

RADIO OBSERVATION DATA
AT SYOWA STATION, ANTARCTICA DURING 1994

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1. Introduction

CRL has been observing the absorption of cosmic radio noise with a standard riometer (relative ionospheric opacity meter) at 30 MHz at Syowa Station, Antarctica since February 1966. This report presents the data observed in January 1 through December 31, 1994. The combined data plots also contain geomagnetic field, HF, VLF, and radar observations for reference.

Copies of these data in digital form are available on request.
Requests should be addressed to:

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2. Location

Syowa Station			
Geographic		Geomagnetic	
Latitude (Deg.)	Longitude (Deg.)	Latitude (Deg.)	Longitude (Deg.)
69.00 S	39.58 E	-70.0	80.2

3. Observer

Kyoji IWASAKI (Communications Research Laboratory)

4. Instrumentation

The riometer receiver has a center frequency of 30 MHz and a band width of 7.5 kHz; it is connected to a vertically directed five-element Yagi antenna whose

elements are oriented in the east-west direction. The antenna is designed to match the 50-ohm coaxial transmission line (8D-2V), which is 80 m long. Noise from a reference noise diode, with power levels of 20000 K, 16000 K, 12000 K, 8000 K, and 4000 K, is inserted each day at 0800 at 45° EMT (Eastern Meridian Time: UT + 3 hours). The data are recorded on magnetic tape in digital form.

5. Remarks

The cosmic noise power level shows a remarkable sidereal diurnal variation caused by the passage of the cosmic radio source across the zenith. Due to the earth's revolution, the time of the zenith passage of a particular cosmic radio source shifts about four minutes earlier each day and returns to its initial time after one year. This diurnal variation of the cosmic noise power is deduced from the record on the quiet days.

The ionospheric absorption in dB is obtained as follows:

- 1) The reference sidereal diurnal variation of the cosmic noise power in K, T_0 , is determined from the diurnal variations on several selected quiet days each month
- 2) Actual received power, T_1 , is read in K.
- 3) Ionospheric absorption in dB, A , is calculated with the following conversion equation:

$$A = -10 \times \log \left(\frac{T_1}{T_0} \right)$$

The combined data plots also include the variation of H-component of the geomagnetic field, HF field strength, phase variation of VLF waves, and auroral radar echo intensity at Syowa Station. In the panel of geomagnetic variations, the H-component increases upward and the calibration signals are added each hour as a depression of 200 nT.

Because of troubles in the data acquisition system, any plot during period showing in table 1 do not appear in the combined data plots.

Variations of auroral radar echo intensity during period from January 1 to February 6, 13:50 UT on September 1 to 19:50 UT September 7 and 06:10 on December 15 to 24:00 on December 31 and of HF field strength during period from 00 UT on January 1 to 07:30 UT on February 19 and 05:00 UT on April 10 to 08:10 on April 26 are not shown because of troubles in the observation system.

H-component of the geomagnetic field during period from February 10 to 11 and from 20:10 on November 29 to 14:50 on November 21 are not shown because of a technical trouble.

The vertical scale of the geomagnetic variation panel after 00 UT on November 20 is half the previous one because of over scale.

If there is any unclear point you would raise or if you have any question, do not hesitate to write us at the address in the introduction section.

Bibliography relevant to RADIO OBSERVATION DATA AT SYOWA STATION, ANTARCTICA (1)
(RIOMETER RECORDS OF 30 MHz COSMIC NOISE AT SYOWA STATION, ANTARCTICA)

Observing Period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
Feb. 1967 - Feb 1968	Ose, M Nishimuta, I	2 (Ionosphere 1)	62	1968
Feb. 1968 - Jan. 1969	Ishizawa, K	7 (Ionosphere 3)	65	1970
1969	Ota, Y.	8 (Ionosphere 4)	74	1970
1970	Shiro, I. Sakamoto, T.	14 (Ionosphere 5)	62	1971
1971	Ogata, T. Ose, M.	18 (Ionosphere 7)	62	1971
1972	Isozaki, S. Miyazaki, S.	20 (Ionosphere 8)	76	1973
1973	Nishimuta, I. Yabuuma, H.	24 (Ionosphere 11)	74	1974
1974	Yamazaki, I. Shiro, I	29 (Ionosphere 13)	84	1975
1975	Sugiuchi, H. Komiya, N.	35 (Ionosphere 15)	84	1976
1976	Ose M. Yamakoshi, A. Sasaki, T.	41 (Ionosphere 17)	87	1977
1977	Ose M. Nishiyama, N. Sakamoto, J.	46 (Ionosphere 19)	82	1978
1978	Ose M. Igarashi, K. Tsuzurahara, S.	51 (Ionosphere 20)	86	1979
(cont)				

Bibliography relevant to RADIO OBSERVATION DATA AT SYOWA STATION, ANTARCTICA (2)
 (RIOMETER RECORDS OF 30 MHz COSMIC NOISE AT SYOWA STATION, ANTARCTICA)

Observing Period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
1979	Ose, M. Ojima, S. Komiyama, N	56 (Ionosphere 22)	84	1980
1980	Ose, M Nozaki, K	70 (Ionosphere 26)	97	1982
1981	Ose, M Kurihara, N	80 (Ionosphere 27)	94	1983
1982	Kuratani, Y Igarashi, K.	87 (Ionosphere 29)	86	1984
1983	Kuratani, Y Yamazaki, I Tanaka, T	99 (Ionosphere 31)	93	1985
1984	Kuratani, Y. Yamamoto, S	112 (Ionosphere 33)	95	1986
1985	Kuratani, Y. Maeno, H	122 (Ionosphere 35)	94	1987
1986	Maeno, H. Suzuki, A.	133 (Ionosphere 37)	96	1988
1987	Maeno, H. Inamori, K	141 (Ionosphere 39)	99	1989
1988	Maeno, H Ohtsuka, A	155 (Ionosphere 42)	98	1990
1989	Maeno, H Yamamoto, S	168 (Ionosphere 44)	184	1991
1990	Ohtaka, K Kunitake, M	176 (Ionosphere 47)	204	1992
(cont)				

Bibliography relevant to RADIO OBSERVATION DATA AT SYOWA STATION, ANTARCTICA (3)
 (RIOMETER RECORDS OF 30 MHz COSMIC NOISE AT SYOWA STATION, ANTARCTICA)

Observing Period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
1991	Nozaki, K. Kunitake, M	189 (Ionosphere 49)	184	1993
1992	Kamata, M Kunitake, M	196 (Ionosphere 52)	202	1994
1993	Yamaguchi, T Kunitake, M.	206 (Ionosphere 54)	190	1995

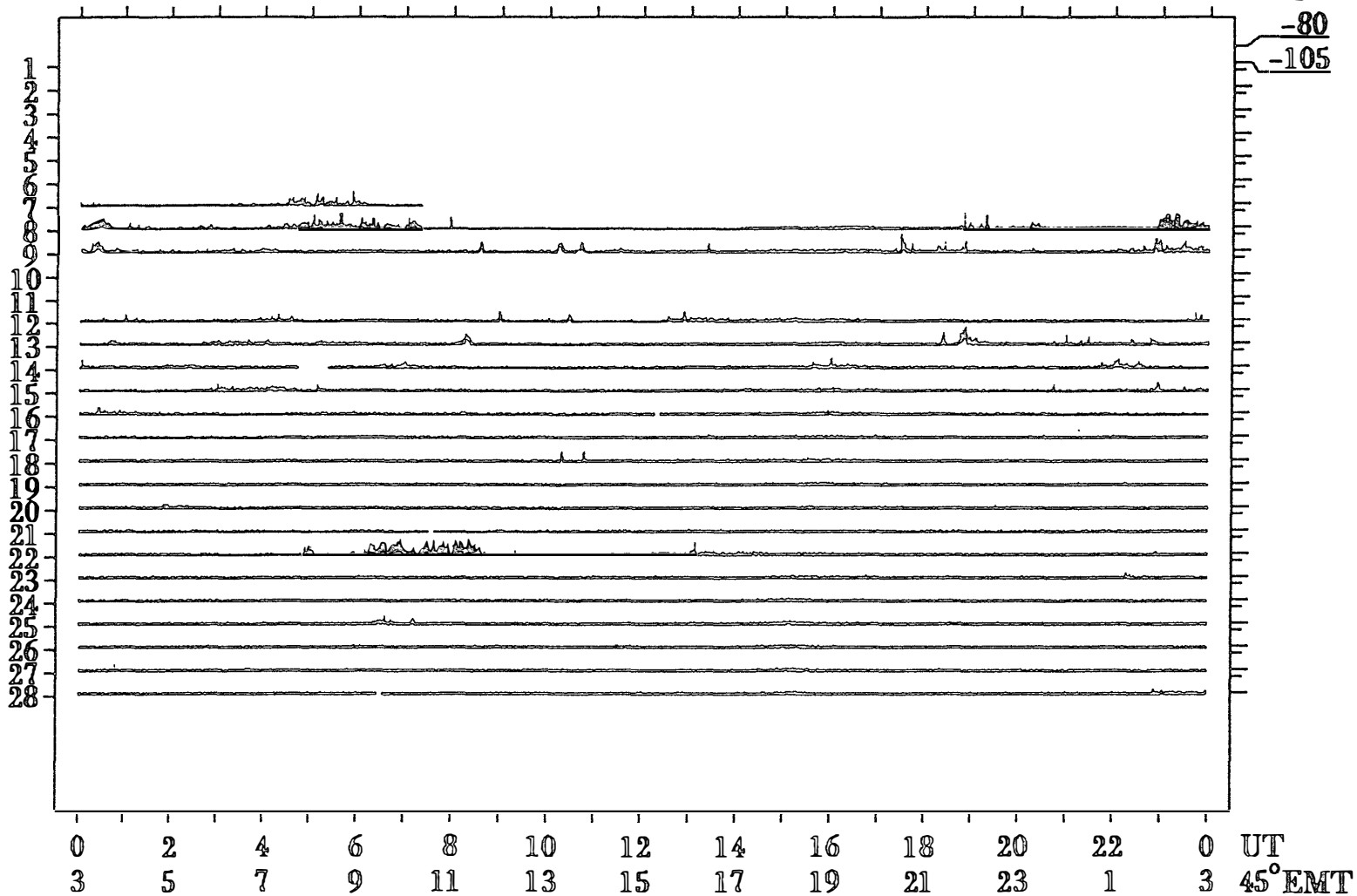
Table 1

month	date	time (UT)
January	3	0730 - 2400
February	4	1900 - 2100
	7	0720 - 2400
	14	0450 - 0520
May	7	2250 - 2400
	8	0000 - 2400
	9	0000 - 0650

CRL Syowa Station Auroral Radar (50MHz) February 1994

Date

[dBm]

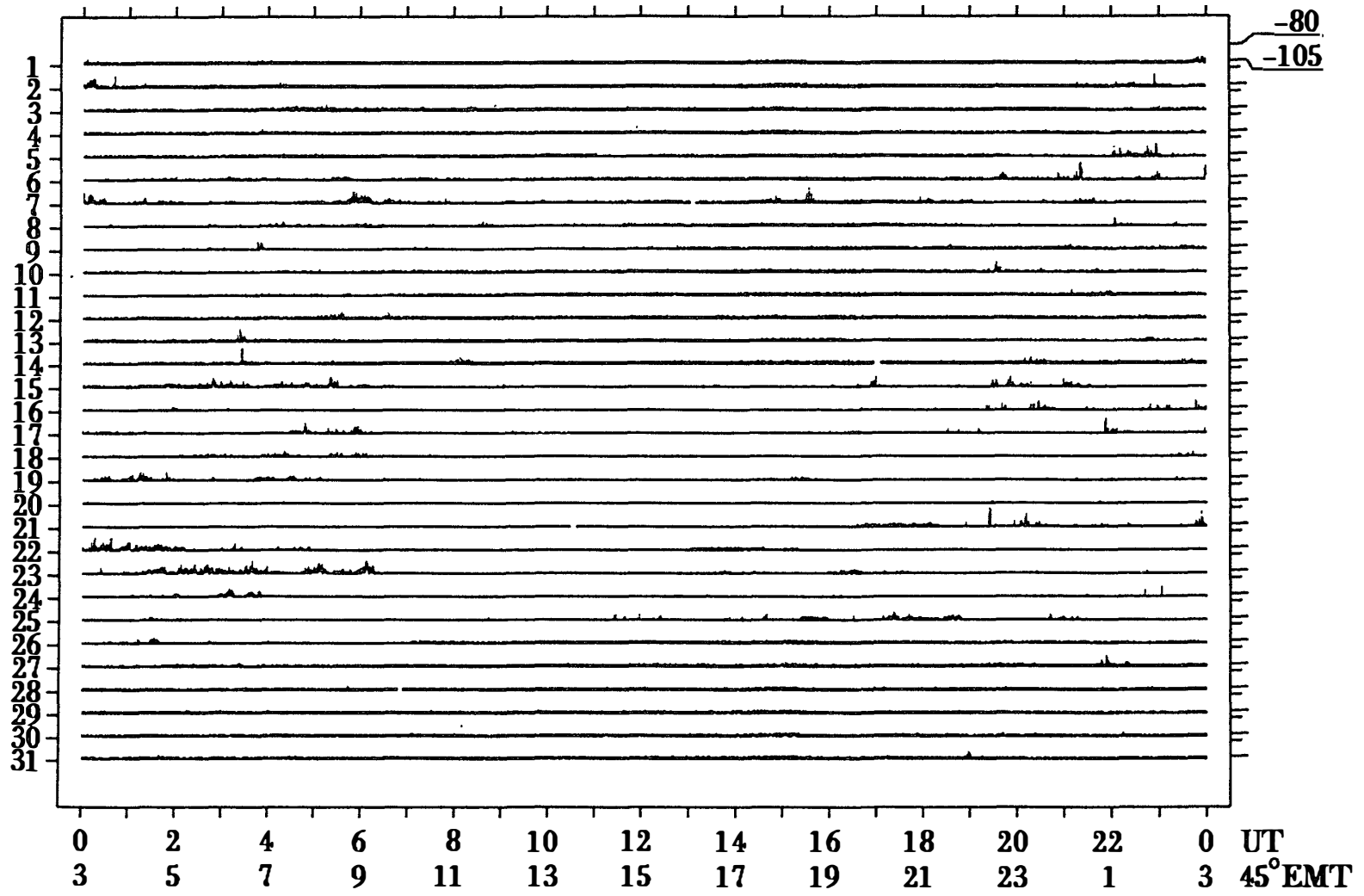


CRL Syowa Station Auroral Radar (50MHz)

March 1994

Date

[dBm]



CRL Syowa Station Auroral Radar (50MHz)

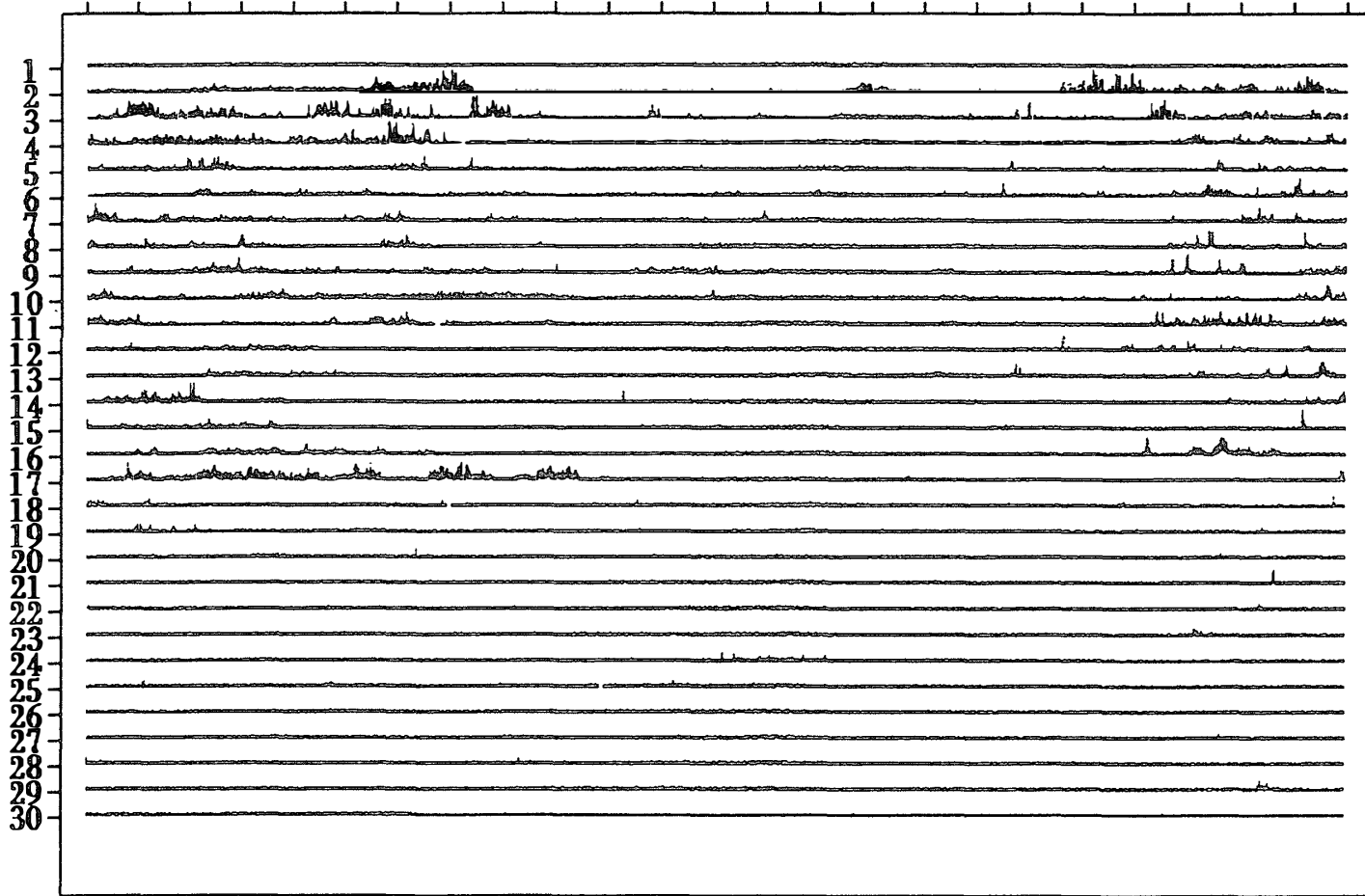
April 1994

Date

[dBm]

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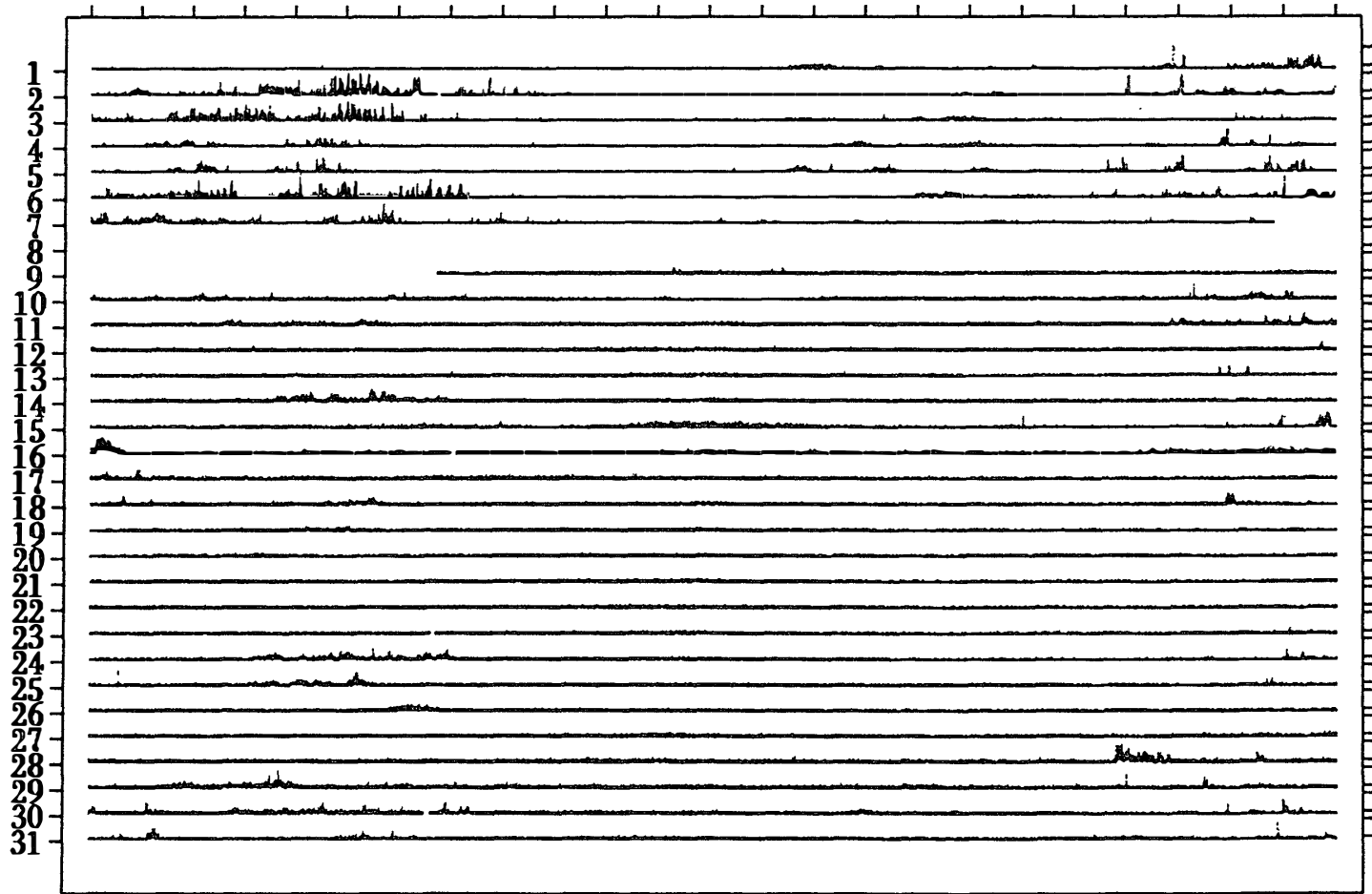
0 2 4 6 8 10 12 14 16 18 20 22 0 UT
3 5 7 9 11 13 15 17 19 21 23 1 3 45° EMT

CRL Syowa Station Auroral Radar (50MHz)

May 1994

Date

[dBm]



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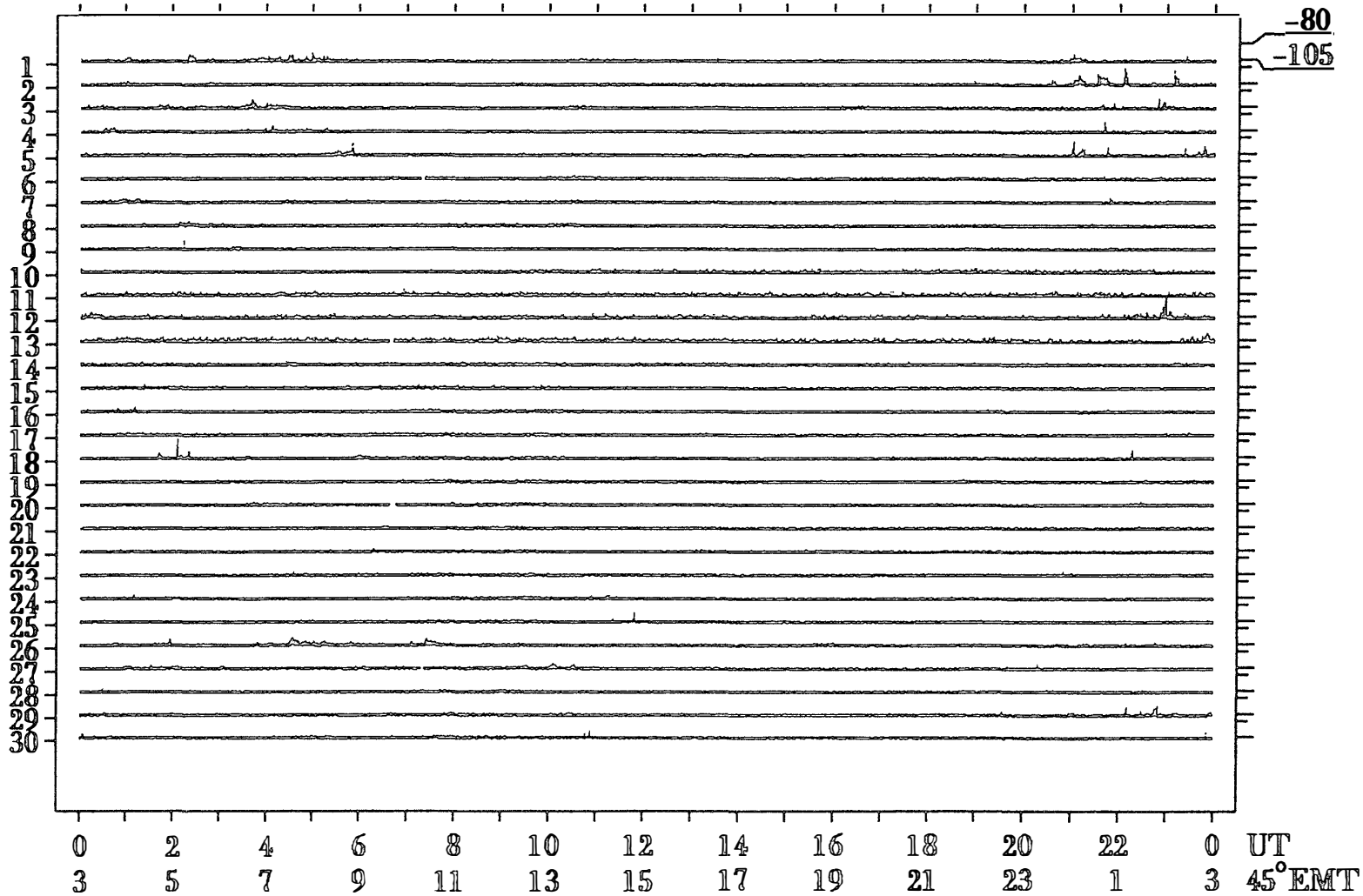
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June 1994

Date

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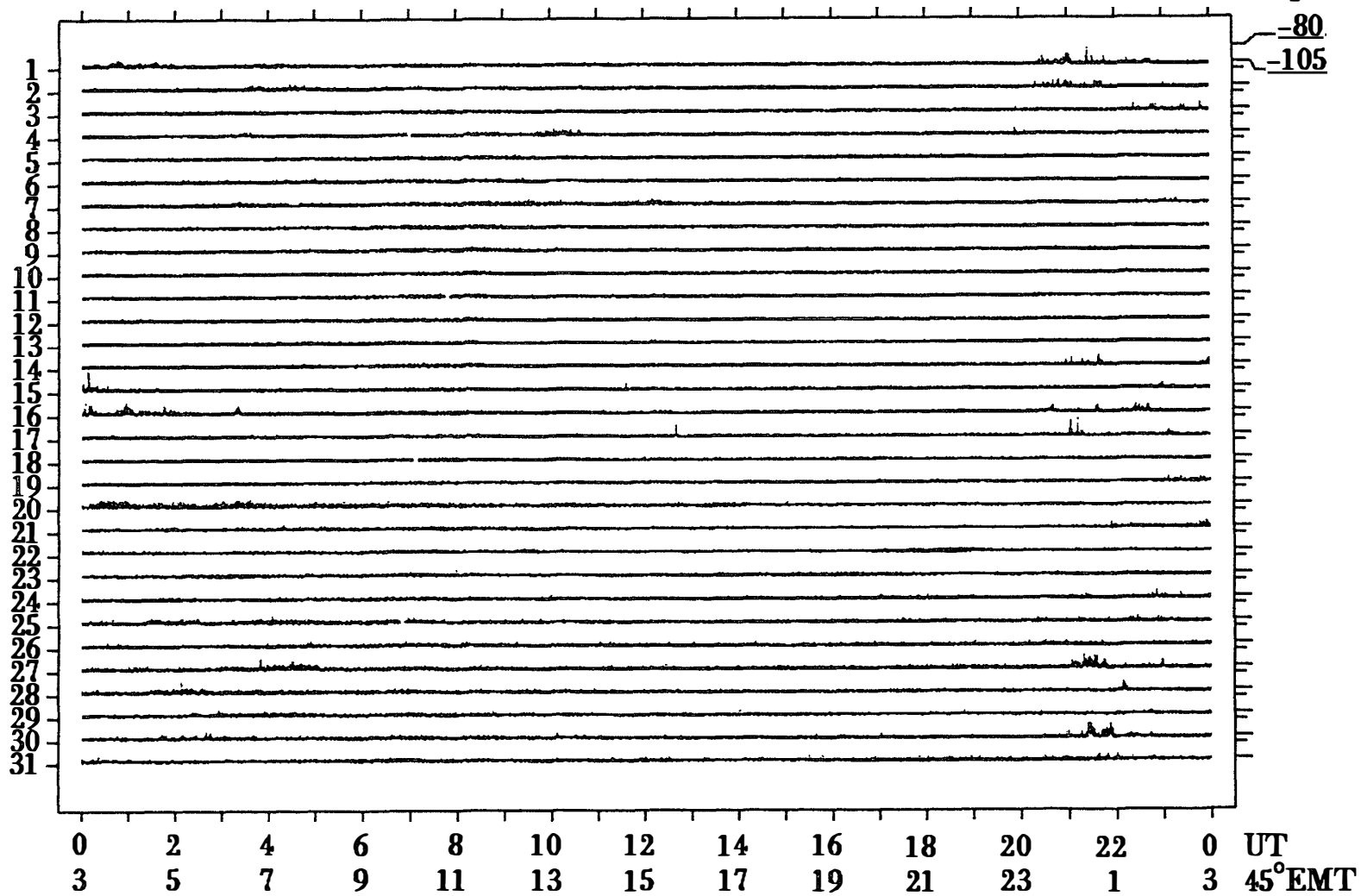


CRL Syowa Station Auroral Radar (50MHz)

July 1994

Date

[dBm]

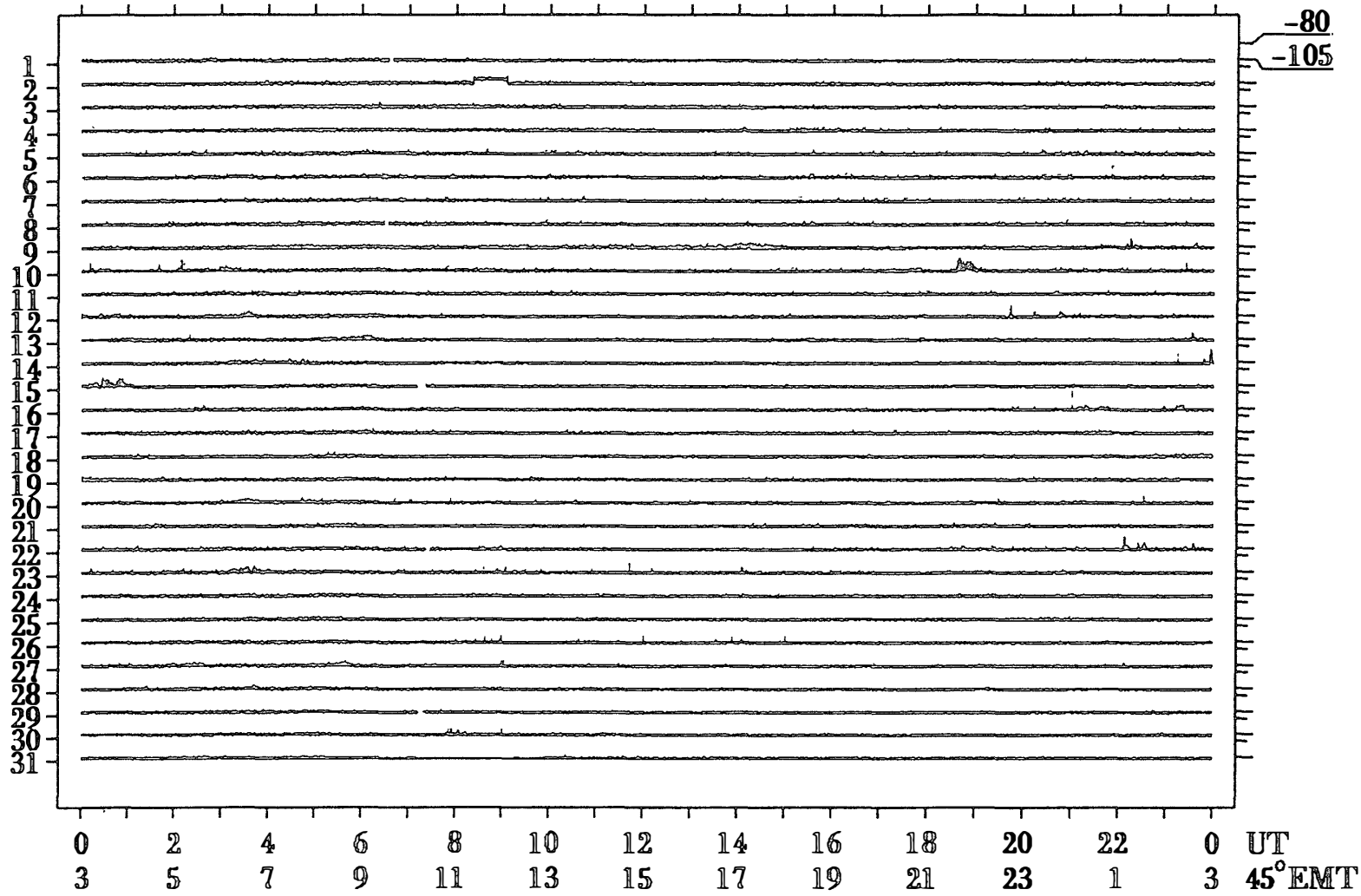


CRL Syowa Station Auroral Radar (50MHz)

August 1994

Date

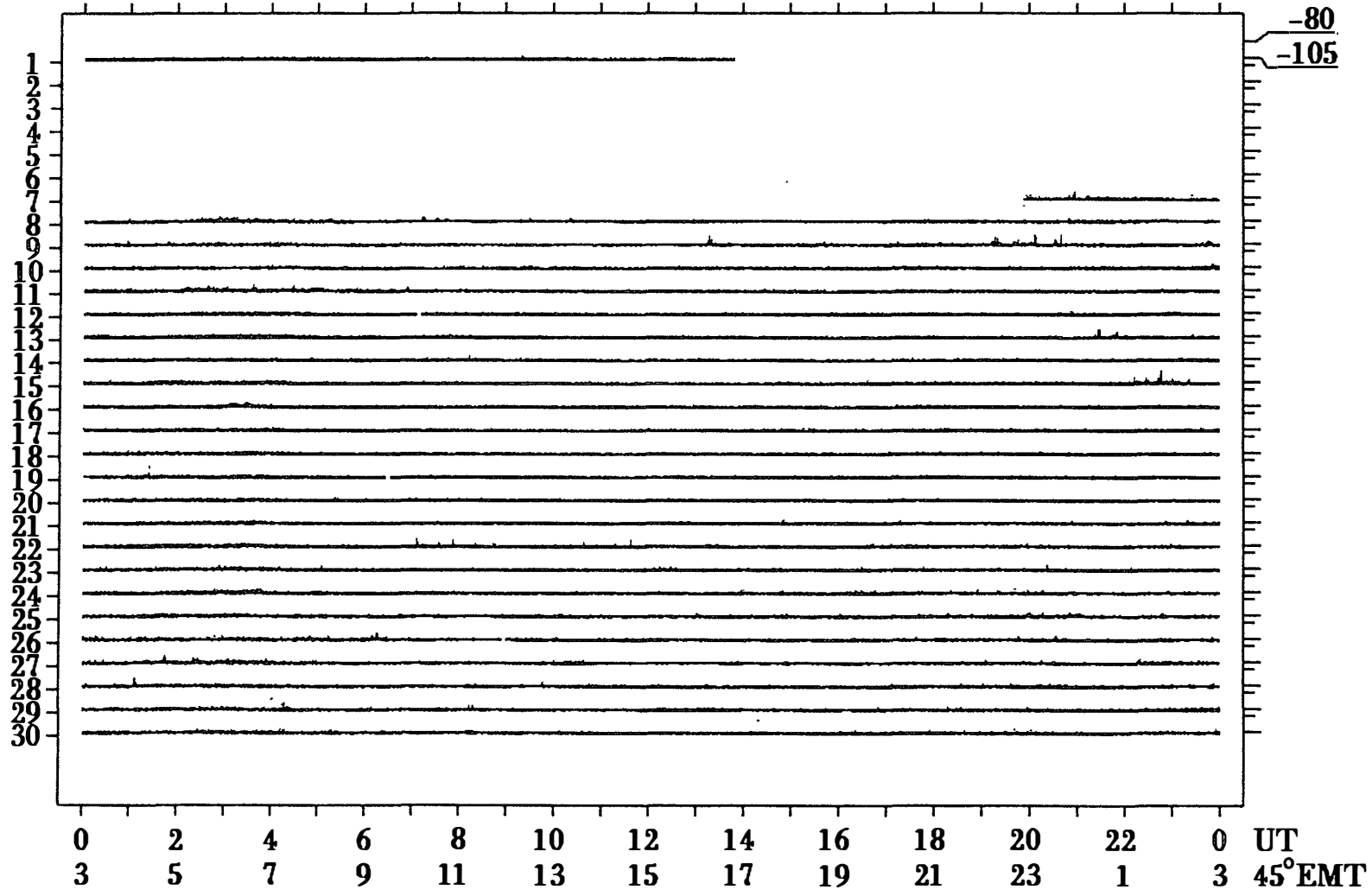
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CRL Syowa Station Auroral Radar (50MHz) September 1994

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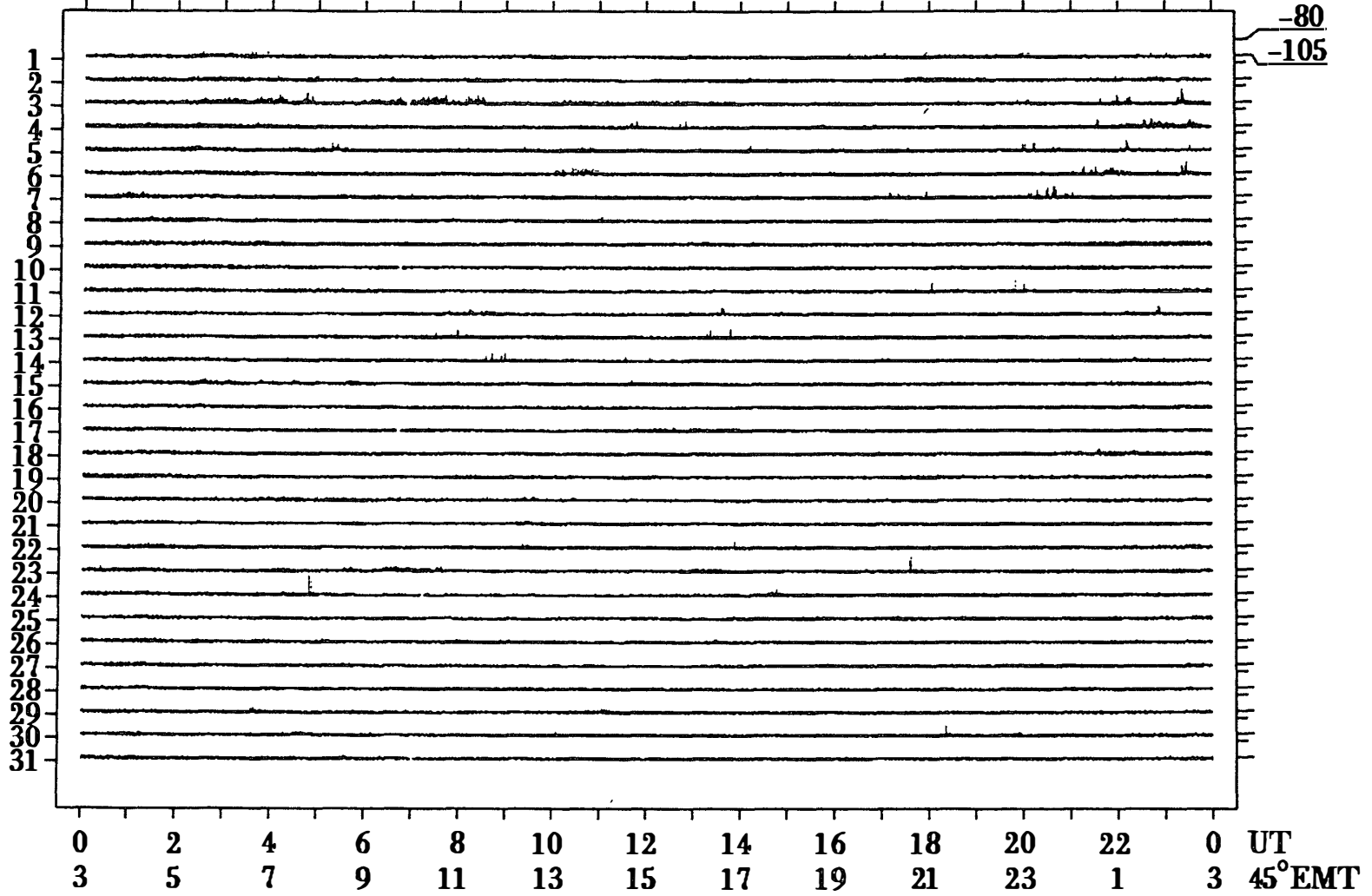
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CRL Syowa Station Auroral Radar (50MHz) October 1994

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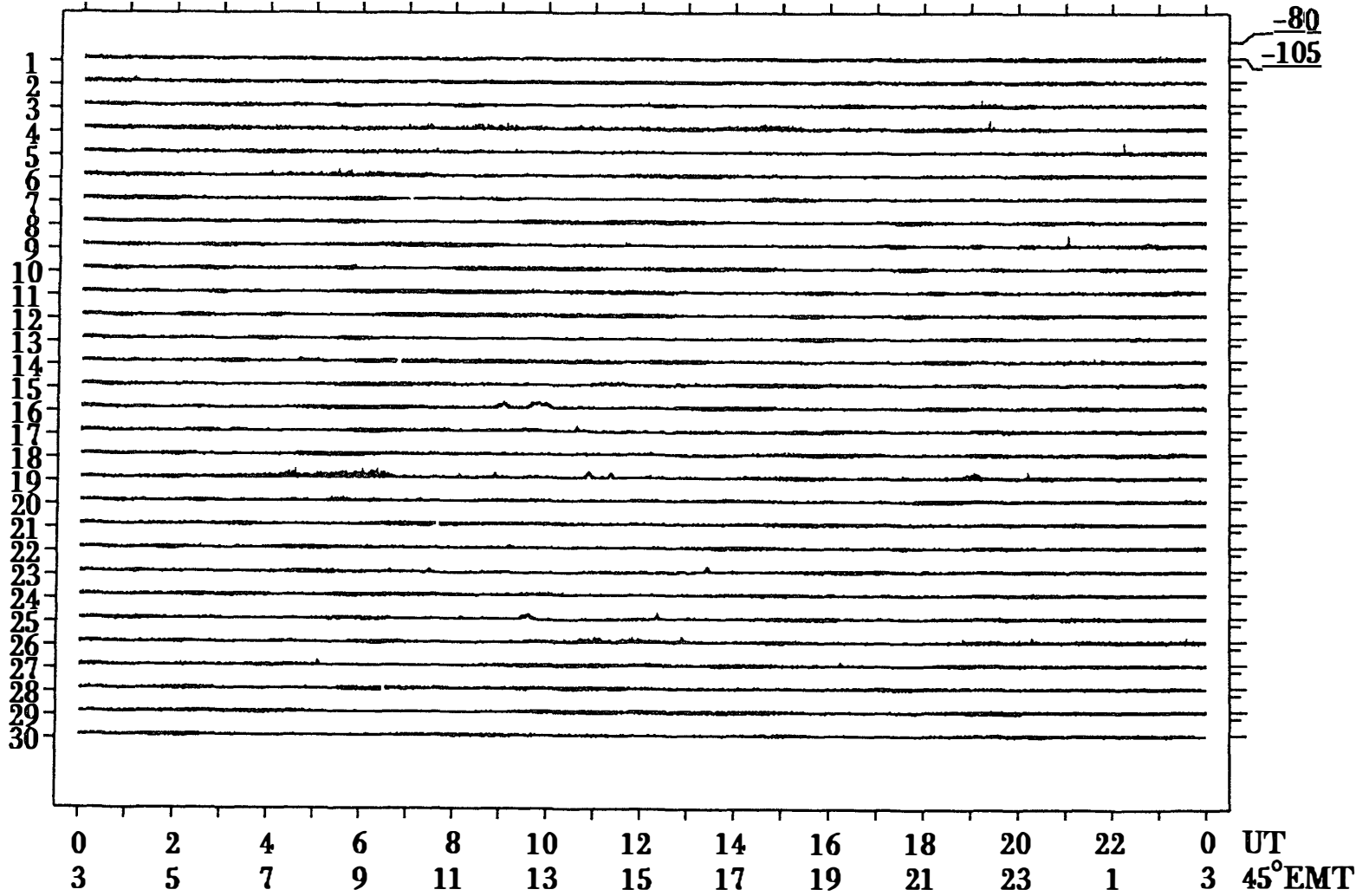
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CRL Syowa Station Auroral Radar (50MHz) November 1994

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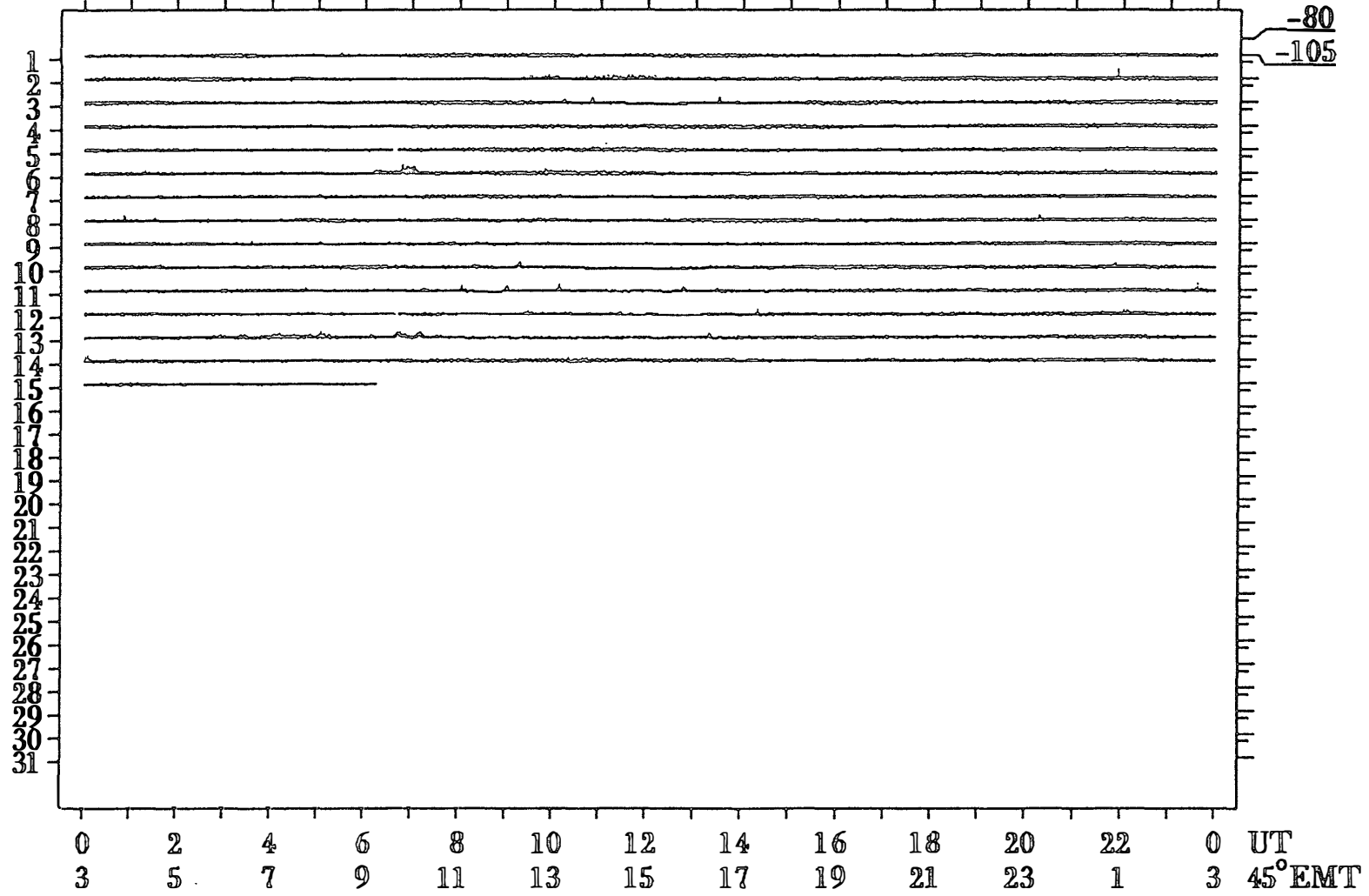
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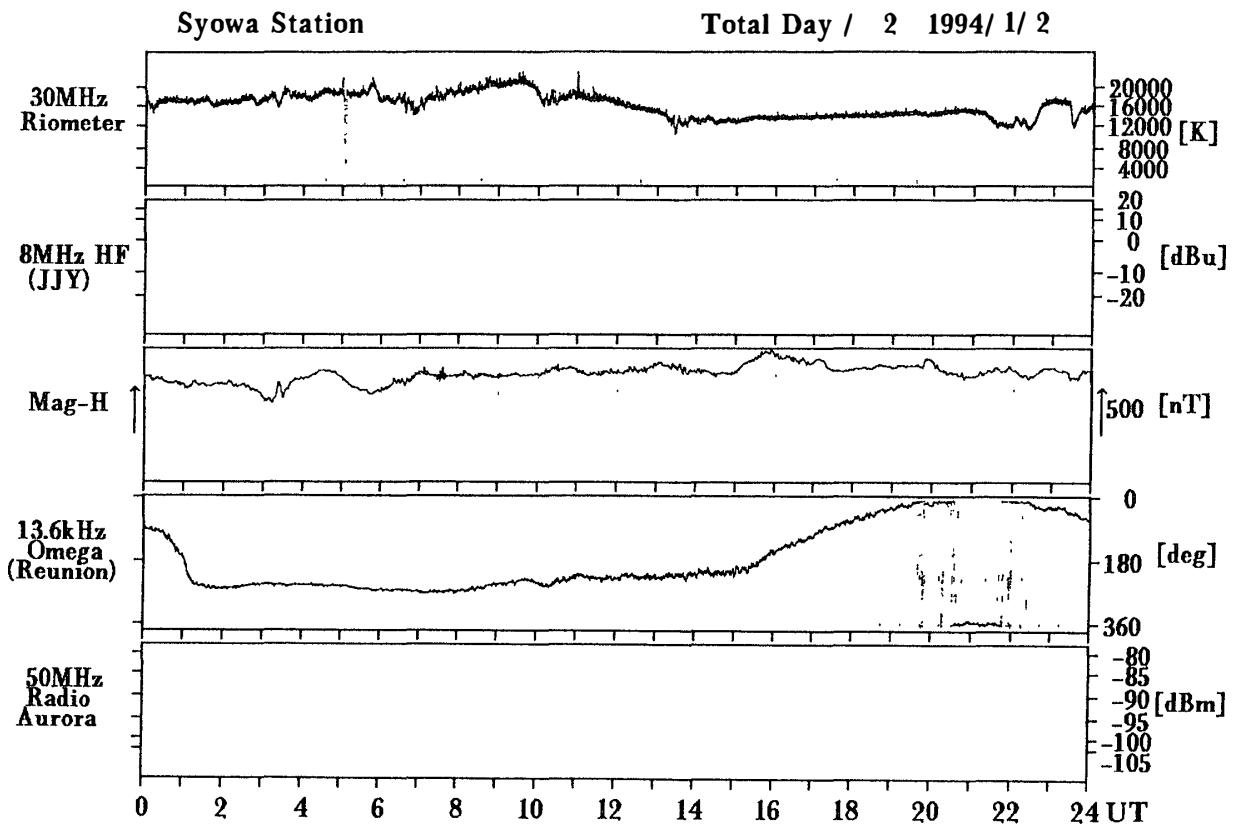
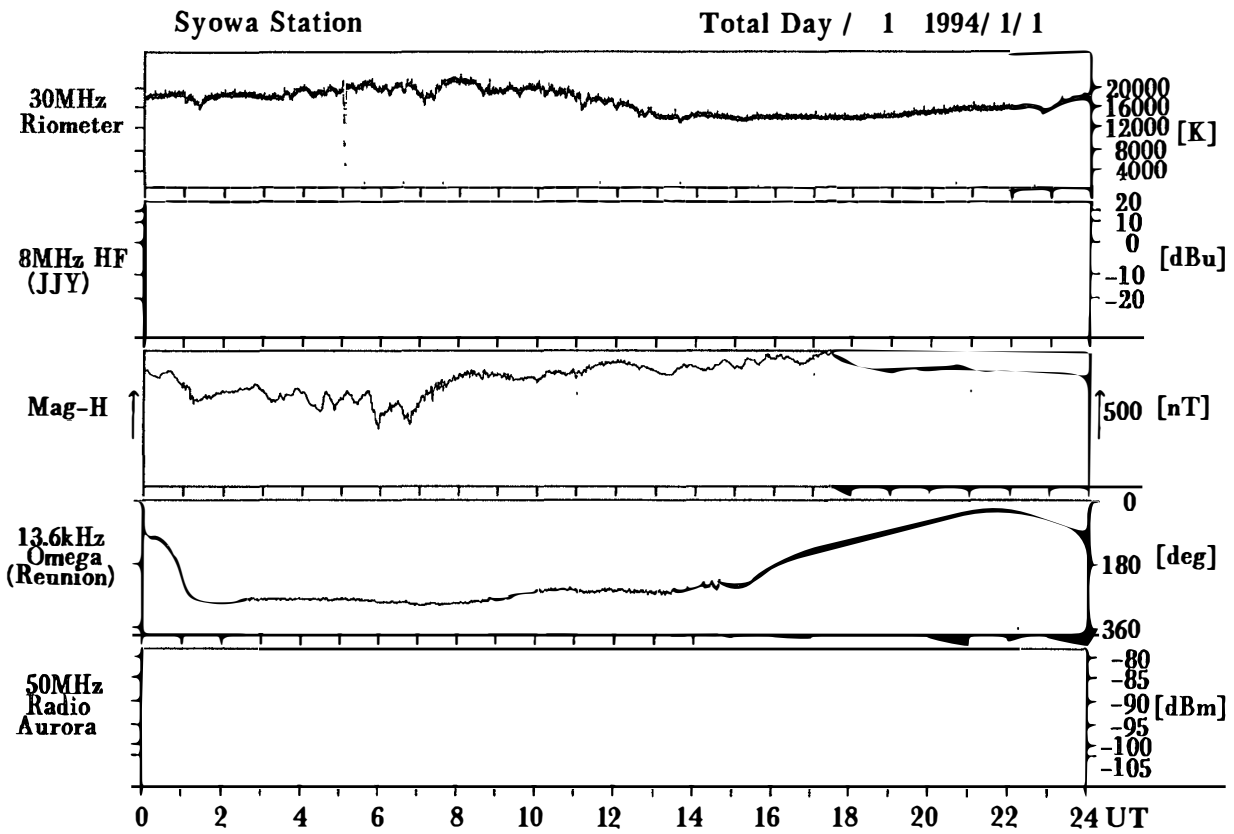


CRL Syowa Station Auroral Radar (50MHz) December 1994

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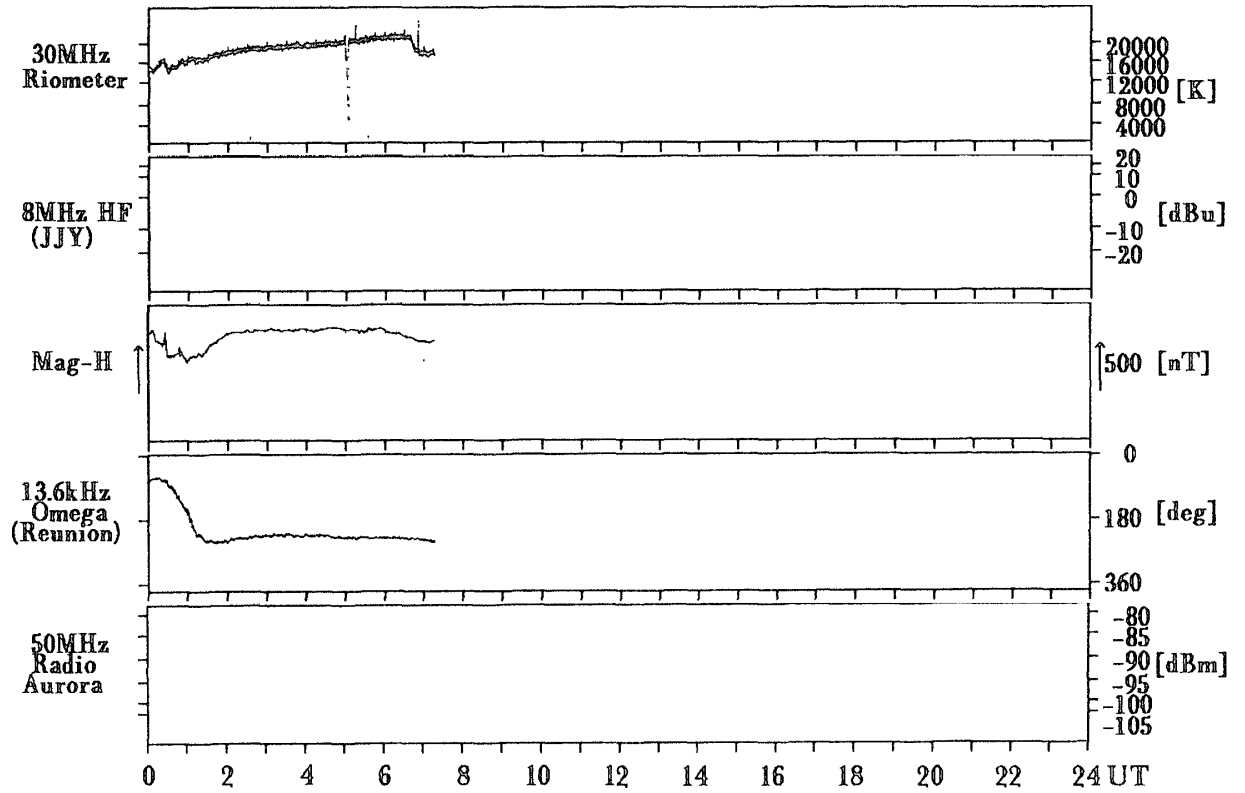
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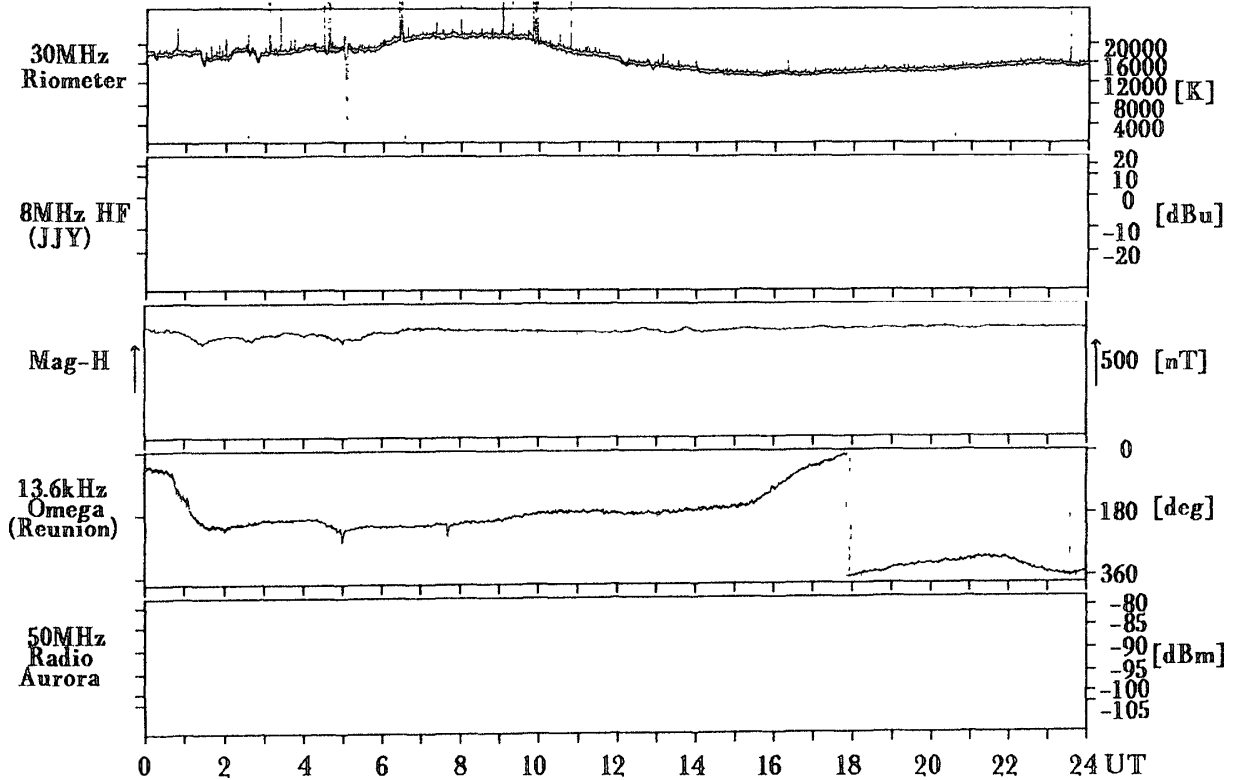
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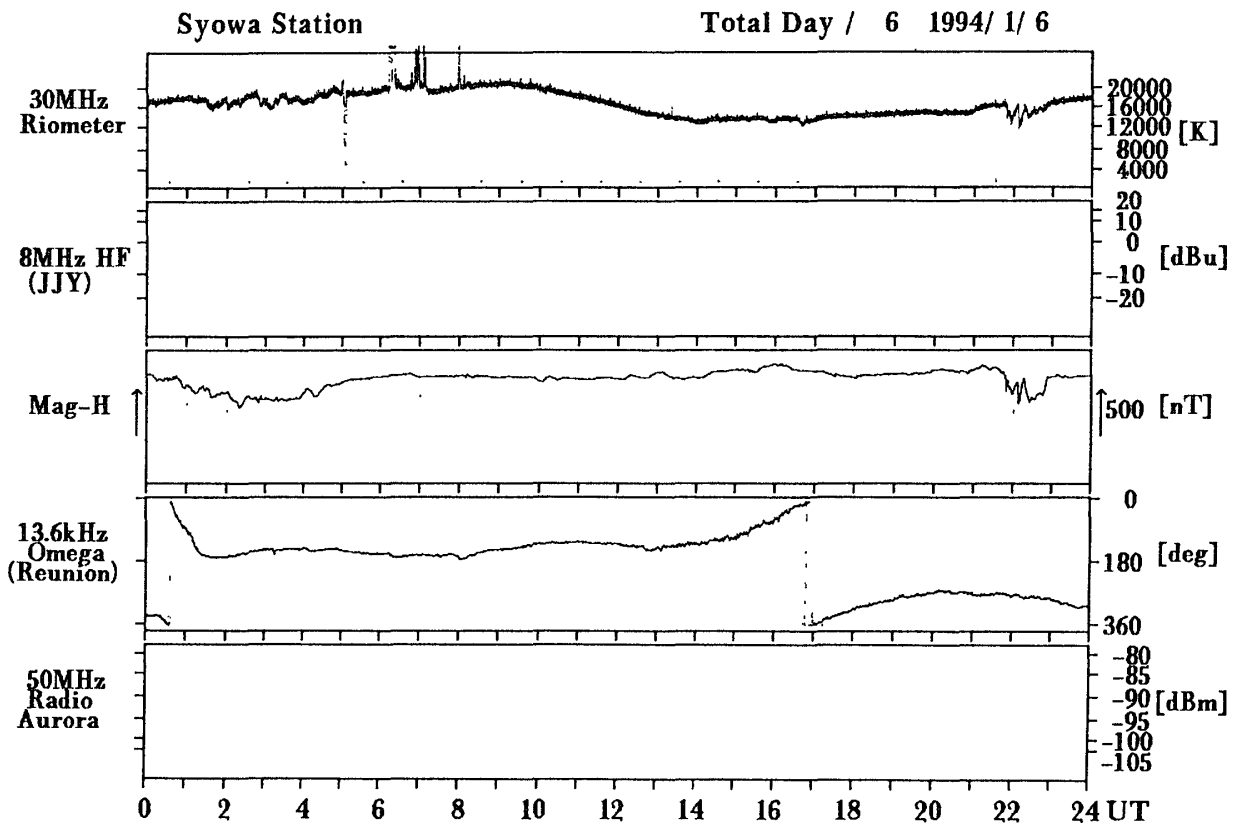
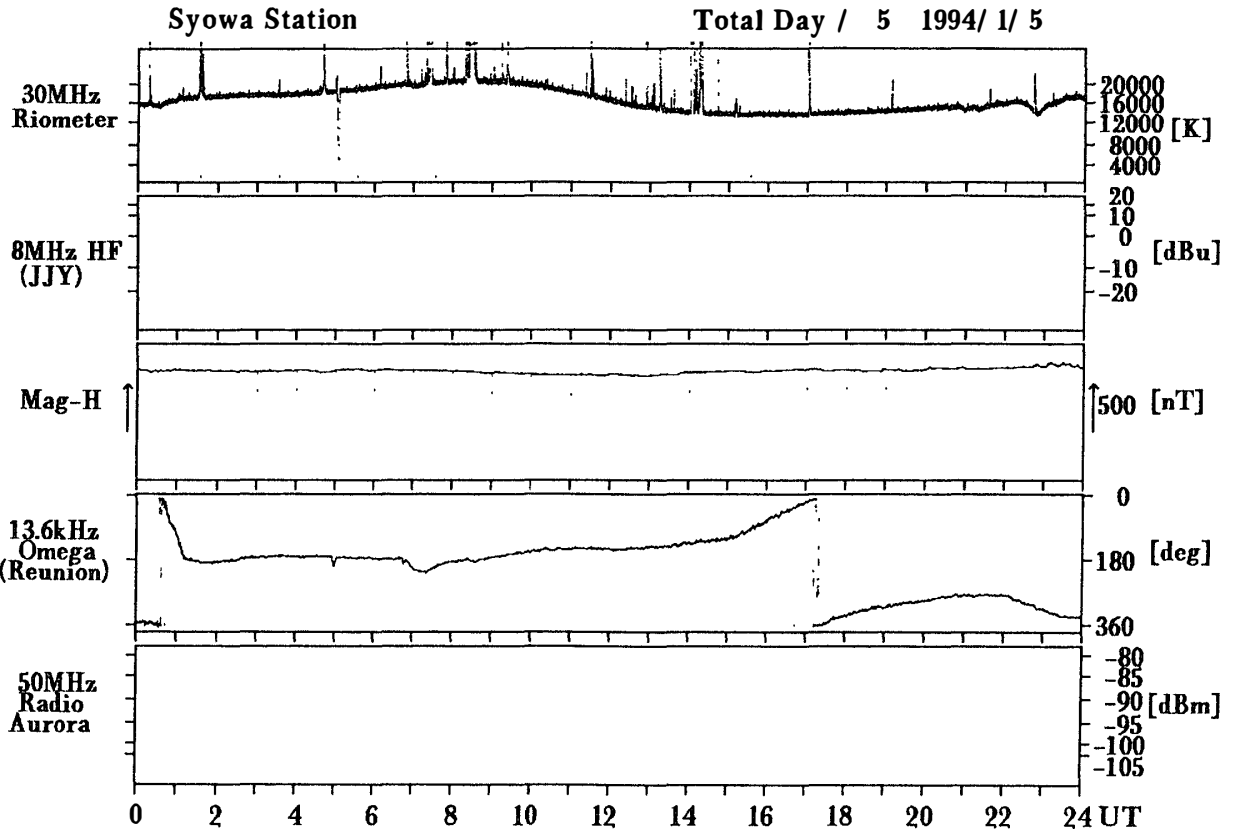
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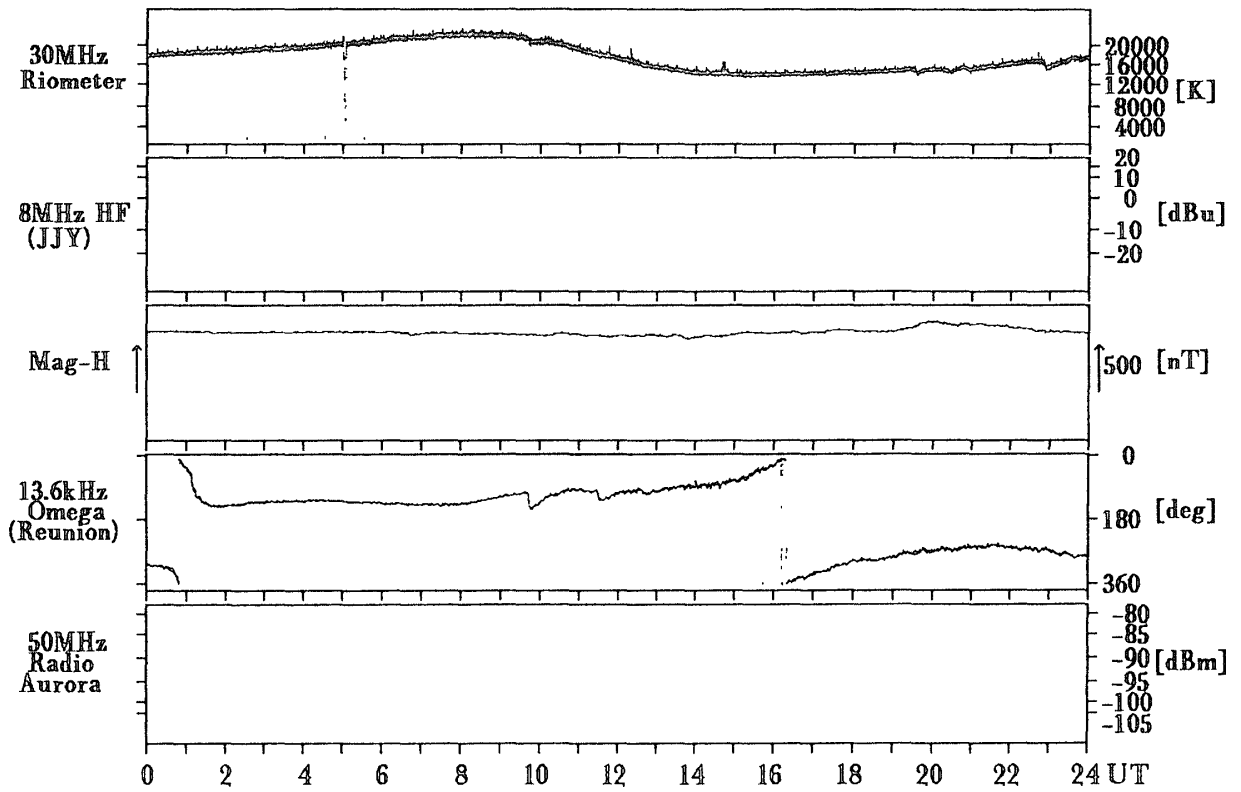
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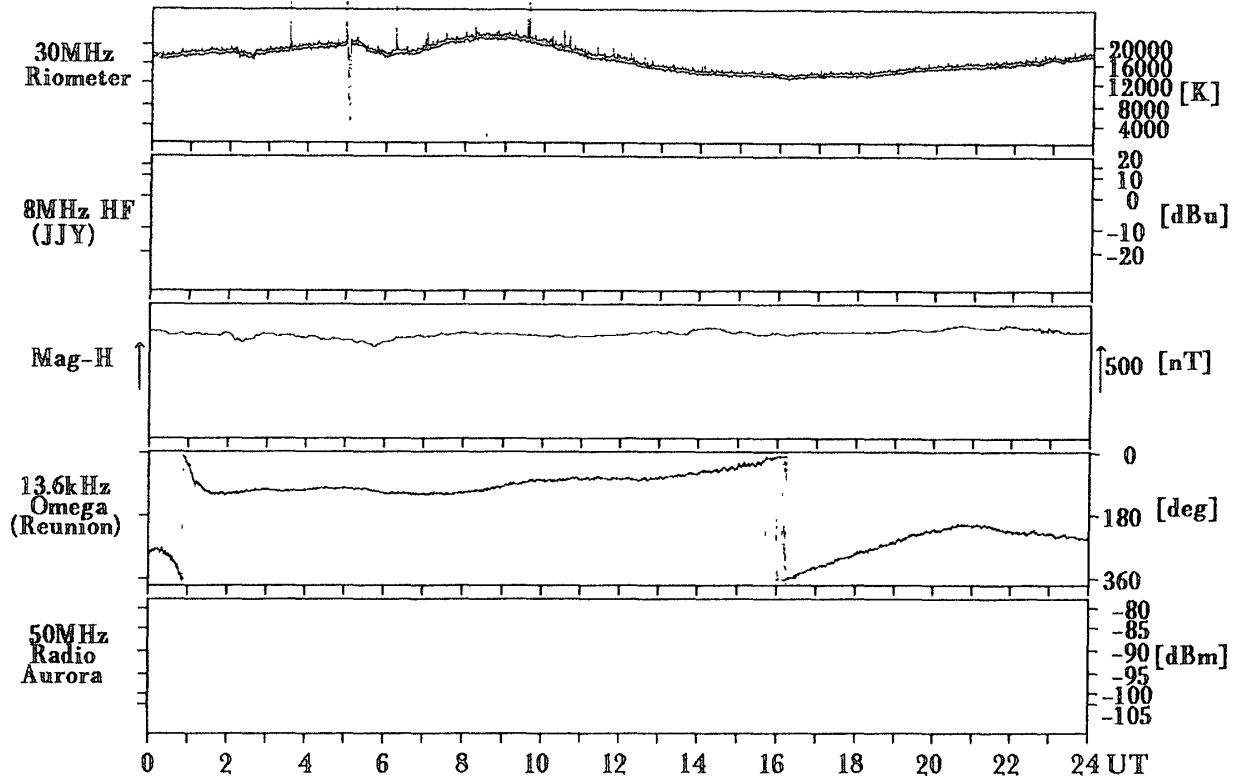
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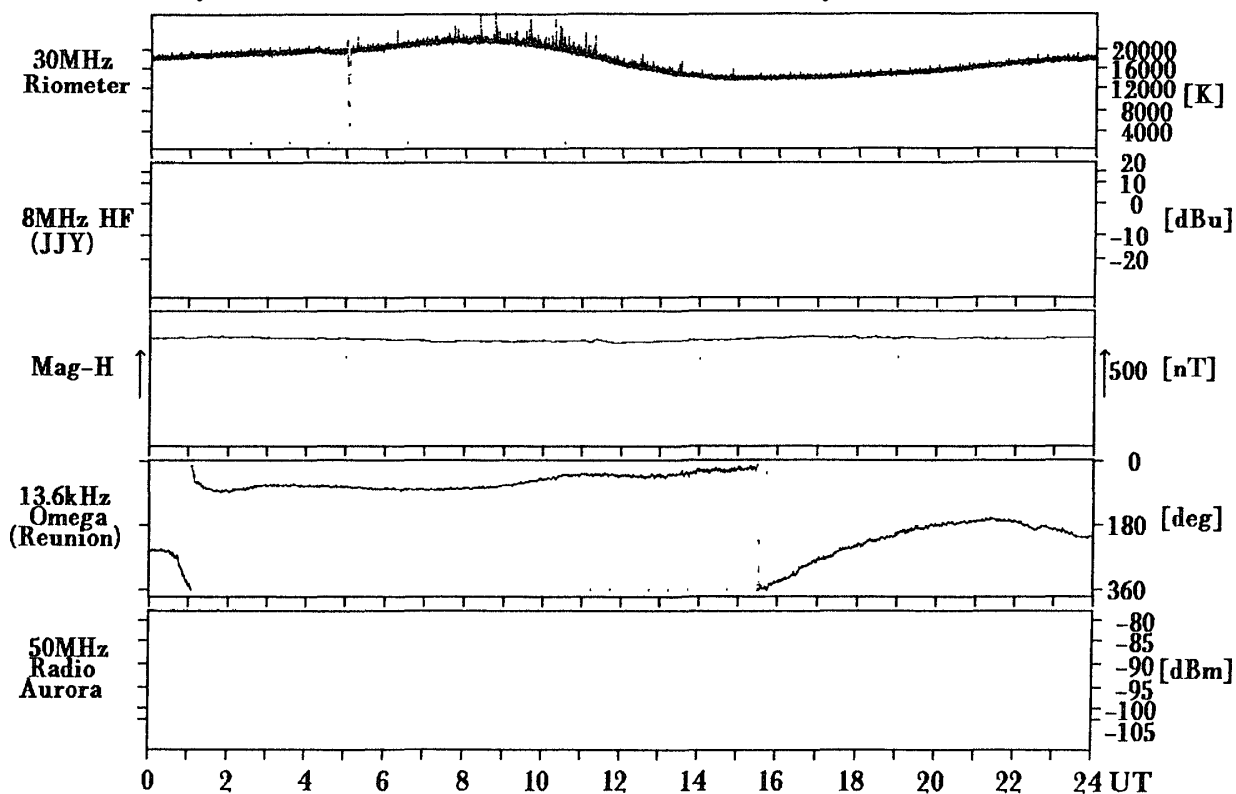
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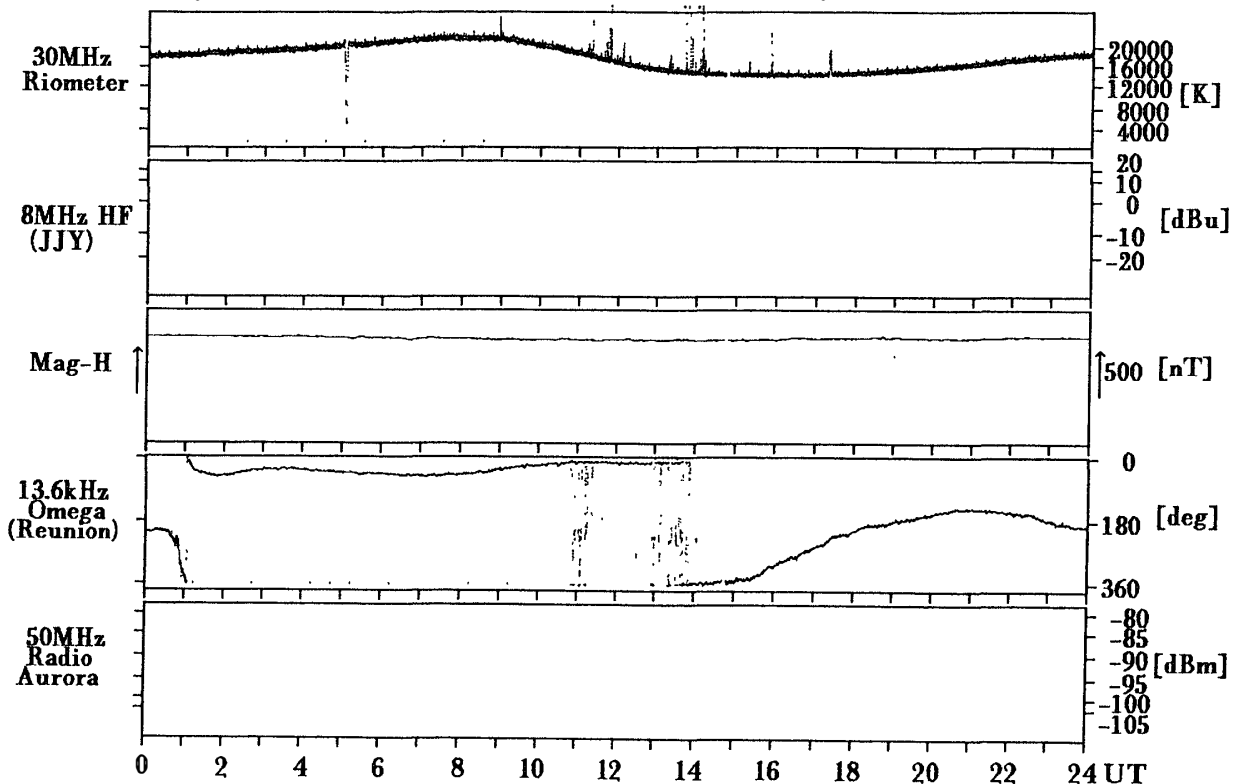
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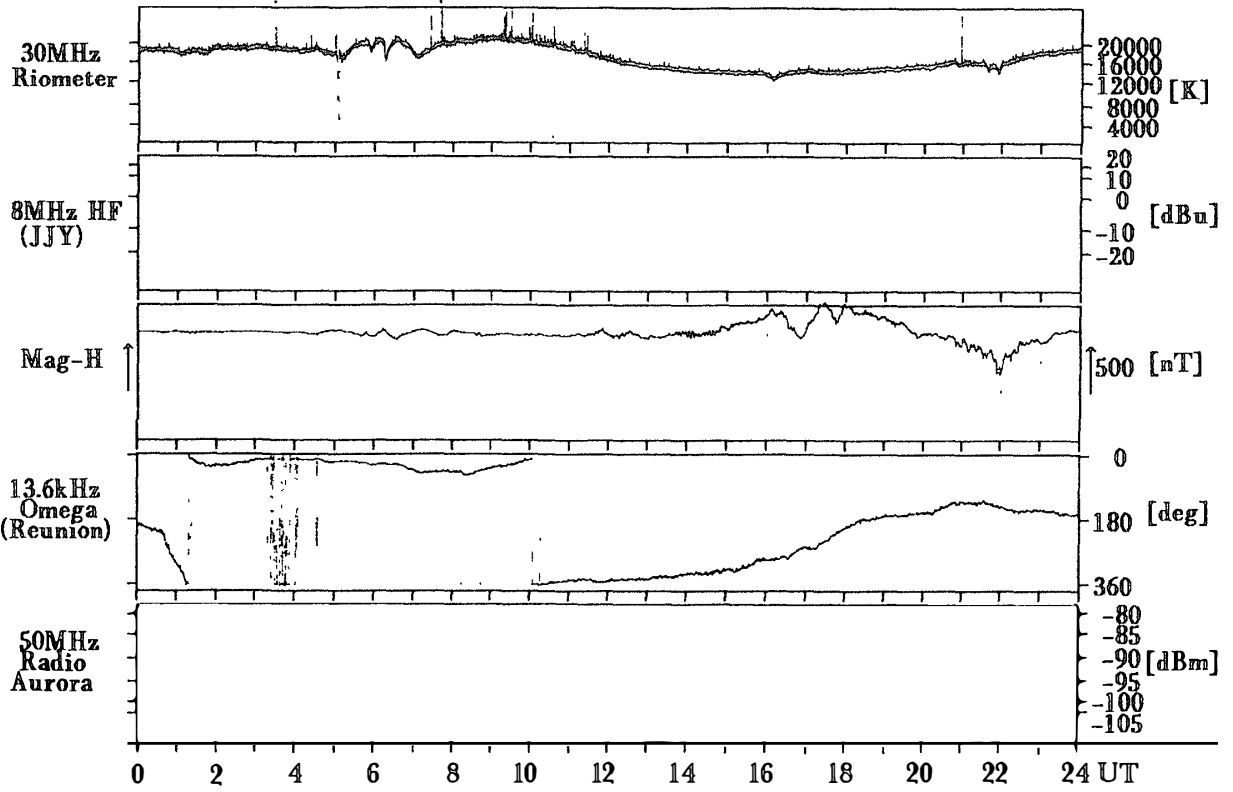
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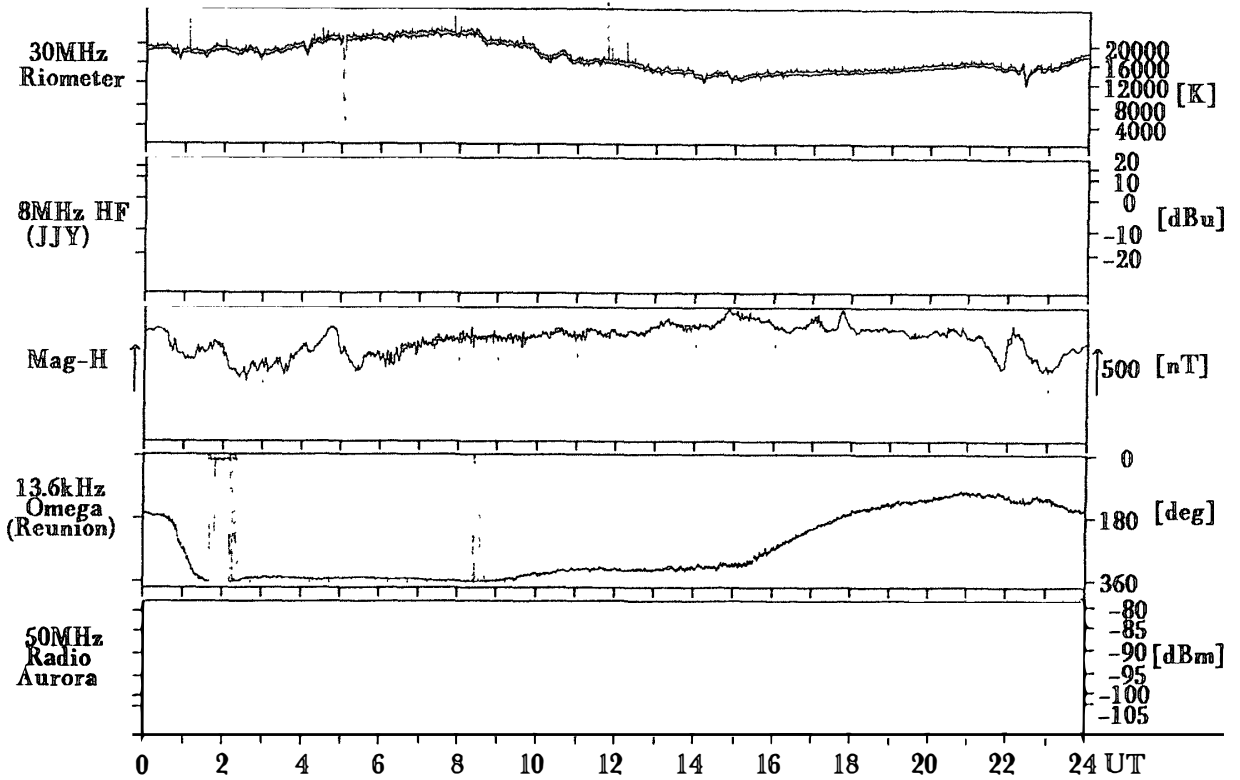
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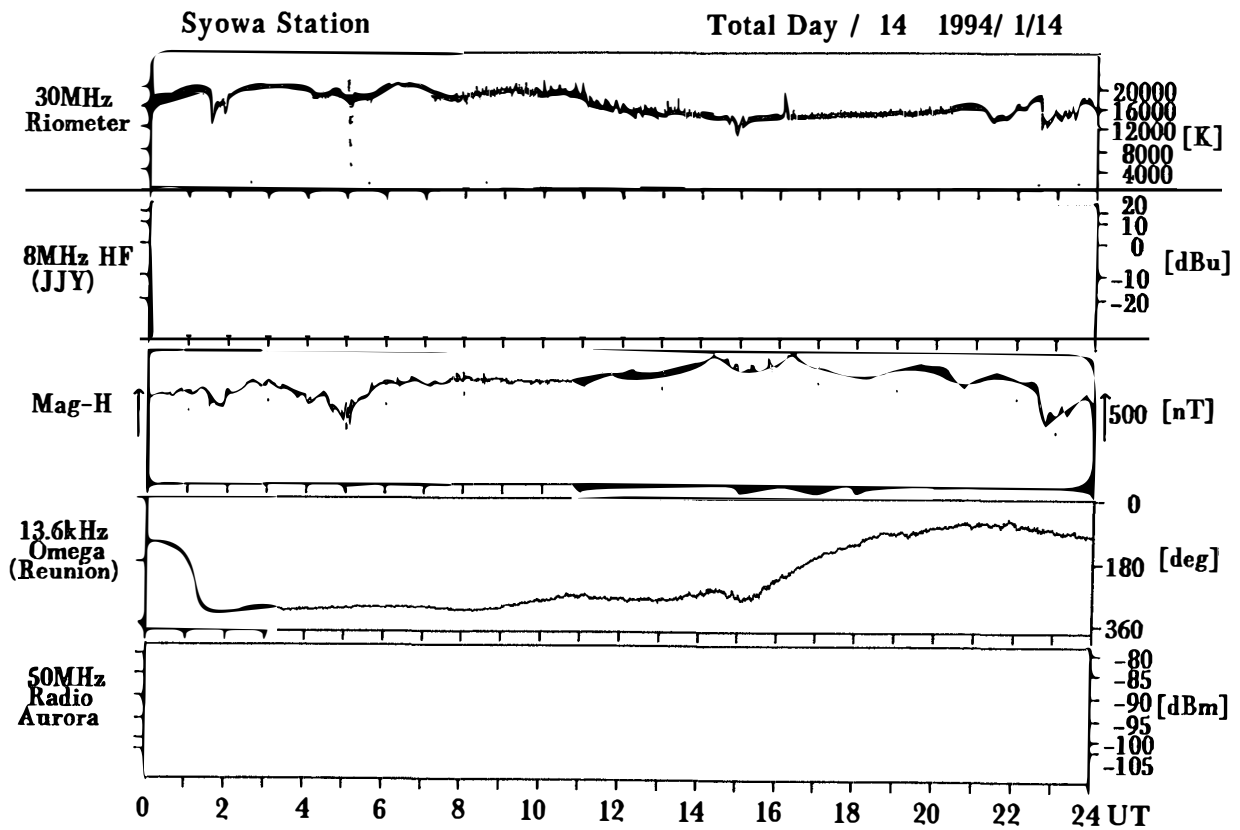
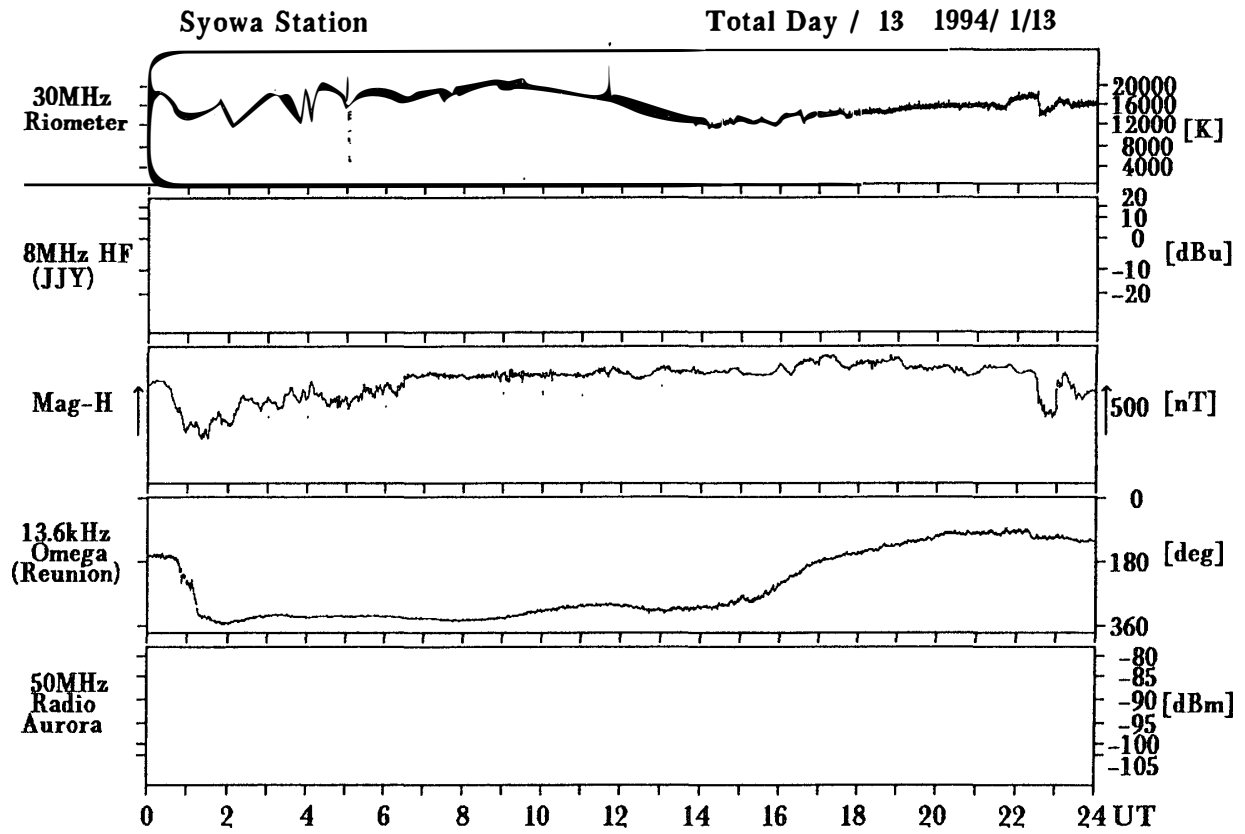
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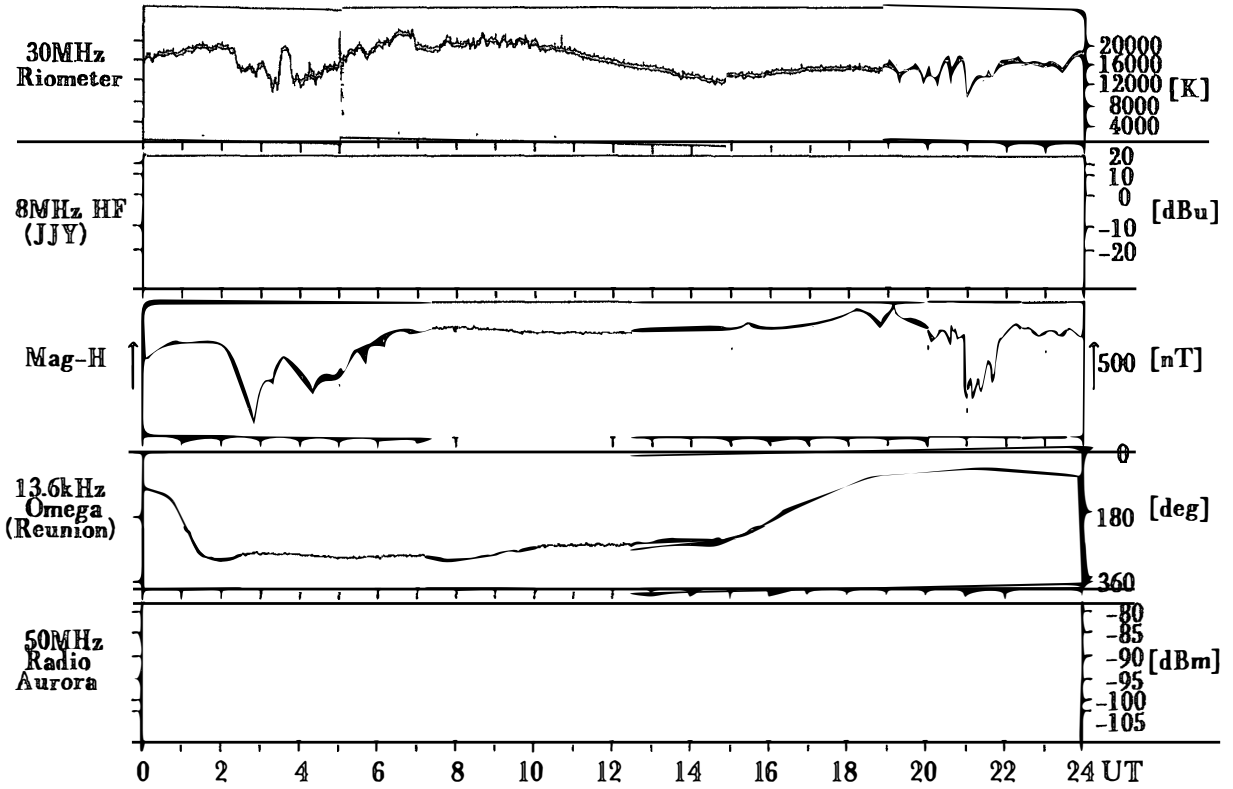
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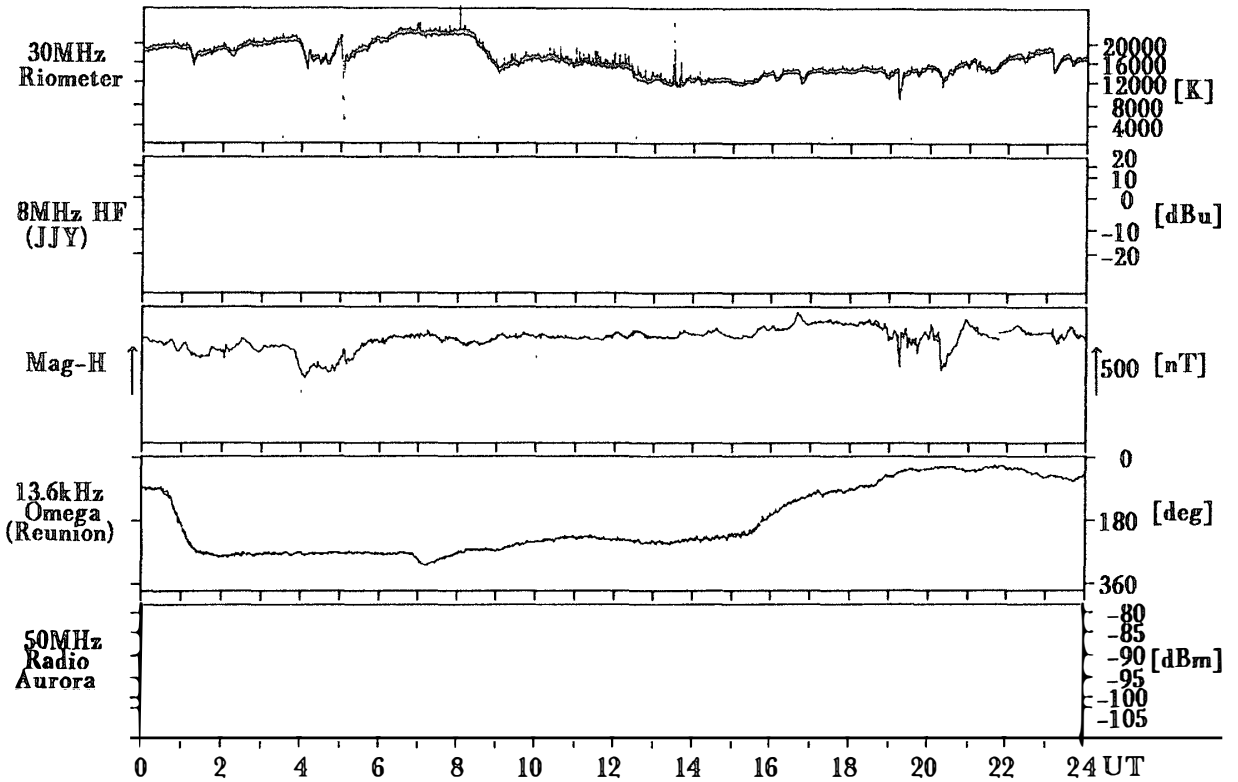
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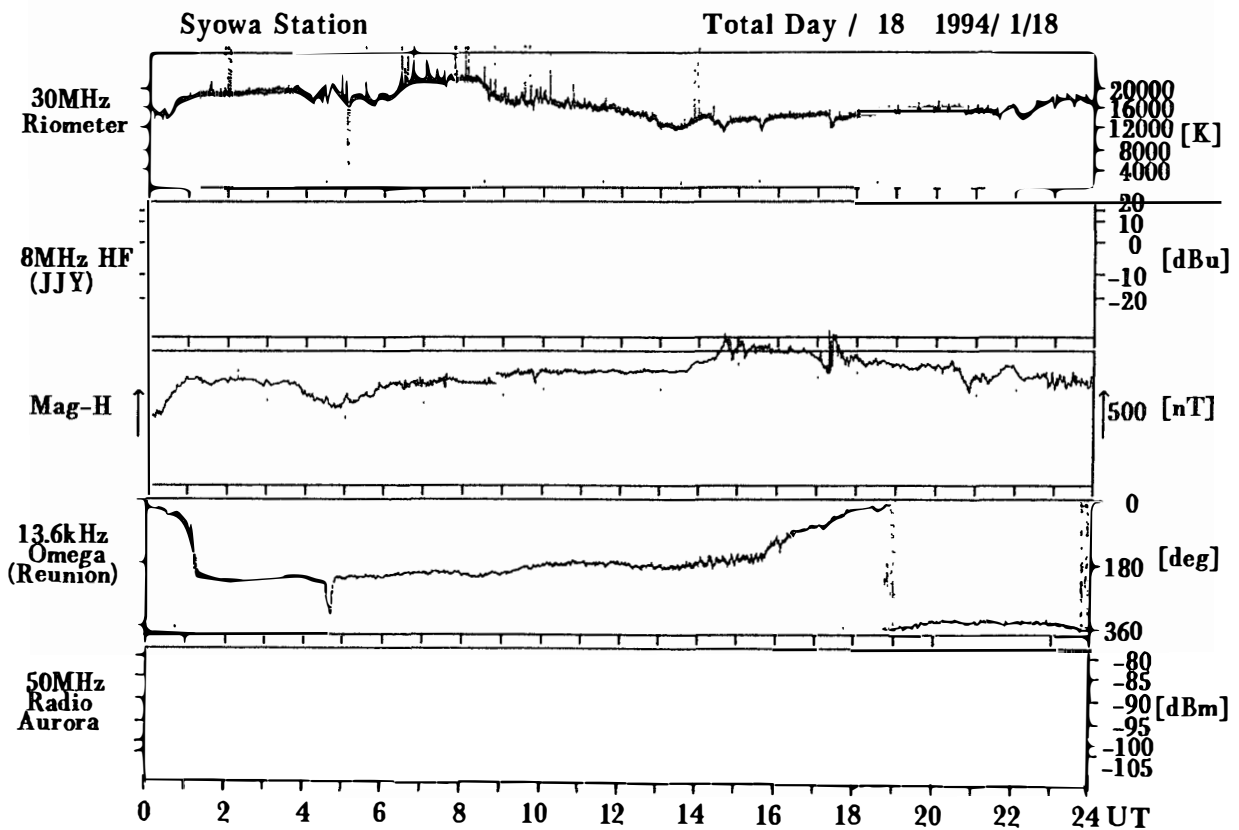
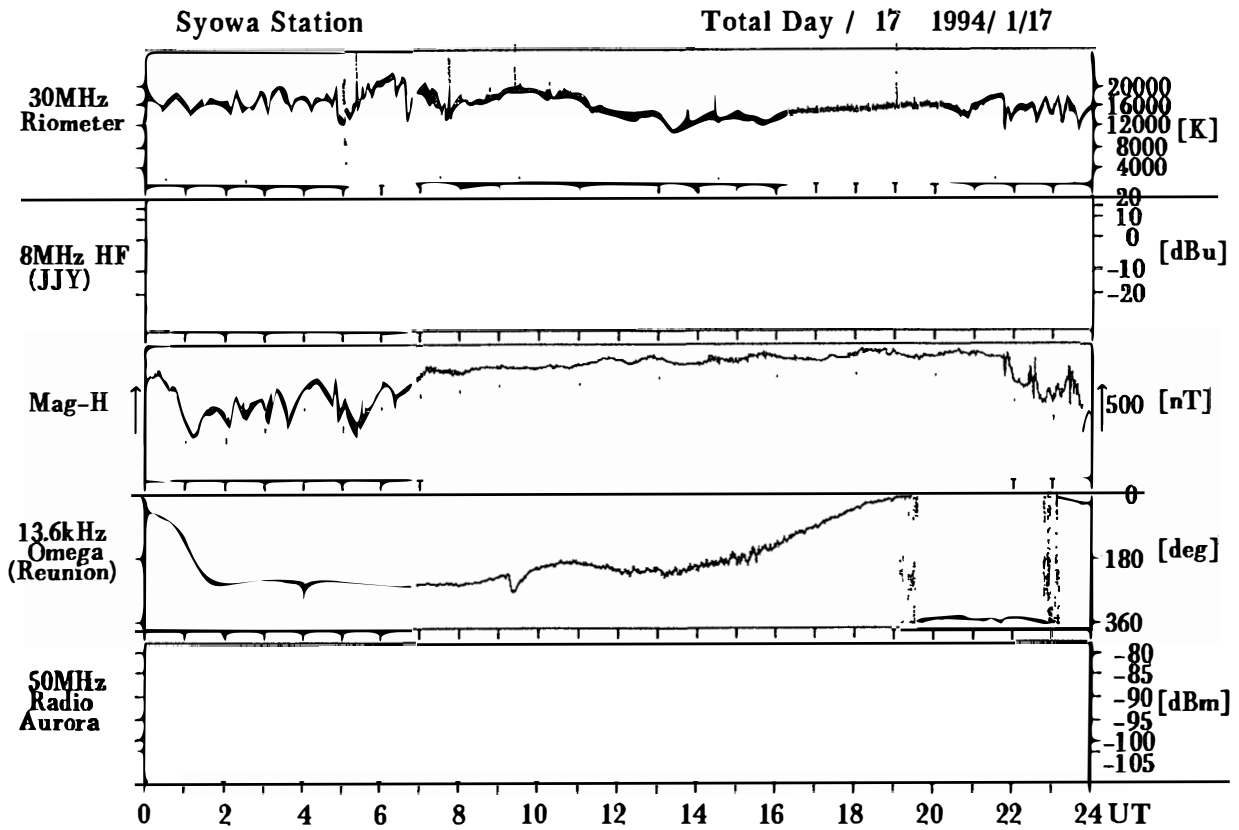
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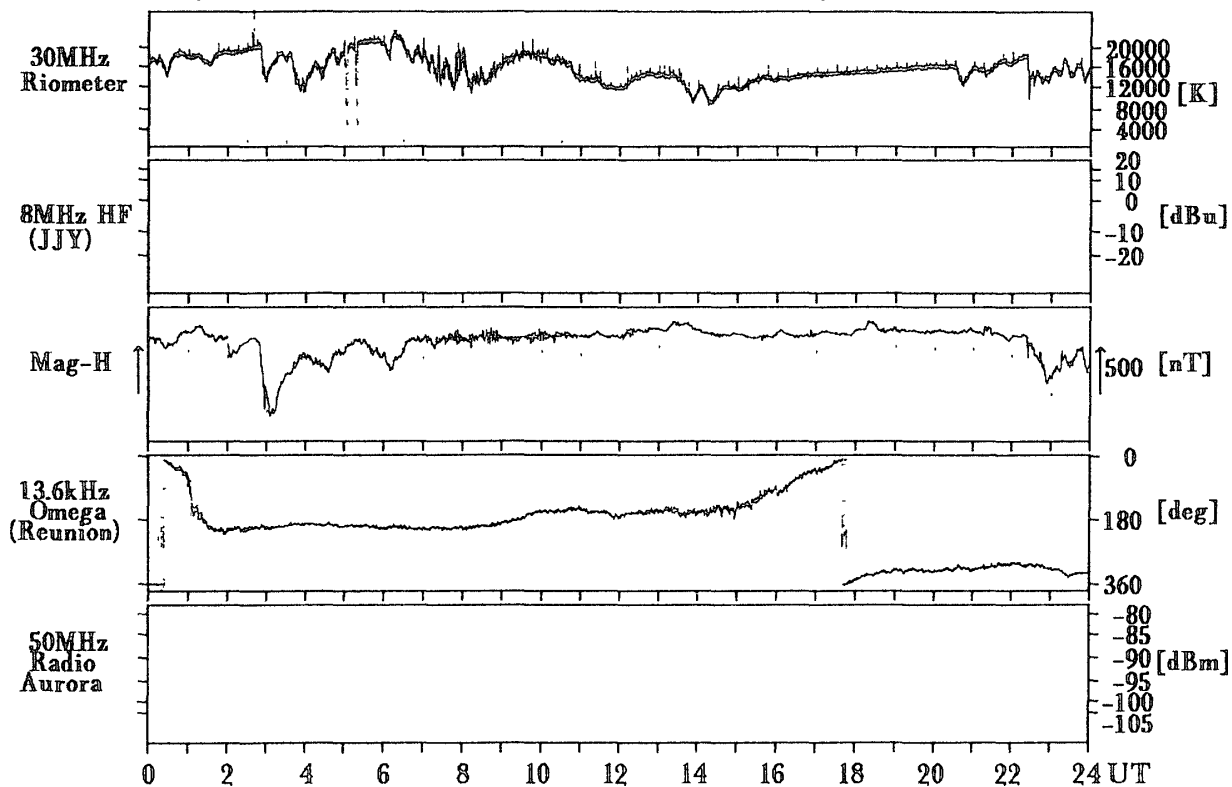
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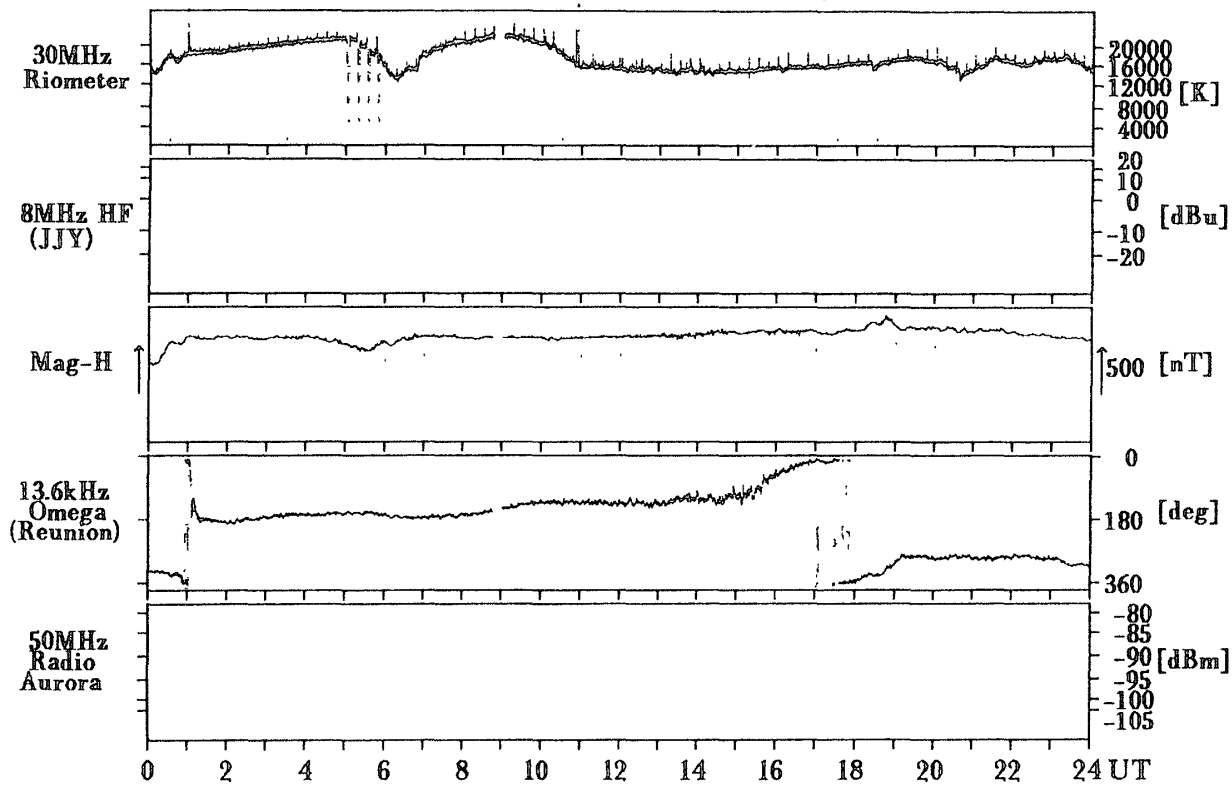
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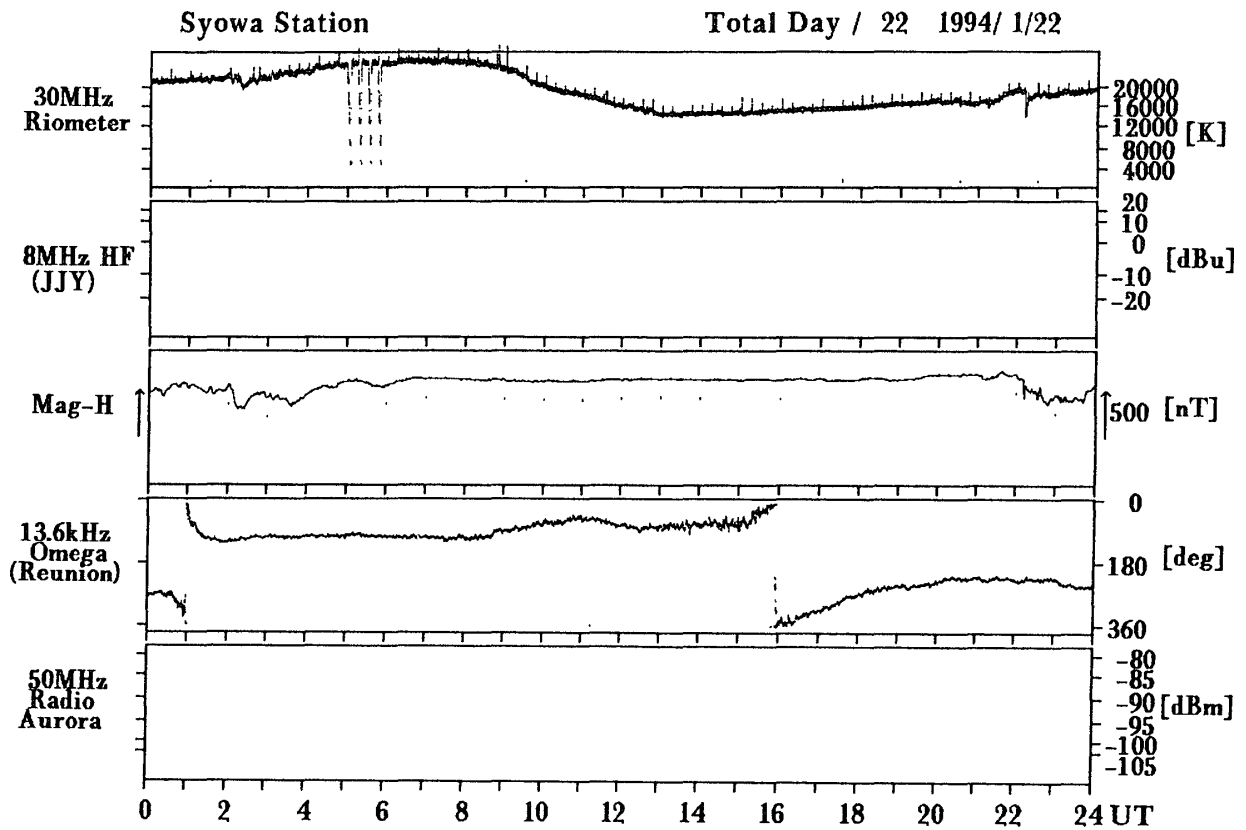
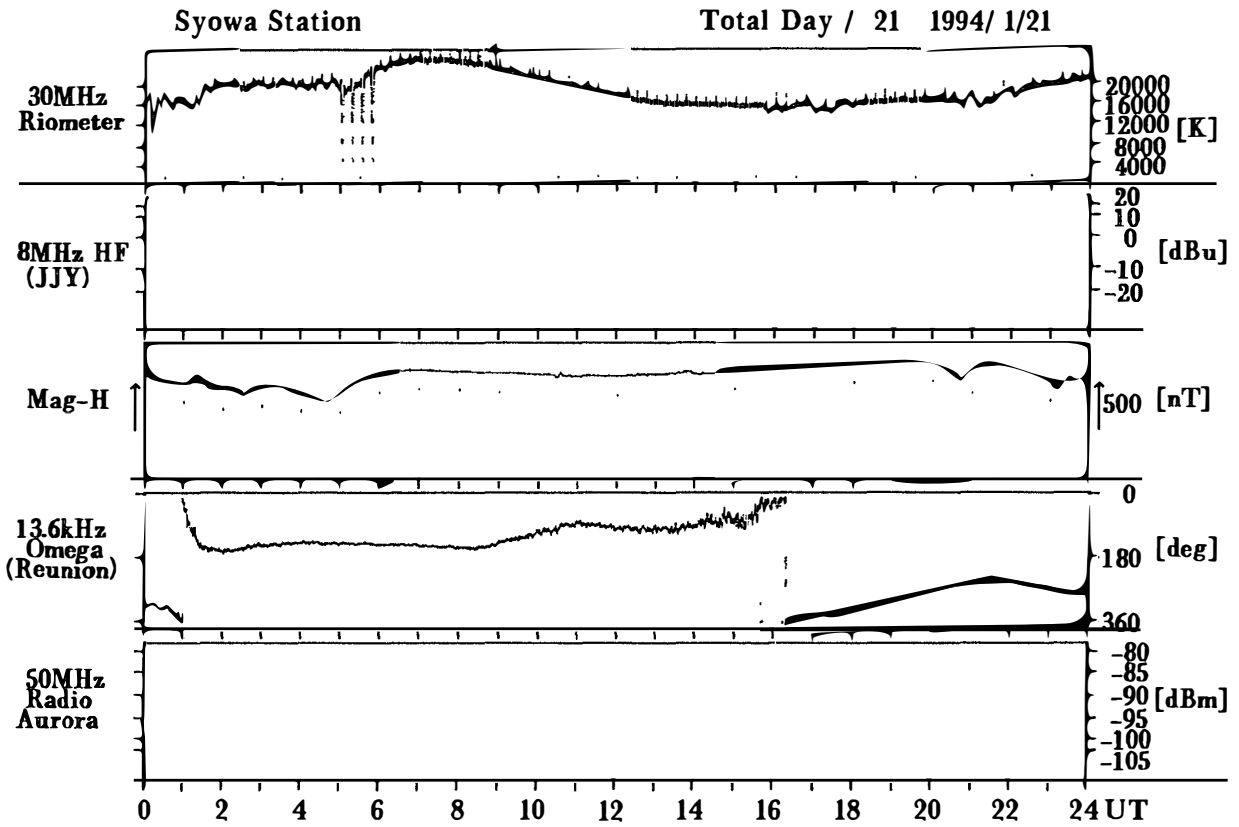
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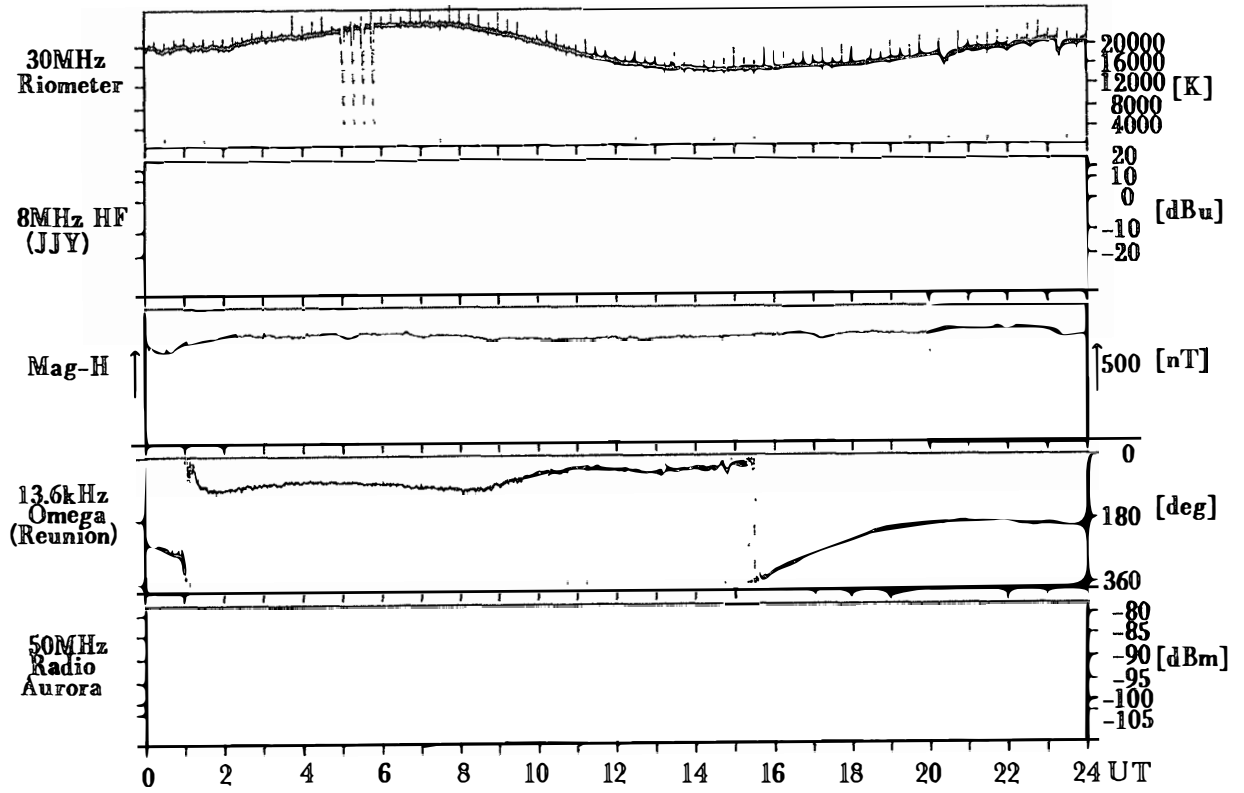
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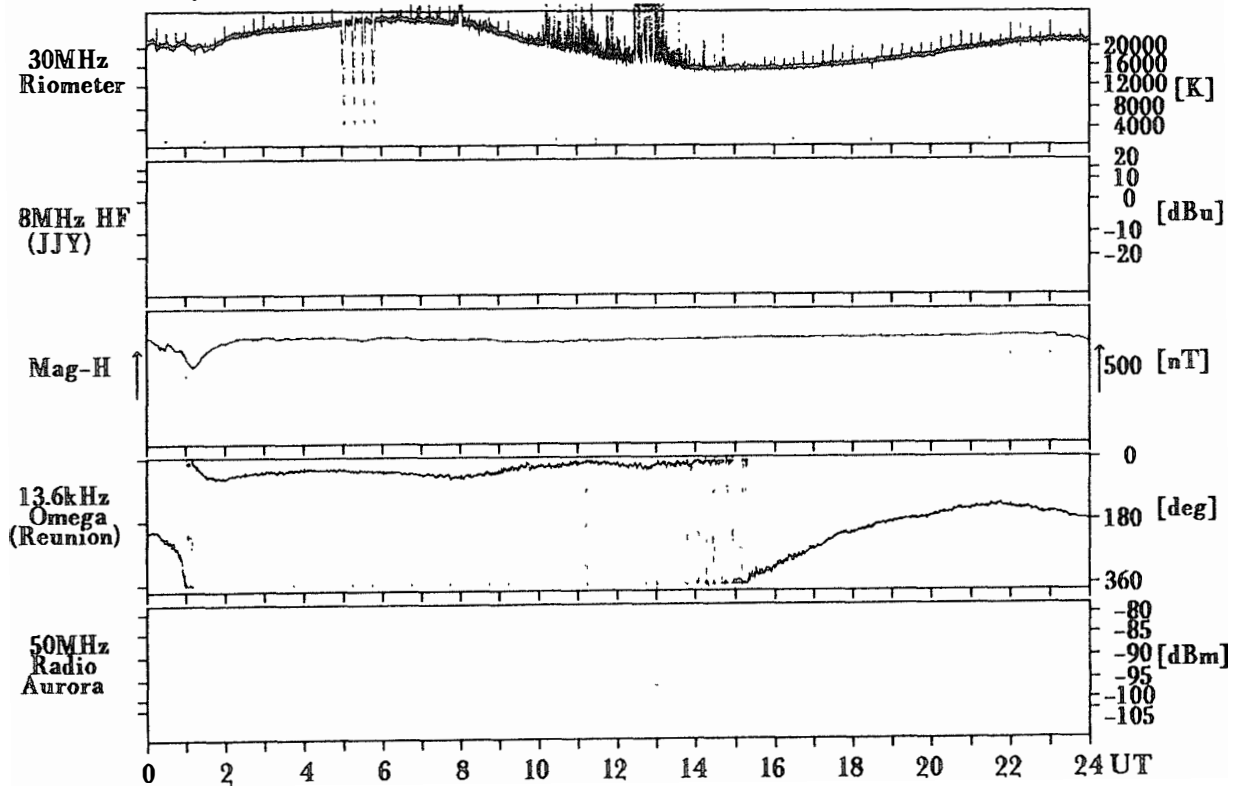
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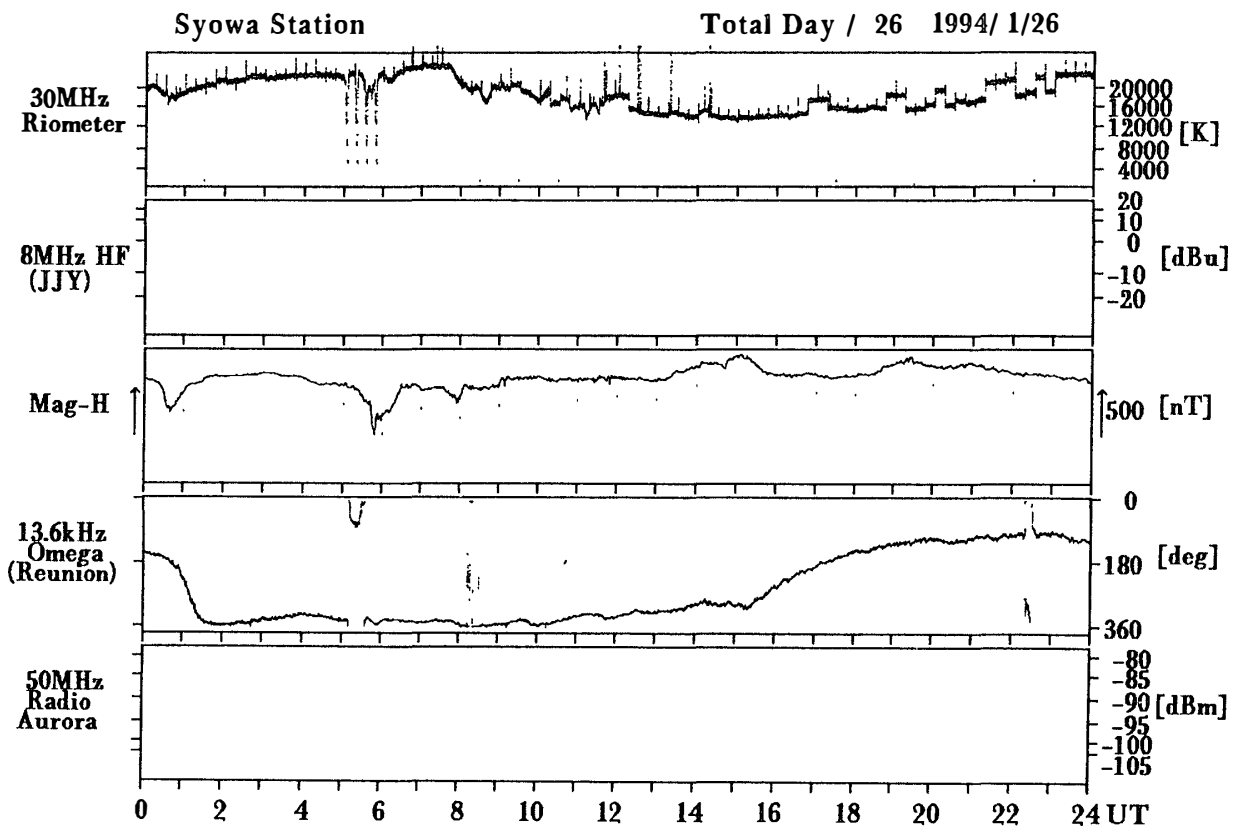
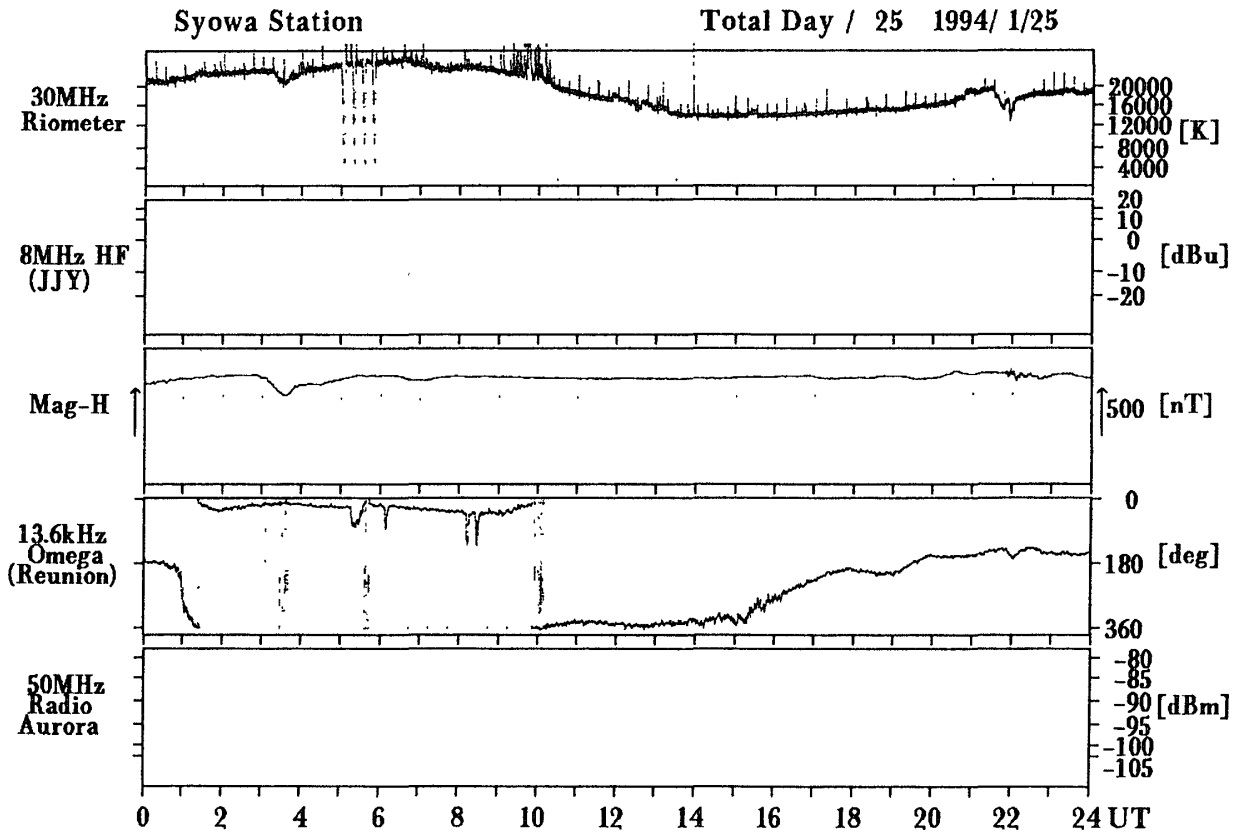
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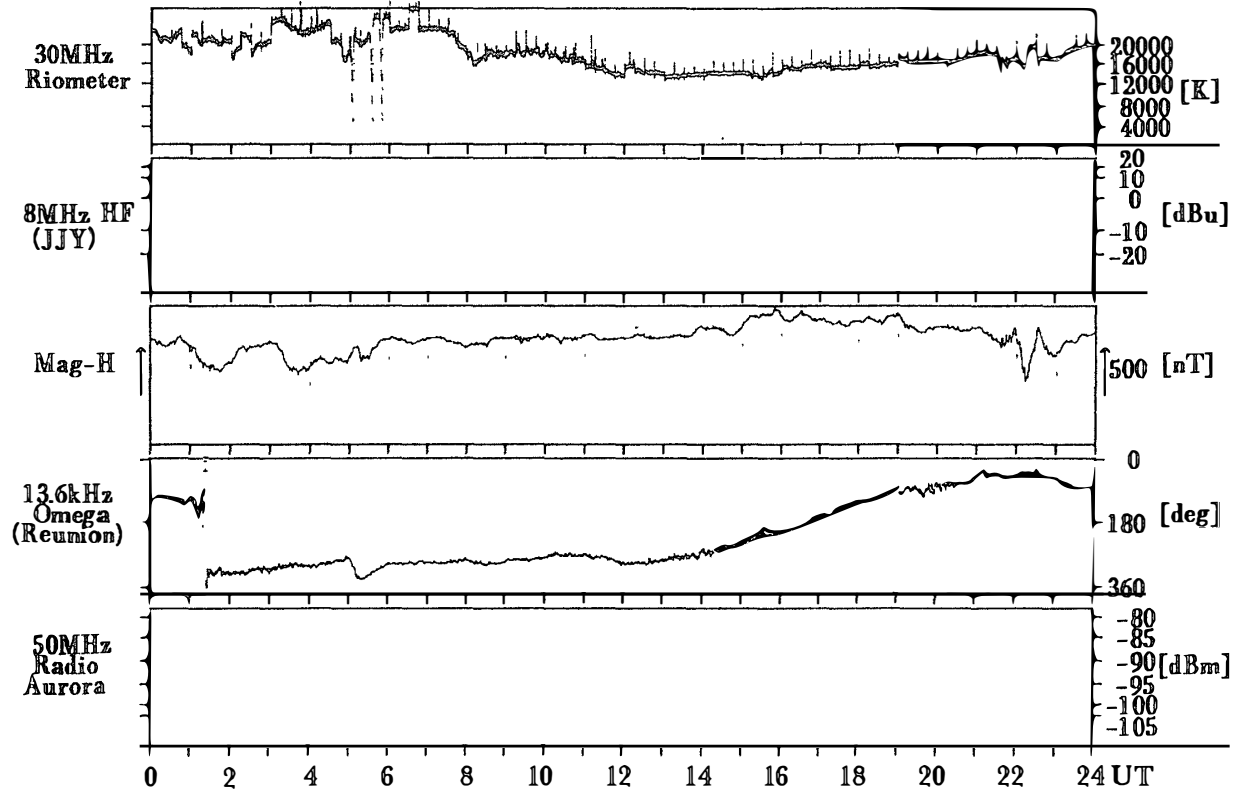
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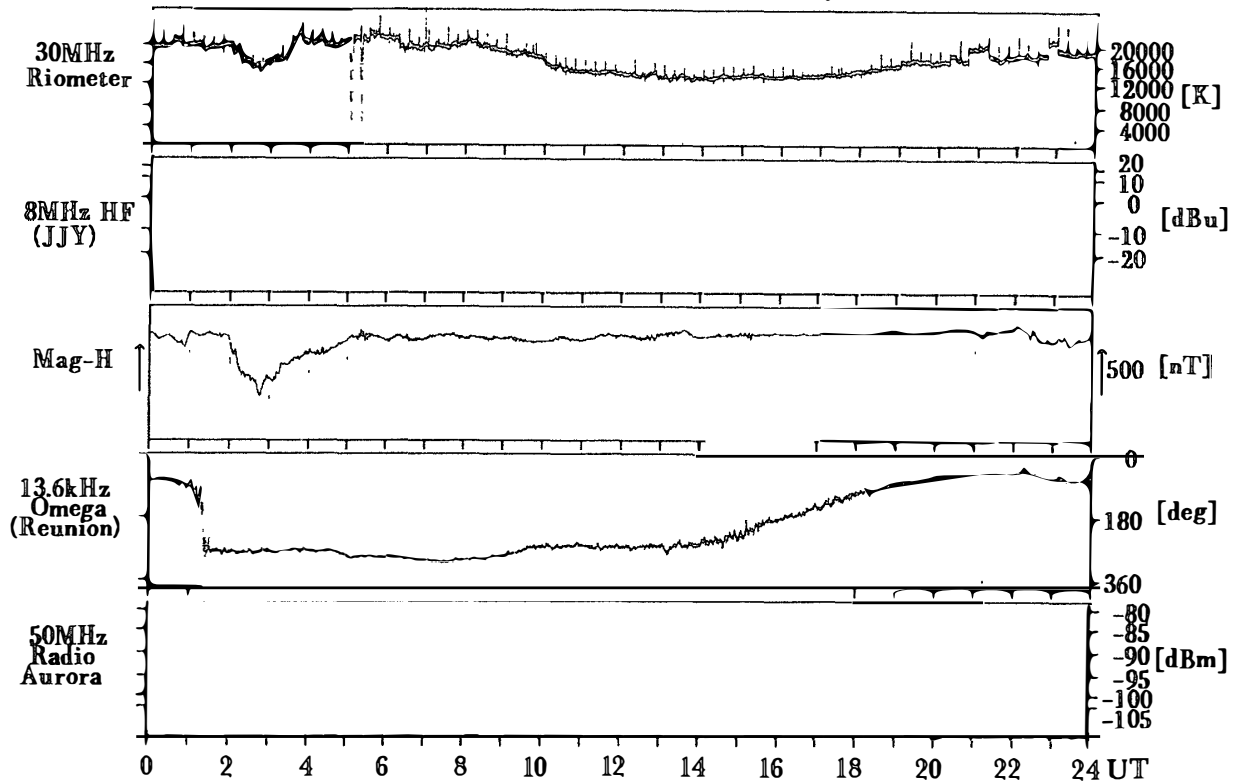
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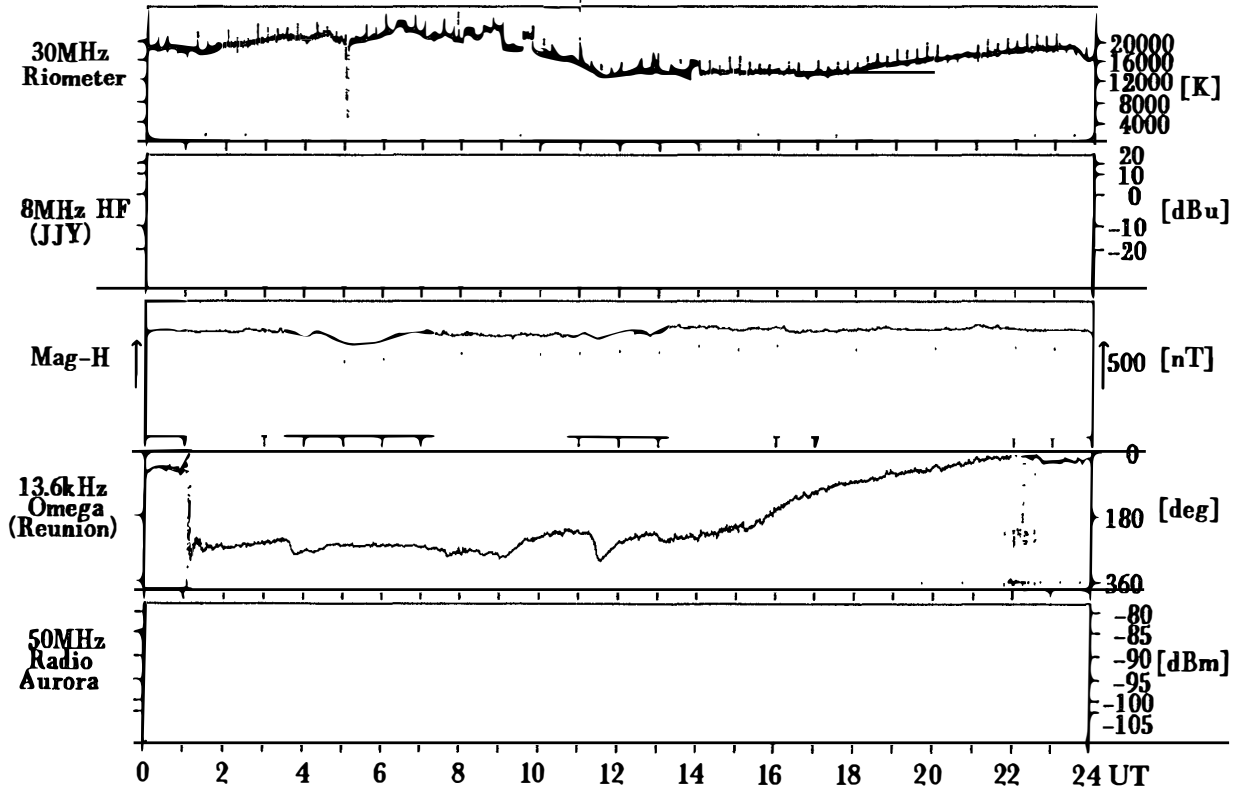
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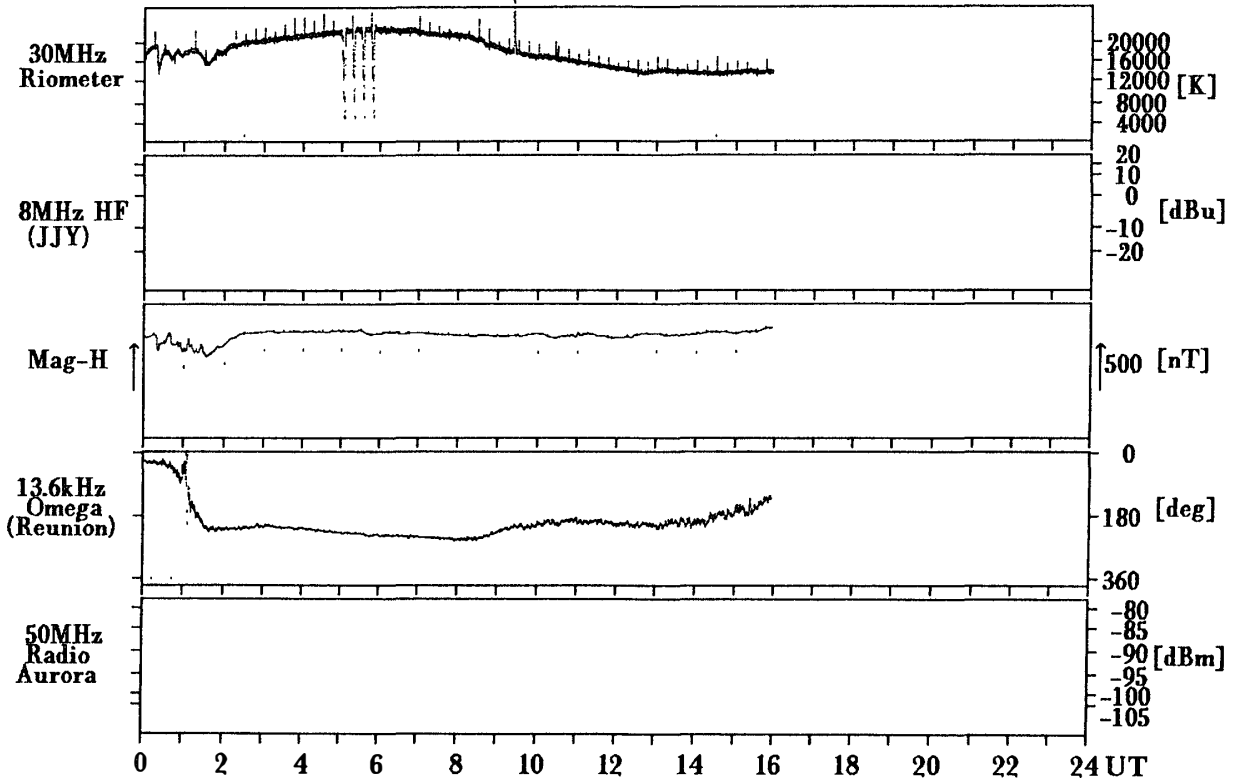
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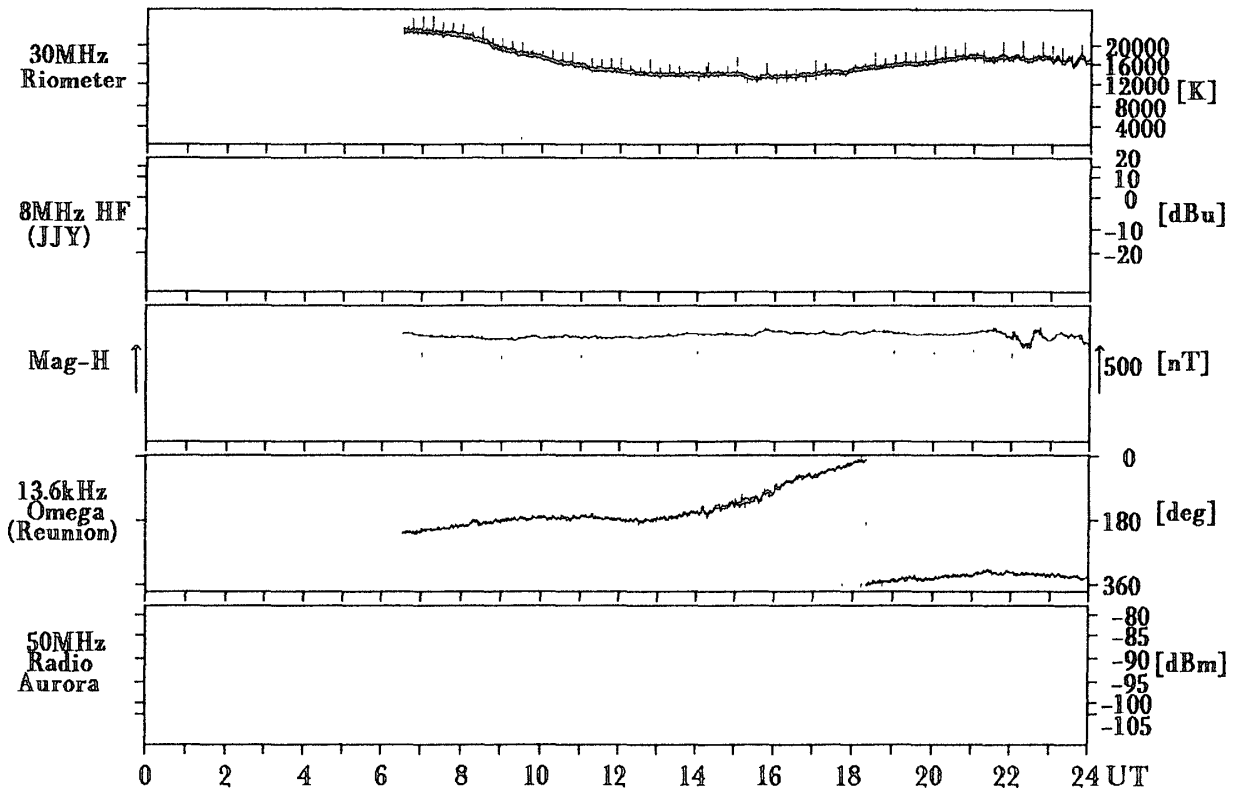
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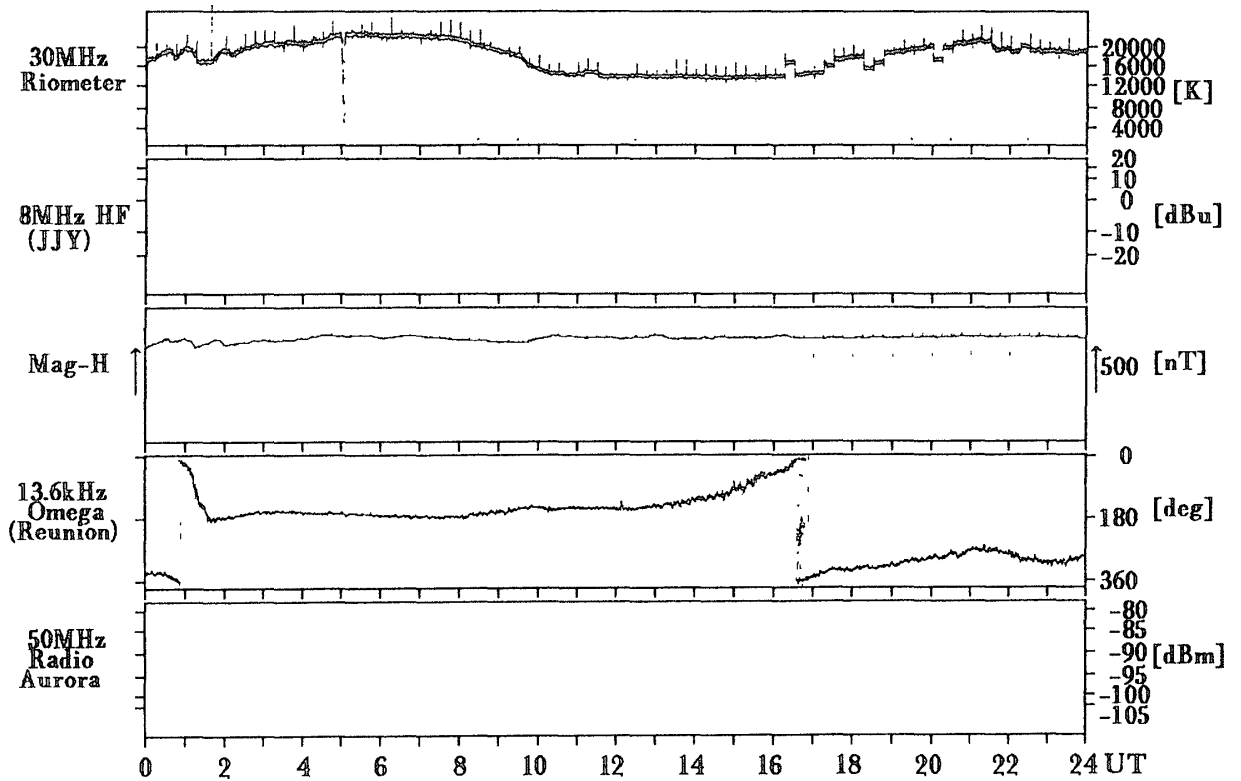
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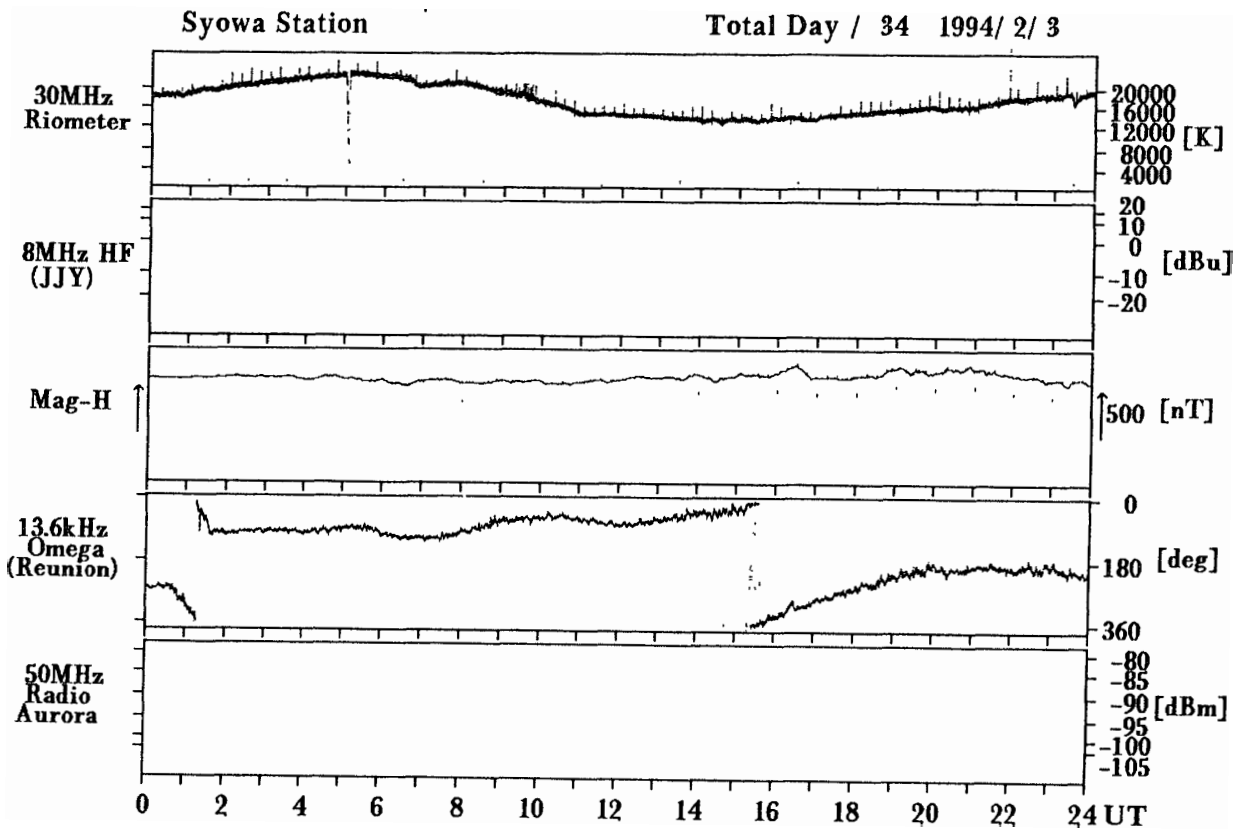
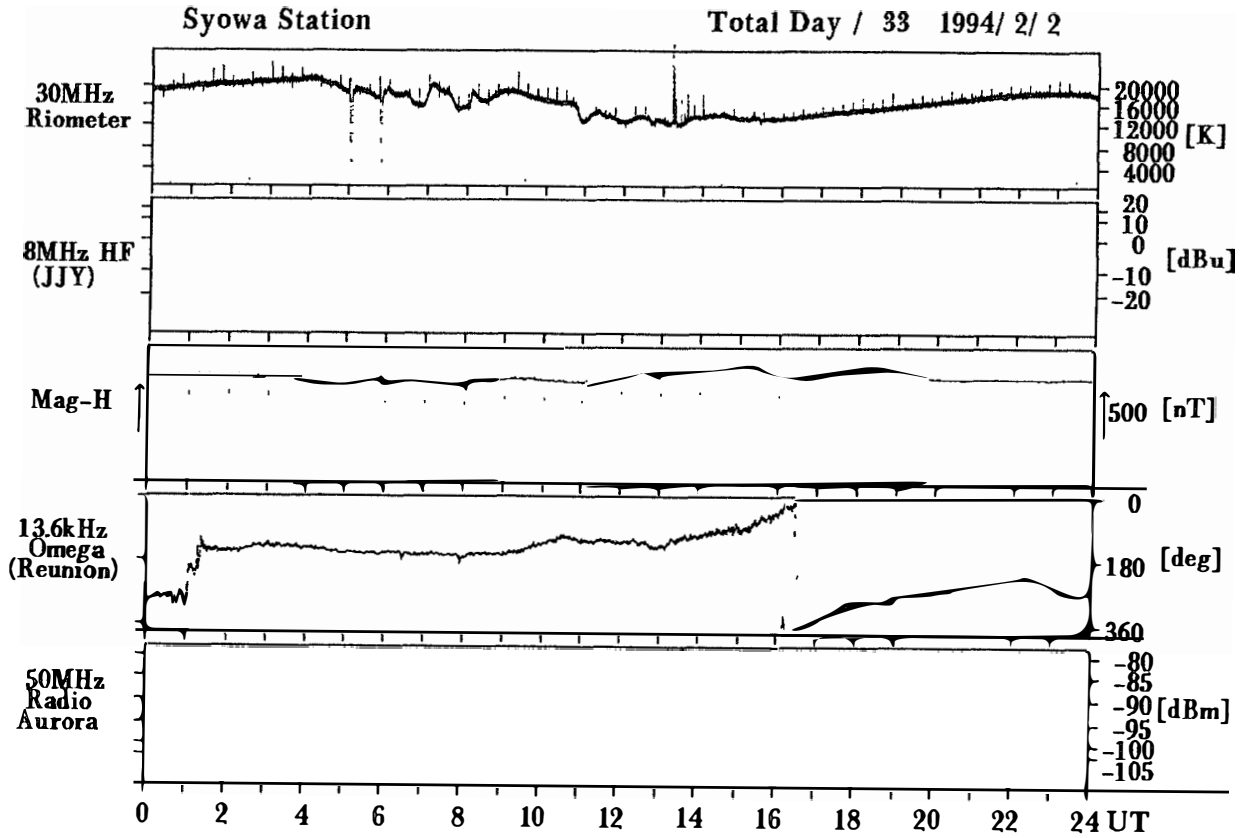
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Syowa Station

