230	7.0	E	-31.2	5	1	- - -	0+As, 0+St, 0+Cs	⊹
6	15	H137	5.0	E	-30.0	30	6	- - -	2Ci, 2Cs, 1St	◐
6	18	H130	6.5	E	-32.5	20	9	- - -	9Ac	◎
6	21	H130	6.0	E	-32.0	-	9	- - -	-	◍
7	06	H130	3.0	E	-39.7	50	0+	- - -	0+St	○
7	09	H130	6.5	E	-37.2	50	0+	- - -	0+St	○
7	12	H 24	5.0	ESE	-27.0	20	10-	- - -	2Sc, 8Ac	◎
7	15	S23-1	4.5	E	-27.1	20	10	- - -	10-Ac, St	◎
7	18	S 16	-	-	-22.0	20	10	- - -	10Sc	◎
8	09	S 16	-	-	-28.2	50	0+	- - -	-	○

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
1981									
Sep. 27	18	Y 16	5.0	E	-44.0	20	0+	Ac	
27	21	Y 21	3.0	E	-48.6	20	0	-	
28	09	Y 21	3.0	E	-45.3	0.5	0+	Ac	
28	12	Y 21	5.0	E	-41.0	0.5	3	Ci	
28	15	Y 21	5.0	ESE	-38.4	1	9	Ac	
28	18	Y 36	8.0	E	-42.1	0.8	5	Ci, Cs	
28	21	Y 42	9.5	E	-44.2	1	1	Ac	
29	09	Y 42	9.0	E	-38.7	0.3	0	-	+
29	12	Y 52	6.0	E	-35.6	0.7	6	Ci, Cs	
29	15	Y 77	5.0	E	-34.6	-	10	Ci	
29	18	Y100	5.0	ENE	-38.8	-	8	Ci, Cs	
29	21	Y100	5.0	ENE	-41.0	-	3	Cs, Ci	
30	09	Y100	7.0	E	-37.0	0.5	3	Cs	
30	12	Y100	5.5	E	-33.3	0.5	10	Cs	
30	15	Y100	5.0	E	-32.9	0.7	10	Cs	
30	18	Y100	4.5	E	-33.2	0.7	10	As	
30	21	Y100	-	-	-33.0	X	6	X	
Oct. 1	09	Y100	7.8	ESE	-35.1	0.7	10	Cs, Ci	
1	12	Y100	7.8	NE	-33.0	2	1	Ci, Ac	+
1	15	Y100	7.2	ESE	-34.6	10	0	-	
1	18	Y100	7.2	ESE	-38.7	10	0	-	
1	21	Y100	8.7	-	-	-	-	-	
2	09	Y100	7.5	-	-44.8	0.7	3	Ci	
2	12	Y100	6.6	E	-38.9	2	9	Cs, Ci	
2	15	Y100	5.4	E	-36.8	10	3	Cs	
2	18	Y100	6.3	ESE	-38.5	10	7	As	
2	21	Y100	5.8	ESE	-38.6	X	5	Cs	
3	09	Y100	9.0	ESE	-37.5	0.5	9	Cs	+

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Oct. 3	12	Y100	10.2	E	-33.5	0.5	10	Cs	+
3	15	Y100	8.4	ESE	-32.7	2	10	Cs	+
3	18	Y100	9.6	ESE	-34.2	0.5	6	Cs	+
3	21	Y100	9.6	E	-36.0	-	6	Cs	
4	09	Y100	7.5	-	-35.3	0.5	10	Cs	
4	12	Y100	6.3	E	-33.1	0.7	10	Cs	+
4	15	Y114	4.5	E	-33.3	2	10	Cs	
4	18	Y140	5.5	E	-38.8	5	9	Cs	
4	21	Y150	6.0	-	-44.0	-	7	Cs	
5	09	Y150	2.5	-	-41.3	20	2	Ci	