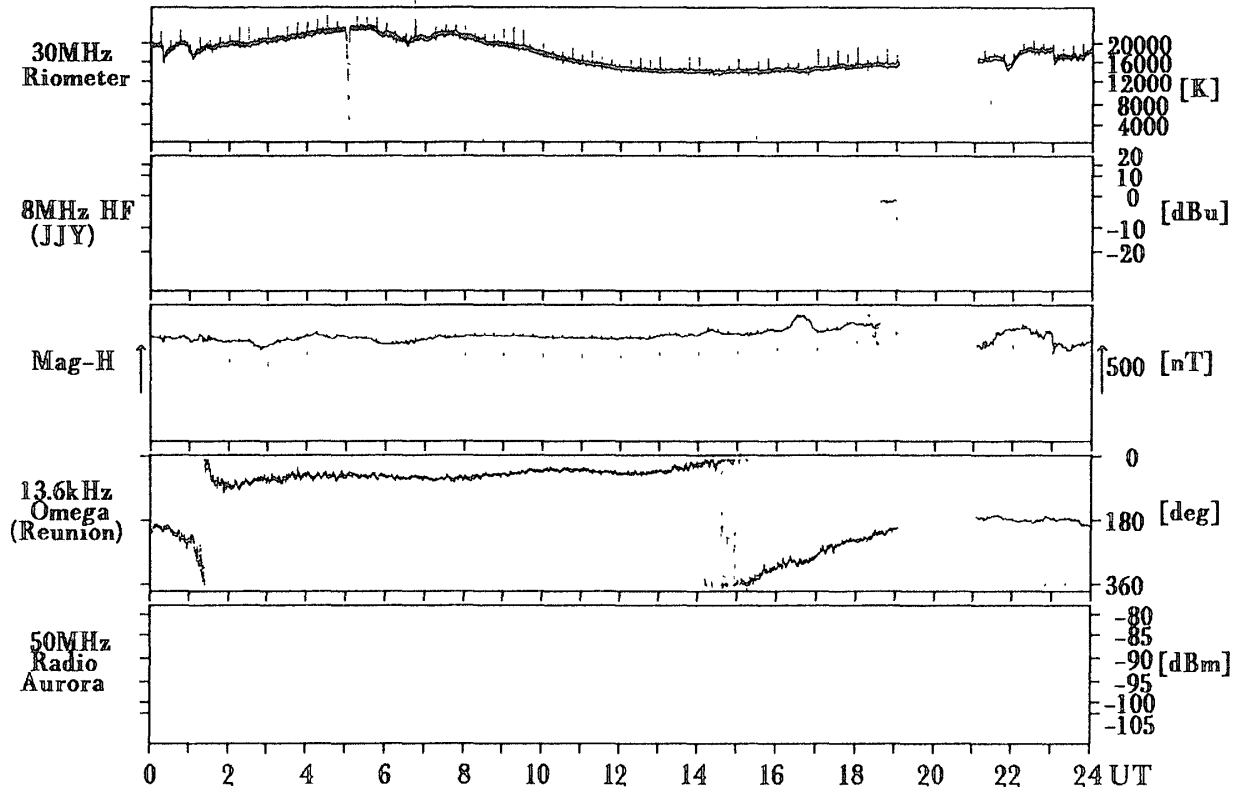
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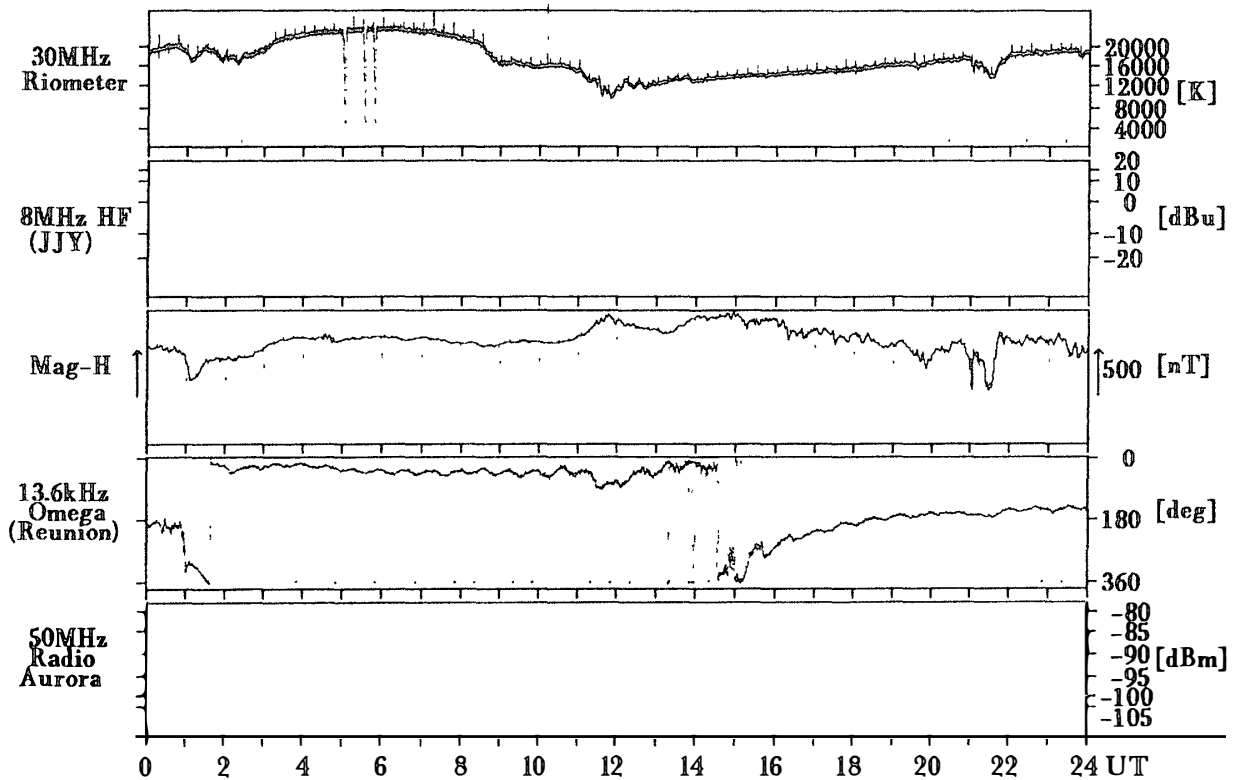
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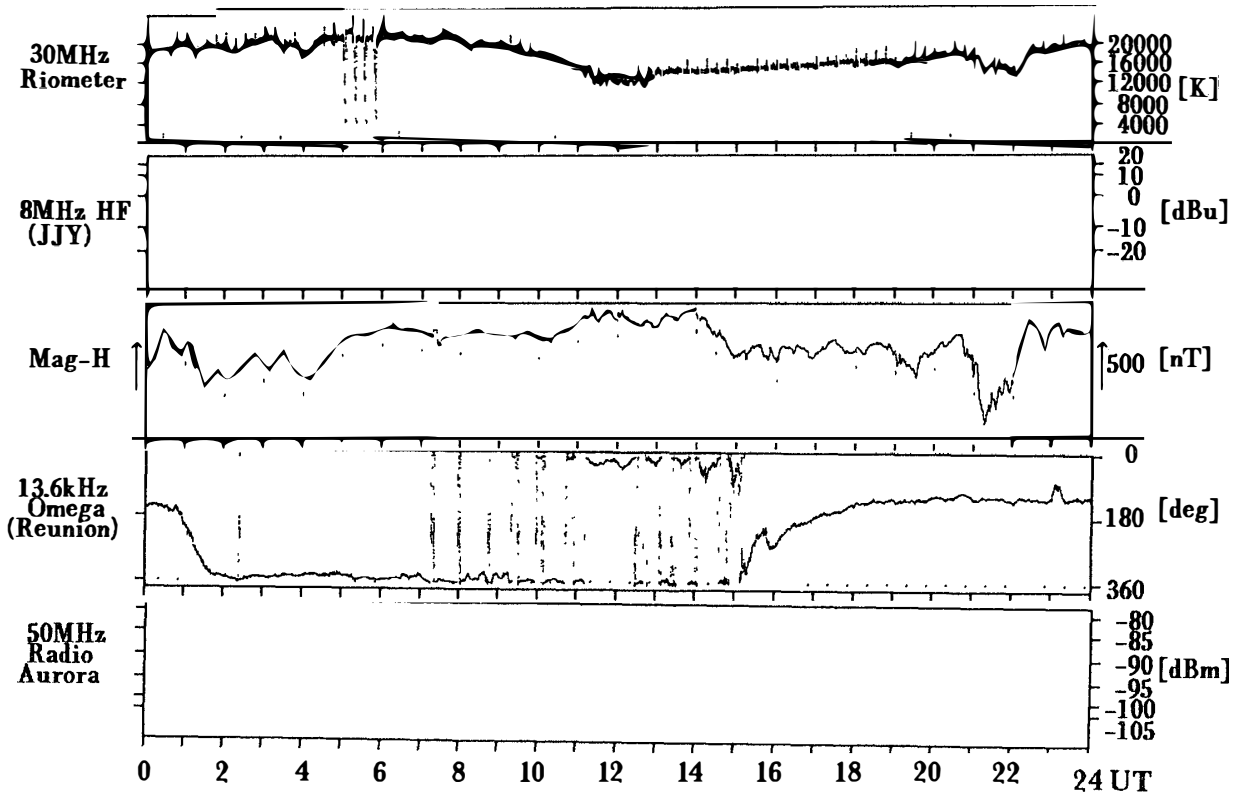
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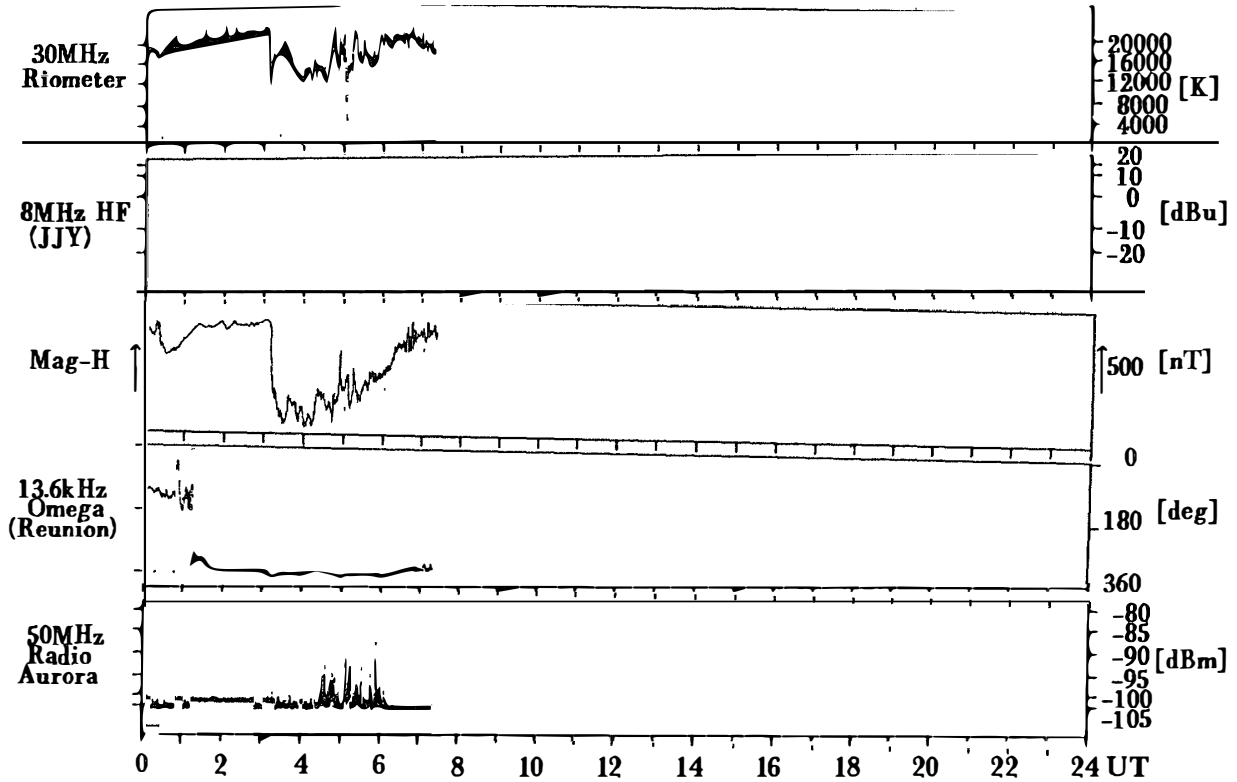
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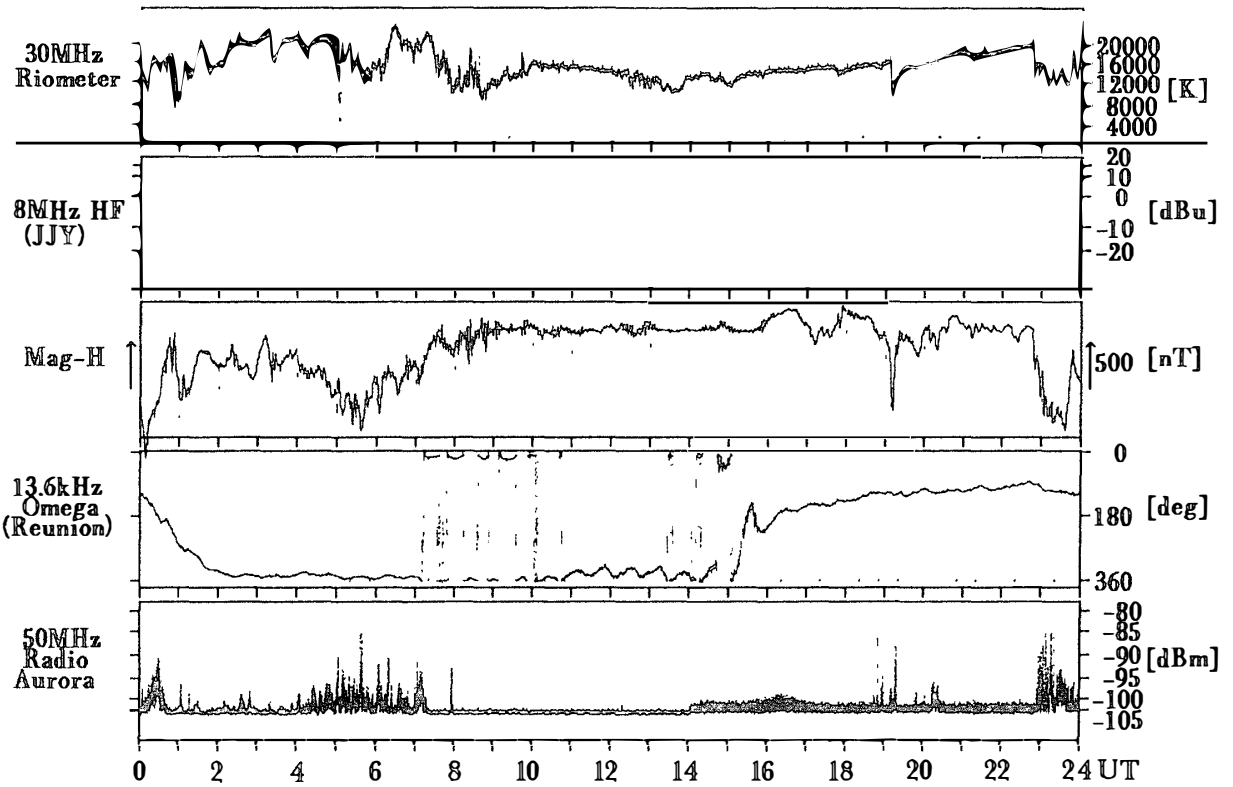
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Total Day / 38 1994/ 2/ 7



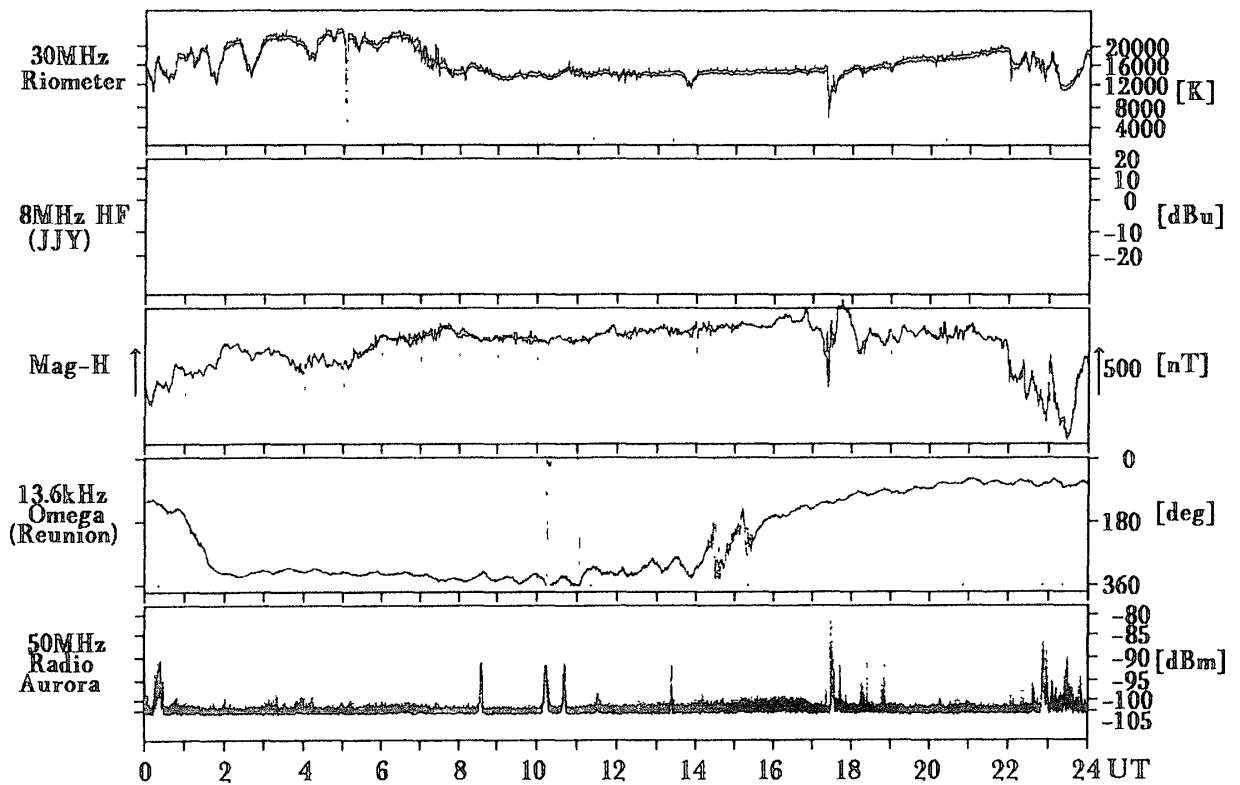
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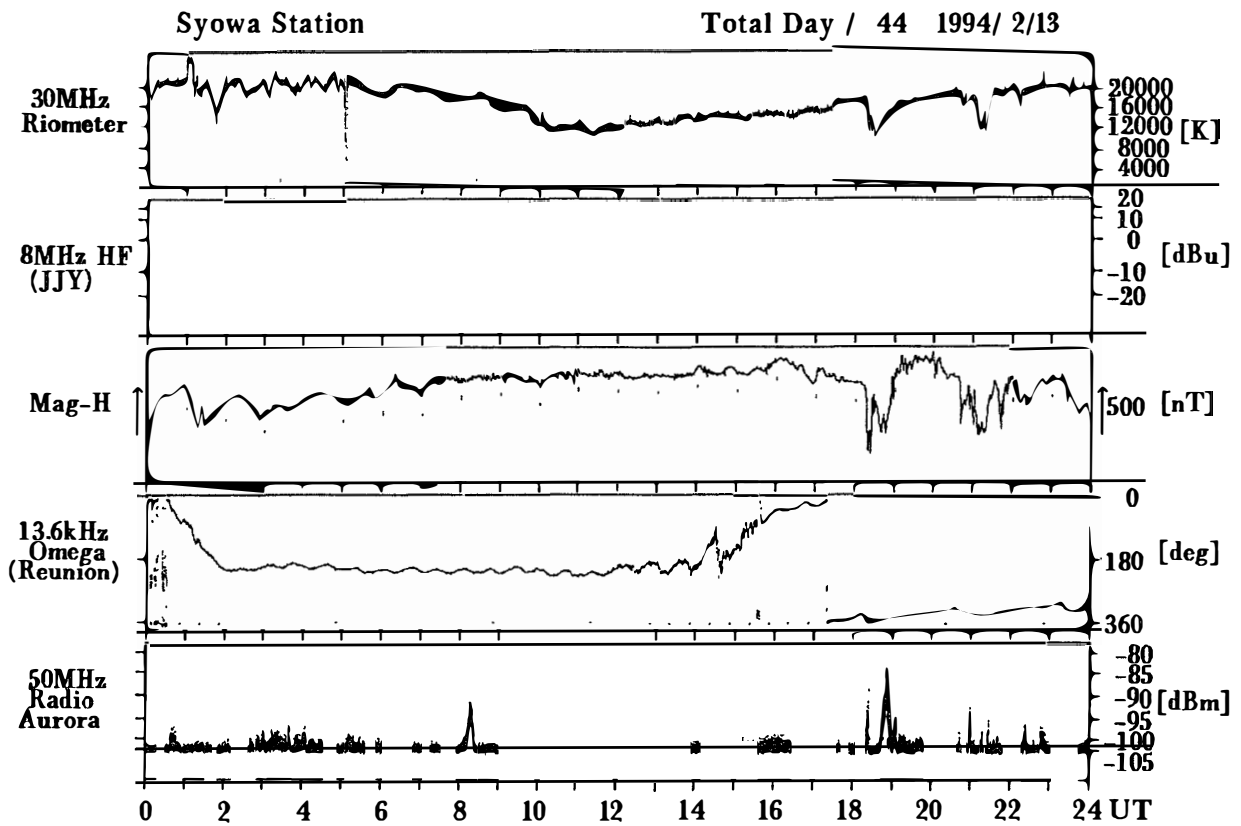
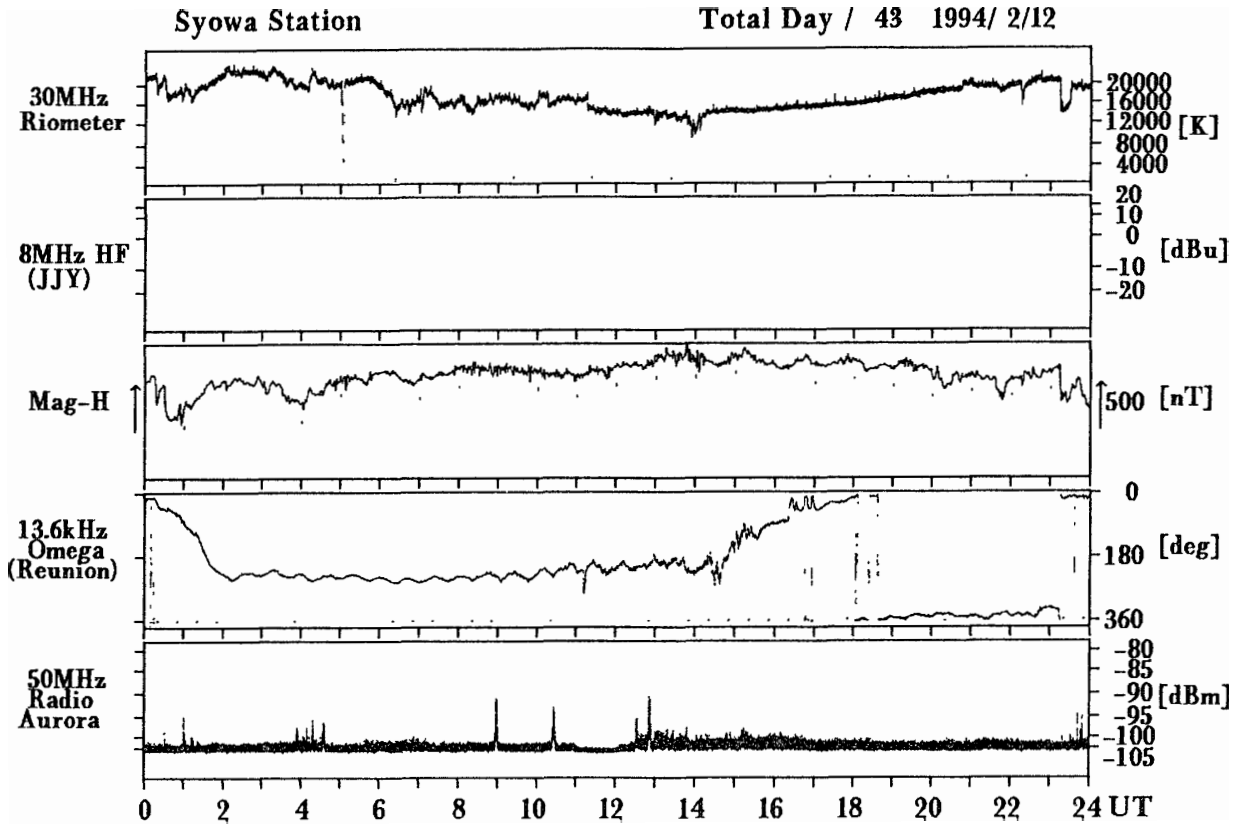
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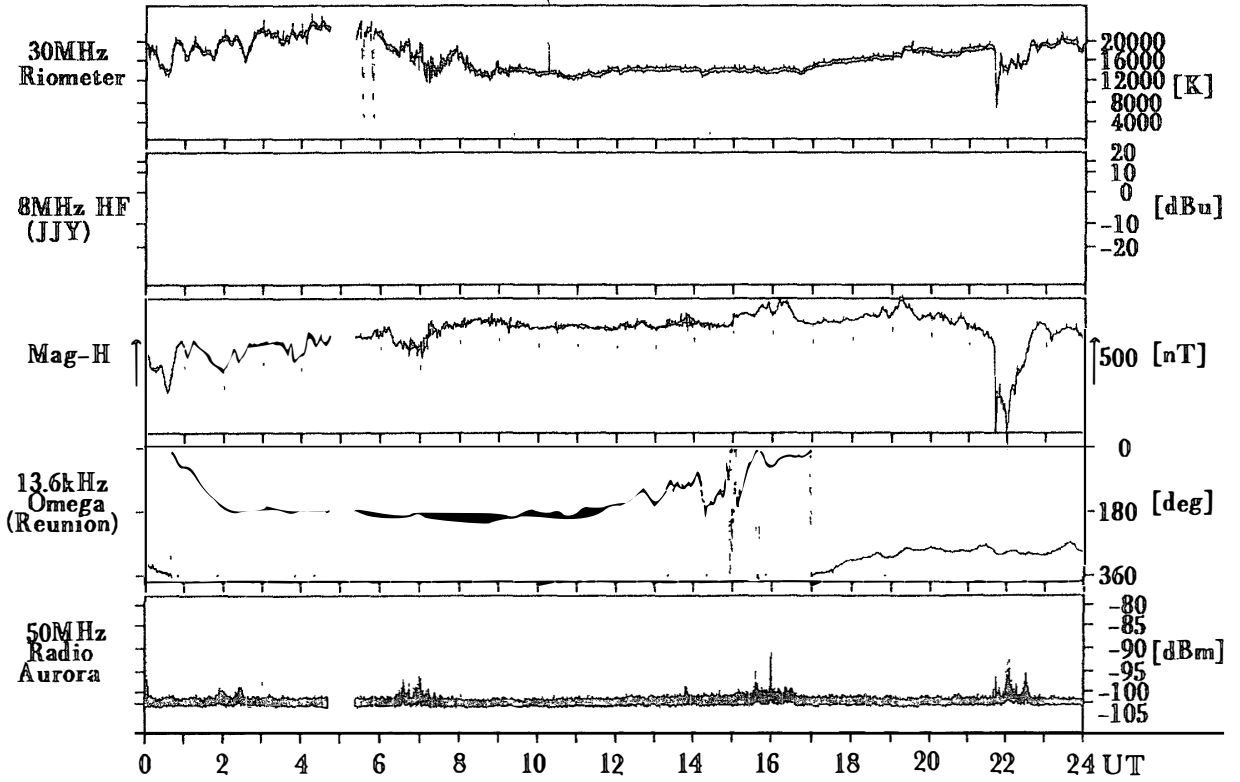
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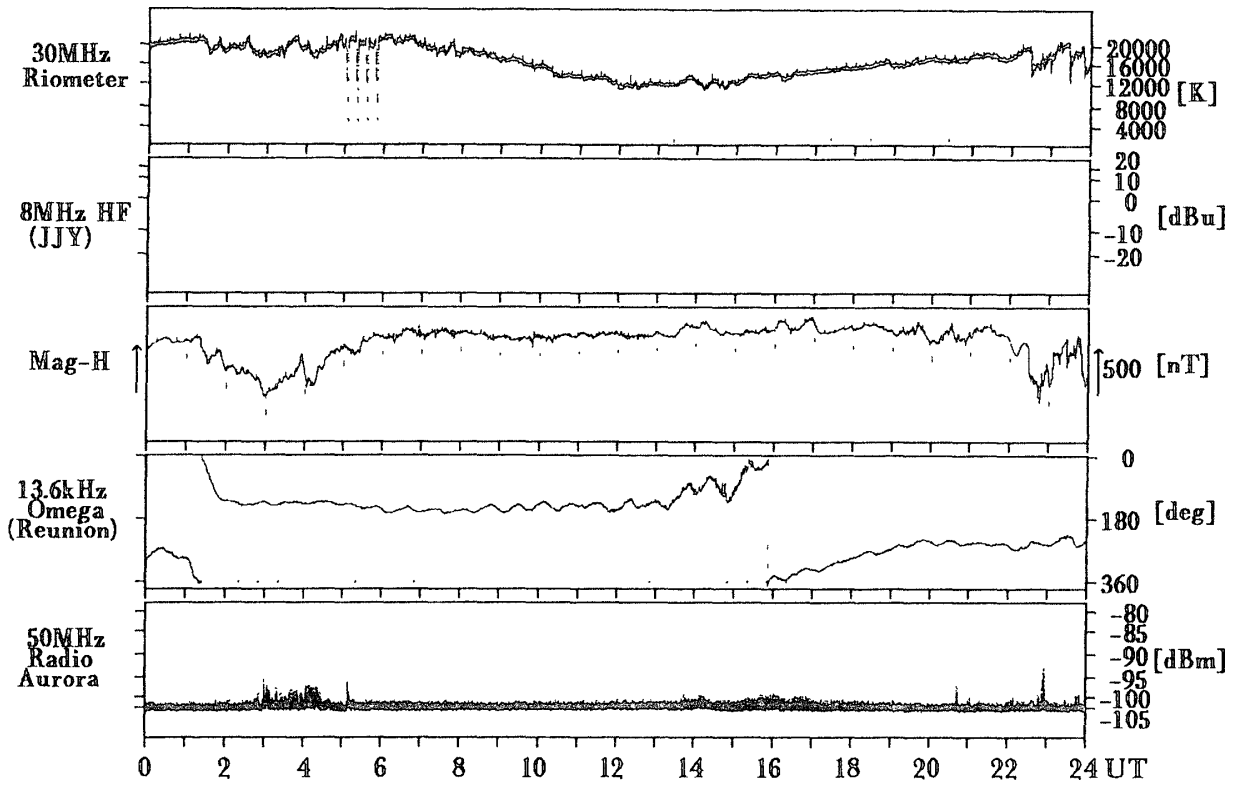
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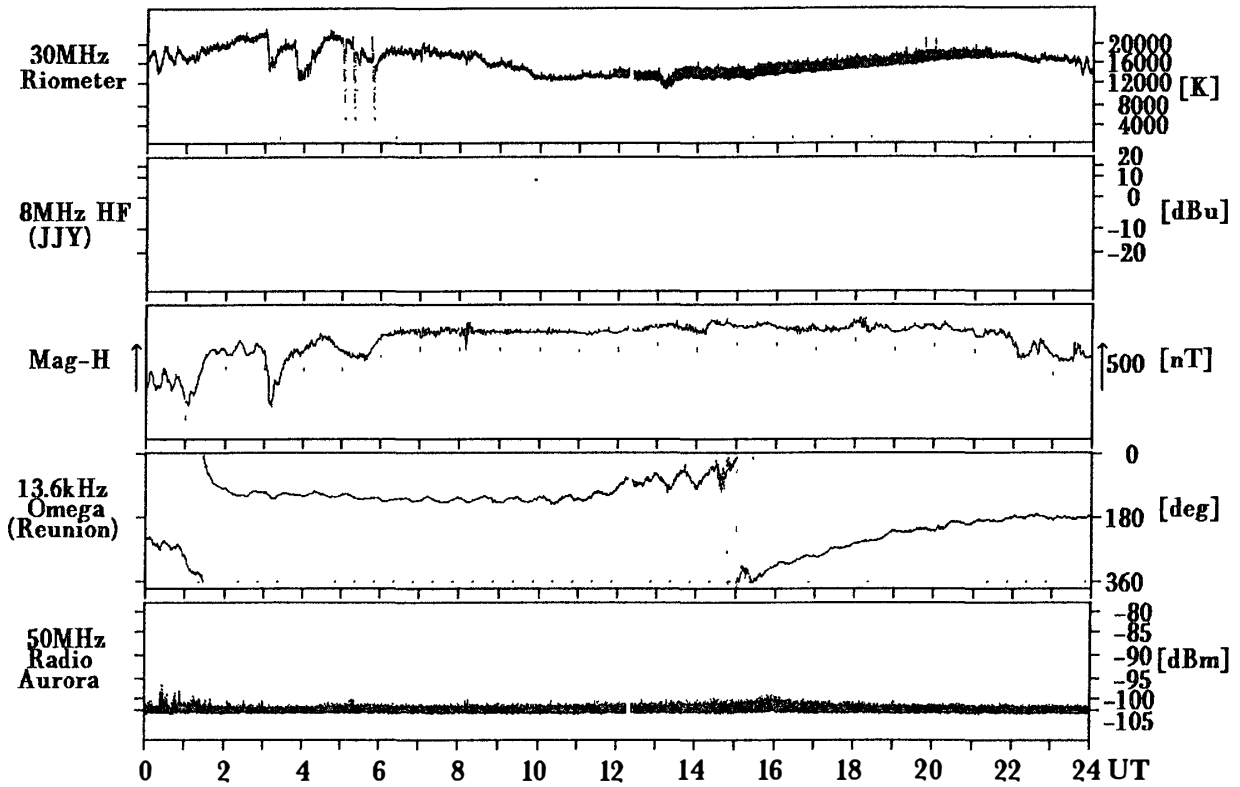
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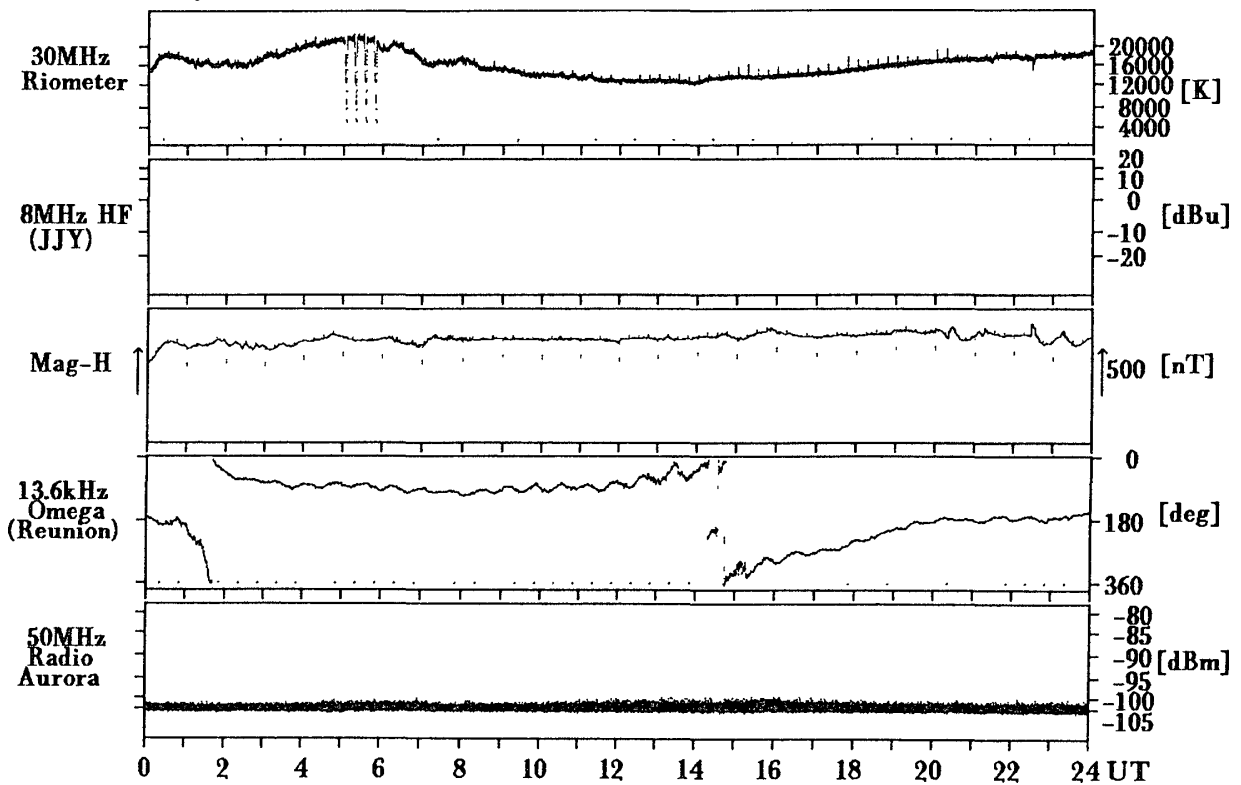
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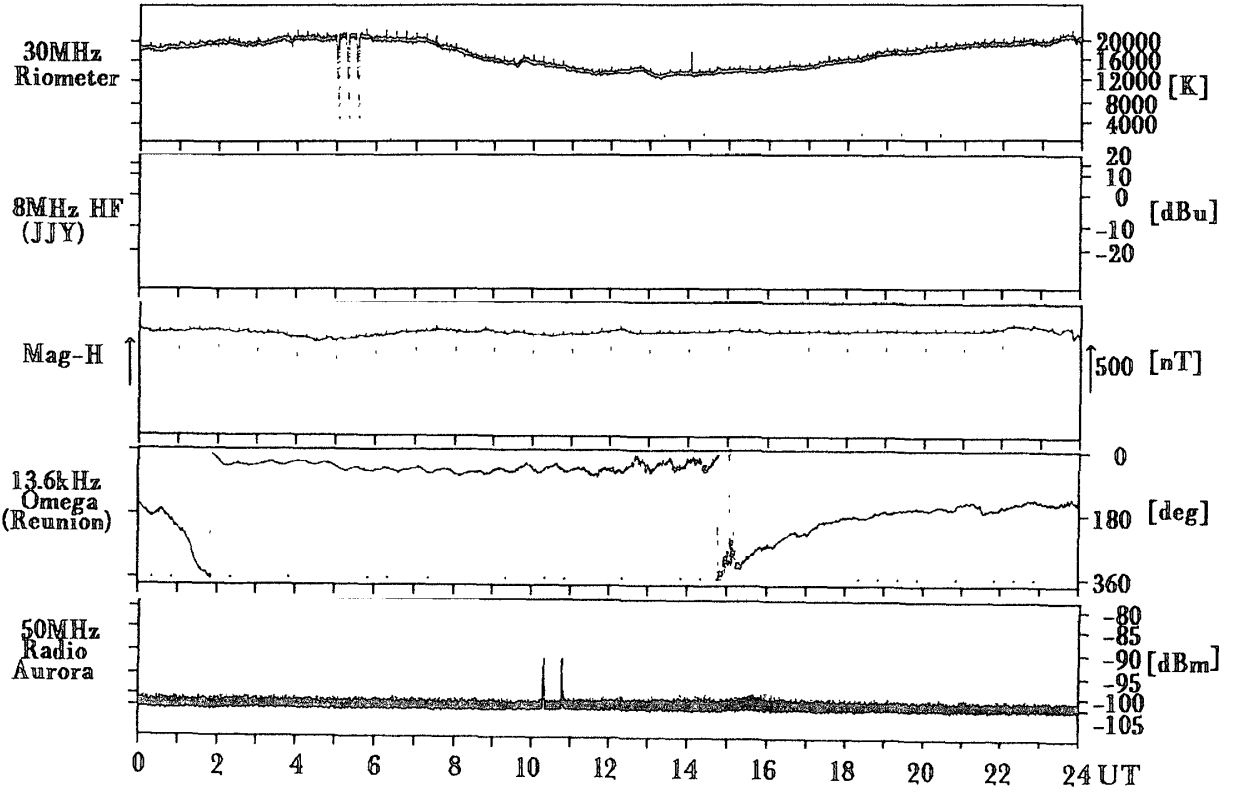
Syowa Station

Total Day / 48 1994/ 2/17



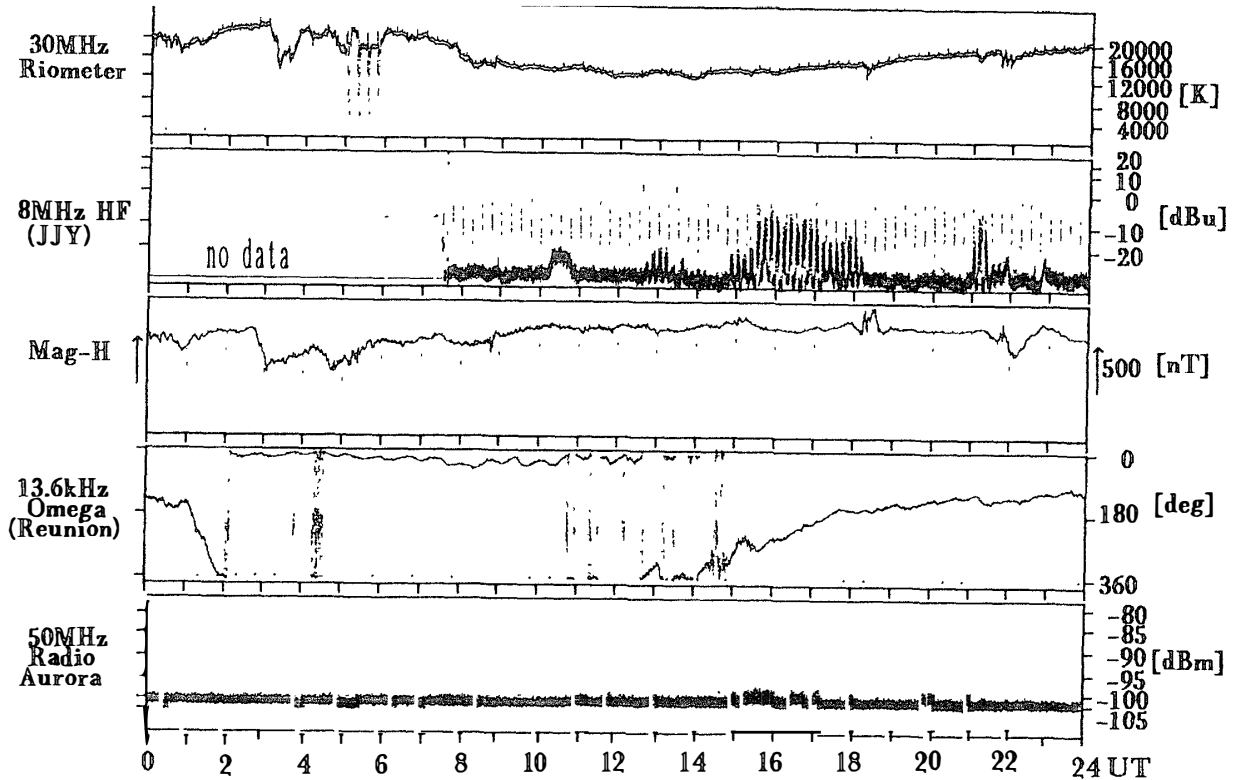
Syowa Station

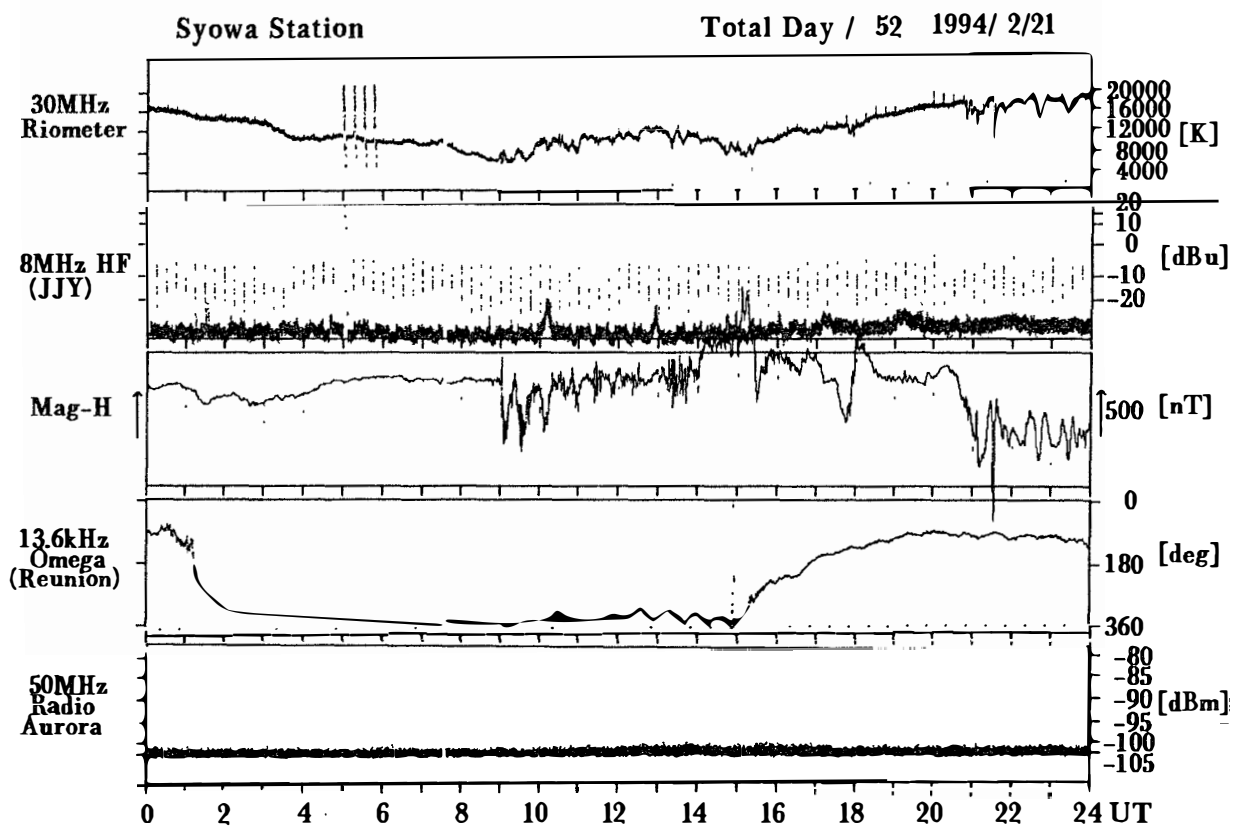
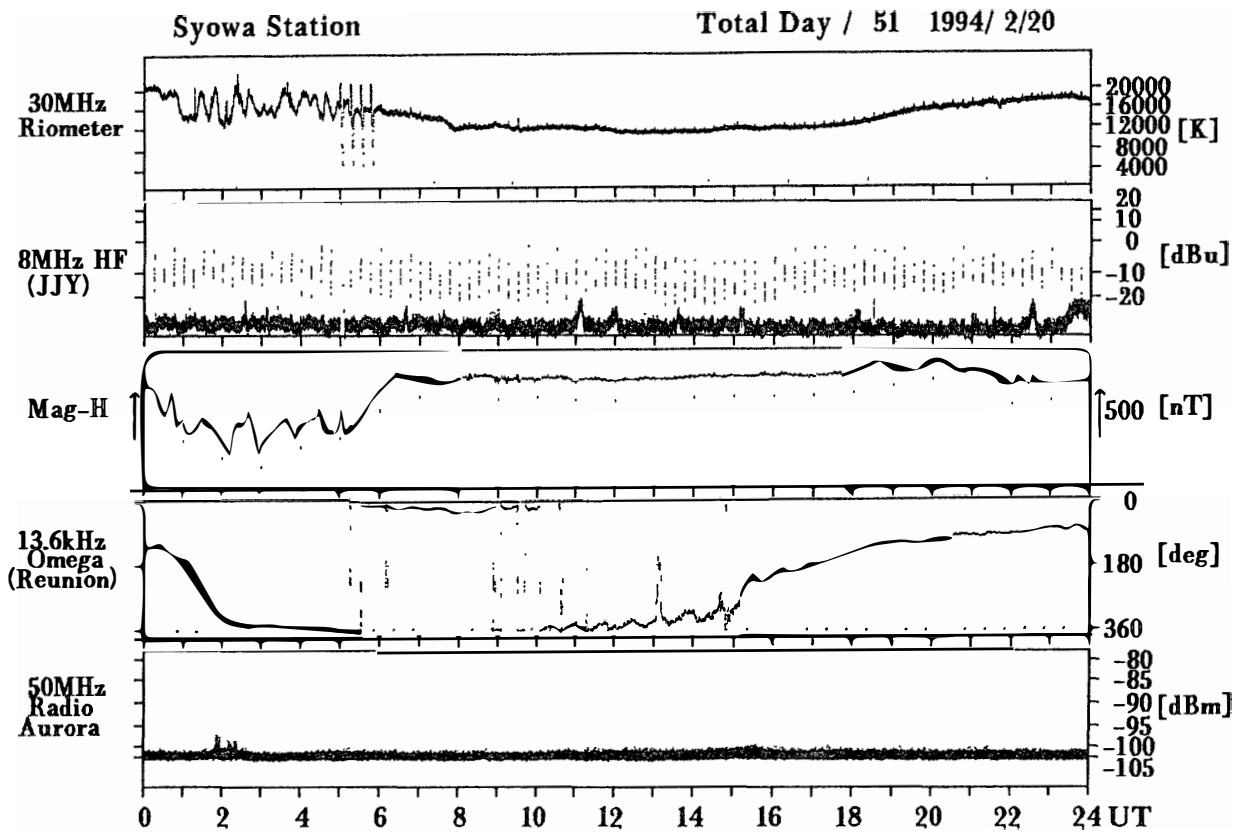
Total Day / 49 1994/ 2/18



Syowa Station

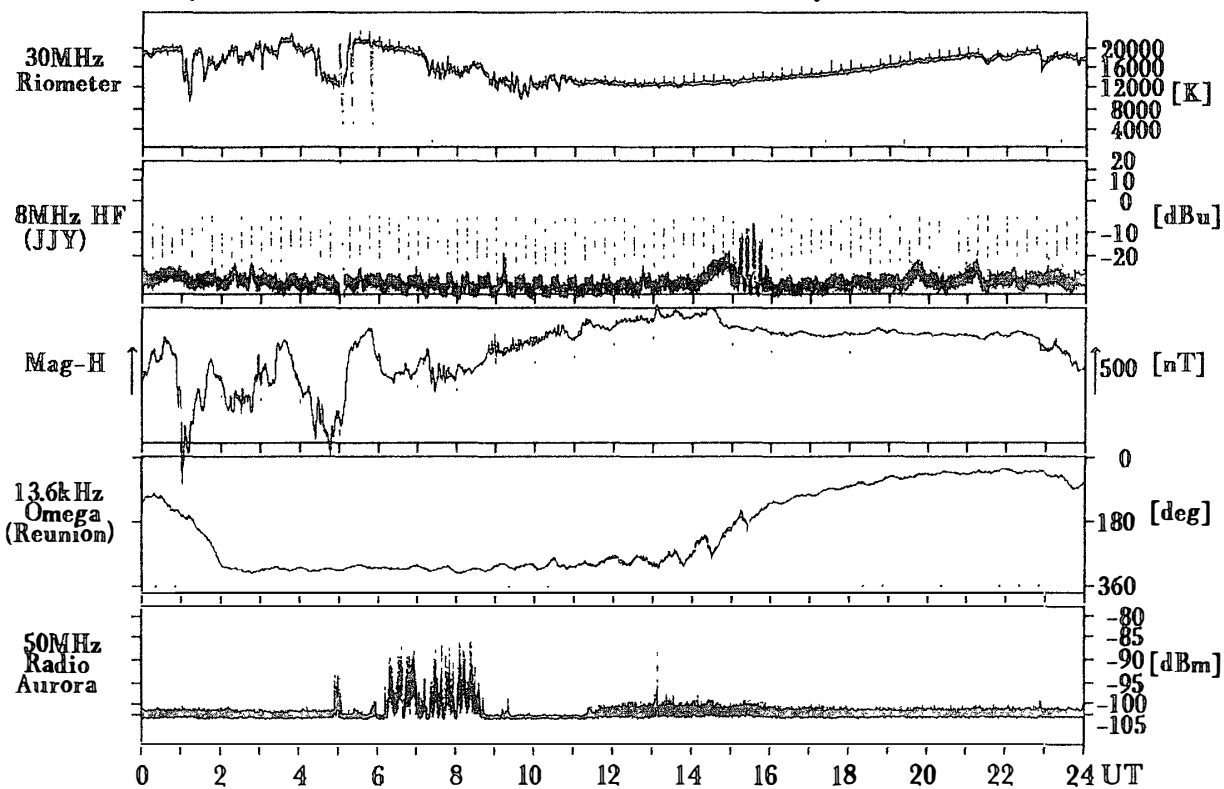
Total Day / 50 1994/ 2/19





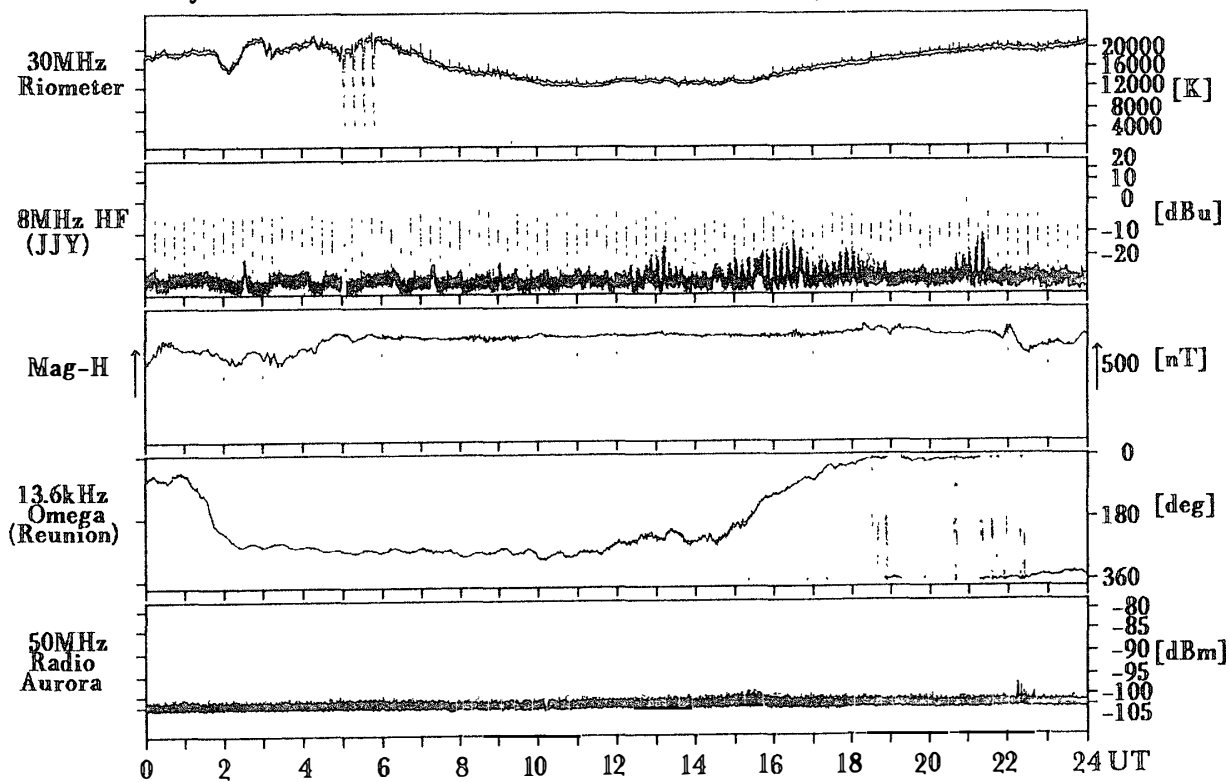
Syowa Station

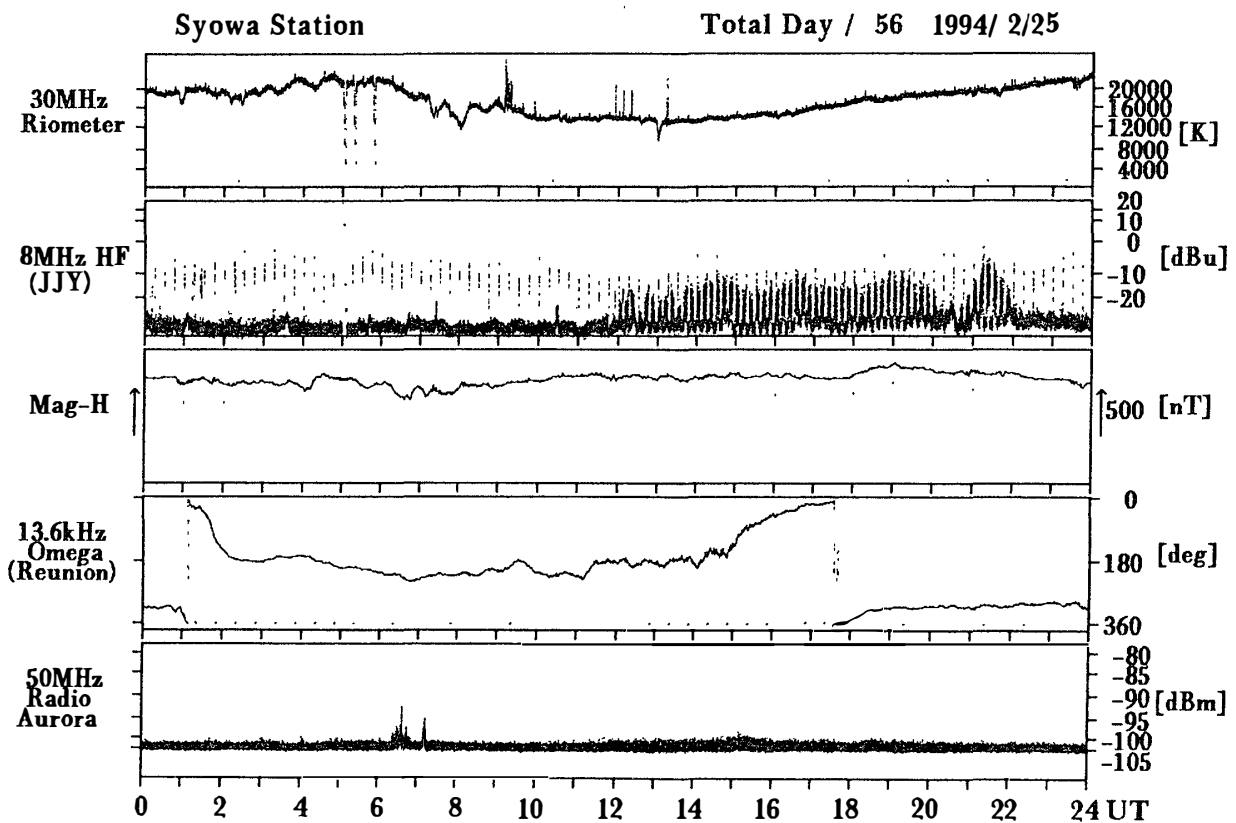
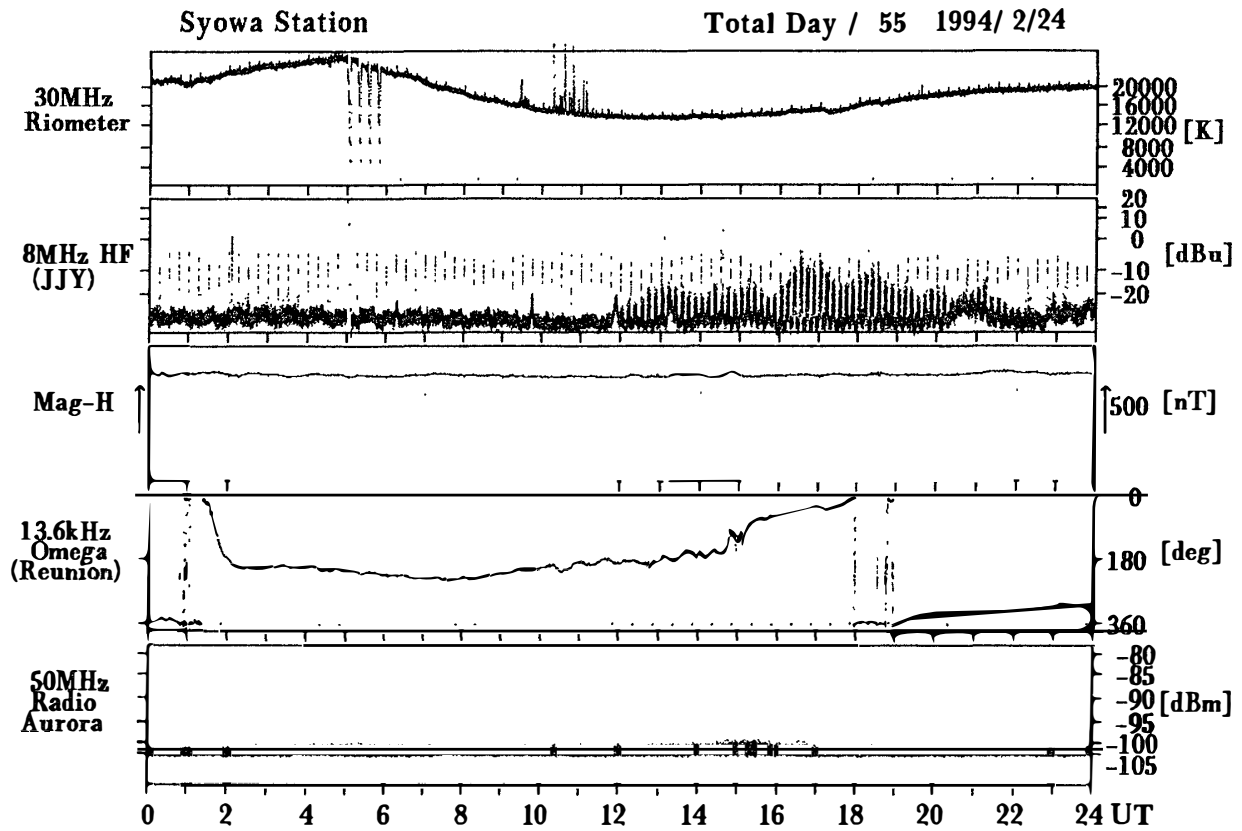
Total Day / 53 1994/ 2/22



Syowa Station

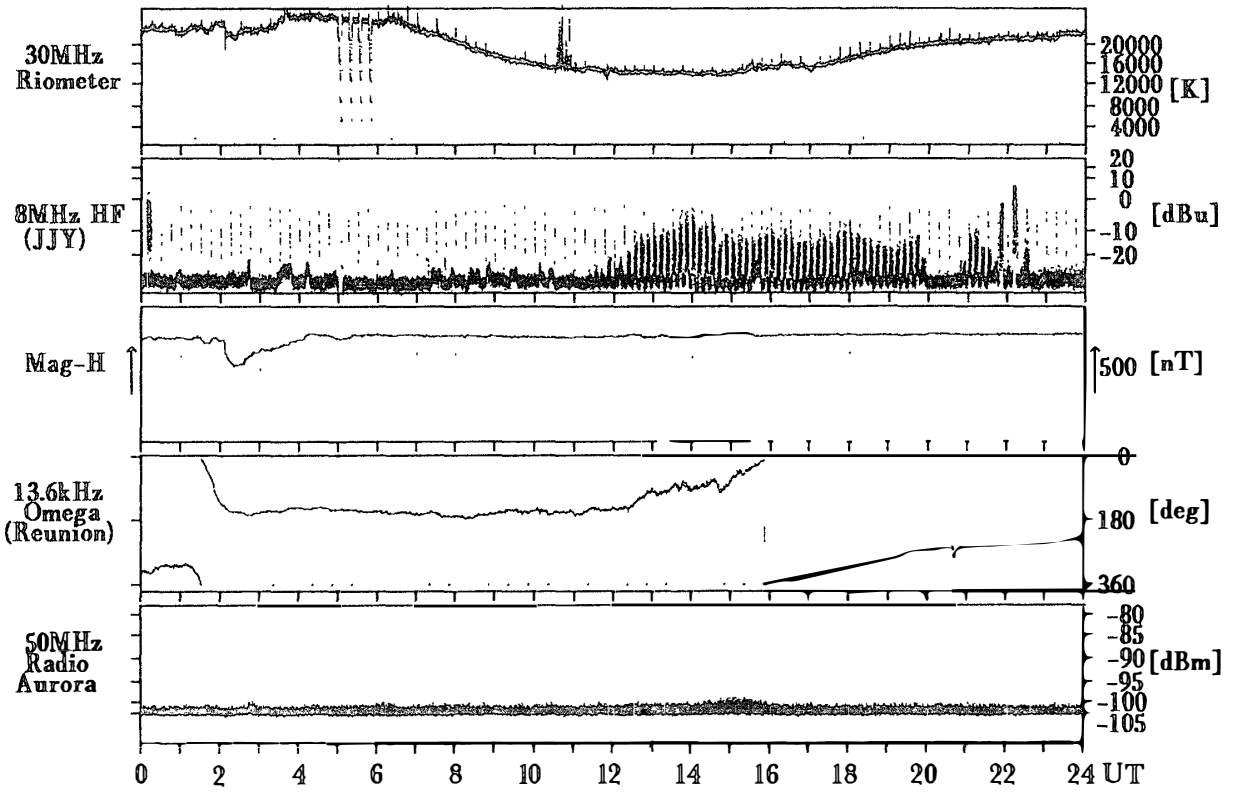
Total Day / 54 1994/ 2/23





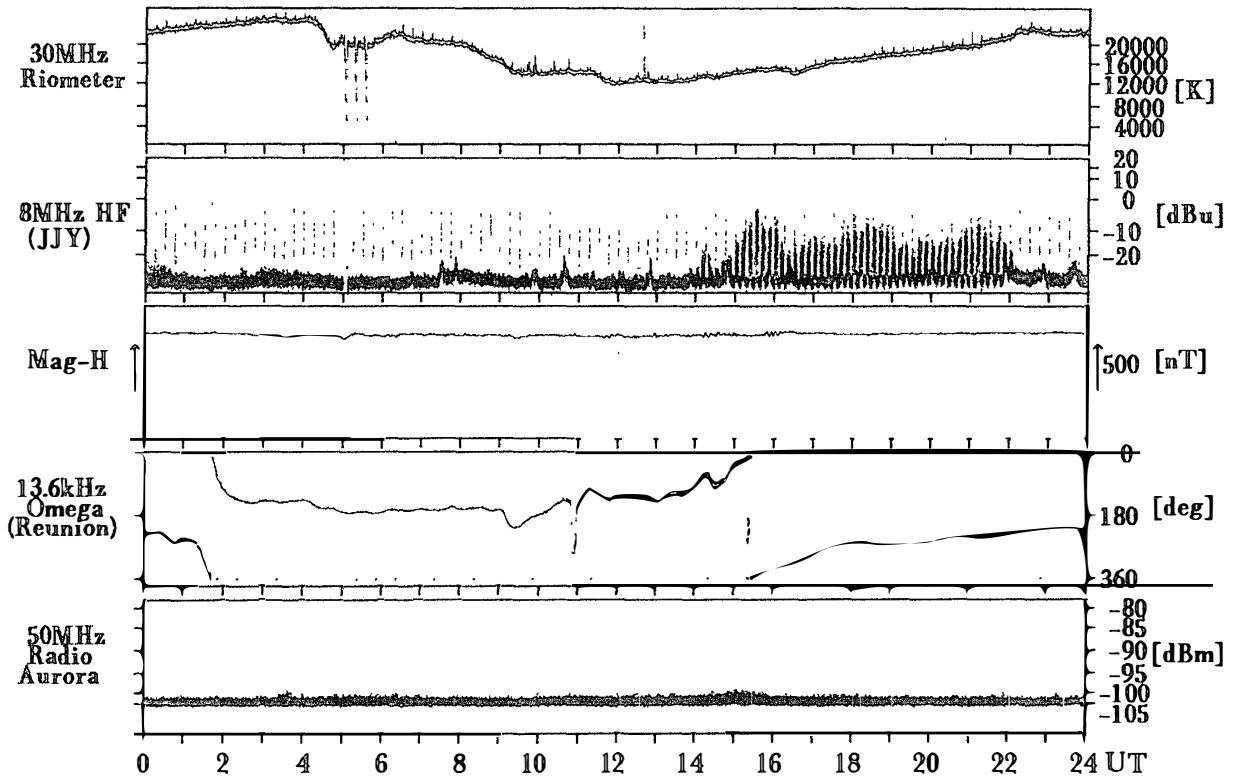
Syowa Station

Total Day / 57 1994/ 2/26



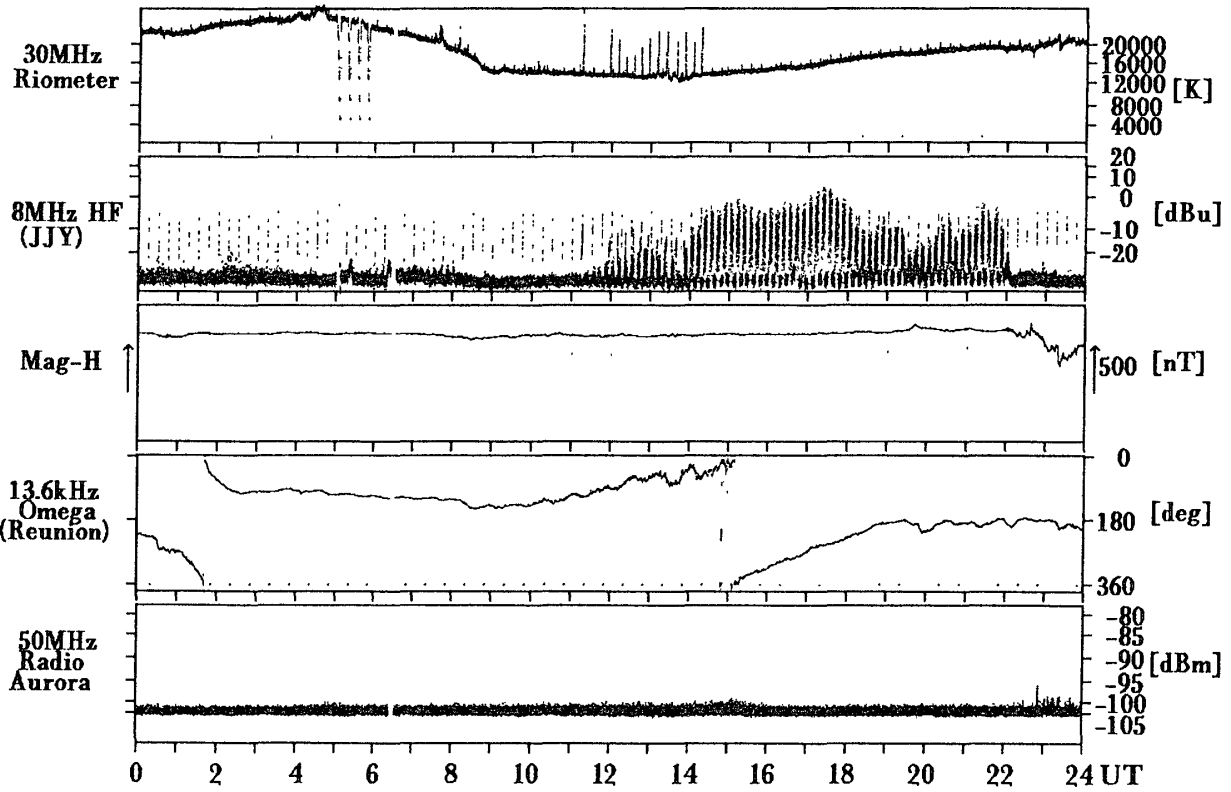
Syowa Station

Total Day / 58 1994/ 2/27



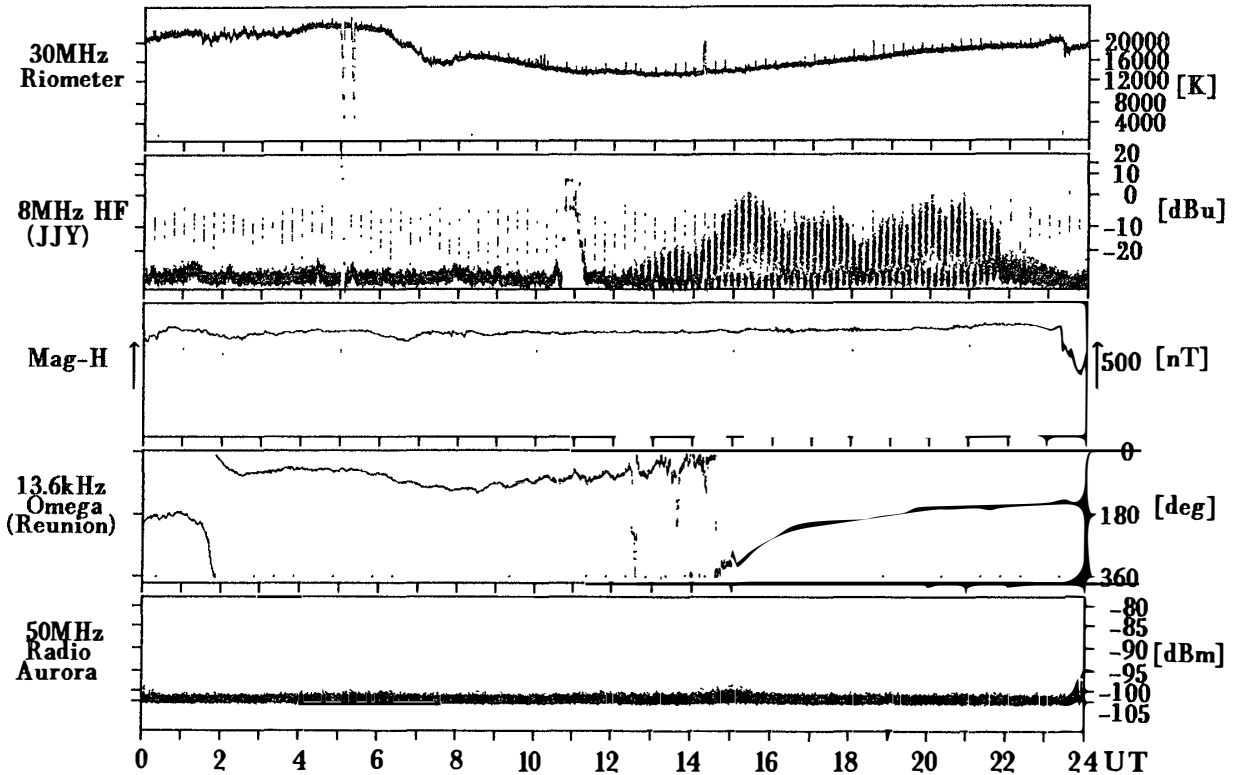
Syowa Station

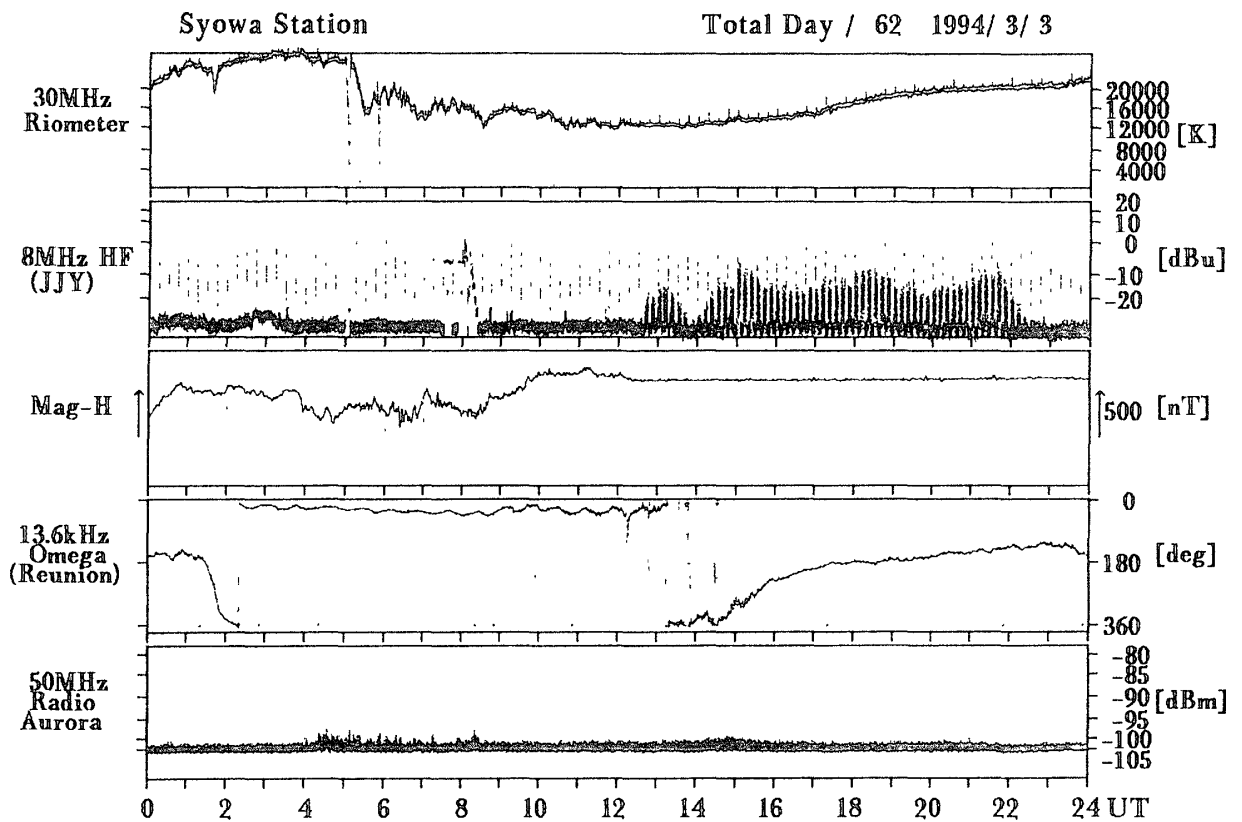
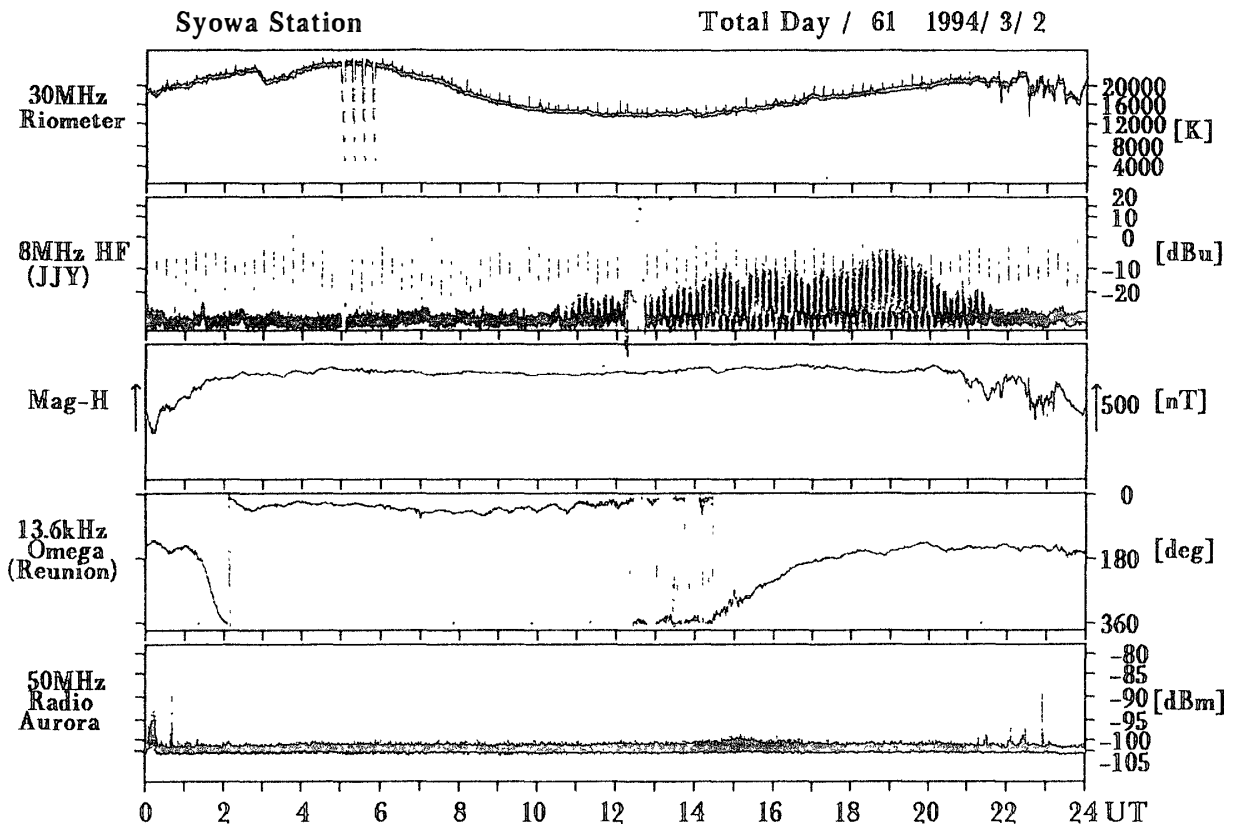
Total Day / 59 1994/ 2/28

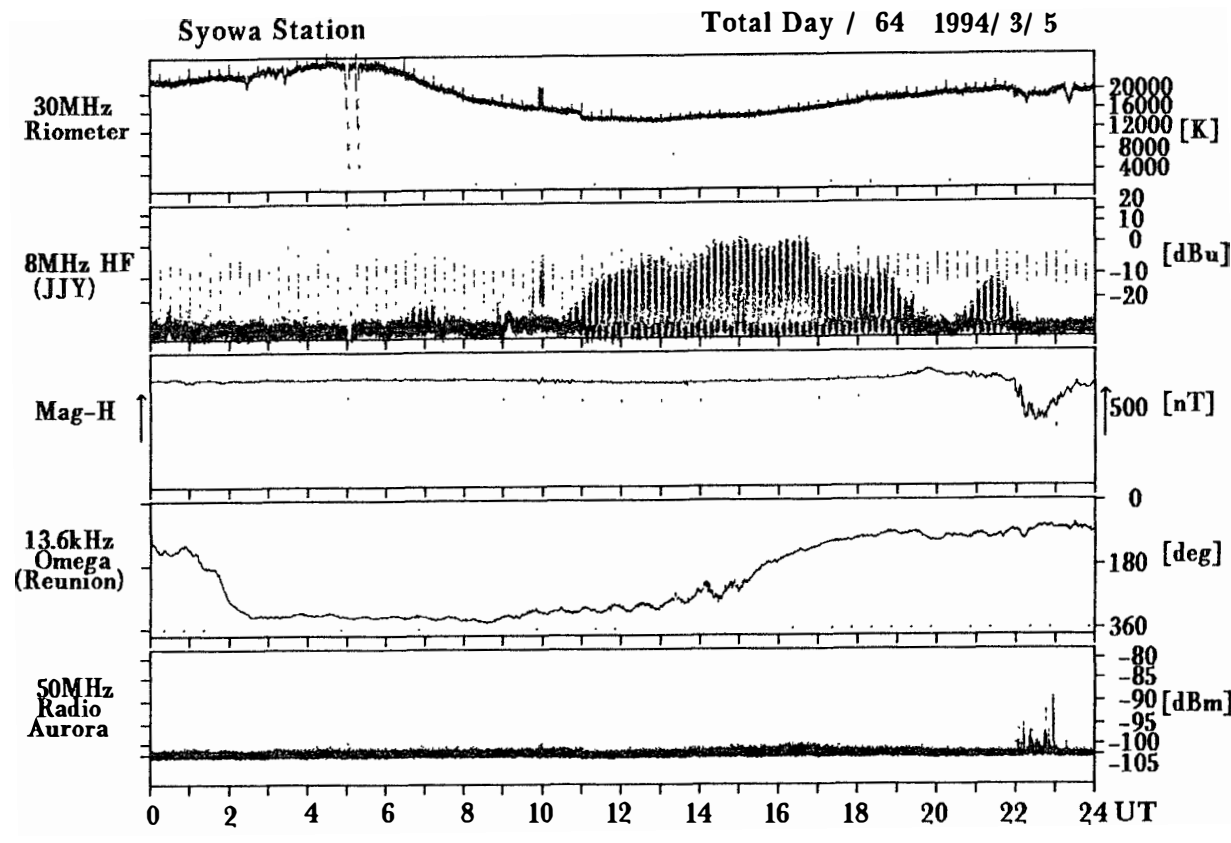
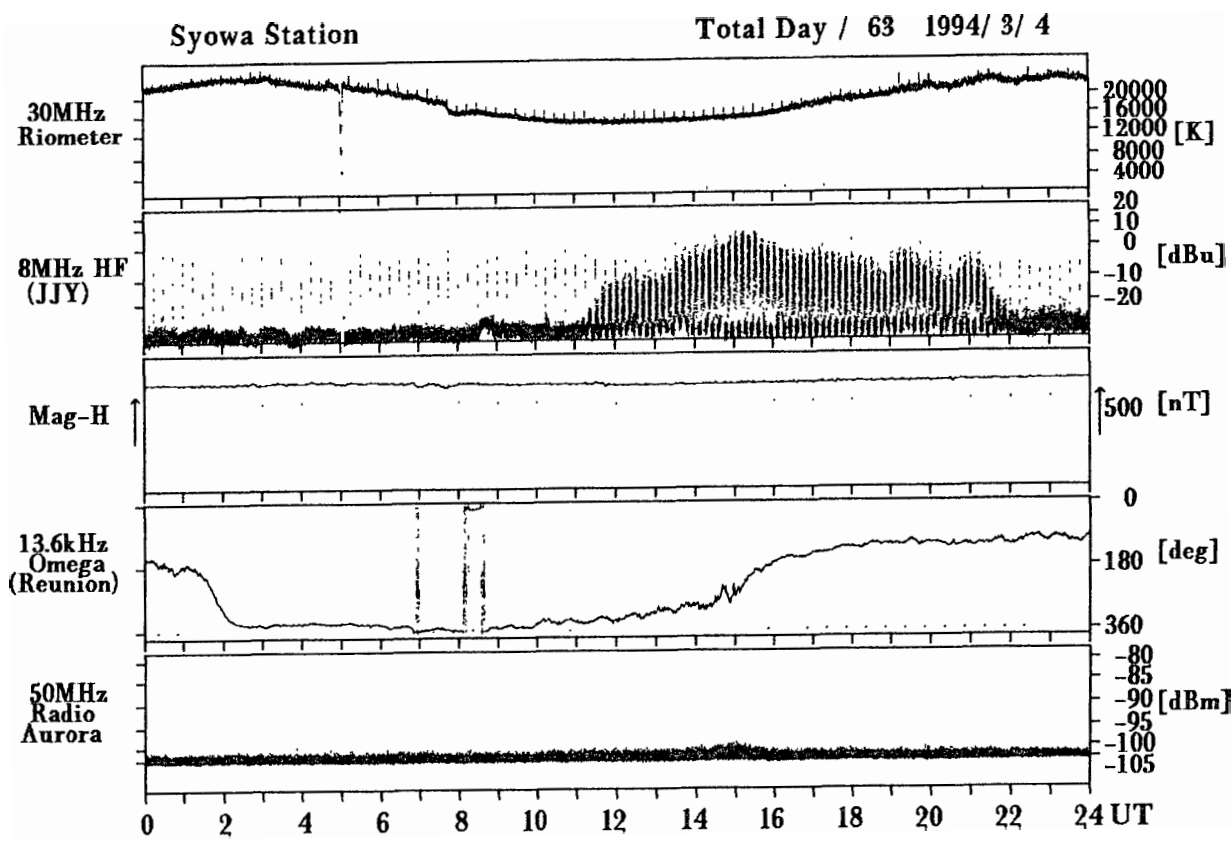


Syowa Station

Total Day / 60 1994/ 3/ 1

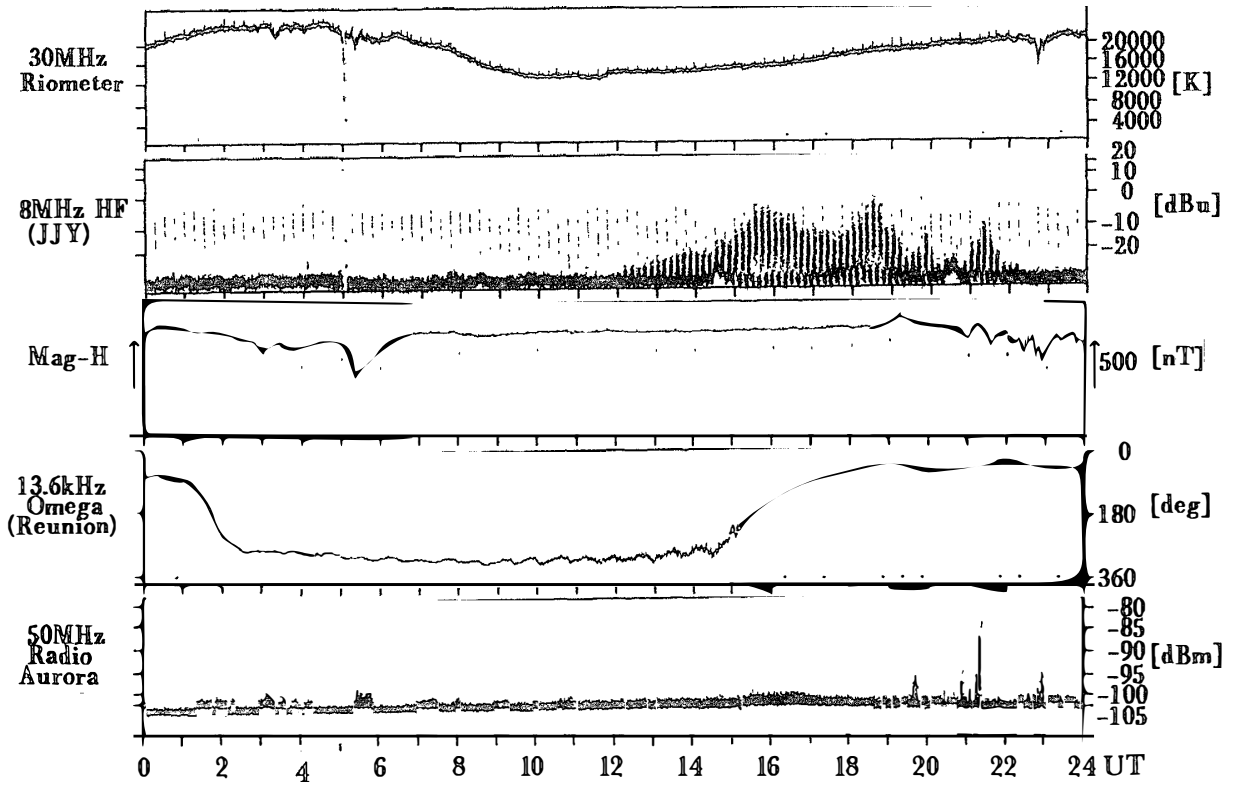






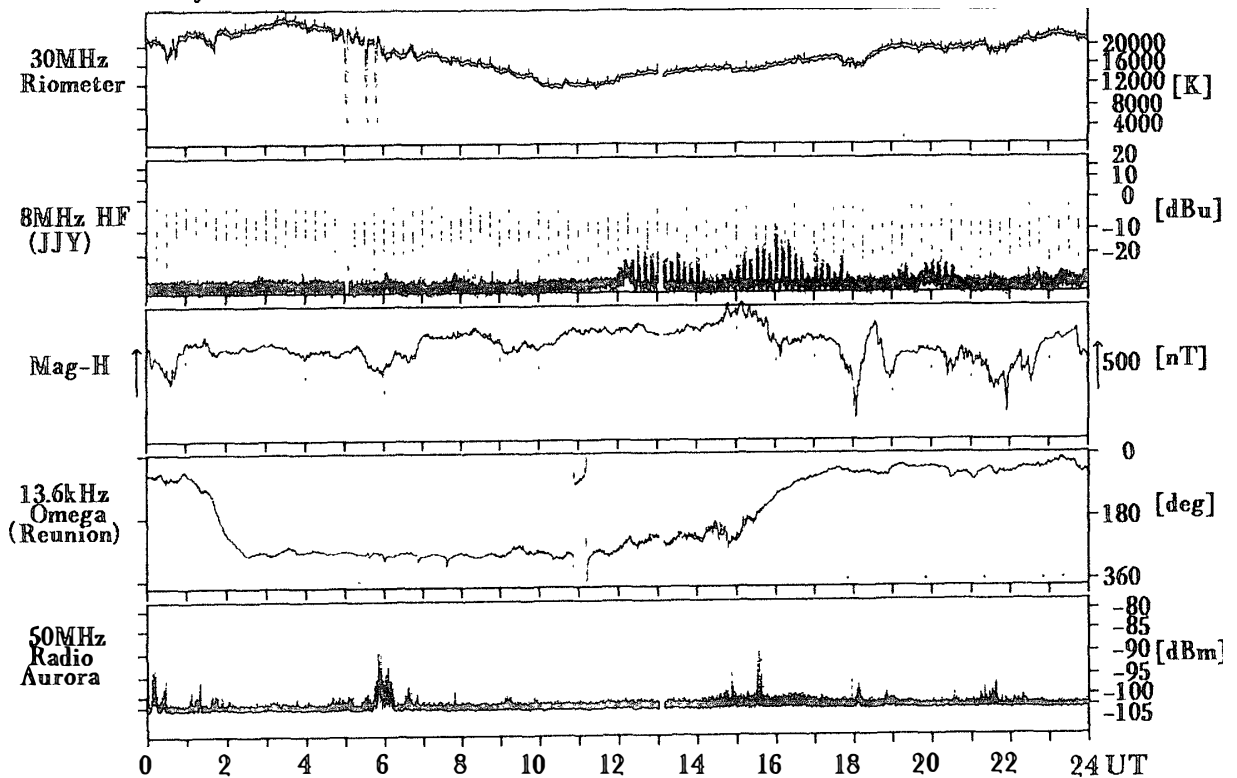
Syowa Station

Total Day / 65 1994/ 3/ 6



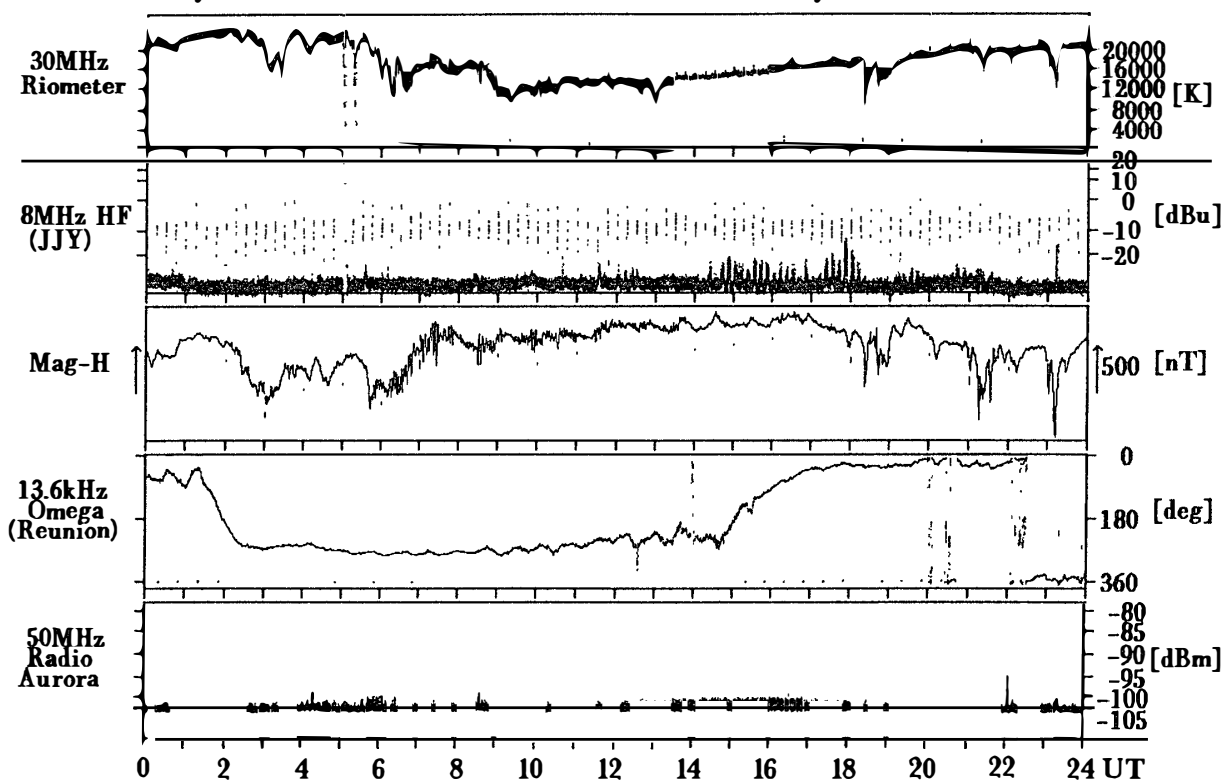
Syowa Station

Total Day / 66 1994/ 3/ 7



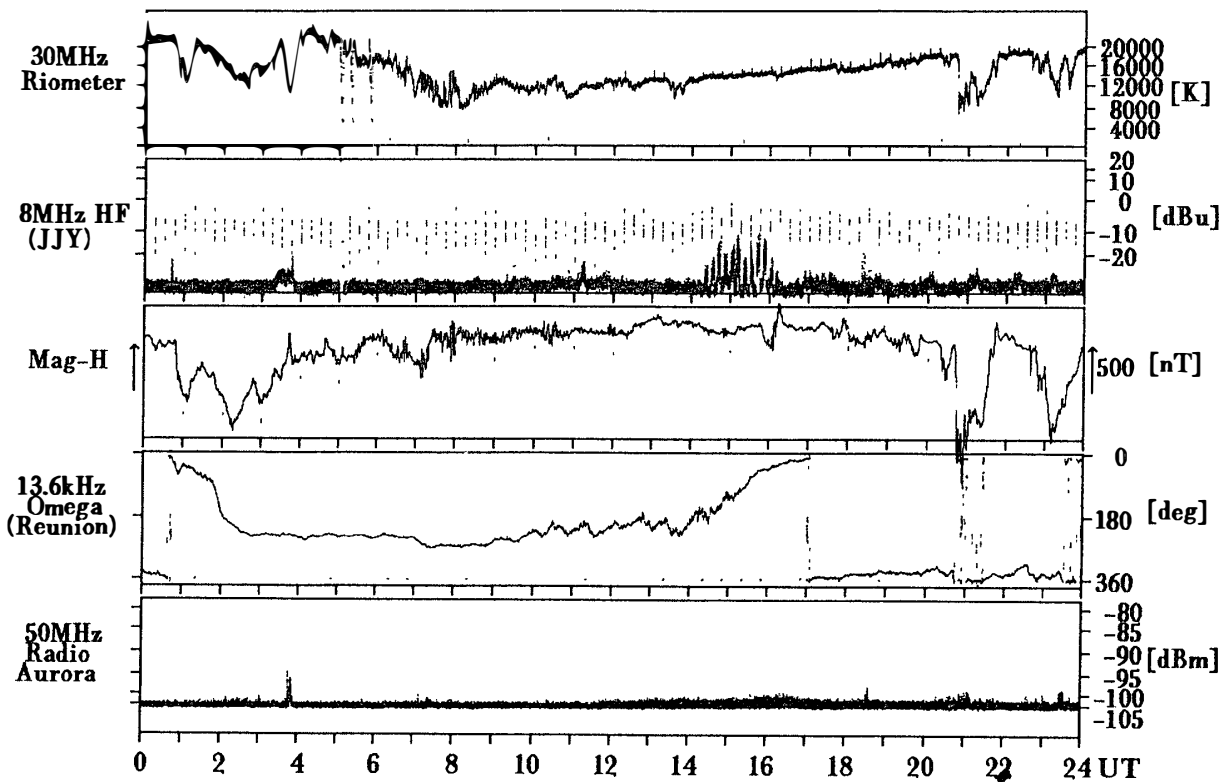
Syowa Station

Total Day / 67 1994/ 3/ 8



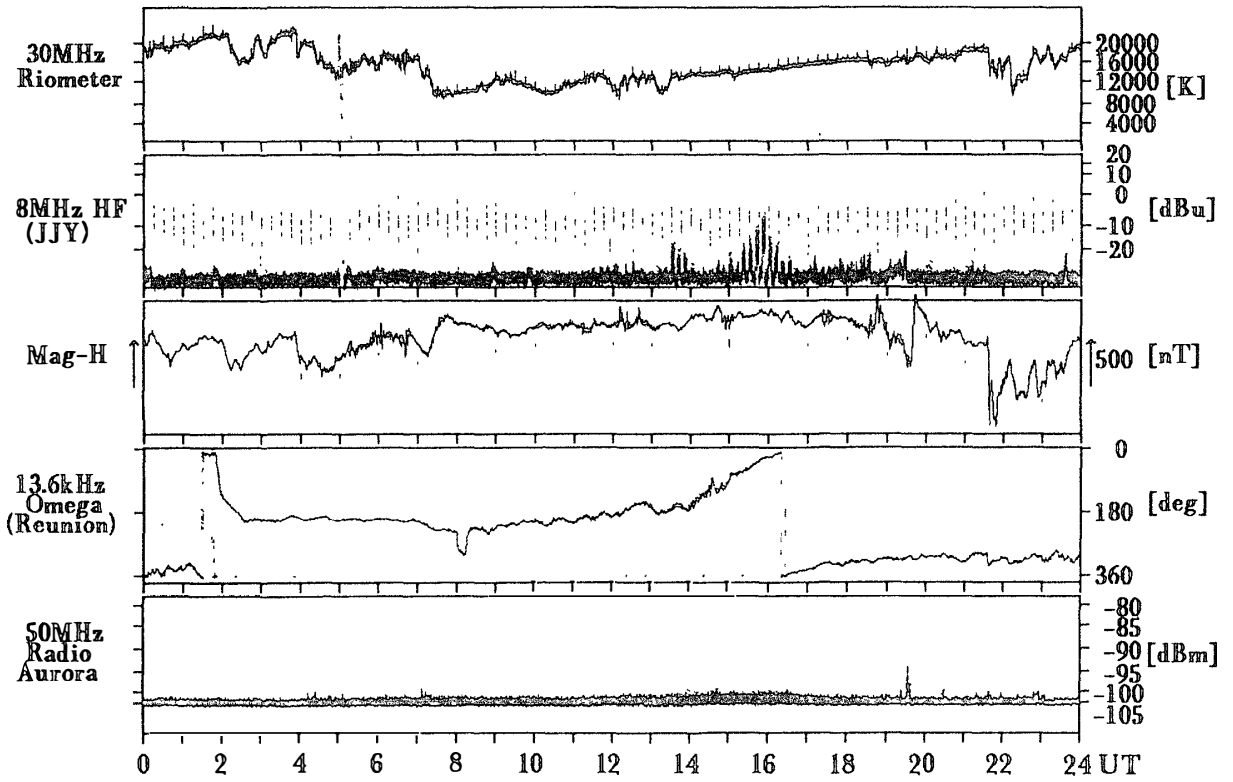
Syowa Station

Total Day / 68 1994/ 3/ 9



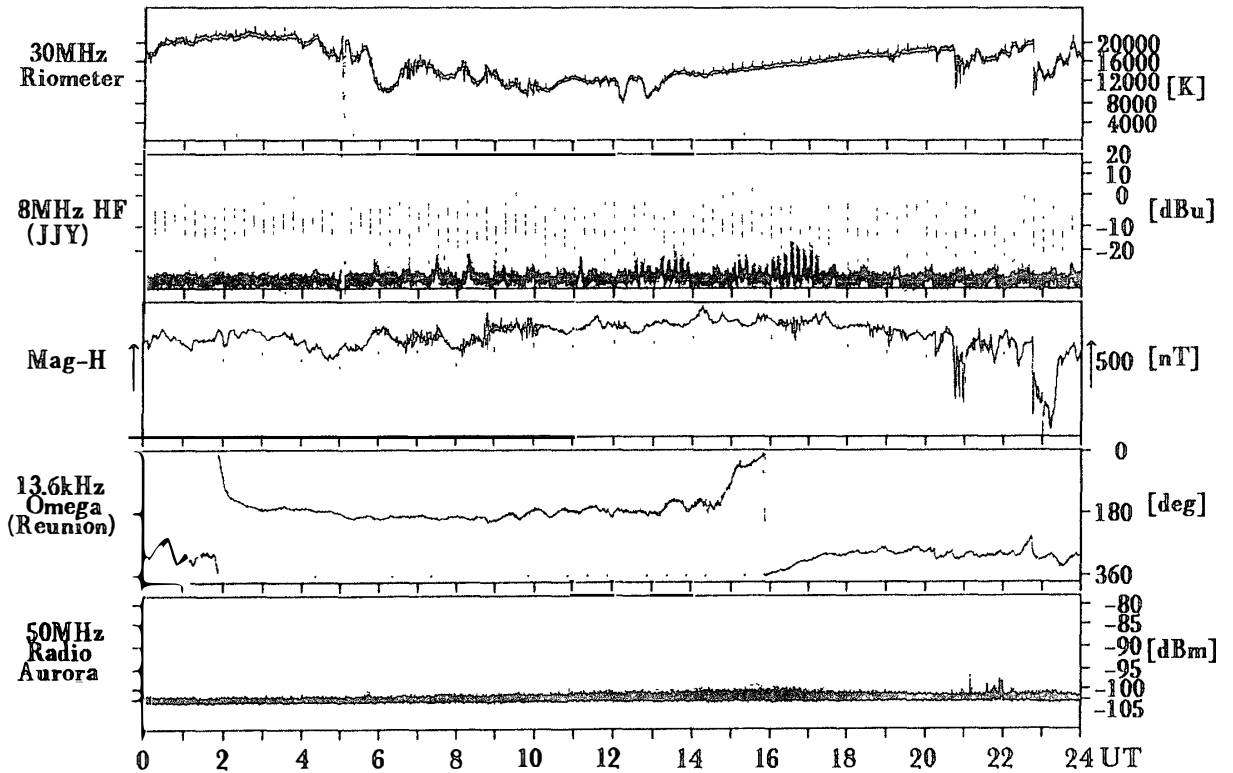
Syowa Station

Total Day / 69 1994/ 3/10



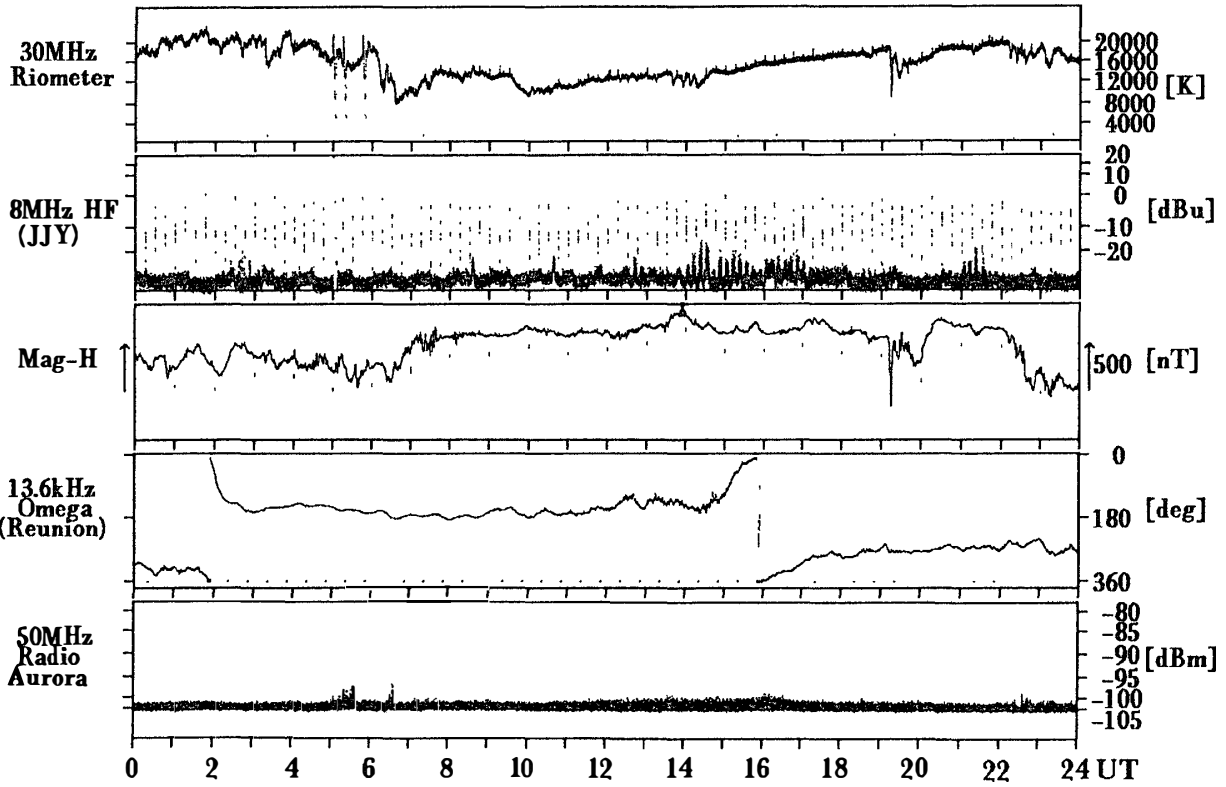
Syowa Station

Total Day / 70 1994/ 3/11



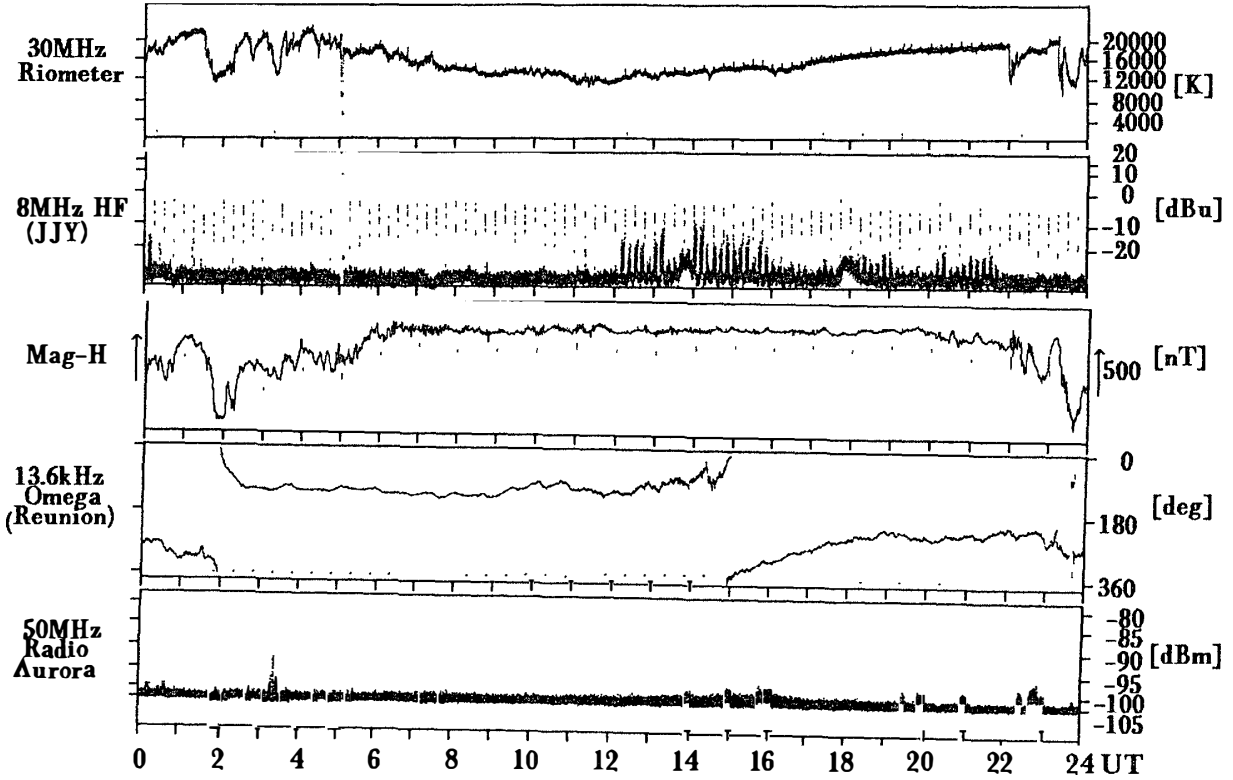
Syowa Station

Total Day / 71 1994/ 3/12



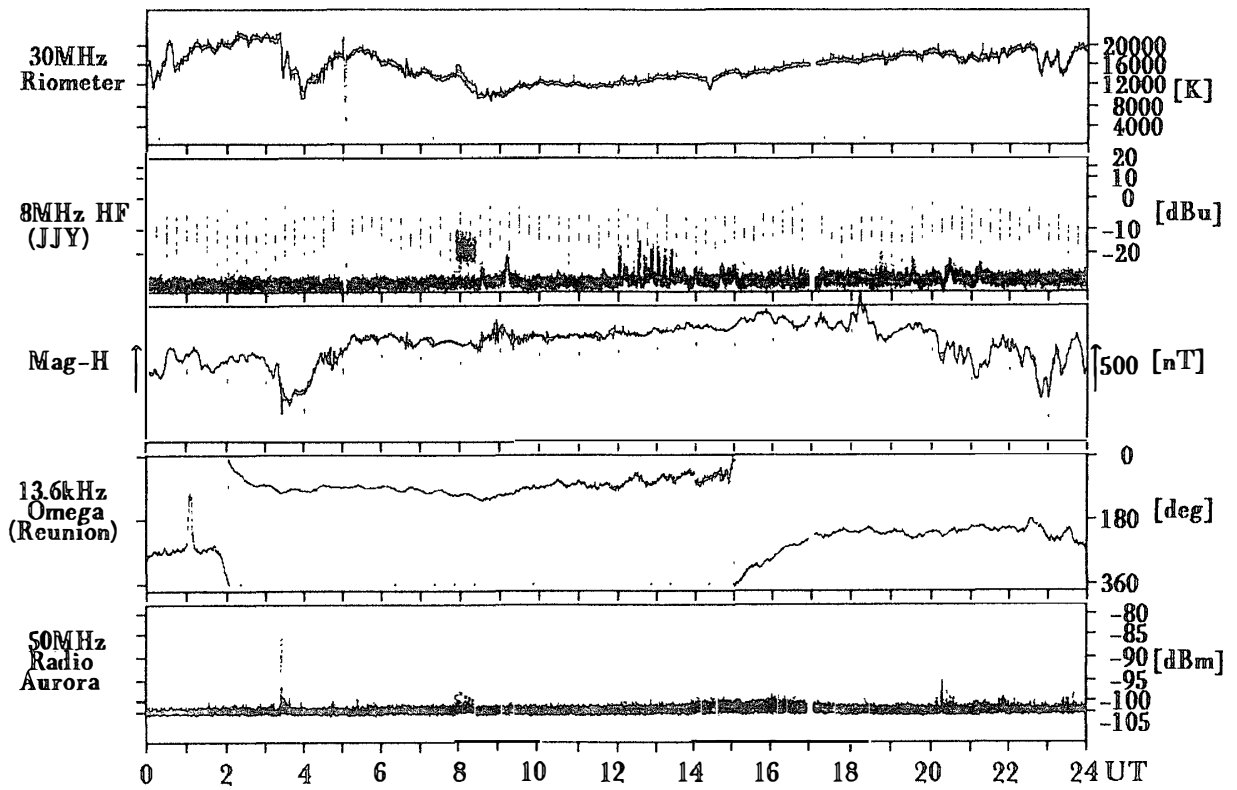
Syowa Station

Total Day / 72 1994/ 3/13



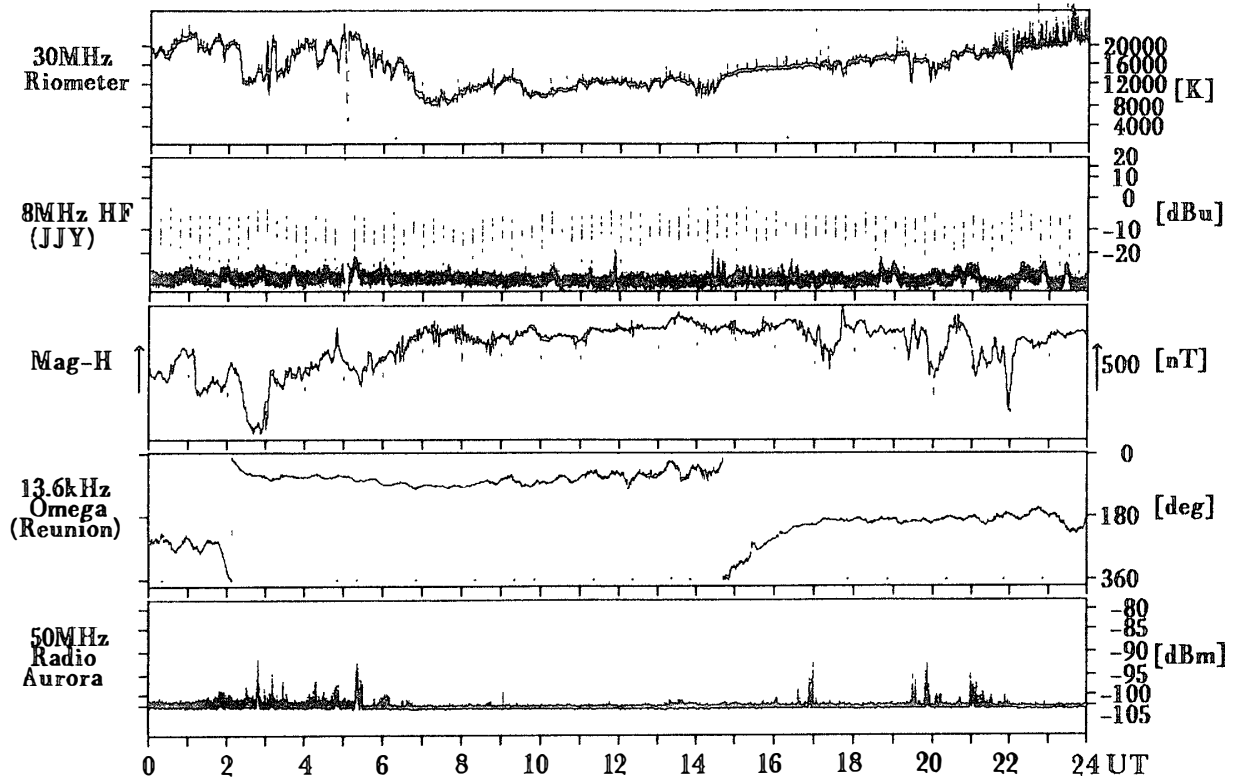
Syowa Station

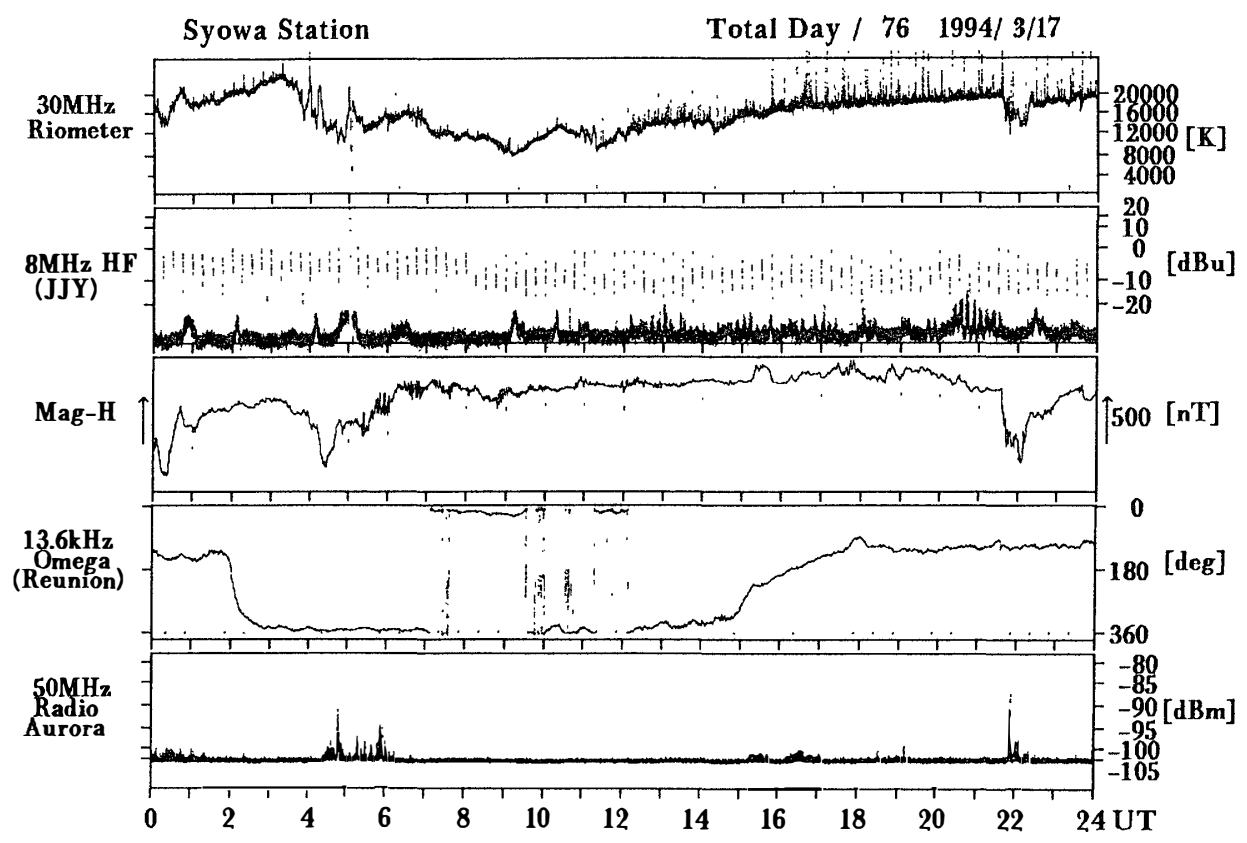
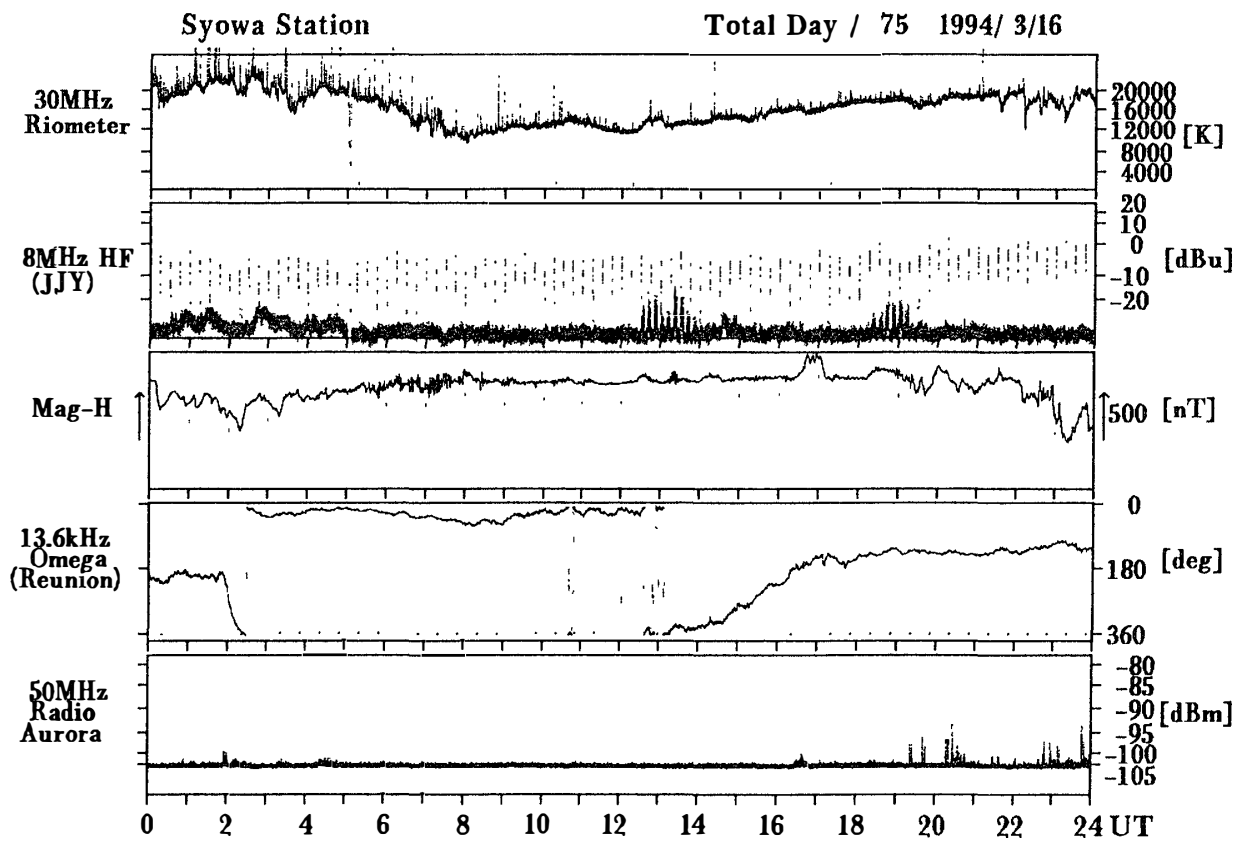
Total Day / 73 1994/ 3/14

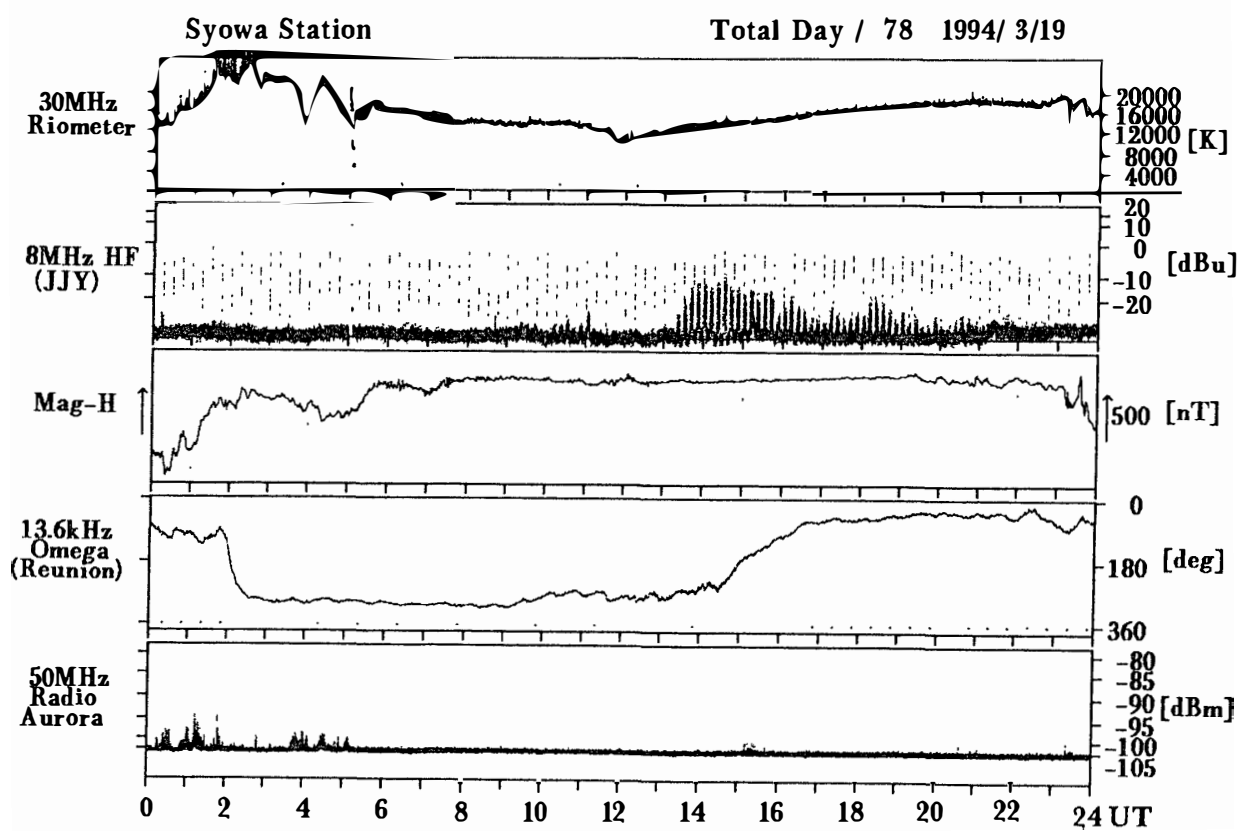
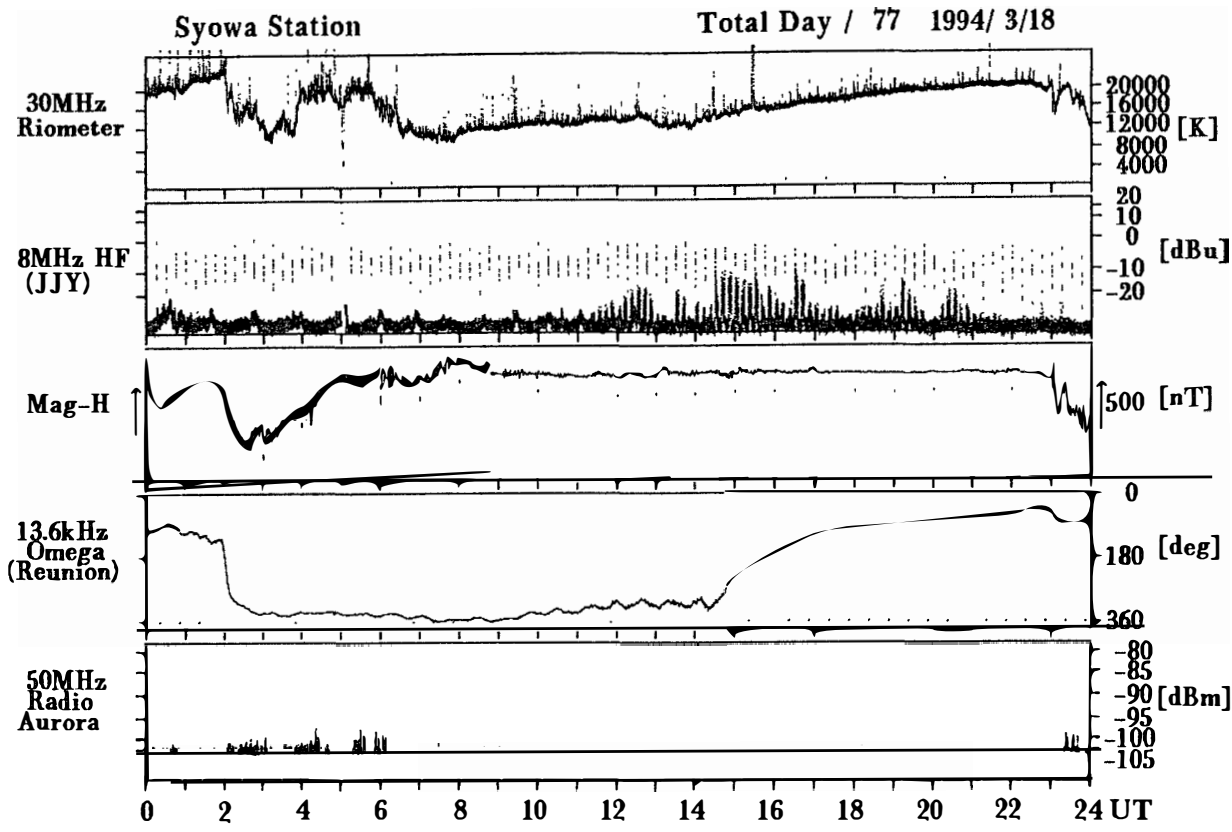


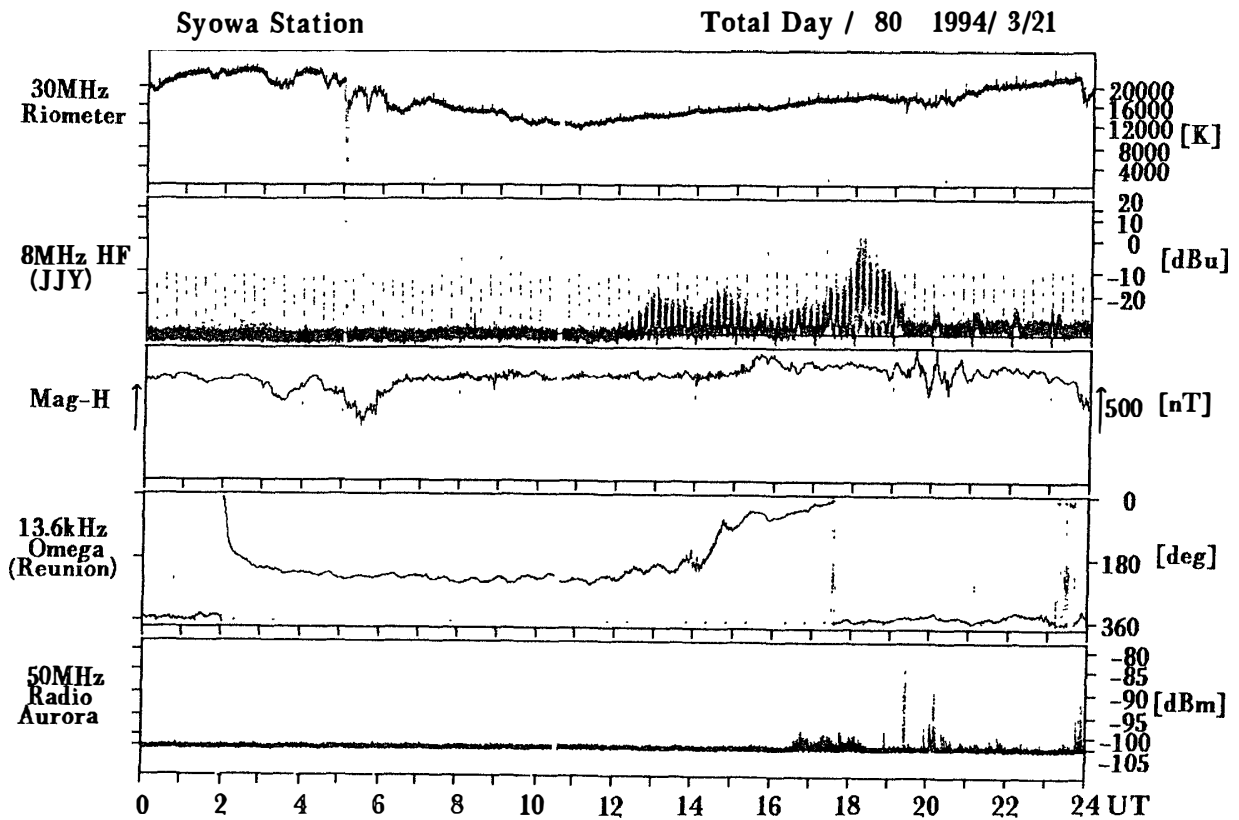
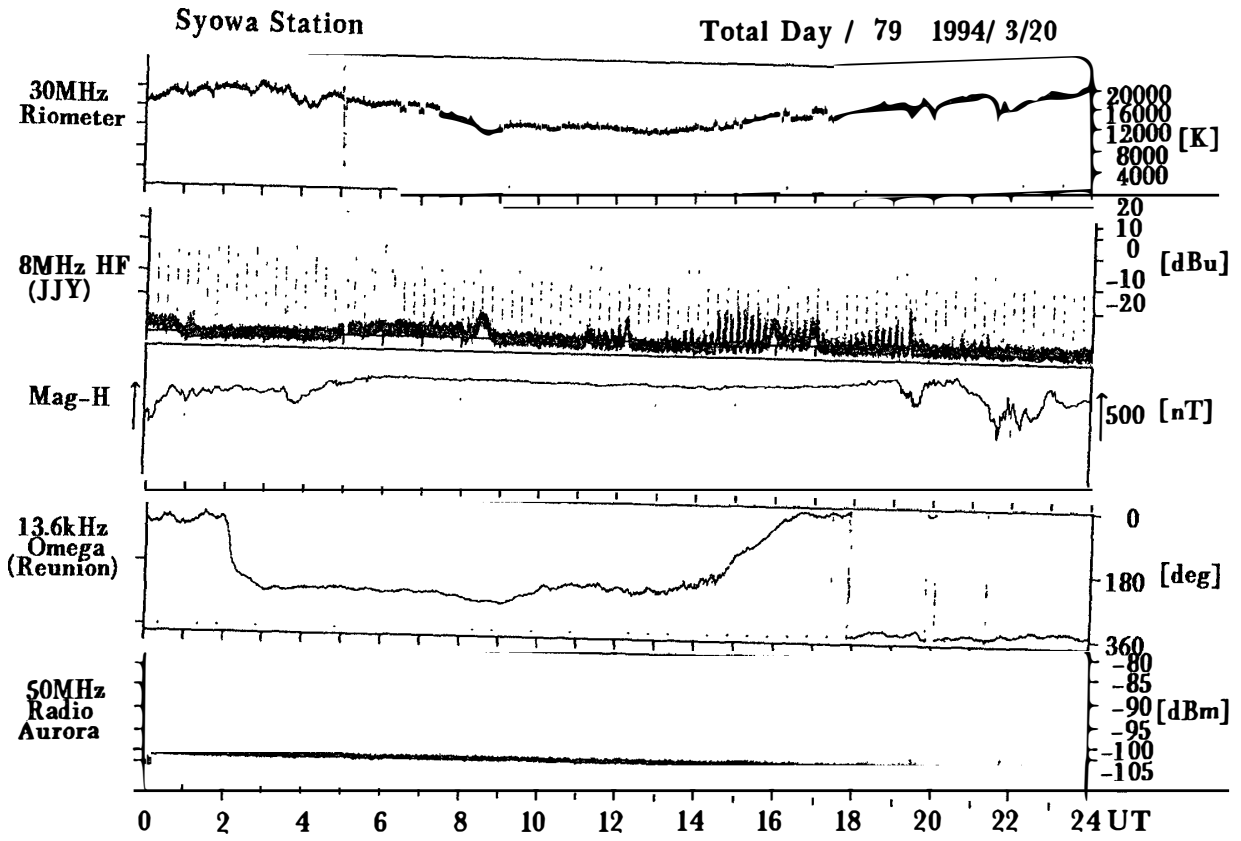
Syowa Station

Total Day / 74 1994/ 3/15



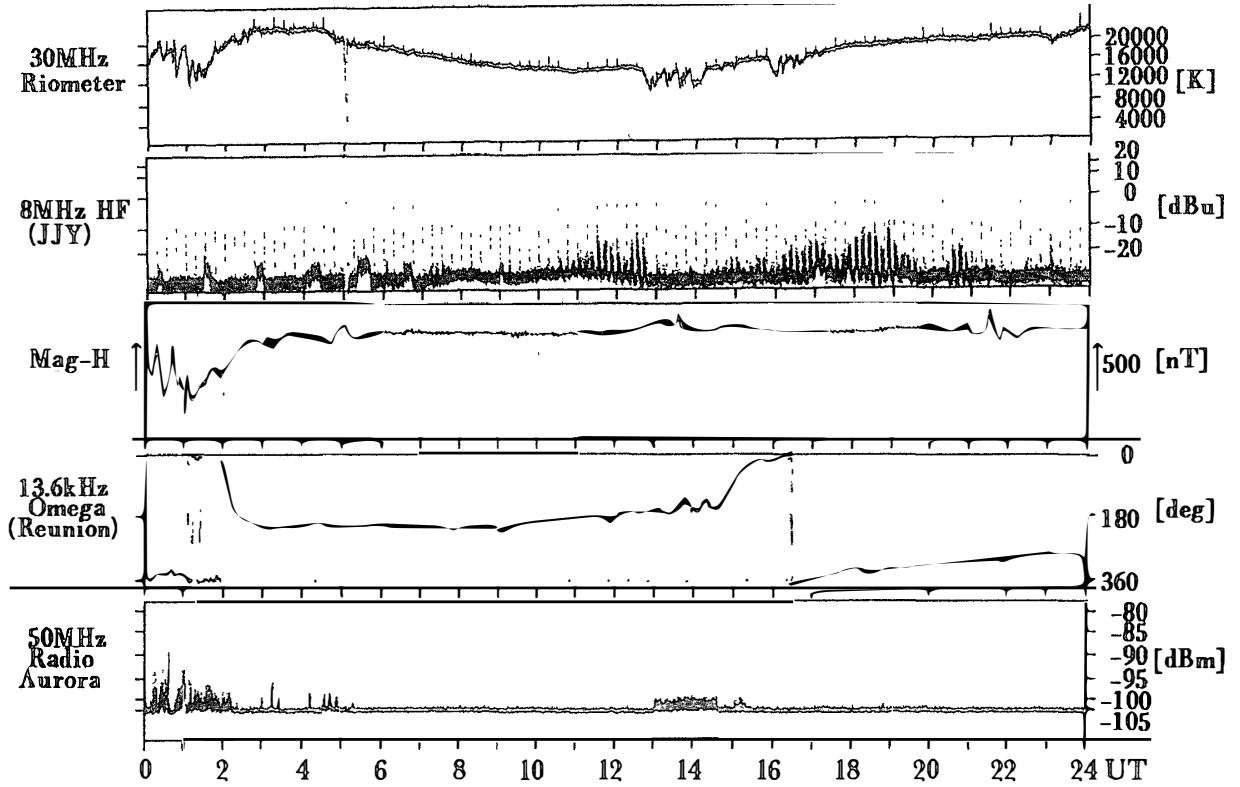






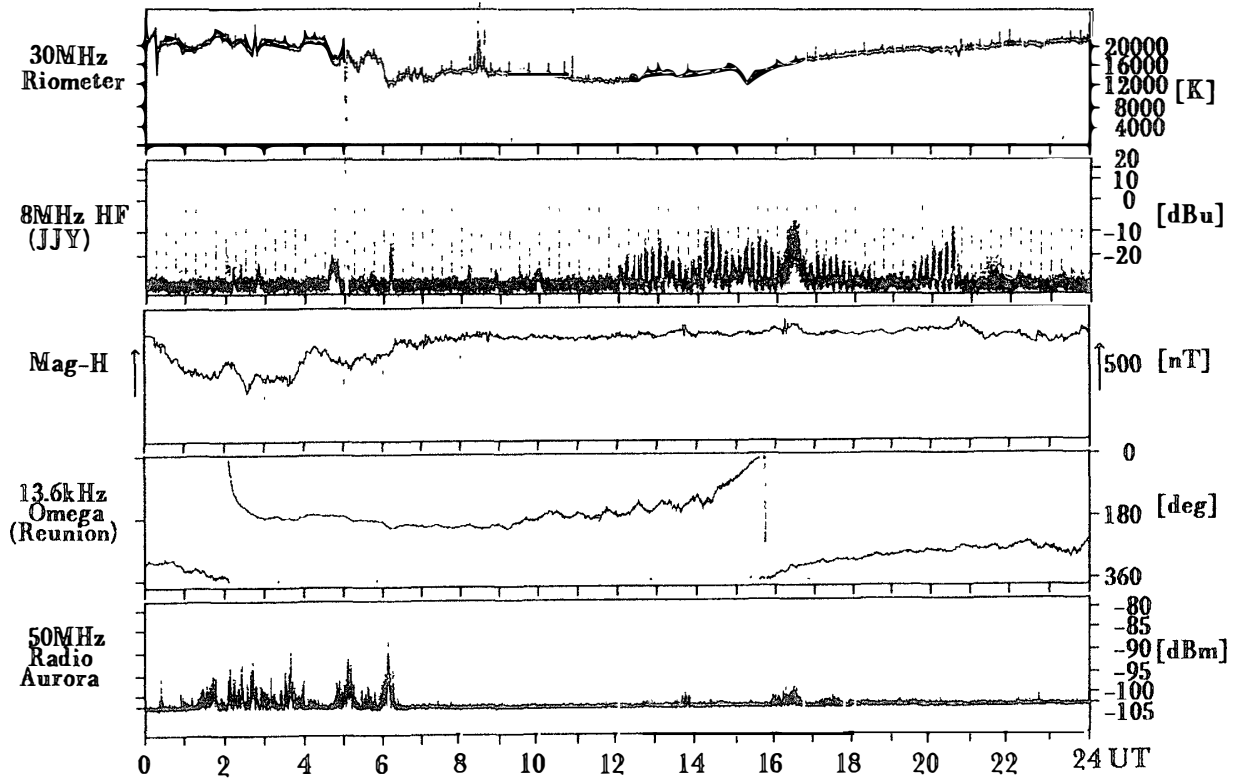
Syowa Station

Total Day / 81 1994/ 3/22



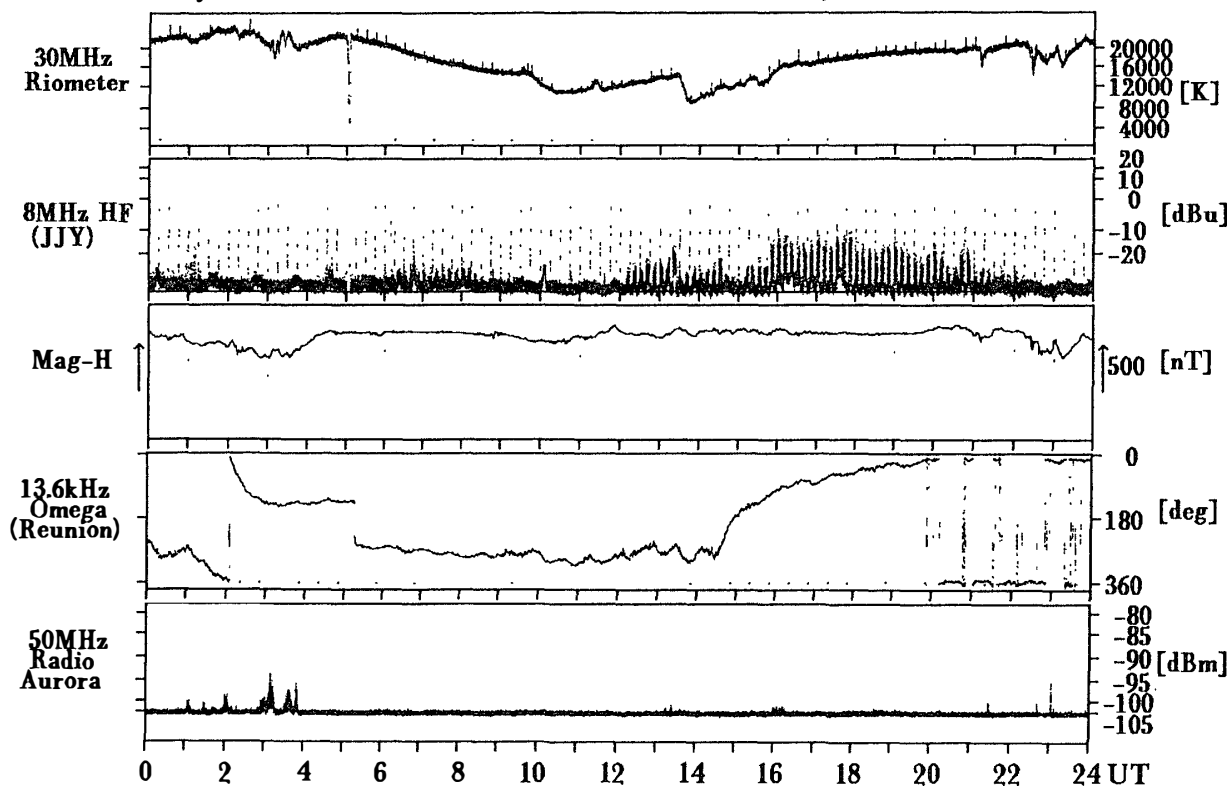
Syowa Station

Total Day / 82 1994/ 3/23



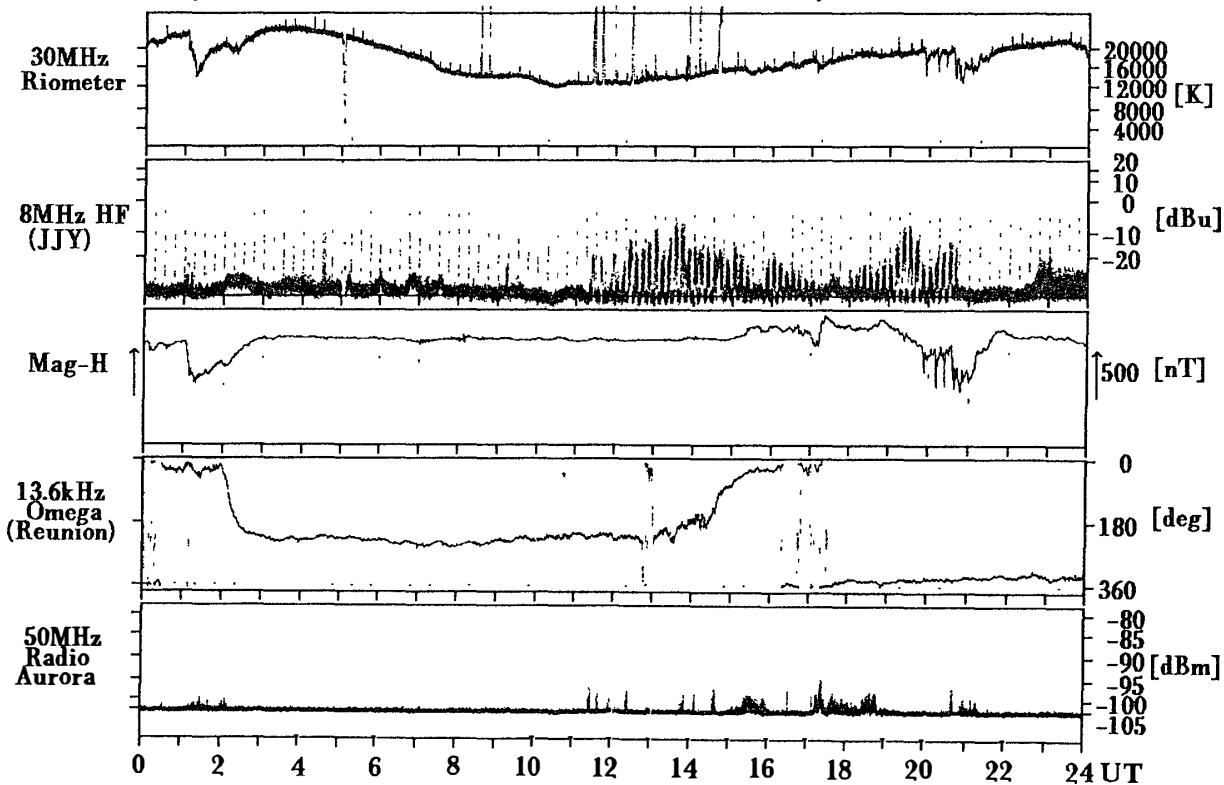
Syowa Station

Total Day / 83 1994/ 3/24



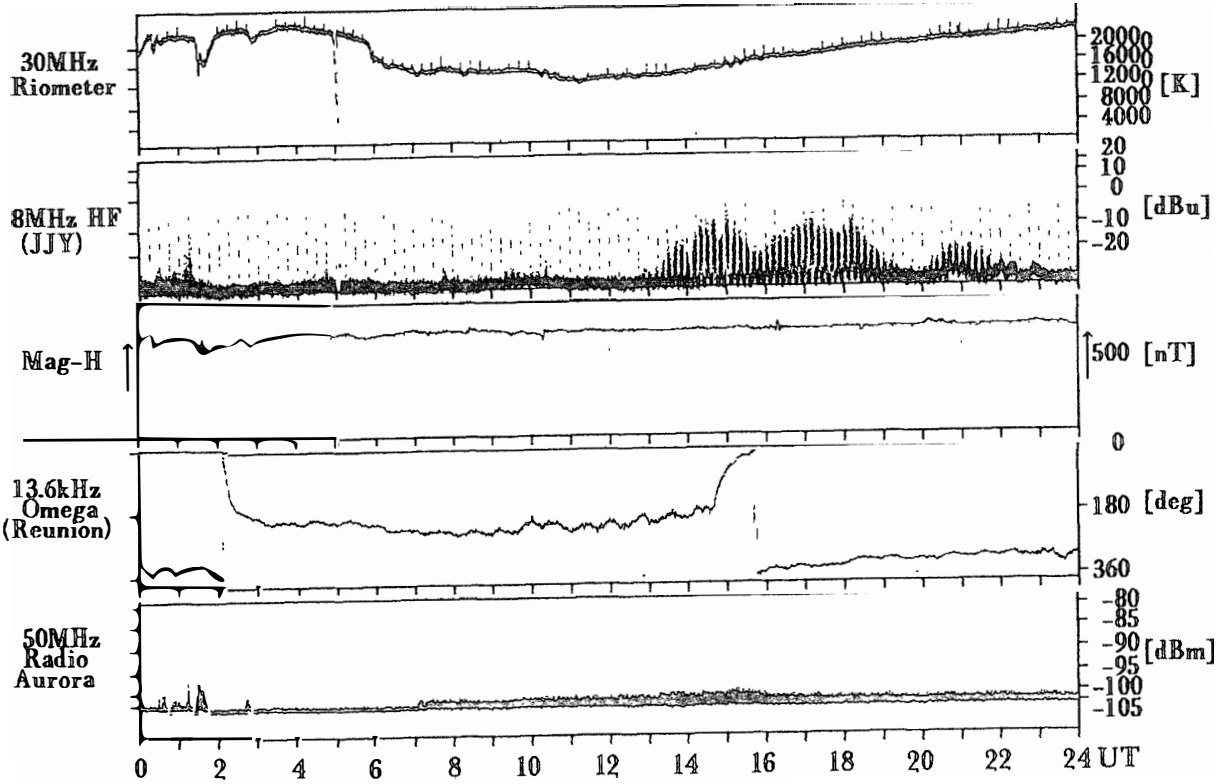
Syowa Station

Total Day / 84 1994/ 3/25



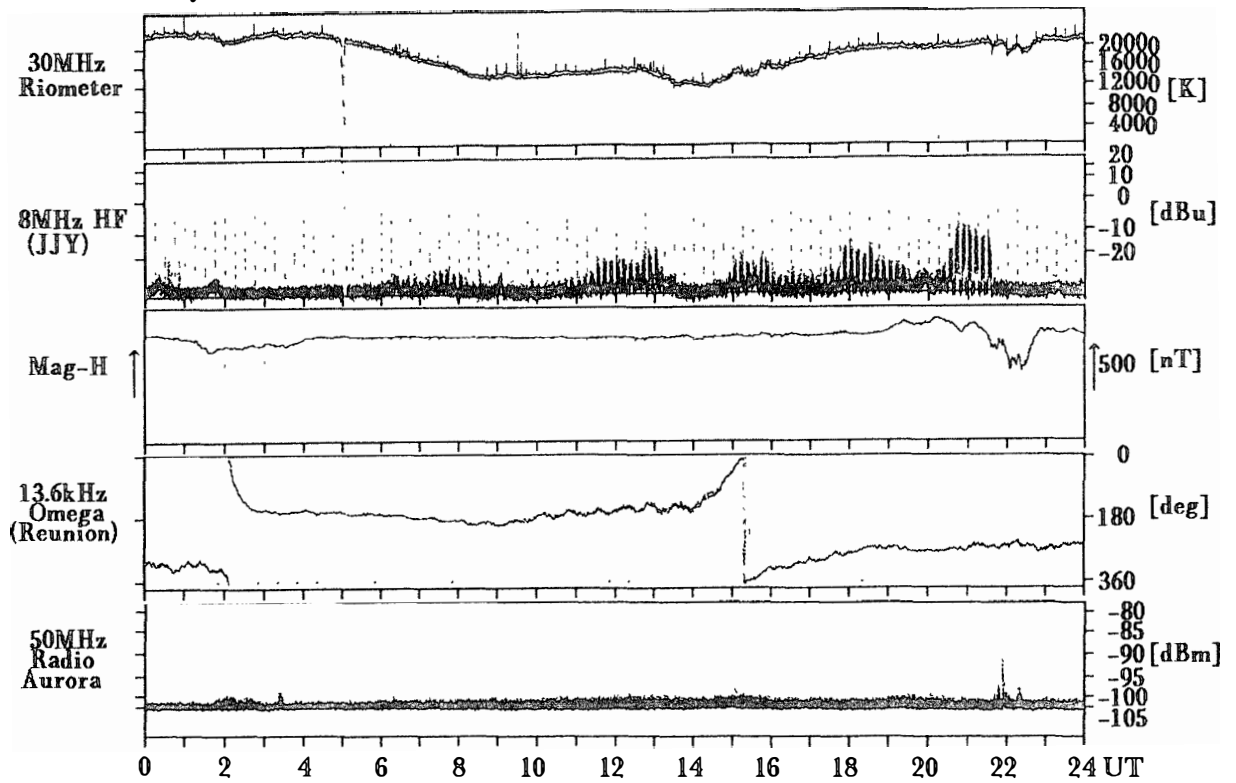
Syowa Station

Total Day / 85 1994/ 3/26



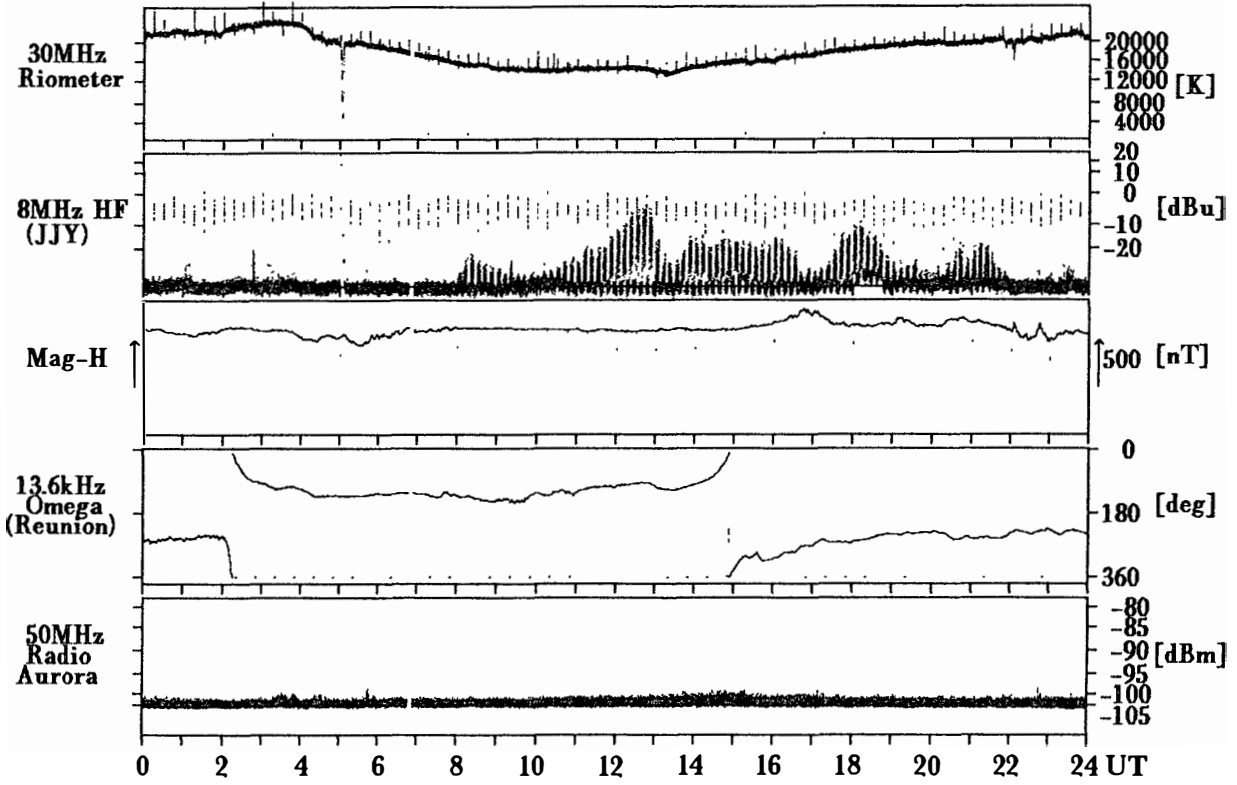
Syowa Station

Total Day / 86 1994/ 3/27



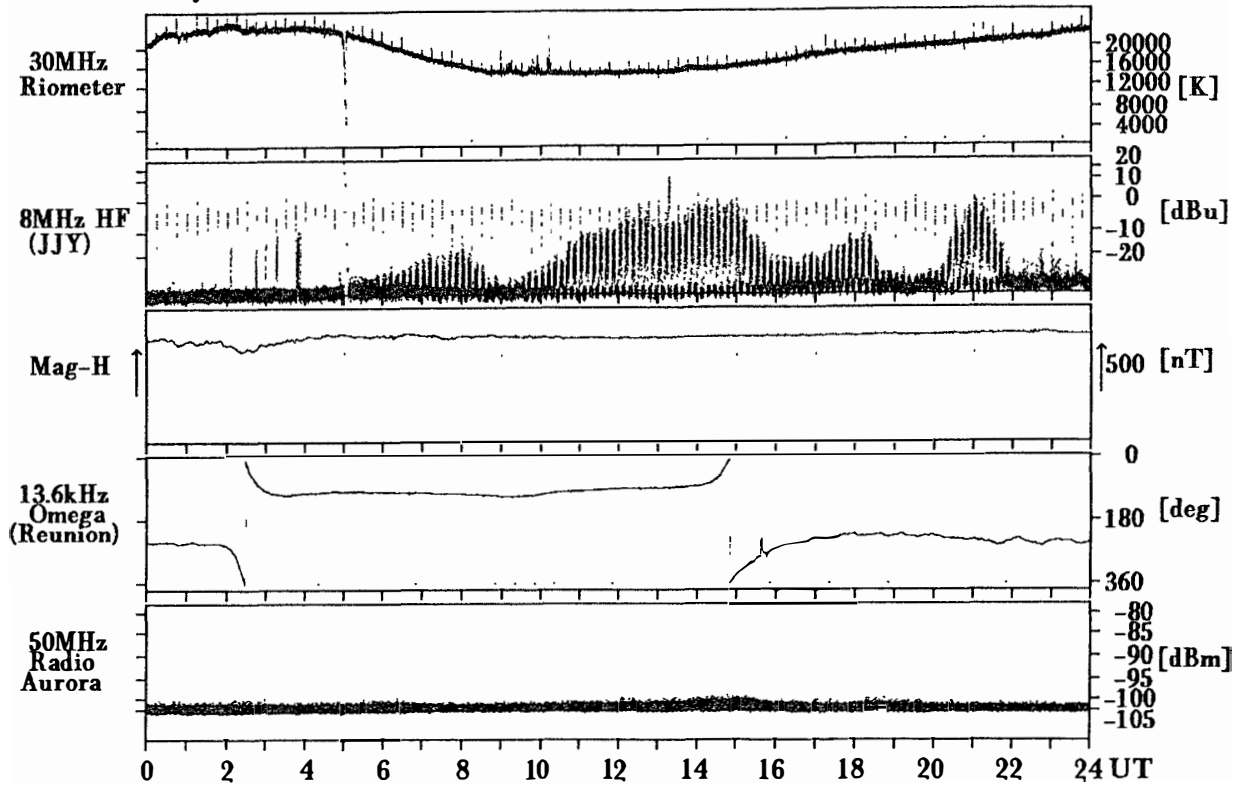
Syowa Station

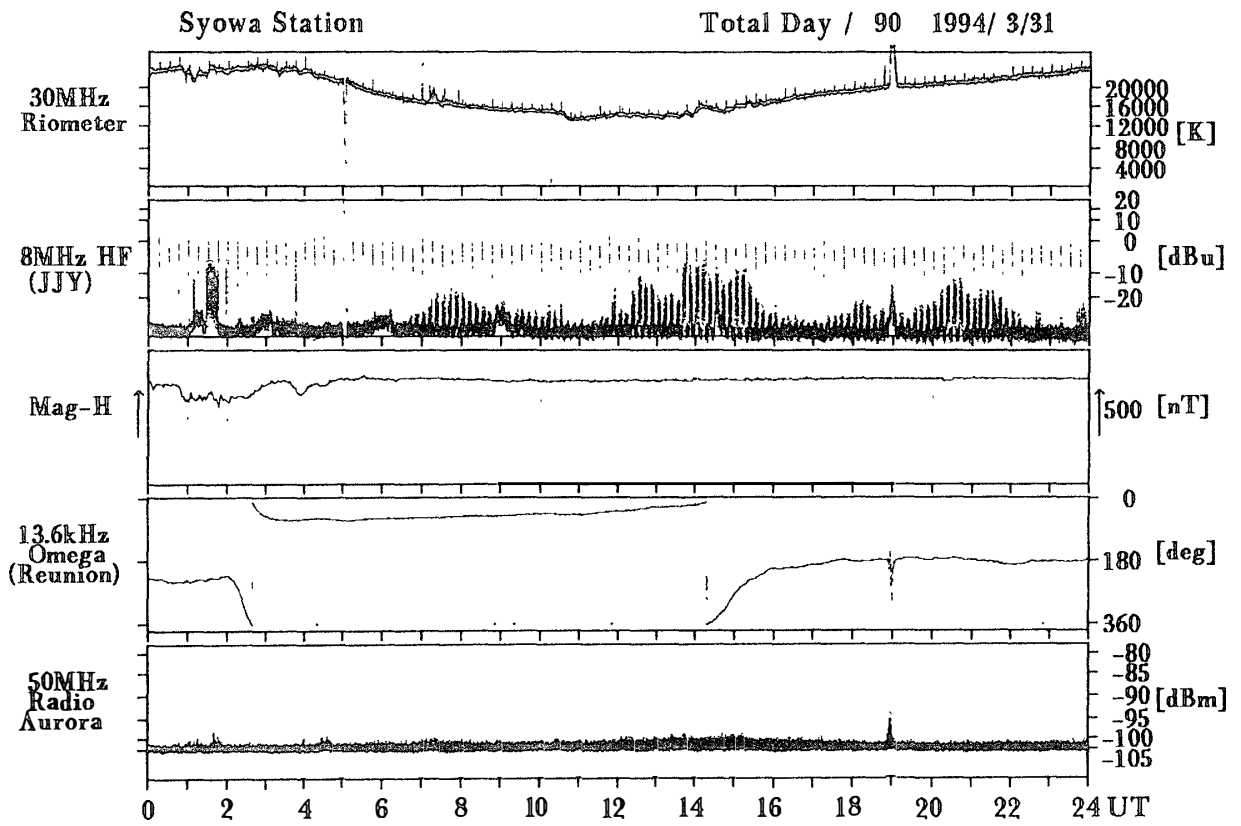
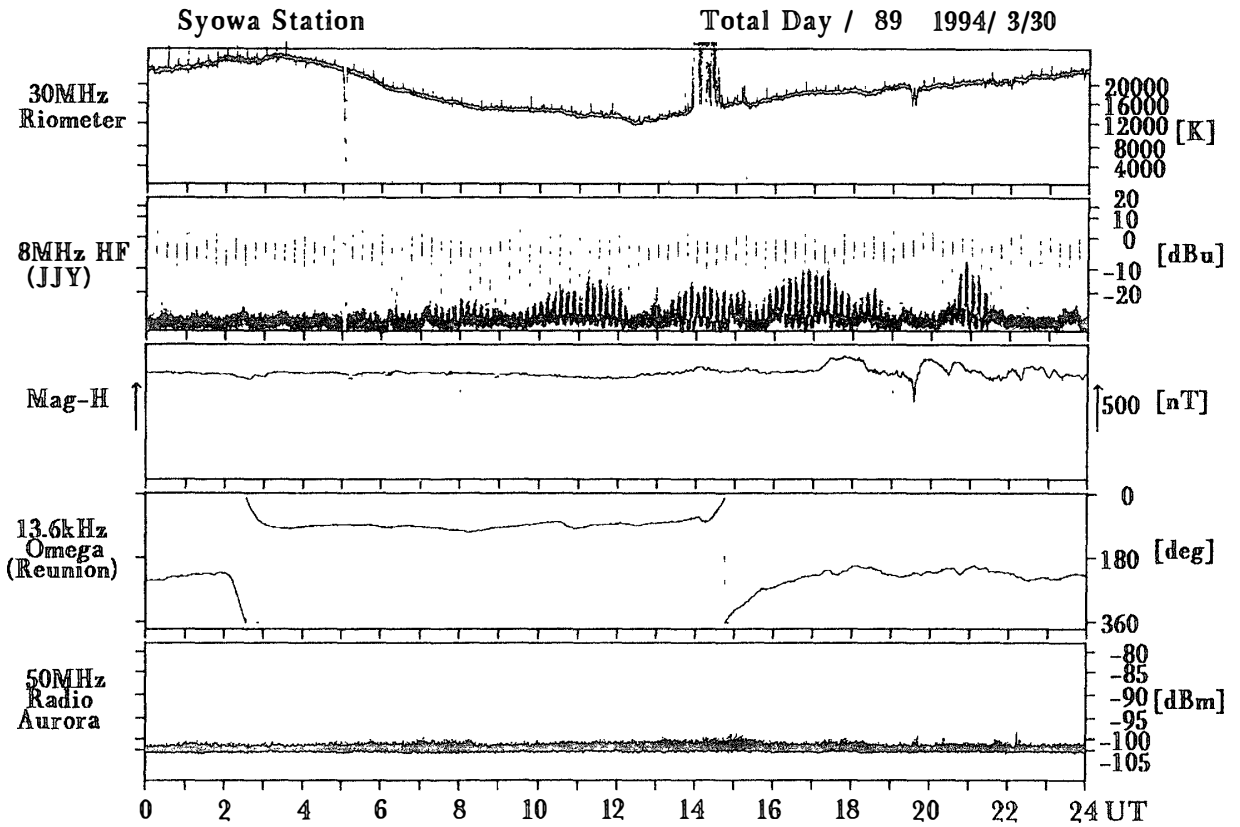
Total Day / 87 1994/ 3/28

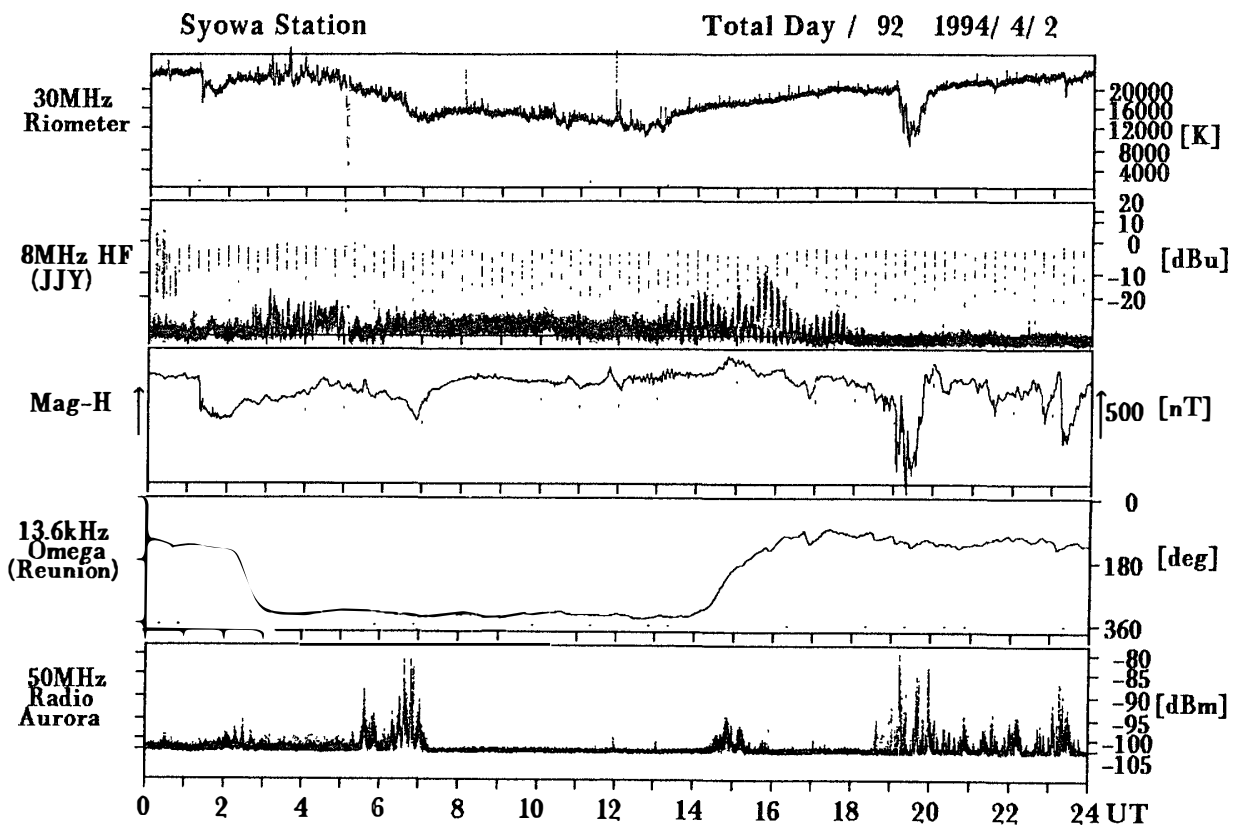
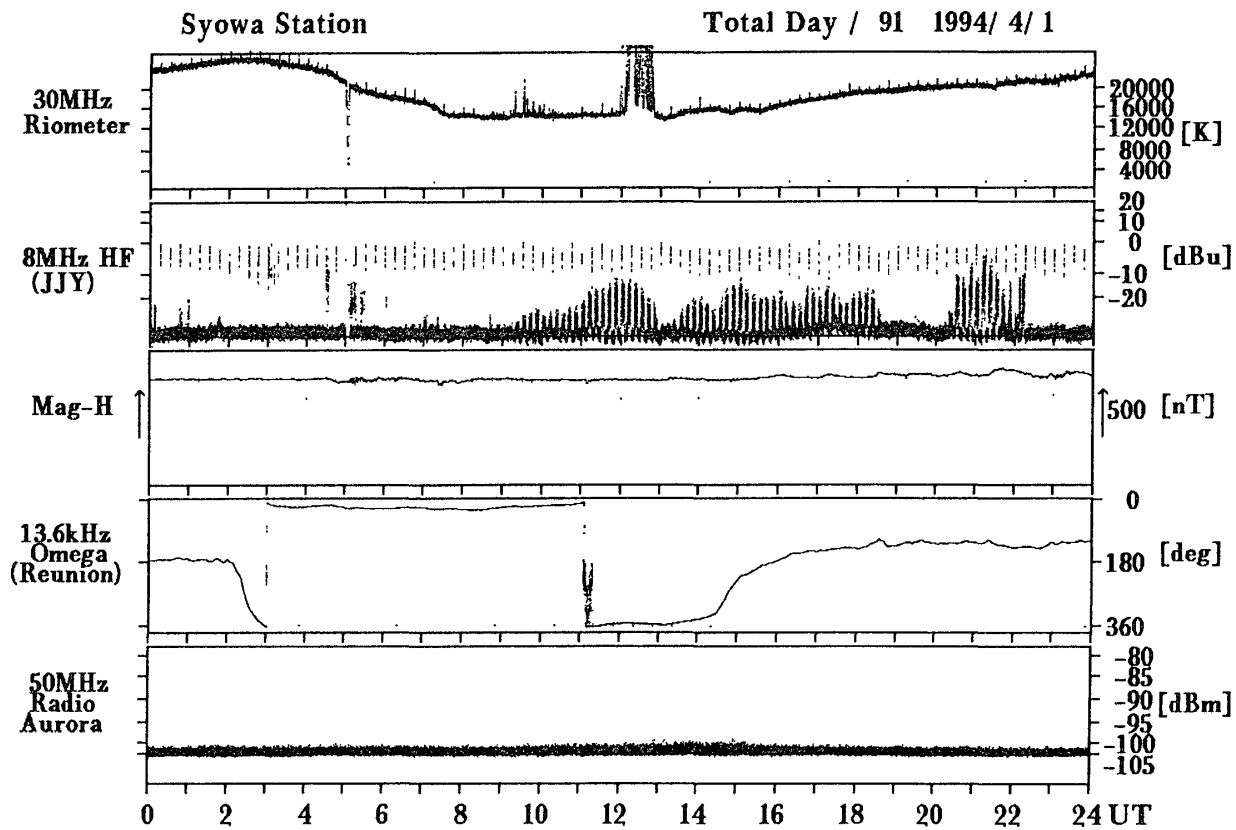