5	12	Y159	2.5	SE	-39.5	-	3	Cs	
5	15	Y182	3.8	SE	-40.0	-	2	Cs	
5	18	Y200	1.0	-	-47.2	20	3	Ci	
5	21	Y200	1.8	SSE	-52.9	20	1	Ci	
6	09	Y200	4.8	ESE	-46.9	20	1	Ci	
6	12	Y200	6.0	ESE	-42.5	20	0	-	
6	15	Y200	6.0	SE	-44.9	-	0+	Cs	
6	18	Y200	6.0	ESE	-48.4	-	1	Cs	
6	21	Y200	6.0	ESE	-49.1	-	0+	Ci	
7	09	Y200	10.8	E	-42.8	0.3	1	Ci	+
7	12	Y200	9.6	SE	-36.5	0.3	2	Cs	+
7	15	Y200	9.6	-	-38.3	1	2	Cs	+
7	18	Y200	7.2	E	-42.0	1	2	Cs	
7	21	Y200	9.6	ESE	-44.1	-	2	Ci	
8	09	Y200	9.6	ENE	-42.9	0.7	2	Cs	
8	12	Y200	10.2	ENE	-39.4	0.7	8	Cs	
8	15	Y200	10.2	ENE	-40.6	0.7	10	Cs	
8	18	Y200	9.0	ENE	-44.1	0.7	10	Cs	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Oct. 8	21	Y200	10.8	-	-	-	10	Cs	
9	09	Y200	9.6	ENE	-46.1	0.3	7	Cs	
9	12	Y200	6.0	ESE	-42.7	0.3	7	Cs	
9	15	V 10	12.0	SE	-42.1	0.2	5	Cs	
9	18	V 30	9.5	ESE	-44.5	0.2	8	Cs, Ci	
9	21	V 40	10.0	-	-50.5	0.3	6	Cs, Ci	
10	09	V 40	10.5	SE	-51.9	0.2	0	-	
10	12	V 50	7.2	SE	-46.4	0.2	0	-	
10	15	V 68	10.0	SSW	-46.9	0.1	0	-	
10	18	V 90	5.0	SSW	-50.0	0.3	0	-	
10	21	V100	6.5	-	-53.7	0.3	0	-	
11	09	V100	10.0	-	-52.1	0.3	0	-	
11	12	V110	9.0	S	-48.9	0.2	0	-	
11	15	V130	5.5	SSE	-48.6	0.3	0	-	
11	18	V142	4.0	-	-51.9	10	2	Ci	
12	09	V142	2.5	-	-51.2	0.5	2	Ci	
12	12	V142	-	-	-50.4	-	-	-	
12	15	V142	8.0	SE	-47.0	-	-	-	
12	18	V142	-	-	-	-	1	Ci	
12	21	V142	2.3	SE	-57.0	-	1	Ci	
13	09	V142	2.7	-	-53.9	20	0	-	
13	15	V142	3.6	-	-47.3	-	2	Cs, Ci	
13	21	V142	5.0	-	-	-	-	-	
14	09	V142	7.0	SSE	-51.0	0.3	9	Cs	
14	12	V142	8.0	SE	-48.9	0.2	3	Cs	
14	15	V142	7.0	SE	-48.9	0.2	8	Cs	
14	18	V142	7.5	SE	-52.2	0.5	5	Ci, Cs	
14	21	V142	7.2	SSE	-	-	-	-	

Date	Lt	St. No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Oct. 15	09	V142	7.3	SE	-49.2	-	-	-	
15	12	V142	5.4	S	-	-	-	-	
15	15	V142	4.5	SSE	-43.3	-	4	Cs, Ci	
15	18	V142	3.2	S	-54.0	-	3	Ci	
15	21	V142	4.8	S	-58.6	-	1	Cs	
16	09	V142	4.9	SE	-52.9	-	2	Ci	