Syowa Station

Total Day / 88 1994/ 3/29

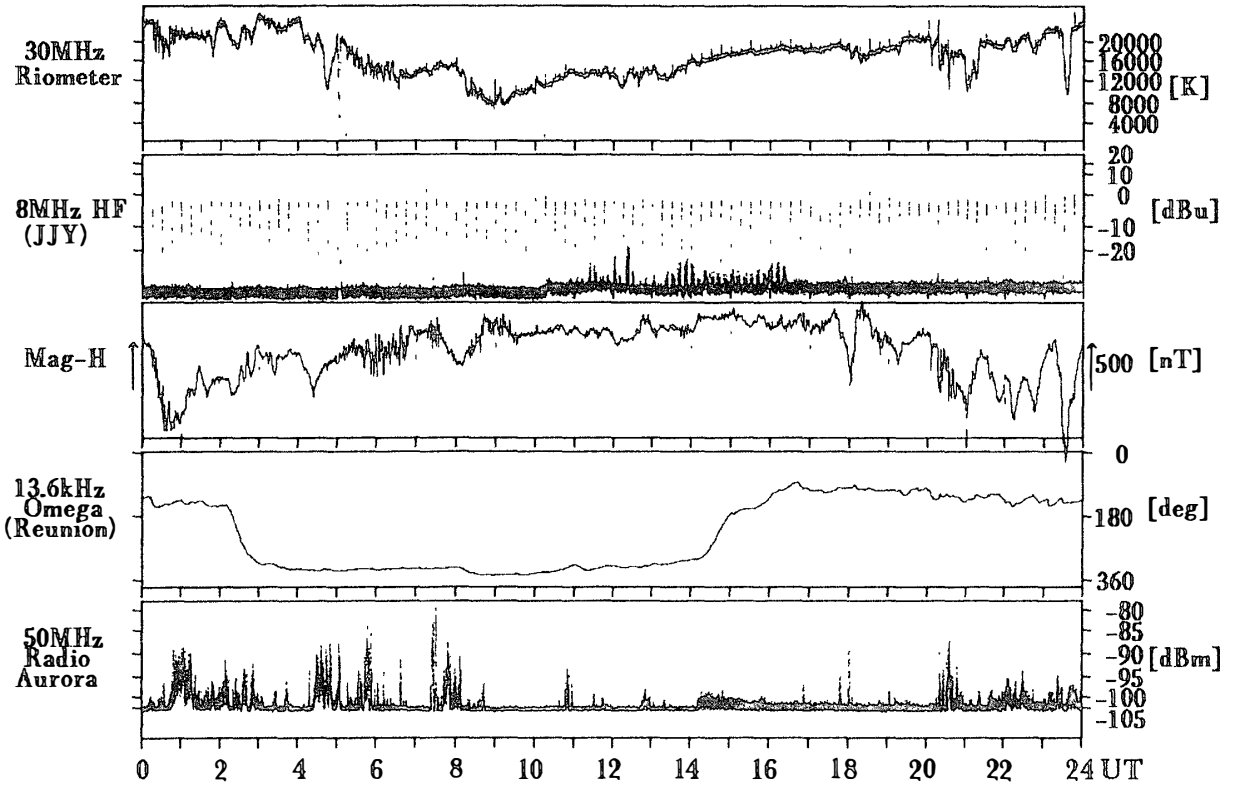






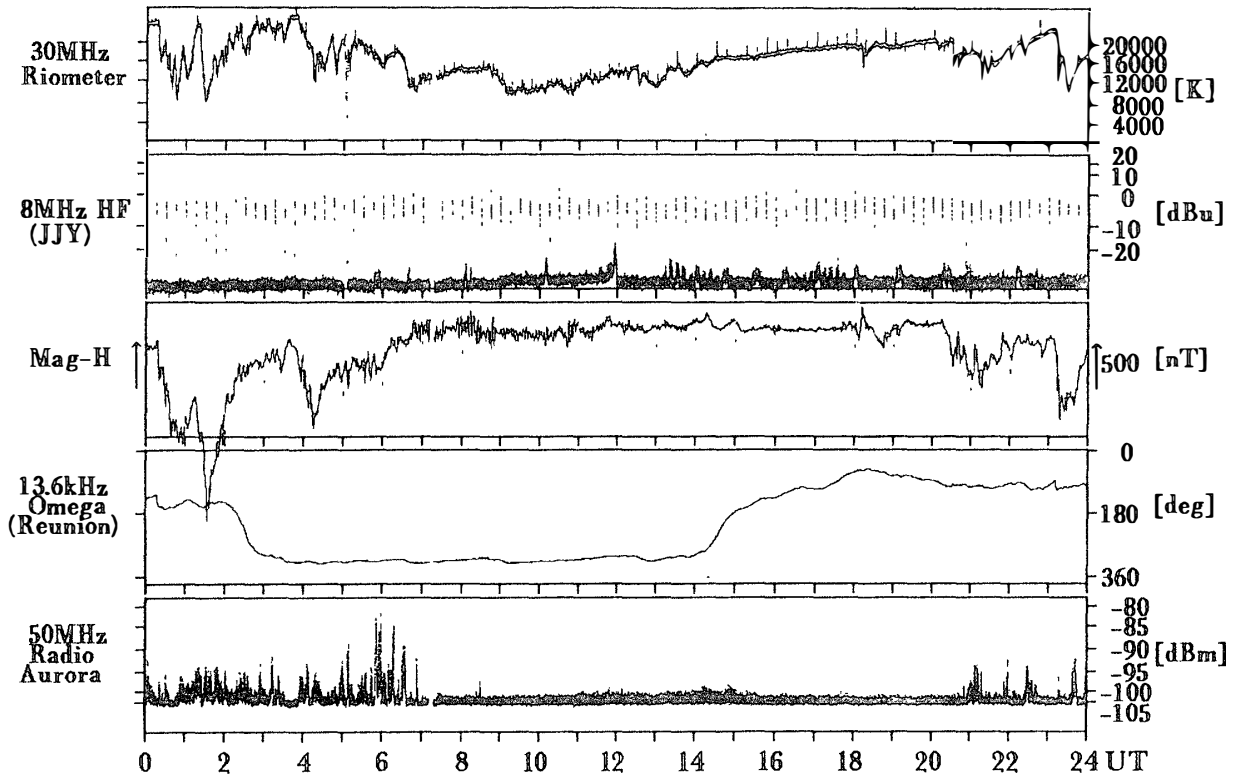
Syowa Station

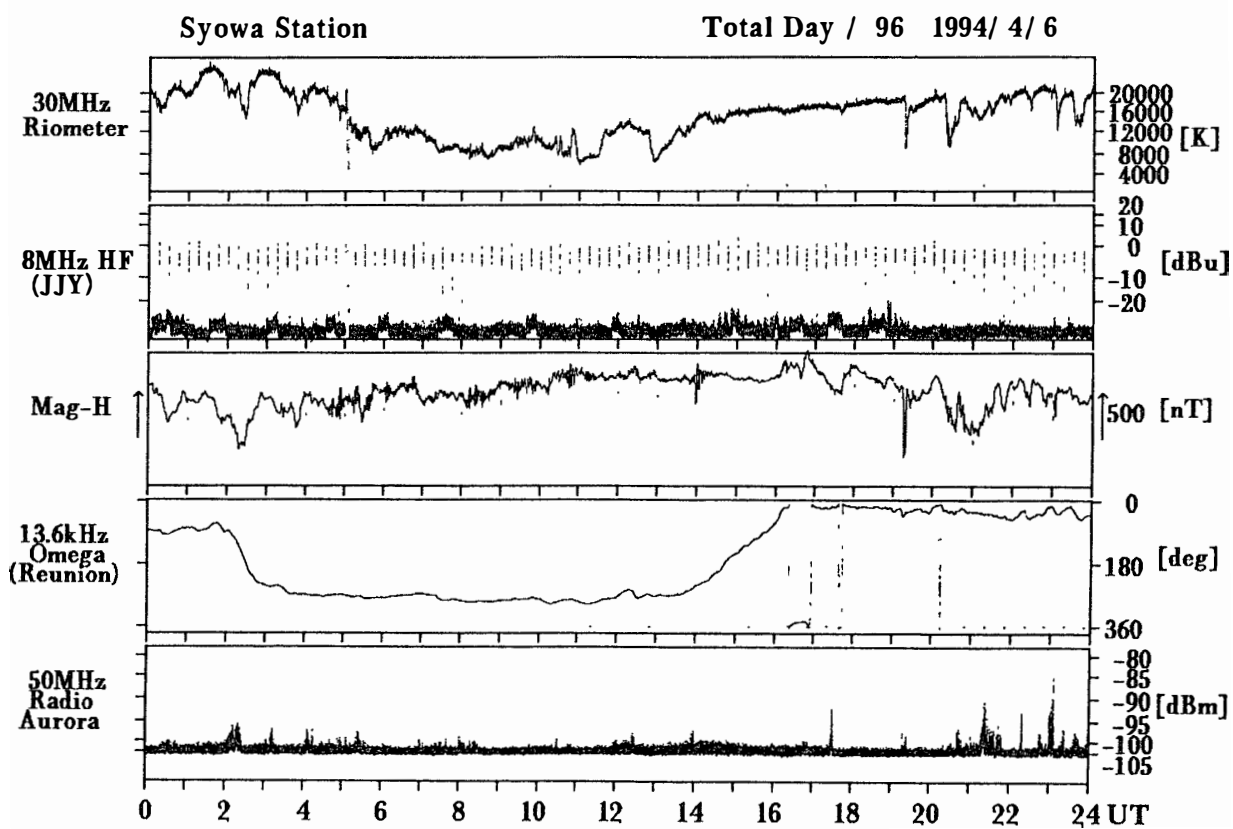
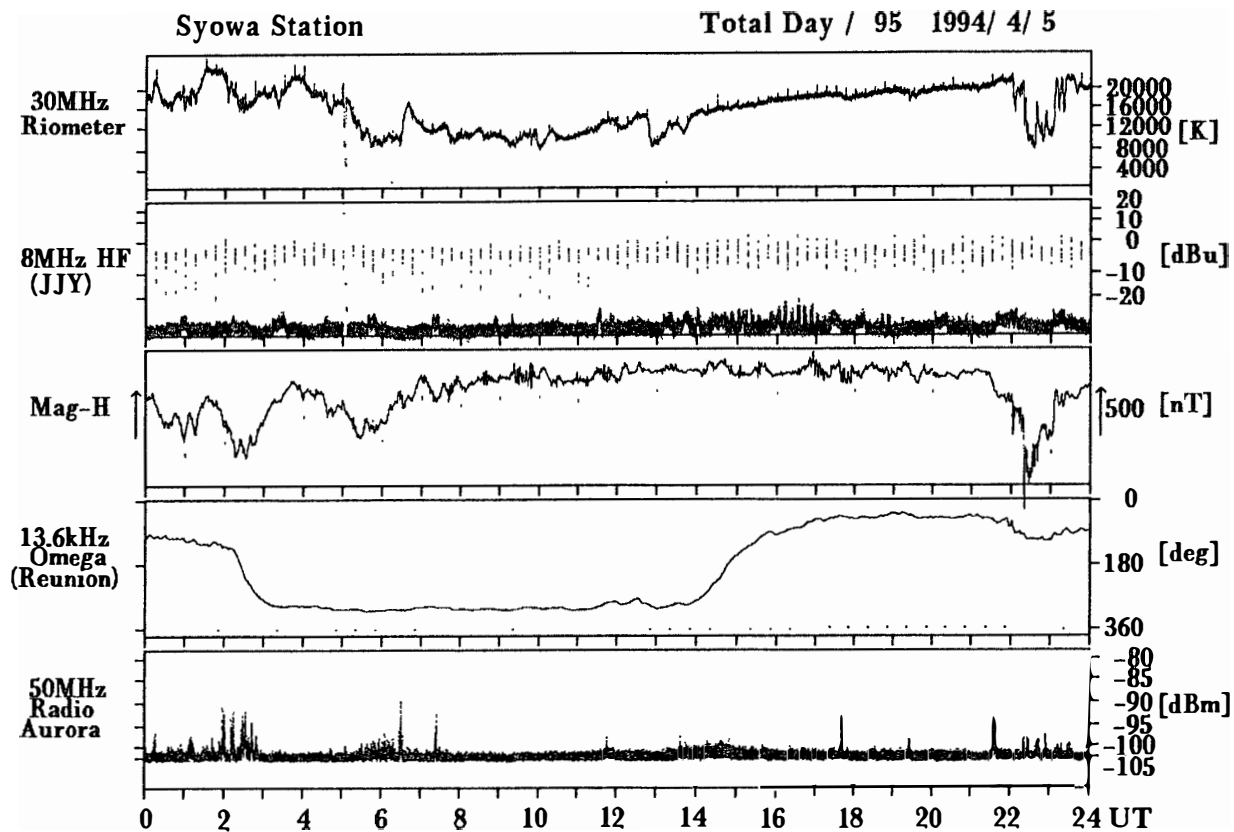
Total Day / 93 1994/ 4/ 3

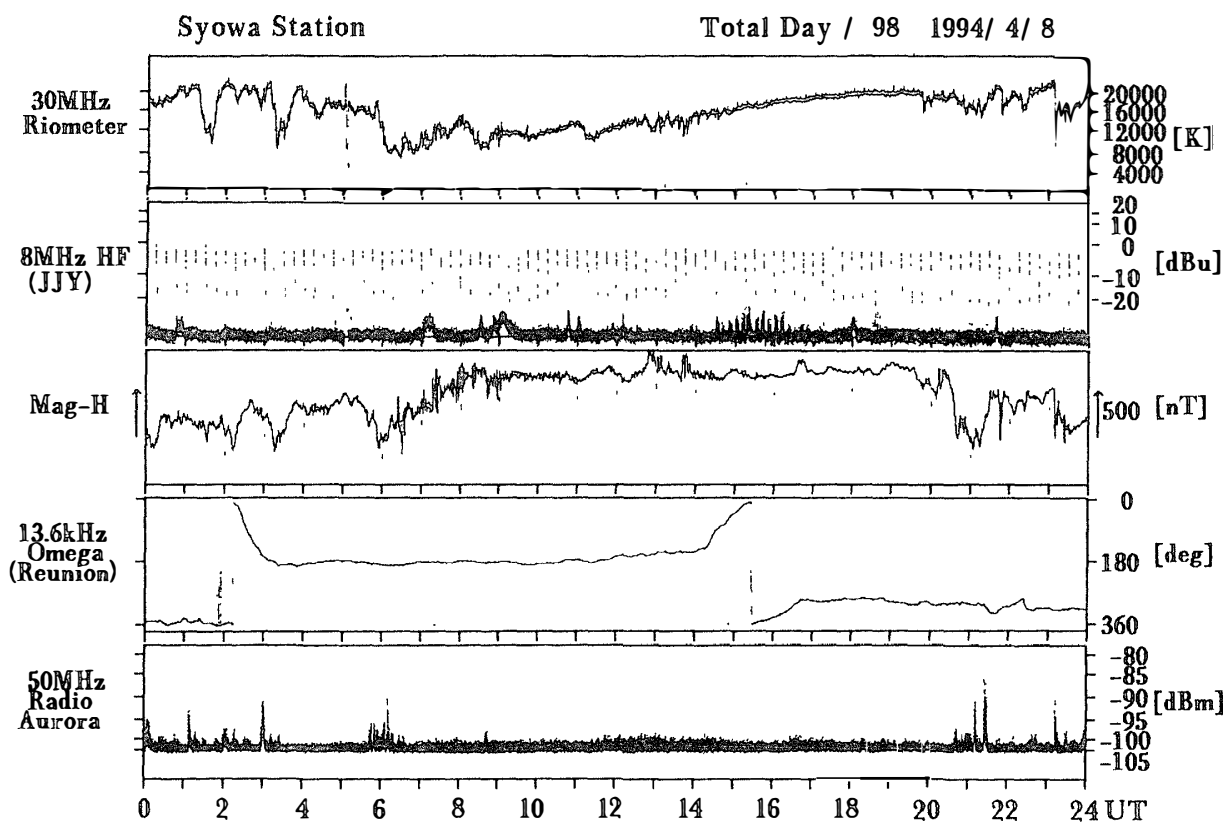
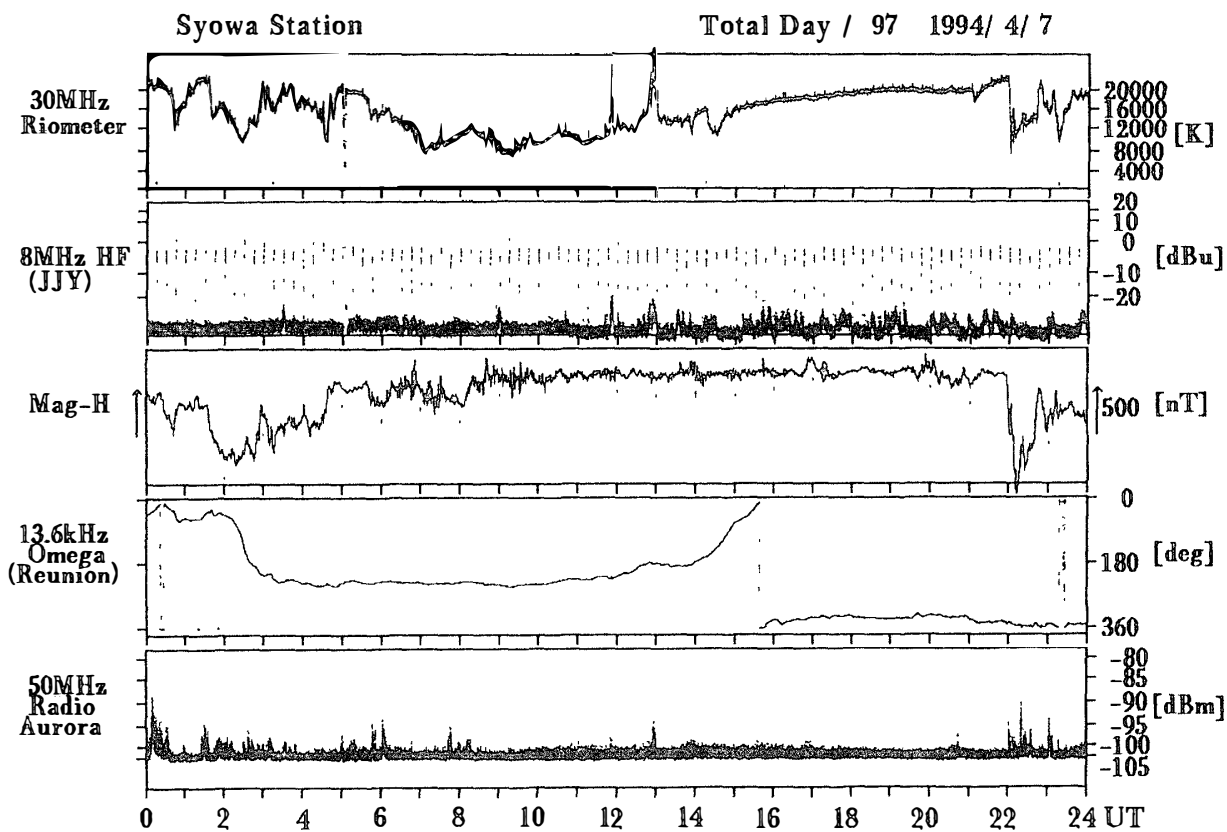


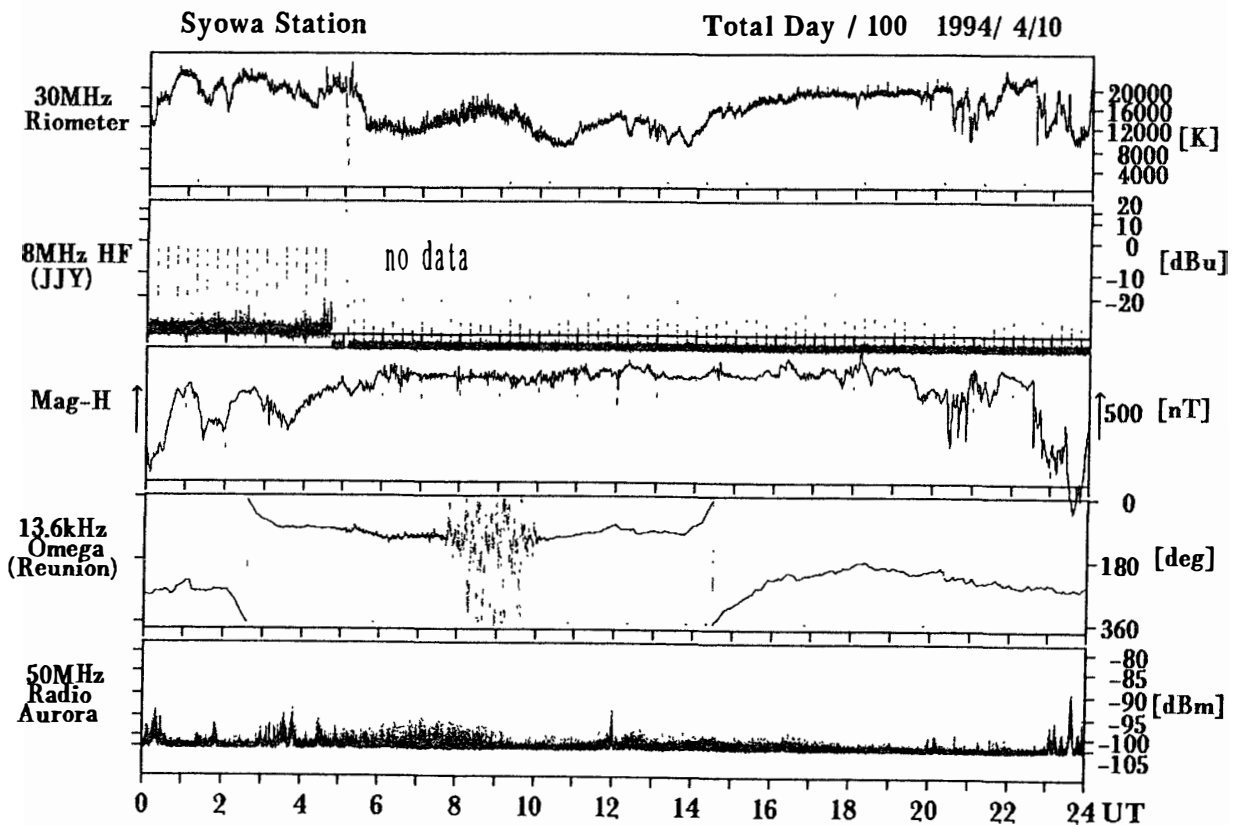
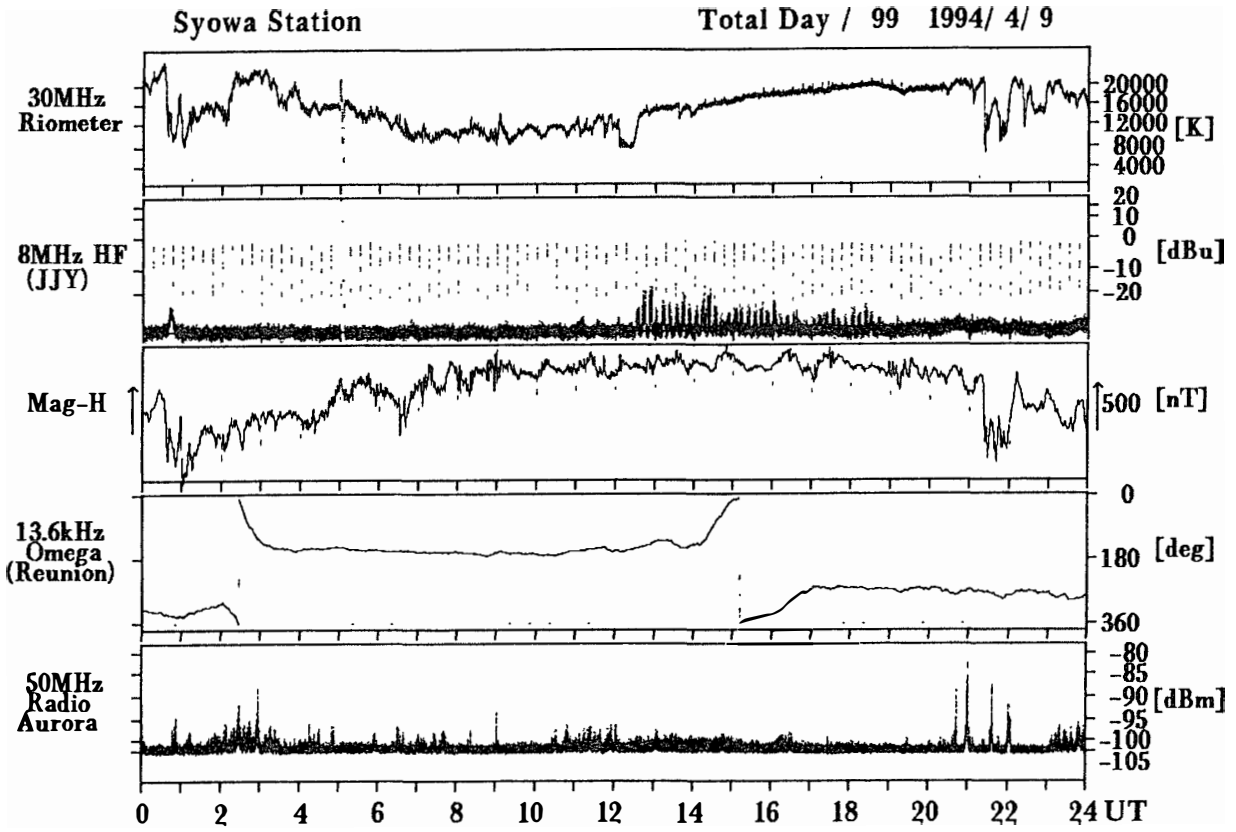
Syowa Station

Total Day / 94 1994/ 4/ 4



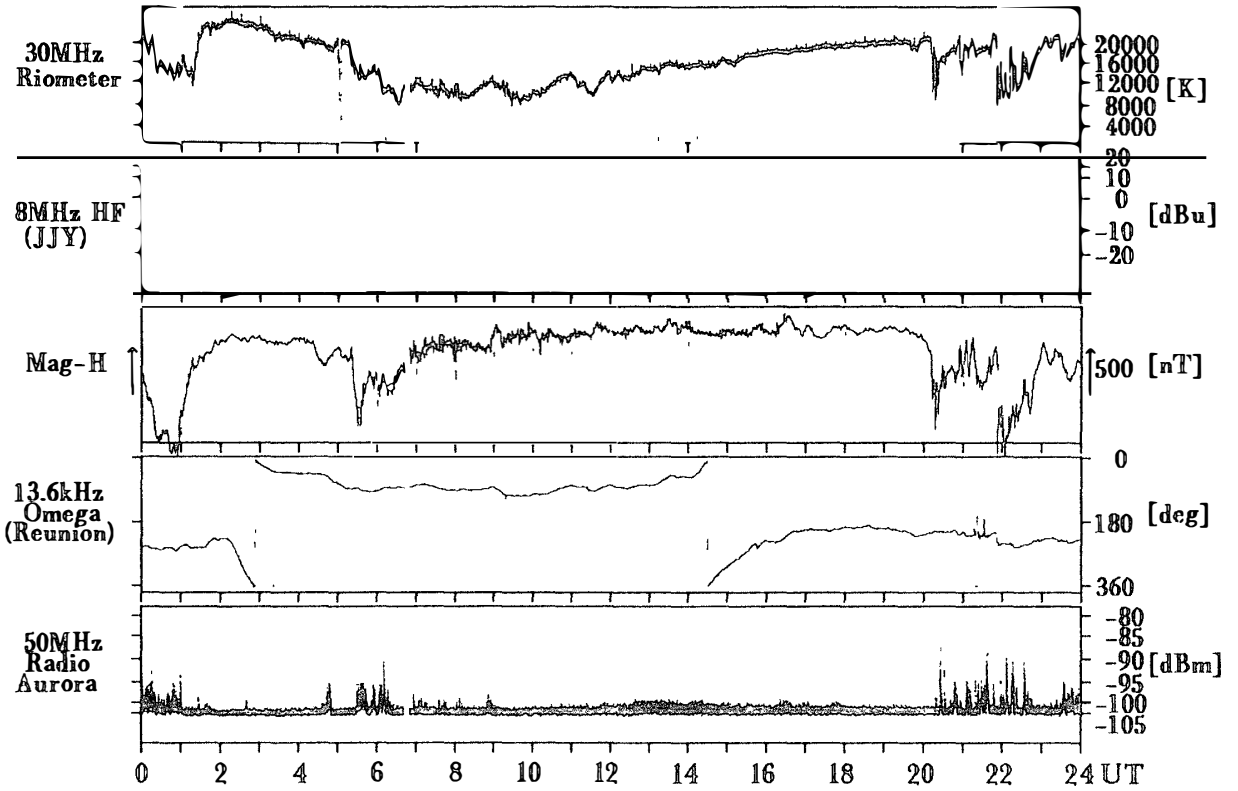






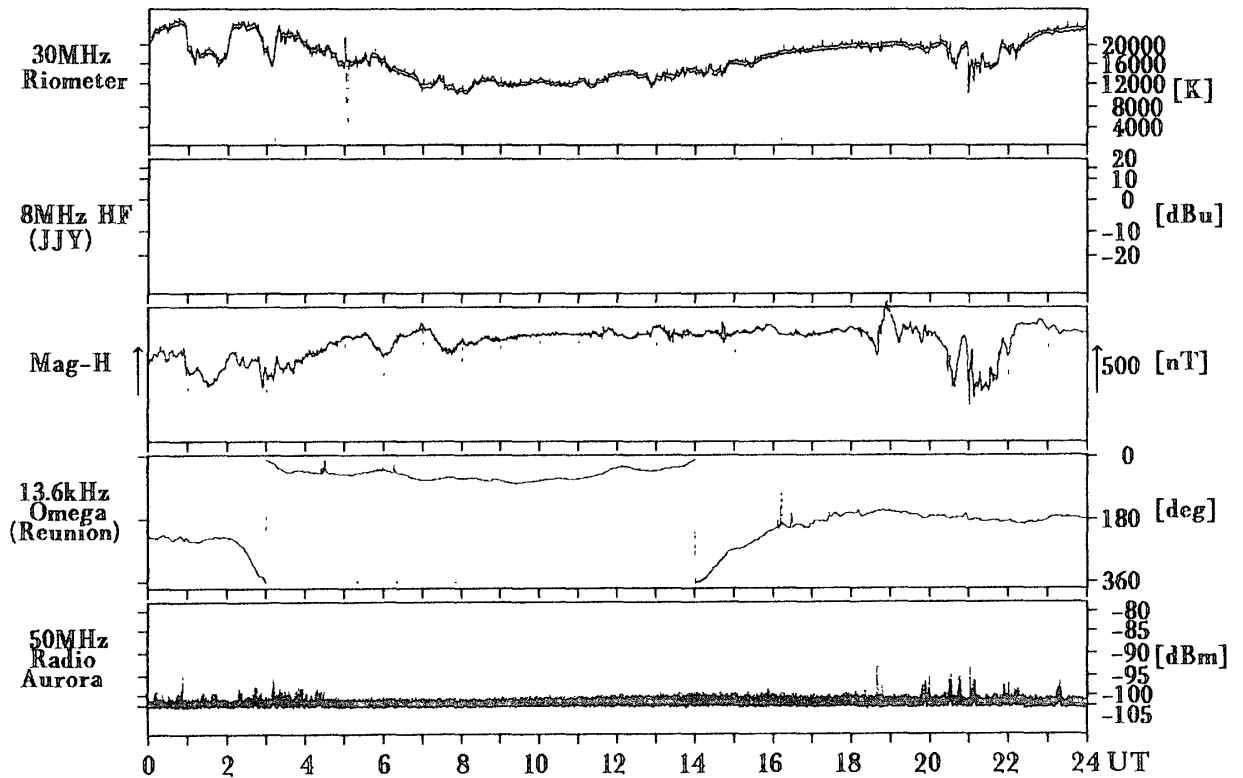
Syowa Station

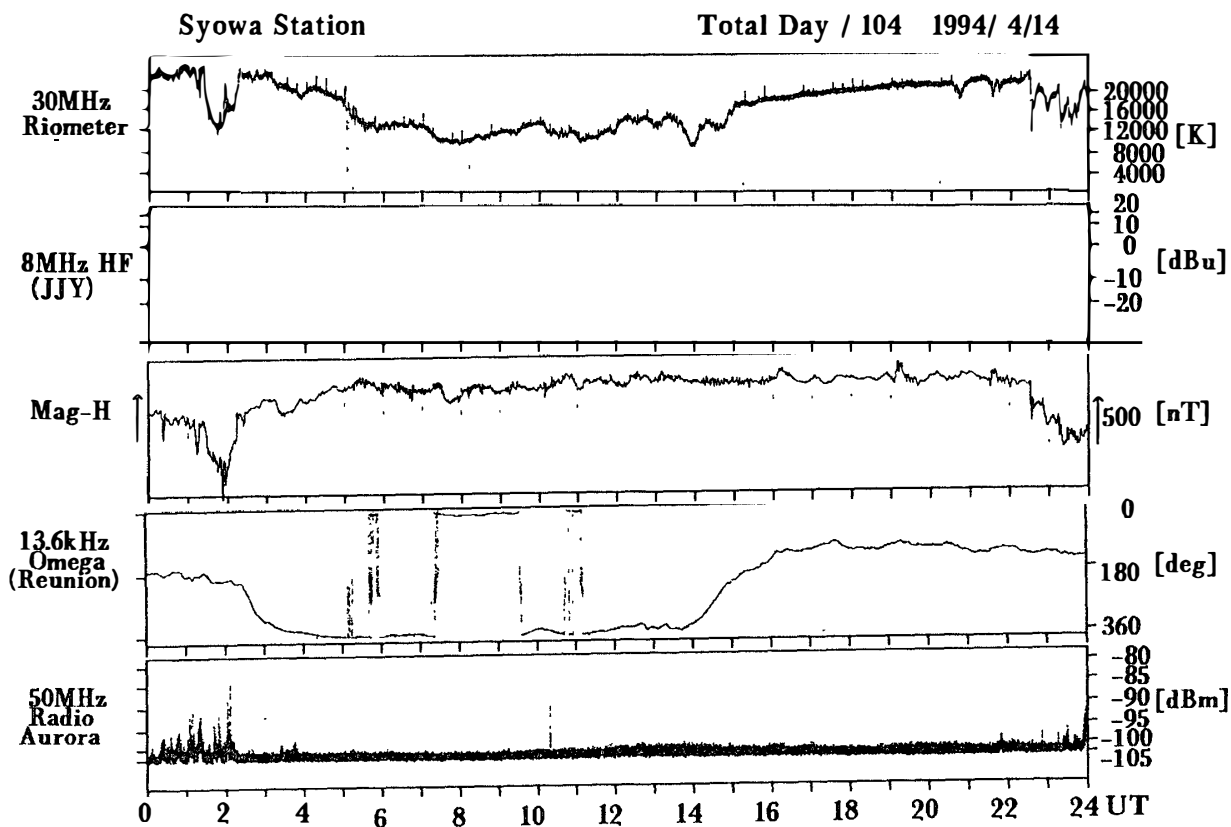
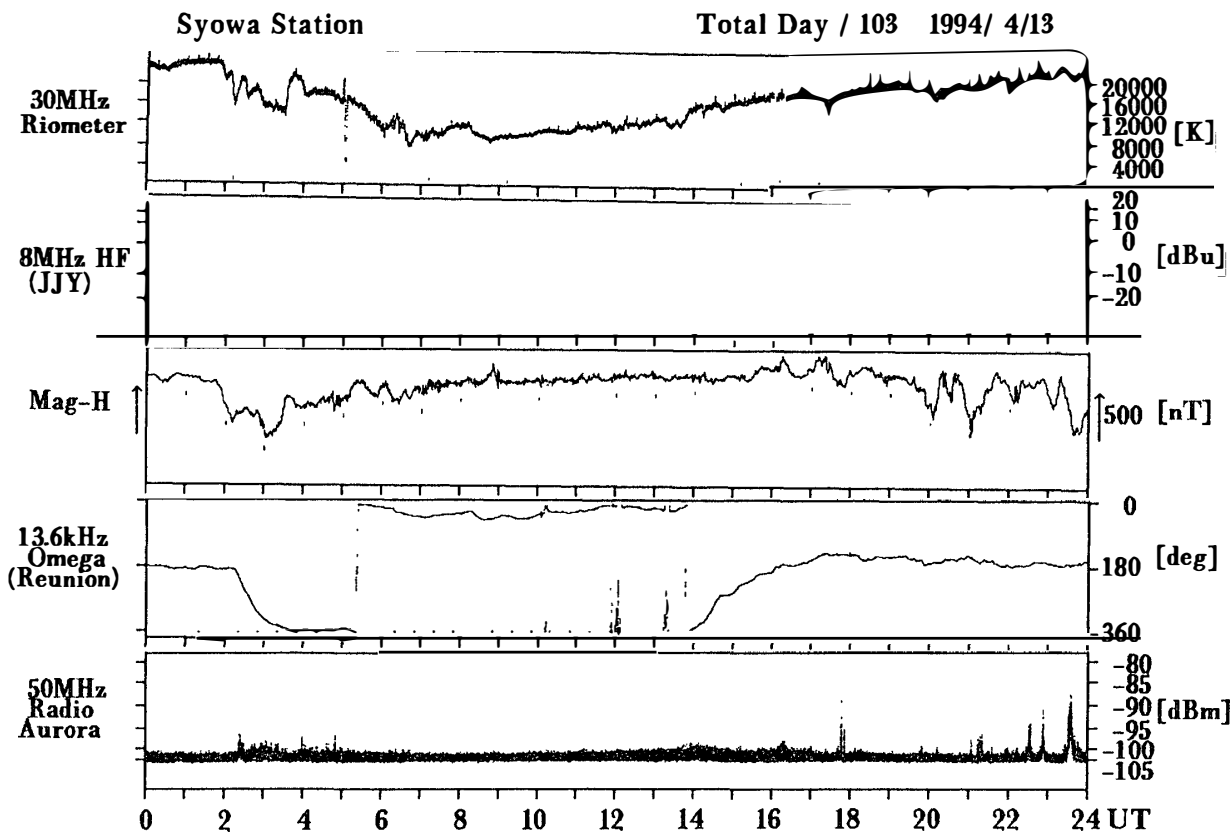
Total Day / 101 1994/ 4/11



Syowa Station

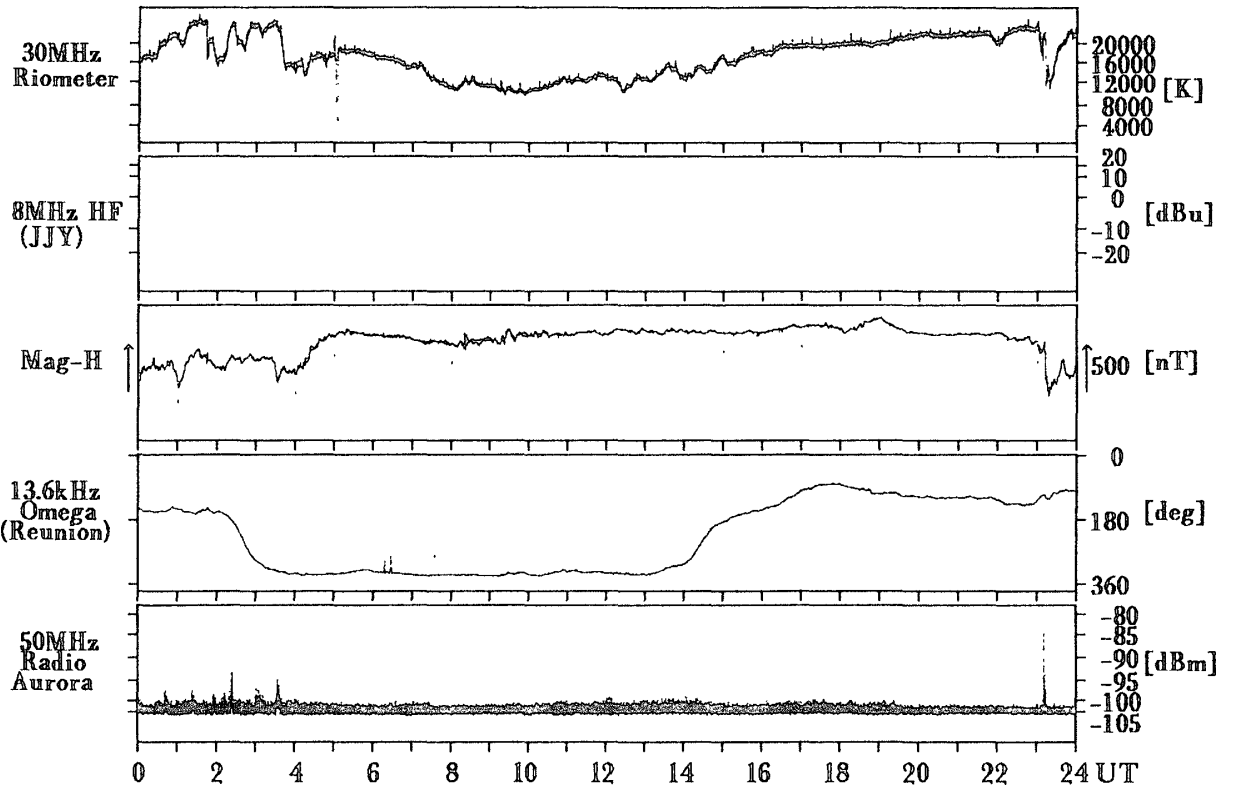
Total Day / 102 1994/ 4/12





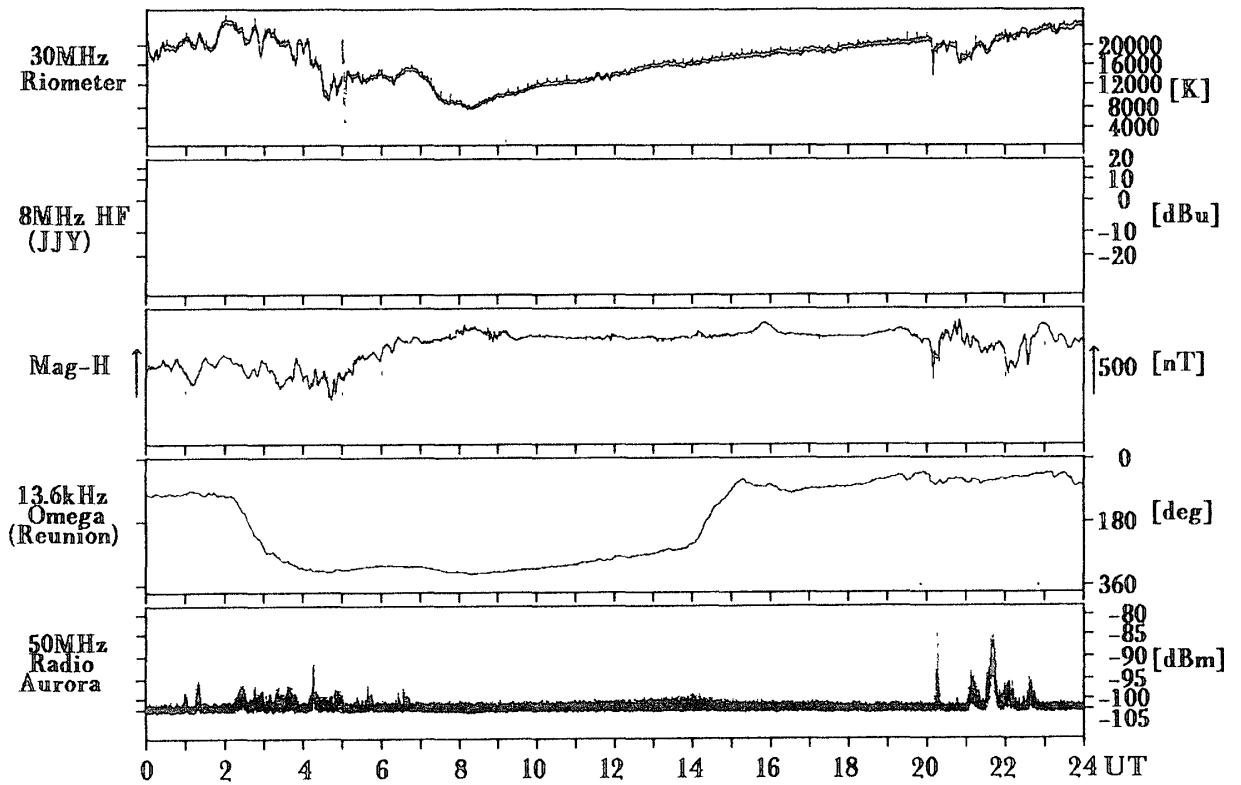
Syowa Station

Total Day / 105 1994/ 4/15



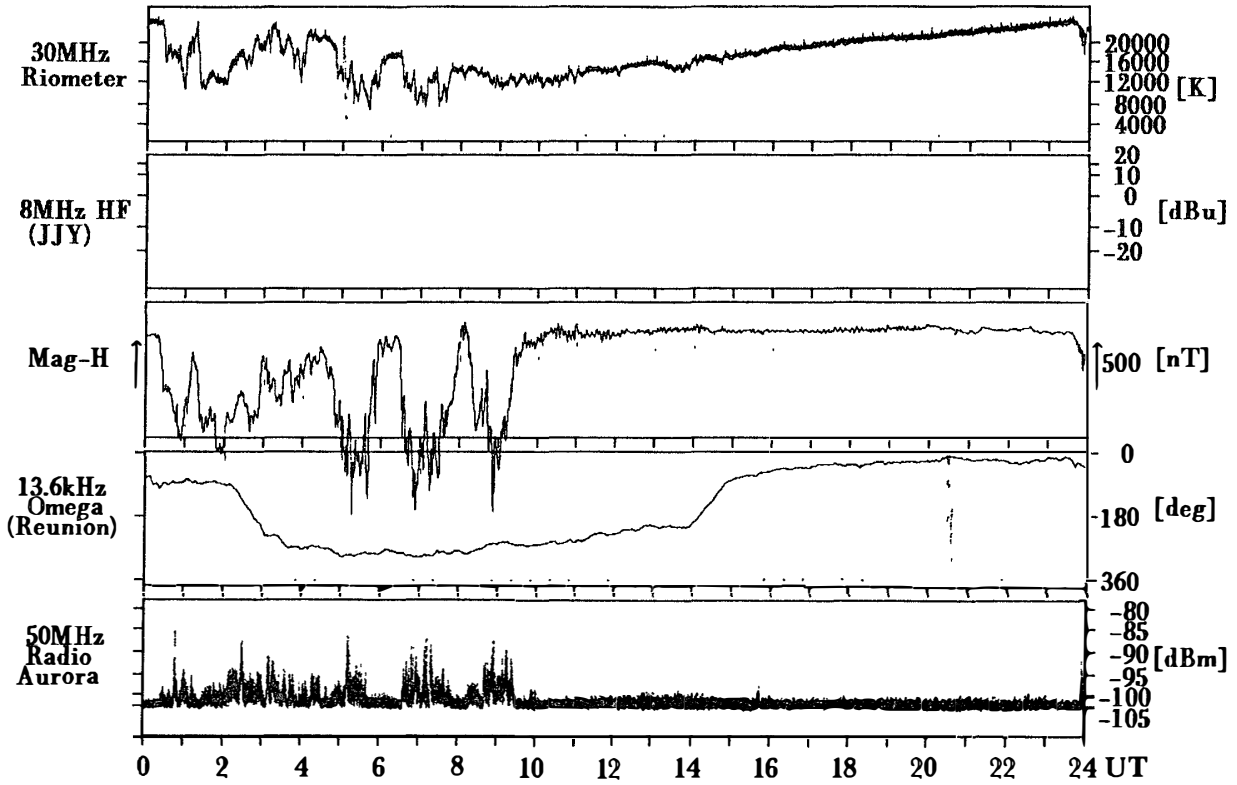
Syowa Station

Total Day / 106 1994/ 4/16



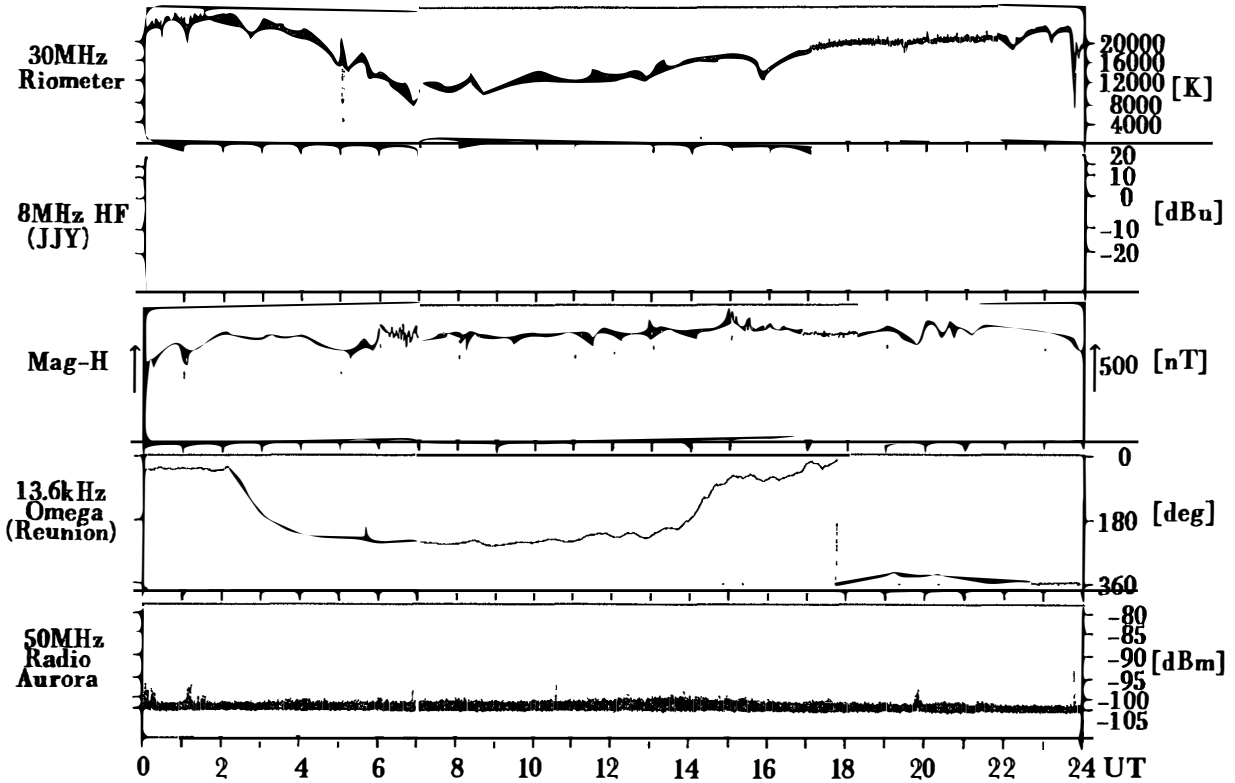
Syowa Station

Total Day / 107 1994/ 4/17



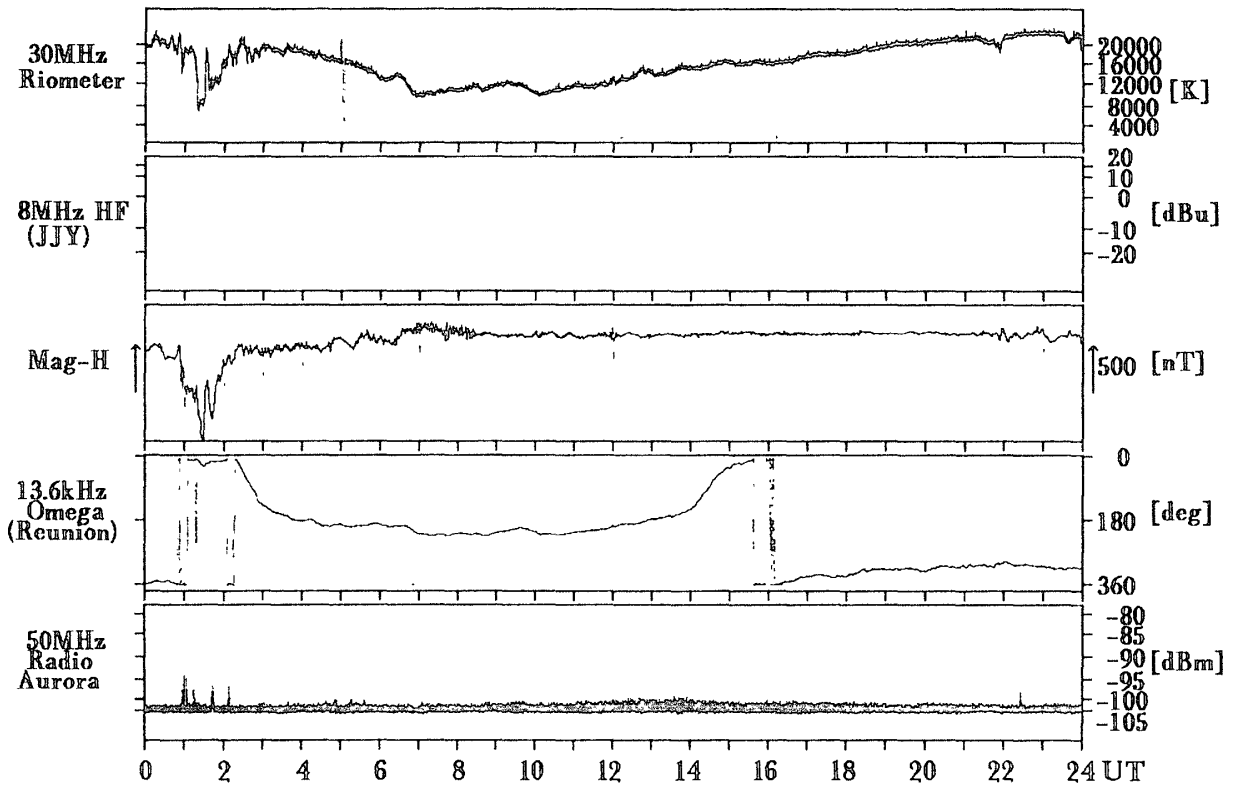
Syowa Station

Total Day / 108 1994/ 4/18



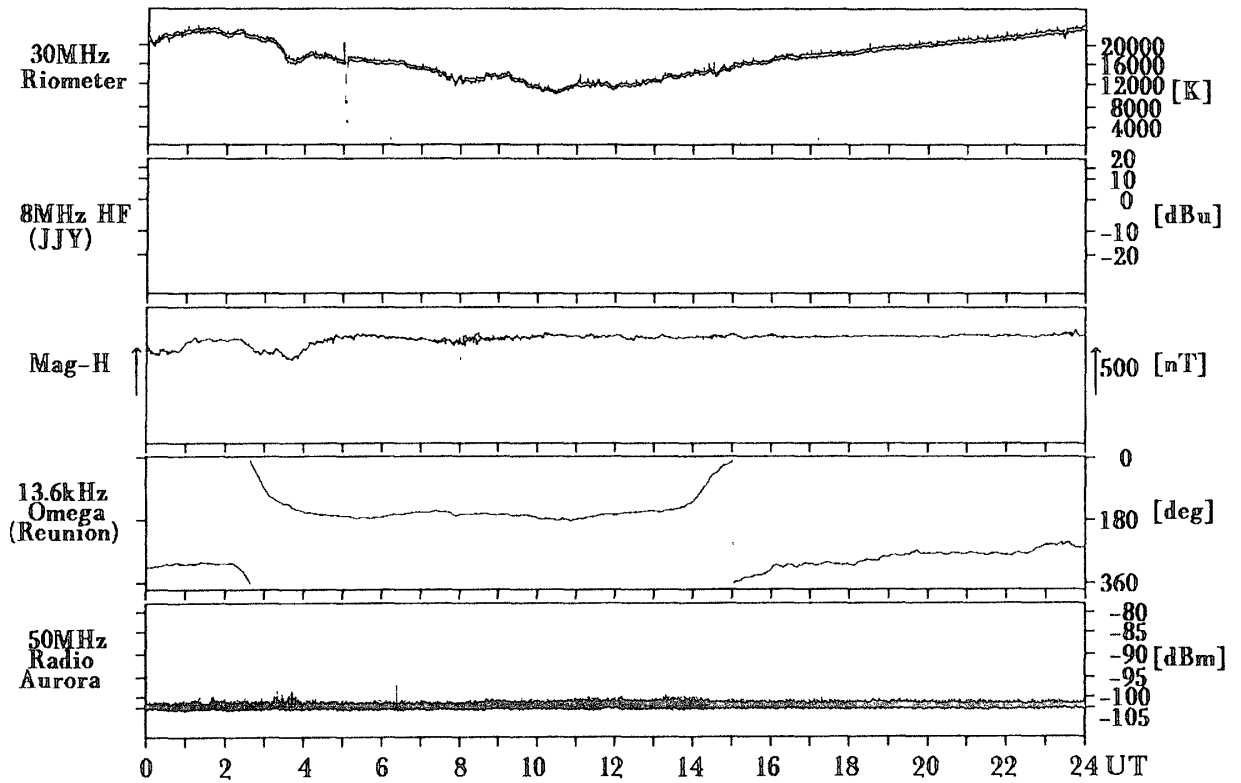
Syowa Station

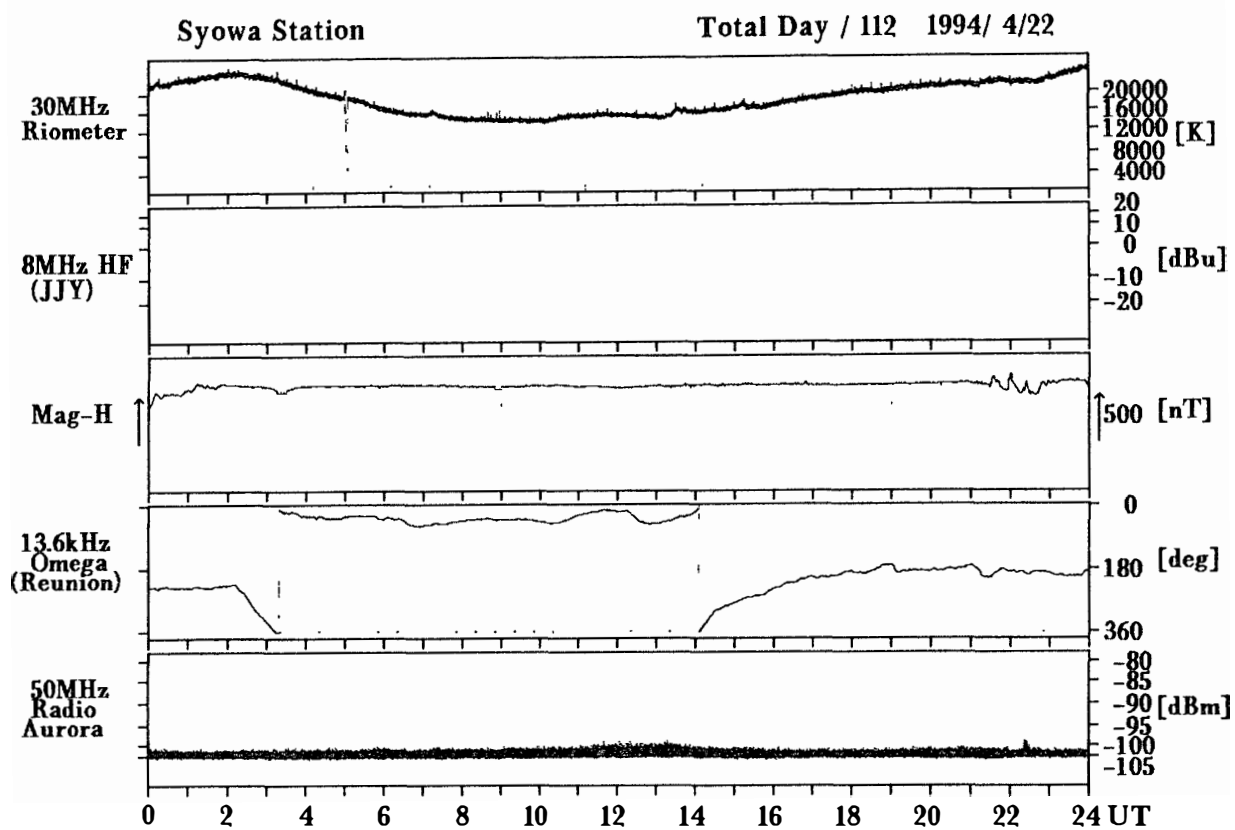
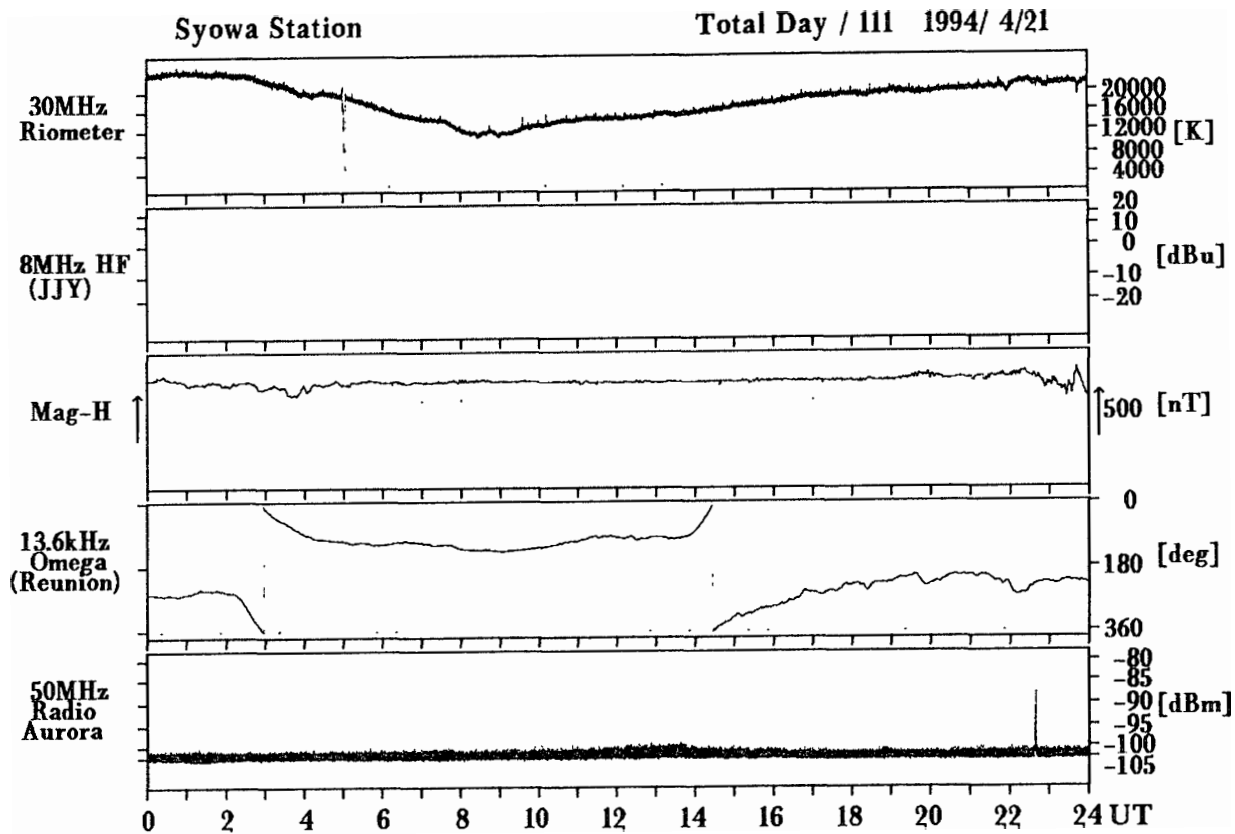
Total Day / 109 1994/ 4/19



Syowa Station

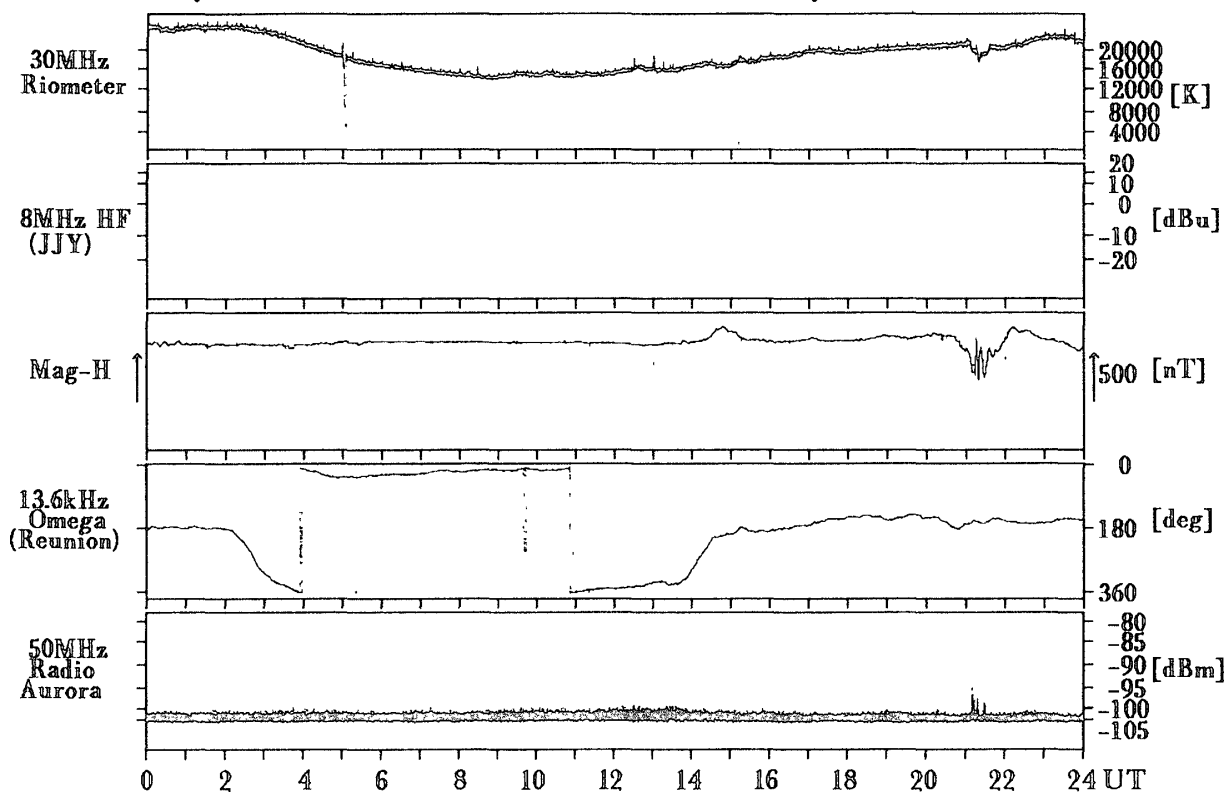
Total Day / 110 1994/ 4/20





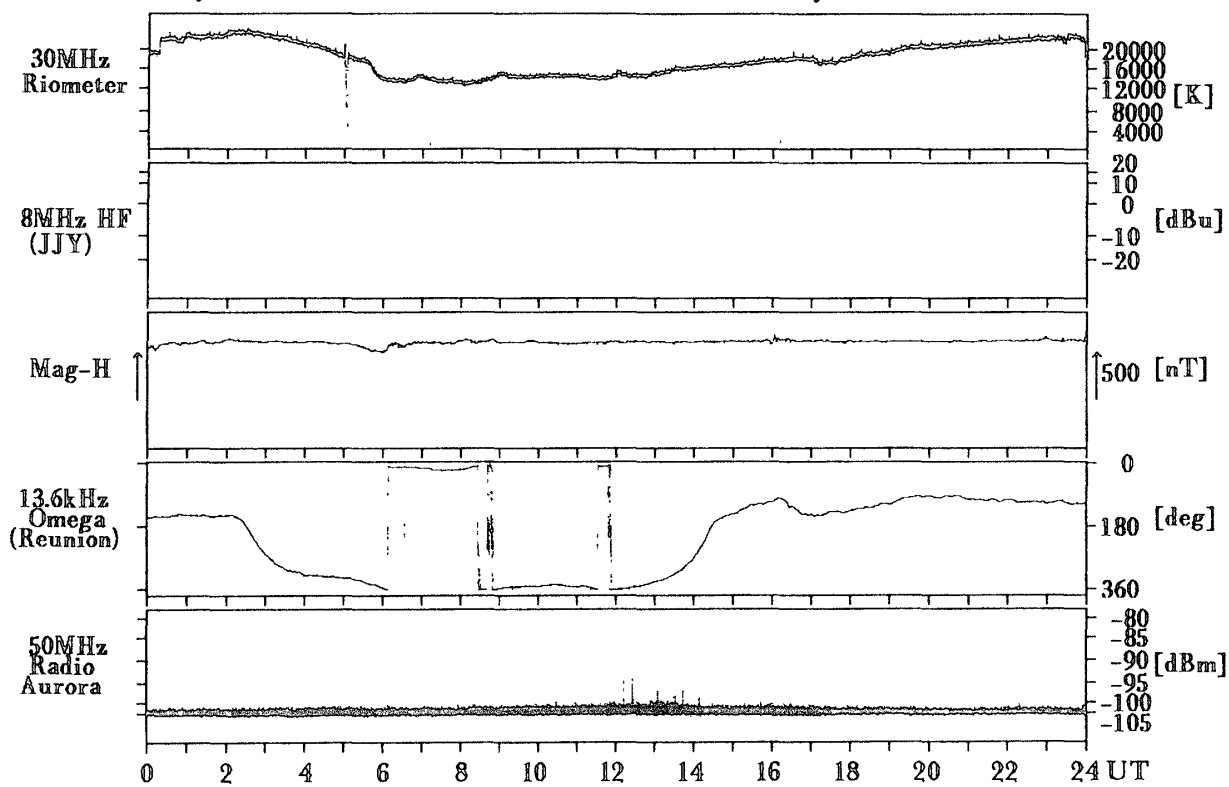
Syowa Station

Total Day / 113 1994/ 4/23



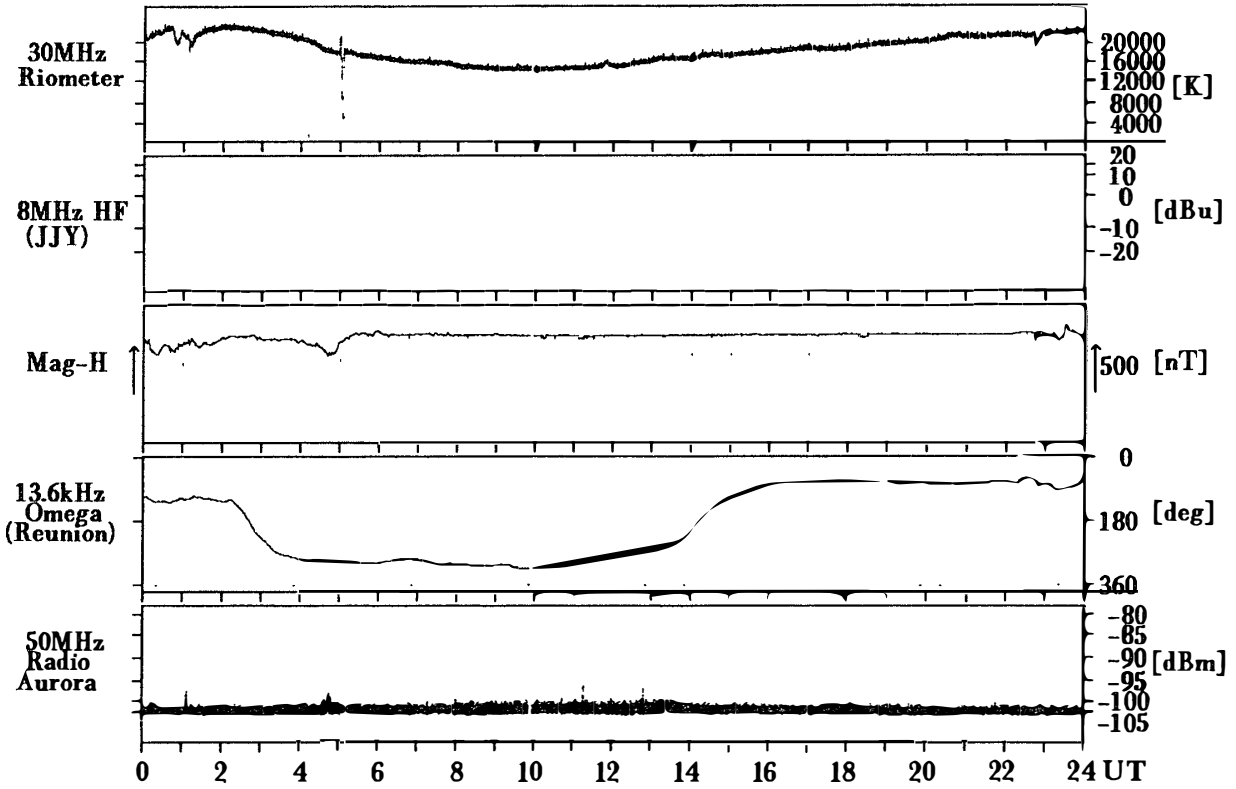
Syowa Station

Total Day / 114 1994/ 4/24



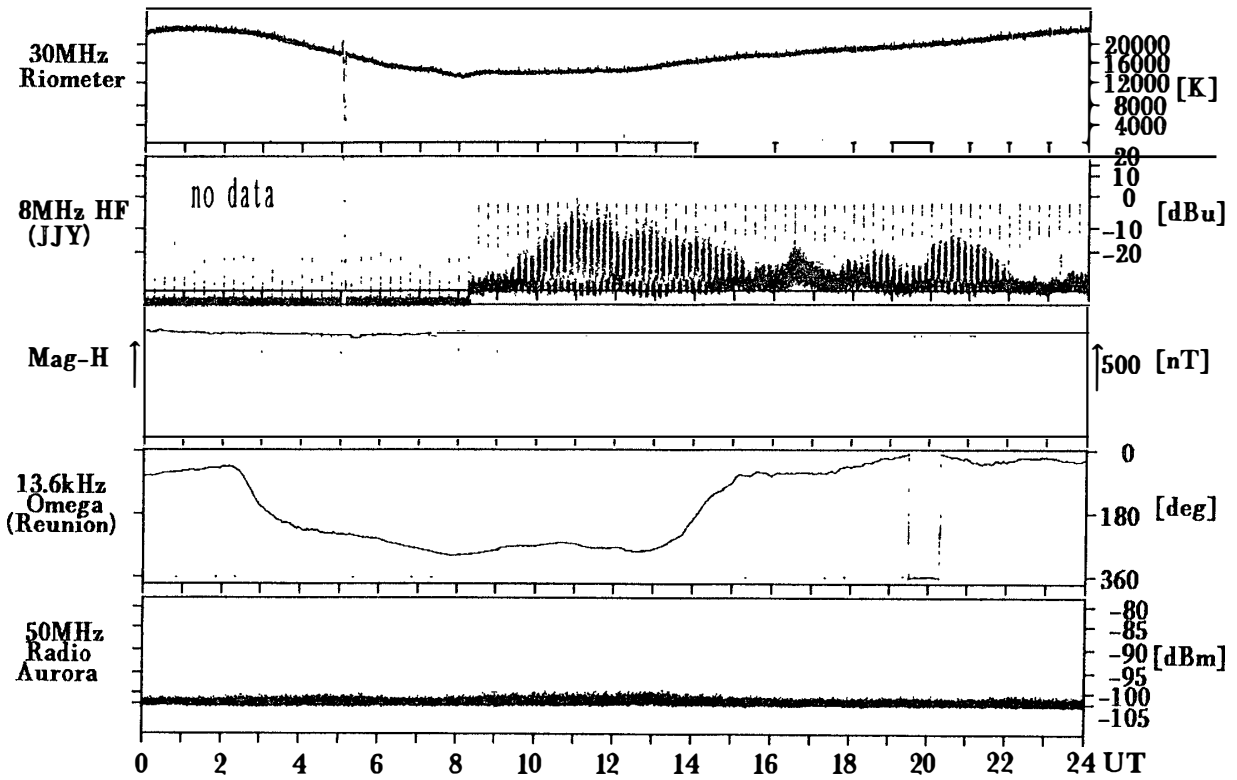
Syowa Station

Total Day / 115 1994/ 4/25



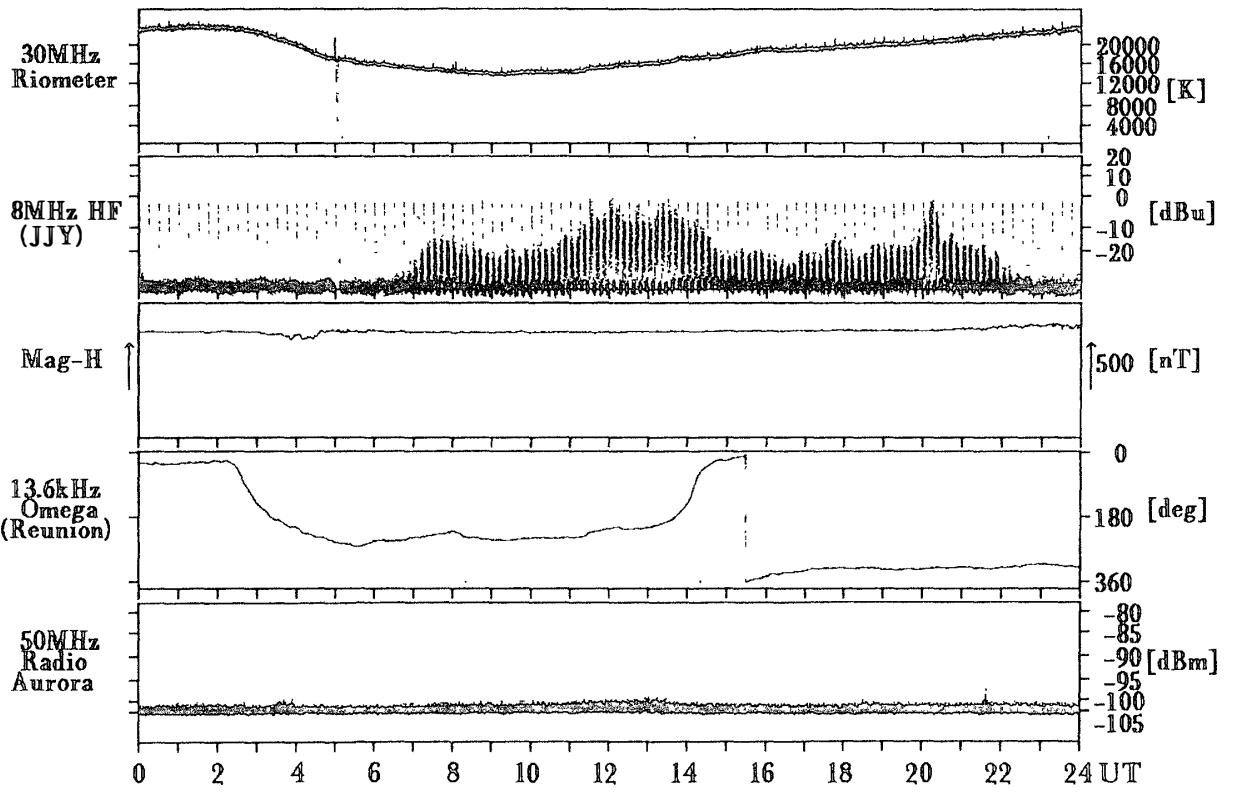
Syowa Station

Total Day / 116 1994/ 4/26



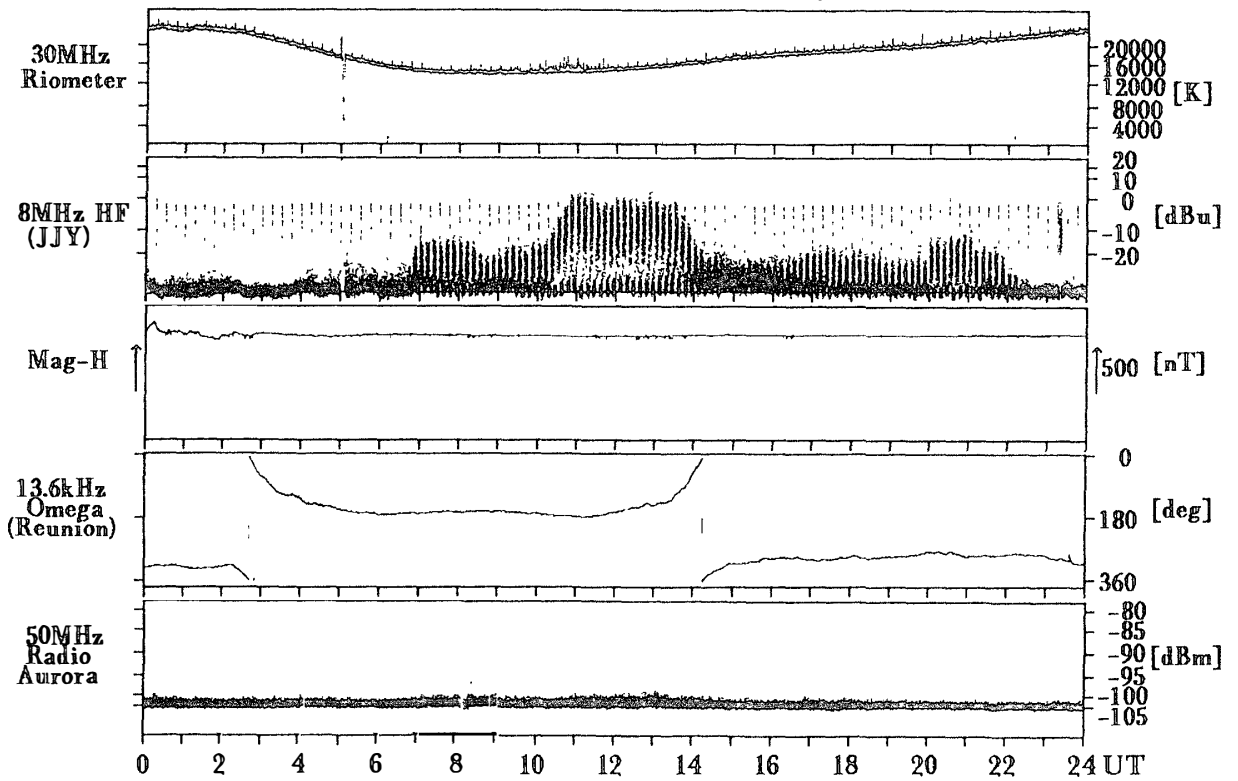
Syowa Station

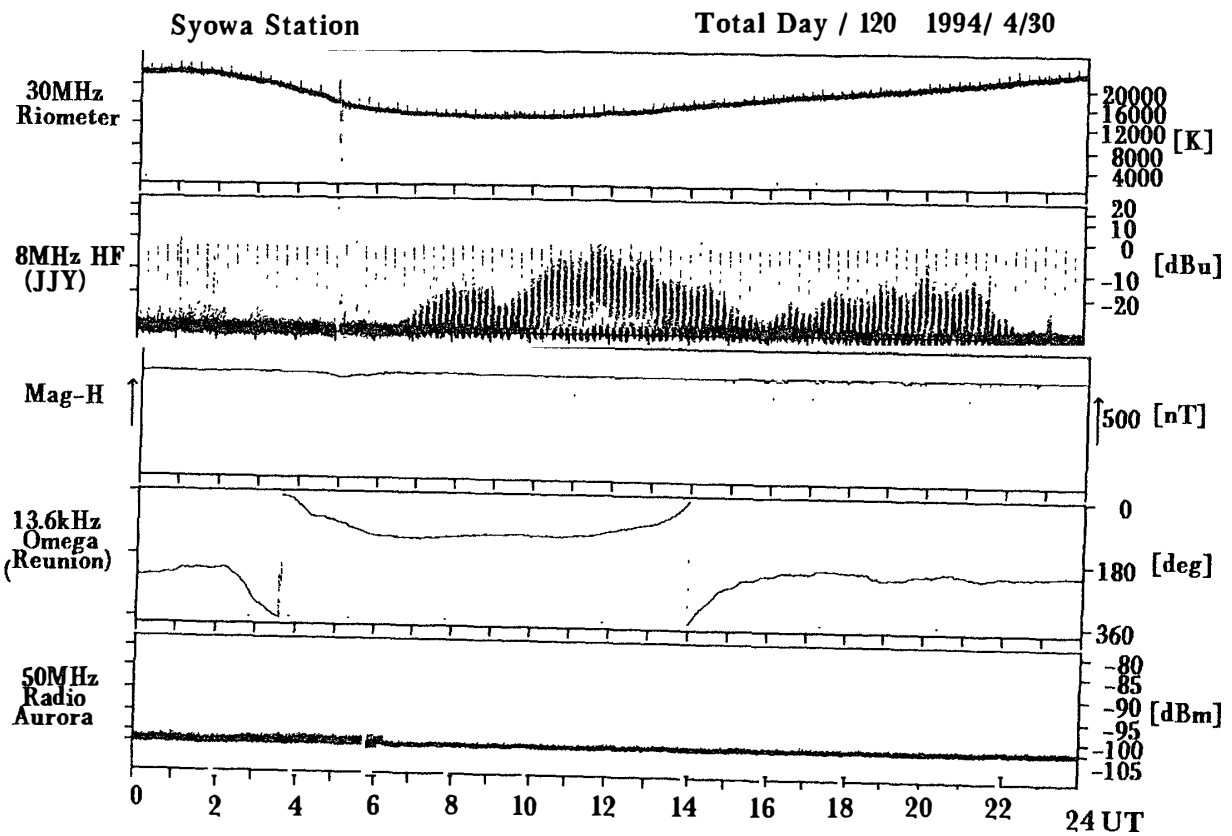
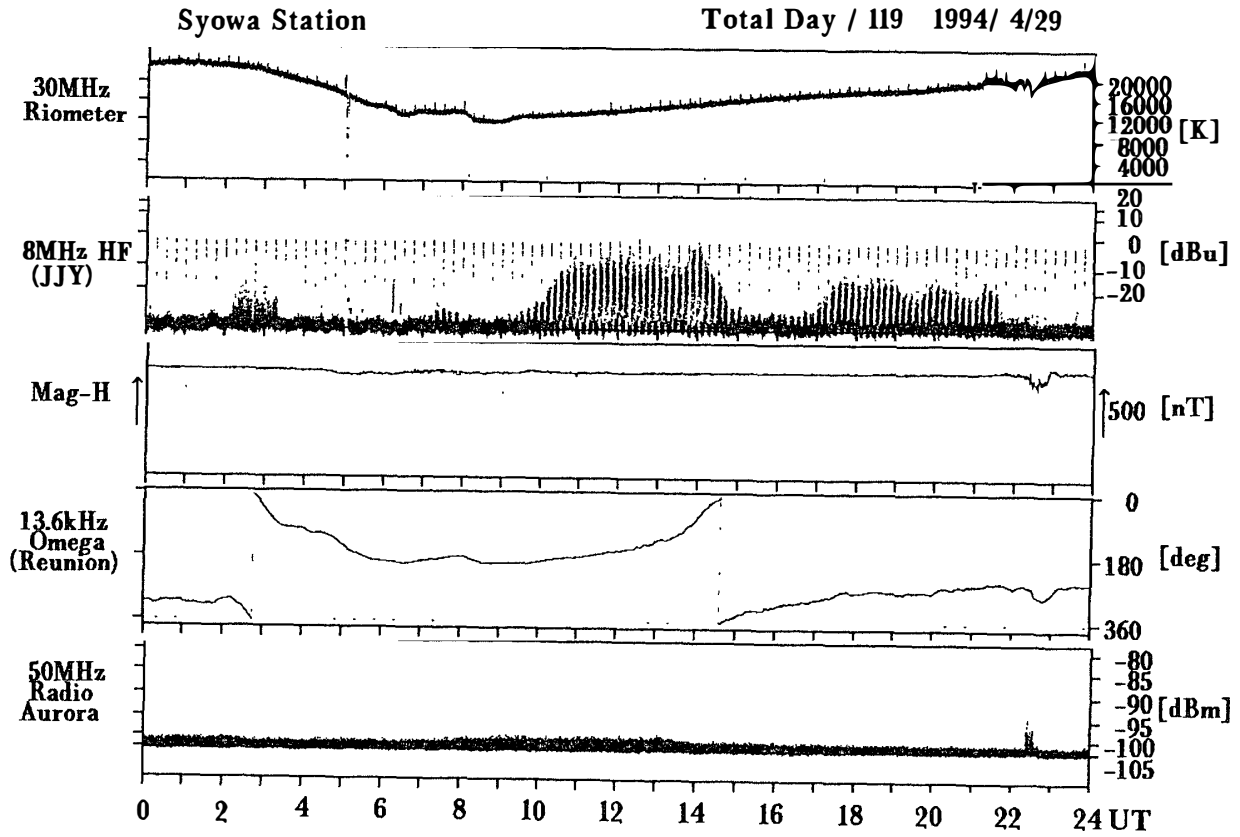
Total Day / 117 1994/ 4/27



Syowa Station

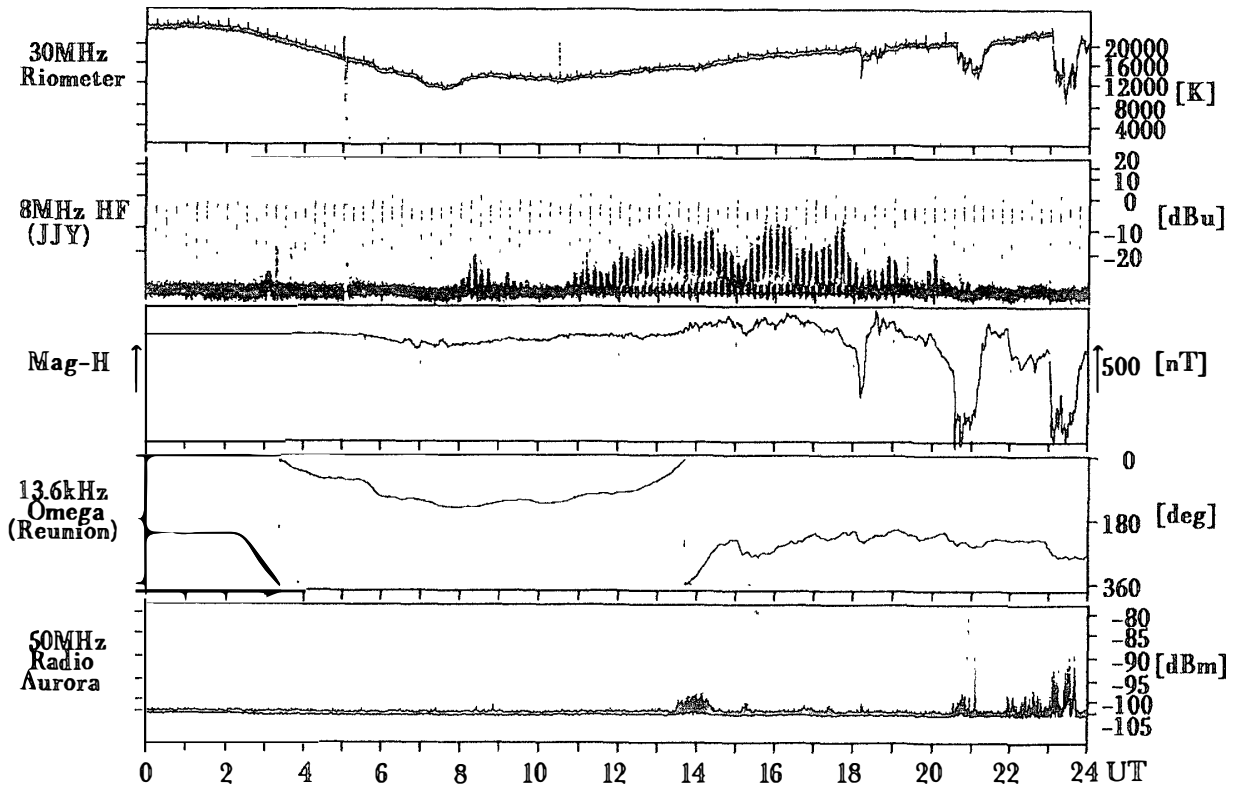
Total Day / 118 1994/ 4/28





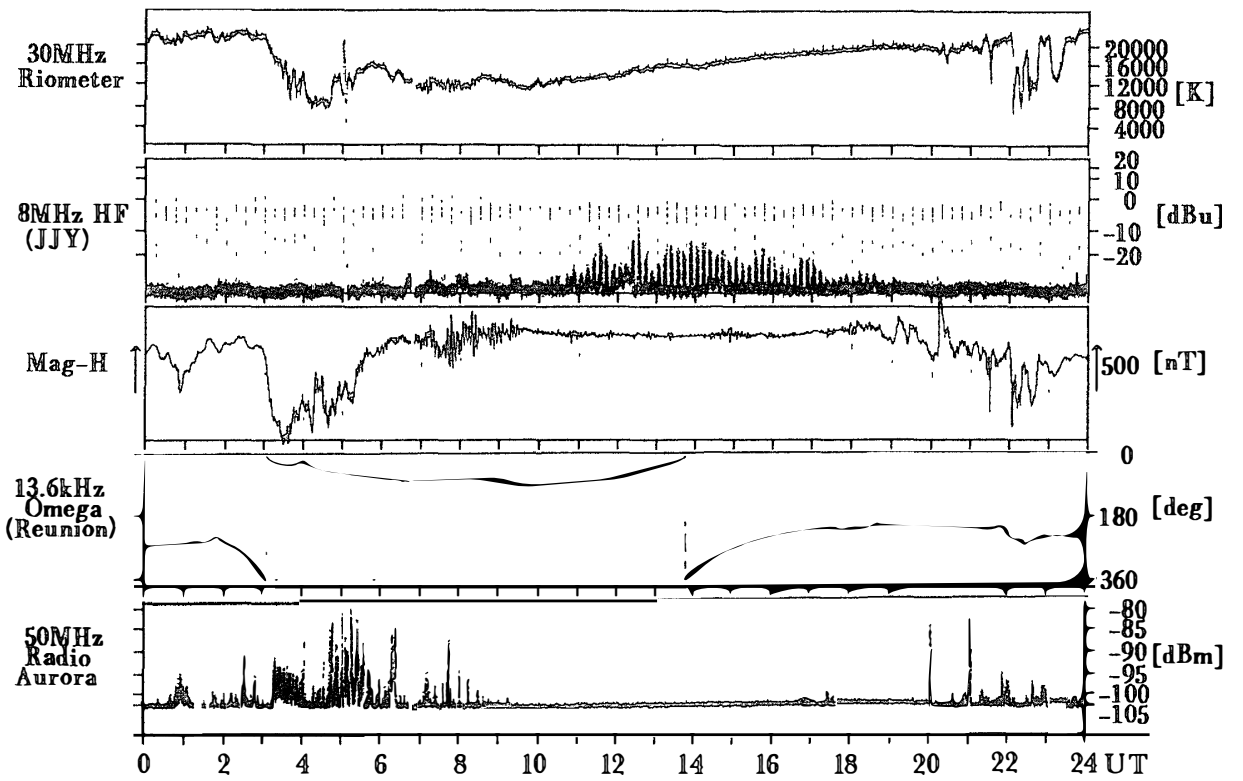
Syowa Station

Total Day / 121 1994/ 5/ 1



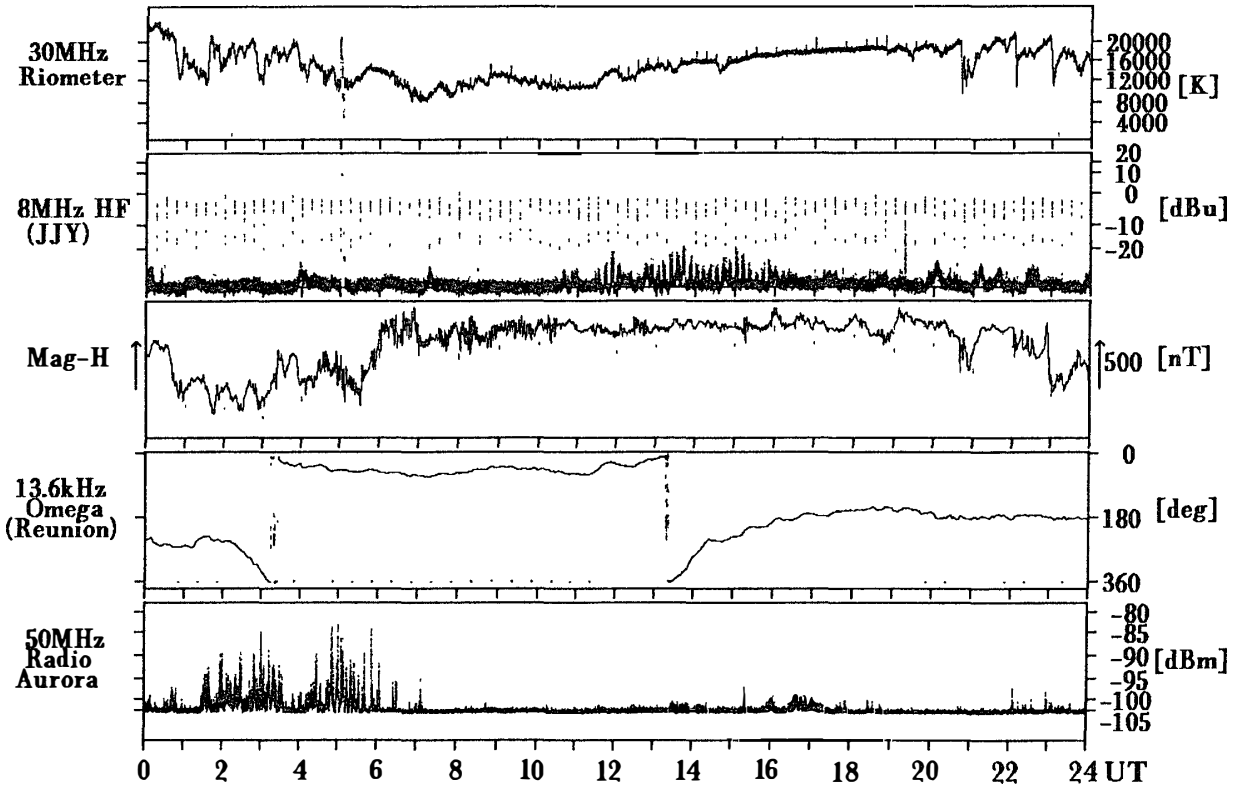
Syowa Station

Total Day / 122 1994/ 5/ 2



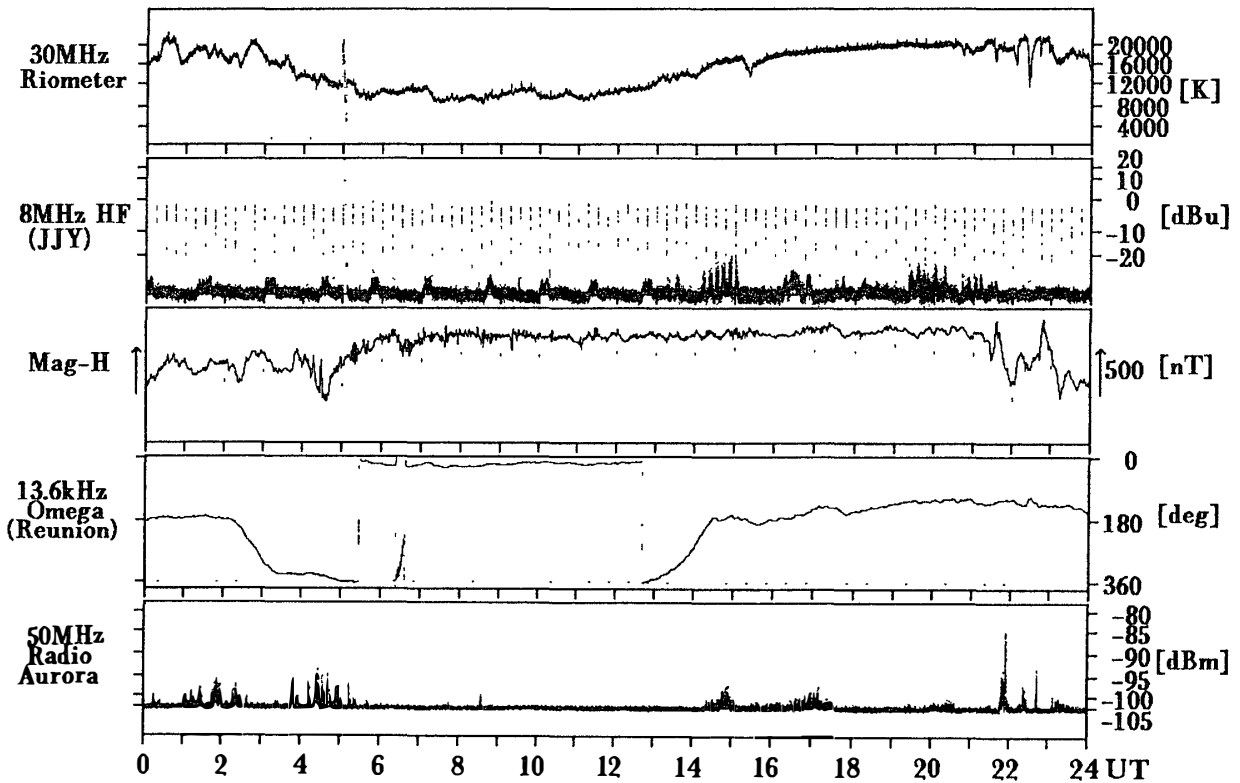
Syowa Station

Total Day / 123 1994/ 5/ 3



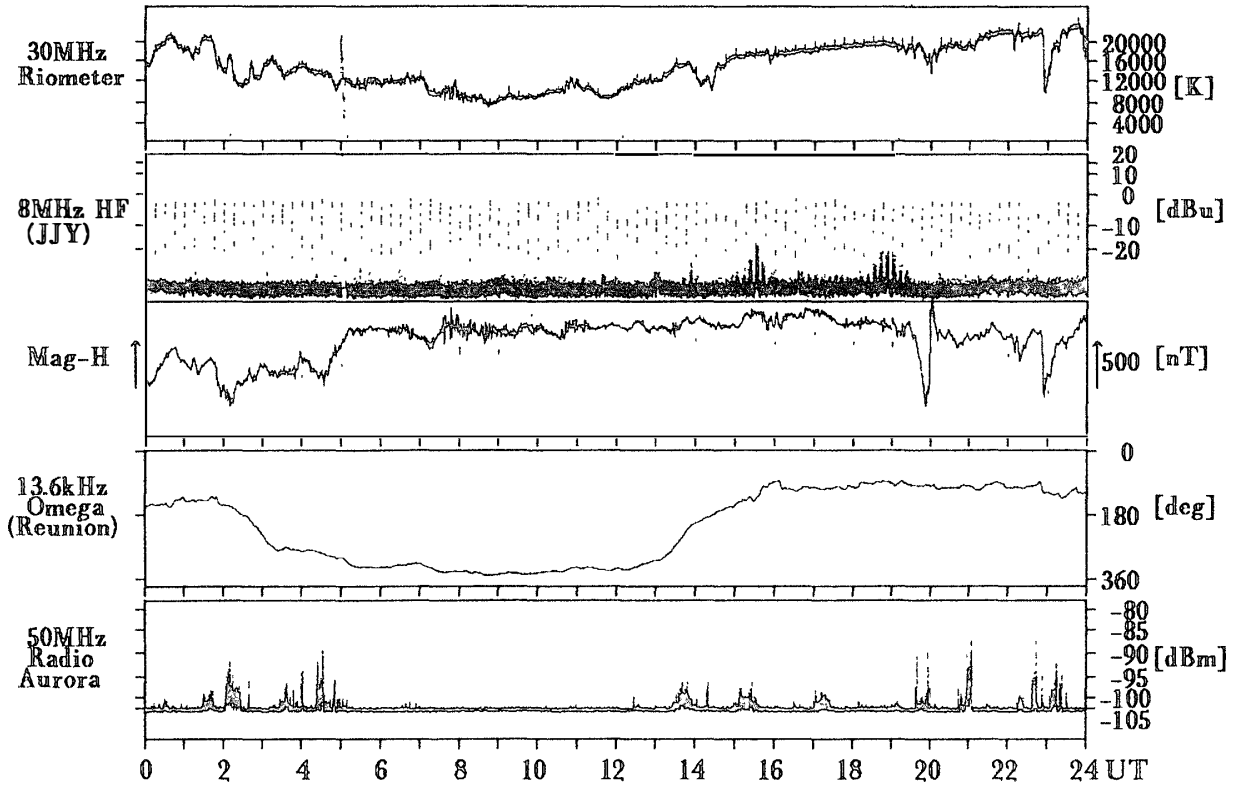
Syowa Station

Total Day / 124 1994/ 5/ 4



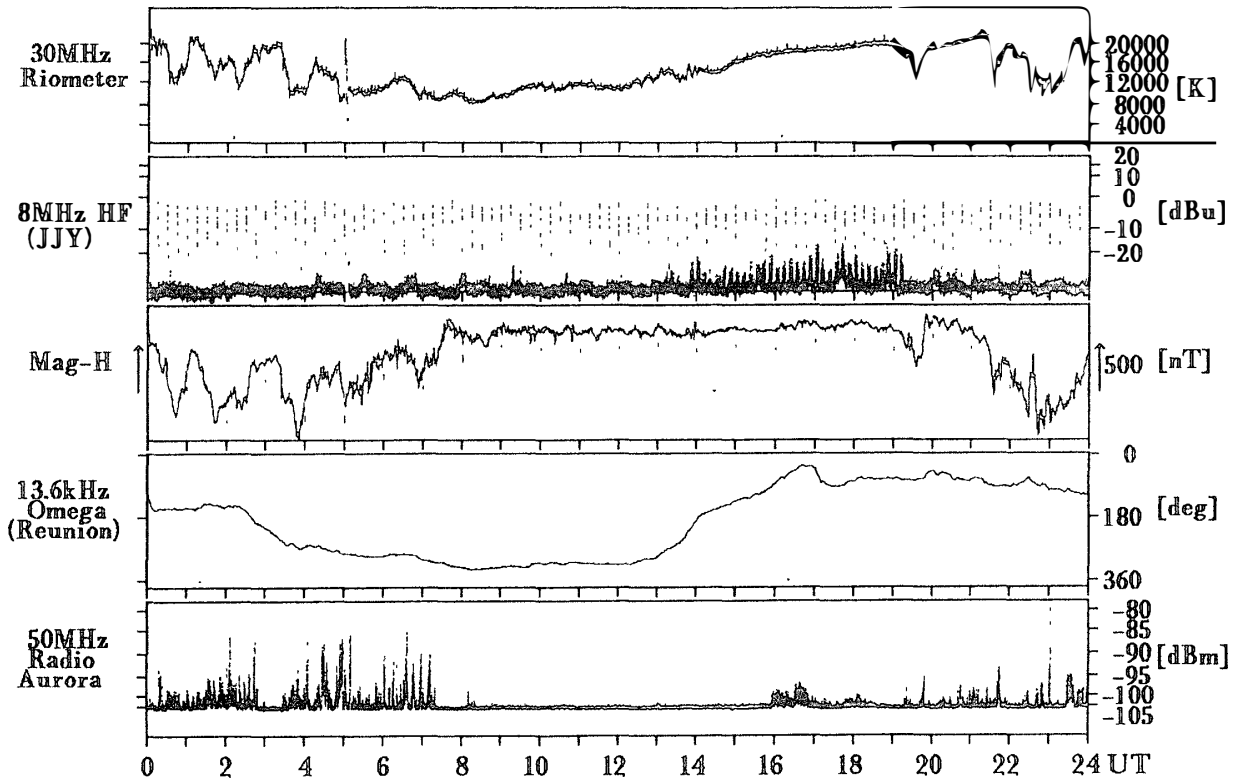
Syowa Station

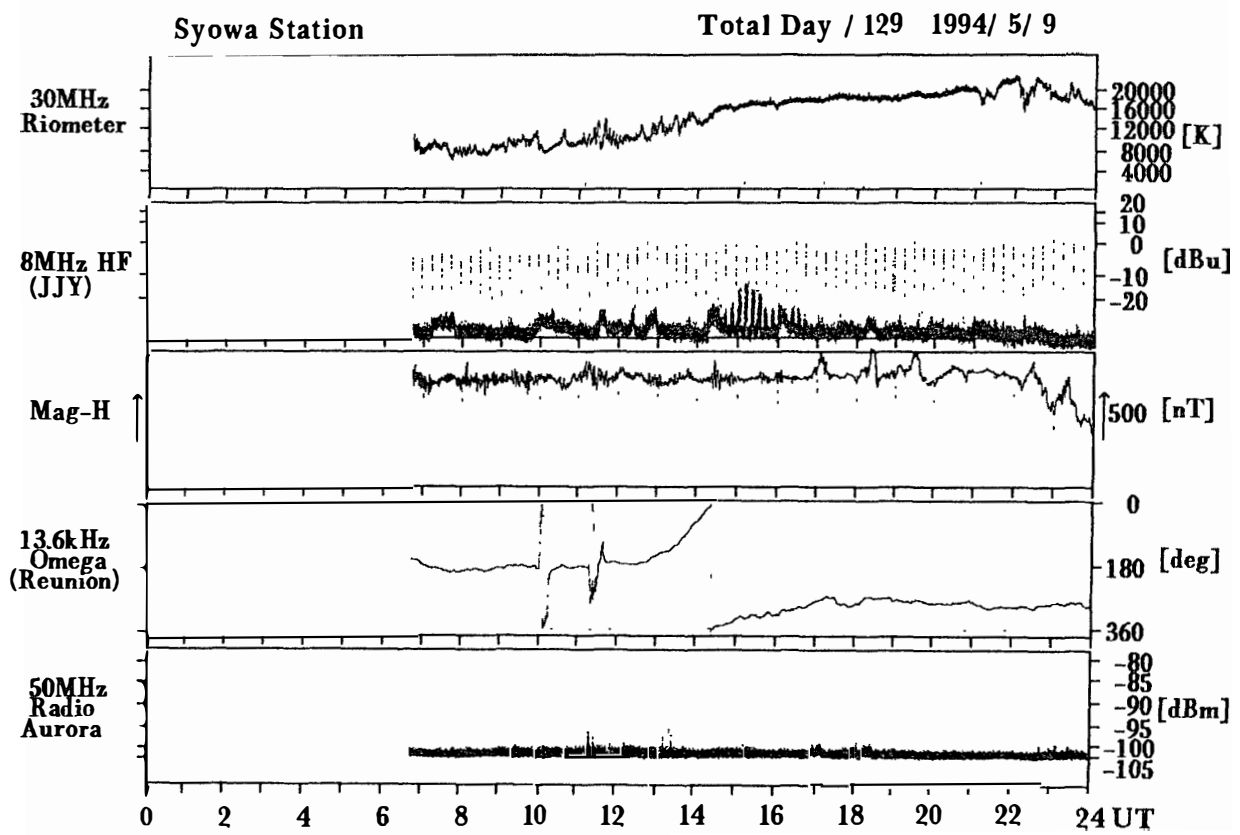
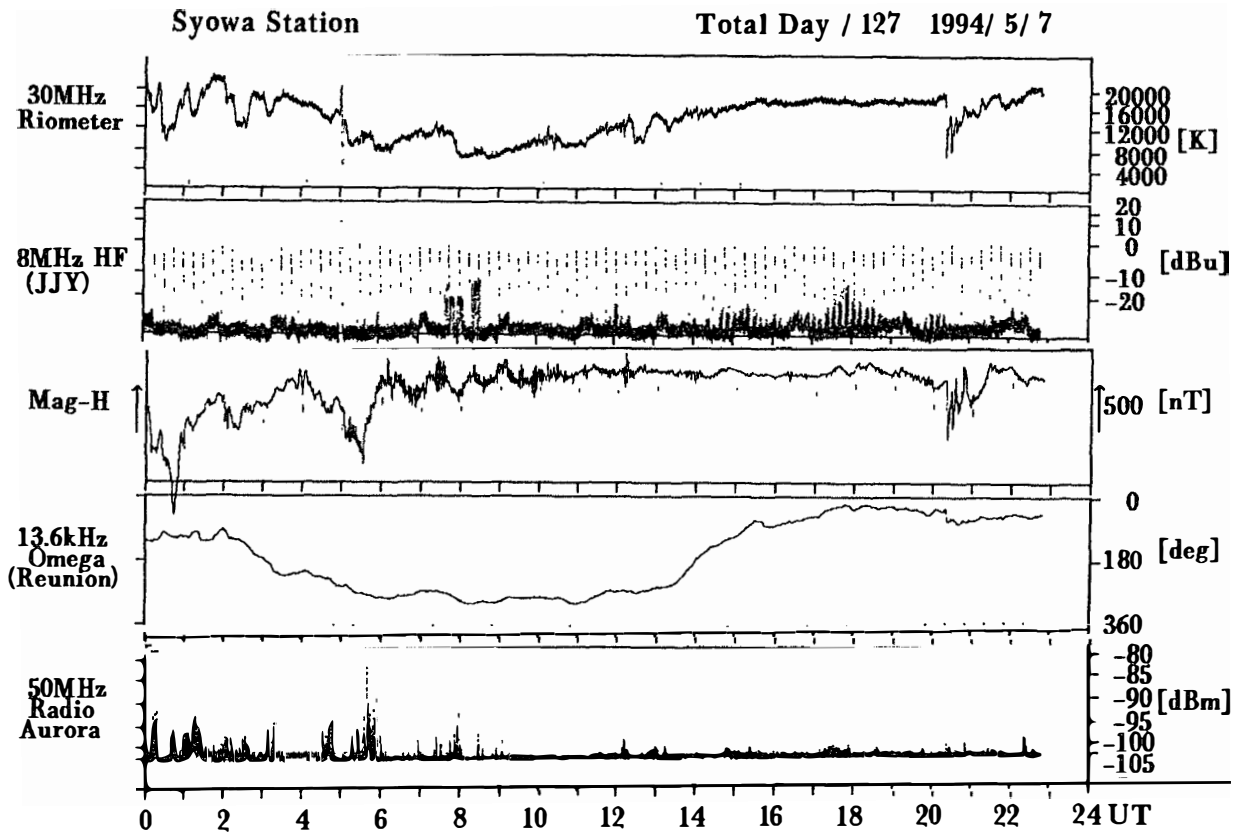
Total Day / 125 1994/ 5/ 5

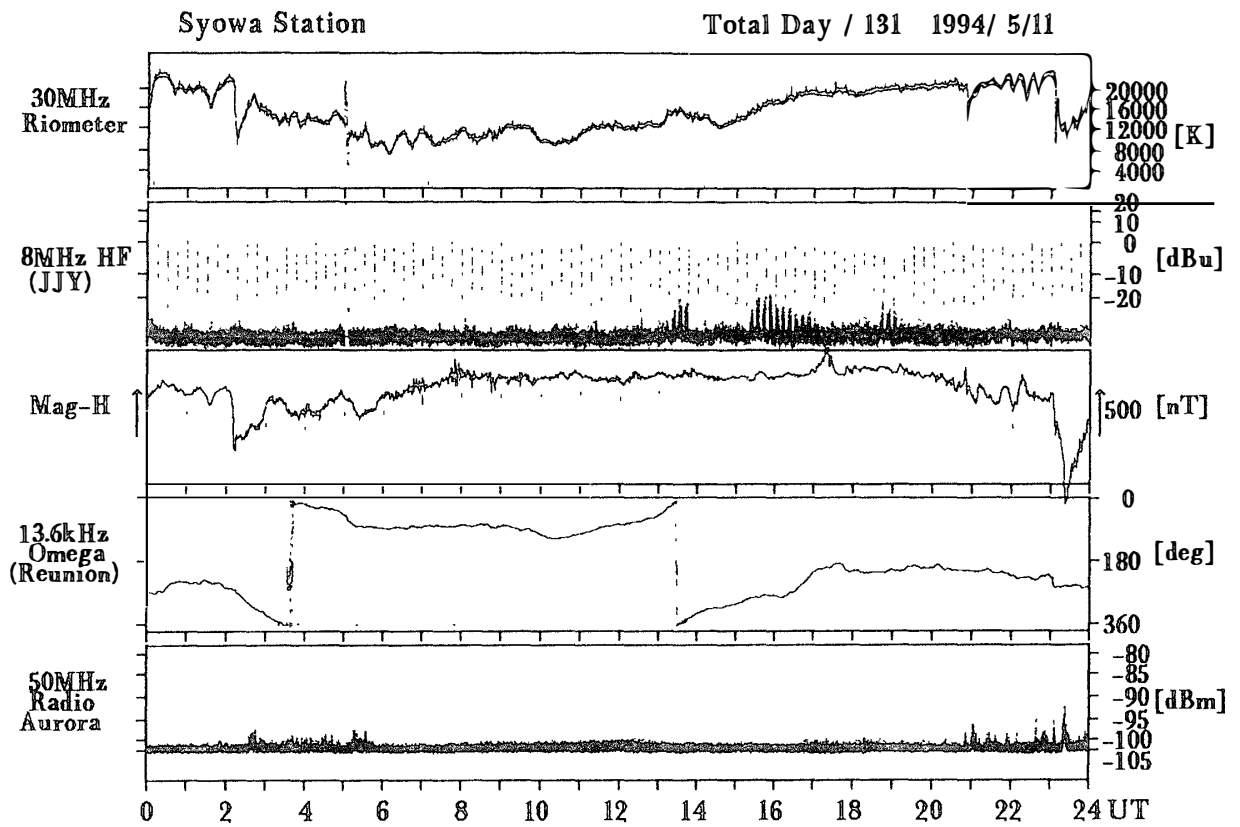
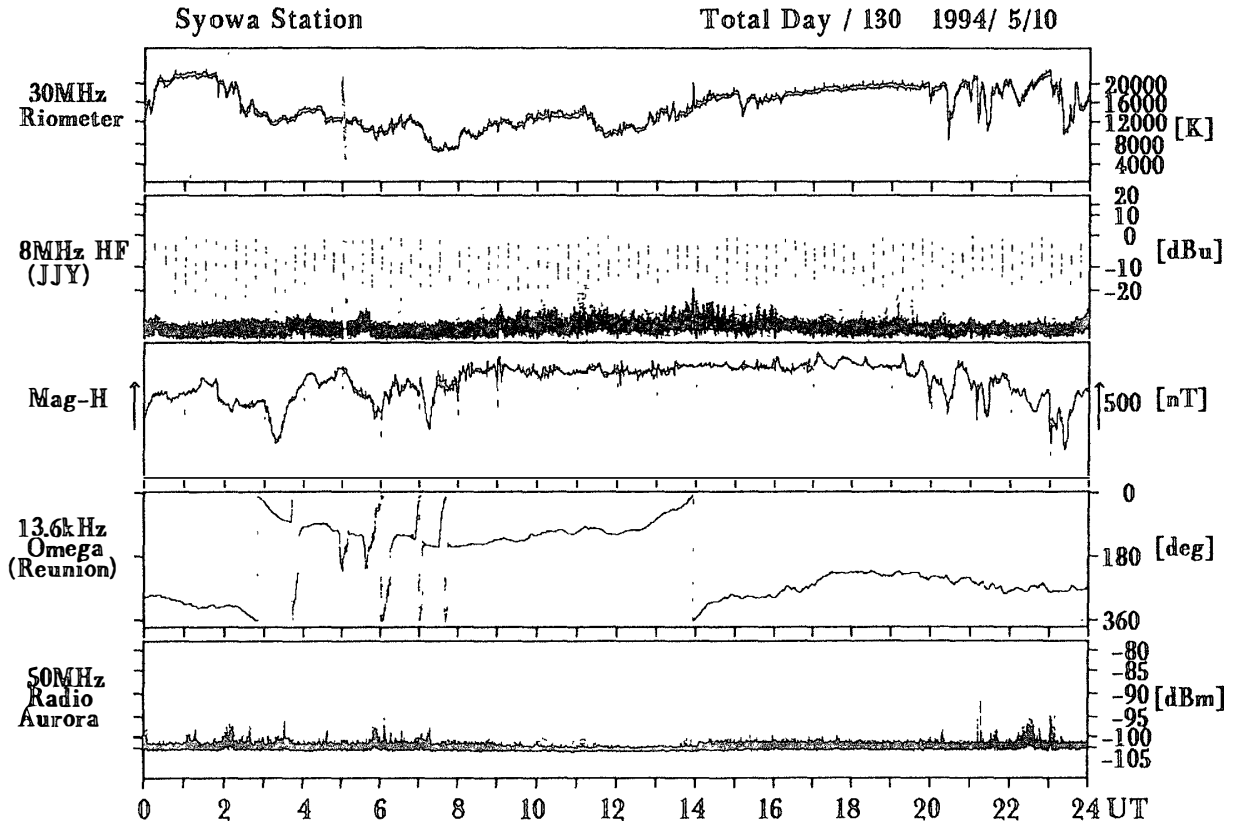


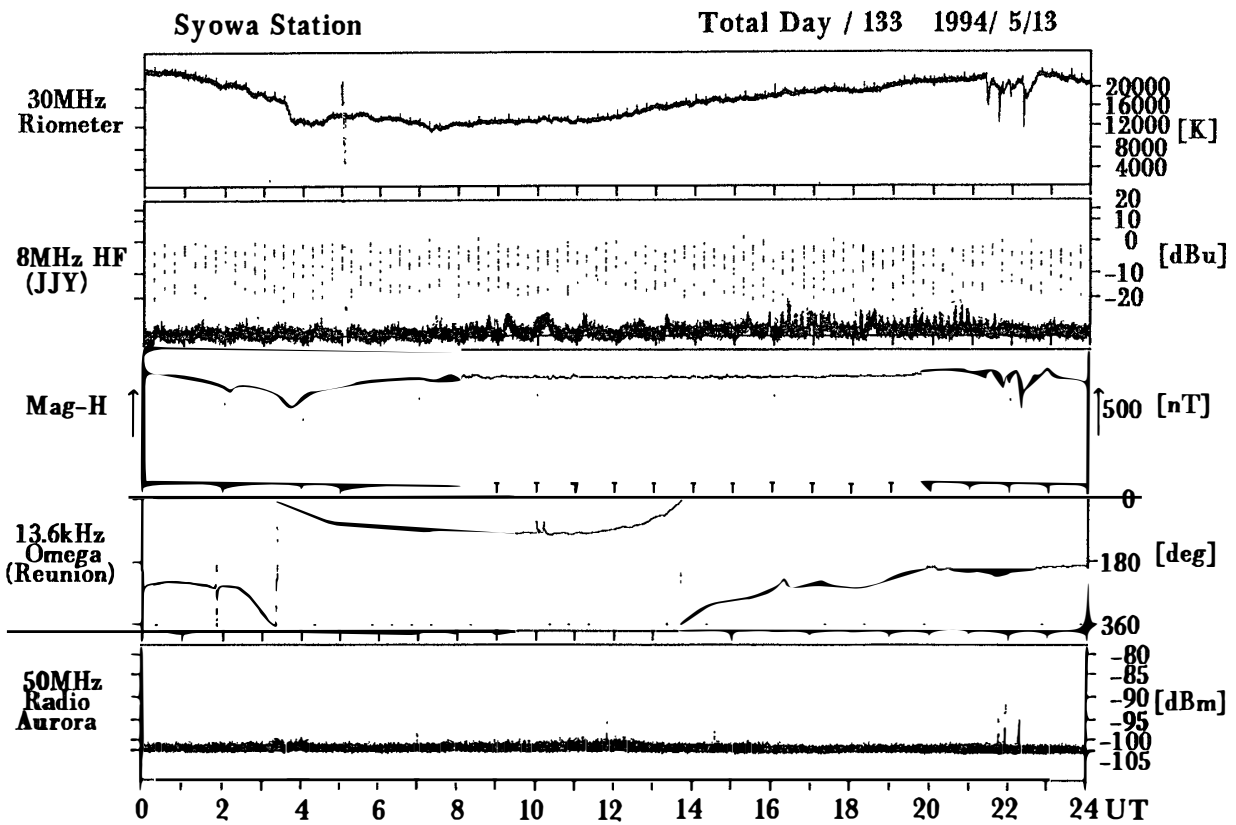
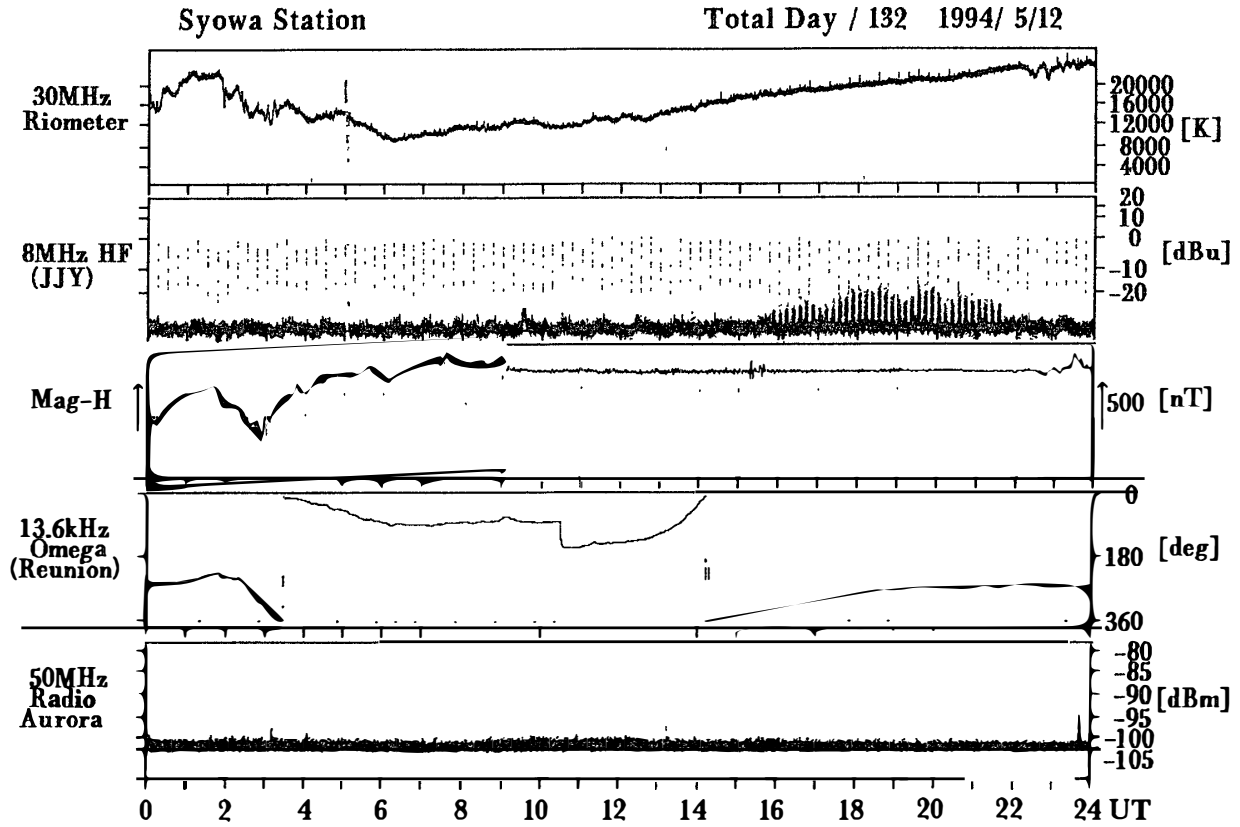
Syowa Station

Total Day / 126 1994/ 5/ 6



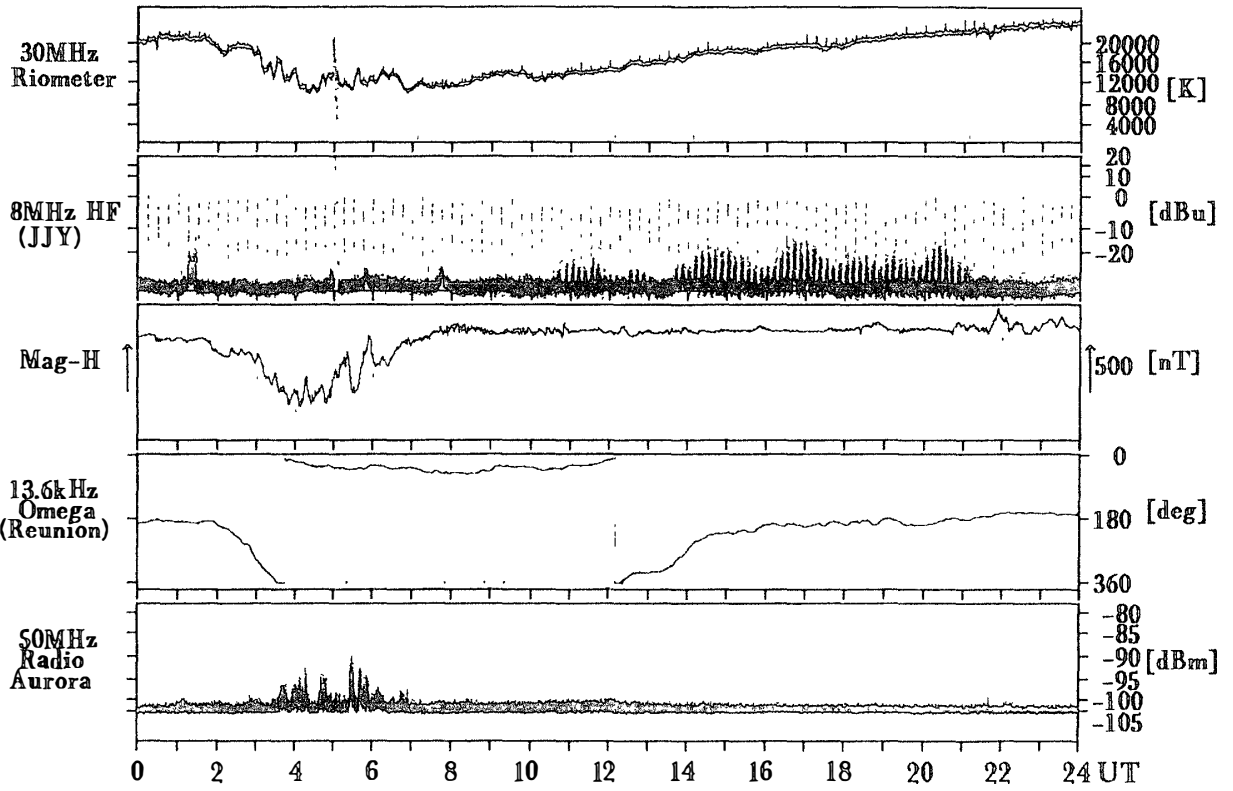






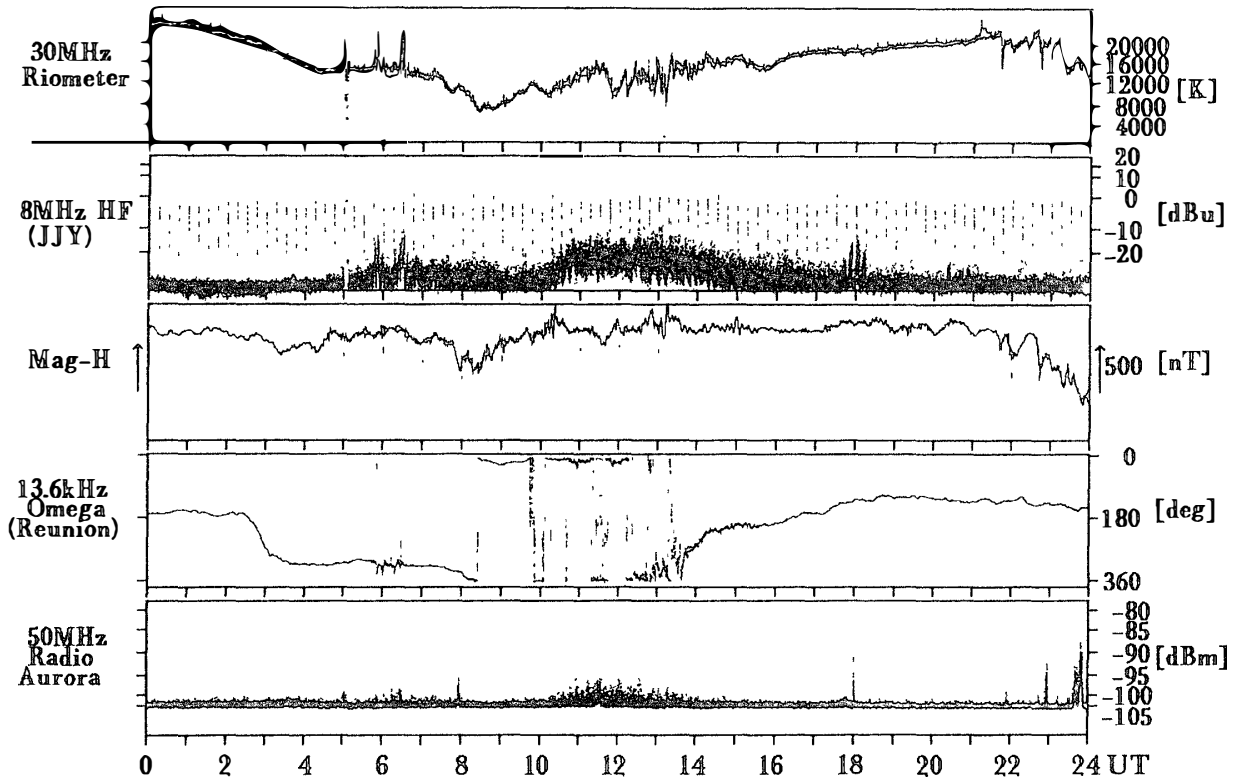
Syowa Station

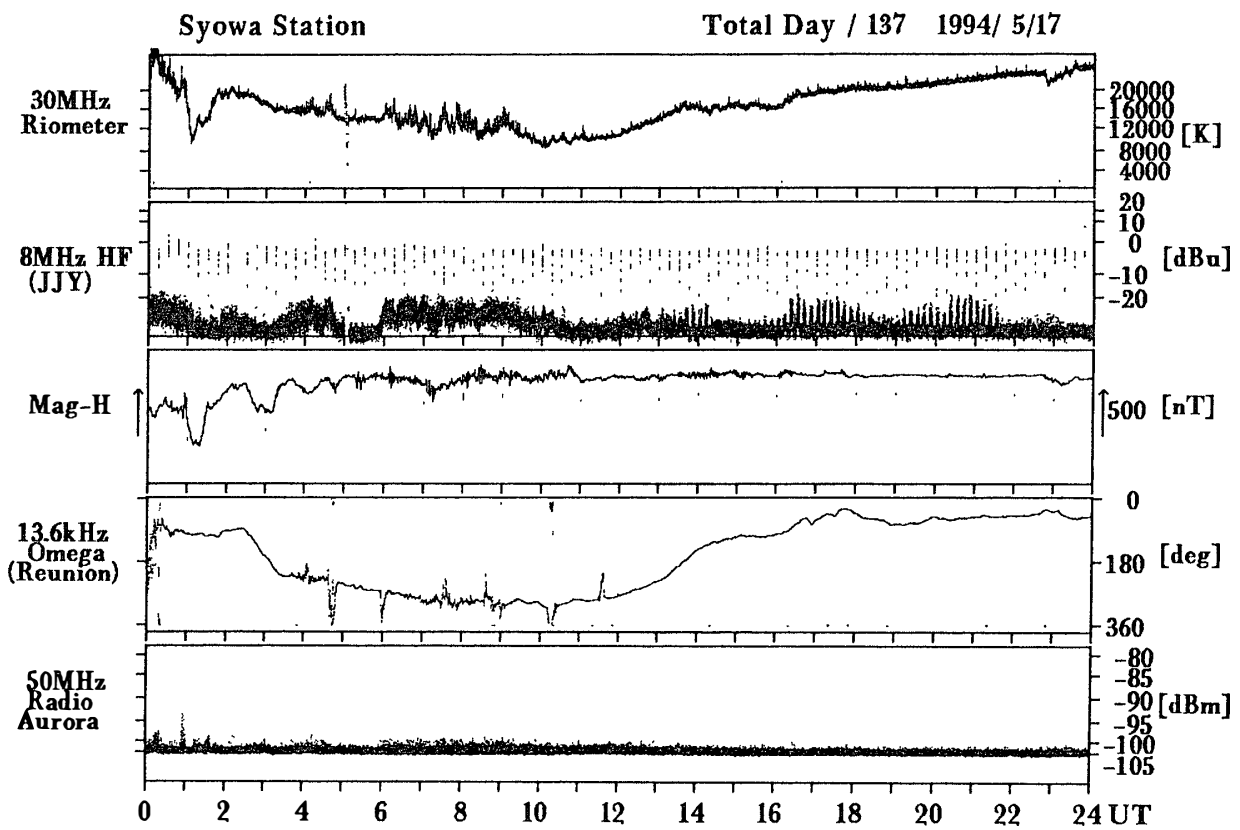
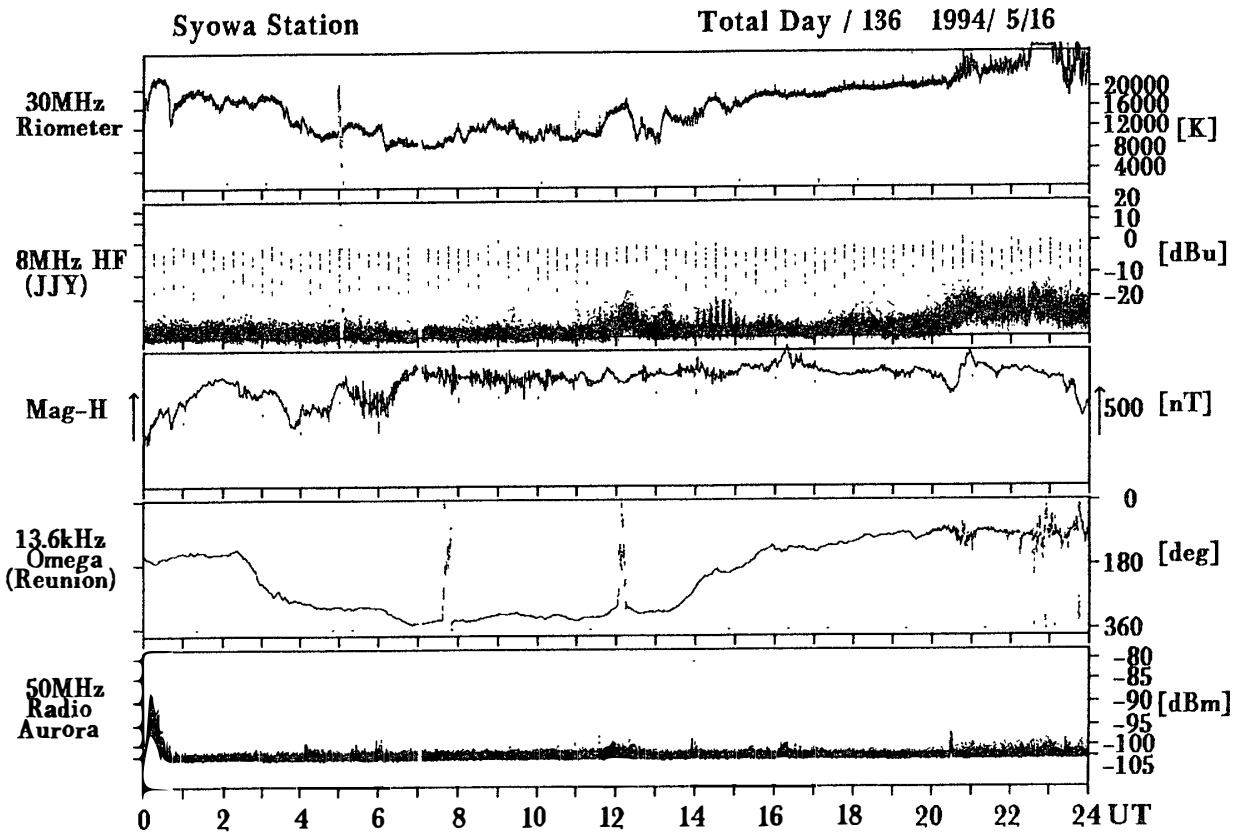
Total Day / 134 1994/ 5/14



Syowa Station

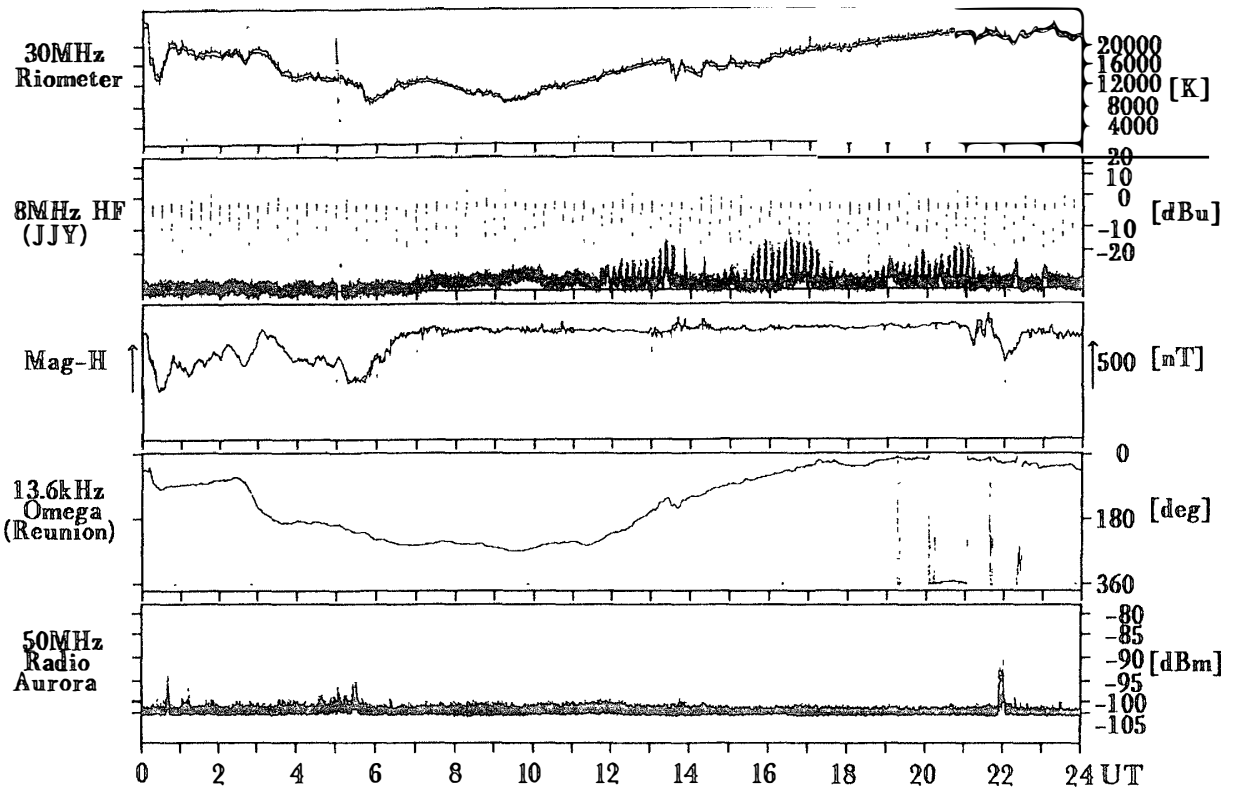
Total Day / 135 1994/ 5/15





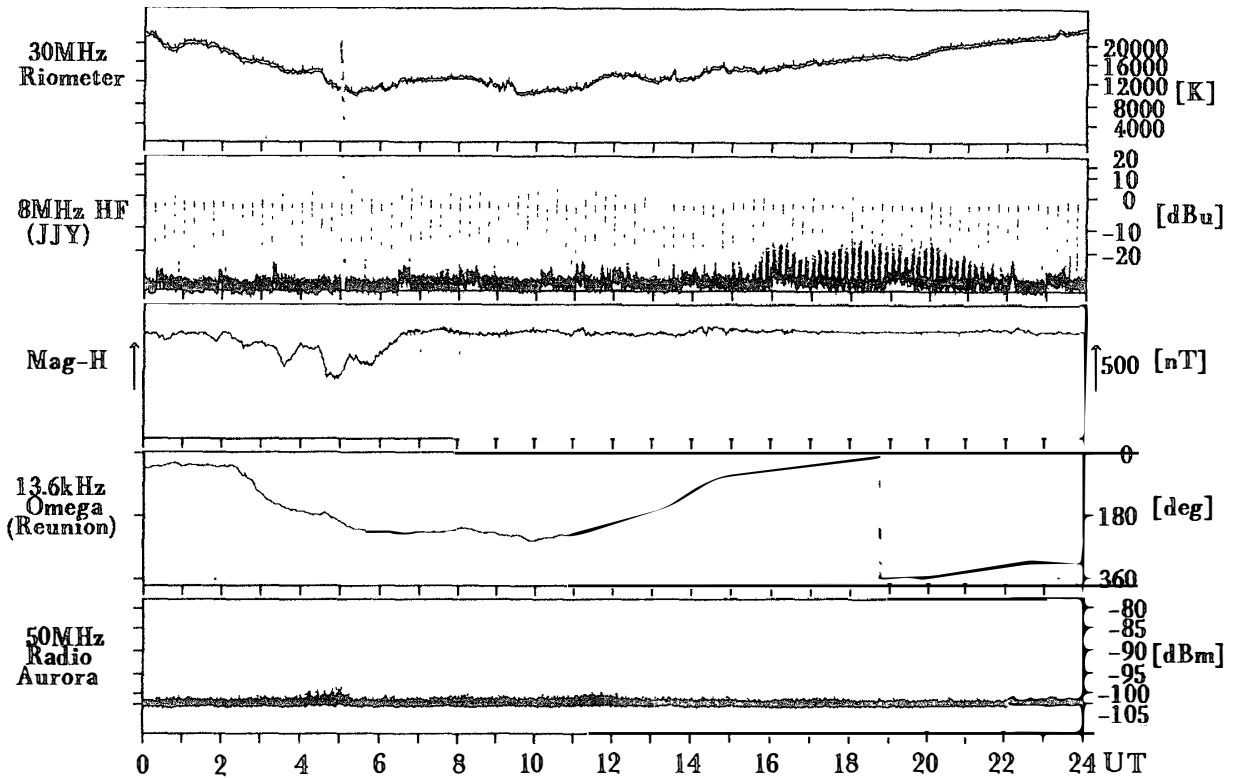
Syowa Station

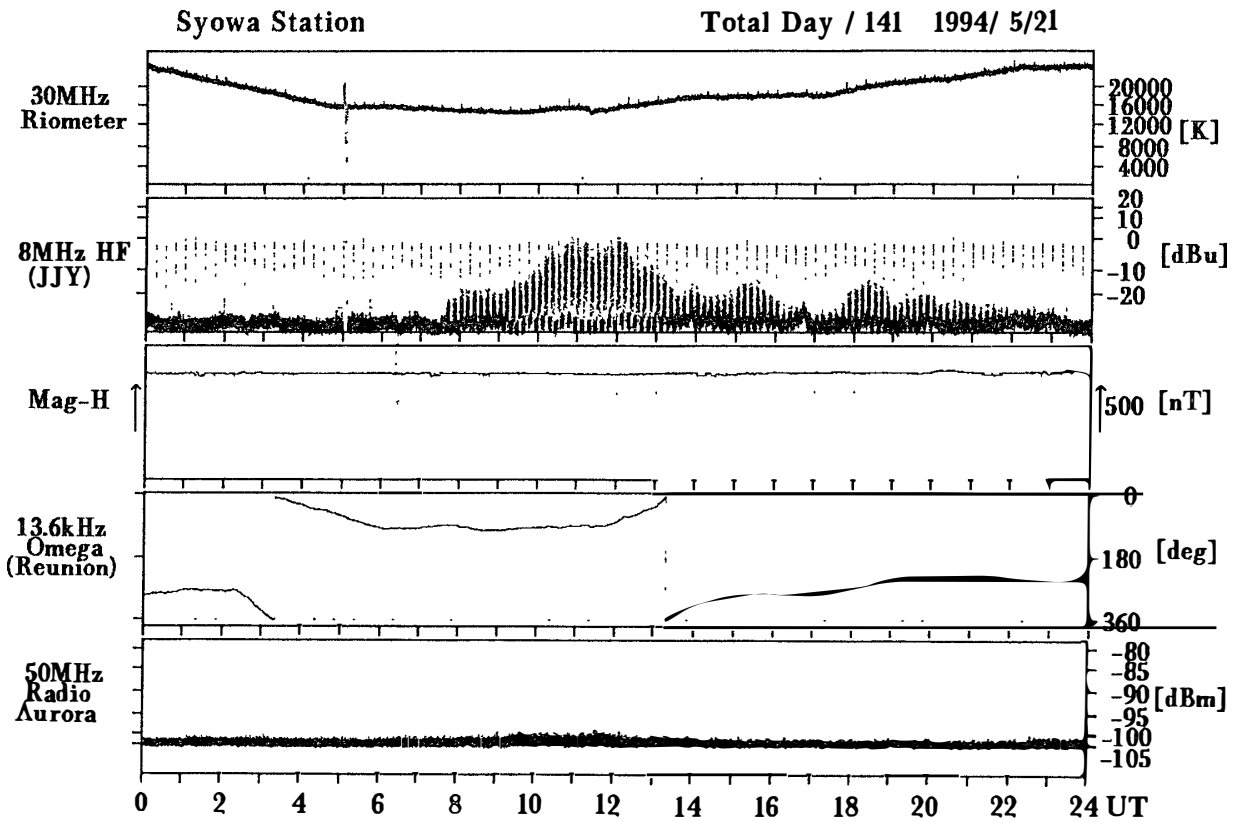
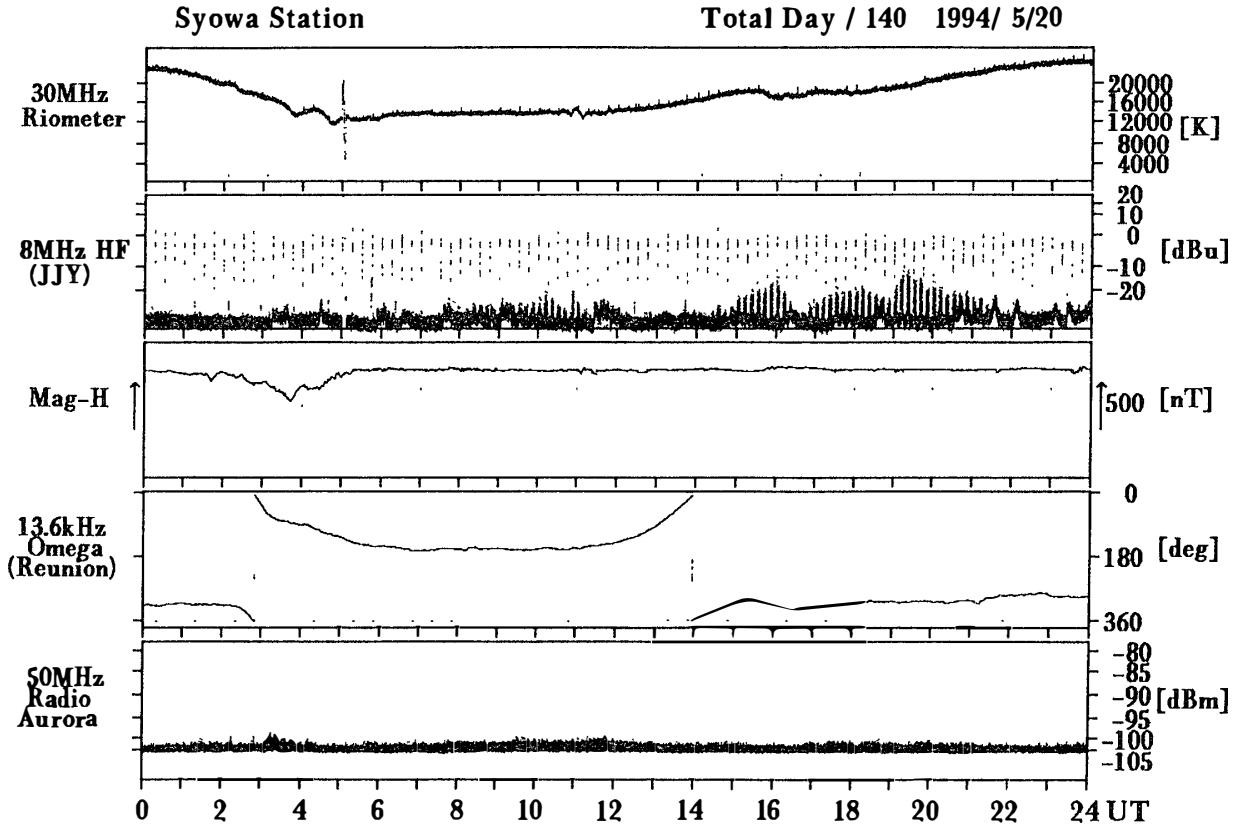
Total Day / 138 1994/ 5/18



Syowa Station

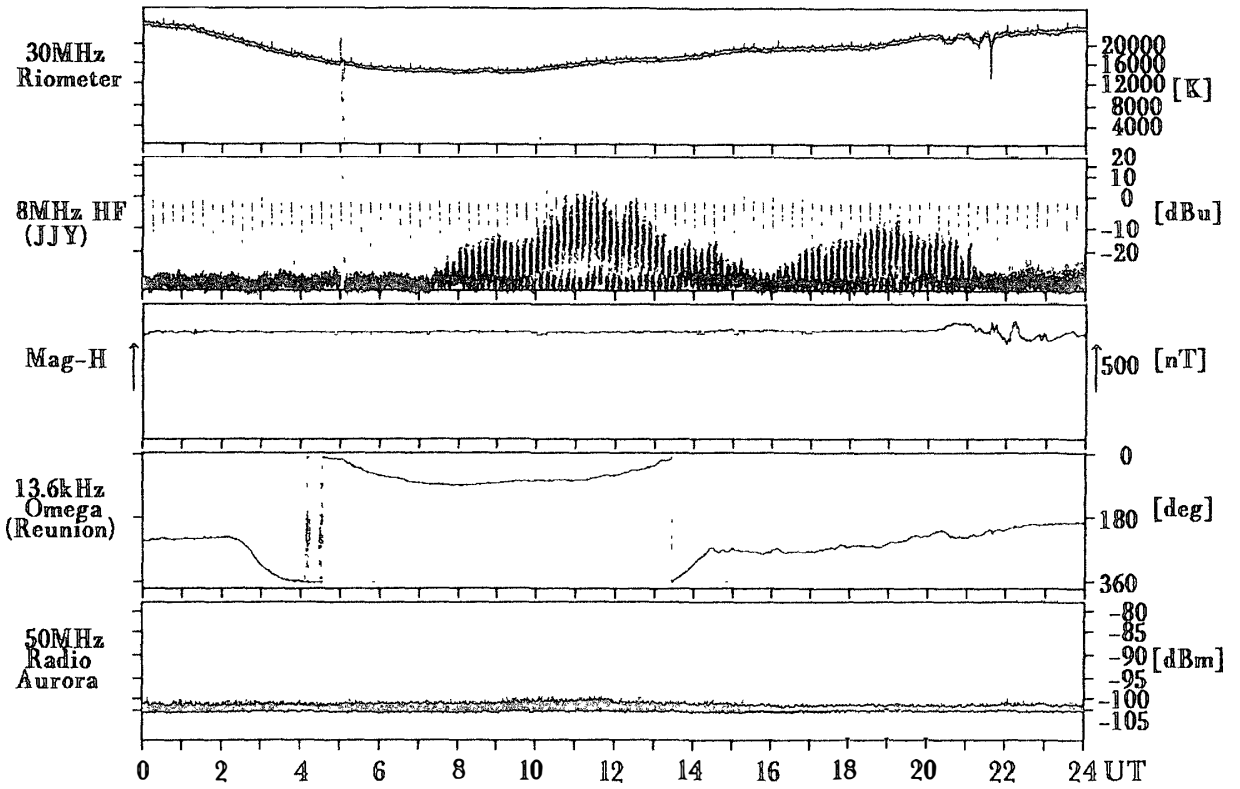
Total Day / 139 1994/ 5/19





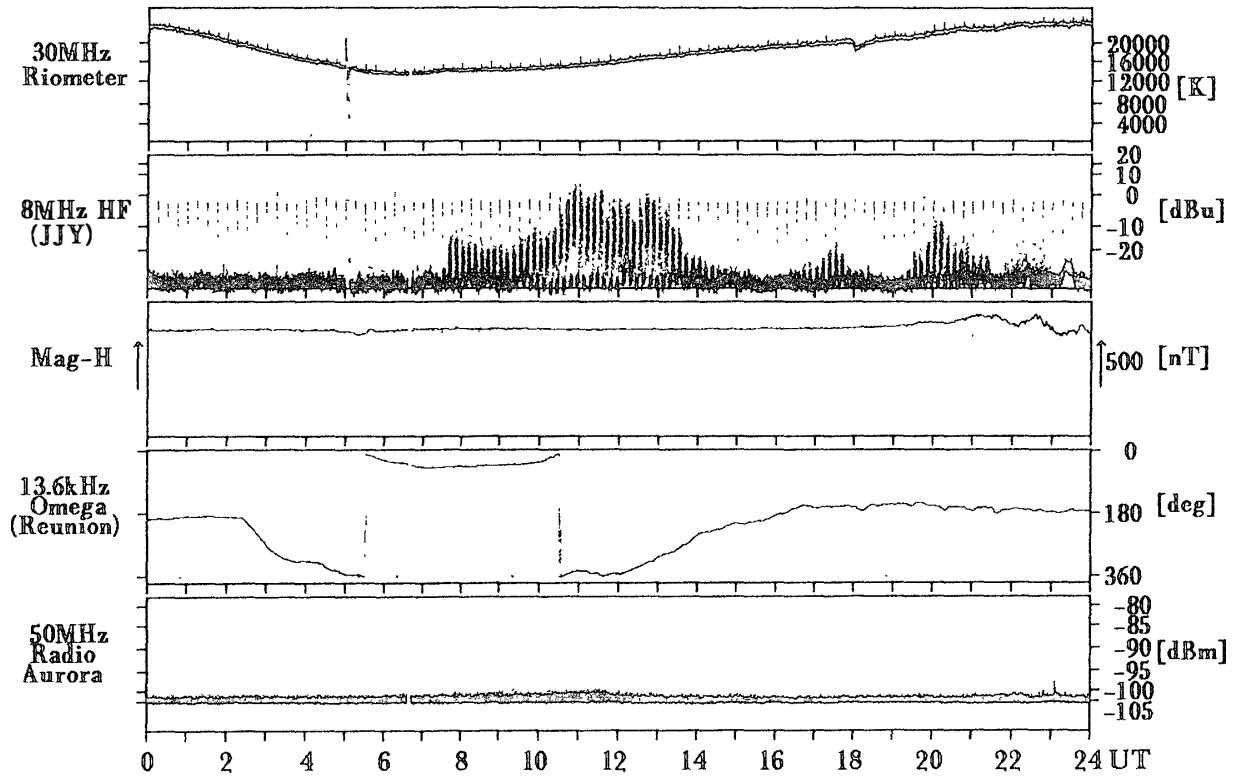
Syowa Station

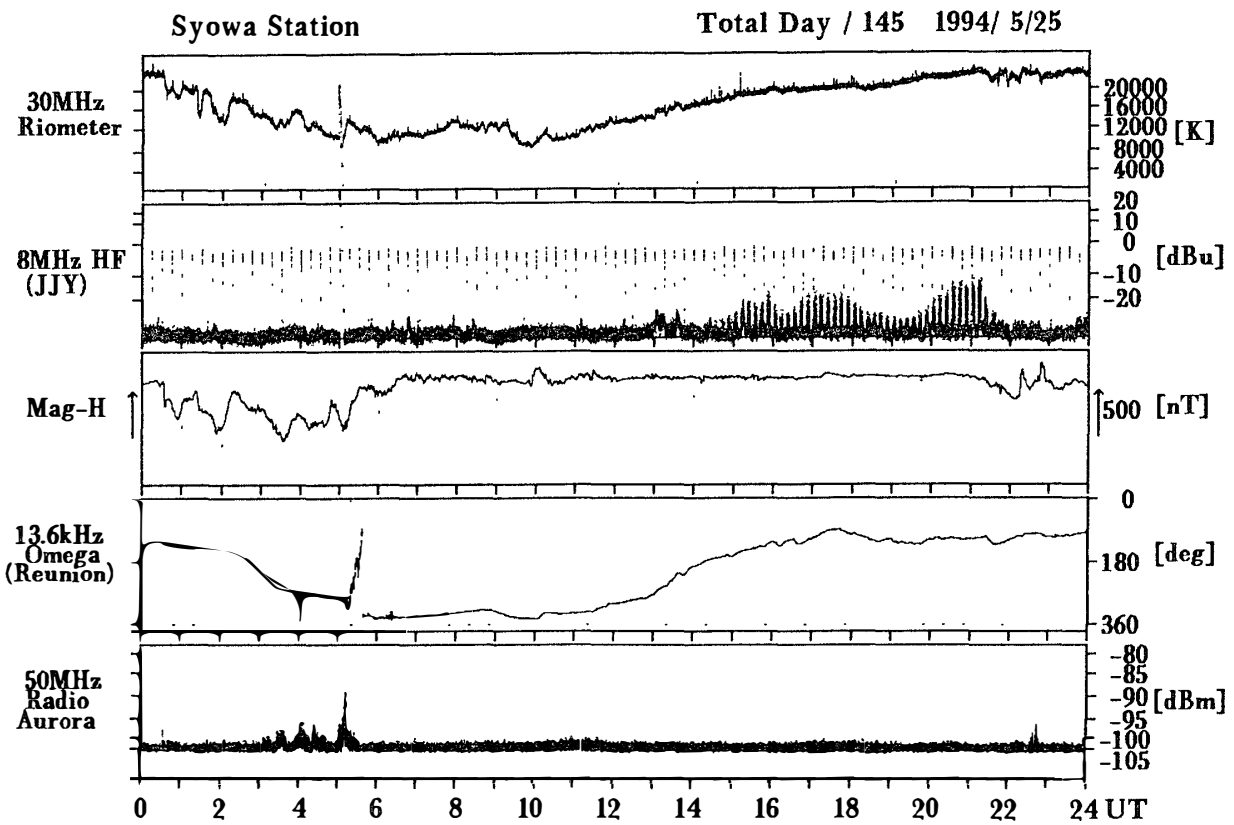
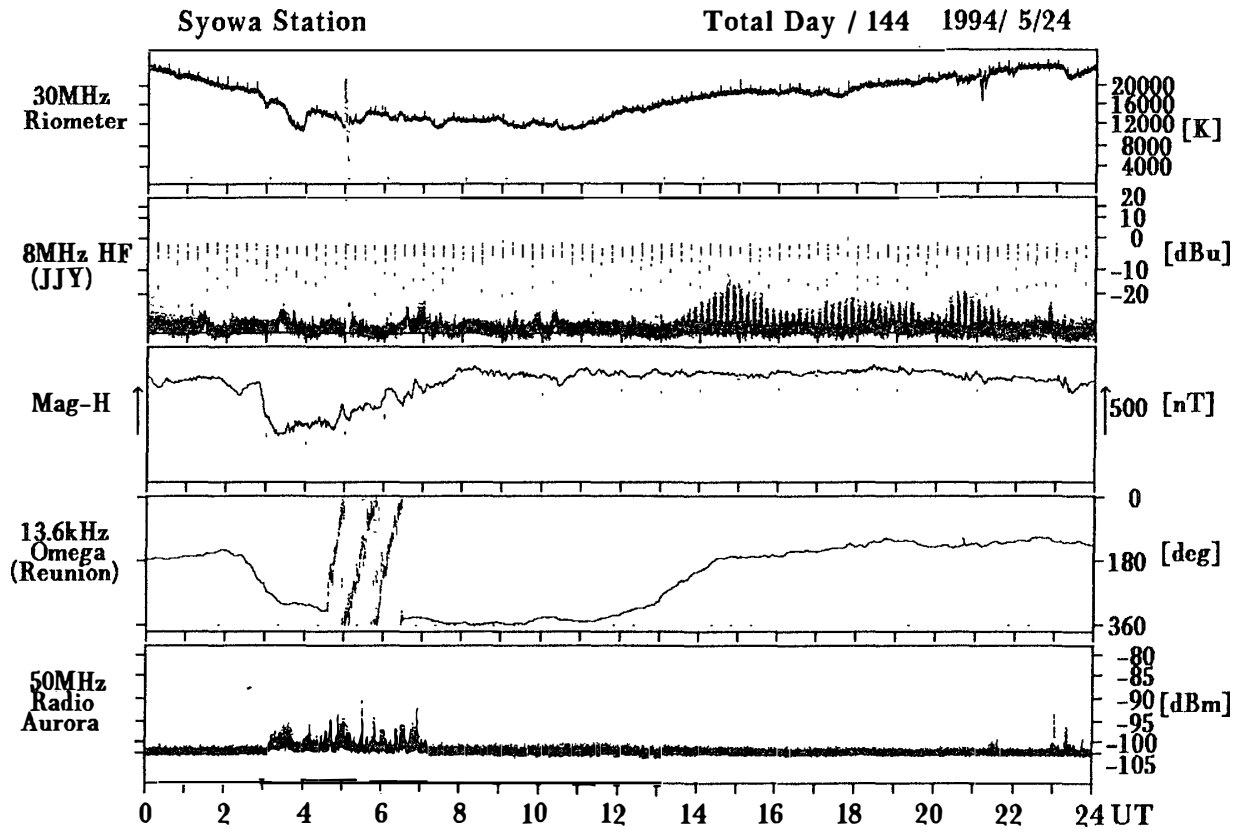
Total Day / 142 1994/ 5/22

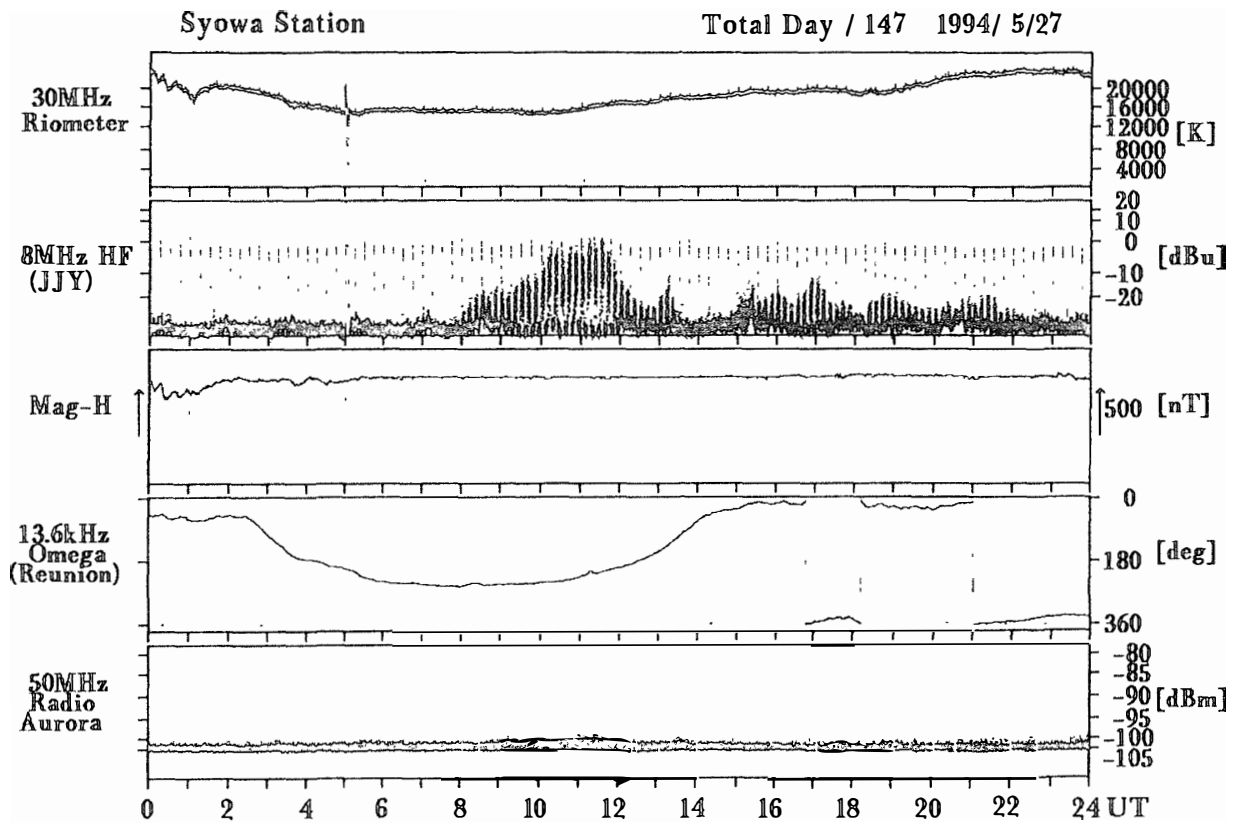
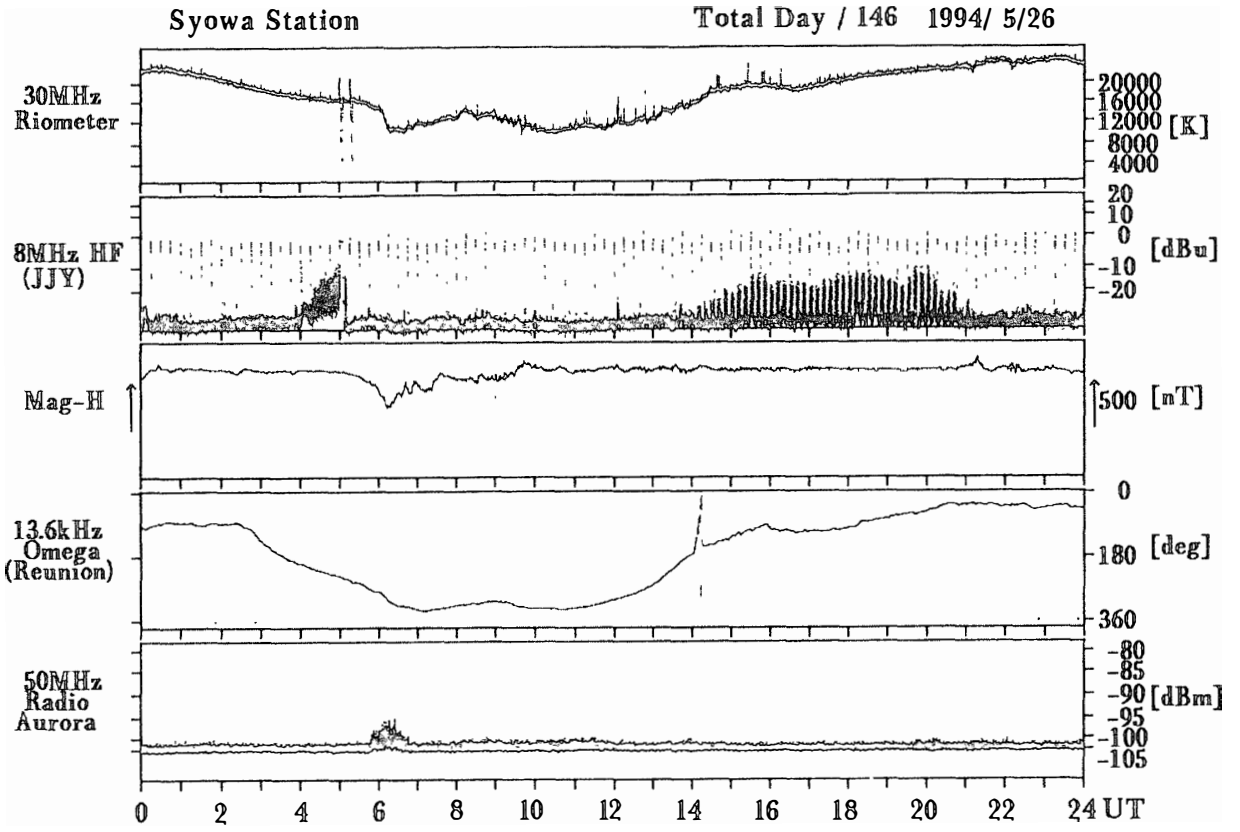


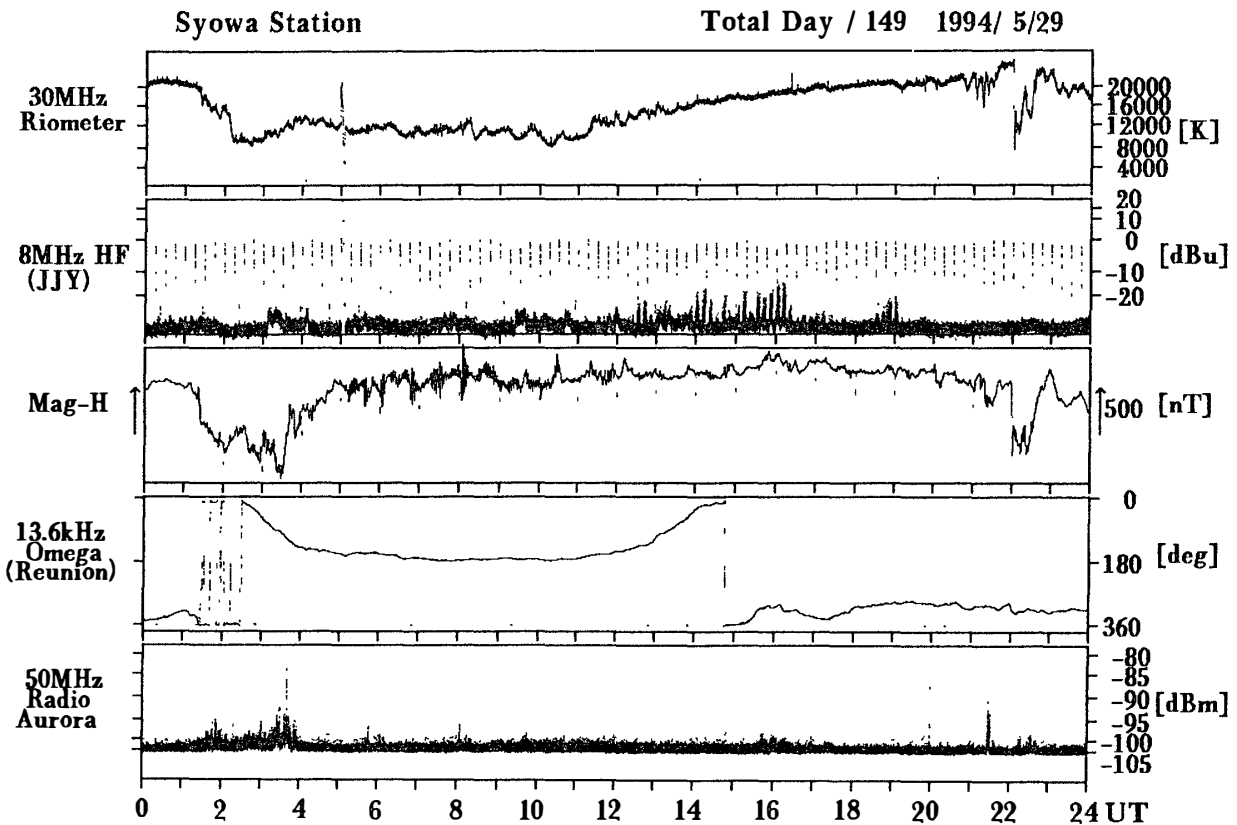
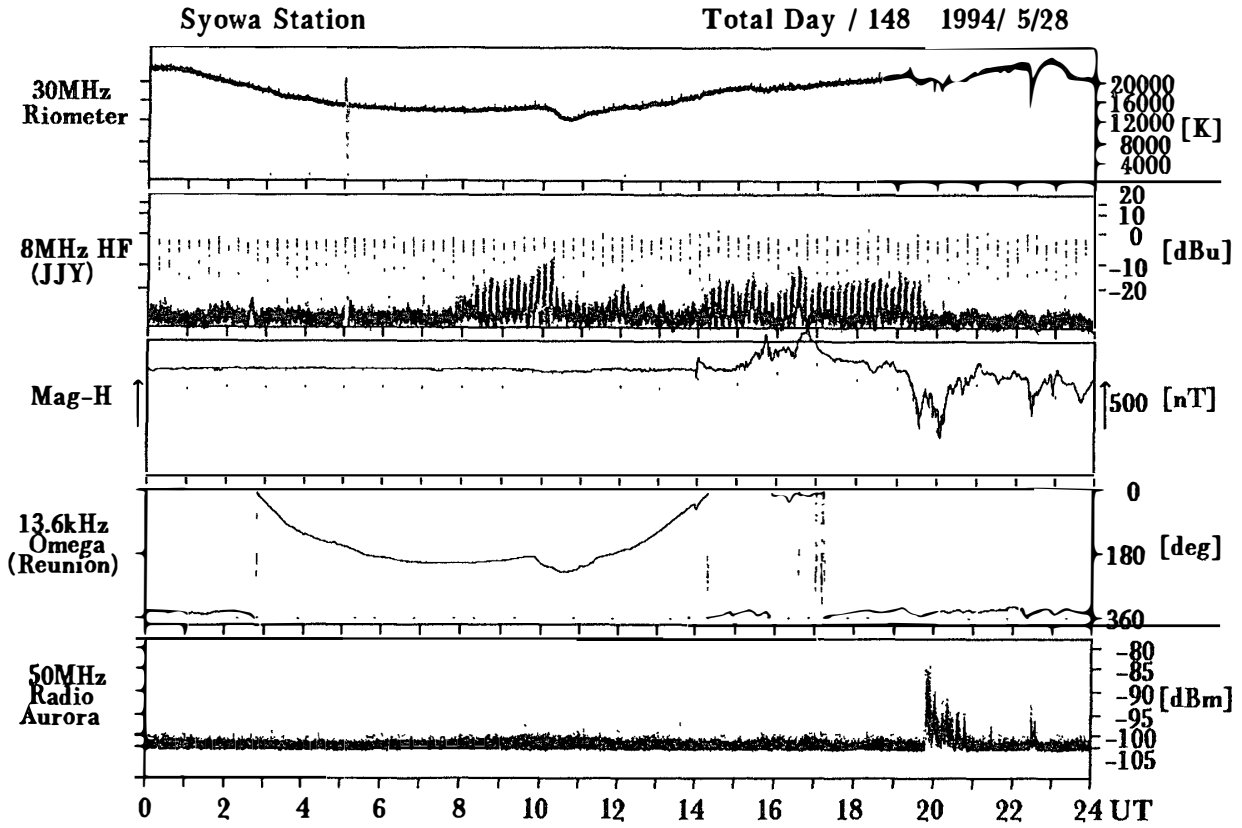
Syowa Station

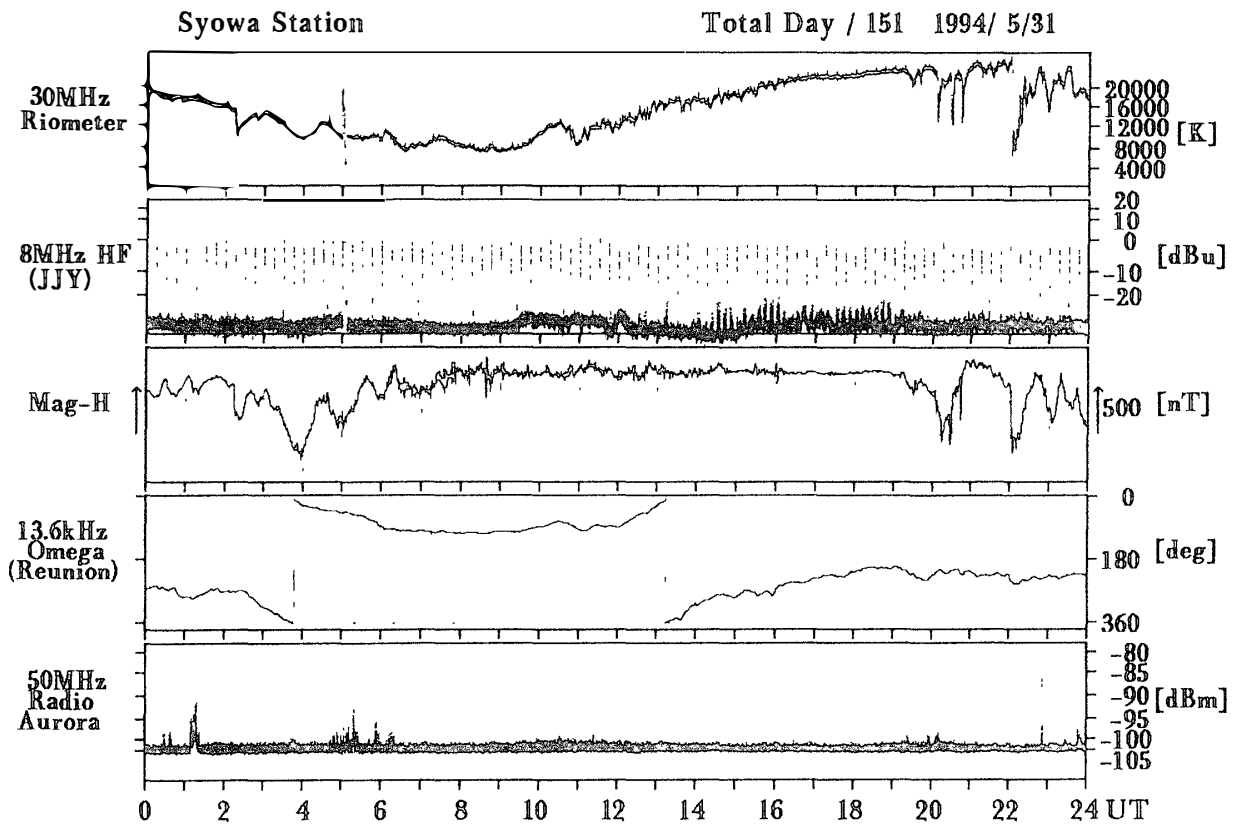
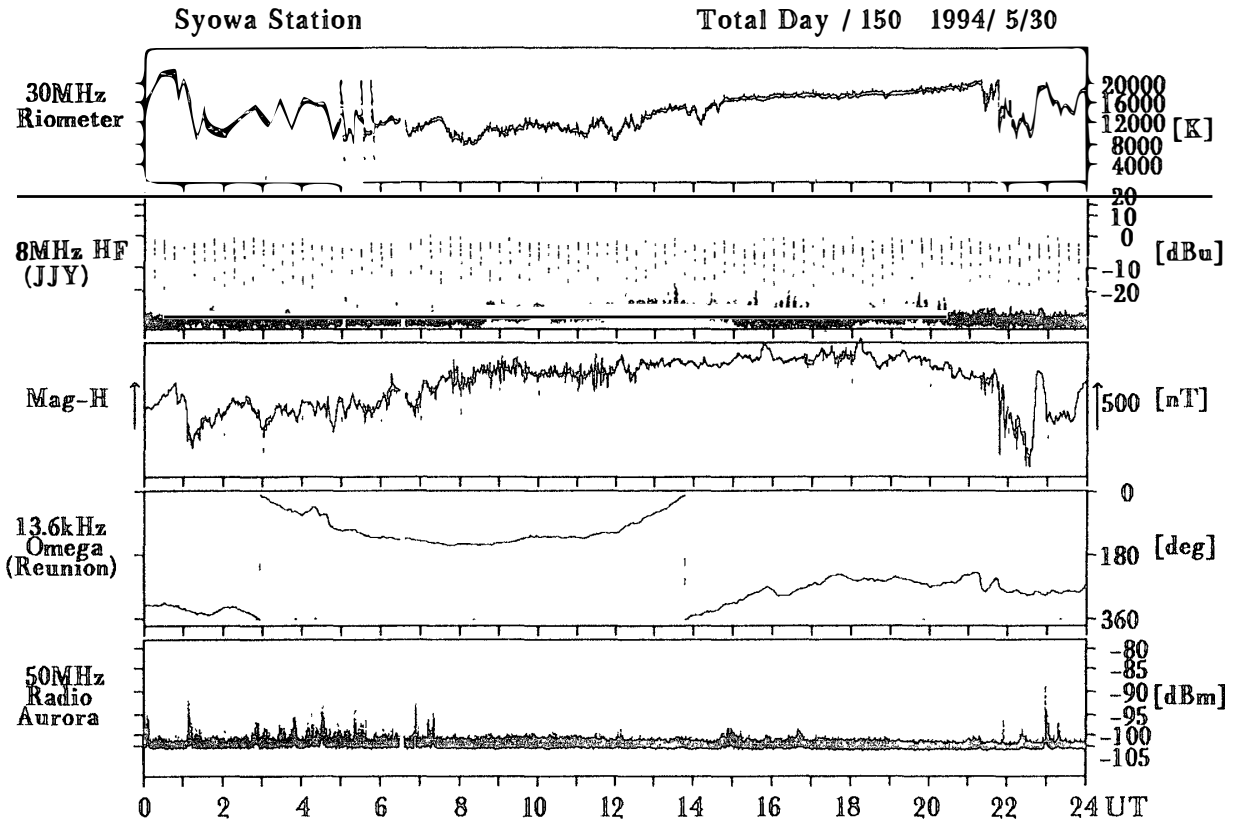
Total Day / 143 1994/ 5/23

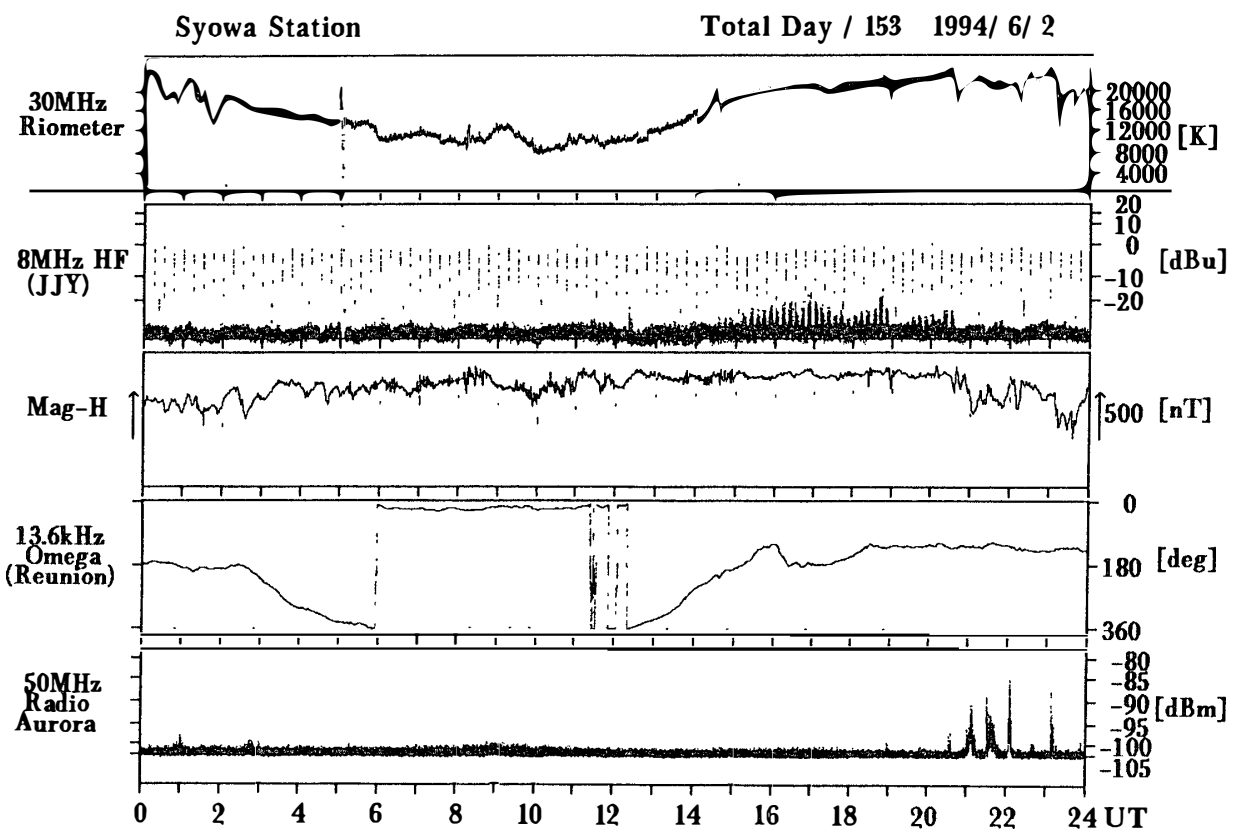
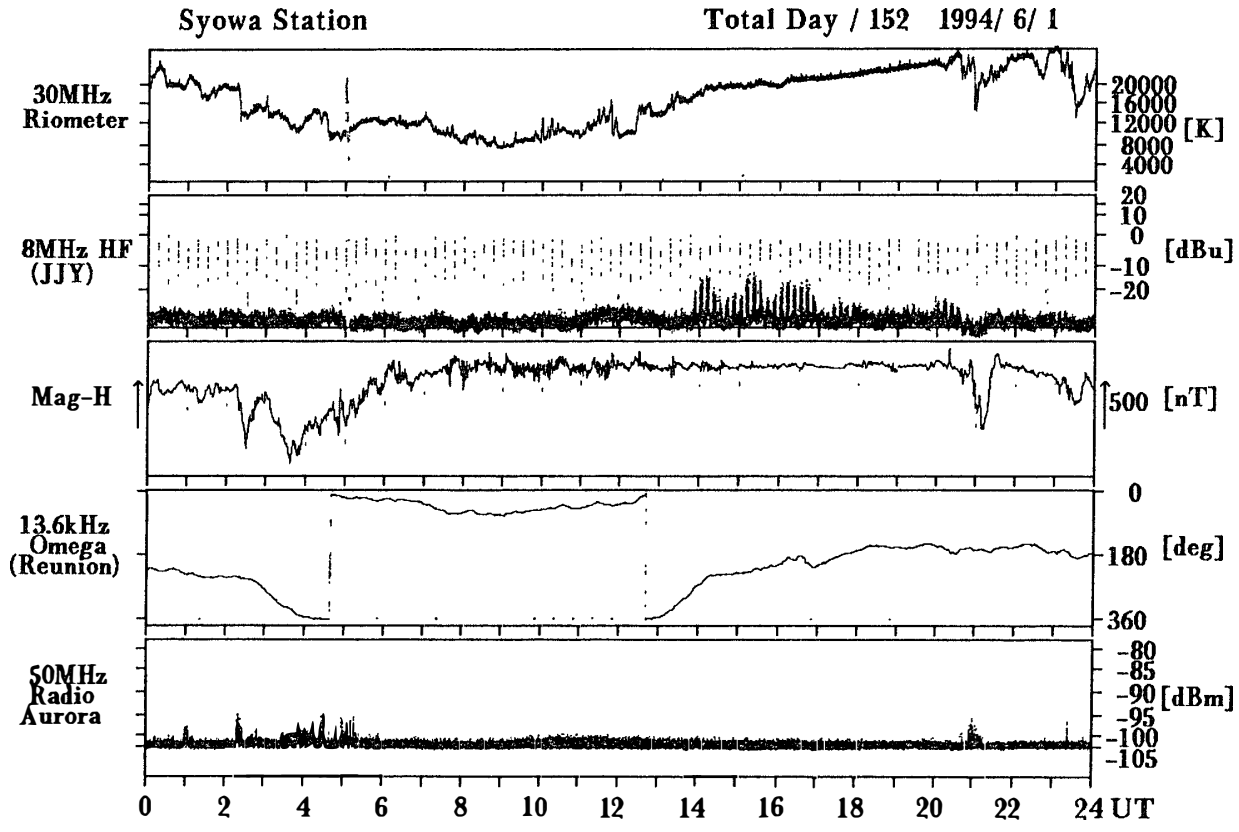






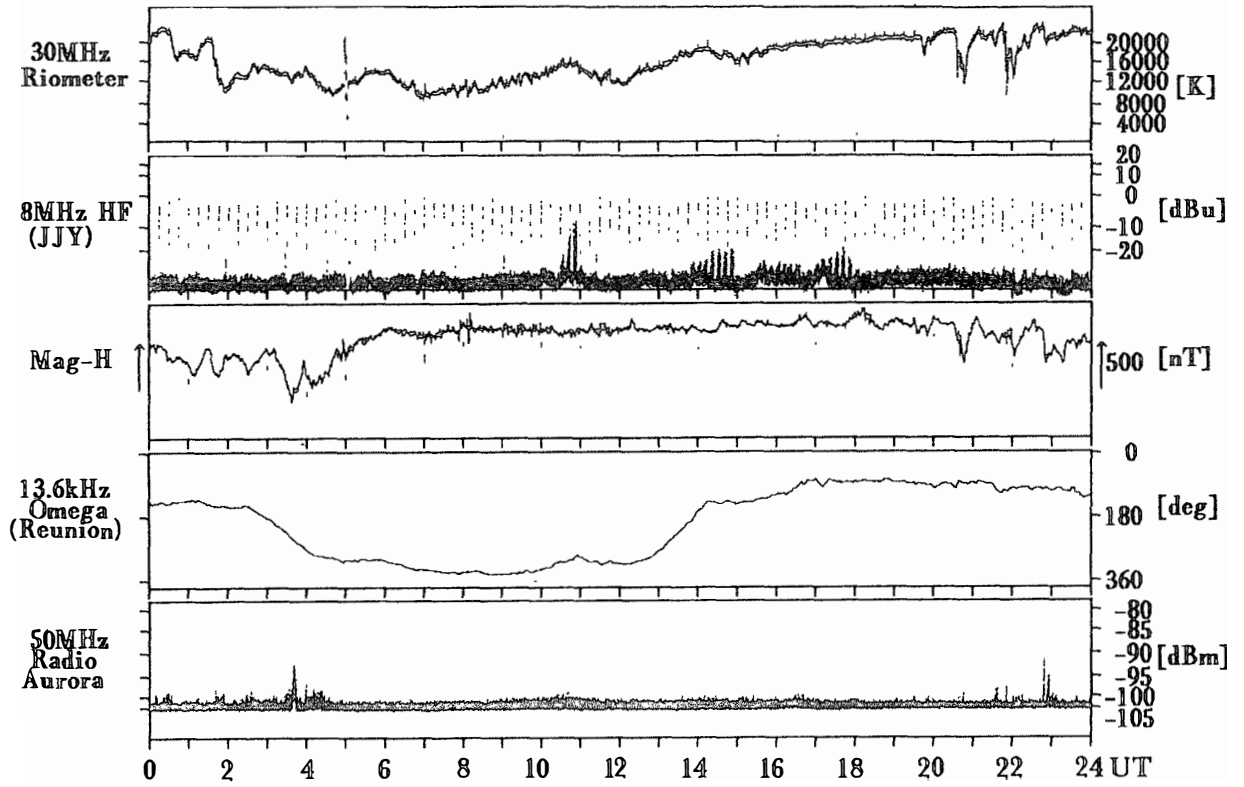






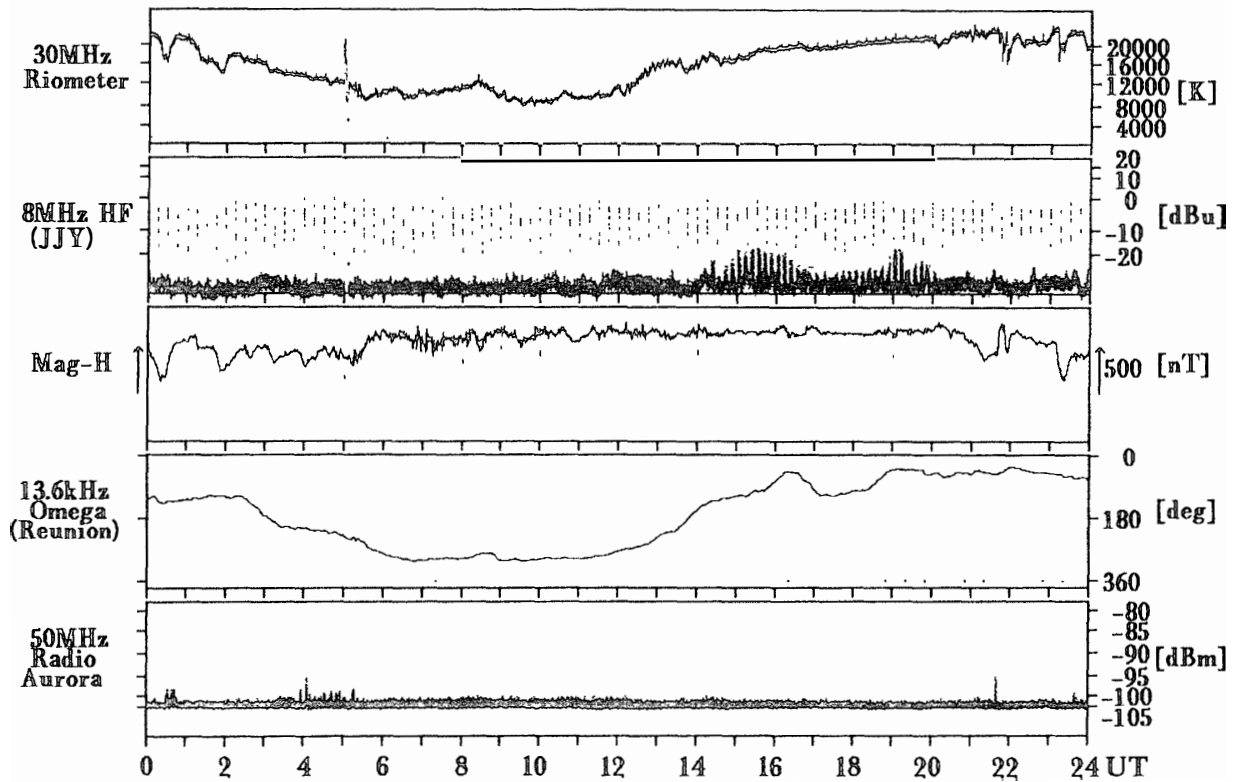
Syowa Station

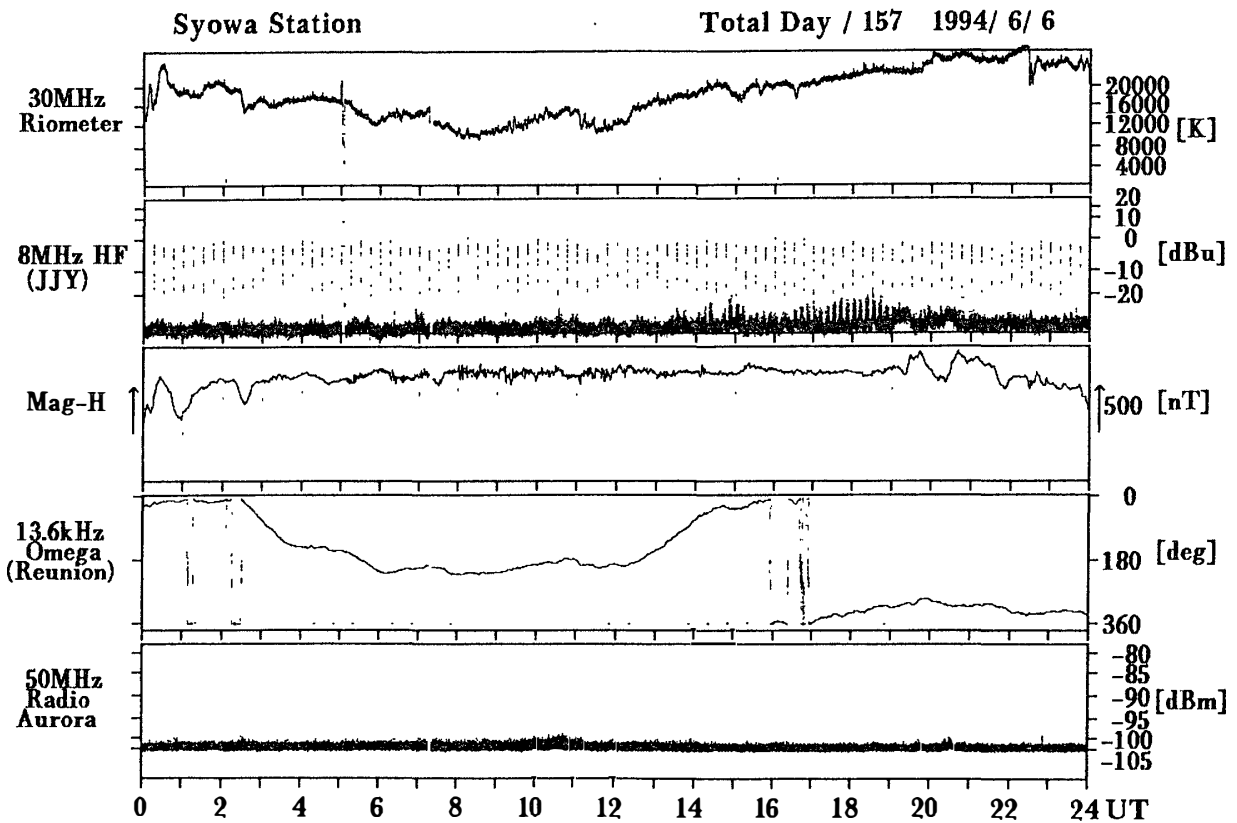
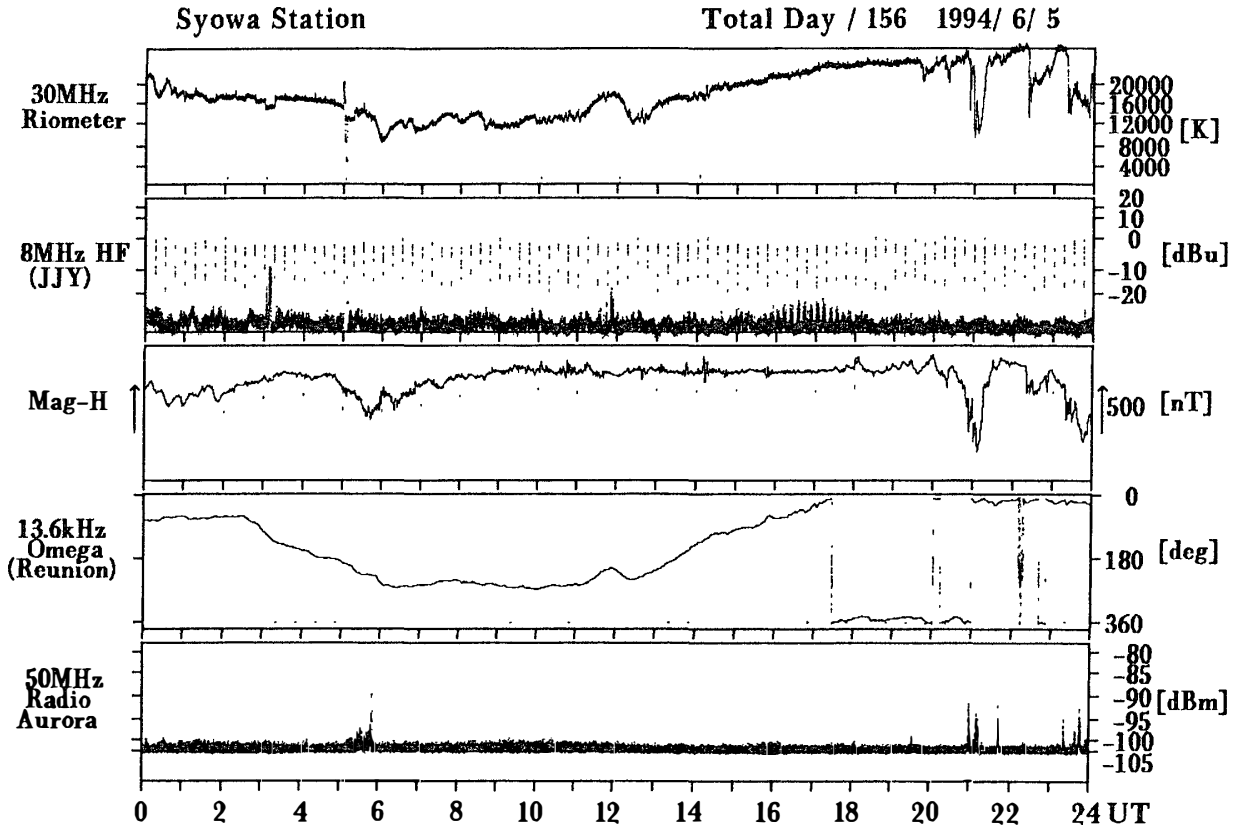
Total Day / 154 1994/ 6/ 3



Syowa Station

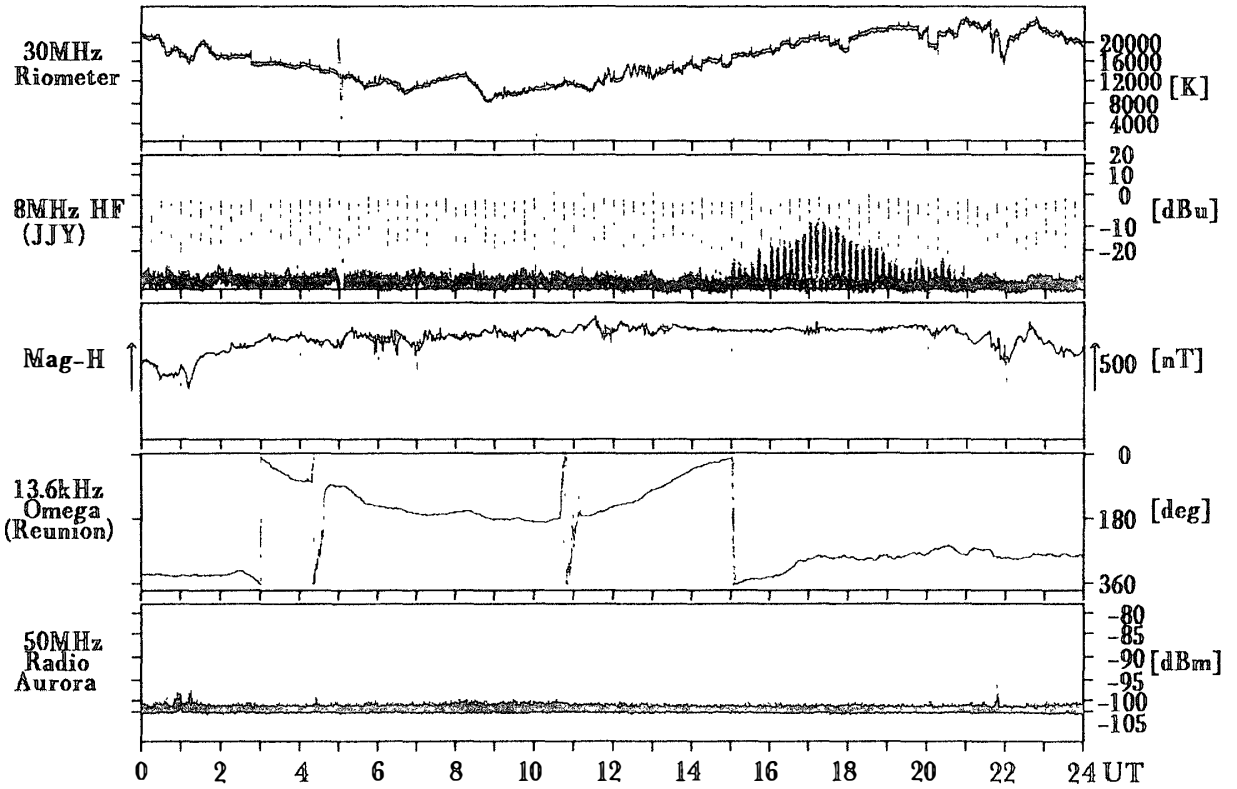
Total Day / 155 1994/ 6/ 4





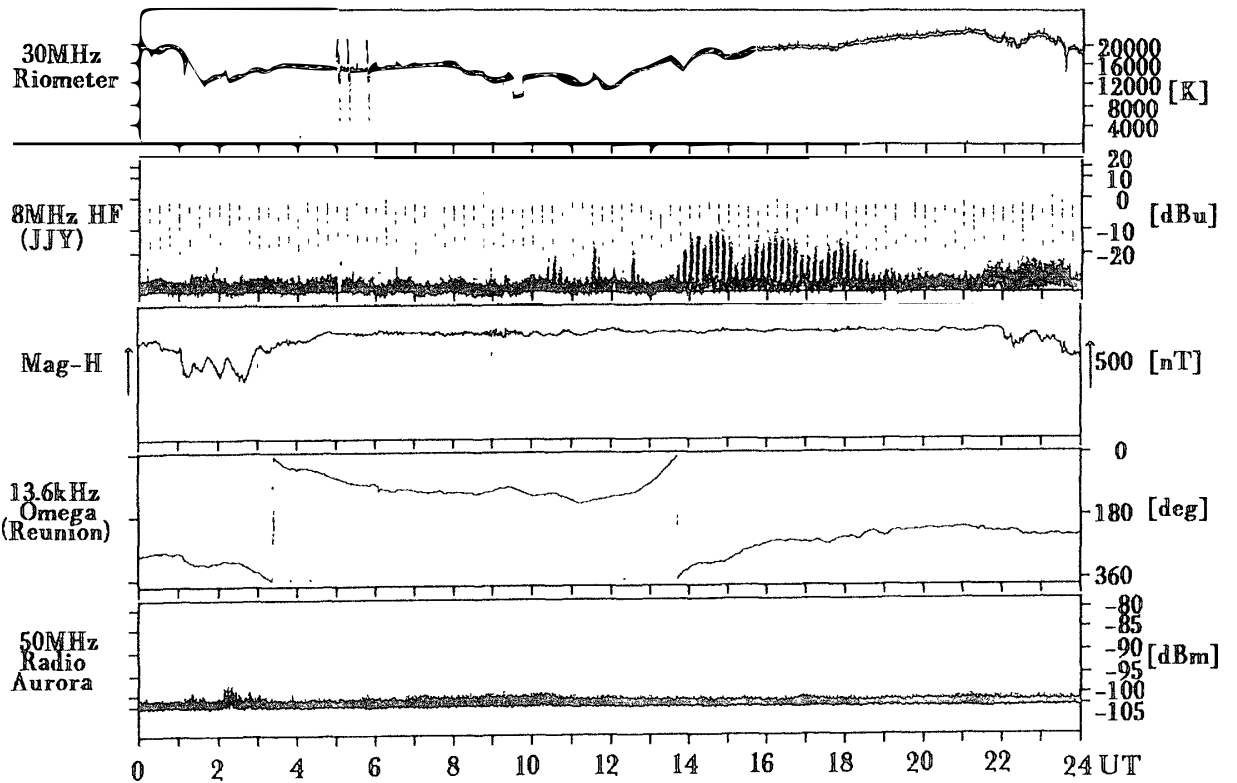
Syowa Station

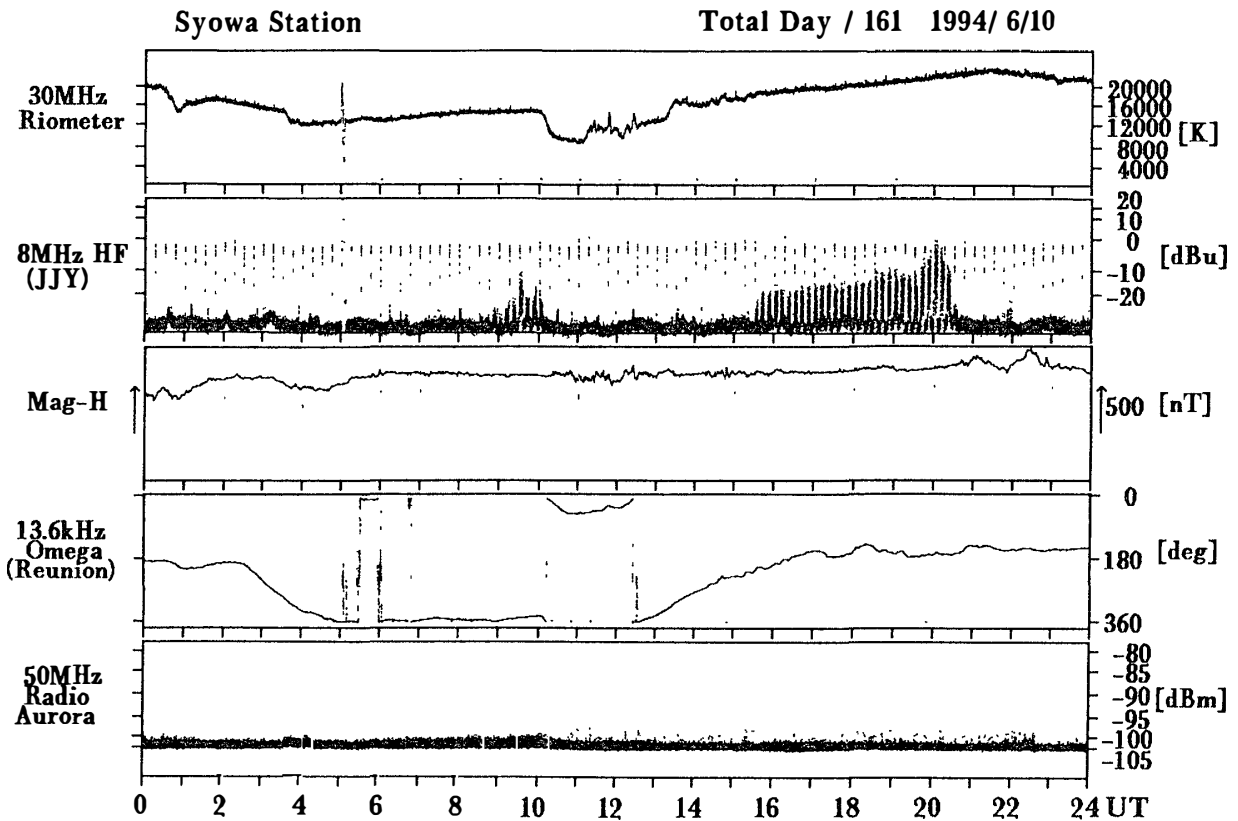
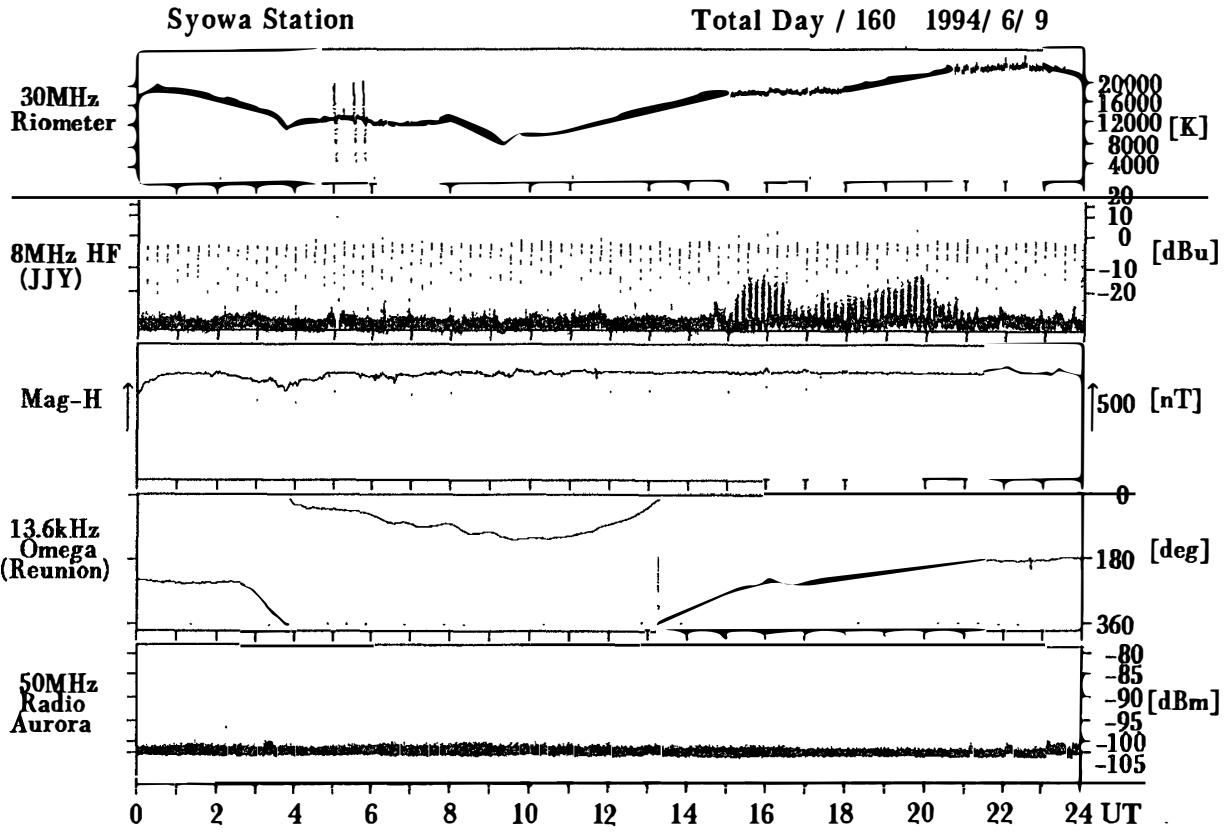
Total Day / 158 1994/ 6/ 7