16	12	V142	5.2	SE	-49.5	1	7	Ci	
16	15	V142	4.2	SE	-48.3	-	2	Ci	
16	18	V142	4.0	SE	-52.0	-	-	-	
16	21	V142	4.0	SE	-58.3	-	-	-	
17	09	V142	4.5	SE	-52.0	-	-	-	
17	12	V142	4.9	ESE	-49.6	-	7	Ci	
17	15	V142	4.2	E	-48.0	-	10	Cs	
17	18	V142	3.9	ESE	-53.2	-	1	Ci	
17	21	V142	4.5	ESE	-59.7	-	1	Ci	
18	09	V142	4.0	SE	-	-	-	-	
18	12	V142	5.0	ESE	-48.0	-	2	Ci	
18	15	V142	5.1	SE	-47.9	-	1	Cs	
18	18	V142	4.8	SE	-52.4	-	1	Cs	
18	21	V142	5.1	SE	-52.1	-	2	Ci	
19	09	V142	7.8	SE	-48.1	-	3	Cs, Ci	++
19	12	V142	8.0	SE	-45.1	0.05	2	Cs	++
19	15	V142	6.5	SE	-44.2	0.1	6	Ci, Cs	
19	18	V142	4.2	SE	-46.4	-	2	Cs	
19	21	V142	2.6	SE	-51.1	-	-	-	
20	09	V142	-	-	-	10	1	Ci	
20	12	V142	3.0	SSE	-42.3	10	1	Cs	
20	15	V142	3.1	SSE	-	-	1	Cs	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Oct.20	21	V142	3.0	SW	-	-	-	-	
21	09	V142	1.9	SW	-49.1	10	2	Ci	
21	12	V142	2.2	W	-45.4	10	2	Ci	
21	15	V142	2.0	W	-43.1	10	4	Cs,Ci	
21	18	V142	3.0	WNW	-48.0	-	0	-	
21	21	V142	3.0	NW	-52.1	-	-	-	
22	09	V142	3.0	N	-	-	10	Cs	
22	12	V142	5.0	N	-36.5	0.8	10	Cs,As	
22	15	V142	3.6	N	-37.6	10	8	Ci	
22	18	V142	3.4	NW	-41.6	10	1	Cs	
22	21	V142	3.0	NW	-55.6	-	1	Ci	
23	09	V142	3.0	NNW	-	-	0	-	
23	12	V142	4.1	WNW	-45.9	5	0	-	
23	15	V142	3.0	NNE	-44.9	10	0	-	
23	18	V142	3.0	W	-50.6	-	0	-	
23	21	V142	2.4	SW	-58.6	-	-	-	
24	09	V142	5.0	SSE	-	-	-	-	
24	12	V142	4.7	SE	-47.7	-	9	Cs	
24	15	V142	6.5	SE	-46.6	0.3	10	As	*
24	18	V142	5.9	ESE	-47.7	-	-	-	
24	21	V142	6.6	SSE	-	-	-	-	
25	09	V142	5.8	S	-	-	-	-	
25	12	V142	6.8	SE	-	0.3	1	Ci	
25	15	V142	6.8	S	-	-	-	-	
25	18	V142	4.8	SE	-47.8	2	0	-	
25	21	V142	7.0	SSE	-53.1	-	0	-	
26	09	V142	9.0	S	-	-	-	-	
26	12	V142	8.0	SE	-47.5	0.05	10	As	+

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Oct. 26	15	V142	7.4	ESE	-46.4	0.3	10	Cs	☩
26	18	V142	4.9	E	-49.1	0.1	10	Cs	
26	21	V142	5.0	S	-	-	-	-	
27	09	V142	7.0	ESE	-48.0	0.2	3	Cs	☩
27	12	V142	7.9	SE	-45.0	0.2	4	Cs	
27	15	V142	5.5	SE	-45.4	0.3	4	Cs	
27	18	V142	4.6	E	-46.2	-	-	-	
27	21	V142	4.3	SSE	-	-	-	-	
28	09	V142	3.5	SE	-	-	-	-	
28	12	V142	3.0	NE	-39.8	-	10	Cs	*
29	12	V142	0	-	-27.0	5	10	Cs	*
29	15	V1410	1.0	WSW	-31.0	5	9	Ci, Cs	
29	18	V1428	1.0	WSW	-38.9	-	0	-	
29	21	V1450	0	-	-44.5	20	0	-	
30	09	V1450	2.5	SSE	-39.8	-	1	Ci	
30	12	V1464	1.5	SSE	-37.5	20	1	Ci	
30	15	V1484	1.5	SSE	-38.5	-	9	Ci, Cs	
30	18	V1500	1.5	SSE	-42.6	20	1	CI	
30	21	V1463	2.0	-	-47.1	20	3	Ci	
31	09	V1463	3.5	SSE	-40.0	2	10	Cs	
31	12	V1450	6.3	SE	-38.5	4	8	Ci, Cs	
31	15	V1420	3.0	-	-38.9	20	3	Ci	
31	18	V142	1.5	ESE	-44.4	20	4	Ci, Cs	
31	21	V142	2.5	ESE	-52.0	10	2	Ci	
Nov. 1	09	V142	-	-	-39.5	-	10	Cs	
1	12	V142	6.5	ESE	-39.0	2	10	Cs	
1	15	V142	4.5	ESE	-34.2	-	4	Ci	
1	18	V142	3.0	ESE	-44.0	-	-	-	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Nov. 1	21	V142	2.5	ESE	-50.0	10	4	Ci	
2	09	V142	-	-	-	-	7	Ci	
2	12	V142	4.5	ESE	-37.3	-	7	Ci, Cs	
2	15	U 9	5.0	SSE	-37.5	-	3	Ci, Cs	
2	18	U 30	4.5	SSE	-40.9	-	4	Ci, Cs	
2	21	U 51	5.5	-	-44.4	-	3	Cs, Ci	
3	09	U 51	9.2	SE	-34.8	-	10	Ci	
3	12	U 53	4.0	SE	-38.2	2	4	Ci	✢
3	15	U 72	8.5	SE	-34.9	5	9	Ci, Cs	
3	18	U 90	7.8	SE	-38.9	-	10	Ci, Cs	
3	21	U111	8.5	SE	-41.8	-	8	Ci	
4	09	U114	9.5	SE	-38.8	-	10	Ci	
4	12	U114	4.5	-	-34.8	-	10	Ci, Cs	
4	15	U138	9.2	E	-34.2	-	10	Ci, Cs	
4	18	U159	6.5	E	-36.1	-	10	Ci, Cs	
4	21	U180	6.2	ESE	-39.1	-	3	Cs	
5	12	U180	5.8	-	-31.2	-	10	Cs, Ci	
5	15	U180	6.0	ESE	-31.1	-	8	Cs	
5	18	U192	7.0	E	-32.1	-	7	Cs, Ci	
5	21	U213	7.0	-	-34.0	-	7	Ci, Cs, Ac	
6	12	U213	8.0	-	-30.0	-	5	Cs, Ci	
6	15	U232	8.3	ESE	-27.7	-	6	Cs, Ci, Ac	
7	12	U232	15.0	E	-27.1	0.2	3	Cs	✢
7	15	U232	13.0	E	-26.8	0.2	3	Cs	✢
7	18	U232	12.0	E	-29.8	0.2	10-	Cs	✢
7	21	U232	10.0	E	-33.8	1	10	Cc	✢
8	09	U232	10.0	ESE	-33.0	-	3	Ac, Cs	