Syowa Station

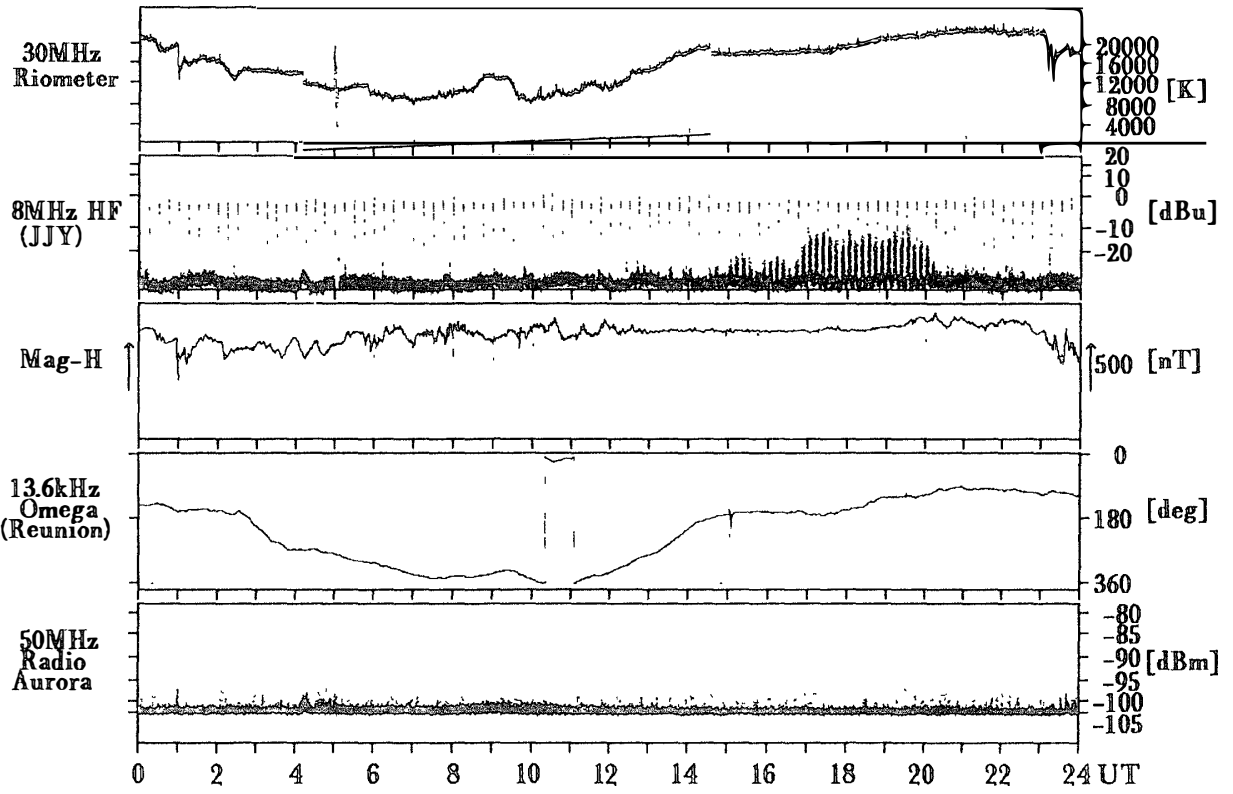
Total Day / 159 1994/ 6/ 8





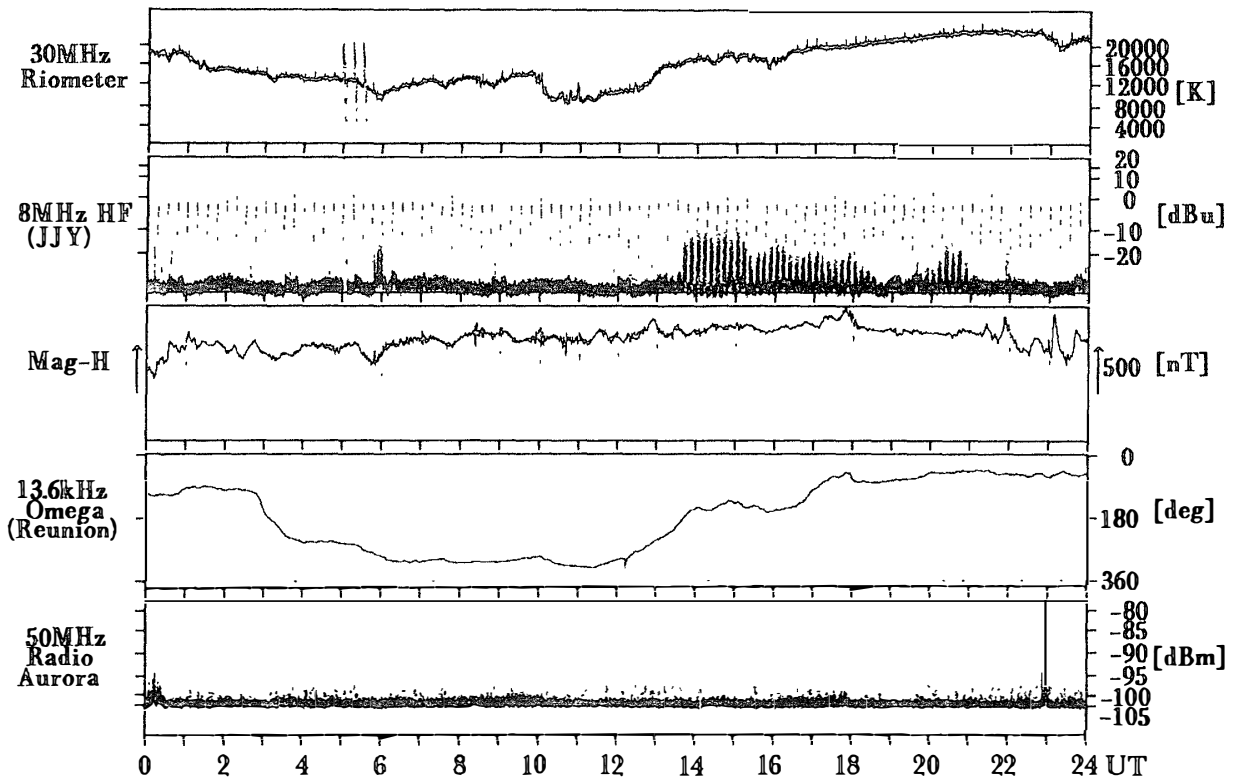
Syowa Station

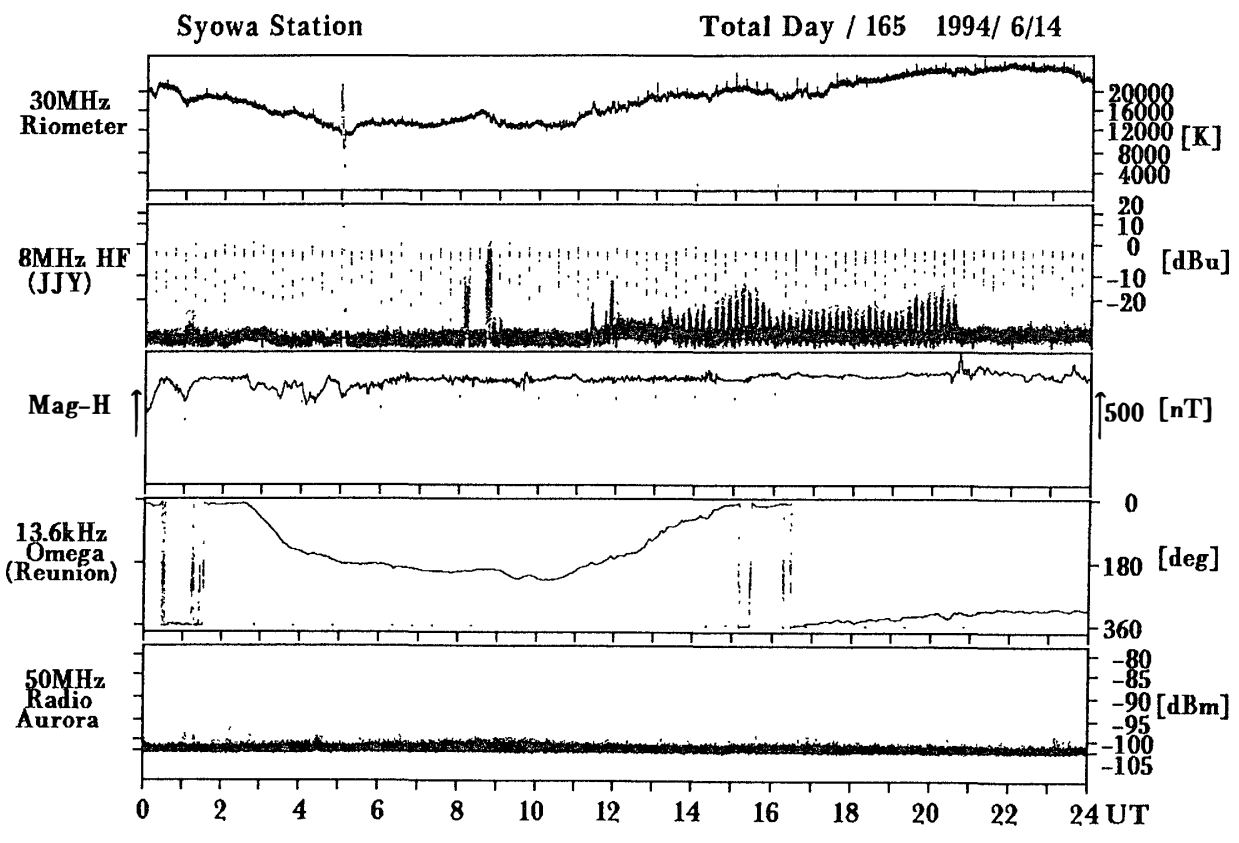
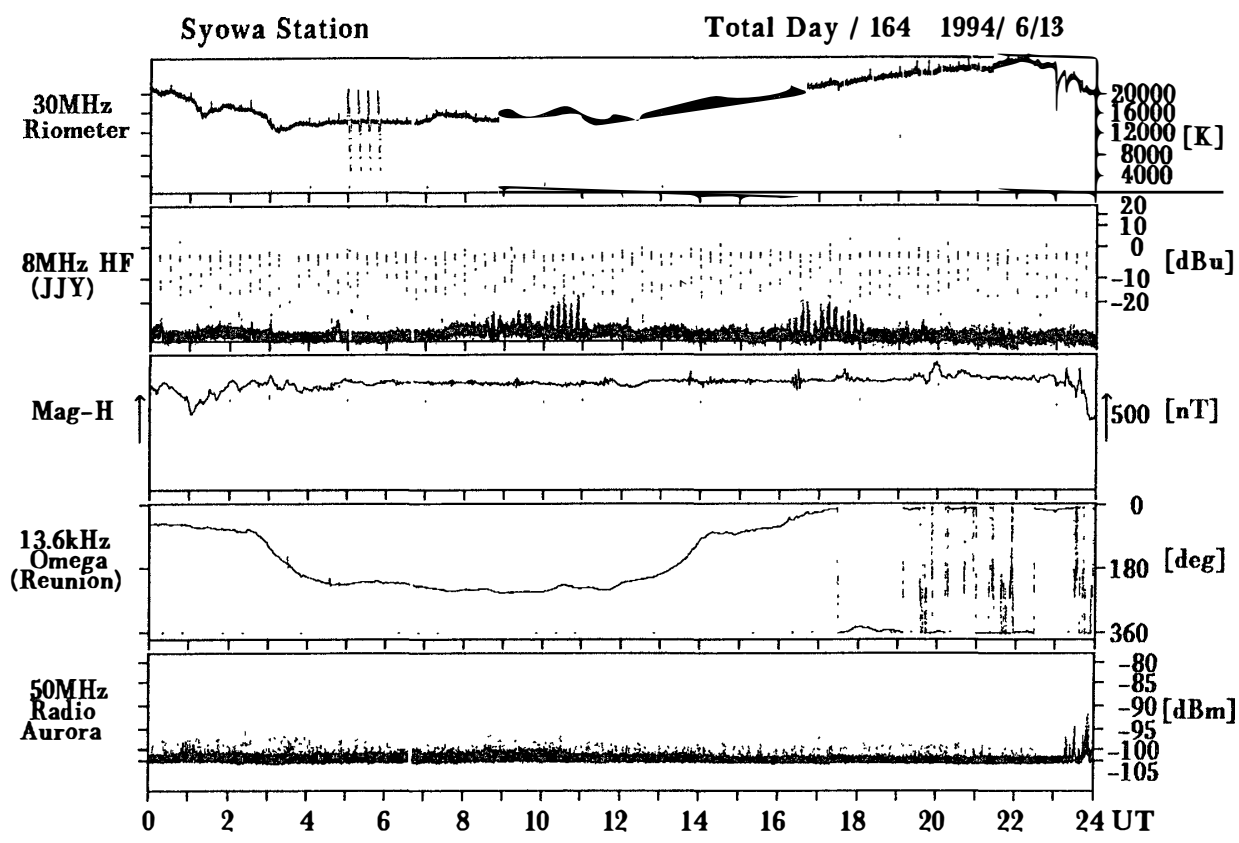
Total Day / 162 1994/ 6/11



Syowa Station

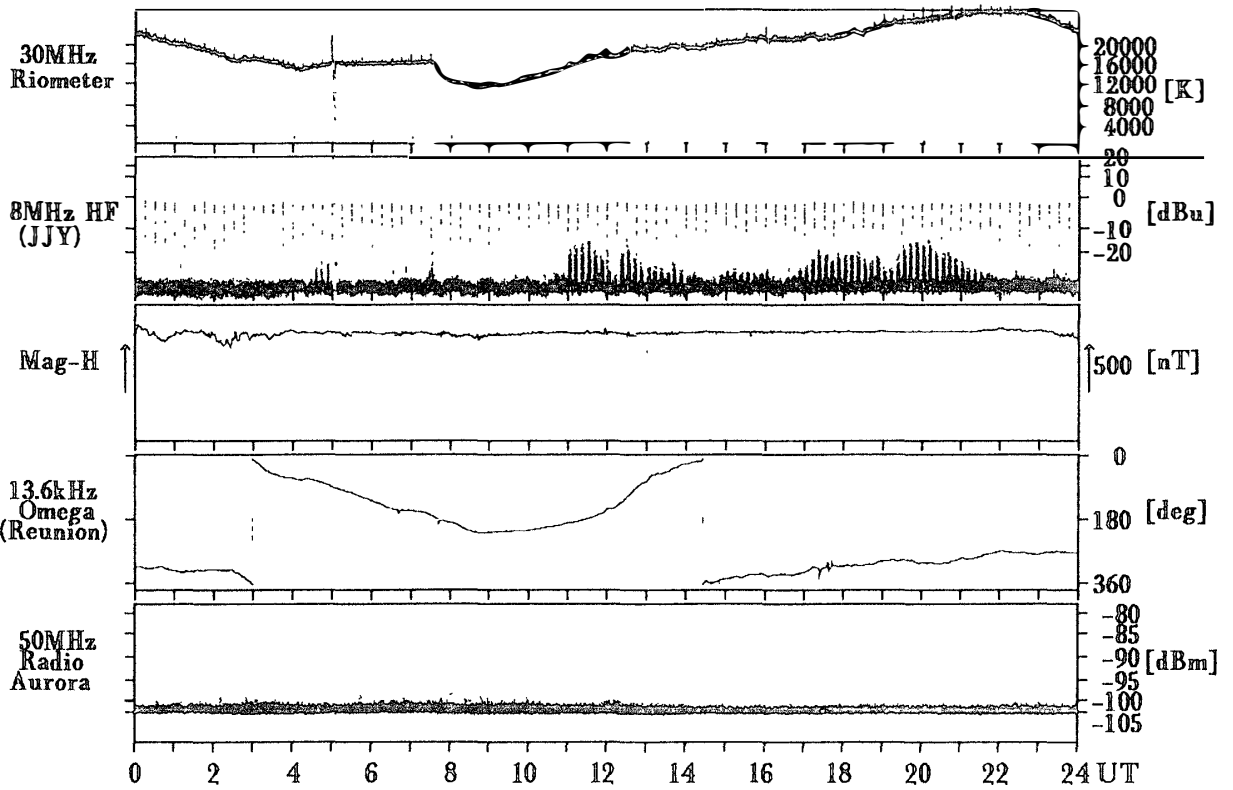
Total Day / 163 1994/ 6/12





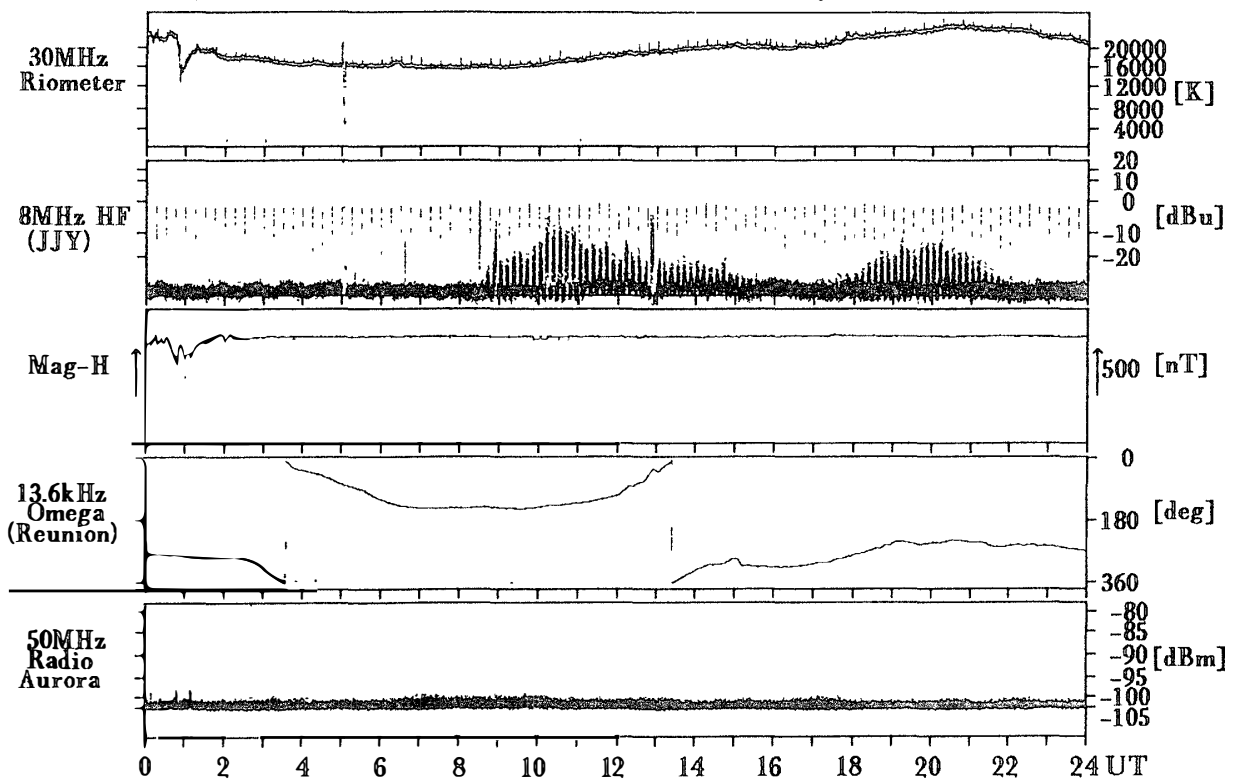
Syowa Station

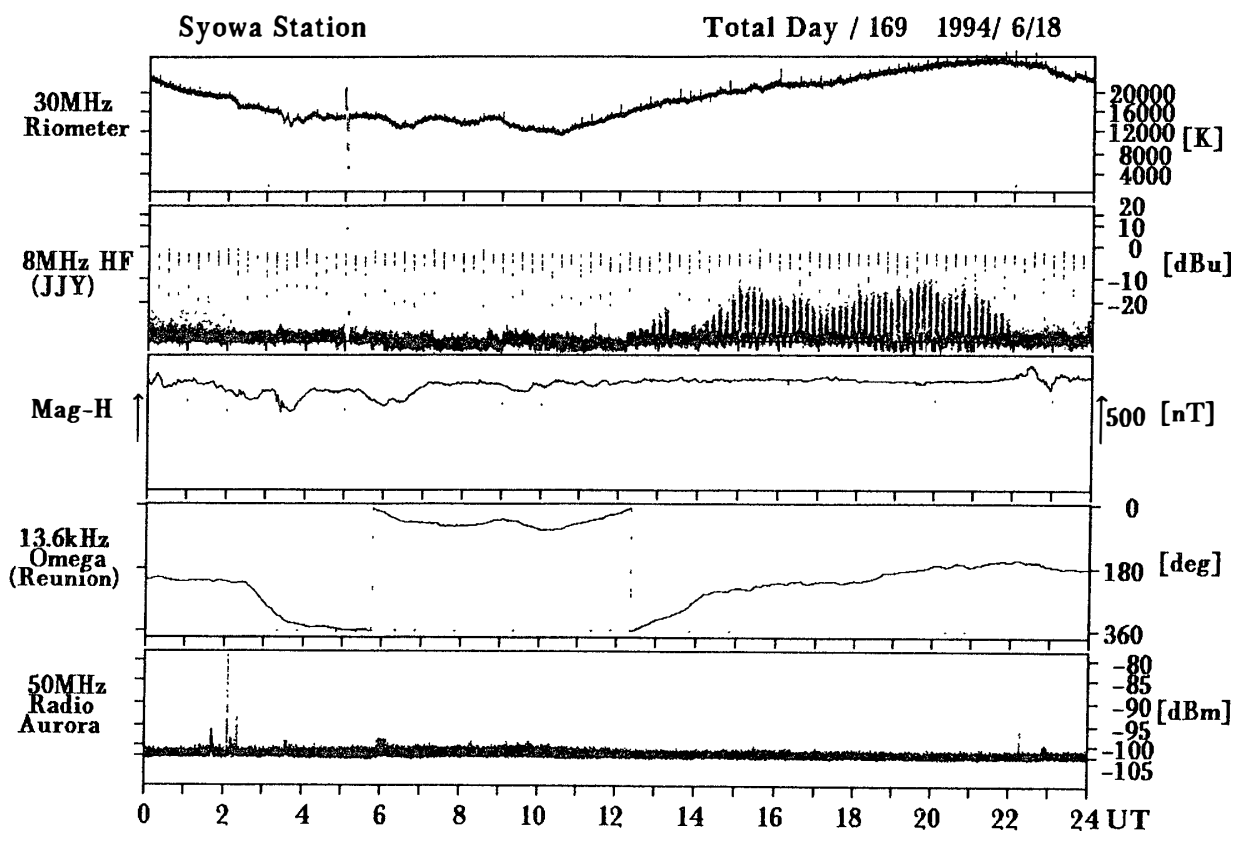
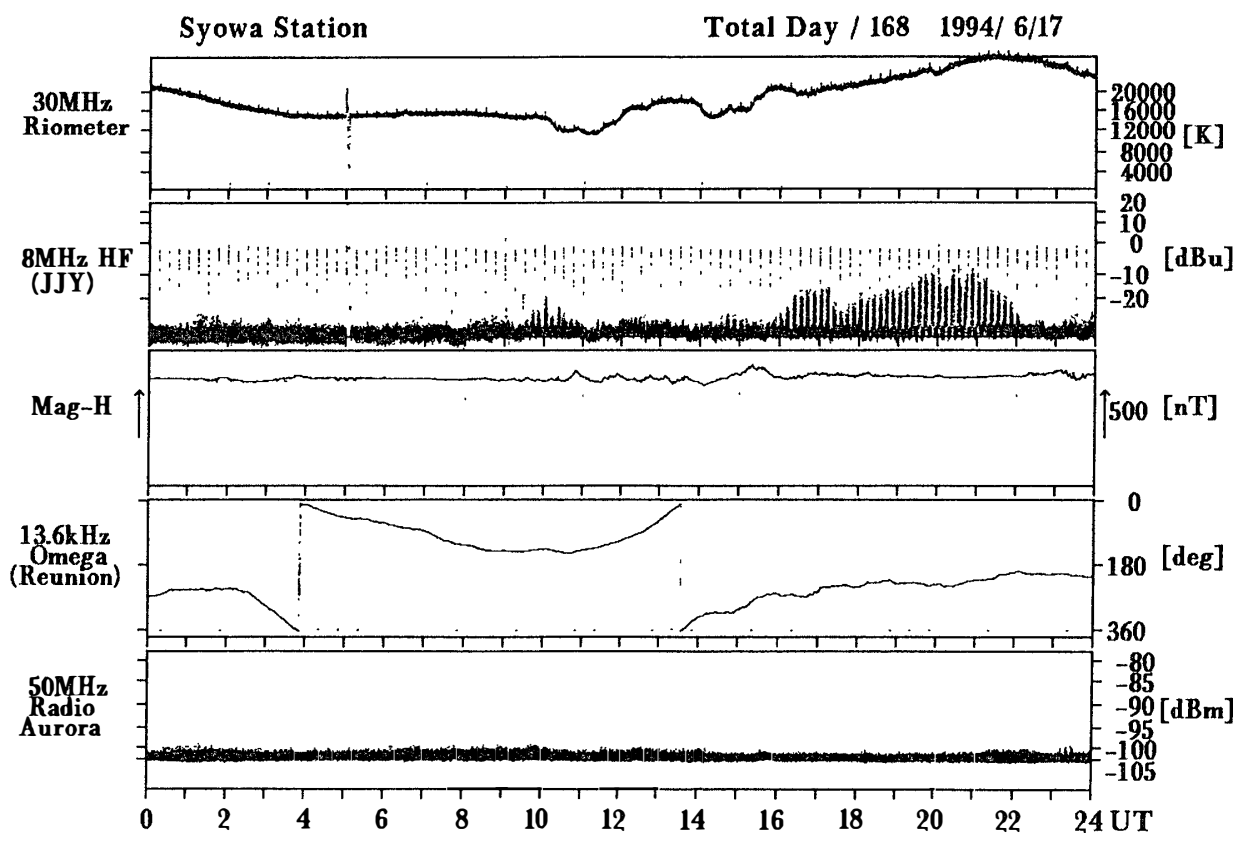
Total Day / 166 1994/ 6/15

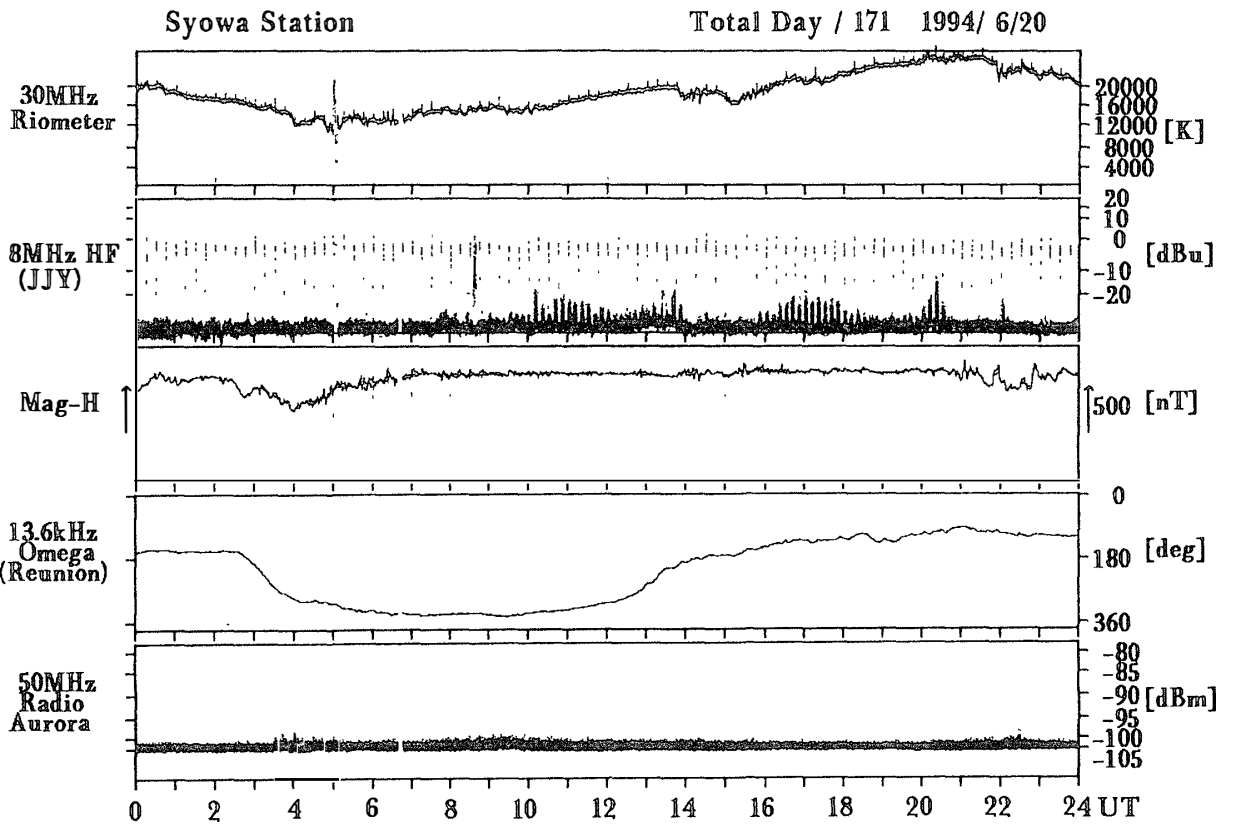
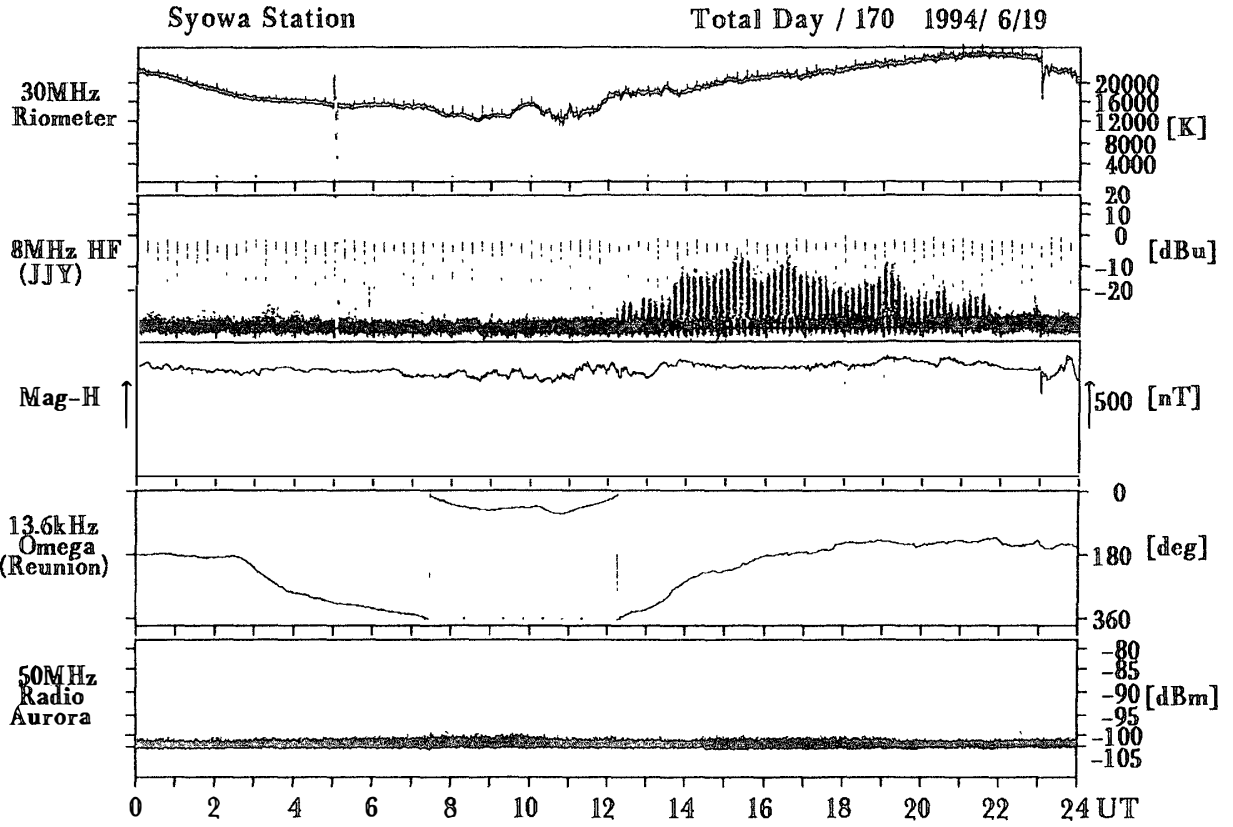


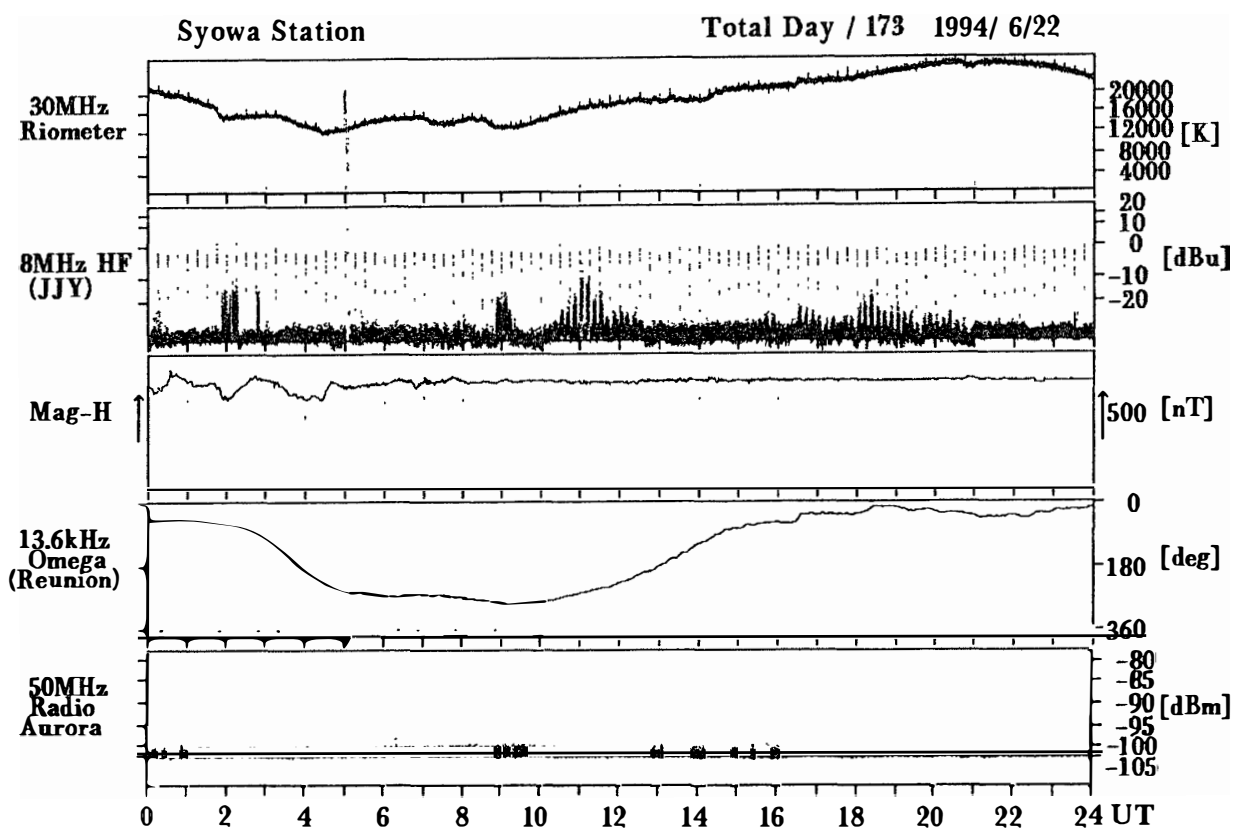
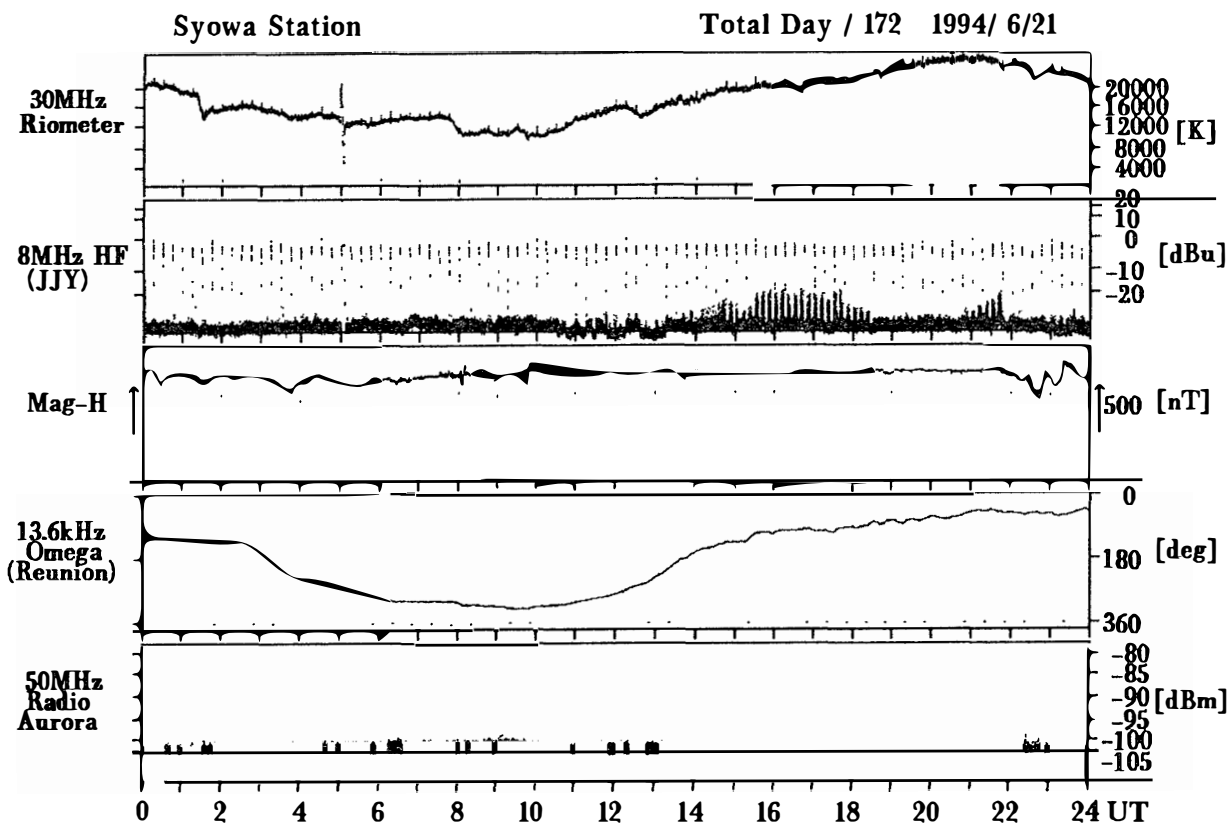
Syowa Station

Total Day / 167 1994/ 6/16



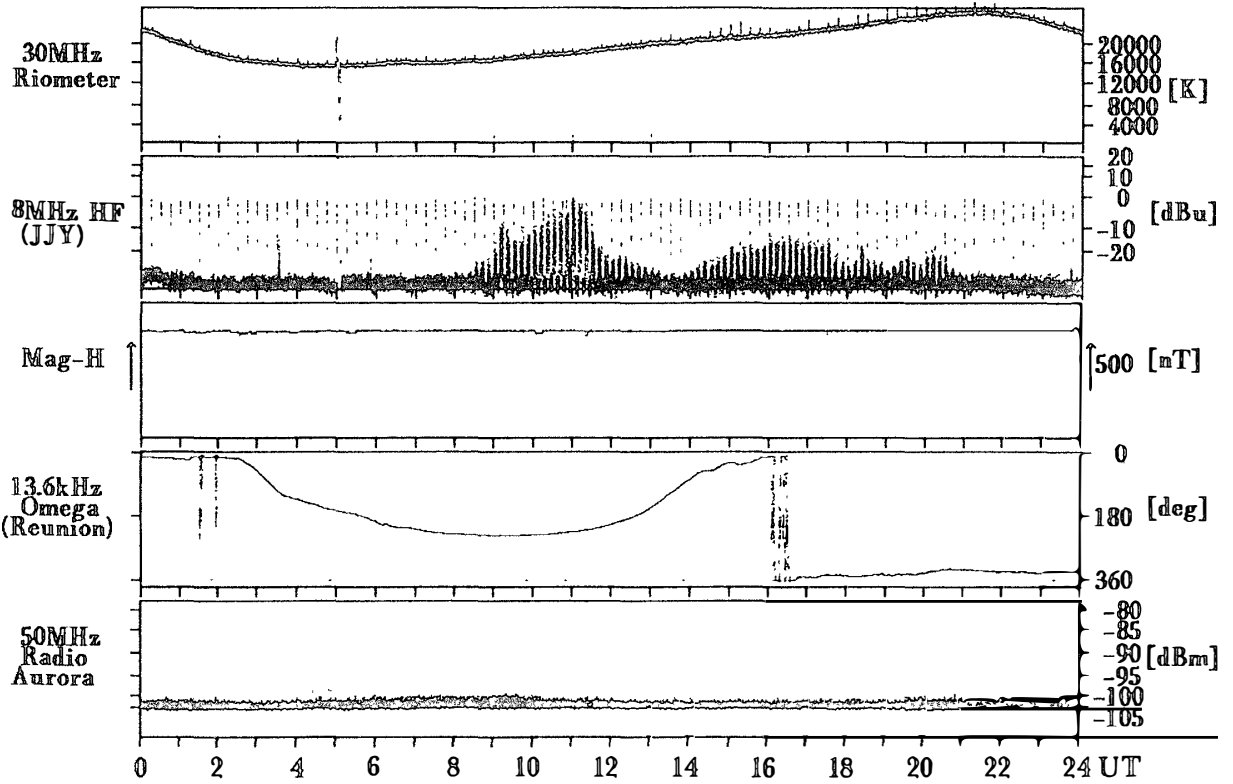






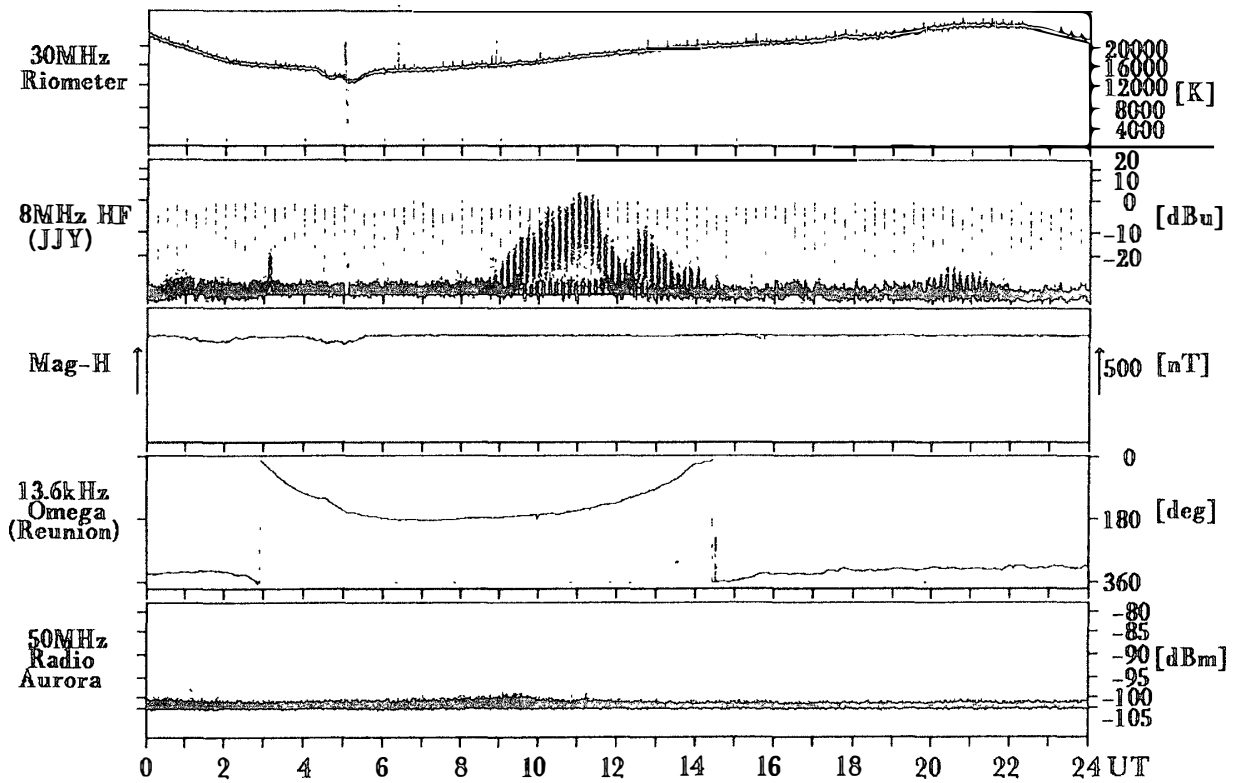
Syowa Station

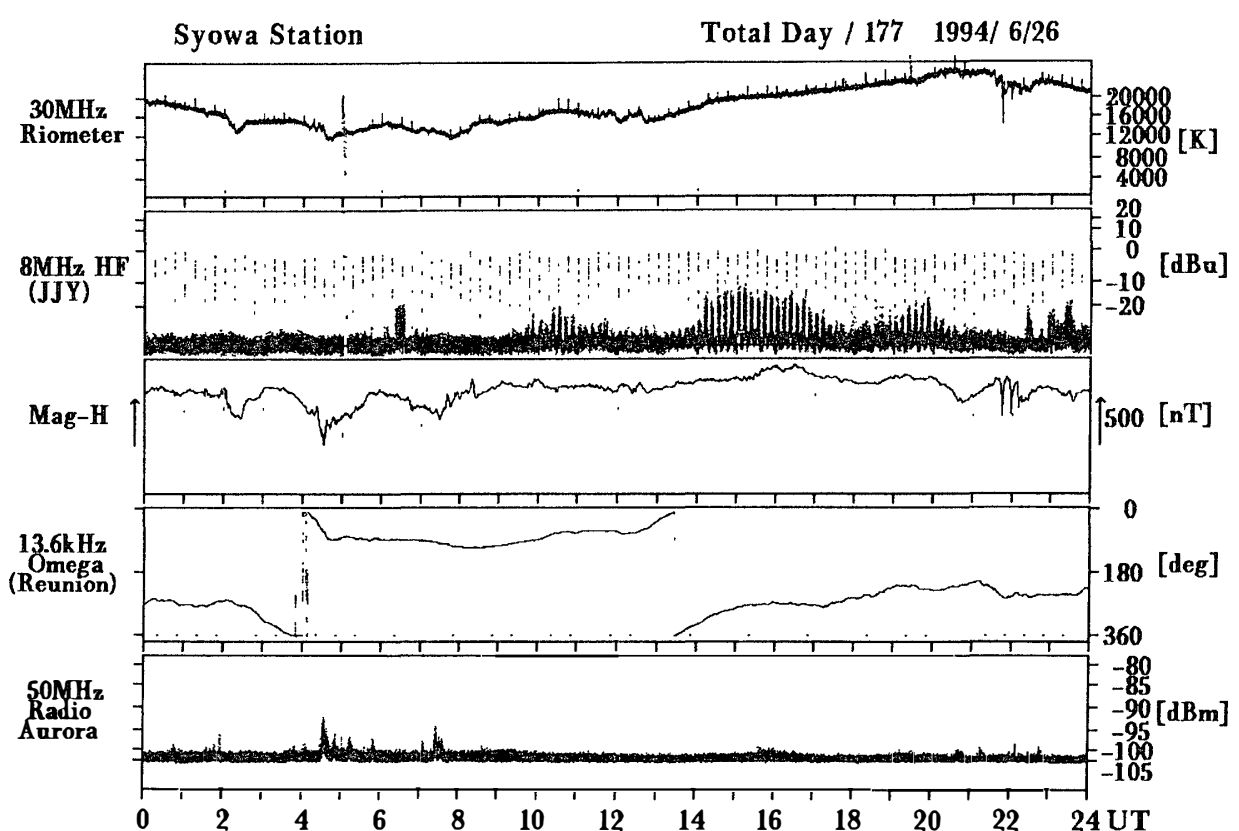
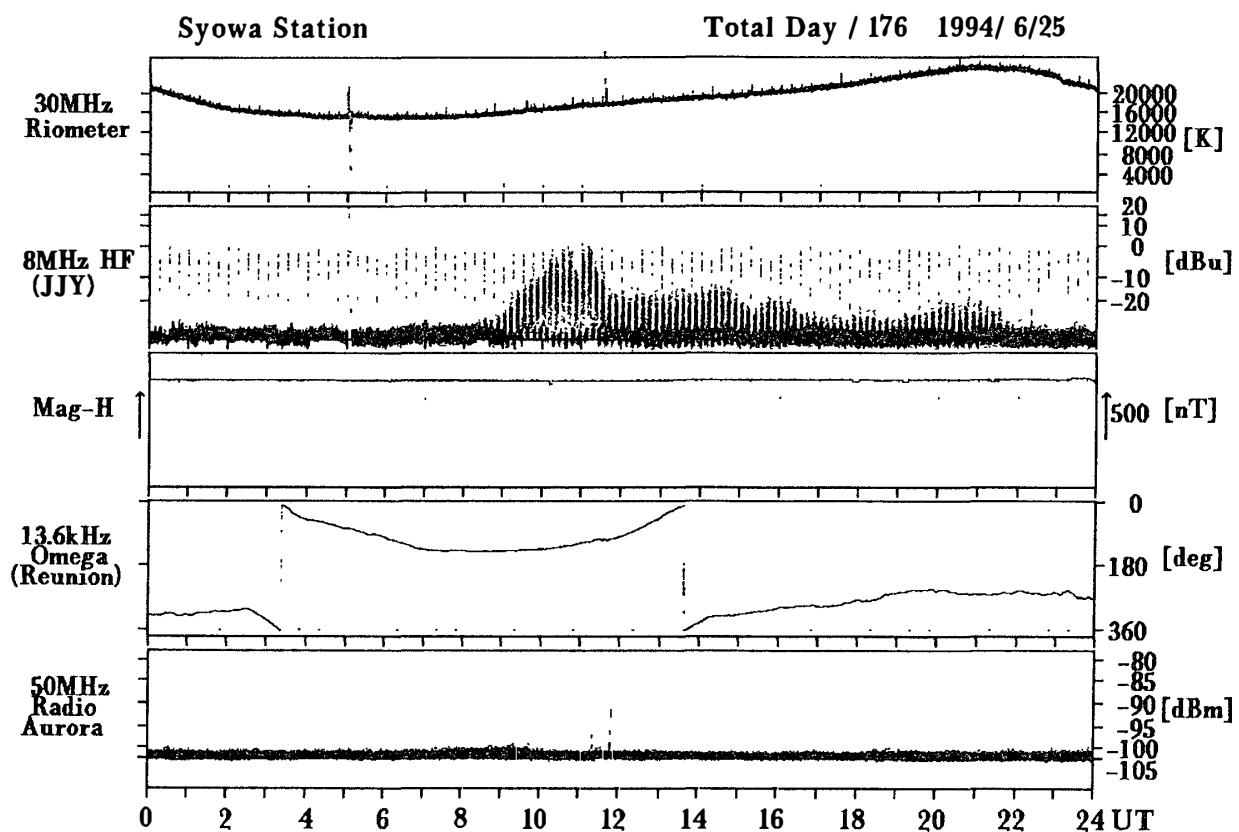
Total Day / 174 1994/ 6/23



Syowa Station

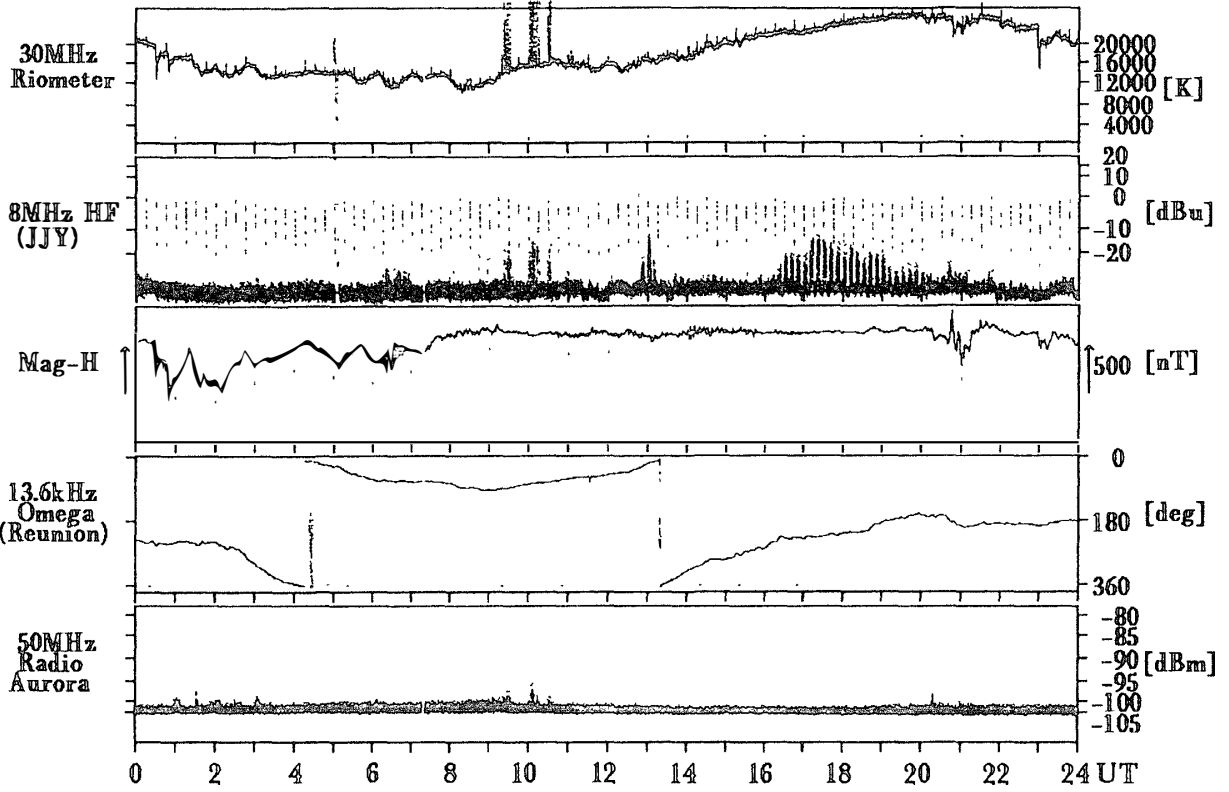
Total Day / 175 1994/ 6/24





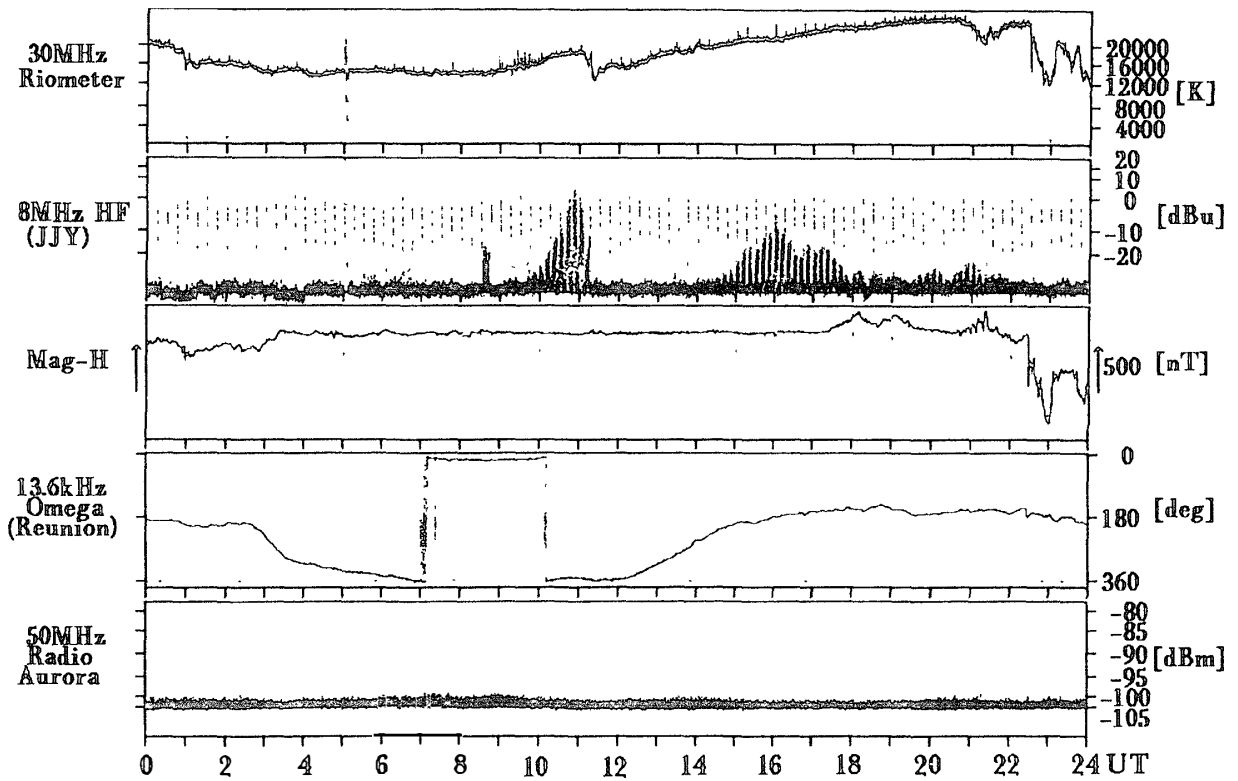
Syowa Station

Total Day / 178 1994/ 6/27



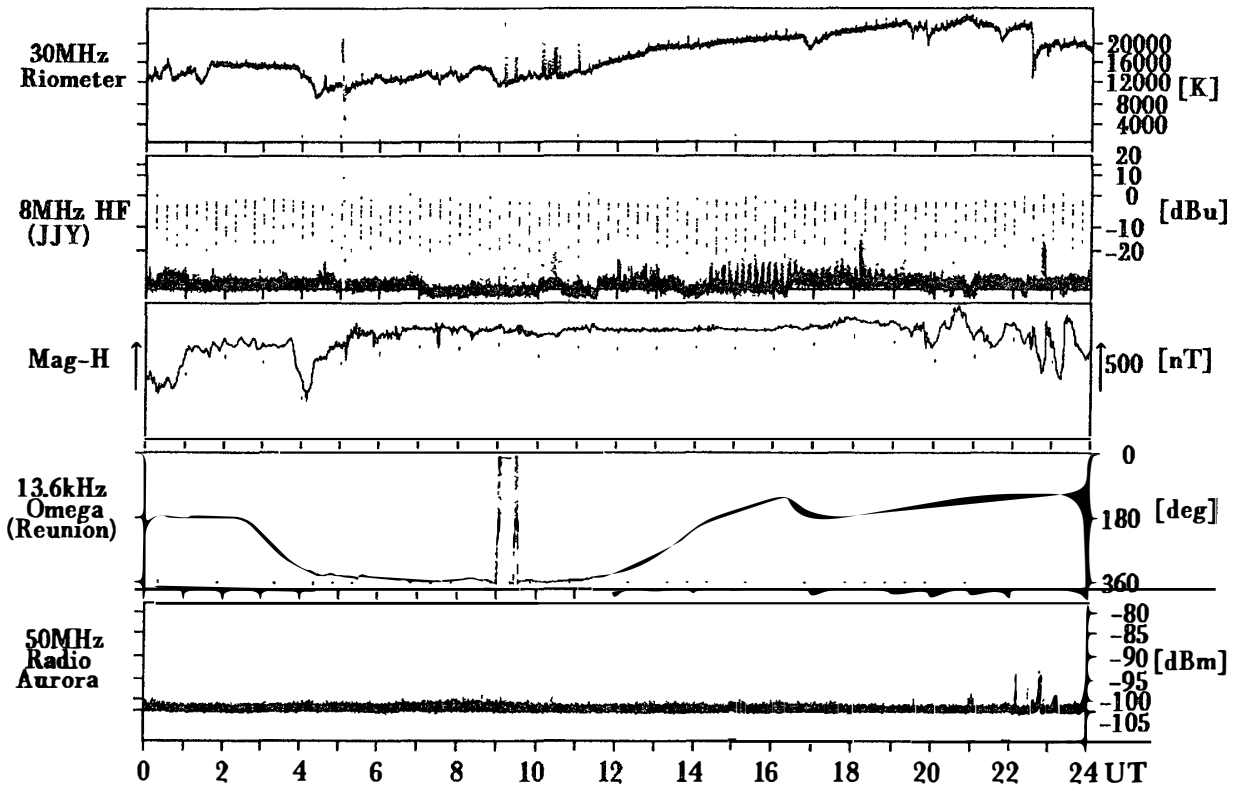
Syowa Station

Total Day / 179 1994/ 6/28



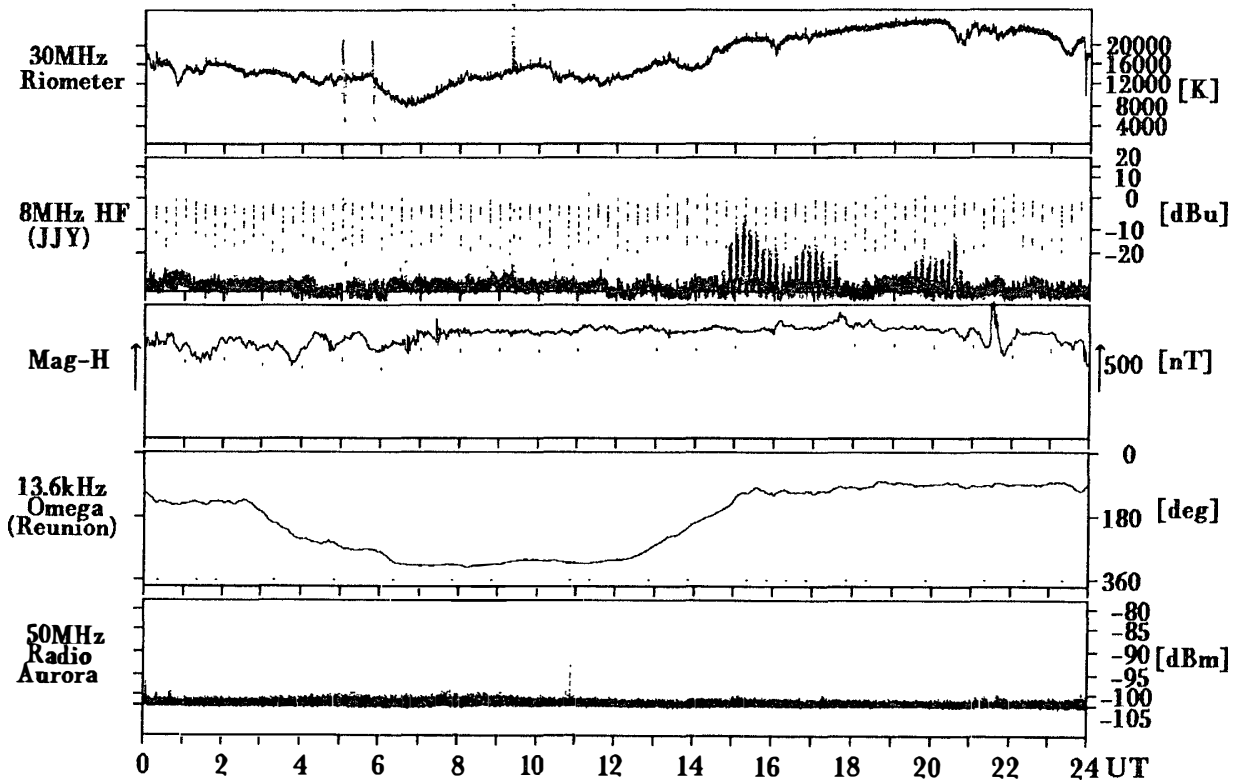
Syowa Station

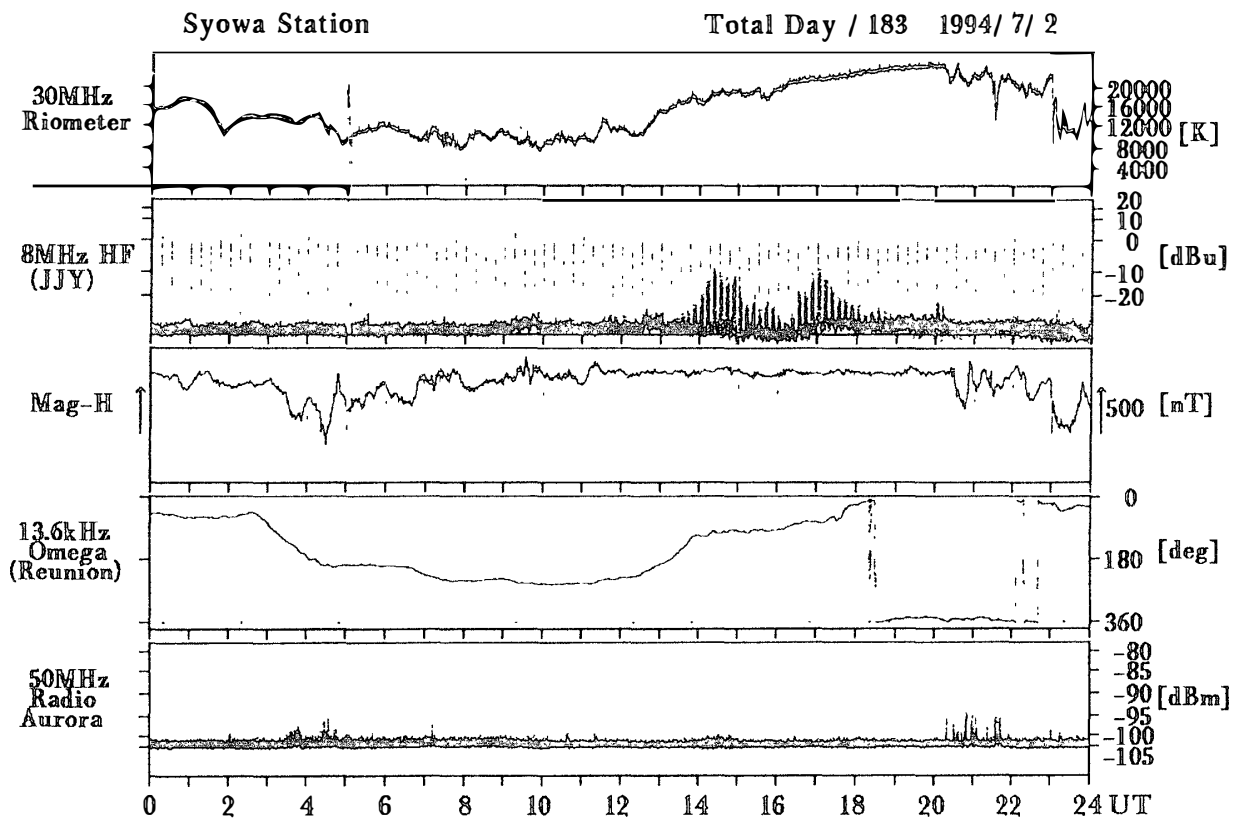
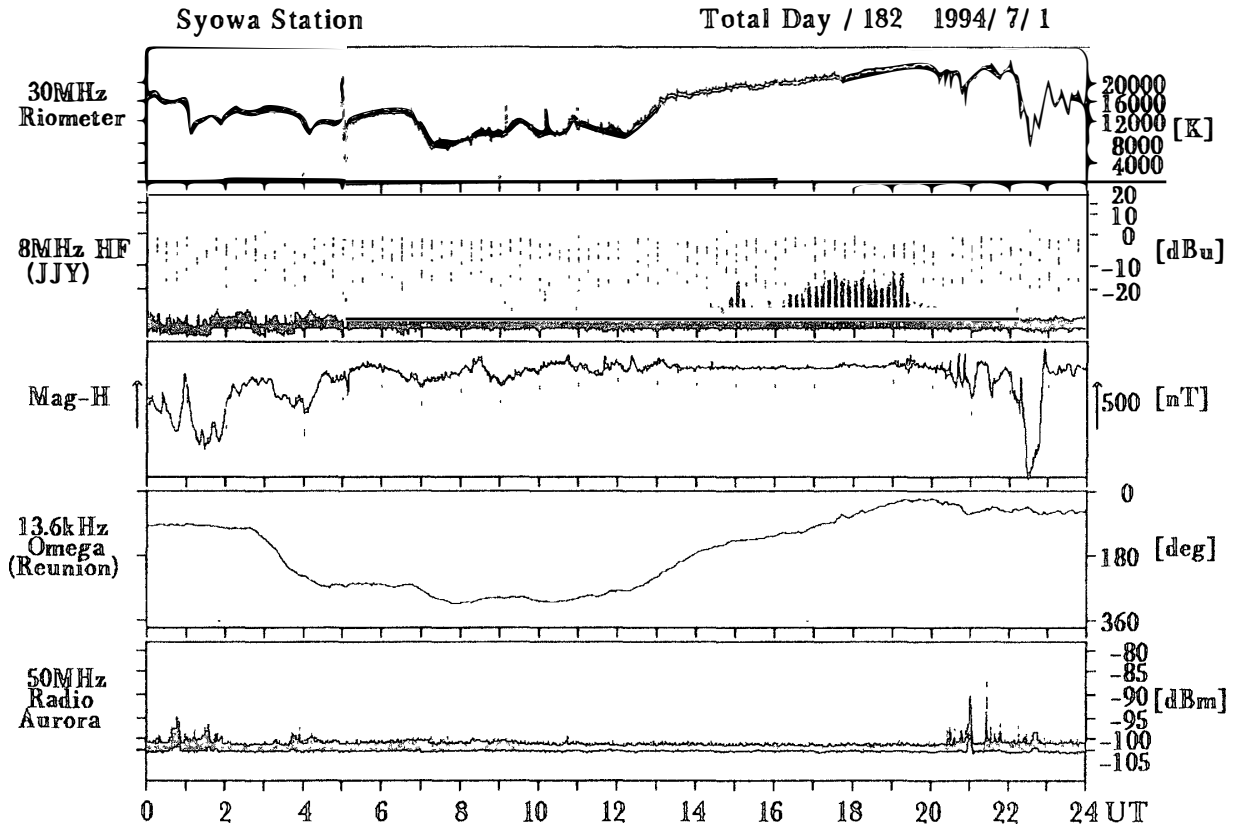
Total Day / 180 1994/ 6/29

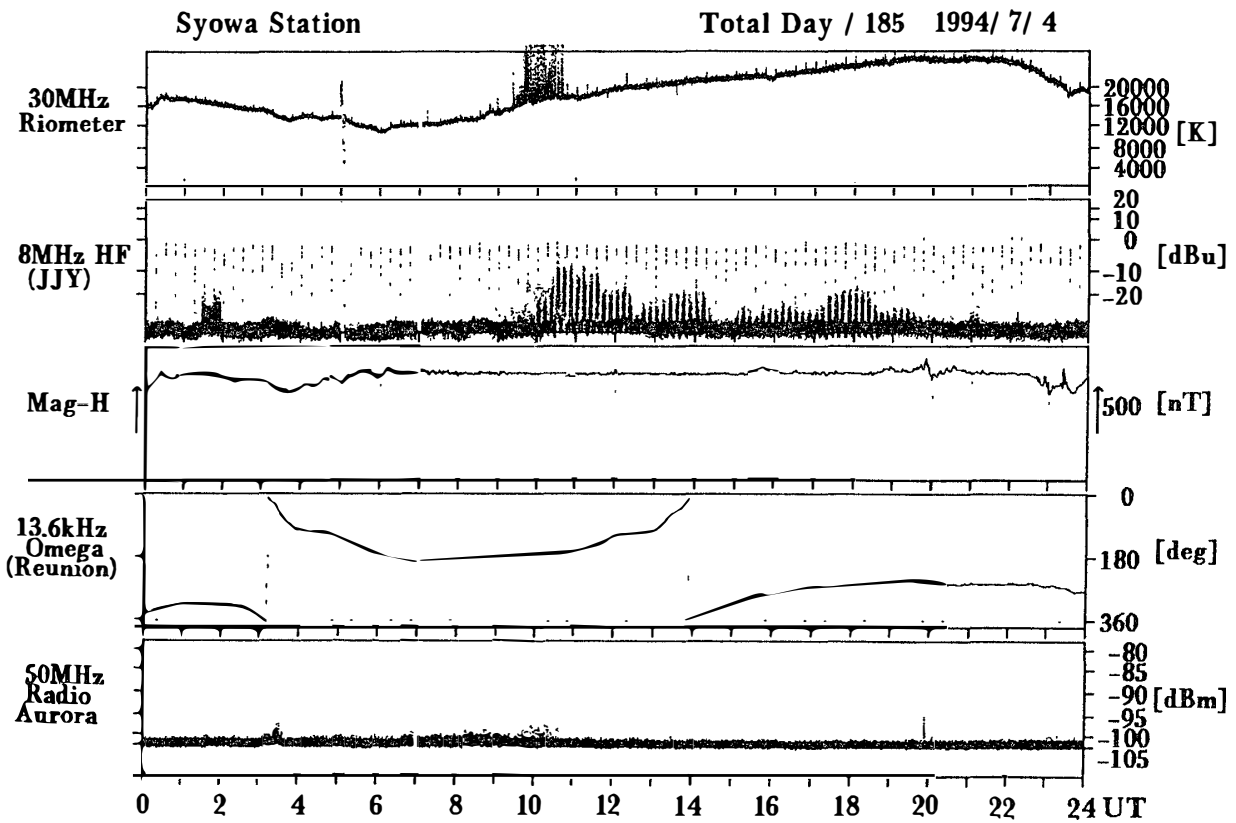
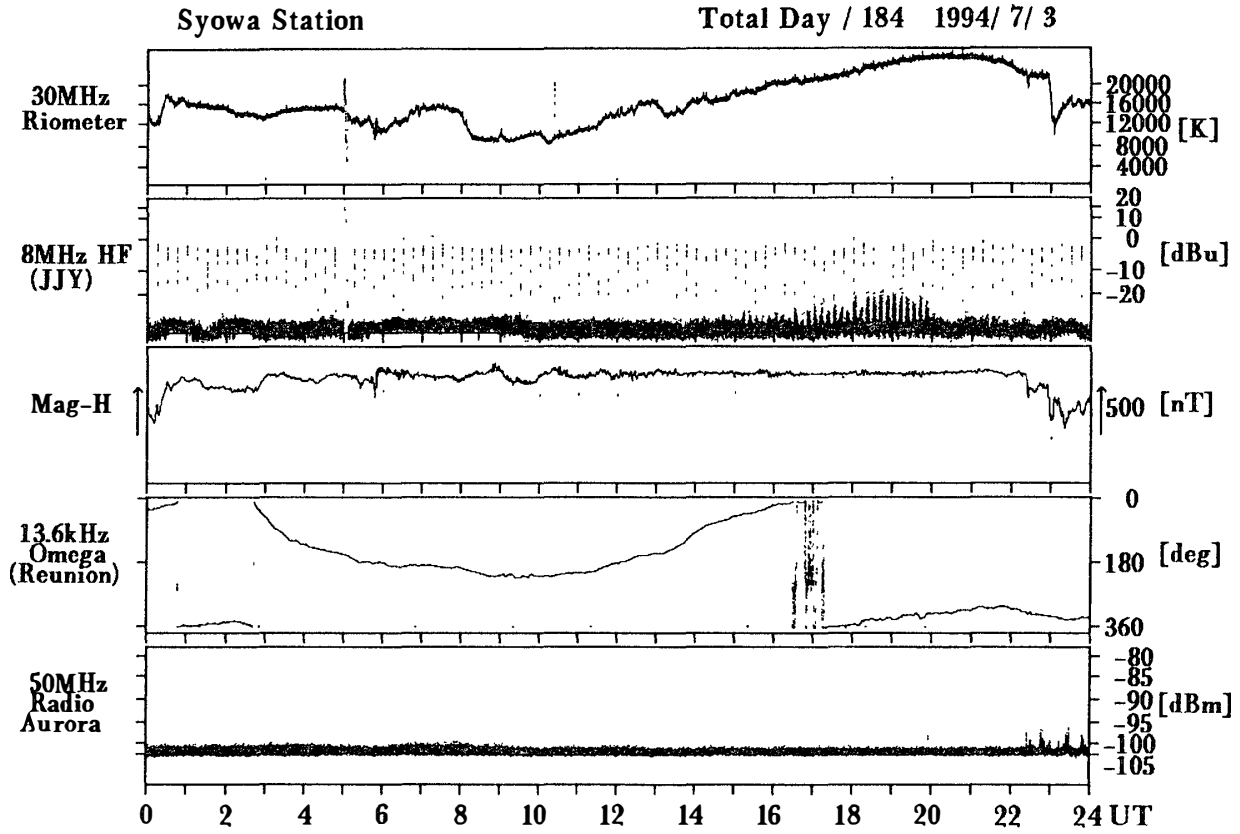


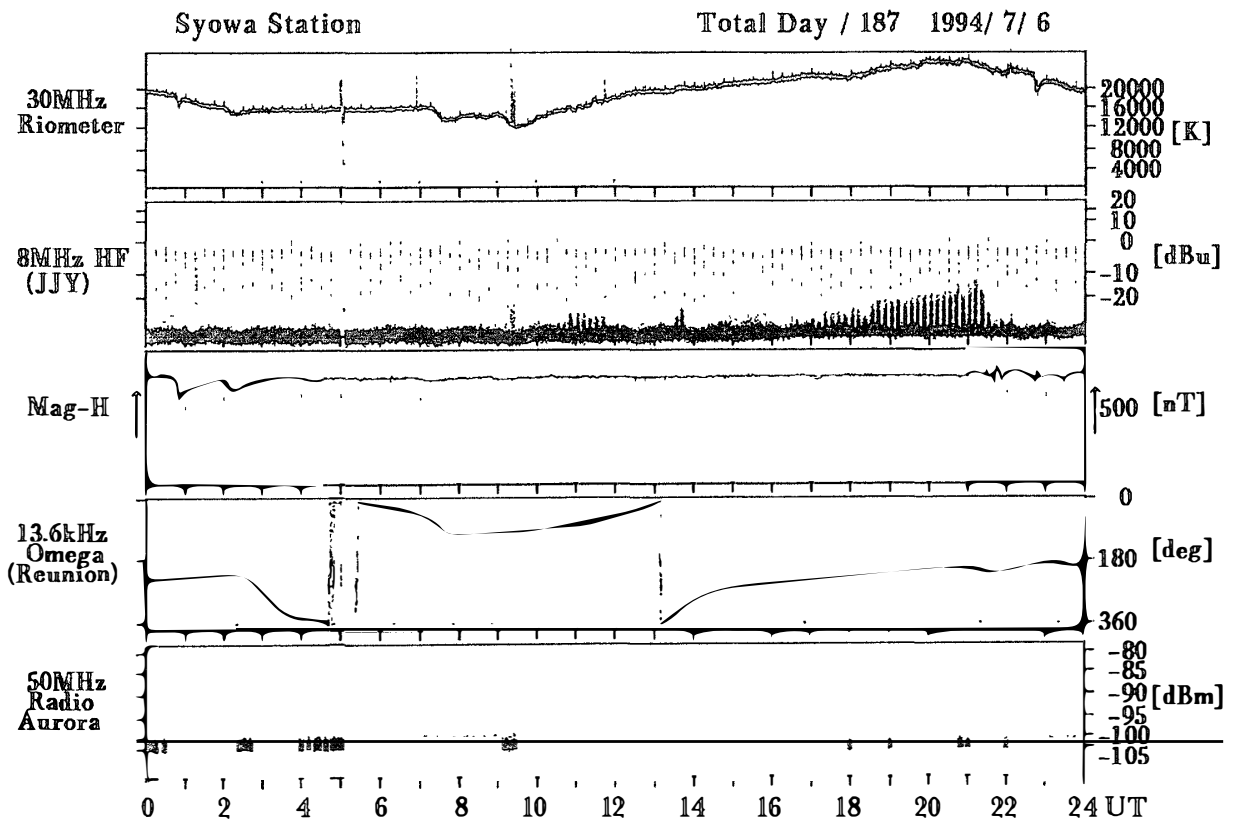
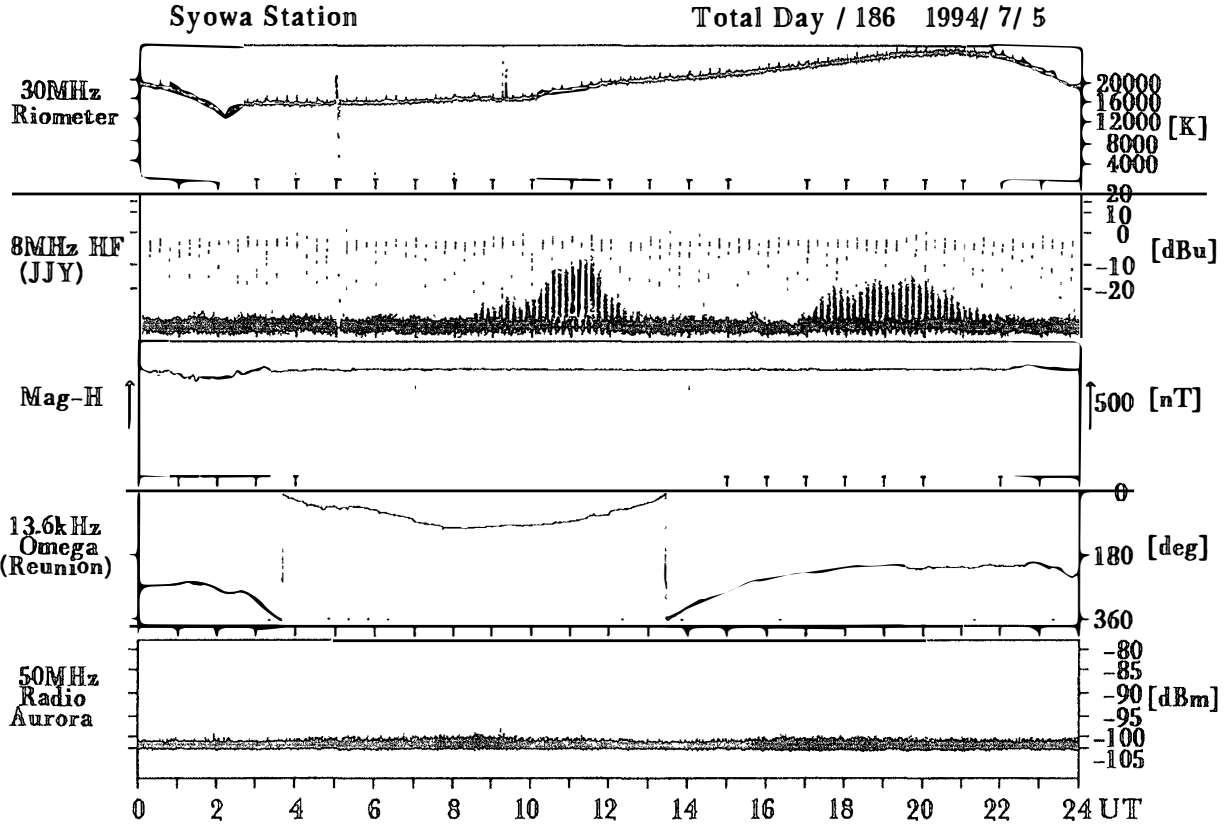
Syowa Station

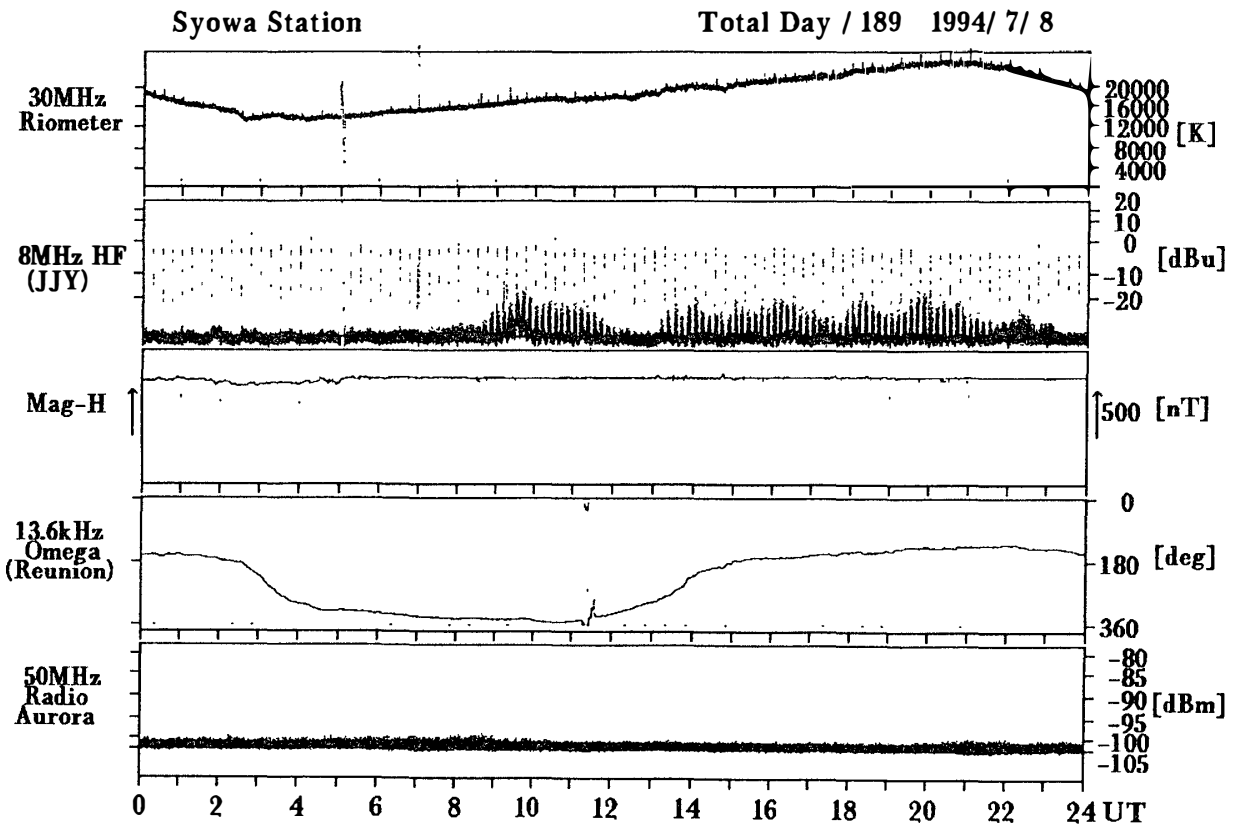
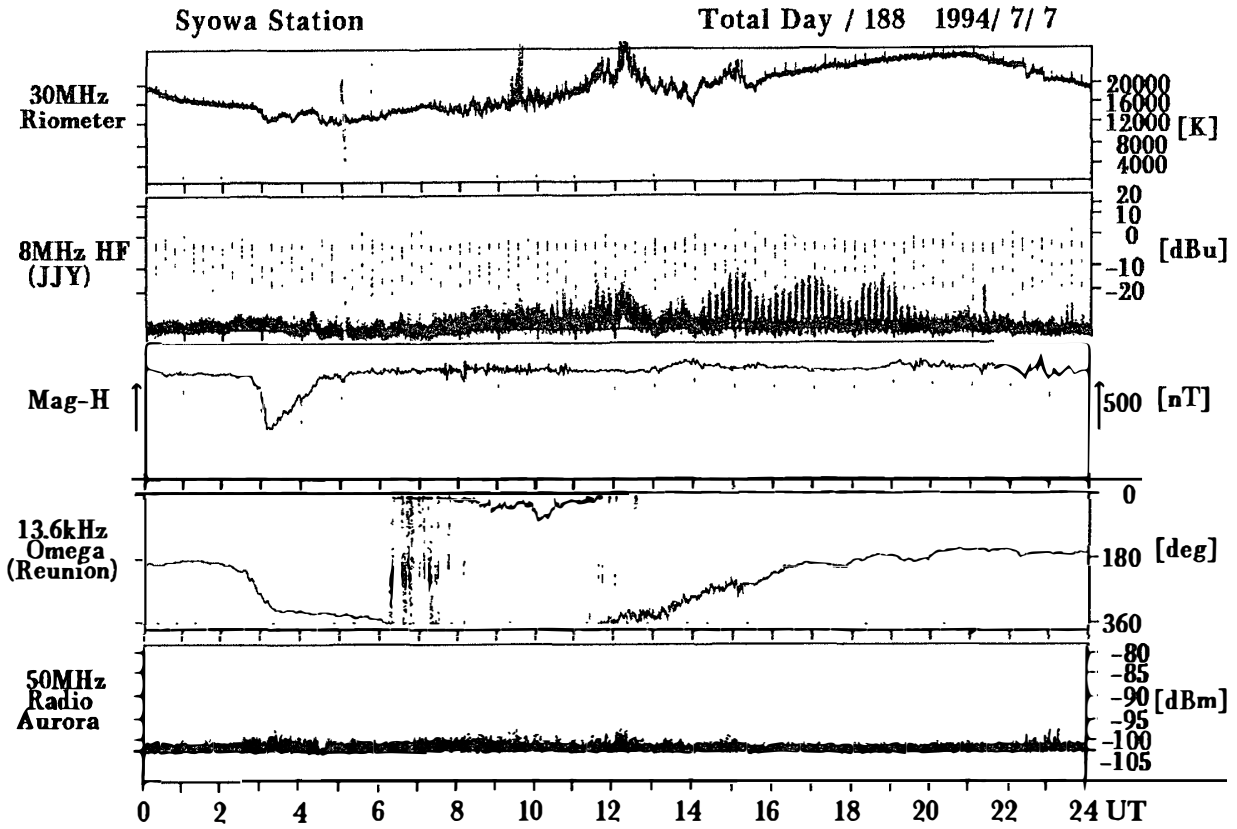
Total Day / 181 1994/ 6/30





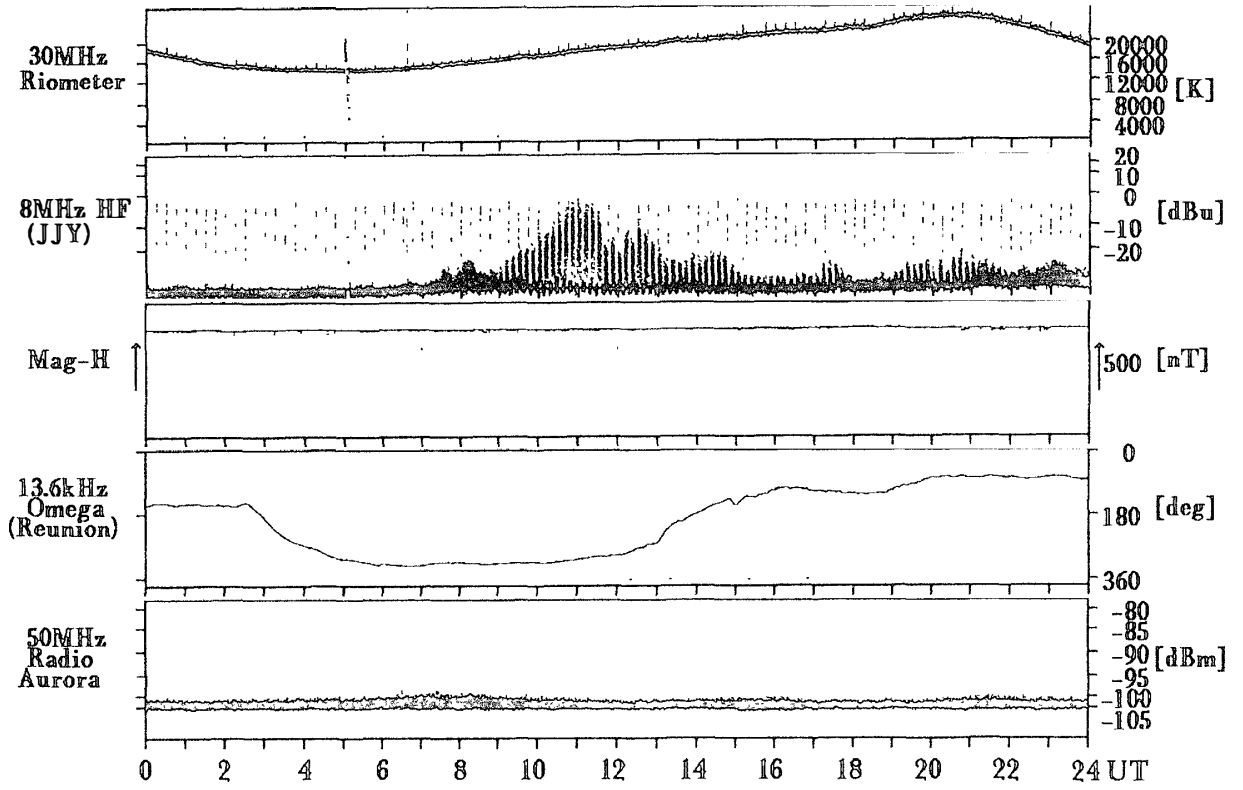






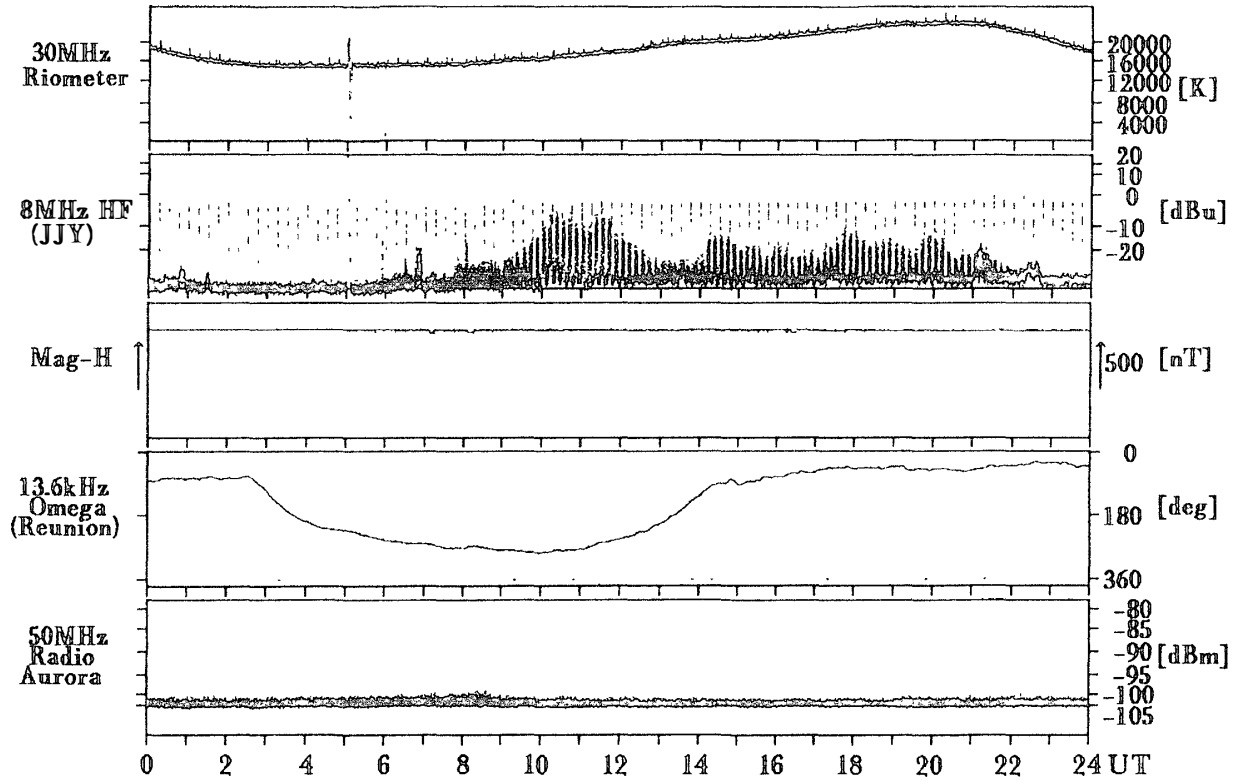
Syowa Station

Total Day / 190 1994 / 7 / 9



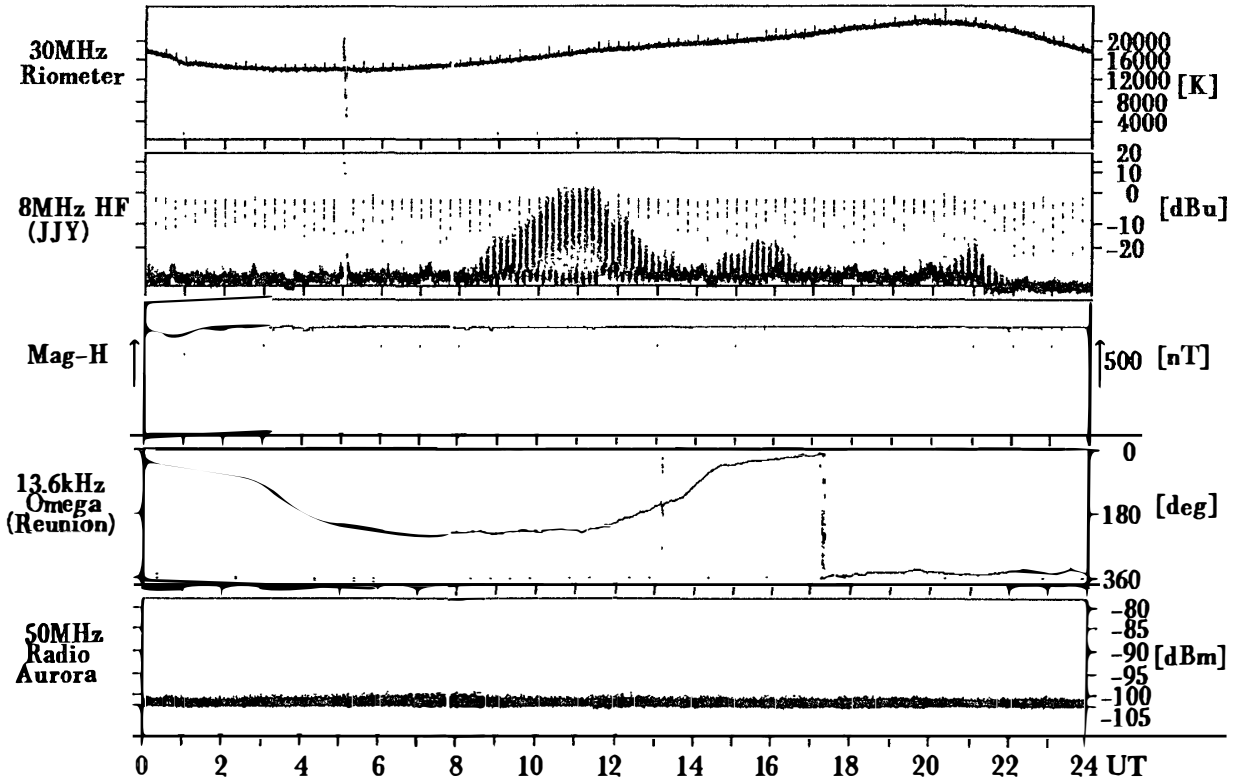
Syowa Station

Total Day / 191 1994 / 7 / 10



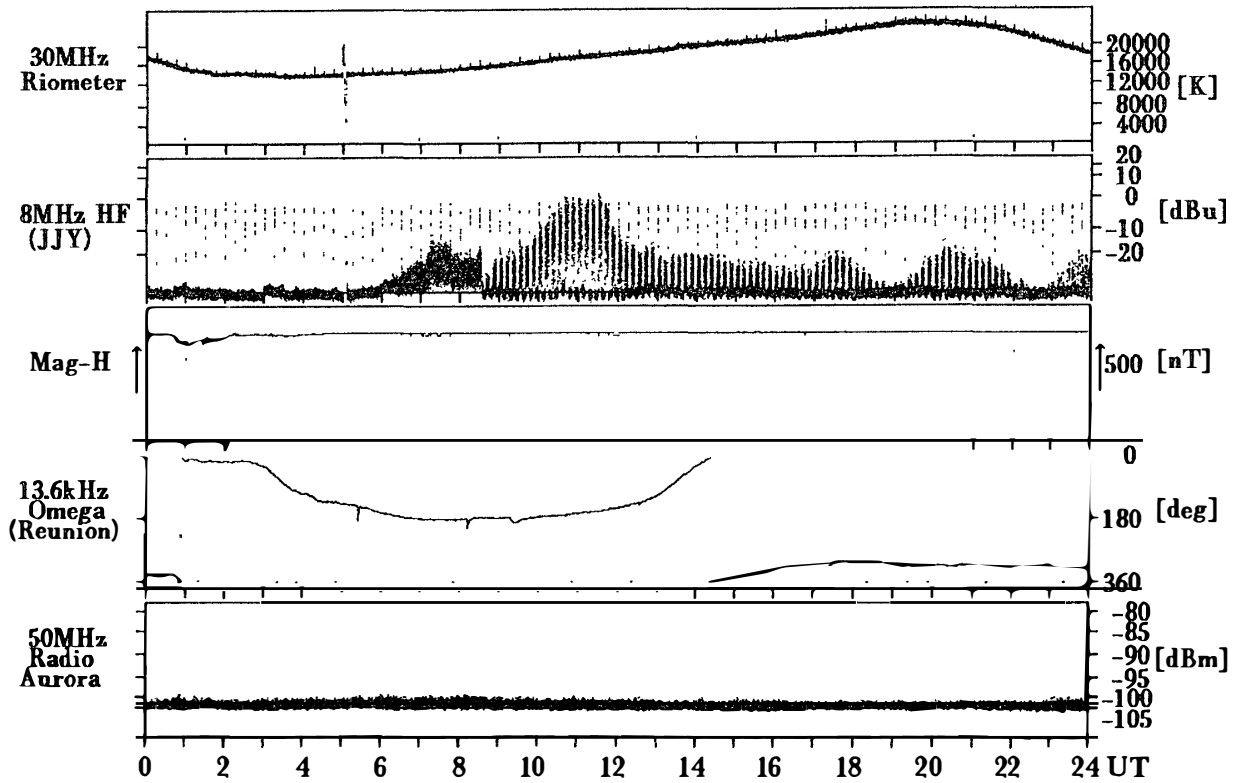
Syowa Station

Total Day / 192 1994/ 7/11



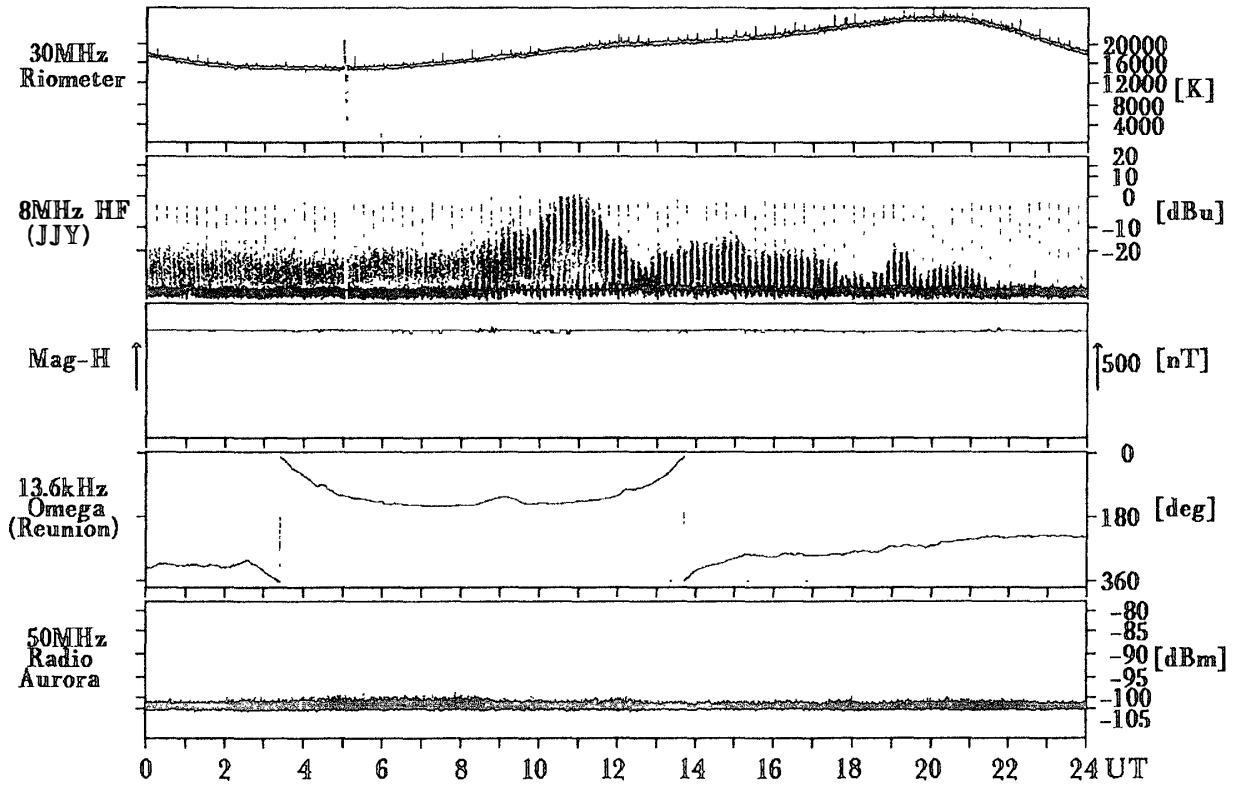
Syowa Station

Total Day / 193 1994/ 7/12



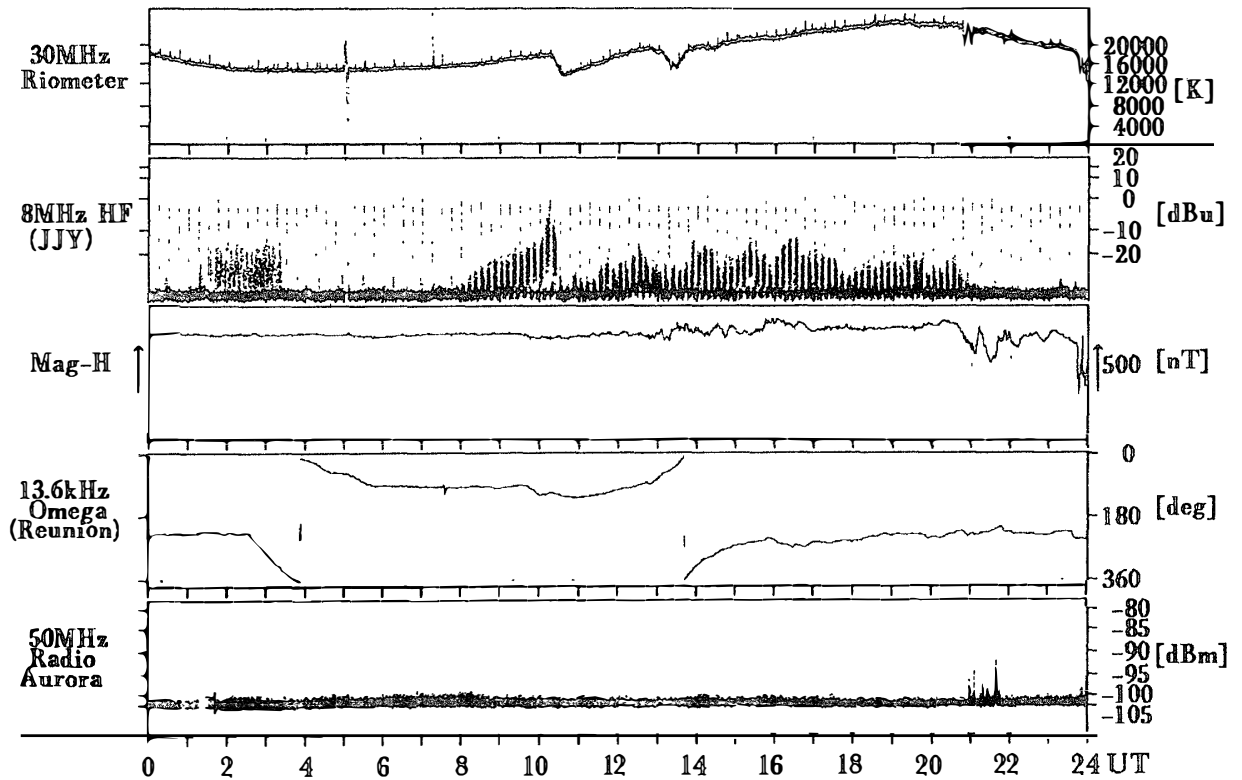
Syowa Station

Total Day / 194 1994/ 7/13



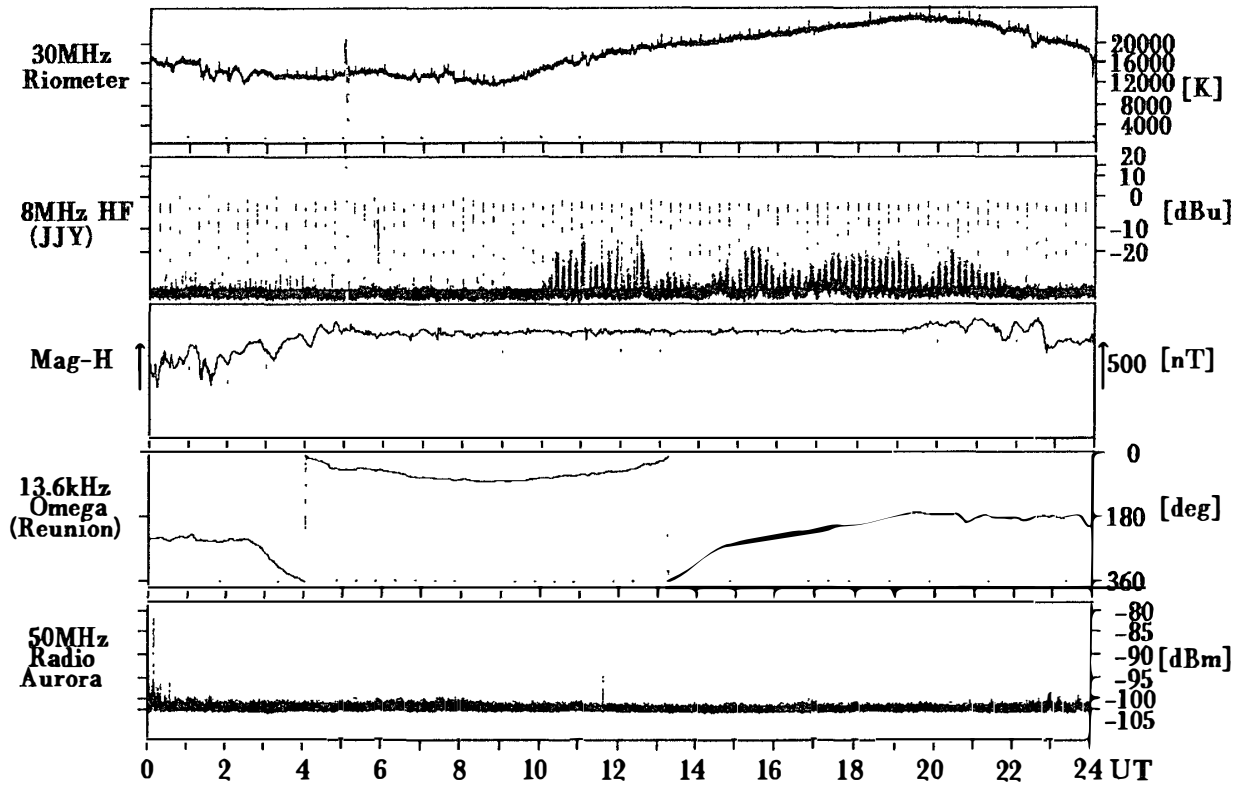
Syowa Station

Total Day / 195 1994/ 7/14



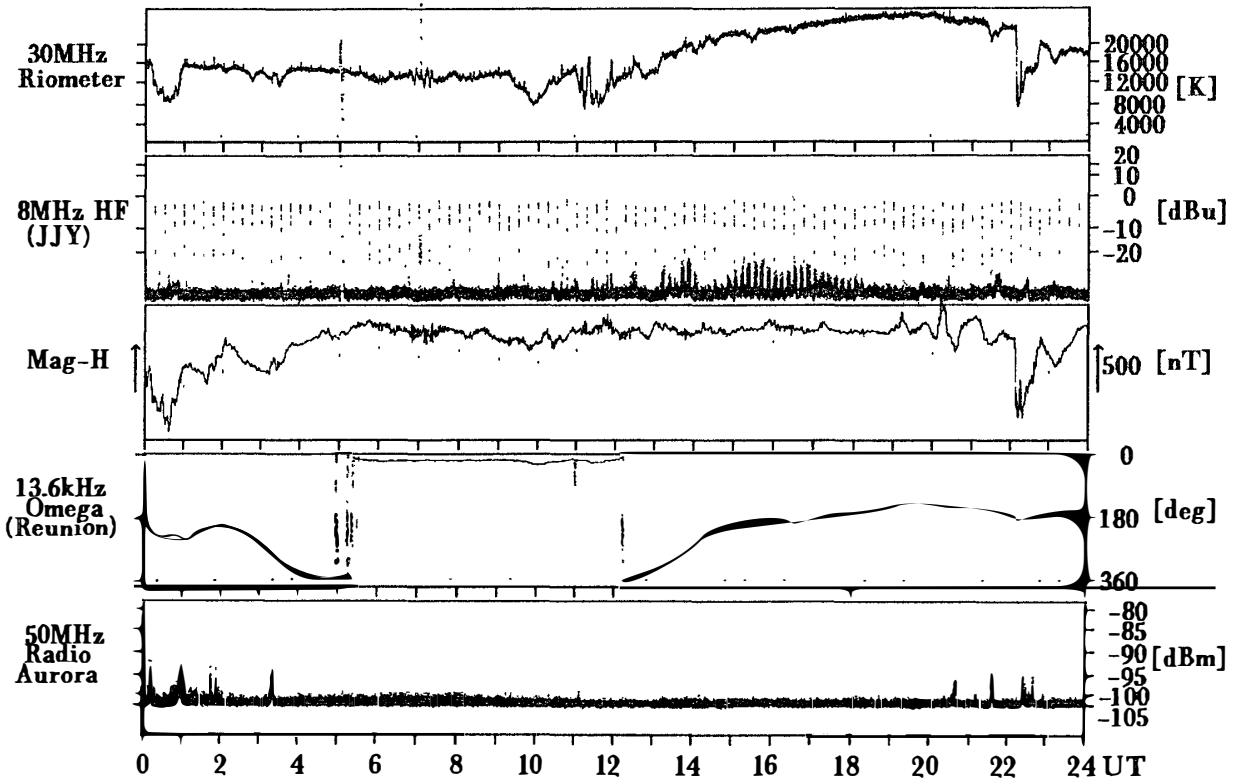
Syowa Station

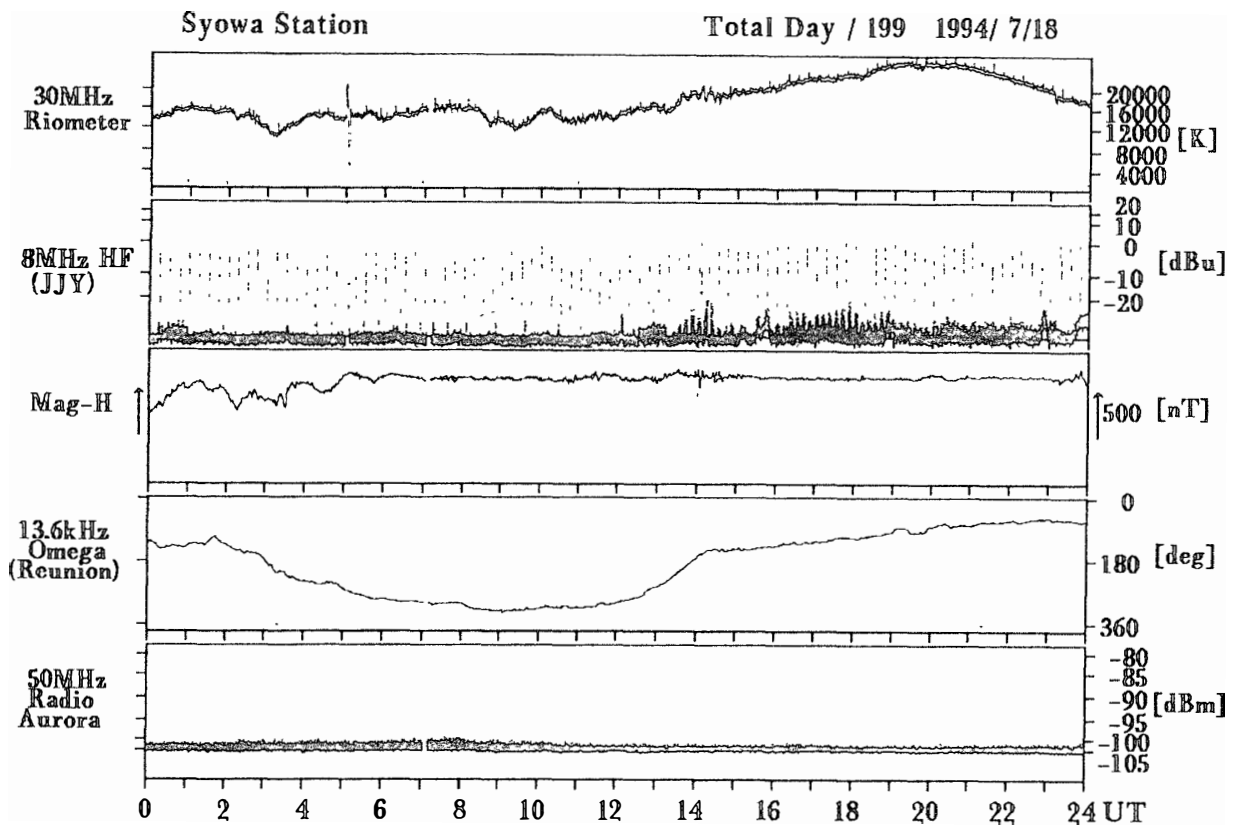
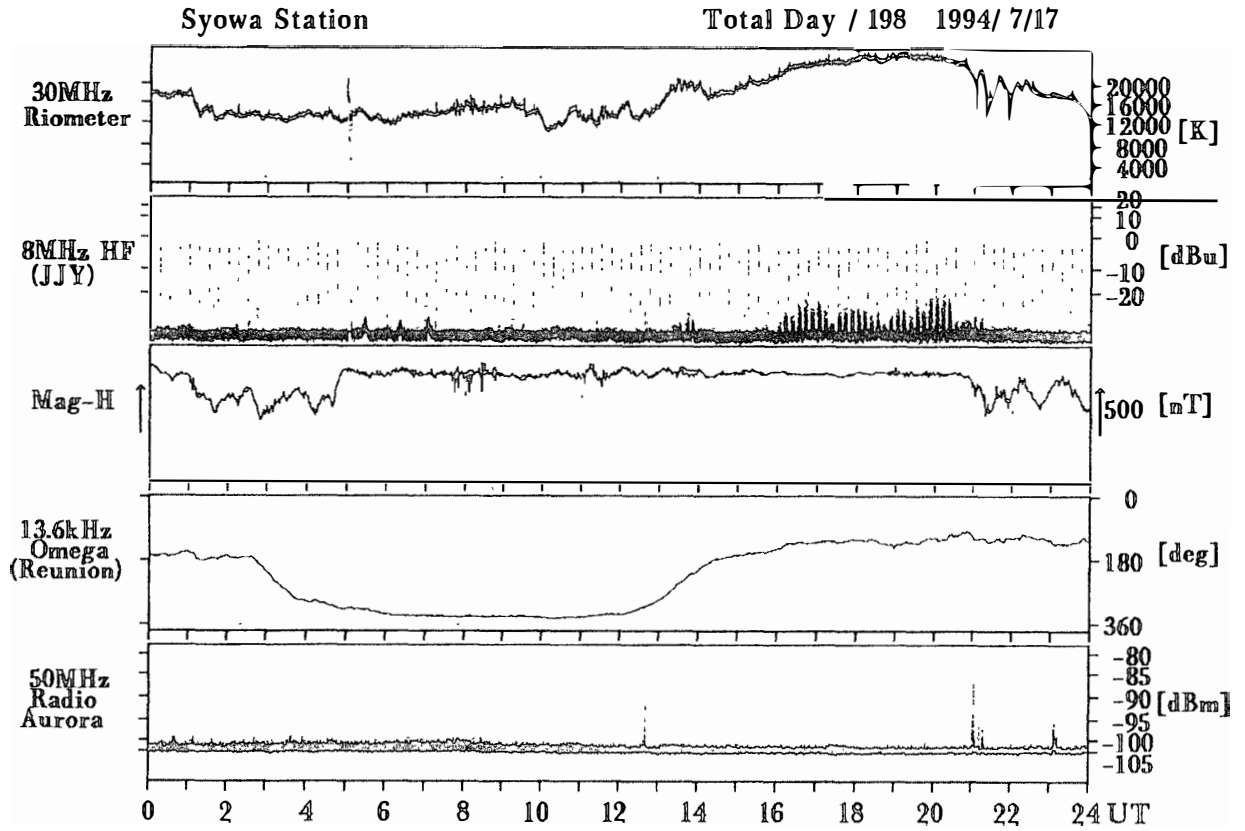
Total Day / 196 1994/ 7/15

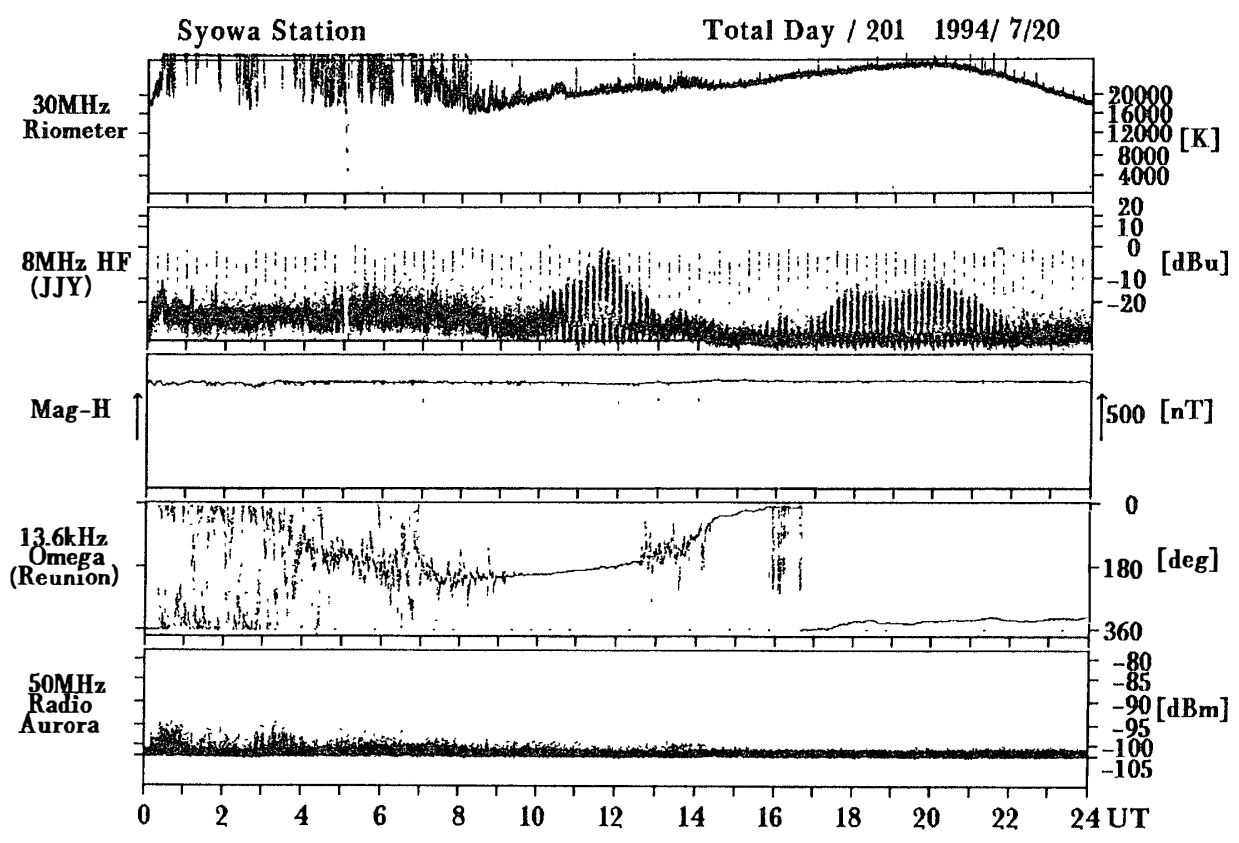
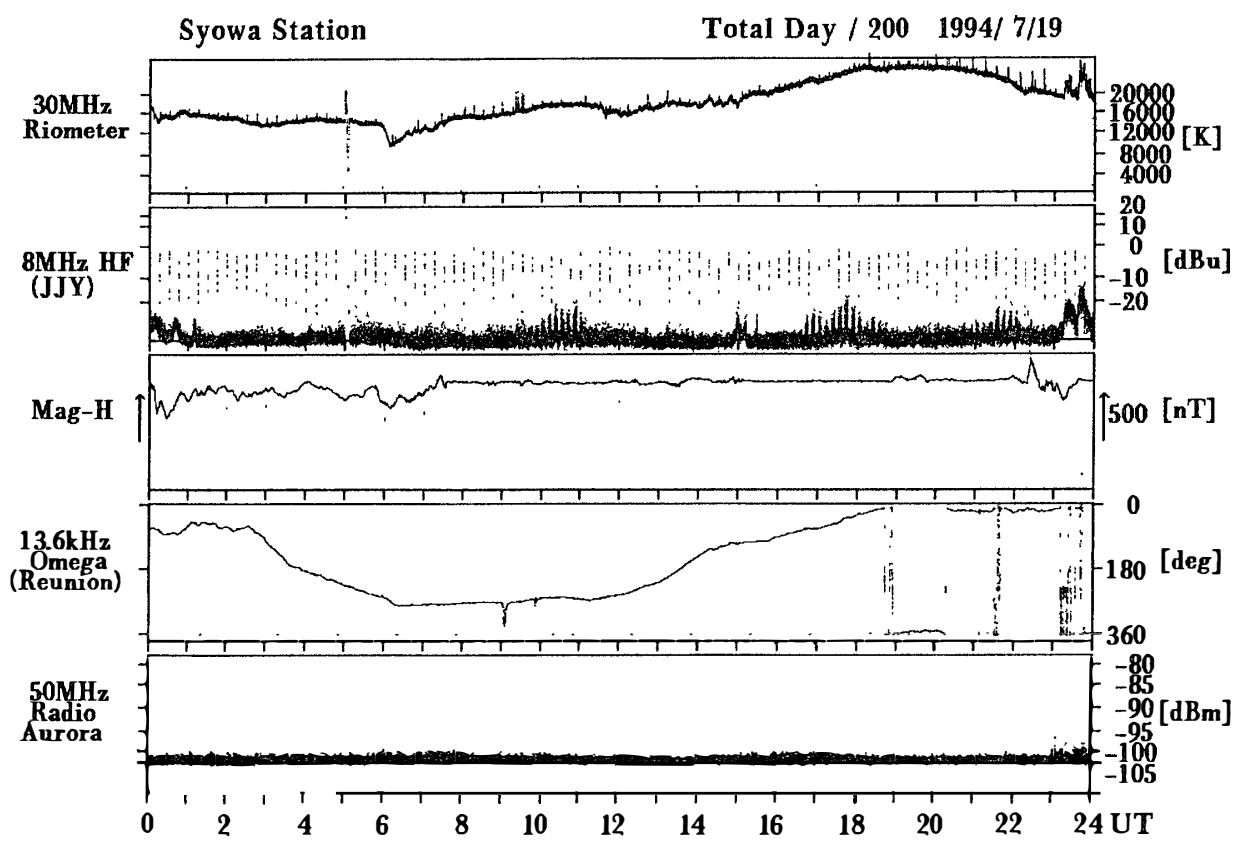


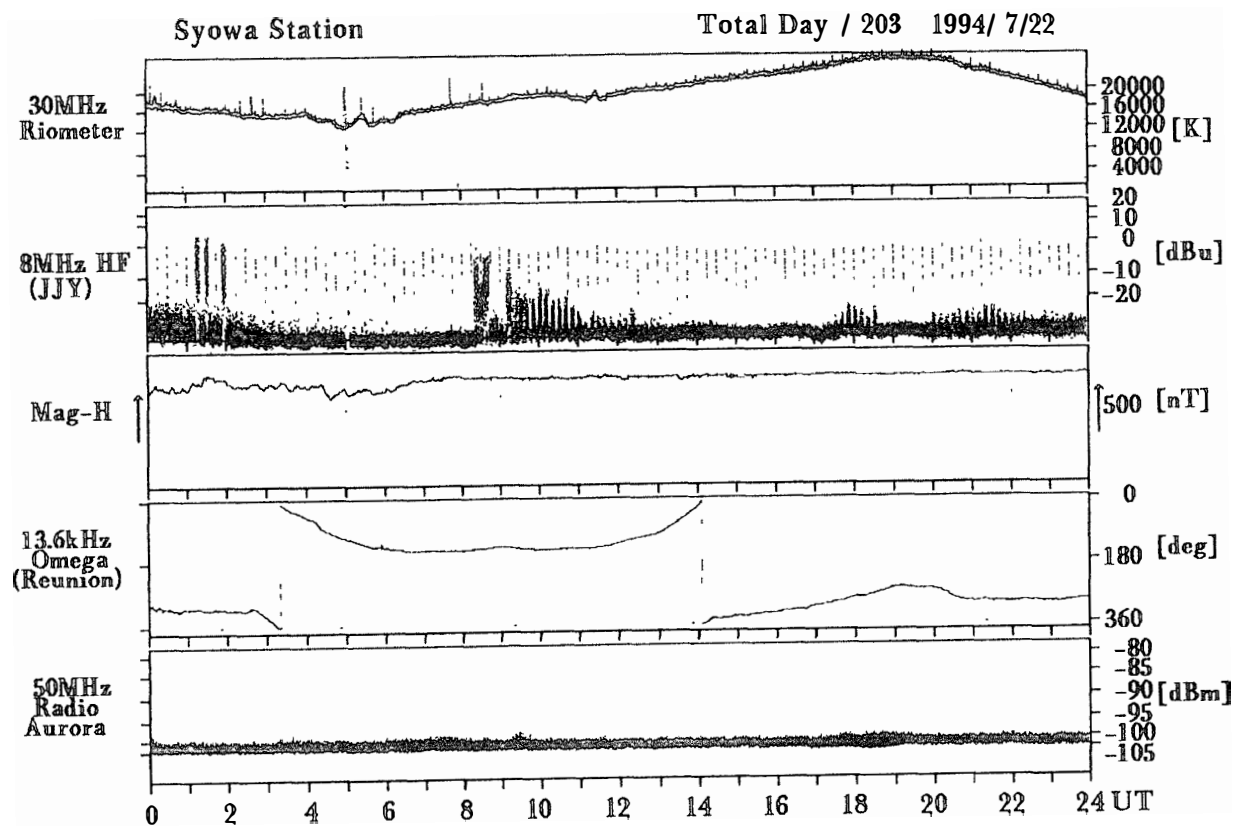
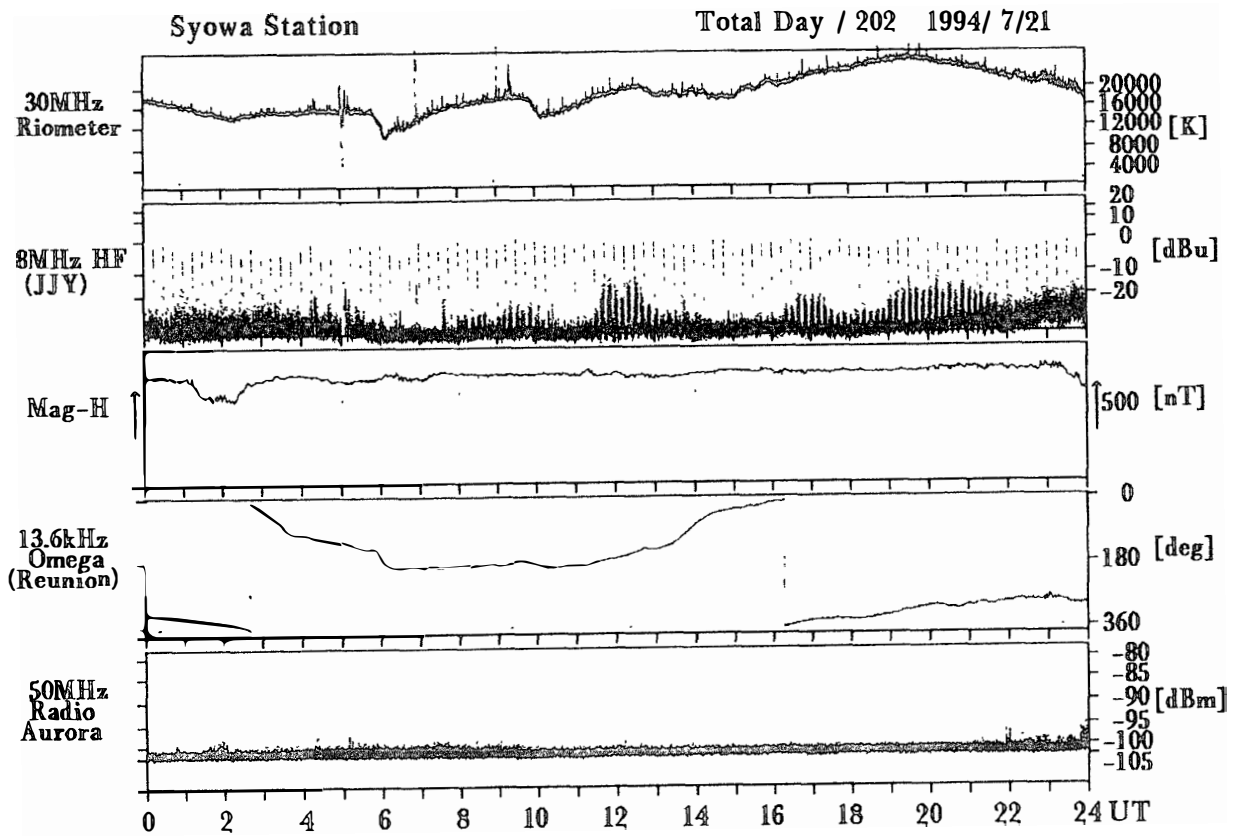
Syowa Station

Total Day / 197 1994/ 7/16



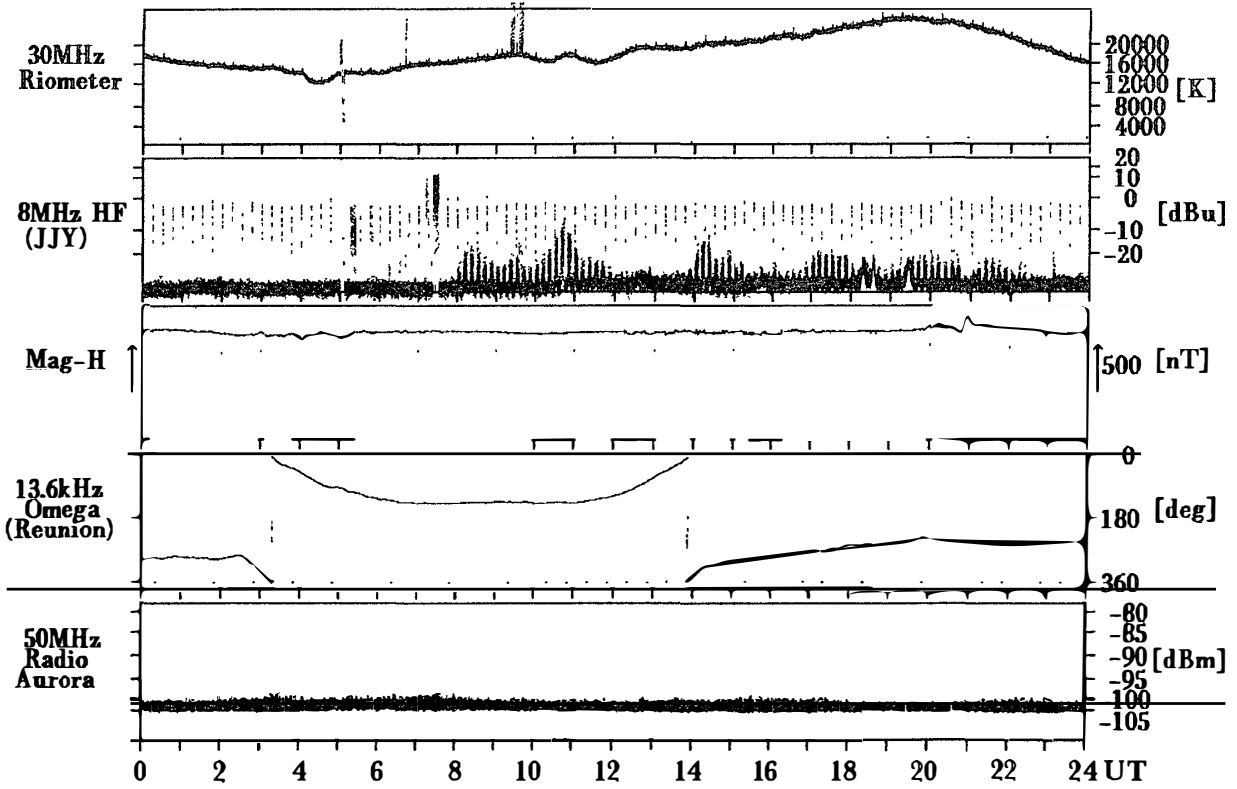






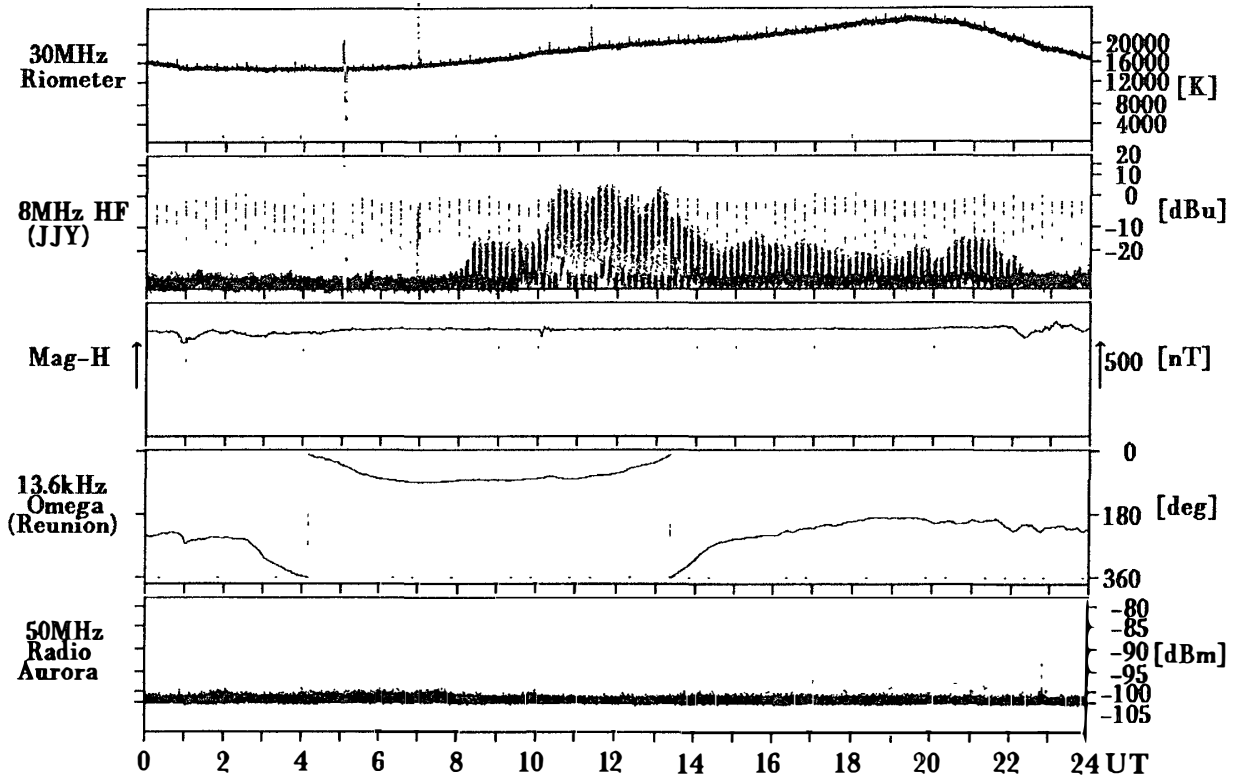
Syowa Station

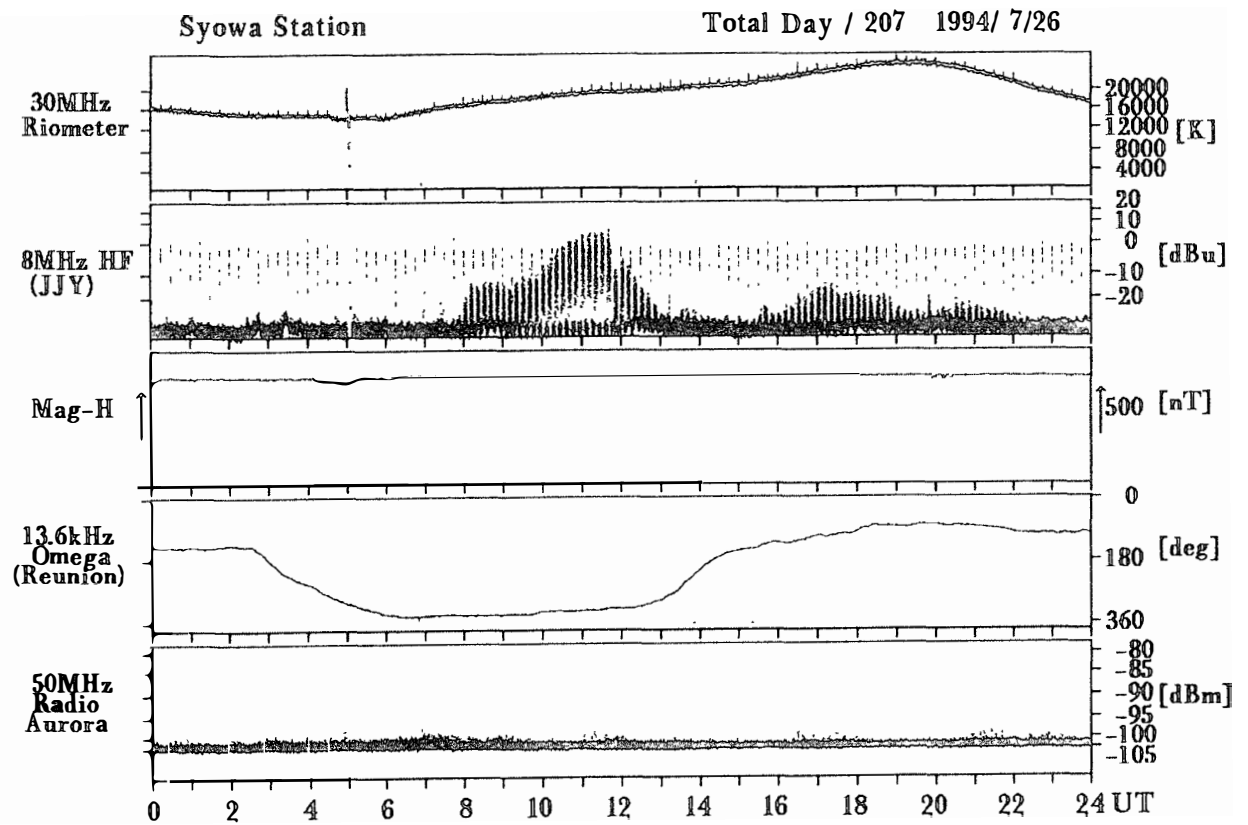
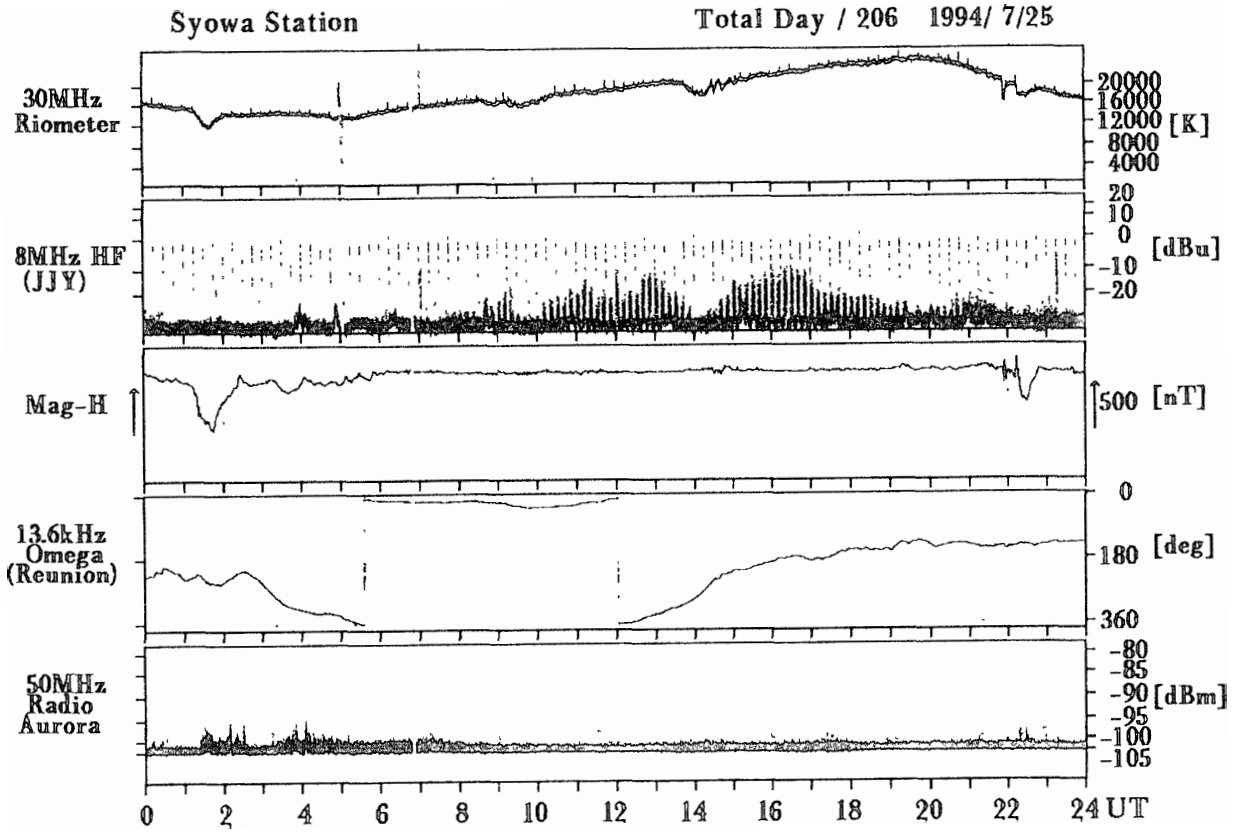
Total Day / 204 1994/ 7/23



Syowa Station

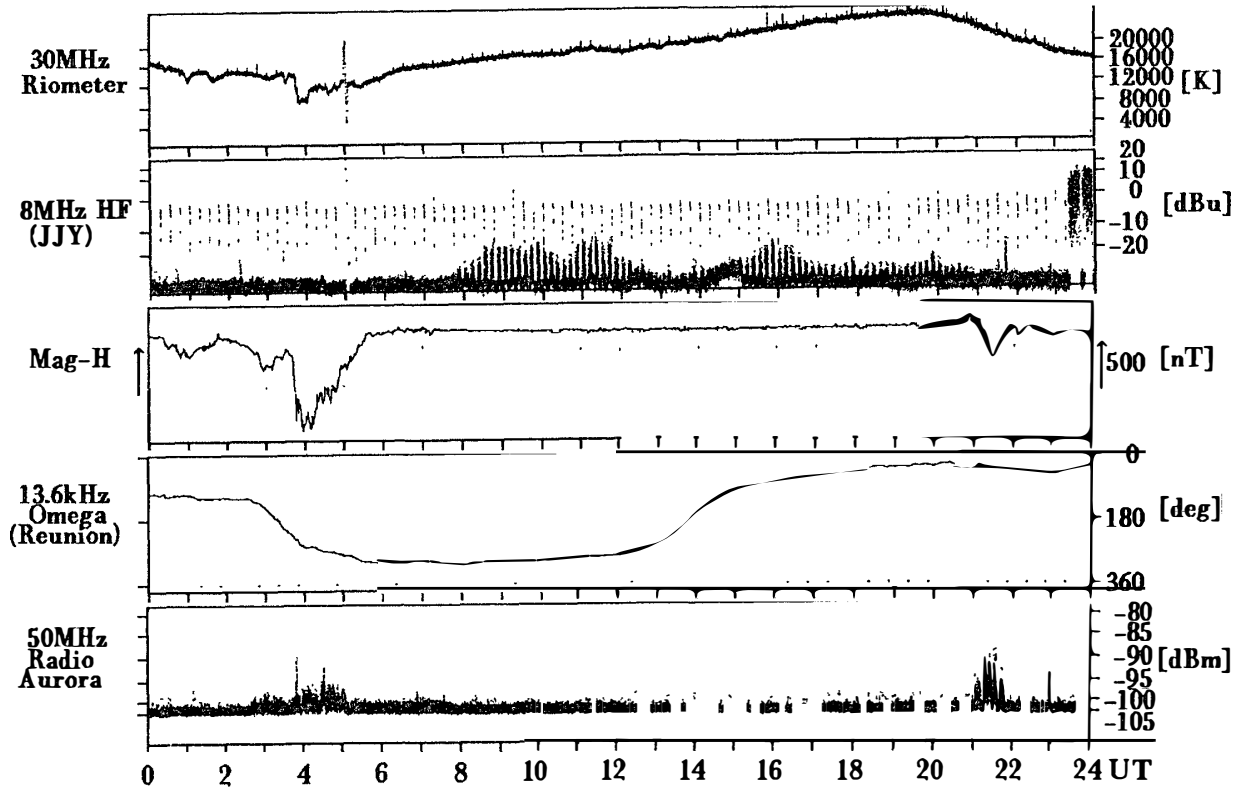
Total Day / 205 1994/ 7/24





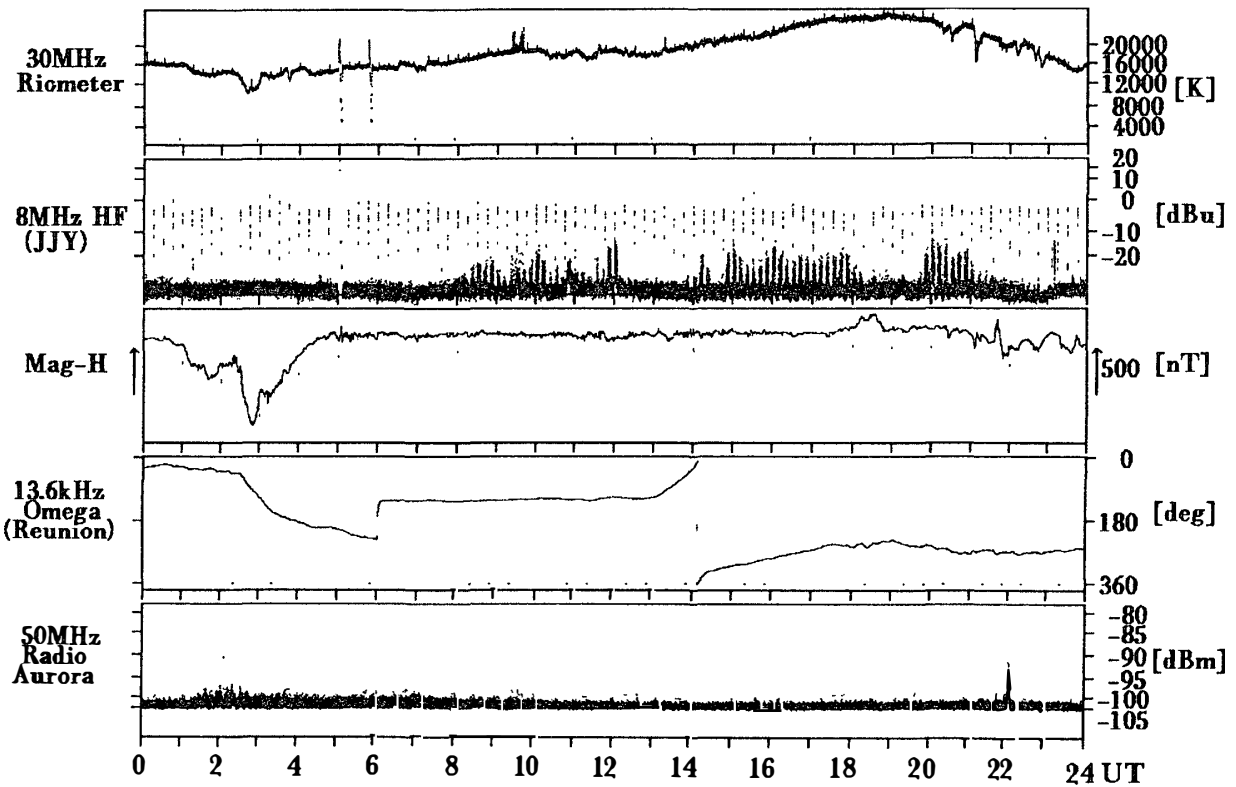
Syowa Station

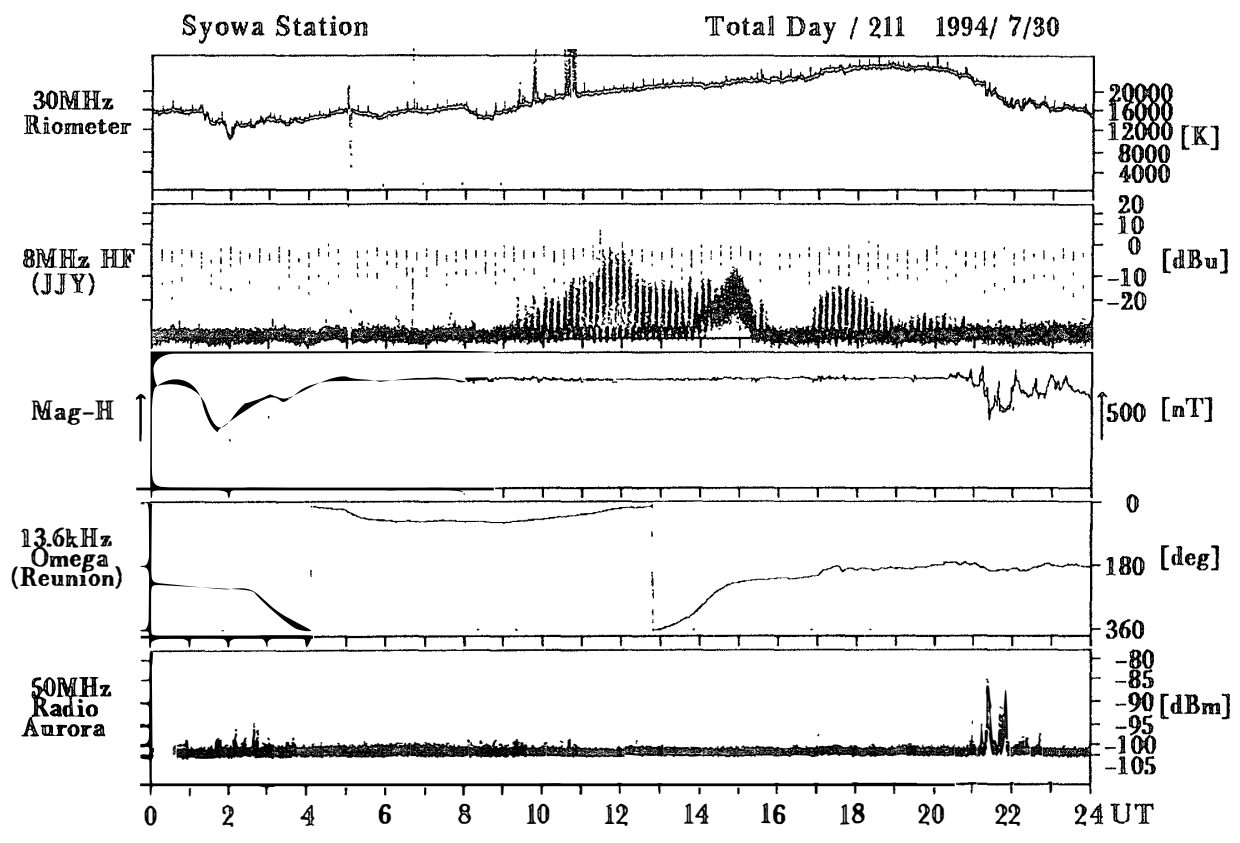
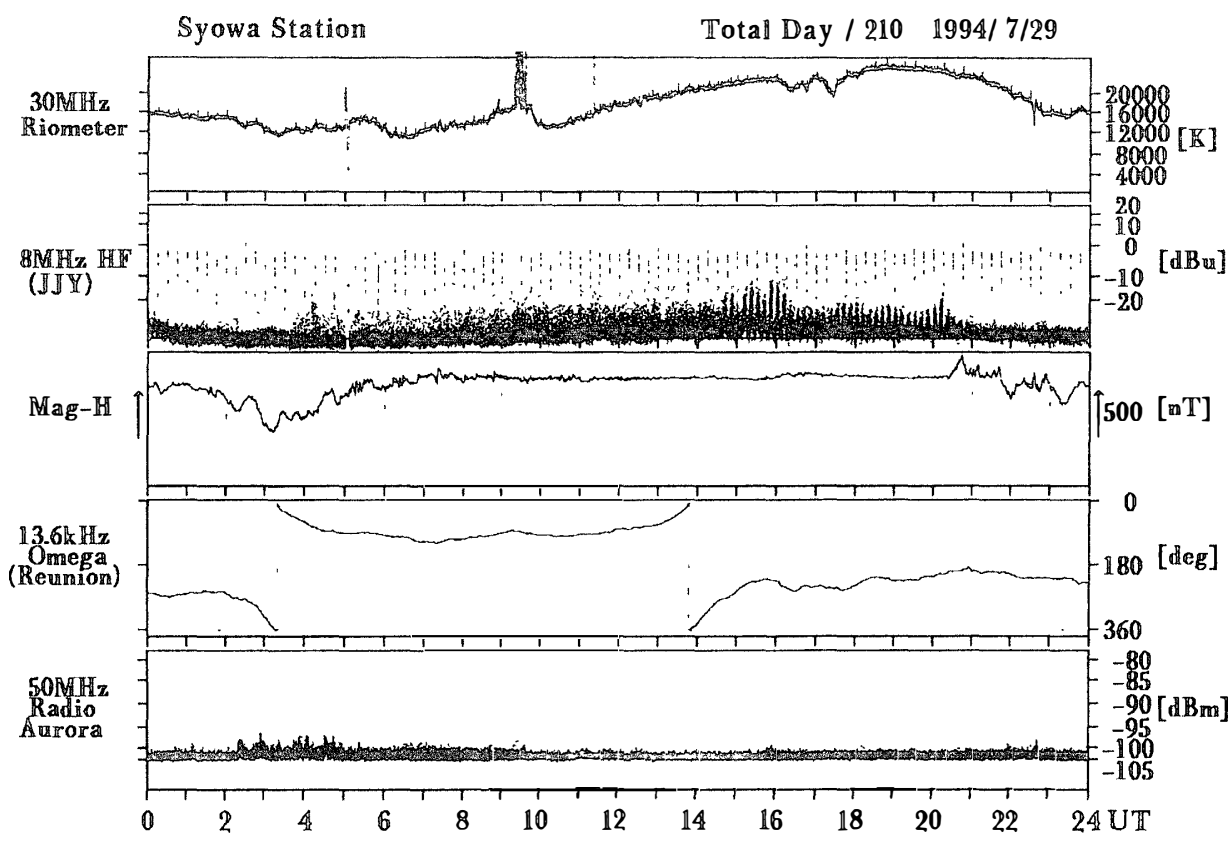
Total Day / 208 1994/ 7/27

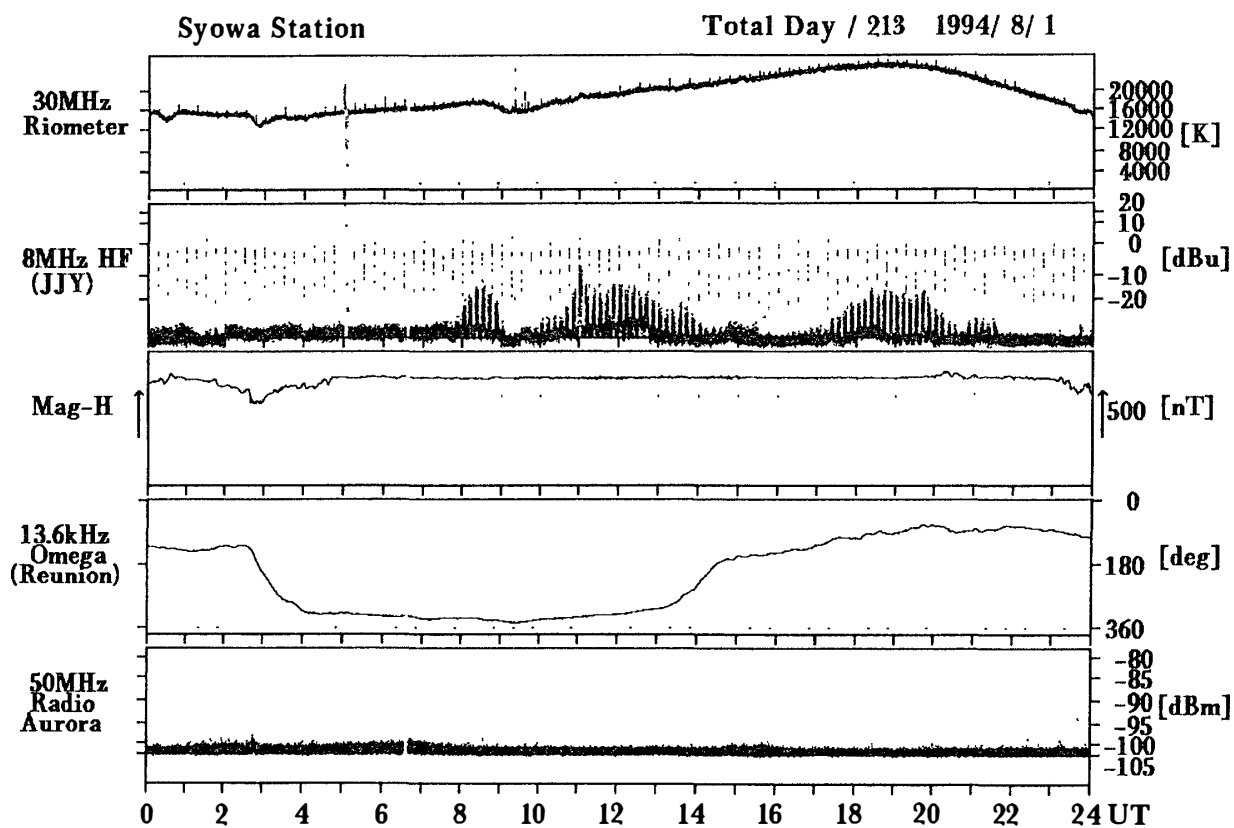
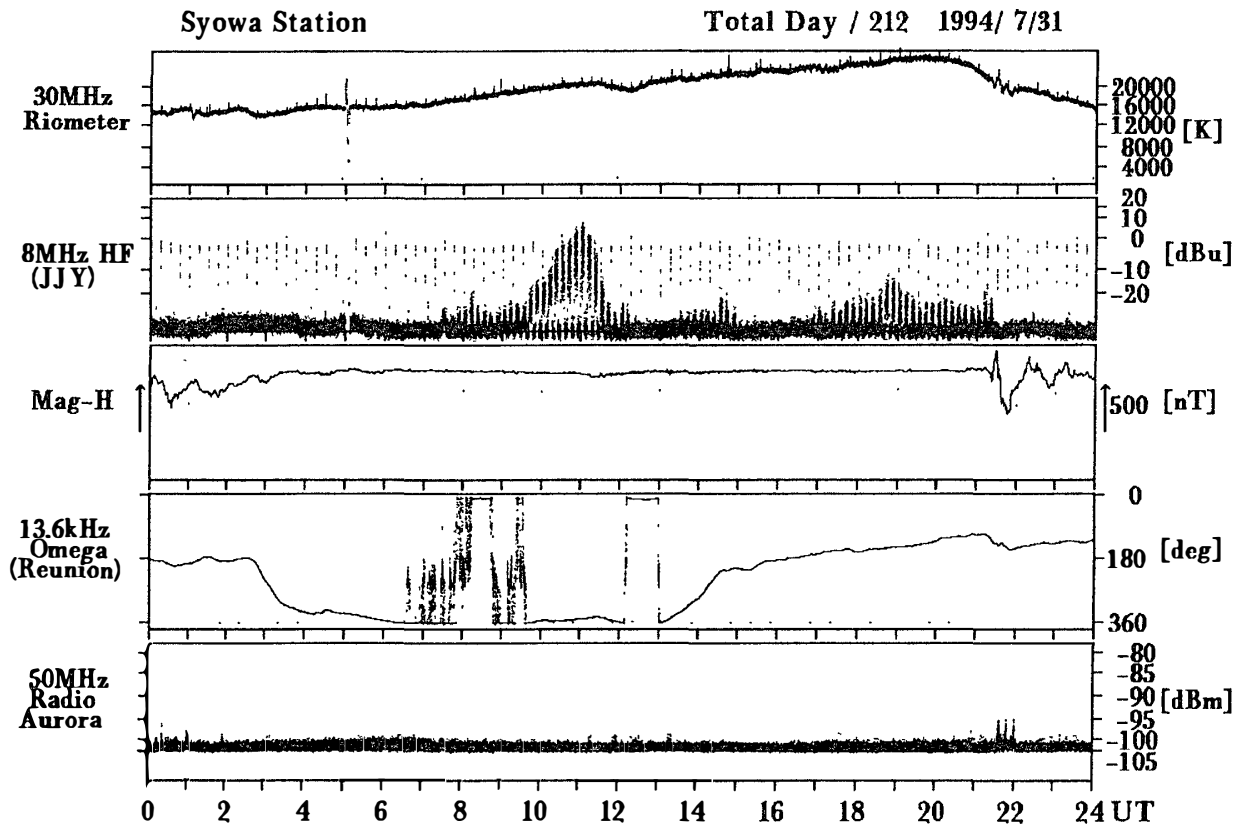


Syowa Station

Total Day / 209 1994/ 7/28

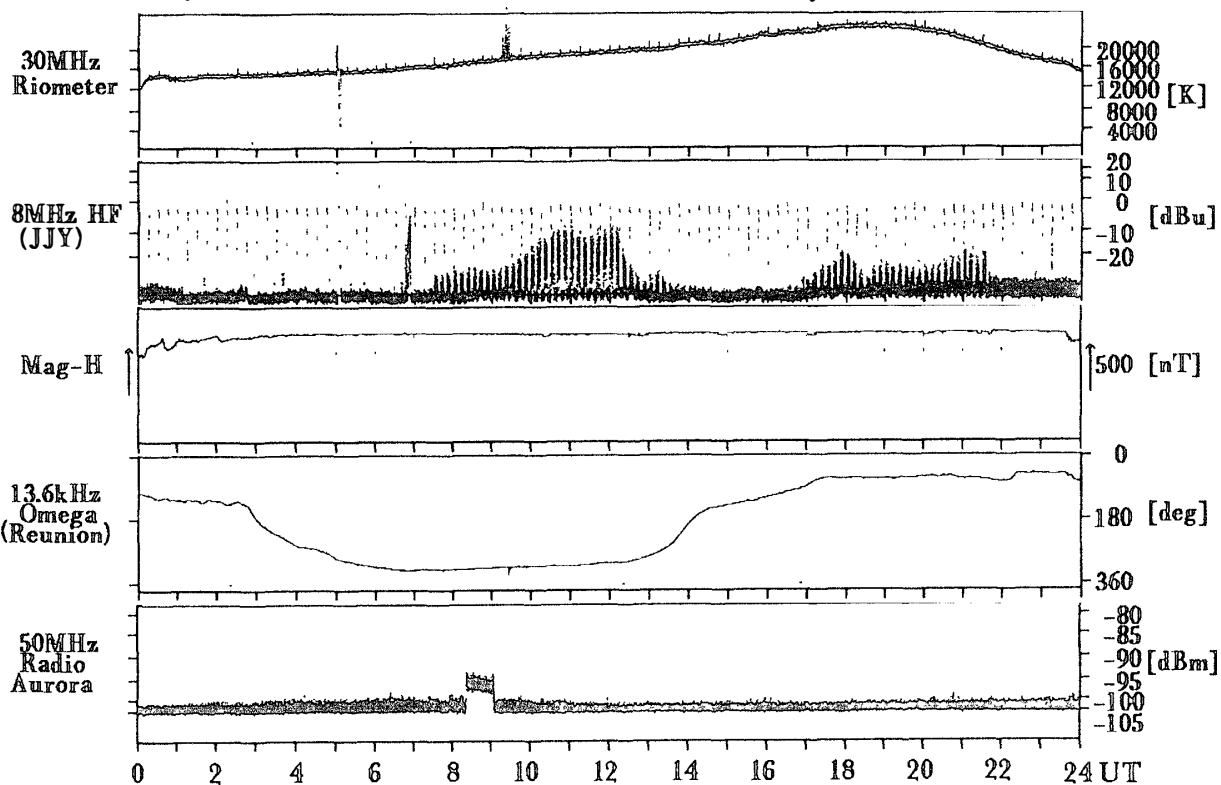






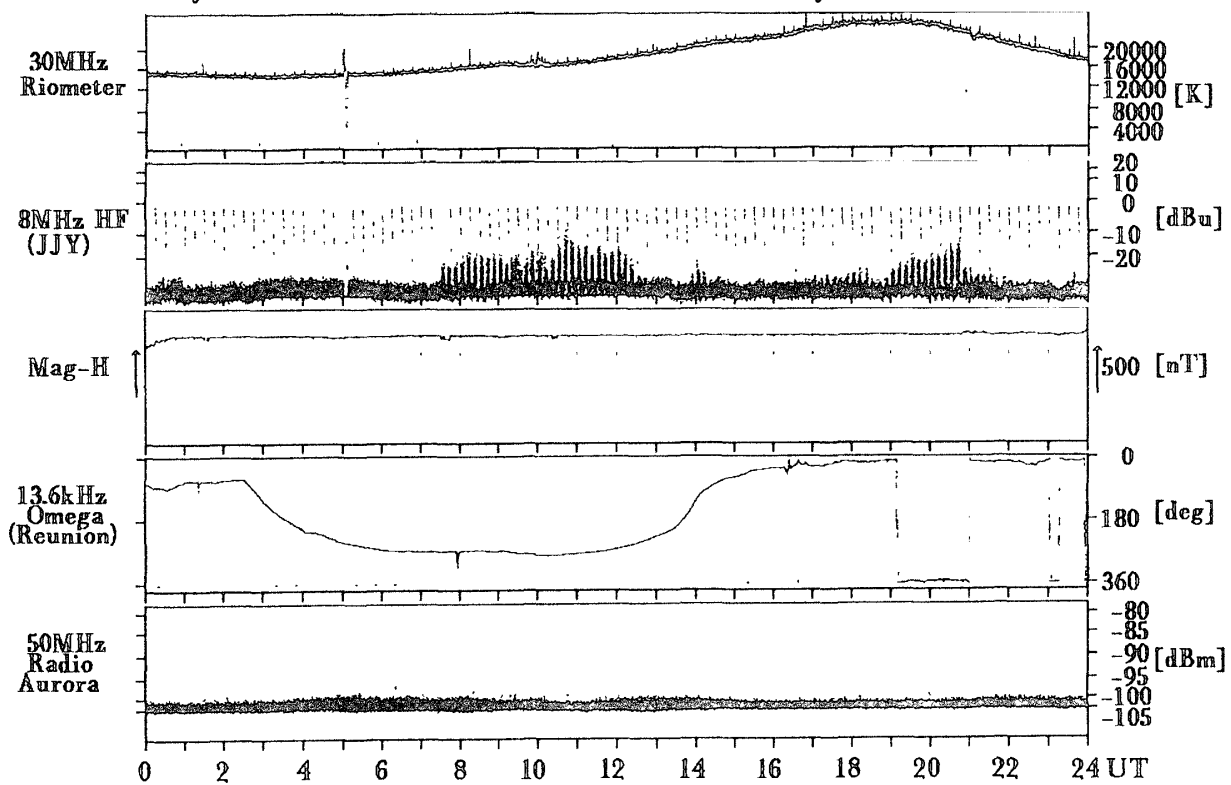
Syowa Station

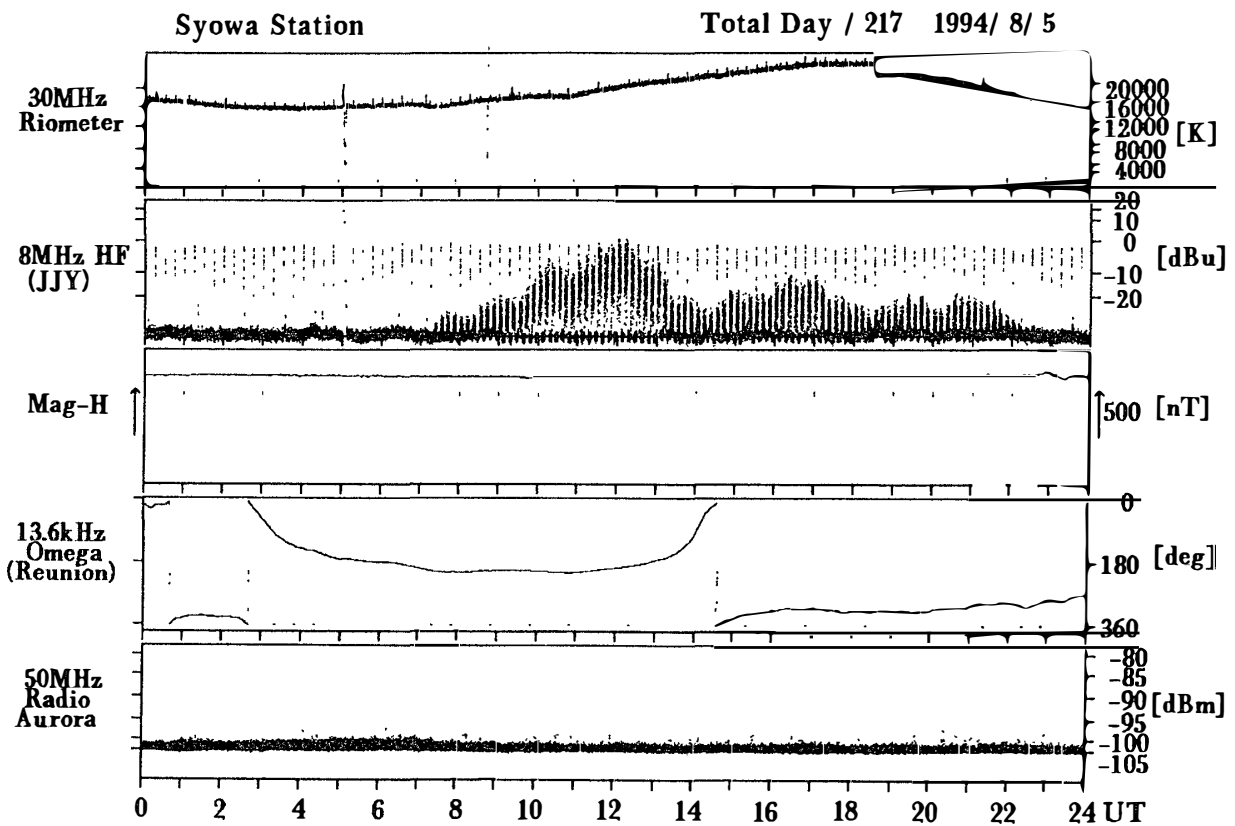
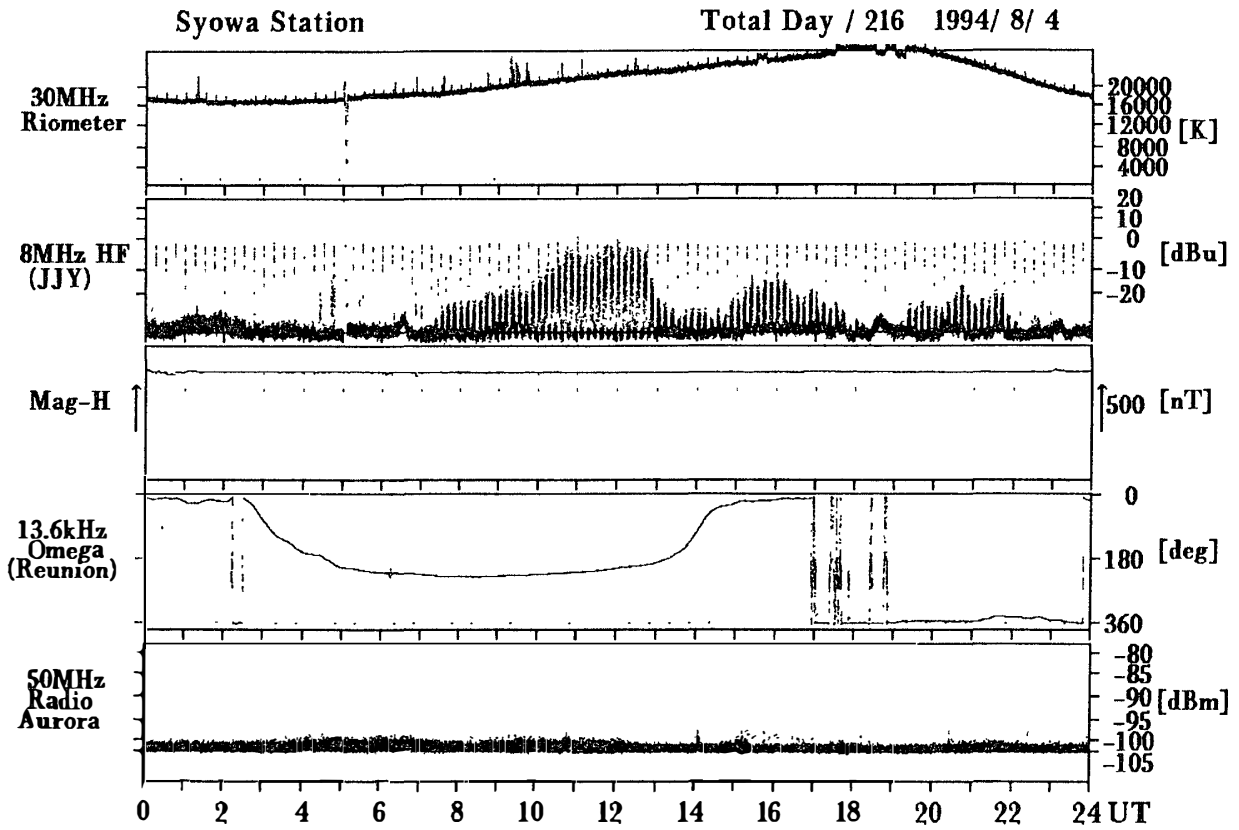
Total Day / 214 1994/ 8/ 2



Syowa Station

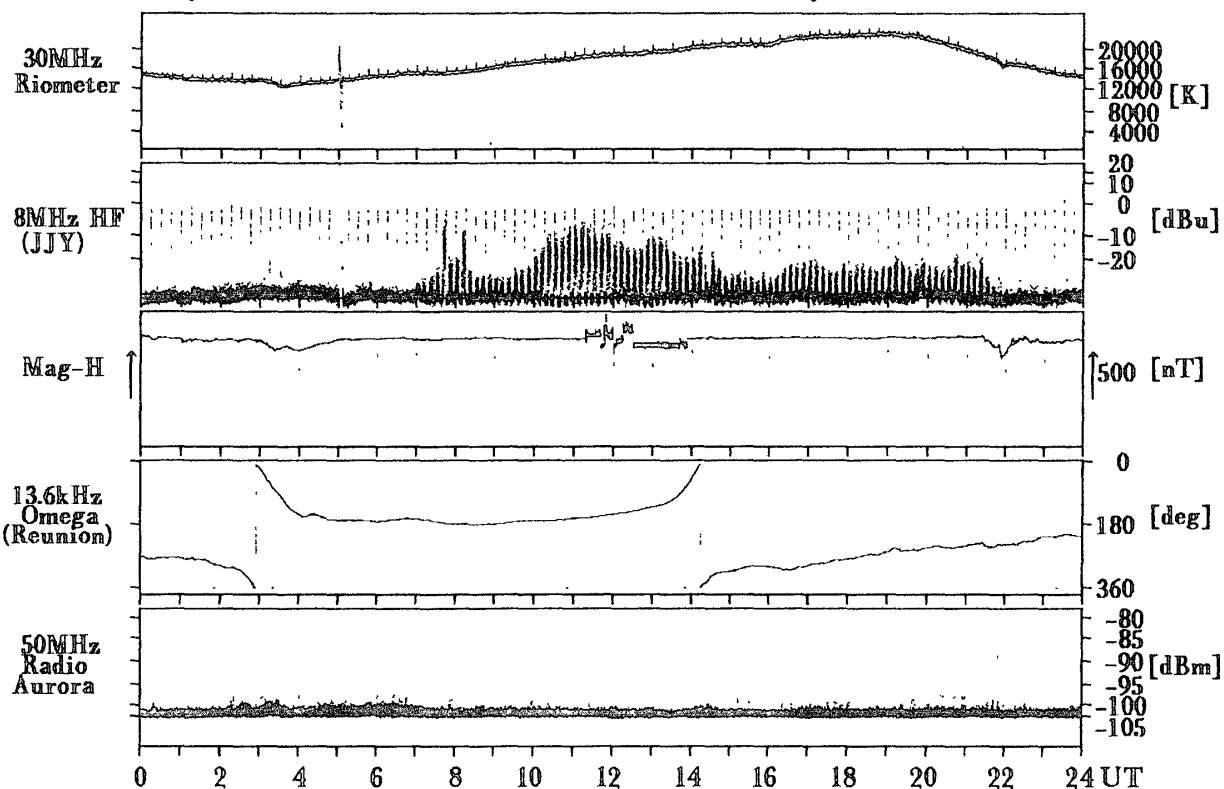
Total Day / 215 1994/ 8/ 3





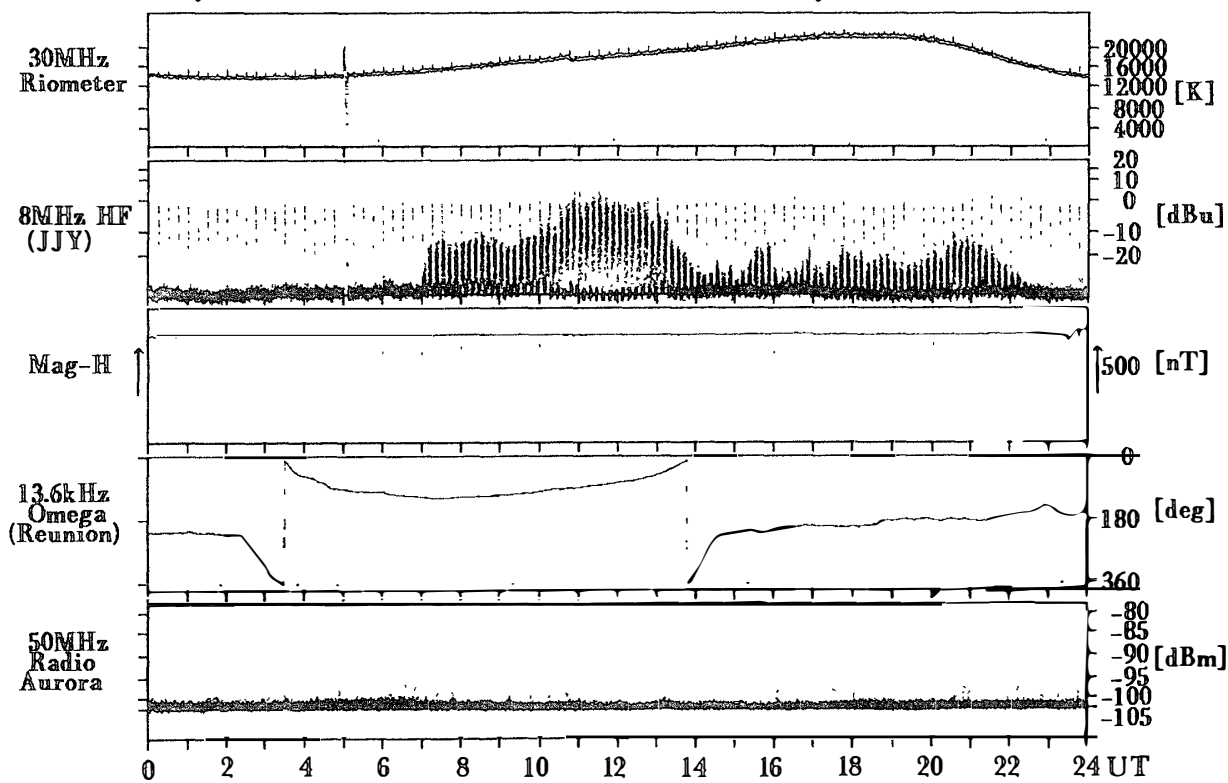
Syowa Station

Total Day / 218 1994/ 8/ 6



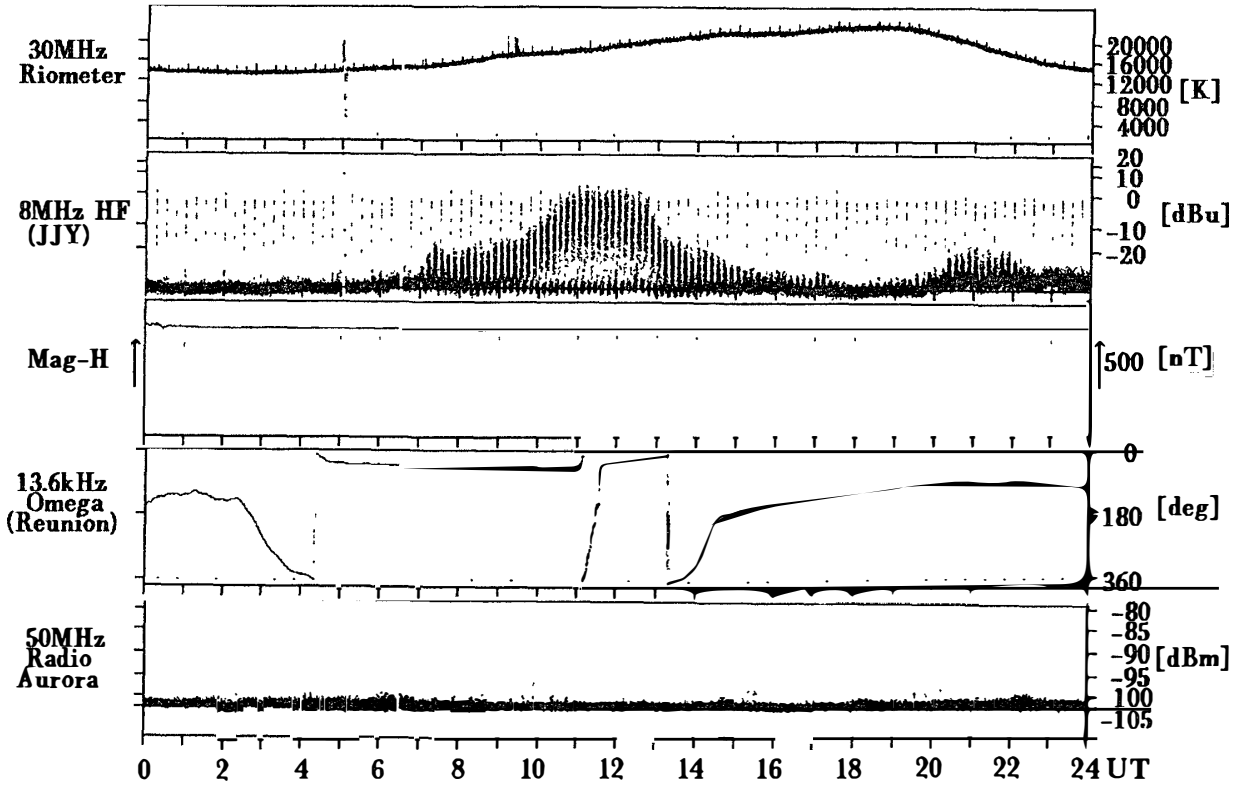
Syowa Station

Total Day / 219 1994/ 8/ 7



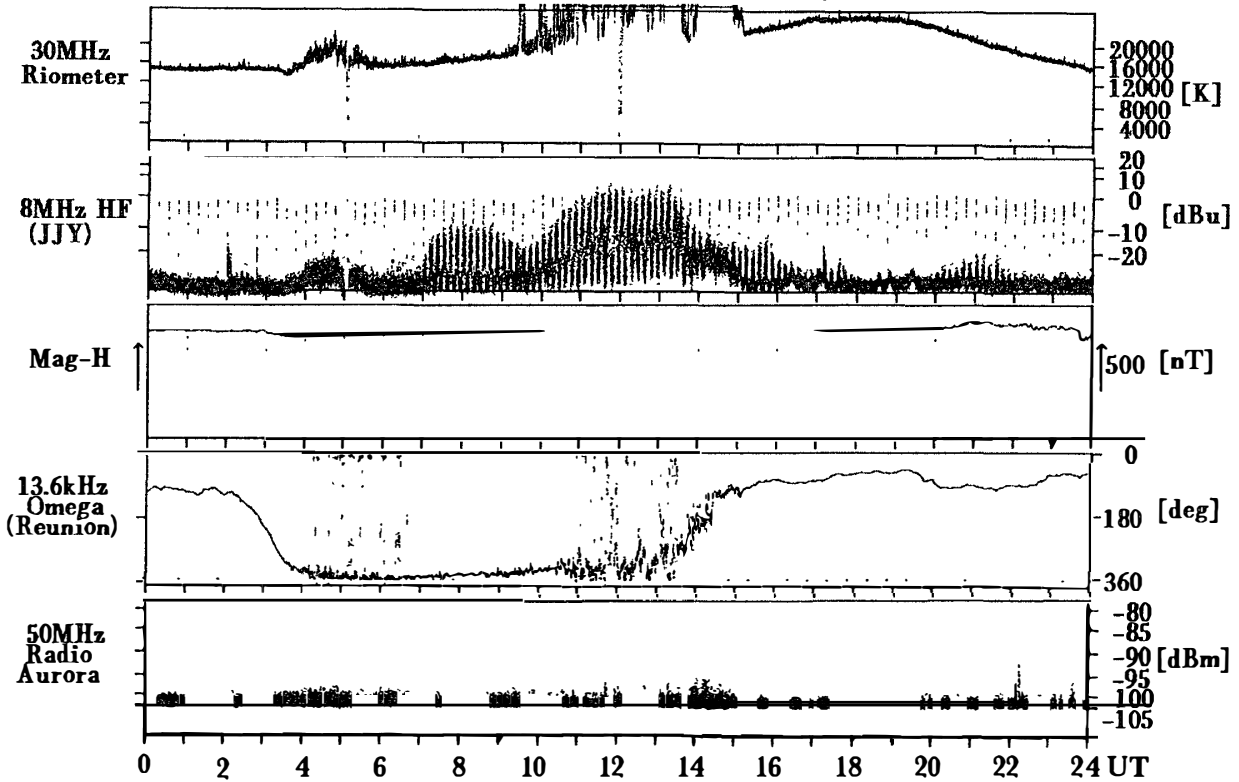
Syowa Station

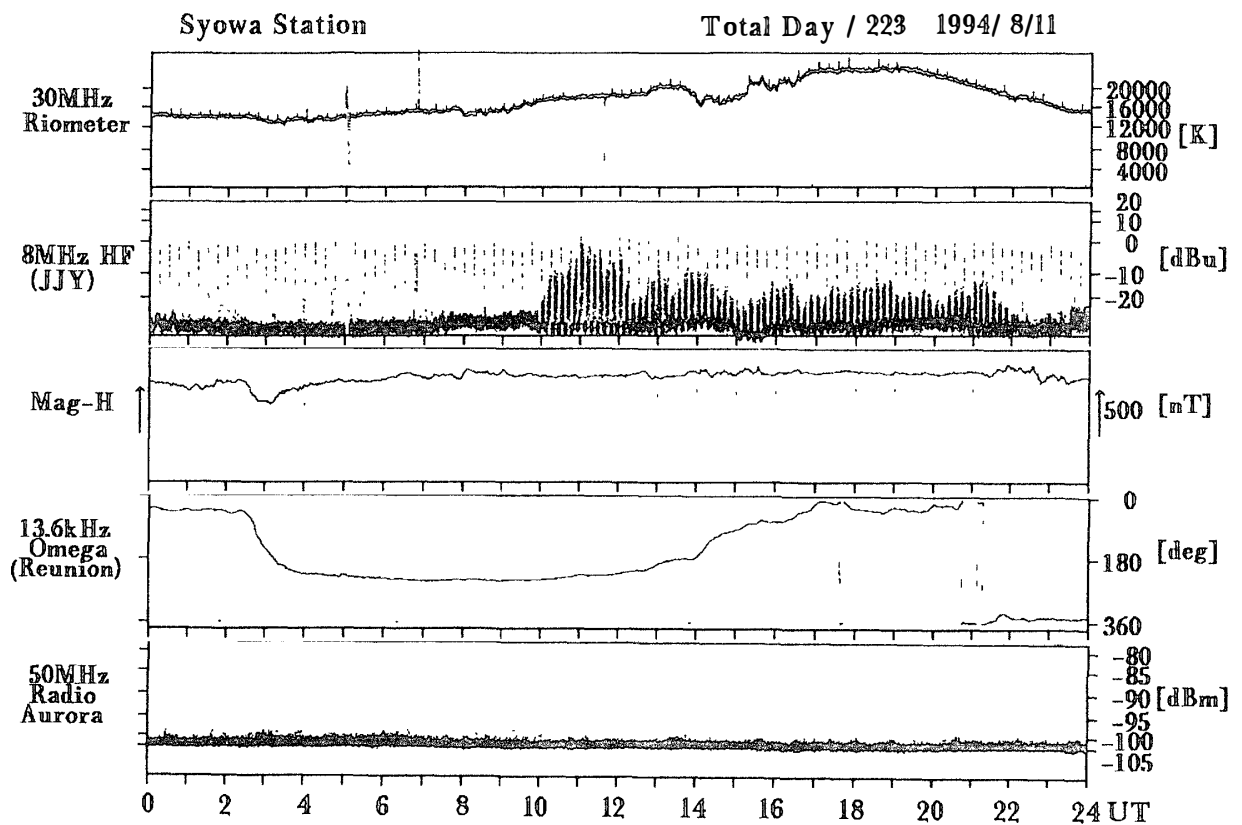
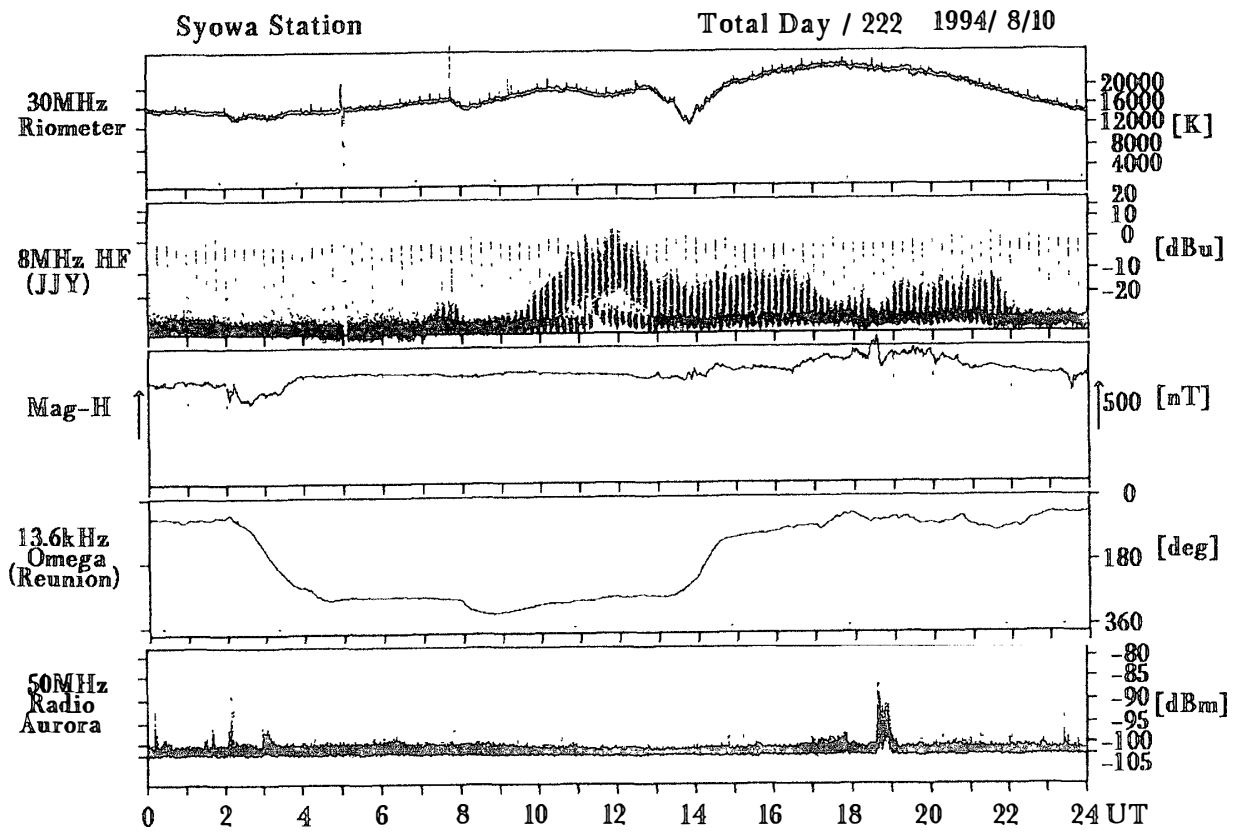
Total Day / 220 1994/ 8/ 8

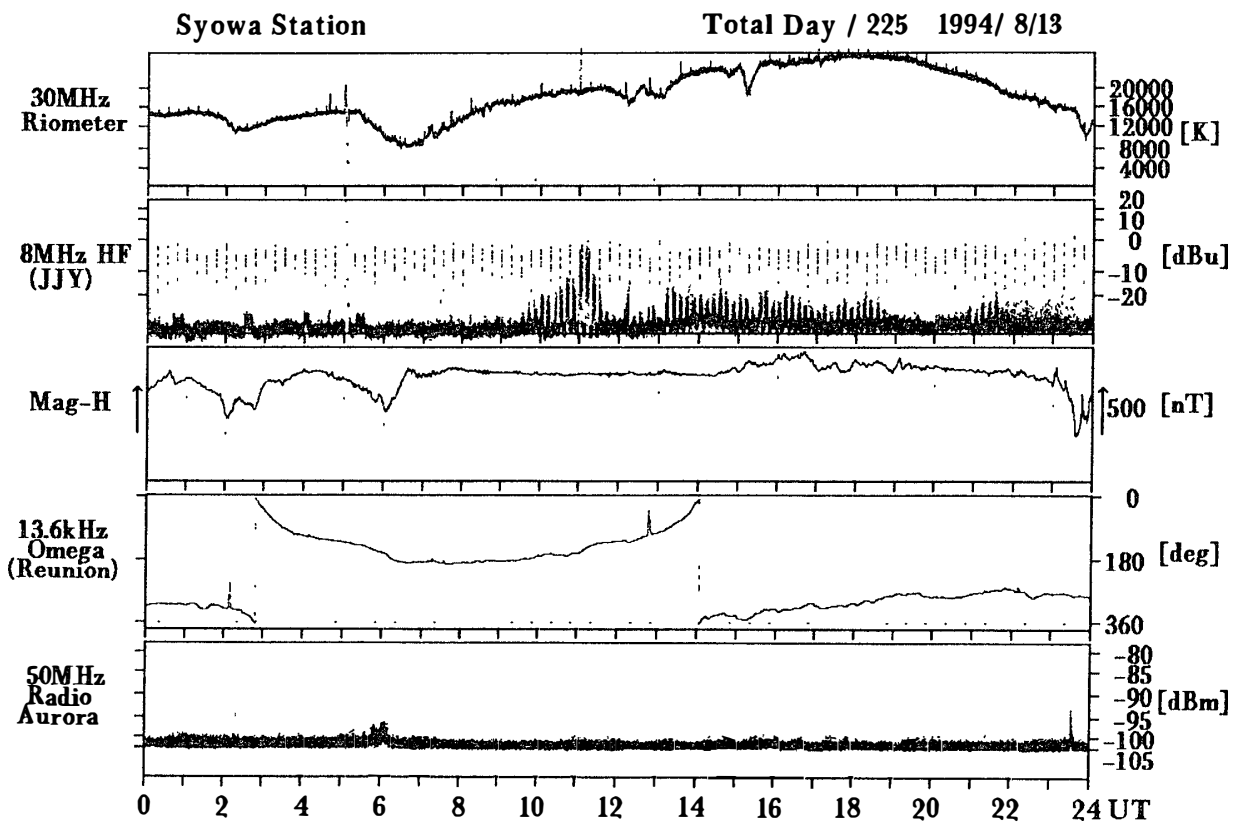
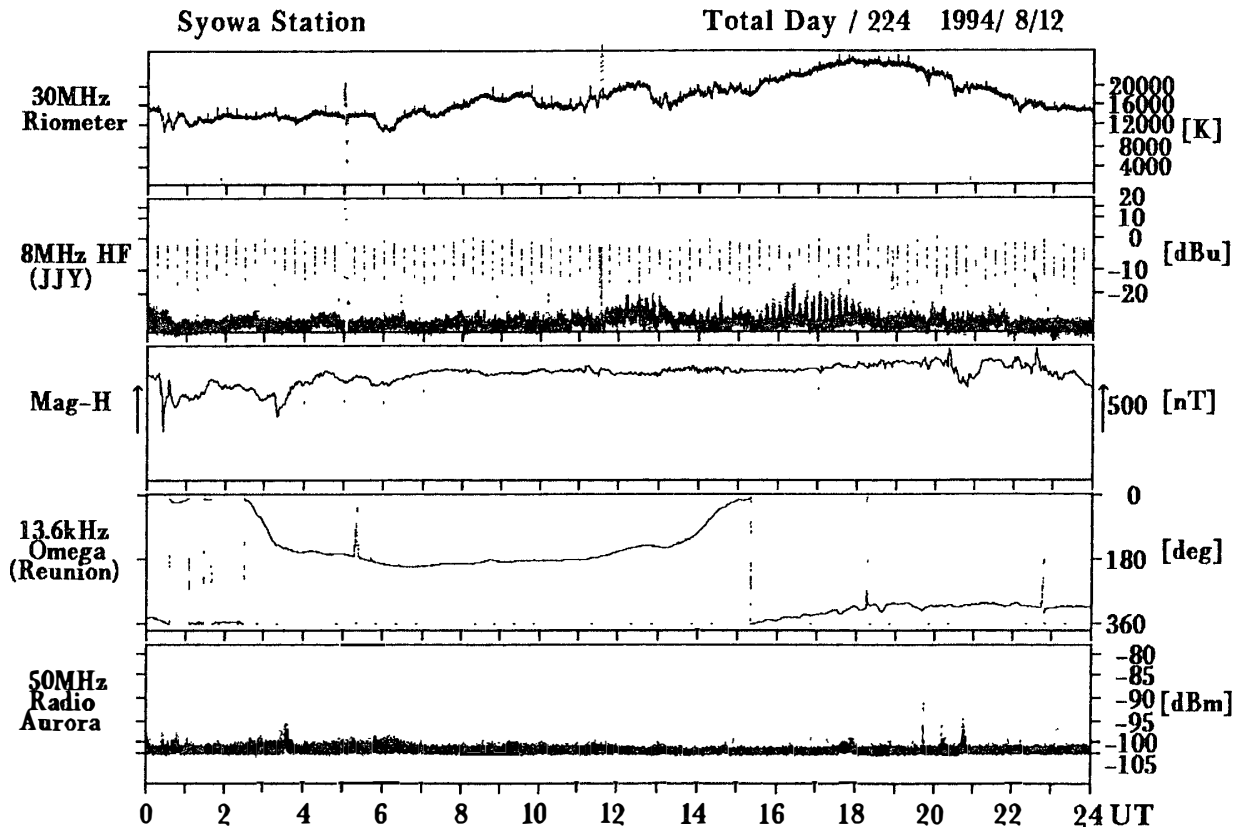


Syowa Station

Total Day / 221 1994/ 8/ 9

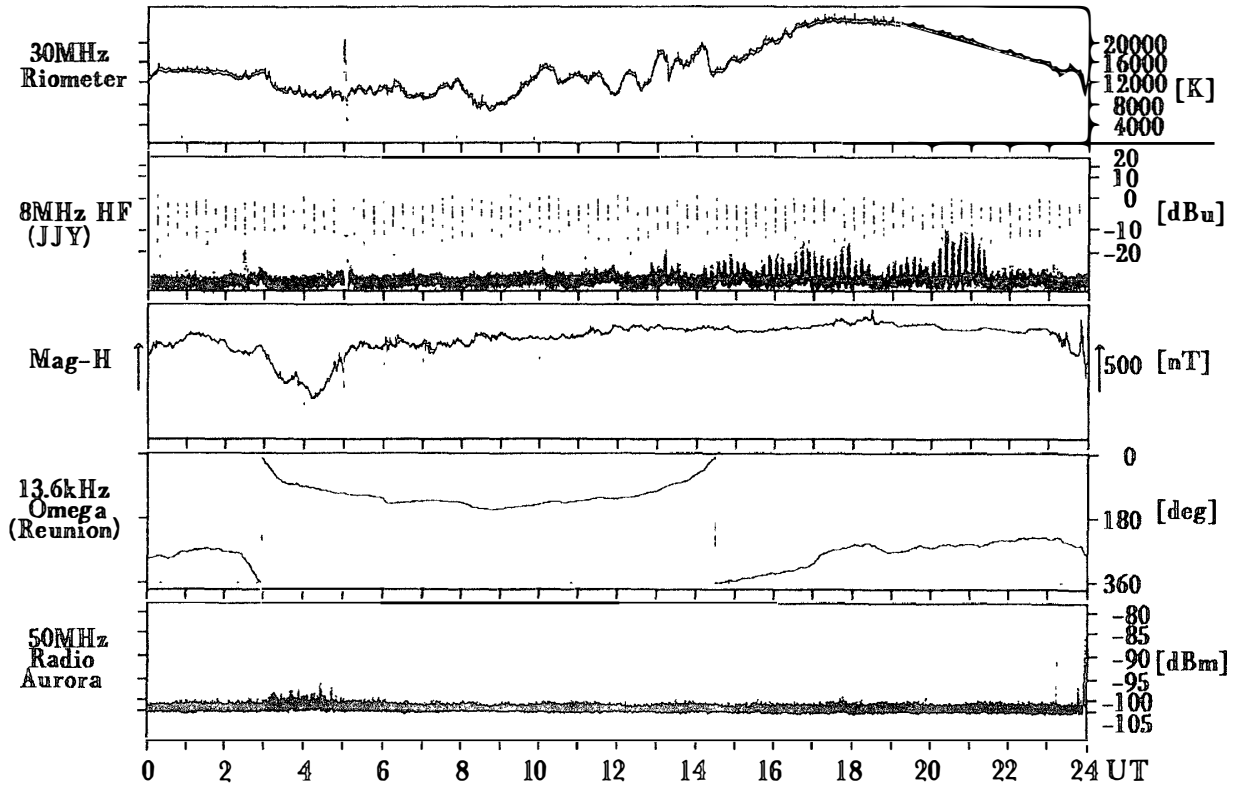






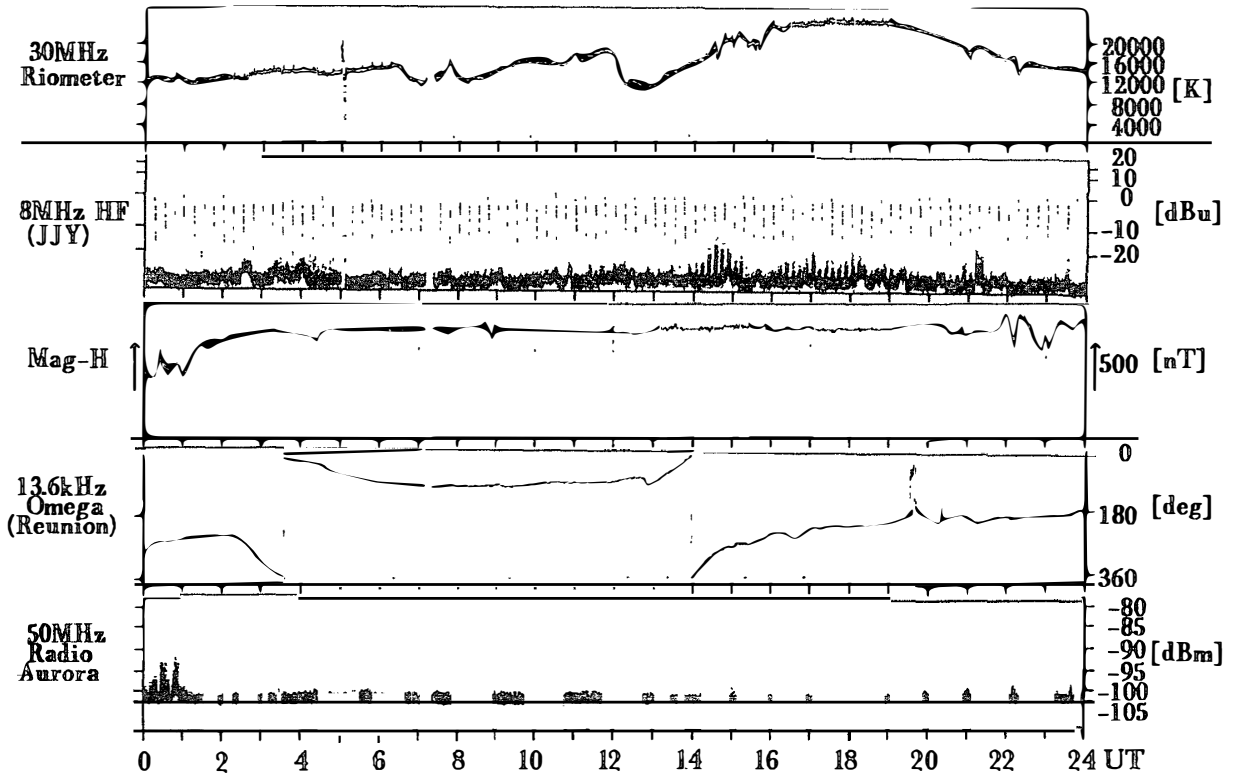
Syowa Station

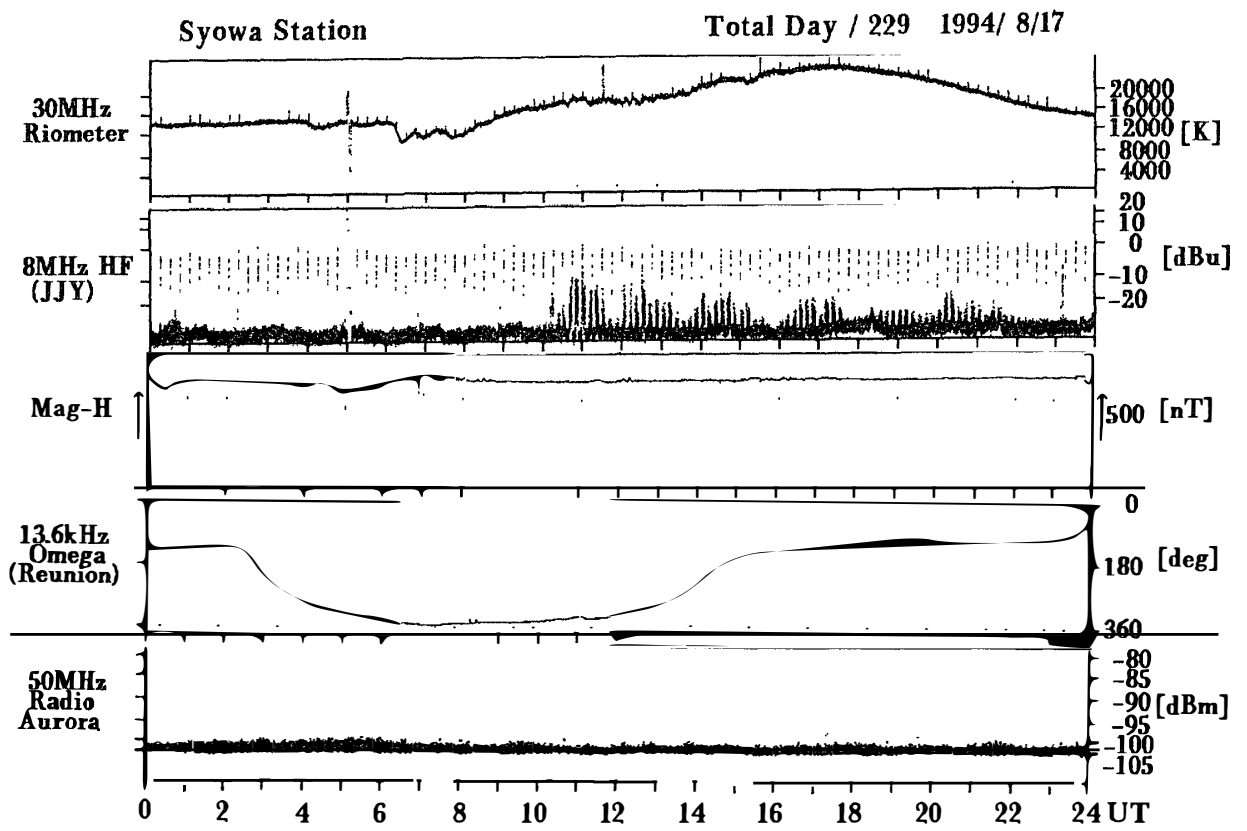
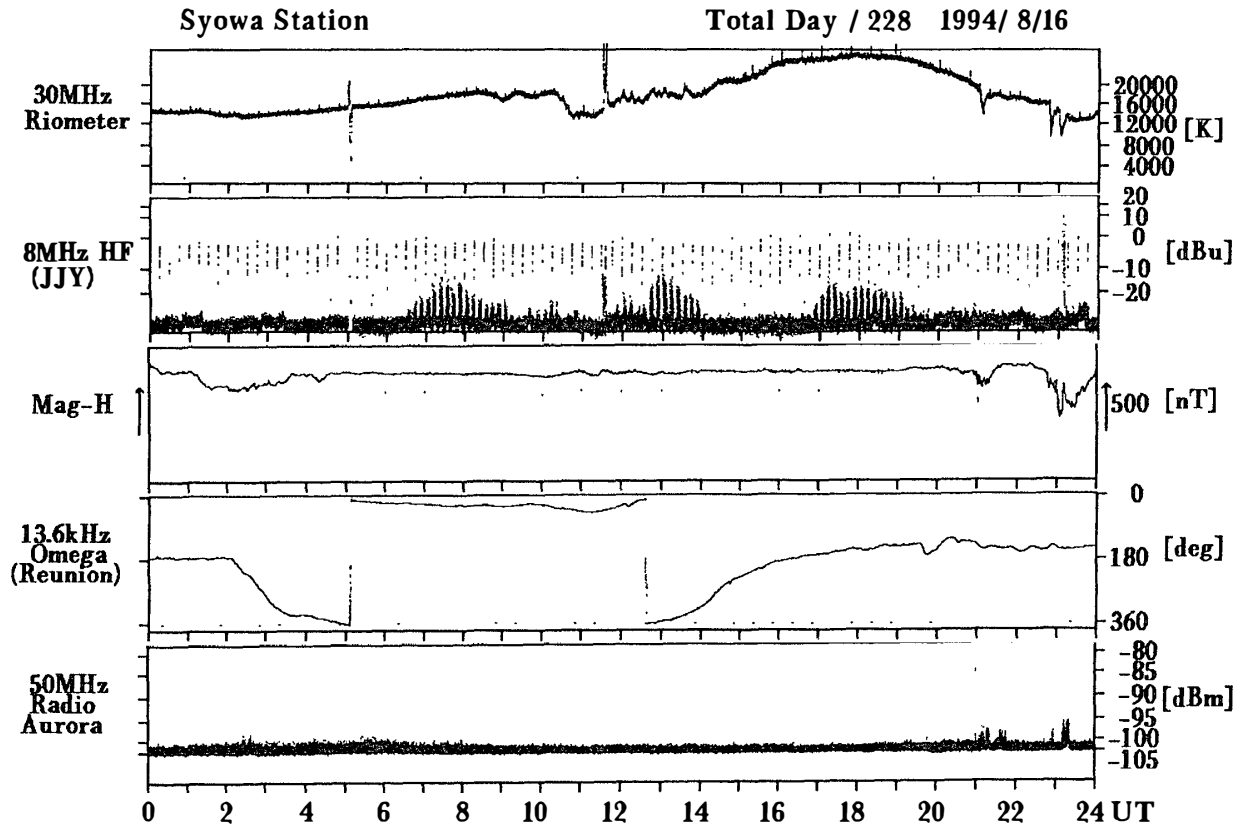
Total Day / 226 1994/ 8/14

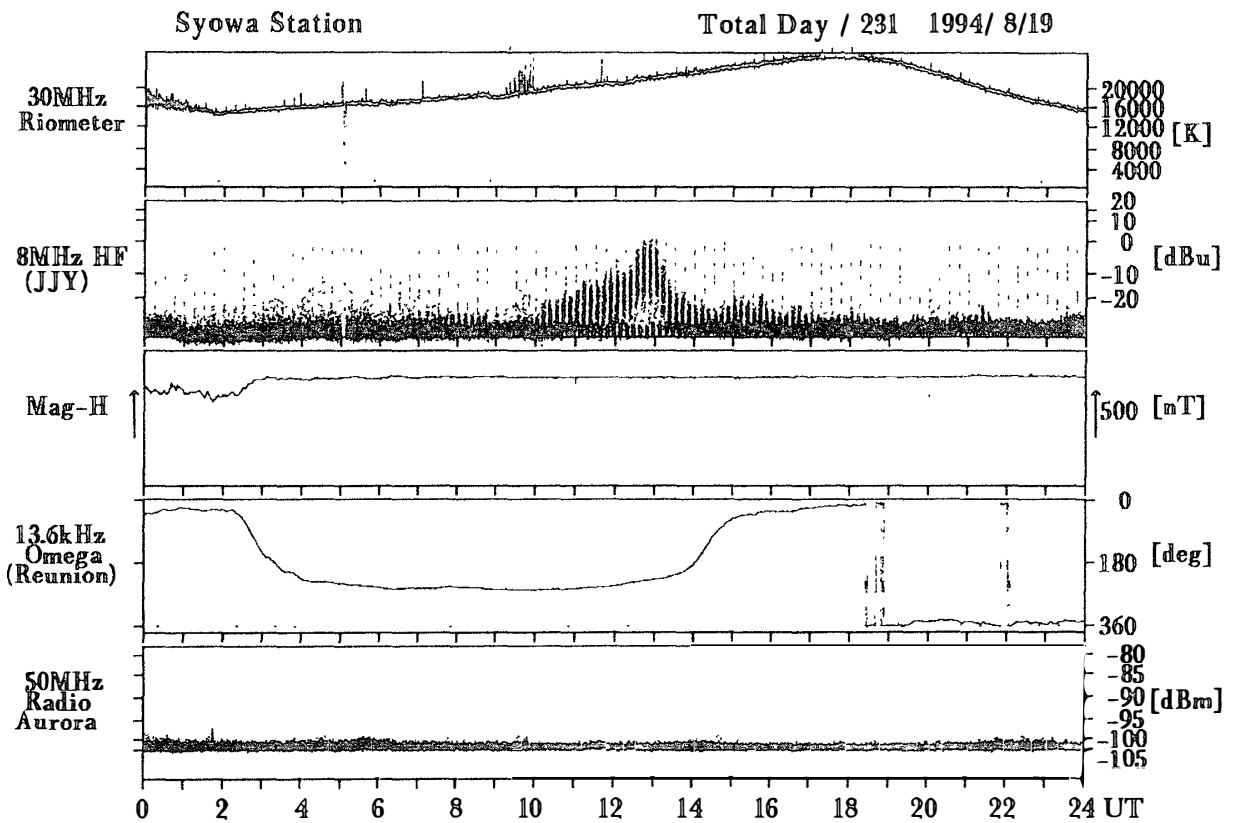
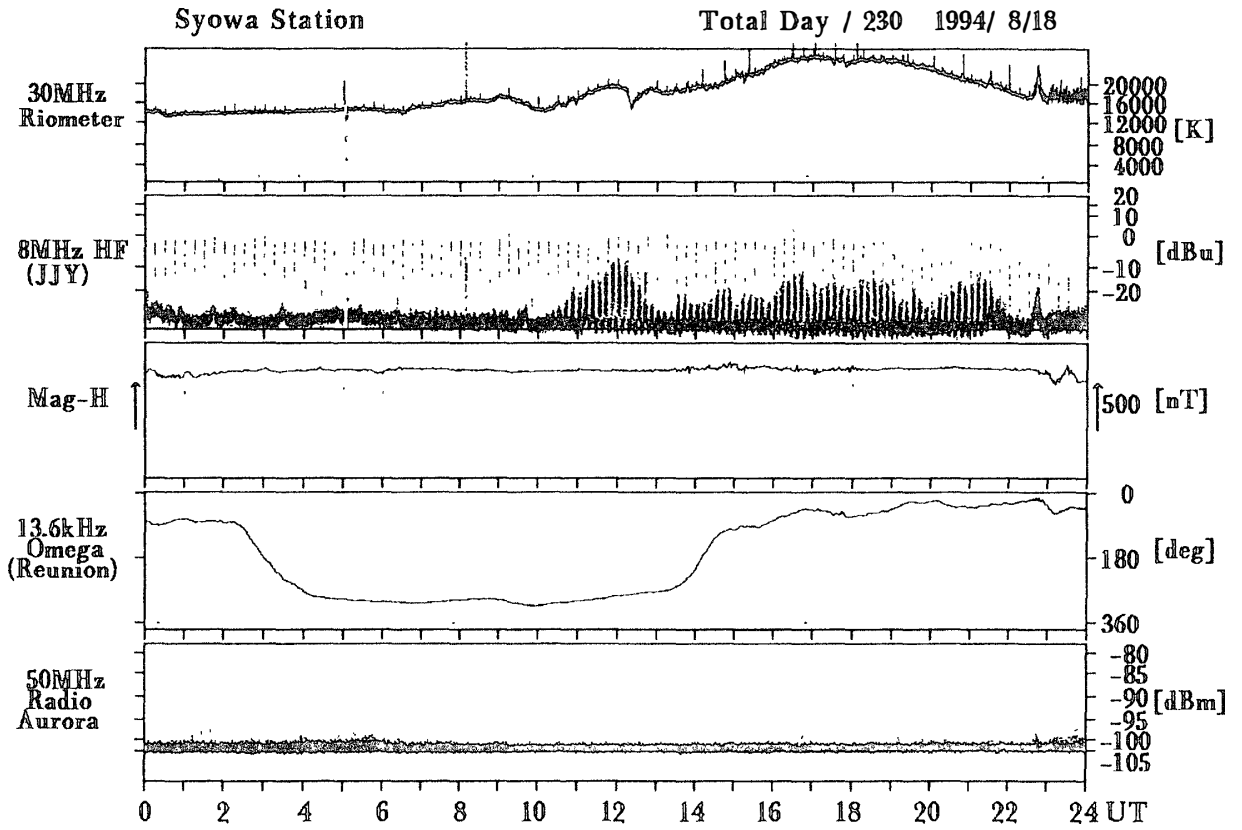


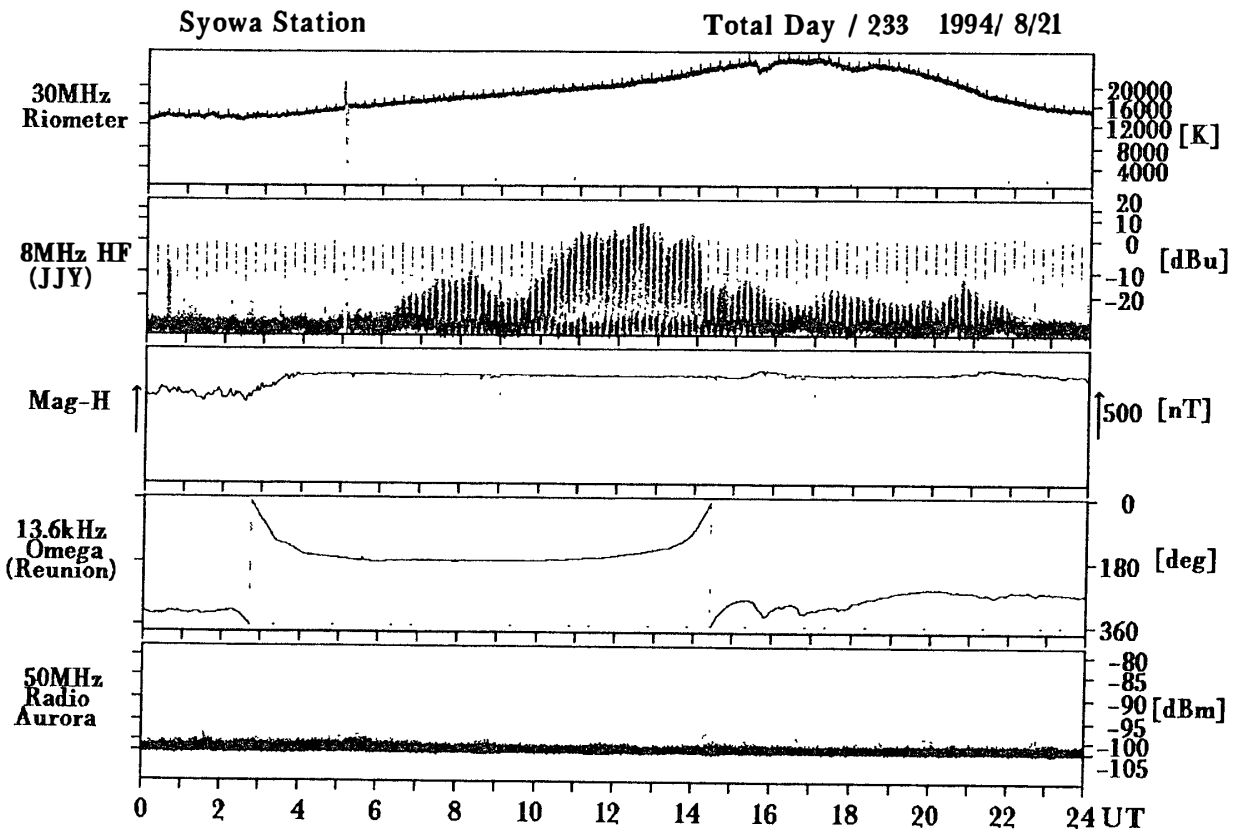
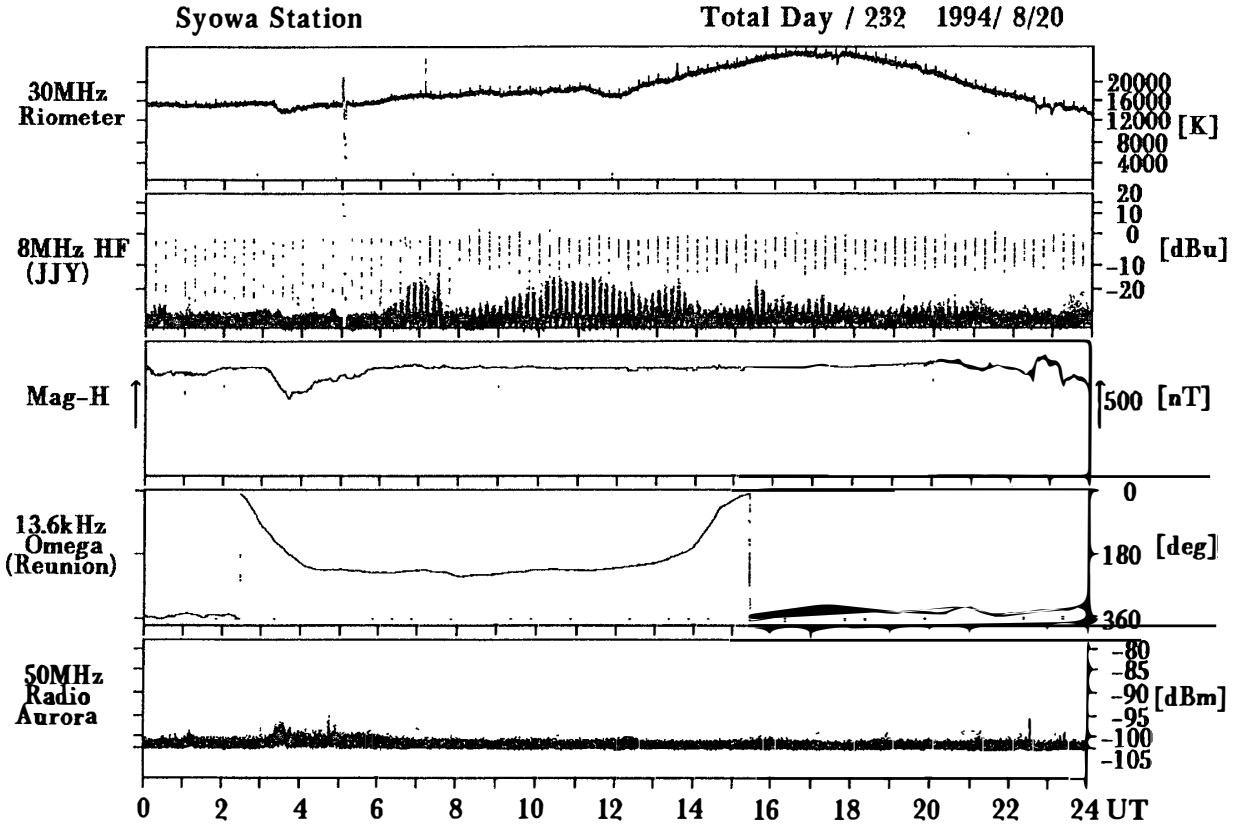
Syowa Station