8	12	U232	11.0	ESE	-28.0	-	3	Ci, Cs	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Nov. 8	15	U232	10.0	ESE	-27.2	-	3	Ci, Cs	
8	18	U232	7.0	ESE	-29.0	-	-	-	
8	21	U232	8.0	ESE	-34.8	-	3	Ci	
9	09	U232	-	-	-	-	10	Cs	
9	12	U232	-	-	-28.6	-	4	Cs	
9	15	UY27	-	-	-	-	2	Cs	
10	12	U232	10.0	ESE	-27.0	2	1	Cs	✢
10	15	U232	10.0	ESE	-26.3	-	1	Cs	
10	18	U232	10.0	ESE	-29.0	-	1	Ci	
11	12	U232	13.0	ESE	-30.3	0.1	-	-	✢
11	15	U232	15.0	ESE	-28.7	0.1	-	-	✢
11	18	U232	13.0	ESE	-31.0	0.3	0	-	✢
12	15	U232	12.5	SE	-25.2	0.5	0	-	✢
12	18	U232	9.0	SE	-27.3	10	0	-	
12	21	U232	-	-	-28.0	-	1	Ci	
13	12	U232	2.5	S	-22.1	20	1	Cs	
13	15	U246	1.5	E	-20.2	20	4	Ci	
13	18	U264	0	-	-24.2	20	8	Ci	
13	21	U282	0	-	-28.6	10	7	Ci	
14	12	U282	0	-	-23.0	15	2	Ci	
14	15	U309	3.0	-	-18.0	-	7	Cs, Ci	
14	18	U327	3.0	-	-23.7	20	5	Ci, Cs	
14	21	U345	-	-	-28.7	10	5	Ci	
15	09	U348	-	-	-	0.05	10	As	✢
15	12	U348	10.0	-	-17.8	0.05	10	As	✢
15	15	U348	12.5	-	-17.1	0.05	10	As	✢
15	21	U348	10.0	-	-23.0	0.1	10	As	
16	12	U348	1.0	-	-18.5	-	10	As	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Nov. 16	15	U348	-	-	-19.0	-	-	-	
16	18	U348	-	-	-21.0	-	2	Ci, As	
16	21	U348	-	-	-26.5	-	1	As	
17	18	U348	0	-	-22.0	-	1	Cs	*
17	21	U348	0	-	-23.0	-	10	As	*
18	15	U348	4.5	E	-19.0	-	10	As	*
18	18	U348	-	-	-20.3	1	10	Cs, As	*
18	21	U348	-	-	-20.2	1	10	As	*
19	12	U348	-	-	-16.5	-	-	-	✣
19	15	W 92	5.5	S	-15.2	0.1	10	As	*
19	18	W'80	4.5	E	-17.8	0.3	10	As	*
19	21	W'60	3.5	-	-20.6	-	10	As	*
20	09	W'60	8.0	-	-21.0	-	2	Ci	
20	12	W'50	10.0	-	-18.8	-	3	Cs, Ci	✣
20	15	W'27	12.5	-	-17.0	-	9	Cs, As, Ci	
20	18	W'10	12.5	-	-18.1	-	9	Ac, As, Ci	

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	CLCMCH	Nc	W
1981										
Nov. 22	21	S 18	8.0	ENE	-11.0	0.5	5	5 4 0	5Sc, 0+Ac	⊖
23	06	S 18	7.5	E	-12.1	2	10-	5 4 5	3Ac, 6Cs, 10-Ci	⊜
23	09	S 30	6.5	E	-10.4	1	10-	0 3 5	1Ac, 7Cs, 10-Ci	⊜
23	12	S 18	5.0	ENE	-	2	10-	5 3 5	0+Ac, 10-Ci	⊜
23	15	S 30	3.5	N	-10.2	5	7	8 4 1	4Cu, 2Sc, , 3Ci	⊛
23	18	H 70	2.0	E	-12.2	3	10-	8 X X	0+Cu, 10-Sc	⊛
23	21	H 74	0.5	E	-15.3	5	4	8 3 1	0+Cu, 2Sc, , 4Ci	⊖
23	24	H135	5.5	E	-27.5	20	0+	5 3 1	1Sc, 0+Ac, 0+Ci	○
24	06	H135	6.0	E	-24.0	50	0+	0 3 1	0+Ac, 0+Ci	○
24	09	H163	5.0	ENE	-19.0	50	0+	0 3 0	0+Ac	○
24	12	H163	3.5	ENE	-16.3	50	0+	5 3 0	0+Sc, 0+Ac	○
24	18	H186	0.5	ESE	-19.0	50	0+	0 0 1	0+Ci	○
24	21	H186	3.5	E	-24.5	50	3	0 0 1	3Ci	⊖
25	06	H212	7.0	E	-22.6	2	0+	0 0 1	0+Ci	○
25	09	H250	8.5	ENE	-20.0	3	0+	0 0 1	0+Ci	○
25	12	H282	9.5	E	-18.2	2	0+	0 0 1	0+Ci	○
25	15	H292	9.5	E	-17.4	2	0+	0 0 1	0+Ci	○
25	18	Z 12	5.0	ENE	-20.1	50	0+	0 0 1	0+Ci	○
25	21	Z 37	6.0	E	-25.0	30	0+	0 0 1	0+Ci	○
26	09	Z 70	9.0	E	-22.5	3	0+	0 0 1	0+Ci	○
Dec. 2	13	Z 30	0.5	NE	-12.3	1	10	5 X X	10Sc	⊛
2	18	S122	1.5	NE	-12.1	3	10	0 2 X	10As	◎
3	06	S122	9.0	NE	-13.4	0.5	10	- - -	-	⊛
3	10	H217	5.0	NE	-9.9	3	10-	- - -	As, Cs, Ci	
3	12	H188	3.0	NE	-9.5	4	10-	- - -	Sc, As, Ci	⊛
3	18	H 62	6.0	NE	-7.5	0.5	10-	- - -	Sc, Ac	✢
4	06	H 62	10.0	NE	-7.2	0.3	10-	- - -	-	✢
4	12	H 61	10.0	NE	-7.3	0.05	10	- - -	-	✢

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	CLCMCH	Nc	W
Dec. 4	18	H 61	8.5	NE	-9.0	0.15	10	- - -	-	⊕
5	06	H 61	7.5	NE	-8.2	0.3	10-	- - -	-	⊕
6	12	S 24	10.0	NE	-5.0	0.03	10	- - -	-	⊕
6	19	S 24	7.0	NE	-6.5	0.05	10	X X X	-	⊕

Date	Lt	St. No.	V (m/s)	D	T	Vi (km)	N	Nc	W
1981									
Dec. 2	15	F 10	–	–	-12.0	2	10	Ns, Ac	◎
2	18	F 16	0.5	E	-15.9	2	8	5Cs, 3Sc	✳
2	21	F 23	3.5	E	-20.0	20	8	8Sc, 0+Cs	◎
3	09	F 24	10.0	E	-15.8	0.5	10-	Cs	✢
3	12	F 31	11.0	E	-13.2	0.4	10	As	✢
3	15	F 38	8.0	ENE	-12.9	0.8	10	As	✳ ✢
3	18	F 48	7.0	ENE	-15.0	1	10-	9Ns, 1Cs	✳ ✢
3	21	F 50	5.5	E	-18.0	5	10-	4As, 2Ns, Cs	◎
4	09	F 50	8.0	ENE	-15.0	0.2	10	X	✢
4	12	F 52	10.0	ENE	-14.0	0.3	10-	X	✢
4	15	F 56	9.0	NE	-13.5	0.2	10-	9Ns, 2Ac	✢
4	18	F 56	7.5	E	-15.2	0.3	10	10Sc	✳ ✢
4	21	F 66	6.5	ENE	-18.0	2	10	10As	✳ ✢
5	09	F 66	10.0	E	-20.2	0.5	3	2Cs, 1St	⊖ ✢
5	12	F 75	9.5	E	-18.0	2	0+	Cs	○ ✢
5	15	F 82	10.5	E	-15.4	2	3	2Cs, 1Ci	⊖ ✢
5	18	F 90	7.5	E	-16.2	10	10-	As	◎
5	21	F 98	9.0	E	-19.1	5	10-	8As, 2St	◎ ✢
6	09	F 98	12.0	E	-17.5	0.02	10	–	✢
6	12	F 98	13.0	E	-17.0	0.05	10-	8Sc, 2Cs	✢
6	15	F 98	10.0	E	-15.5	0.05	10	Sc	✢
6	18	F 98	8.0	E	-15.9	0.1	10	As	✢
6	21	F 98	7.0	E	-17.2	0.5	10	6As, 4St	✳ ✢
7	09	F 98	11.0	E	-16.6	0.1	10	As	✢
7	12	F106	11.0	E	-13.9	0.2	10	As	✢
7	15	F113	11.0	E	-14.0	–	10	10As, 3Ns	✢
7	18	F122	9.0	E	-15.1	1	10	As	✢
7	21	F130	10.5	E	-17.2	5	10	9Sc, 1As, 0+Cs	✢

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Dec. 8	09	F130	12.0	ESE	-18.0	0.2	10	As	✢
8	12	F140	10.0	E	-16.7	1	10-	10-Cs, 1As	✢
8	15	F148	10.0	ESE	-16.3	5	8	8Cs, 0+As	◎
8	18	F160	11.5	ESE	-16.8	1	6	4Cs, 2Cc, 0+Ci	✢
9	12	F166	13.0	ESE	-18.0	0.5	0+	0+St	○✢
9	15	F173	-	-	-15.8	0.5	-	-	○✢
9	21	F177	14.5	ESE	-17.5	0.1	0	-	✢
10	09	F177	20.0	ESE	-19.3	0.05	0	-	✢
10	12	F177	21.0	ESE	-16.5	0.05	0	-	✢
10	15	F177	18.0	ESE	-15.0	0.05	0	-	✢
10	18	F177	16.0	ESE	-15.3	0.05	0	-	✢
10	21	F177	14.0	ESE	-17.7	2	0	-	✢
11	09	F177	16.0	ESE	-17.0	0.1	0	-	✢
11	12	Motoi	11.5	ESE	-14.0	2	0	-	✢

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
1981									
Dec. 5	18	F 4	7.5	-	-16.7	-	9	Ci, Cs	
5	21	F 16	10.0	-	-18.0	-	10	As	
6	09	F 16	15.0	-	-17.3	0.2	10	As	✢
6	12	F 23	14.0	SE	-15.0	0.3	8	As	✢
6	15	F 35	12.0	ESE	-12.0	1	10	Cs, Cu	*
6	18	F 49	-	-	-14.5	2	9	Cs	
6	21	F 60	4.5	-	-15.5	-	10	Cs, As	*
7	09	F 60	-	-	-	0.2	10	As	
7	12	F 60	7.5	-	-14.3	0.3	10	Ci, As	
7	15	F 68	7.5	ESE	-12.5	1	10	Ci	
7	18	F 79	5.5	SE	-12.8	1	10-	Cs	
7	21	F 90	5.0	SE	-16.8	1	10-	Cs, As	*
8	09	F 90	12.0	-	-16.5	0.2	8	Ci, Cs	✢
8	12	F 95	10.0	SE	-15.0	0.5	9	Ci, Cs	✢
8	15	F105	7.5	SE	-14.9	1	9	Ci	✢
8	18	F118	4.5	SE	-15.2	10	3	Ci	
8	21	F130	4.0	-	-19.0	-	0	-	
9	09	F130	-	-	-19.8	2	0	-	✢
9	12	F135	7.5	-	-17.0	3	0	-	✢
9	15	F145	7.5	SSE	-15.6	5	0	-	✢
9	18	F155	7.5	SE	-16.8	0.5	0	-	✢
9	21	F155	10.0	SE	-19.1	-	1	Ci	
10	09	F155	-	-	-	0.05	0	-	✢
10	12	F155	16.0	-	-18.6	0.05	0	-	✢
10	15	F155	17.0	-	-16.2	0.05	0	-	✢
10	18	F155	-	-	-	0.3	-	-	✢
10	21	F155	14.0	-	-18.9	0.3	-	-	✢
11	09	F155	-	-	-	0.5	0	-	✢

Date	Lt	St. No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Dec. 11	12	No. 3	9.5	SSE	-13.5	1.5	1	Ac	⸸
11	15	No. 10	9.5	SE	-12.0	1	1	Ci	⸸
11	18	No. 17	10.0	-	-12.0	-	4	Cc	
12	15	B. C.	13.0	SE	-12.8	-	-	-	
13	09	B. C.	12.0	-	-	0.2	4	Ci	⸸
13	12	B. C.	13.0	-	-17.0	2	3	Cs	⸸
13	21	B. C.	10.0	E	-16.0	-	-	-	
14	09	B. C.	6.0	ESE	-19.5	-	8	Ci	
14	15	B. C.	-	-	-	-	10	As	*
14	18	B. C.	-	-	-	-	10	As	*
14	21	B. C.	4.0	NW	-16.5	10	9	Ac	
15	09	B. C.	-	-	-	1	10	As	⸸
15	15	B. C.	-	-	-	0.2	10	Ac	⸸
15	21	B. C.	-	-	-	-	10-	Ac, Cu	
16	09	B. C.	-	-	-	0.02	10	As	⸸
16	12	B. C.	18.0	E	-17.5	-	-	-	
16	15	B. C.	14.0	E	-16.0	0.1	10-	As	⸸
16	18	B. C.	13.0	E	-16.5	1	4	Ac	
17	12	B. C.	14.0	E	-16.0	0.2	10	Cs	⸸
17	15	B. C.	13.0	E	-16.0	0.05	10	Cs	⸸
17	18	B. C.	12.0	E	-16.0	0.5	10	Cs	⸸
17	21	B. C.	-	-	-	-	3	Ci	
17	24	B. C.	-	-	-	10	3	Ci	⸸
18	12	B. C.	13.0	ESE	-15.5	0.5	3	Ac	⸸
18	15	B. C.	-	-	-	0.3	3	Ac	⸸
18	18	B. C.	16.0	E	-19.8	0.5	3	Ac	⸸
18	21	B. C.	13.0	E	-20.5	-	-	-	
19	12	B. C.	12.5	E	-15.0	0.5	10	Cs	⸸

Date	Lt	St.No.	V (m/s)	D	T	Vi (km)	N	Nc	W
Dec. 19	15	B.C.	10.0	ENE	-15.0	-	4	Ci, Cs, Ac	
19	18	B.C.	7.0	E•	-15.3	-	2	Ac, Cs	
19	21	B.C.	6.5	E	-16.6	-	1	Ac	
21	15	B.C.	13.0	E	-17.4	1	0	-	⊹
21	18	B.C.	12.0	E	-17.8	1	0	-	⊹
21	21	B.C.	11.0	ESE	-19.6	2	0	-	⊹
22	15	B.C.	9.5	ESE	-16.0	10	0	-	⊹
22	18	B.C.	7.0	ESE	-16.5	20	0	-	⊹
22	21	B.C.	10.0	ESE	-18.5	20	0	-	
23	15	B.C.	13.0	ESE	-16.0	10	1	Ci	⊹
23	18	B.C.	-	-	-	-	1	Ci	
23	21	B.C.	-	-	-	-	1	Ci	
24	15	B.C.	-	-	-15.4	0.5	10	As	⊹