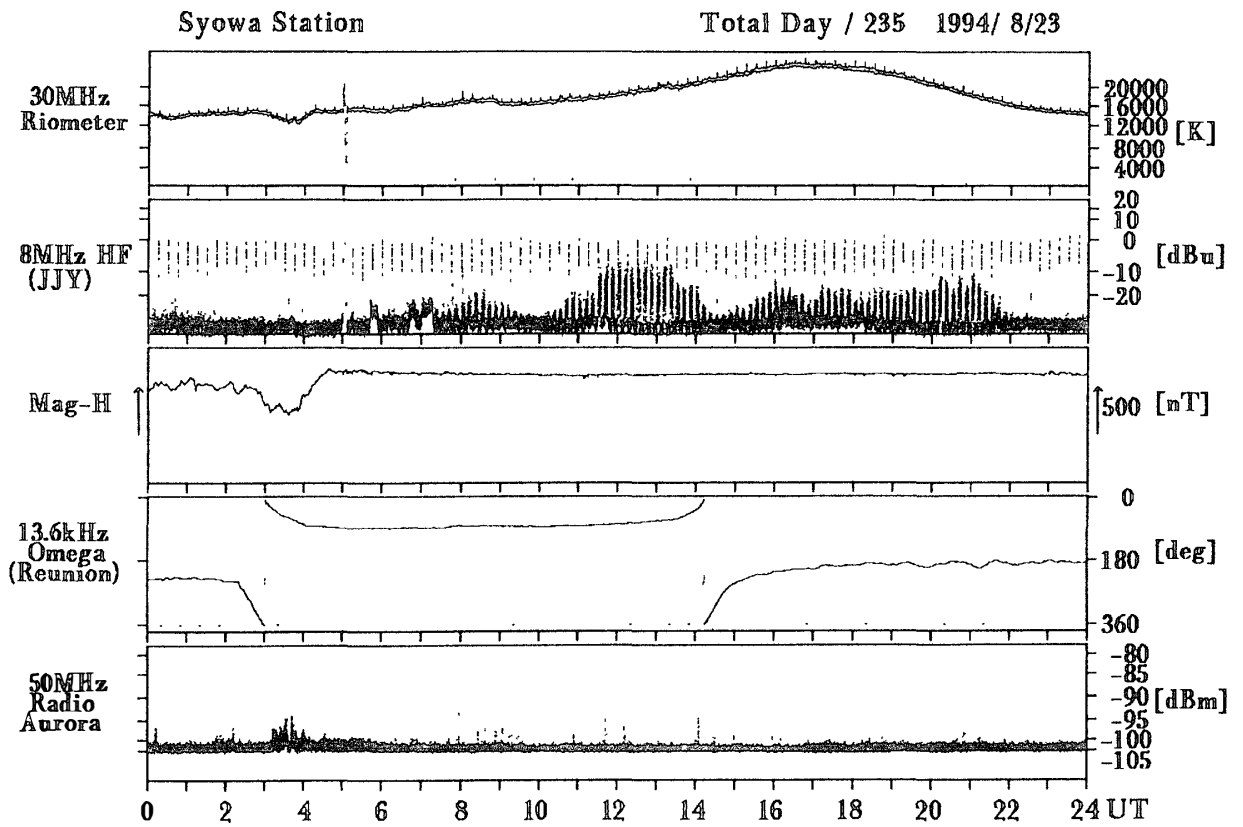
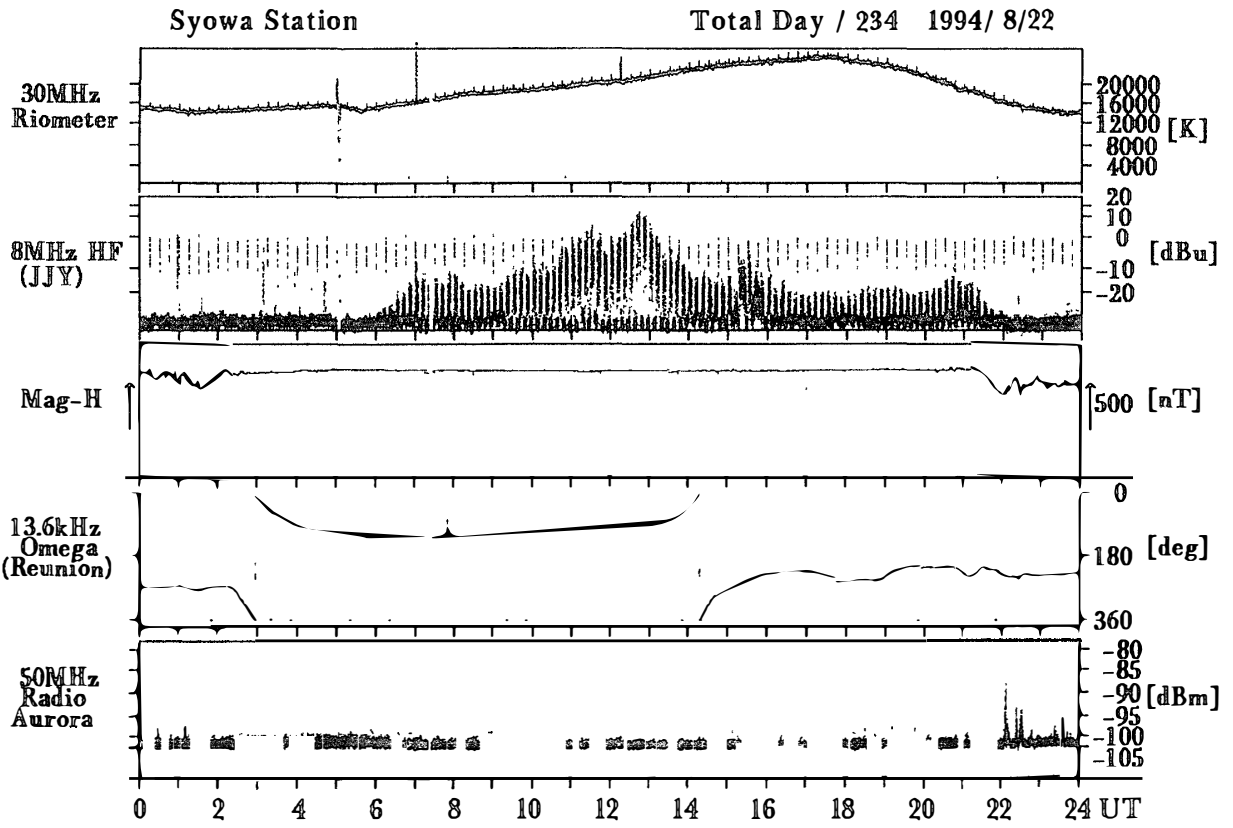
Total Day / 227 1994/ 8/15

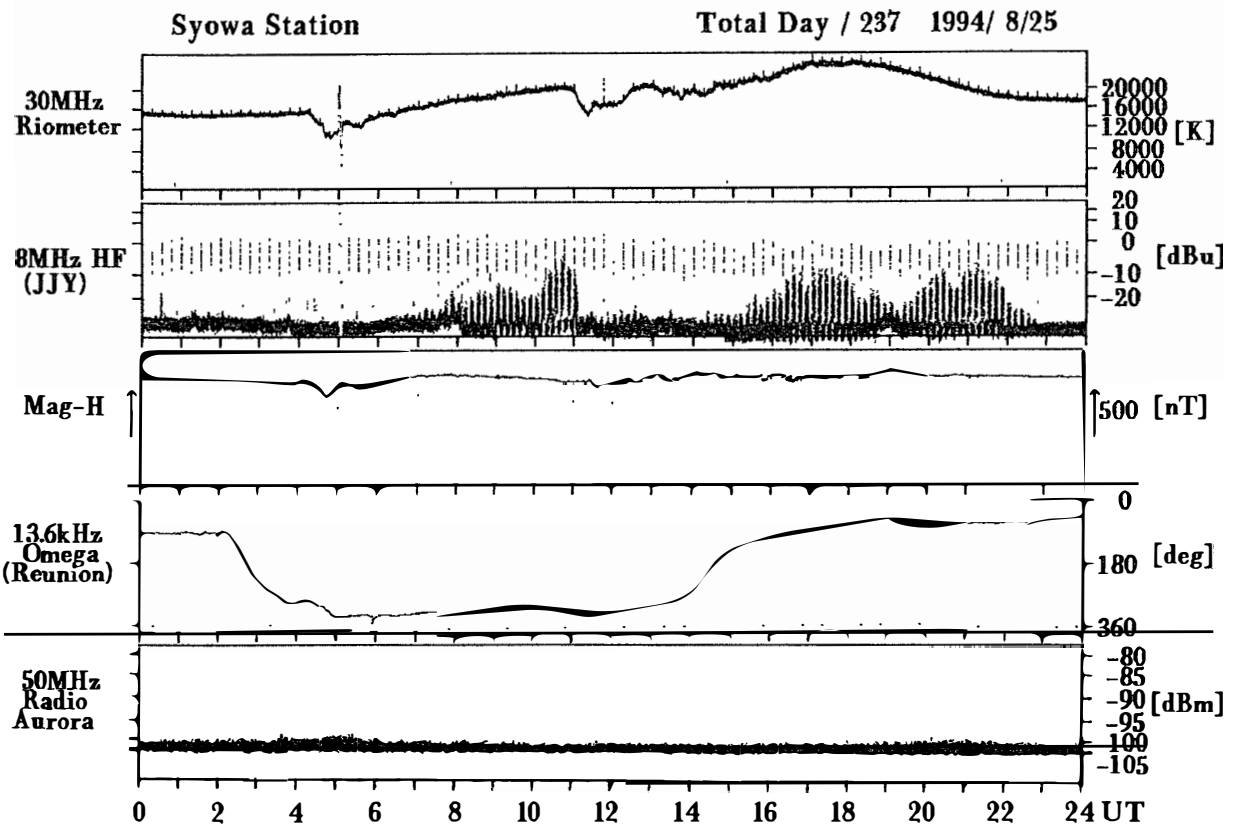
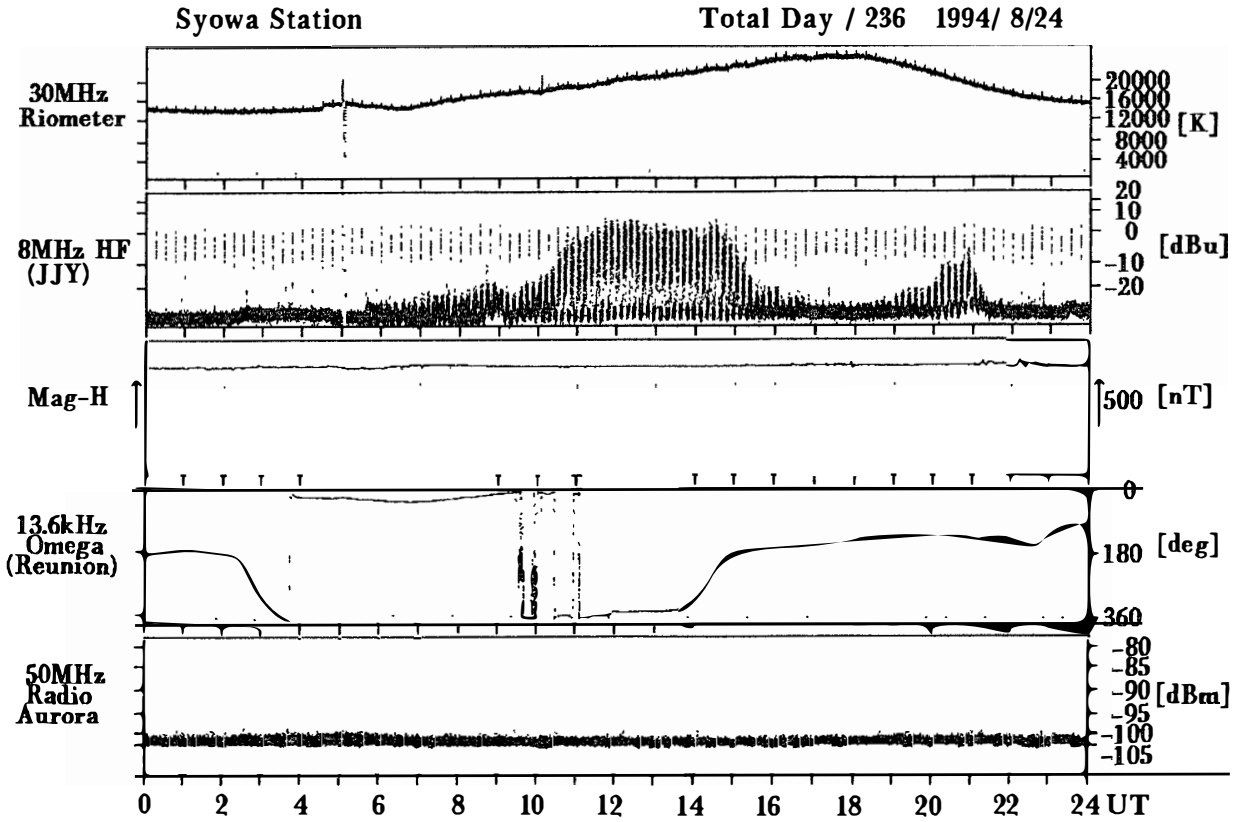


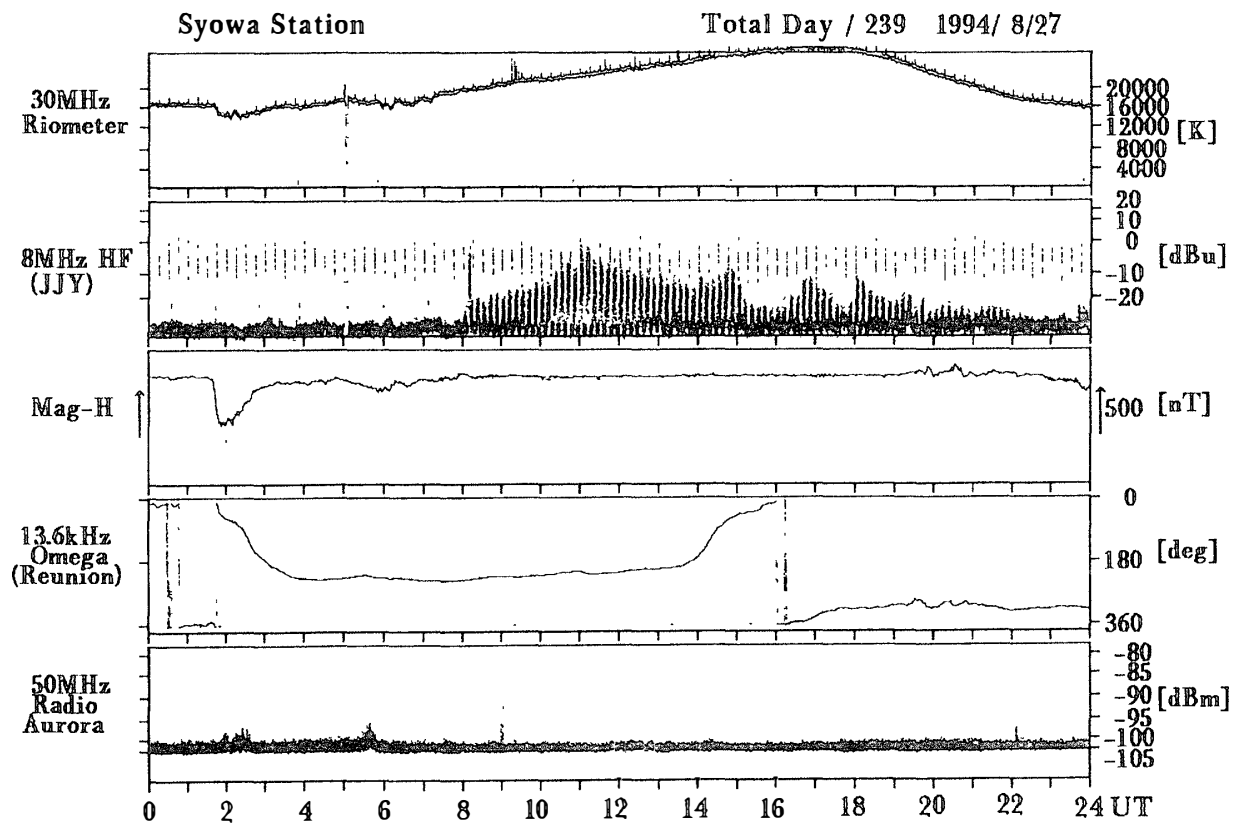
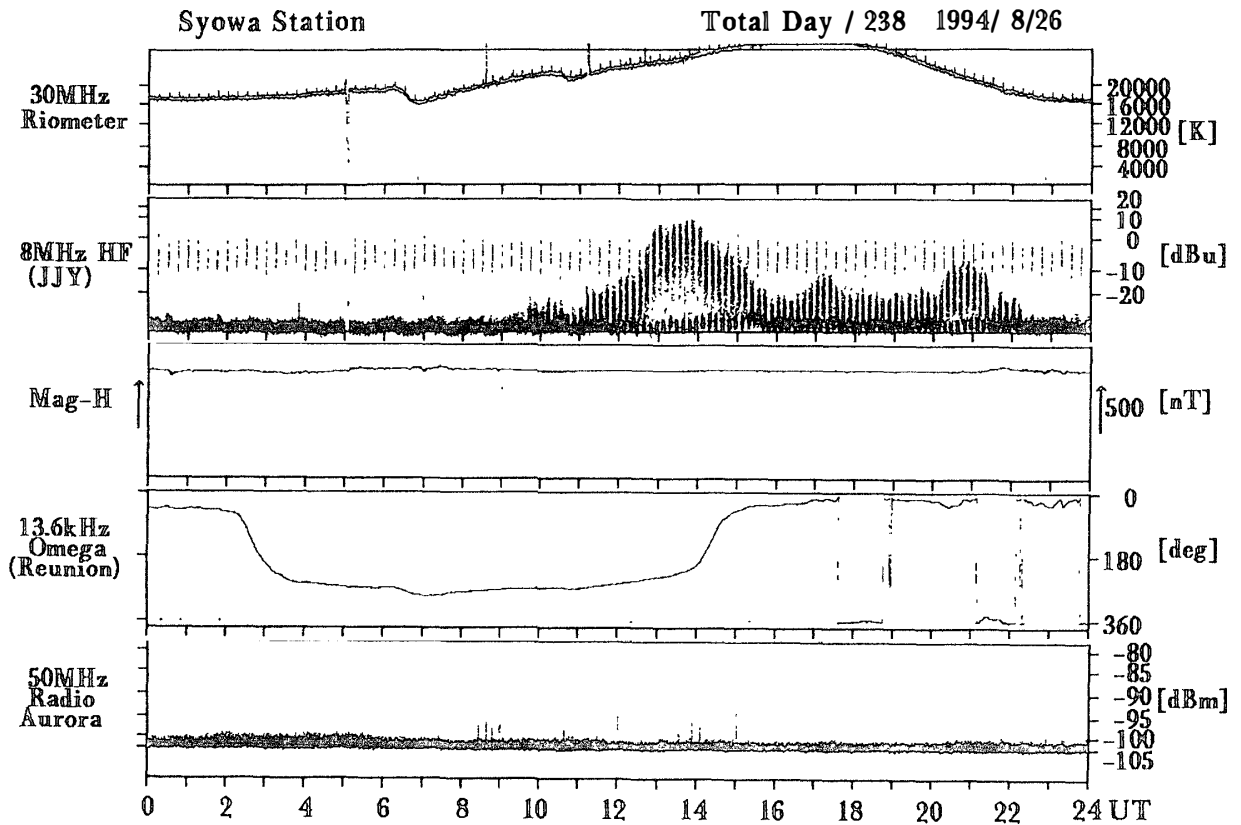


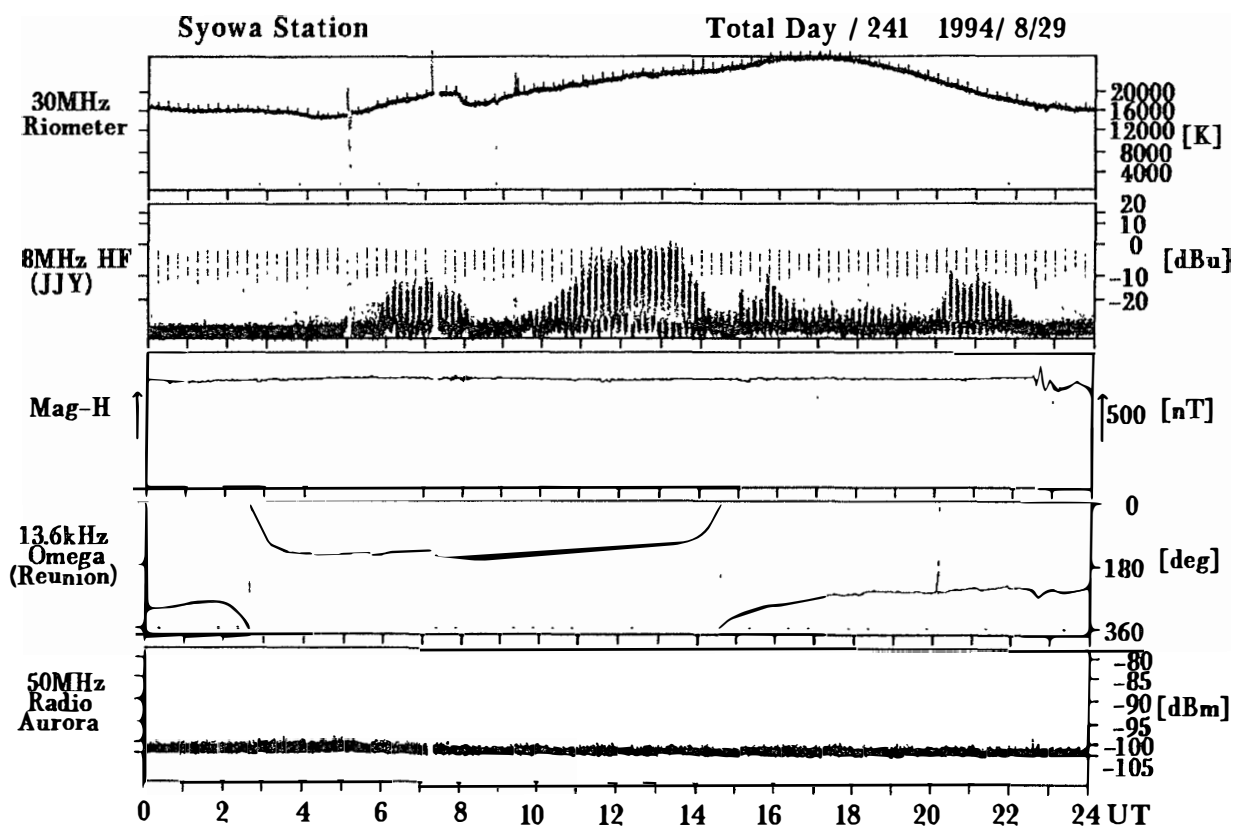
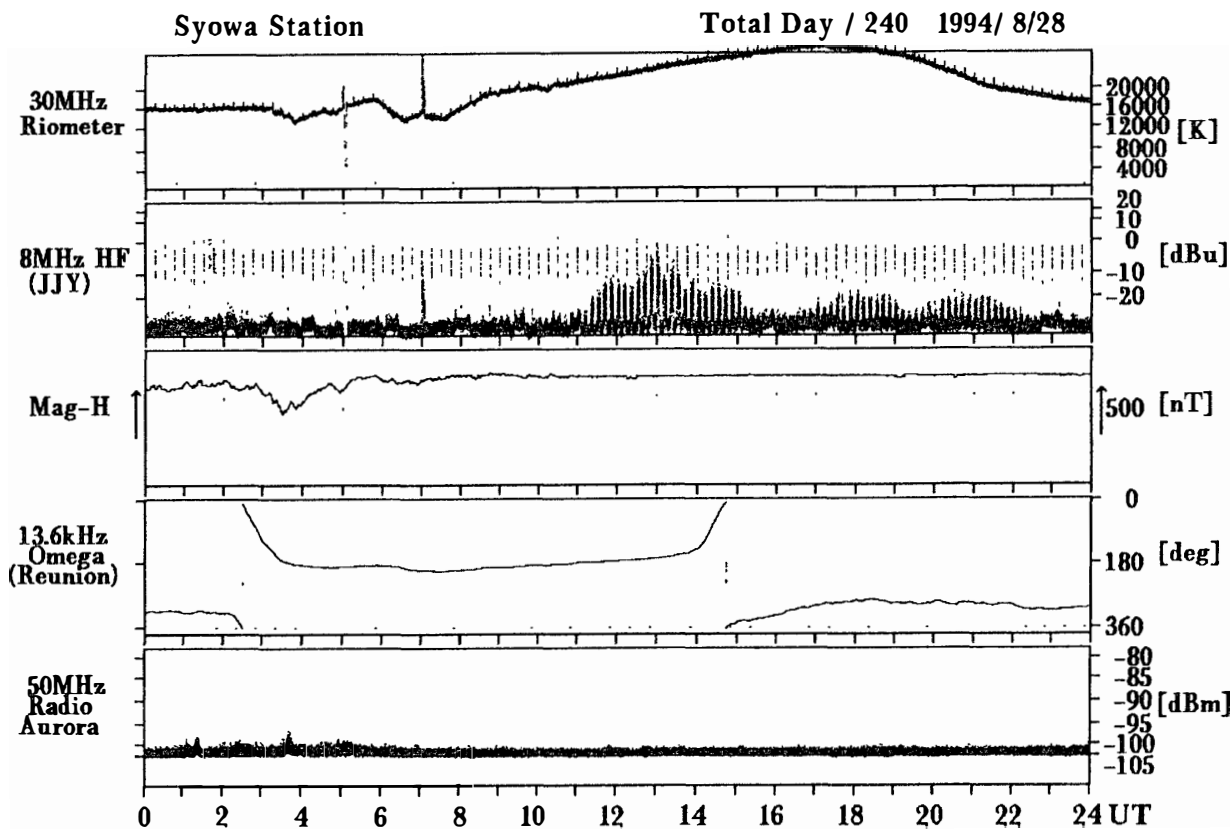






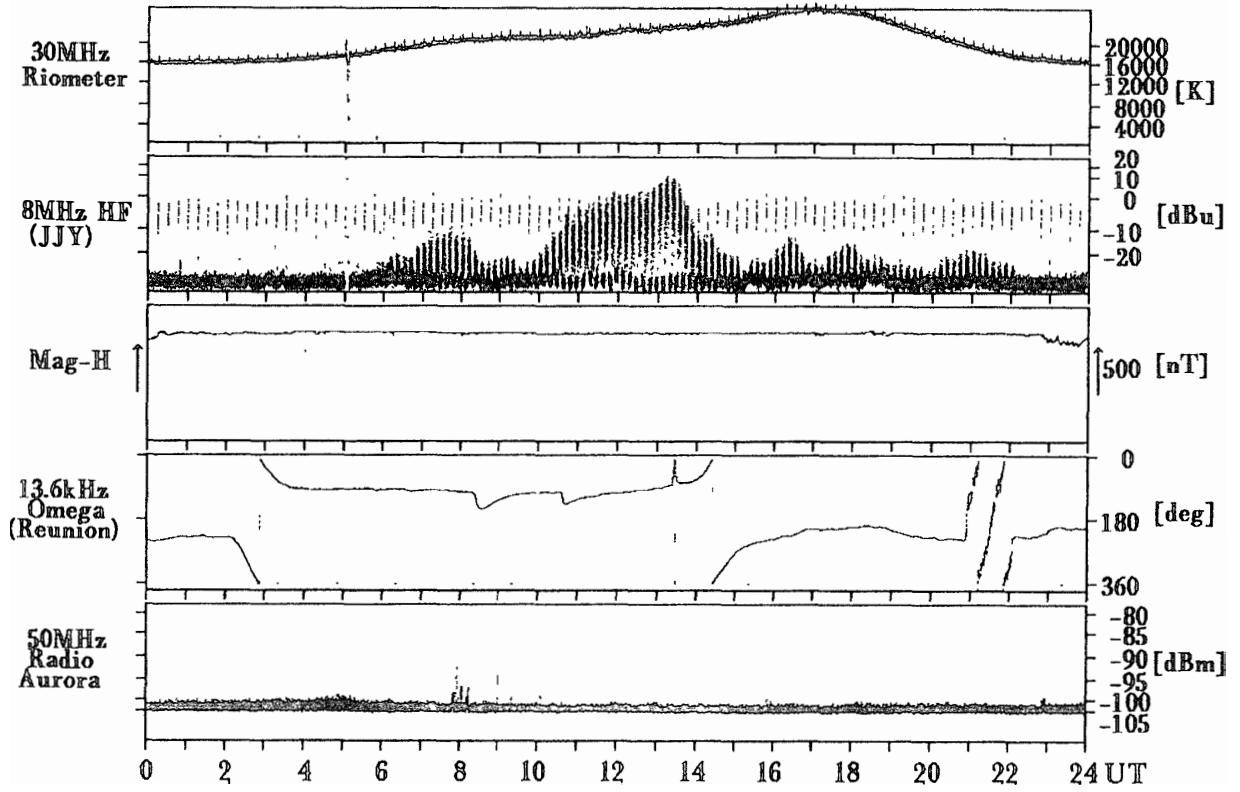






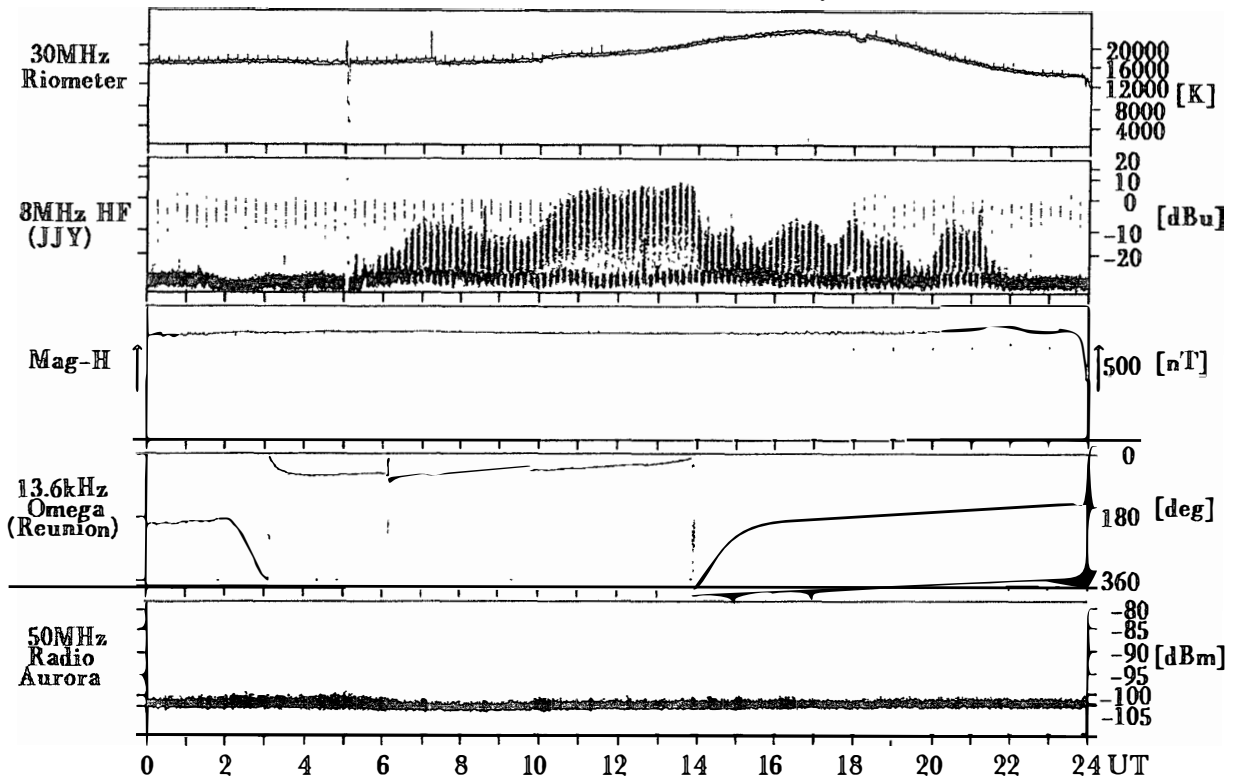
Syowa Station

Total Day / 242 1994/ 8/30



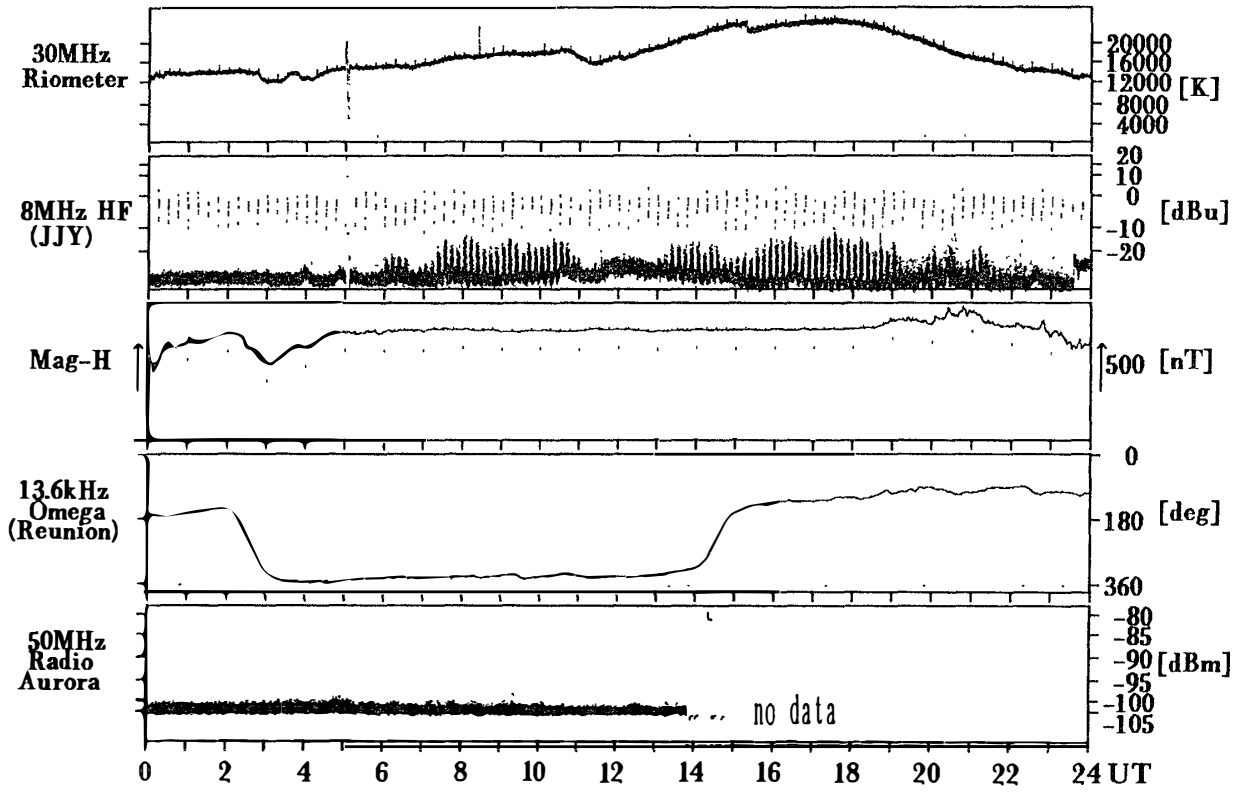
Syowa Station

Total Day / 243 1994/ 8/31



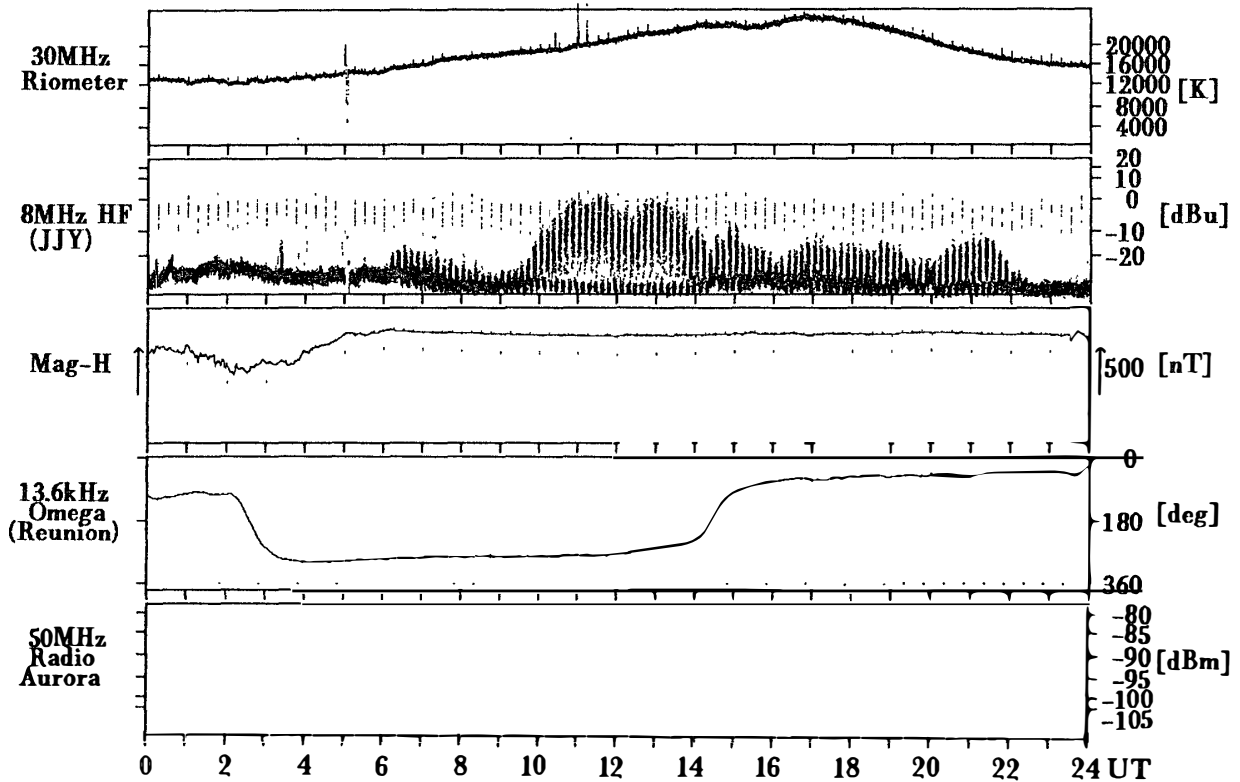
Syowa Station

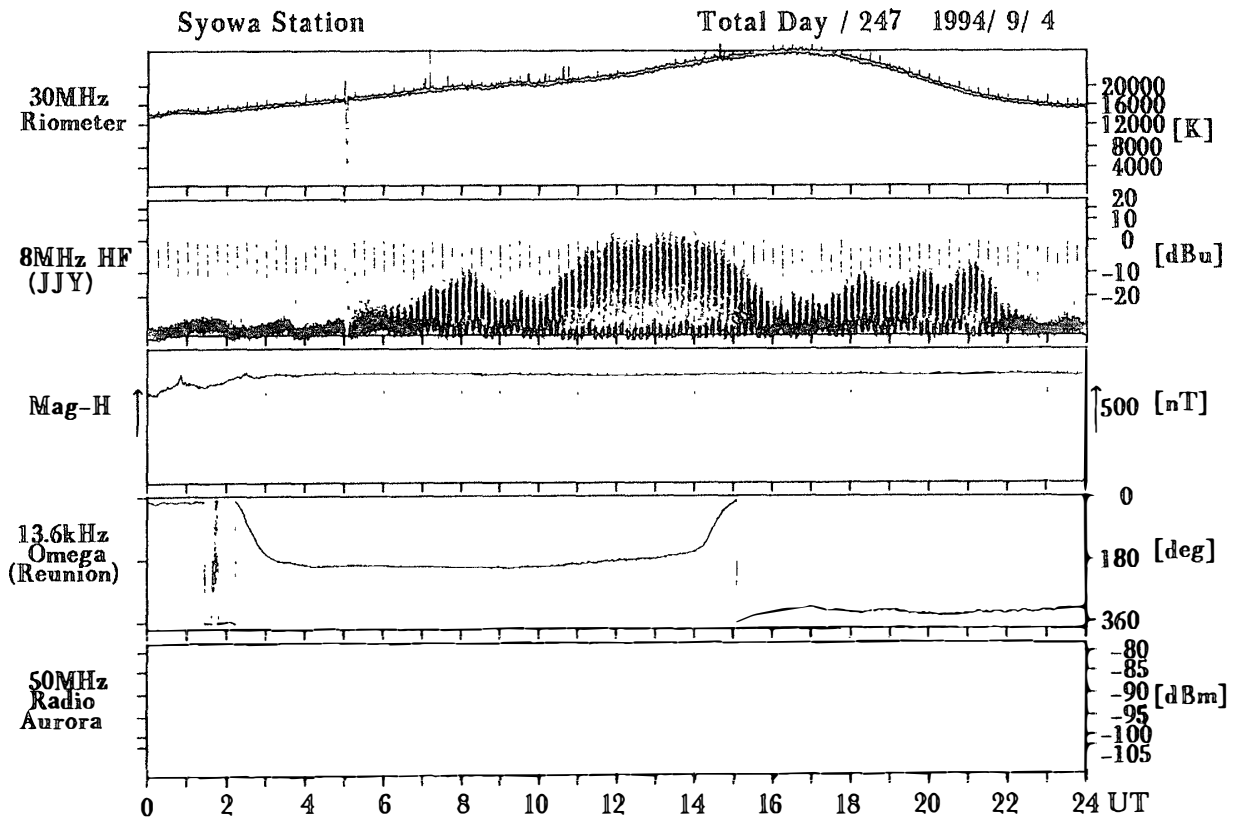
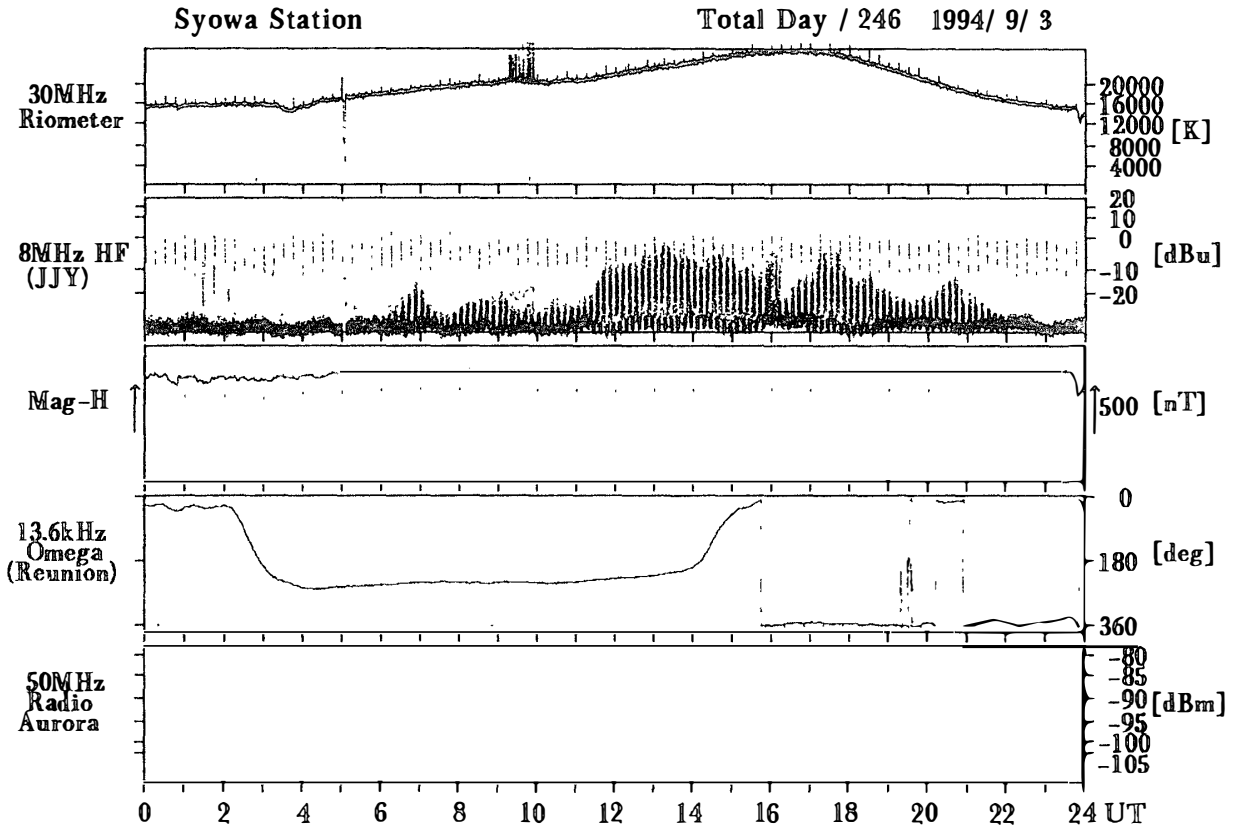
Total Day / 244 1994/ 9/ 1

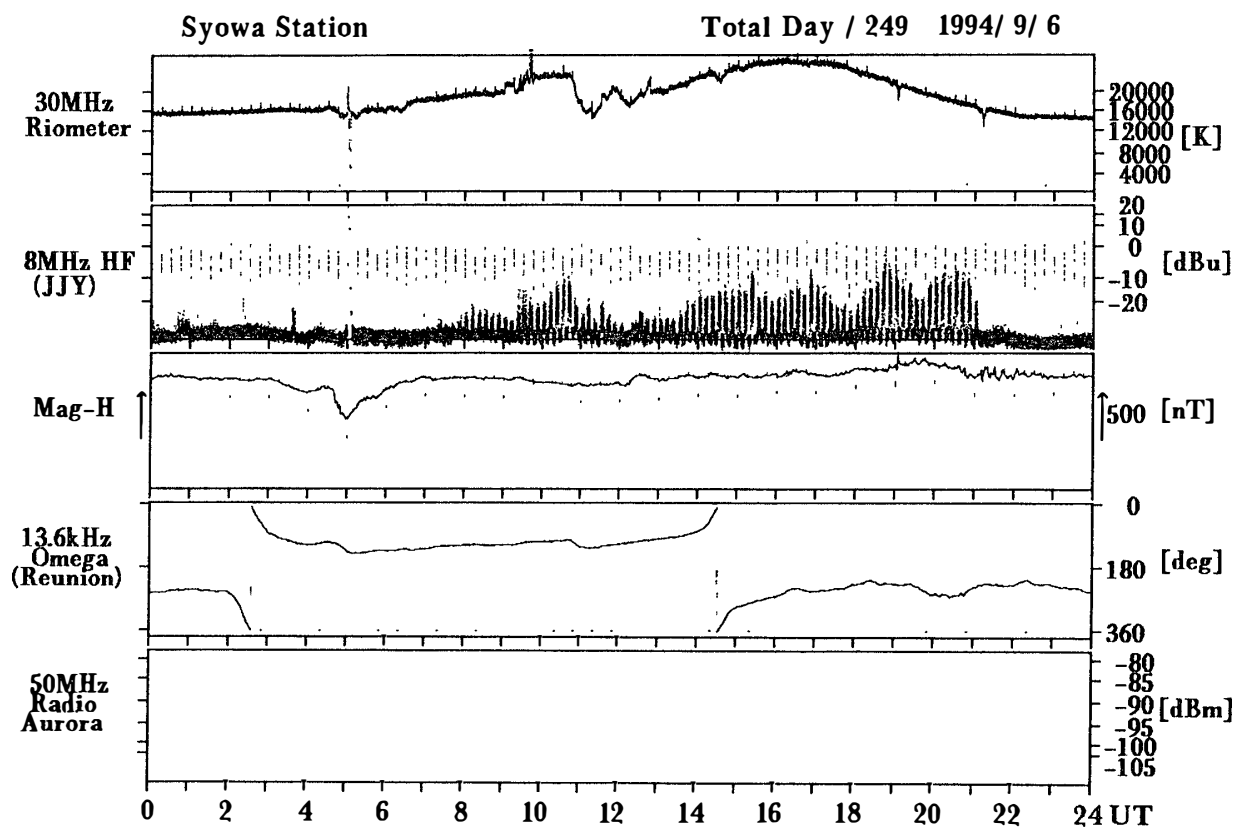
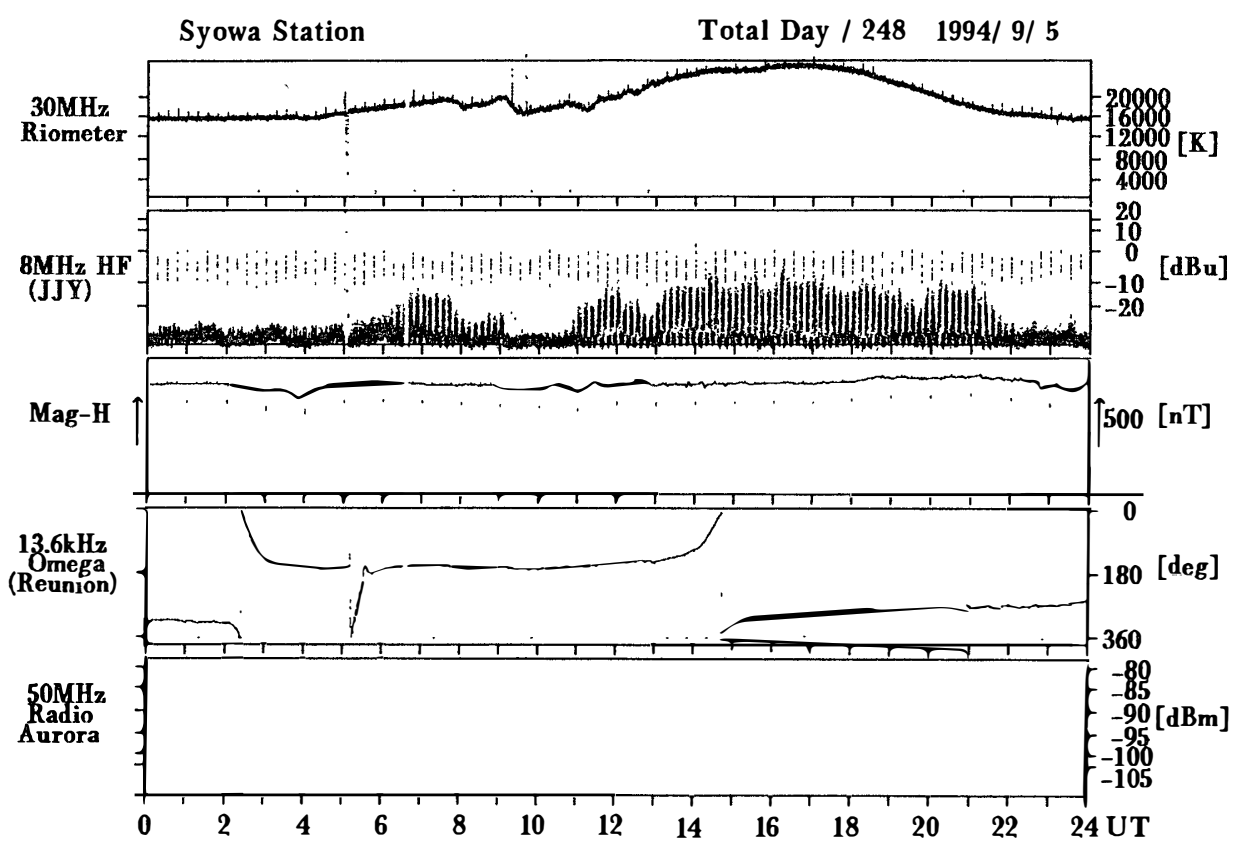


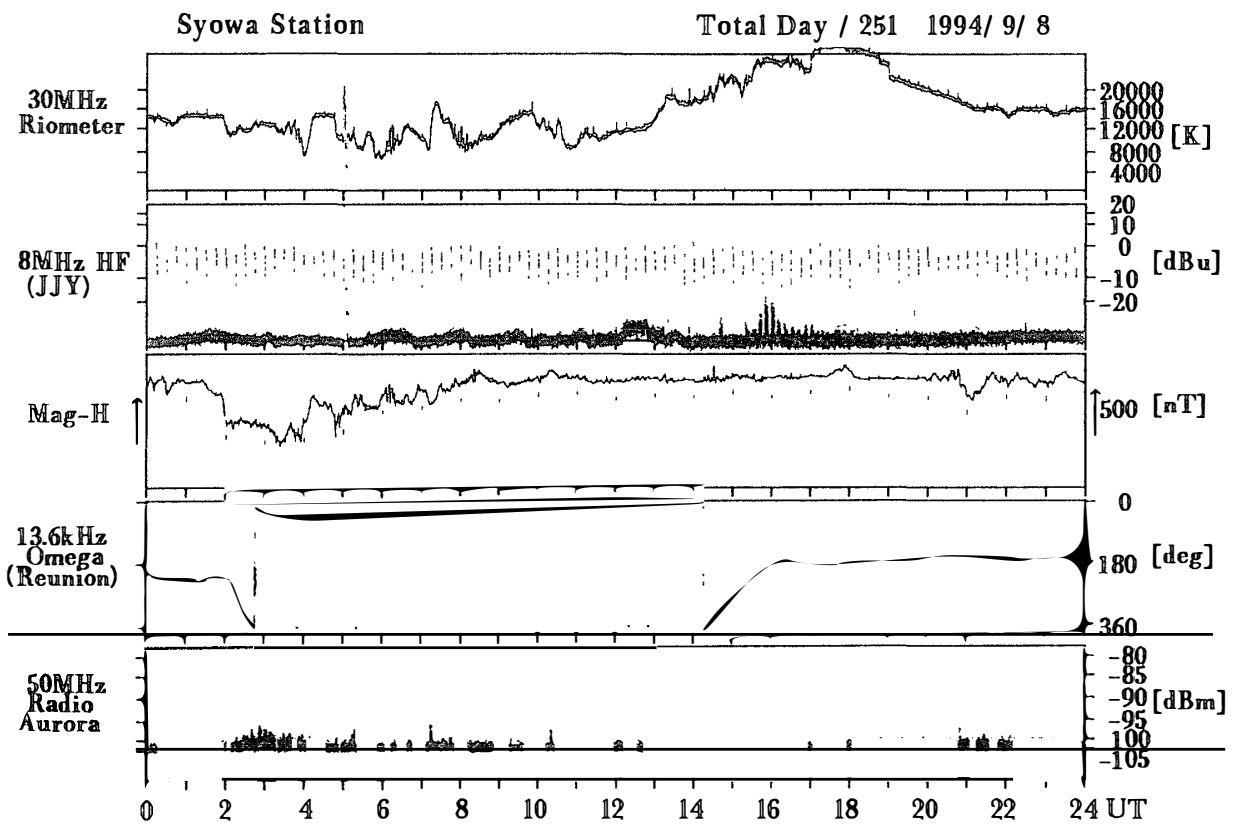
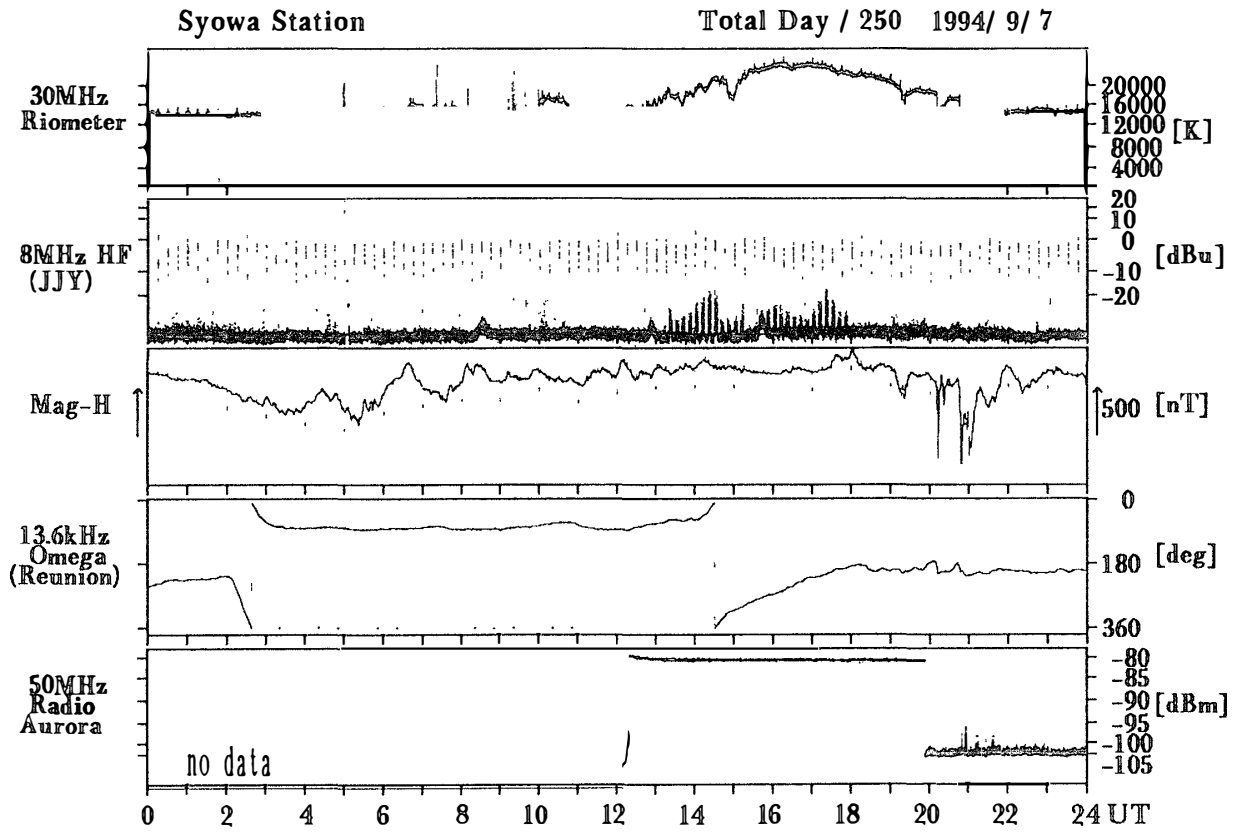
Syowa Station

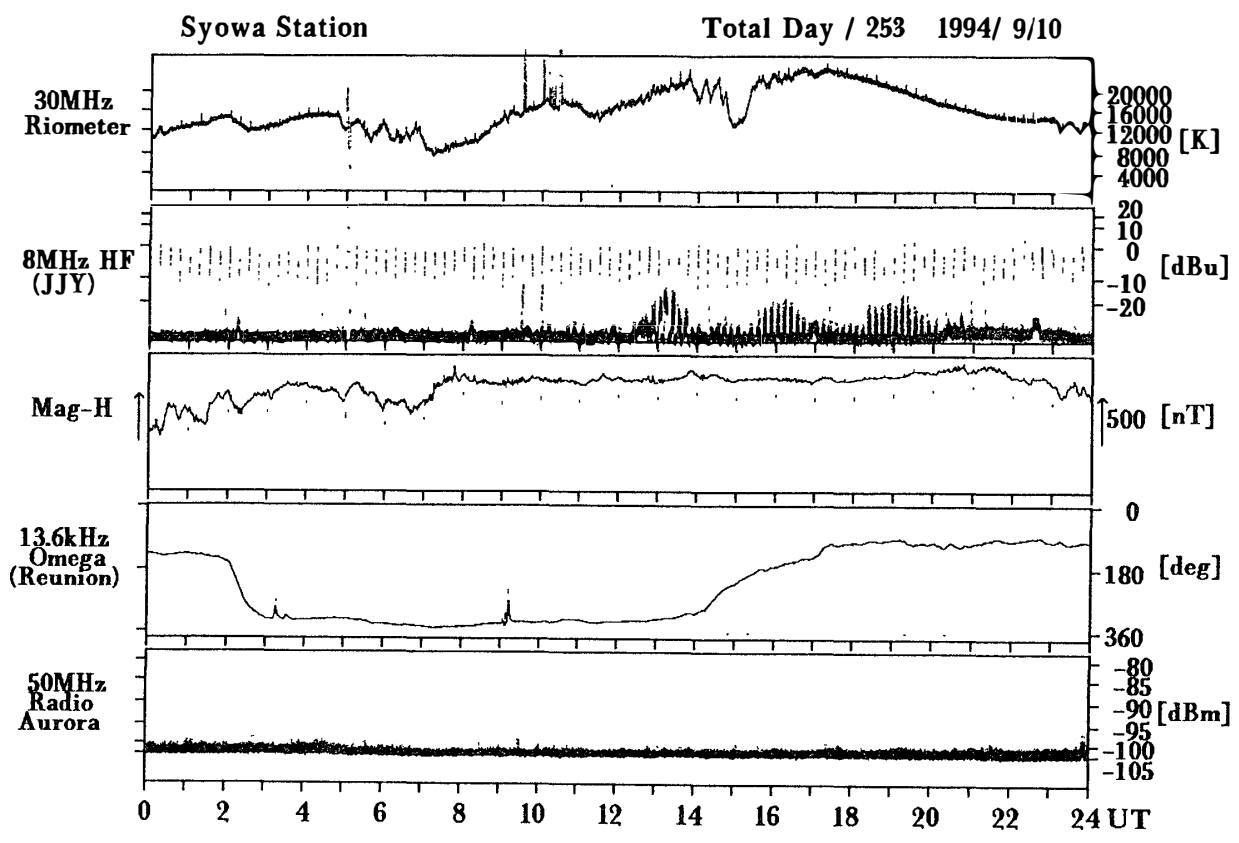
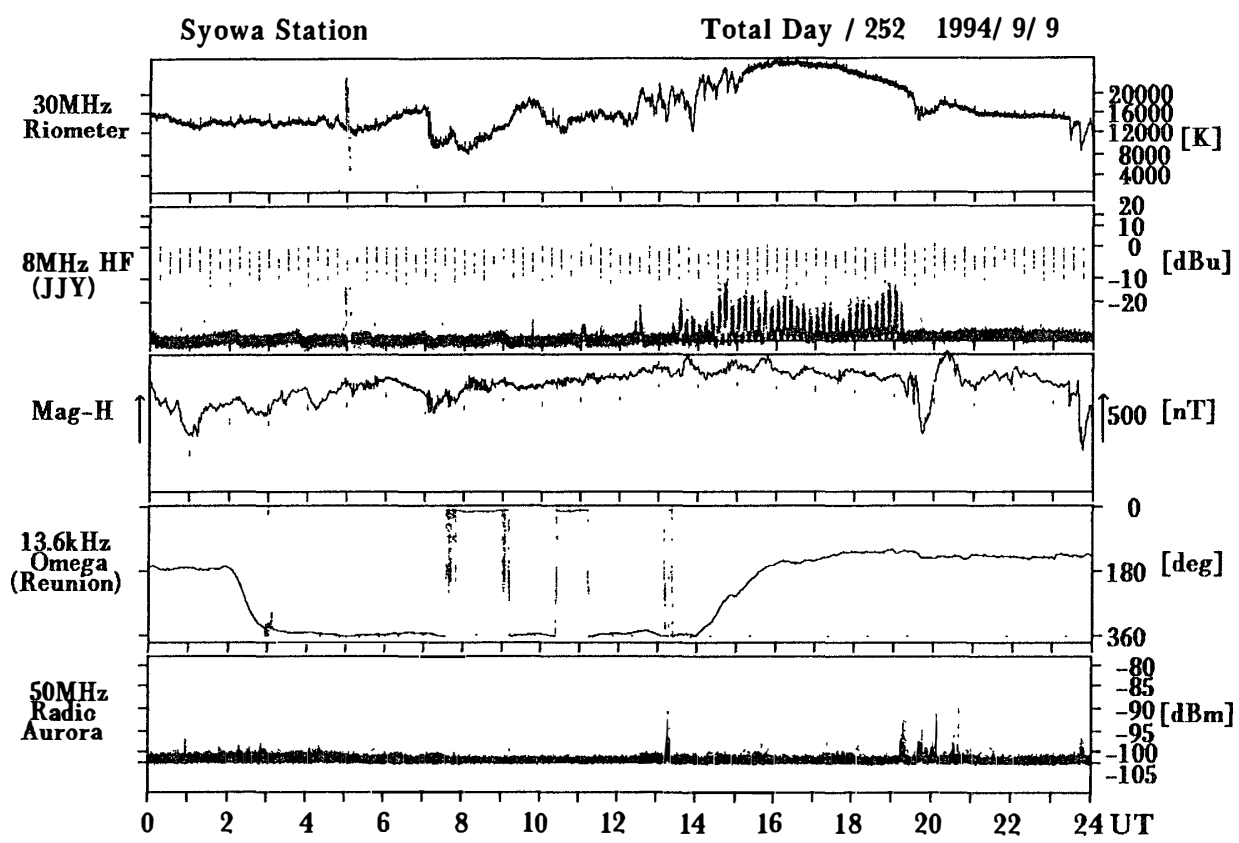
Total Day / 245 1994/ 9/ 2

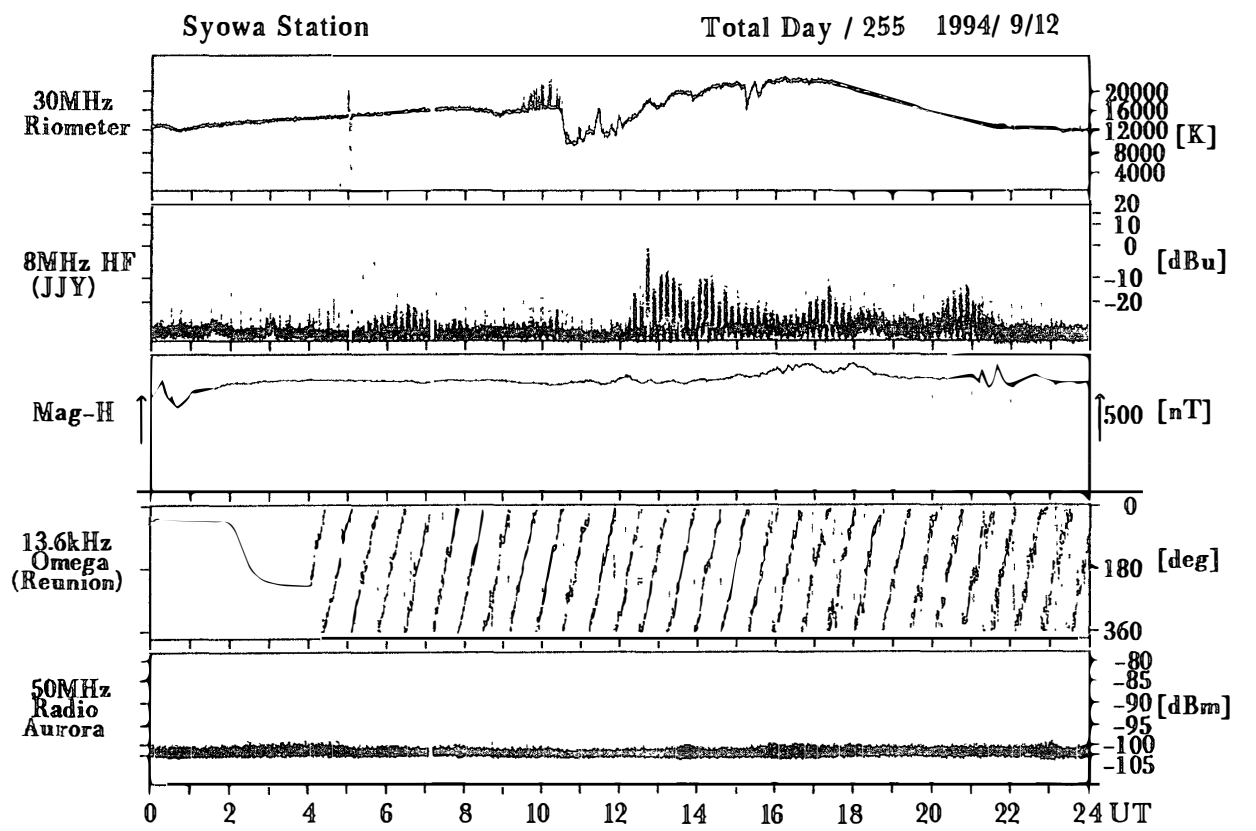
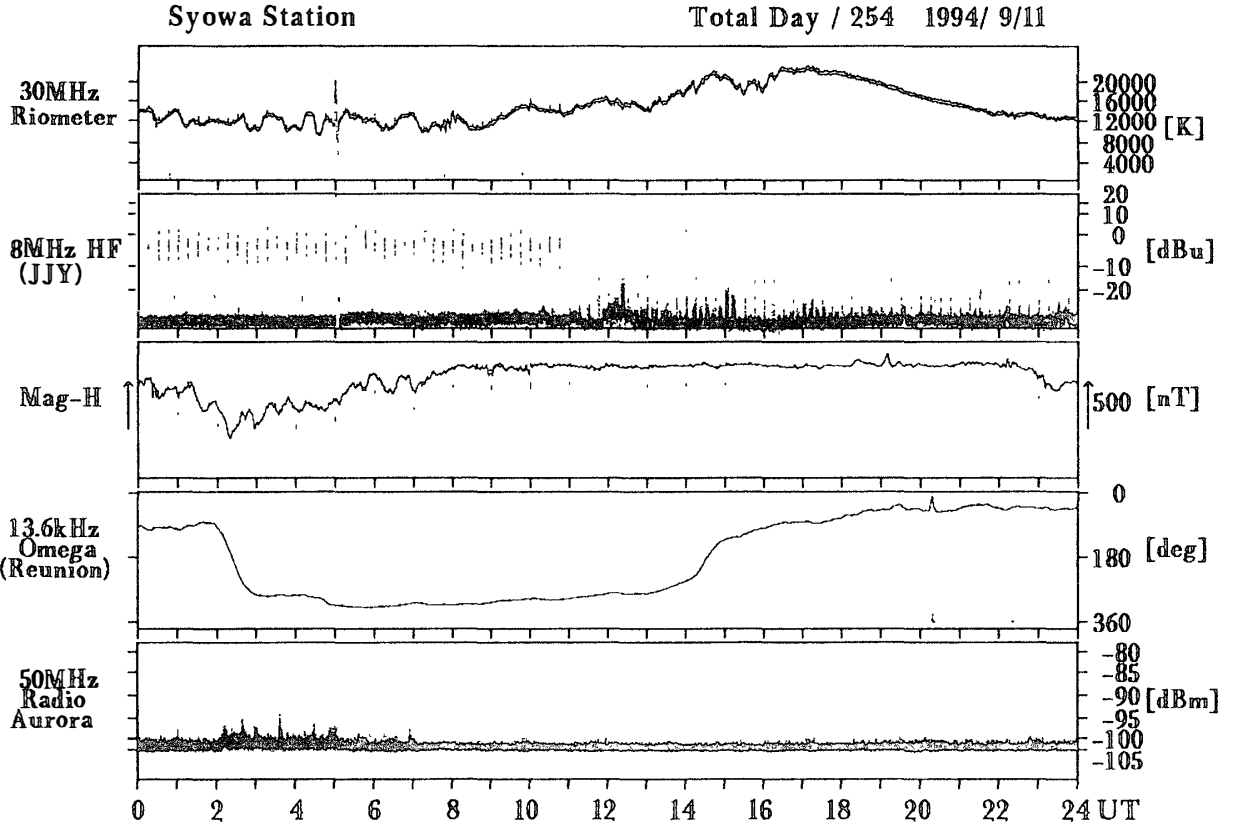






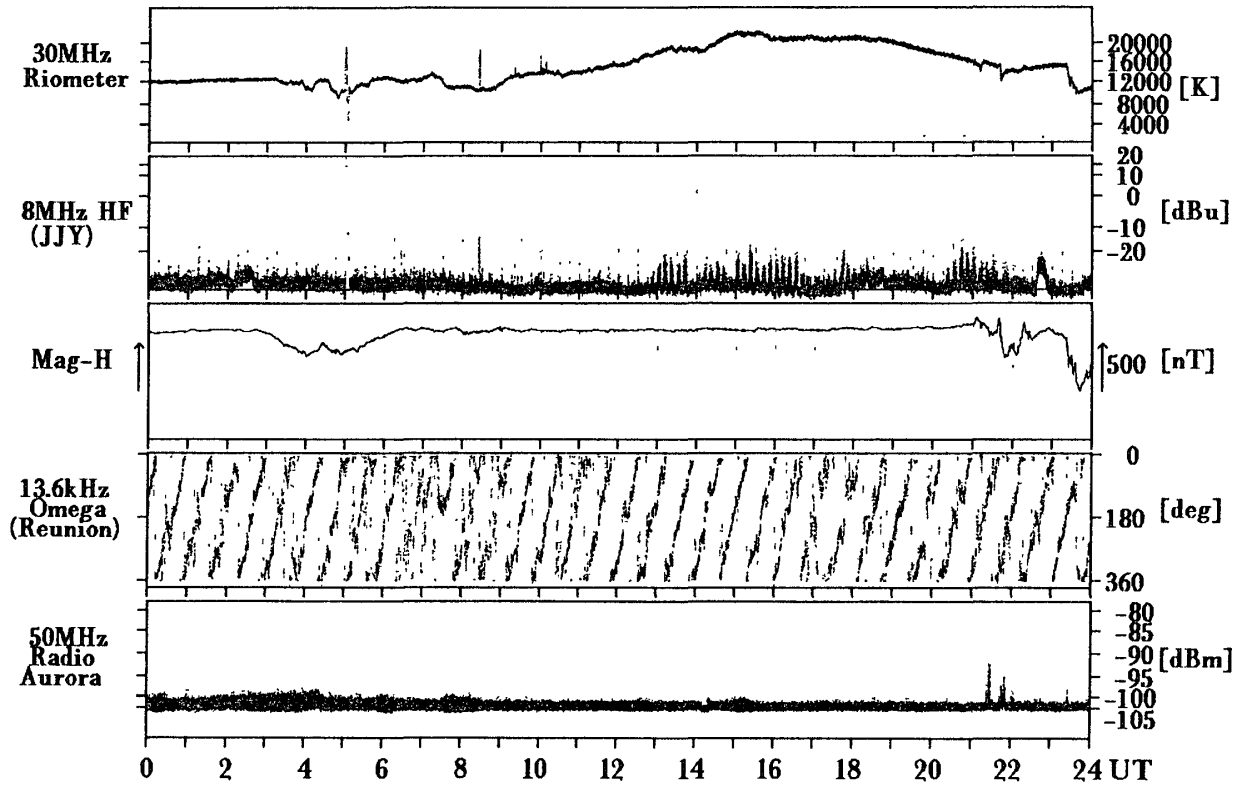






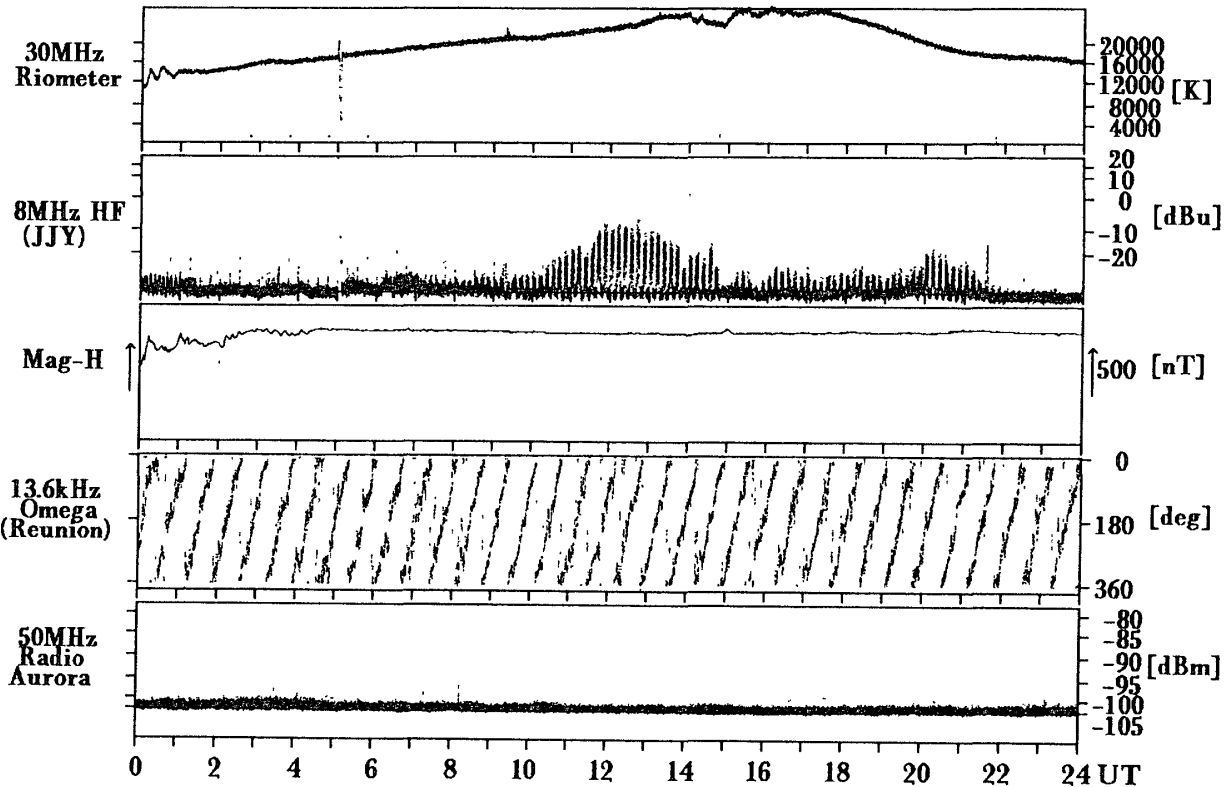
Syowa Station

Total Day / 256 1994/ 9/13



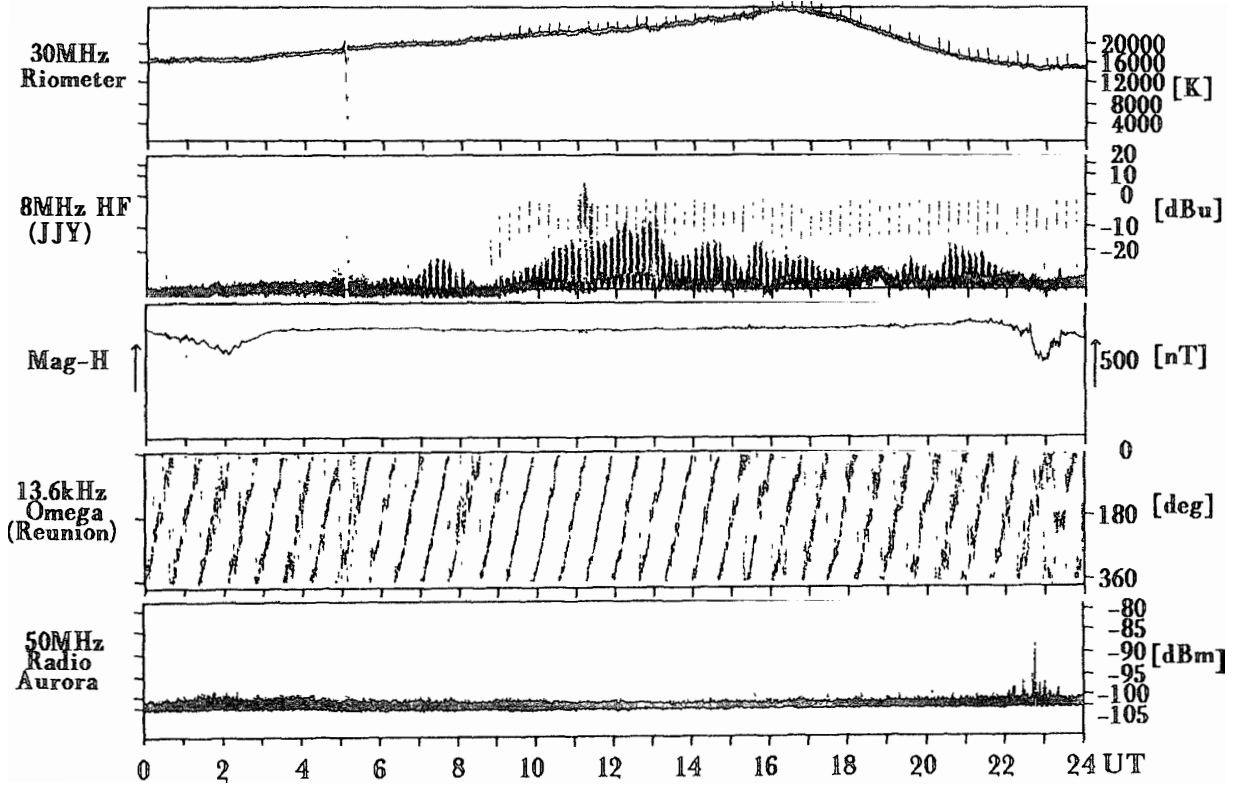
Syowa Station

Total Day / 257 1994/ 9/14



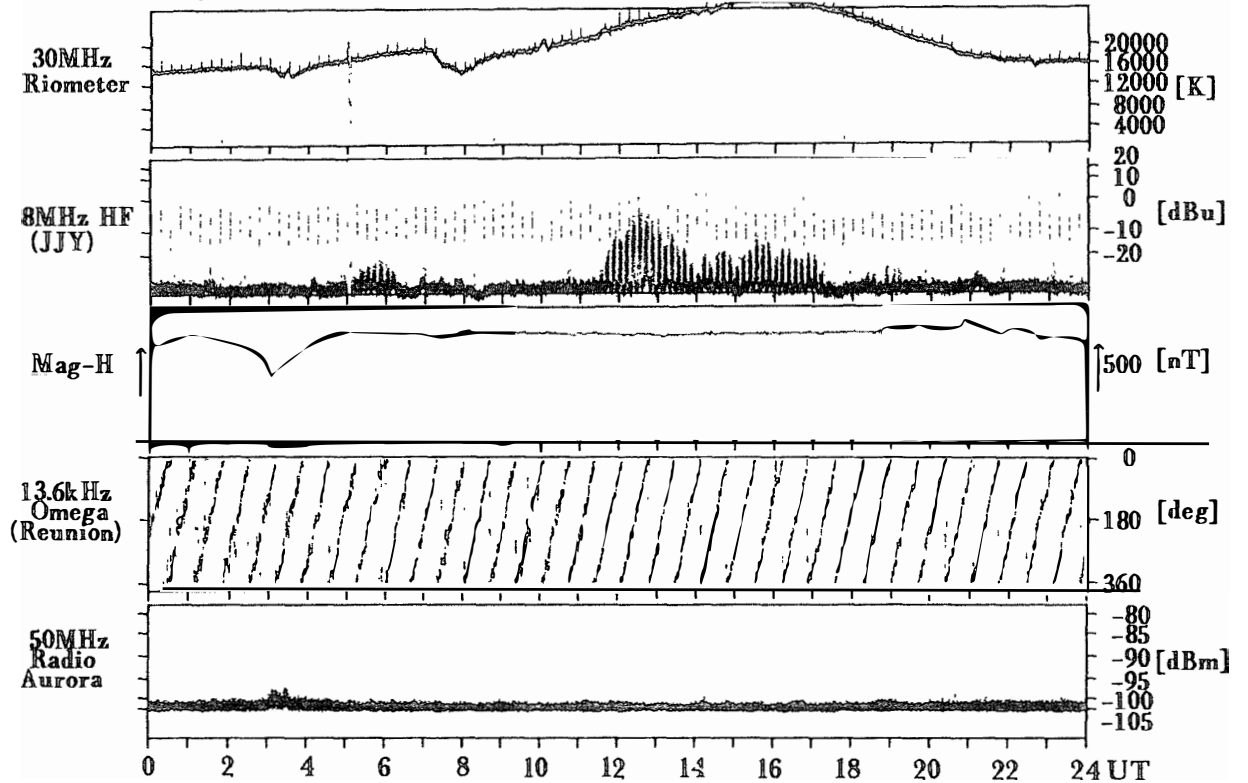
Syowa Station

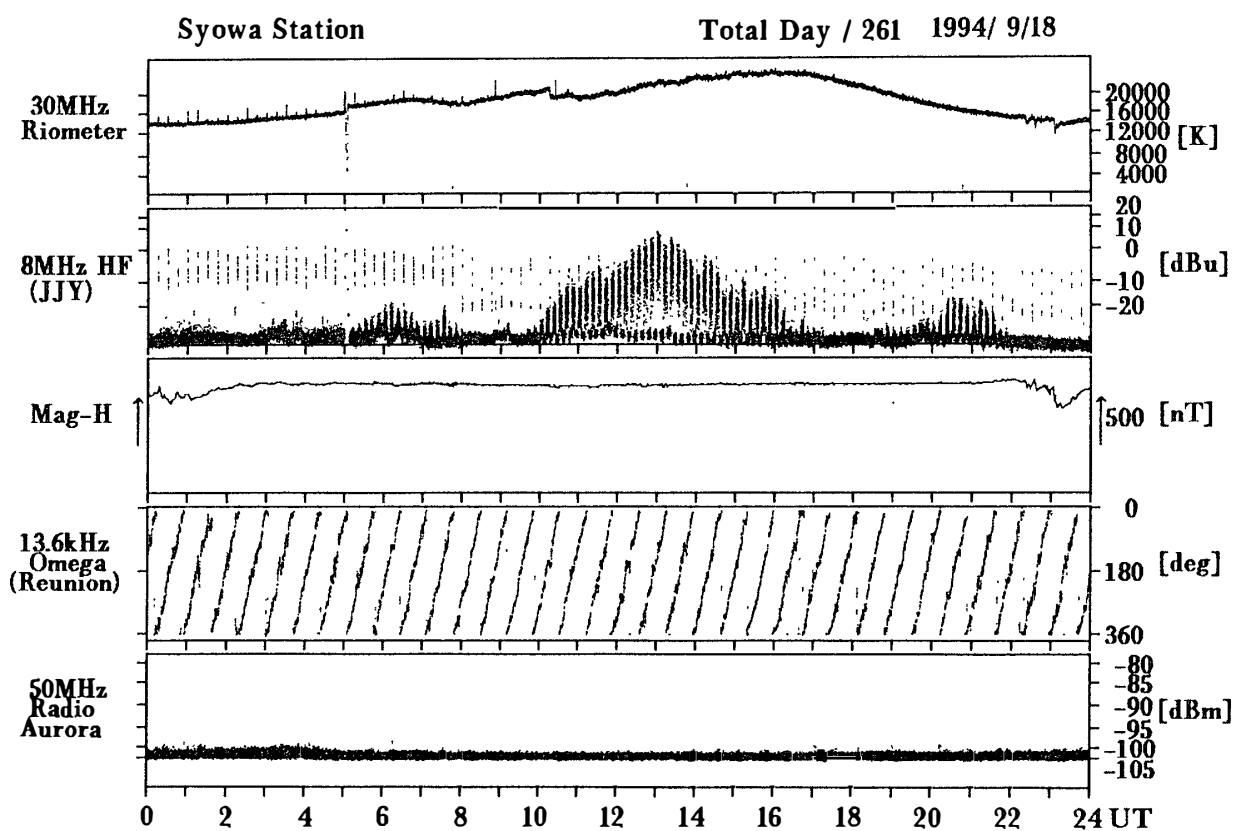
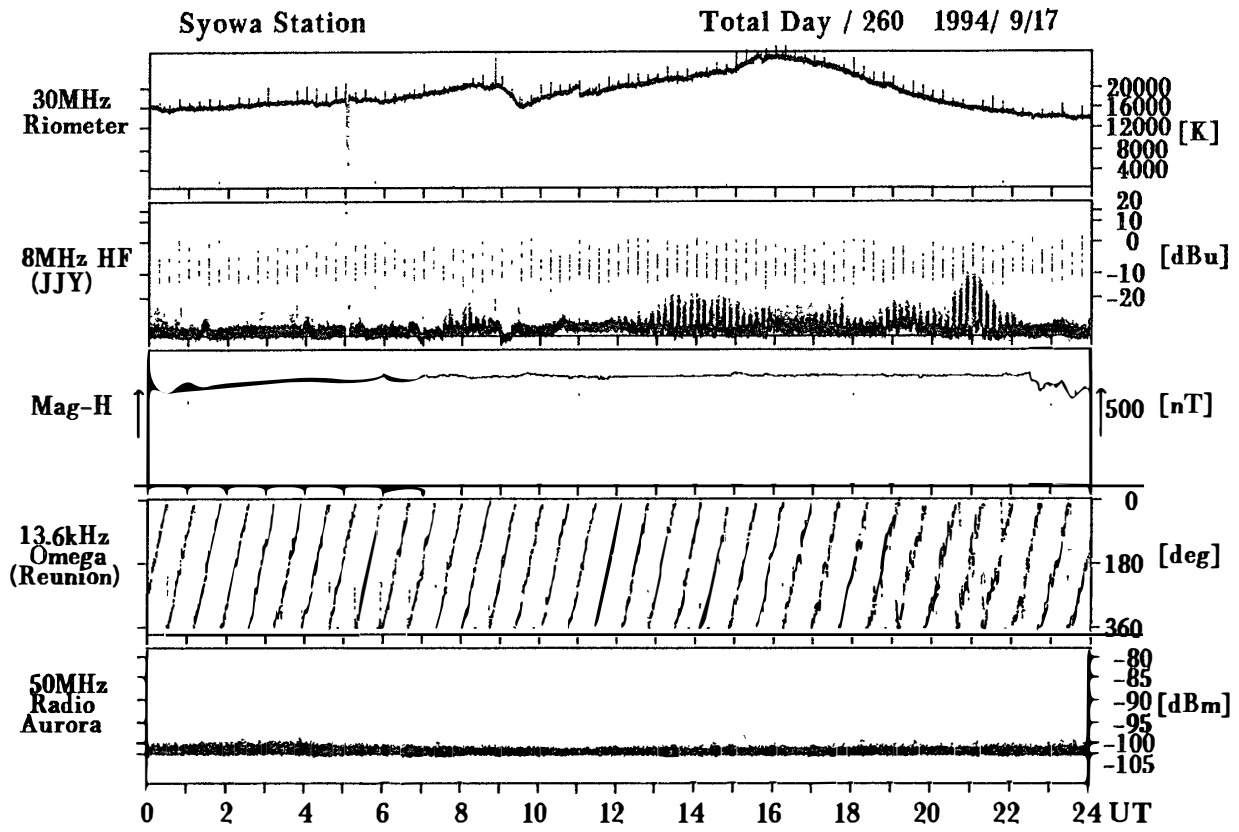
Total Day / 258 1994/ 9/15

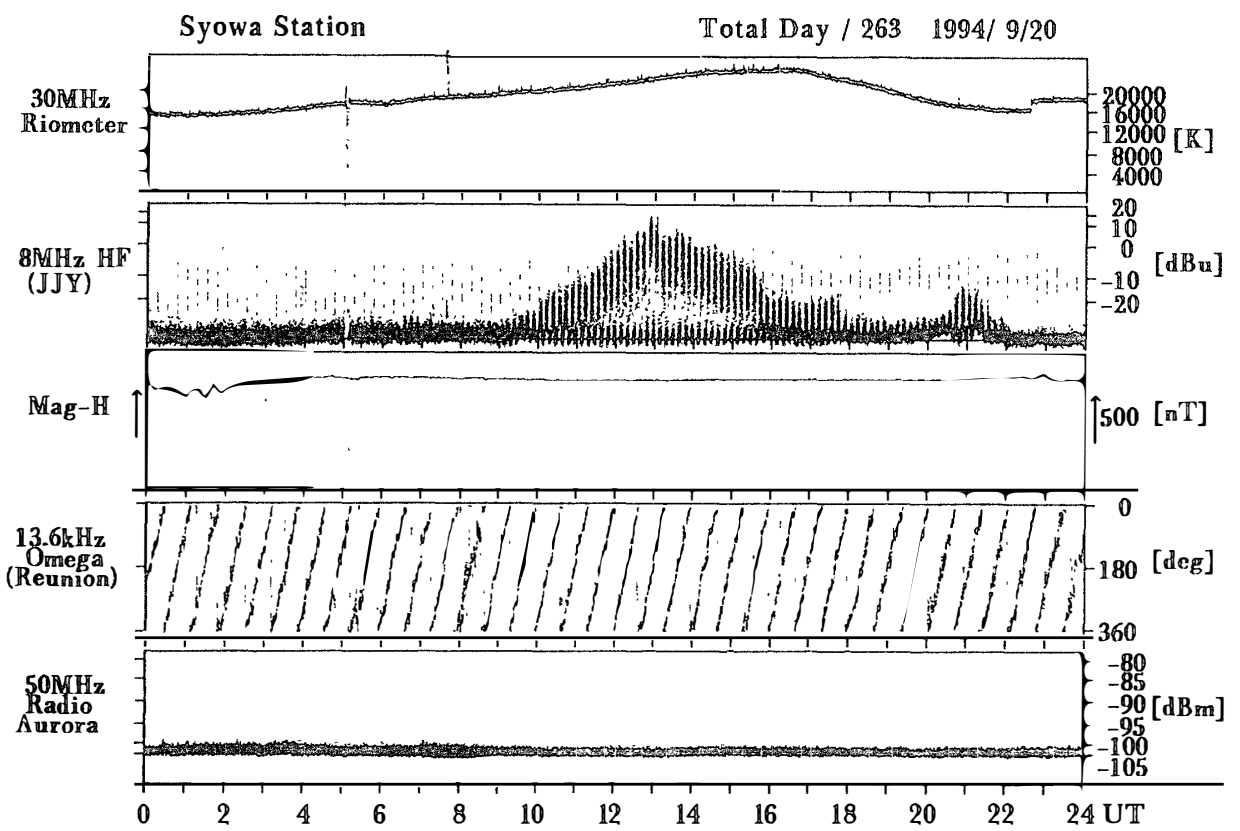
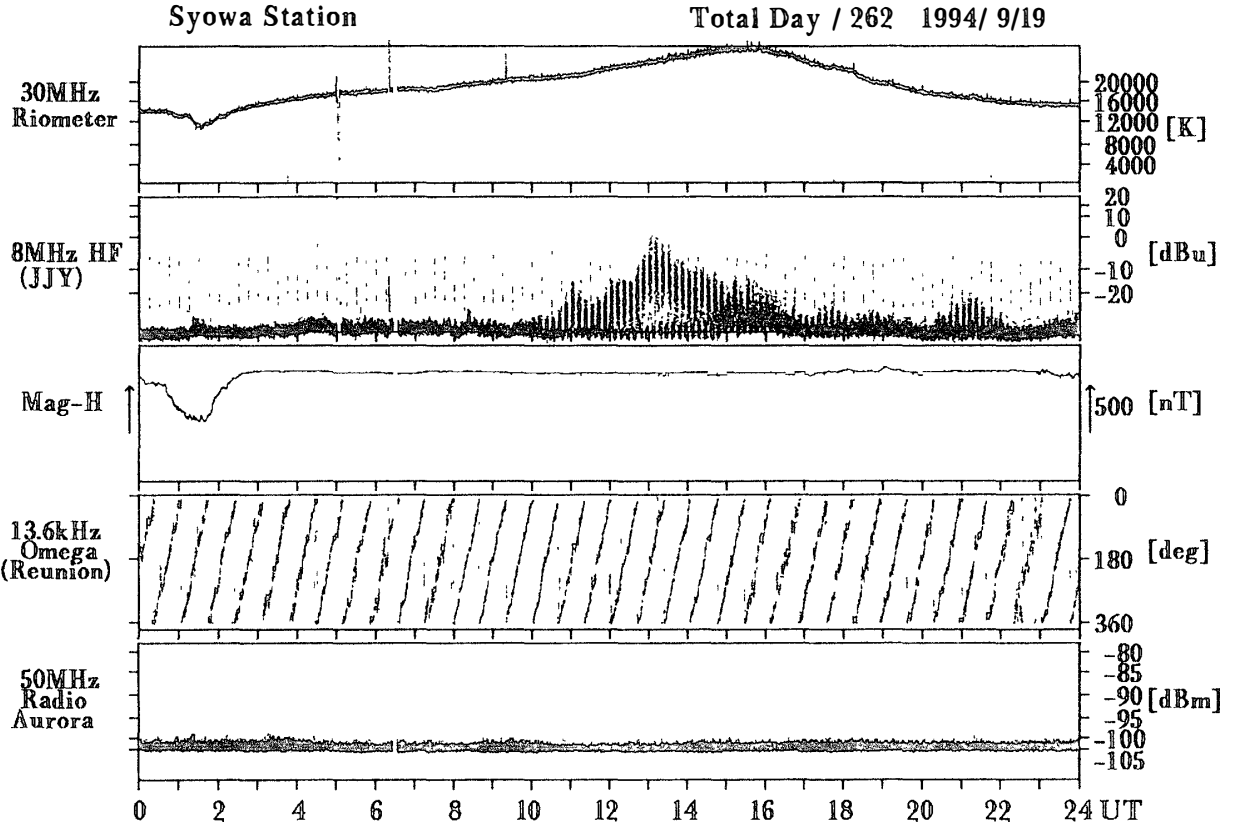


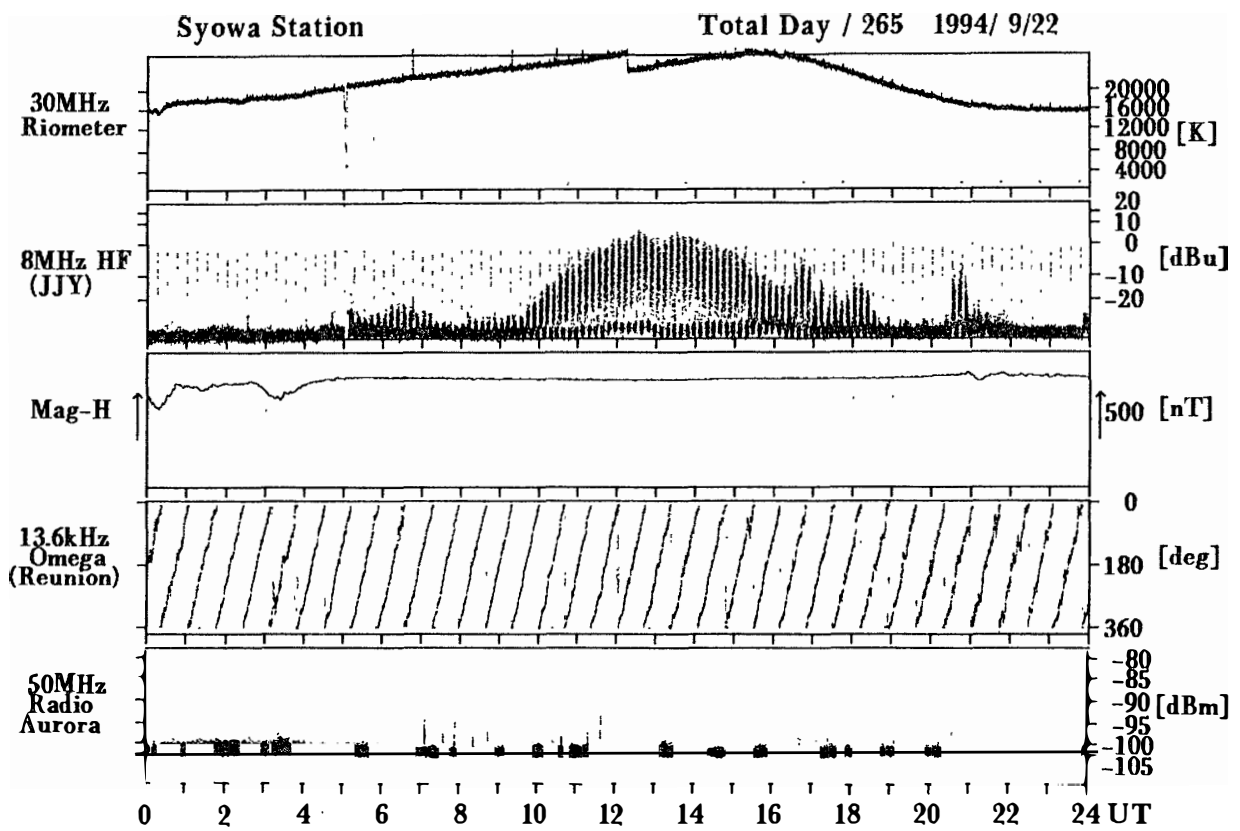
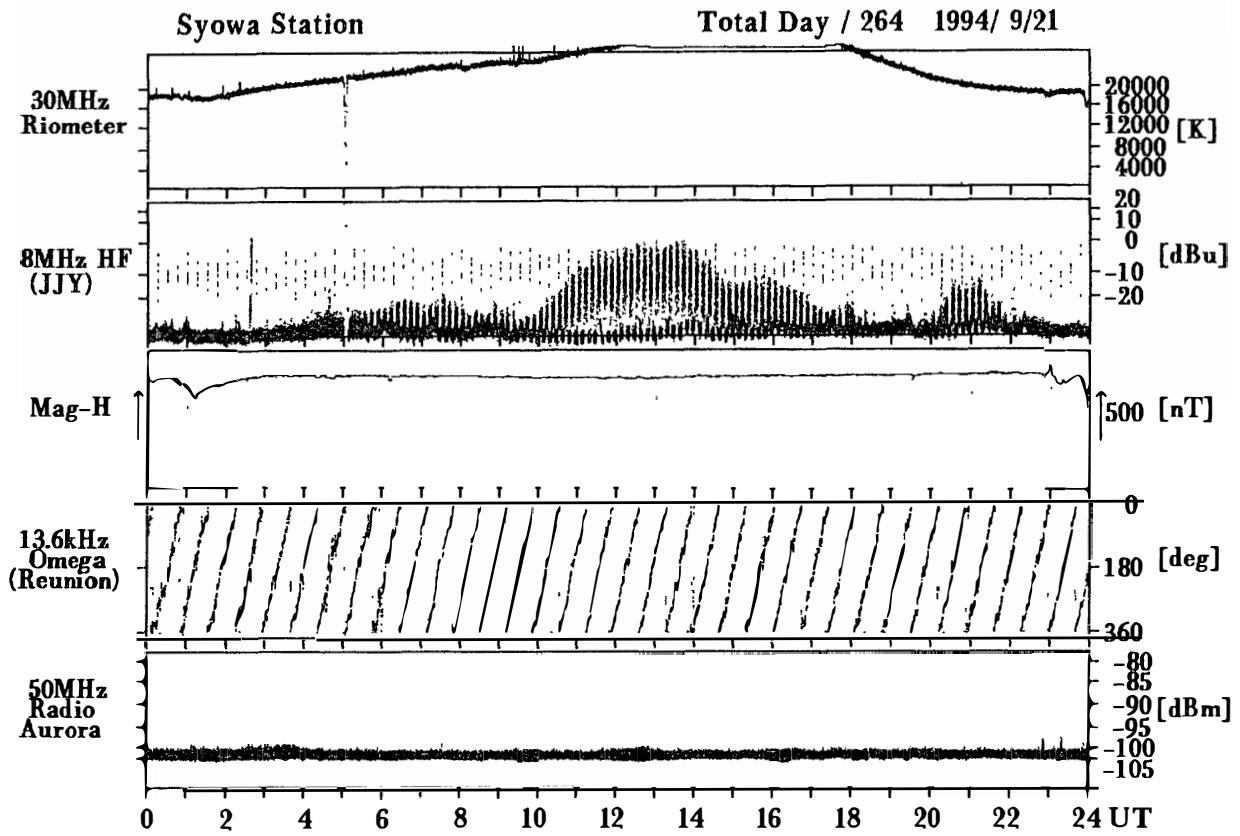
Syowa Station

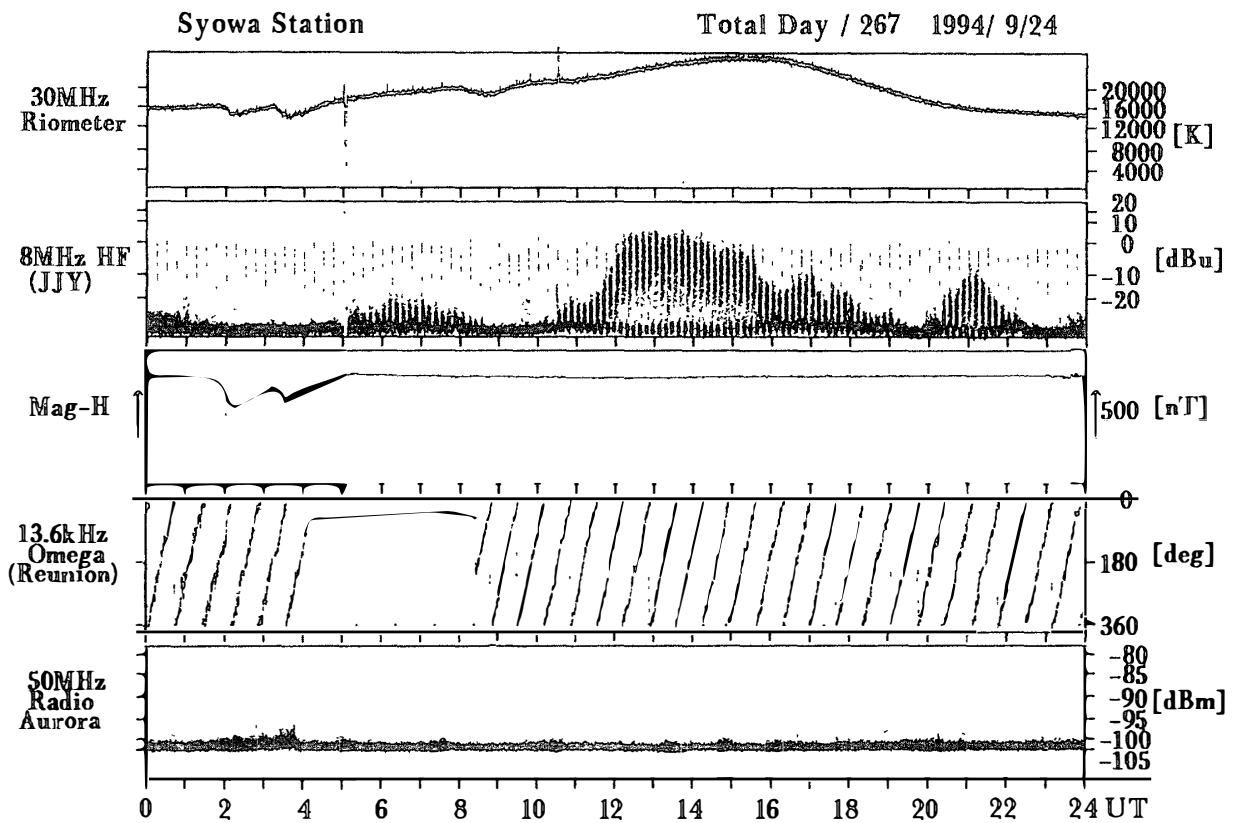
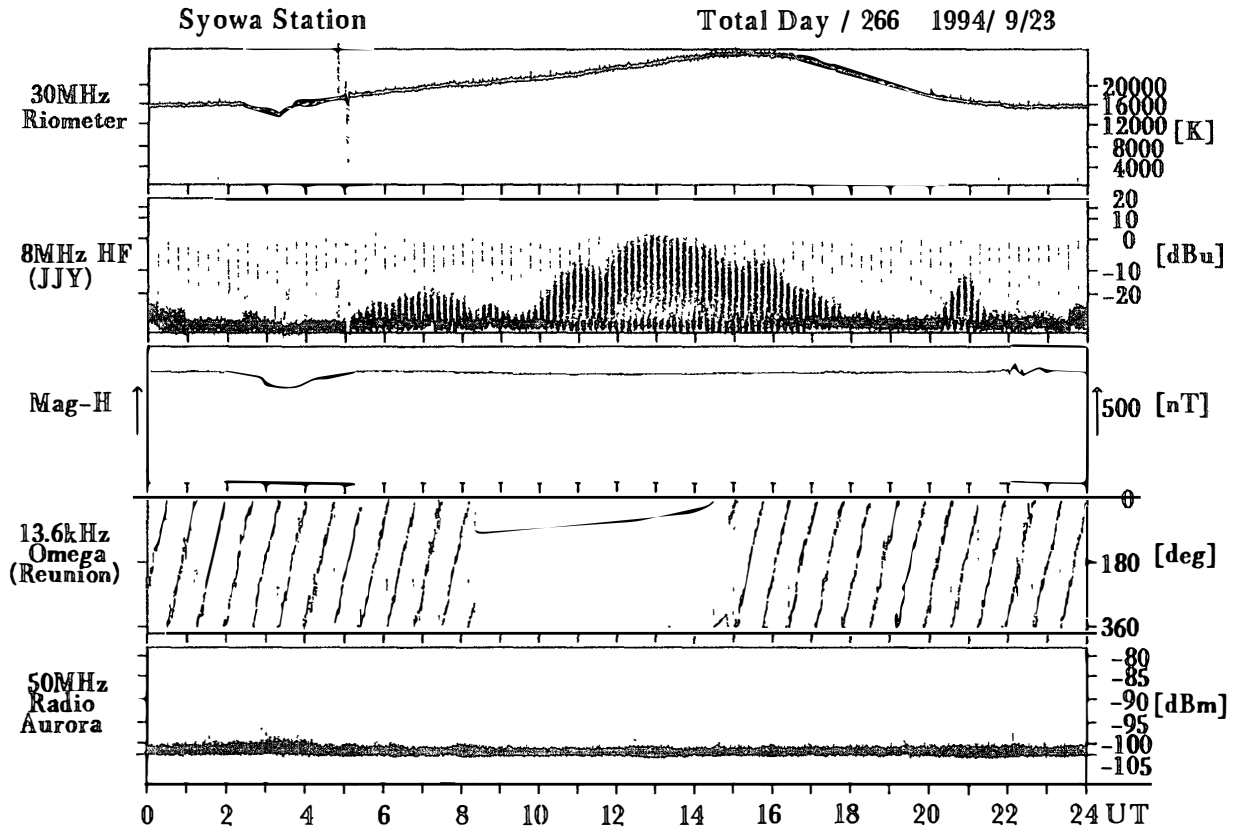
Total Day / 259 1994/ 9/16

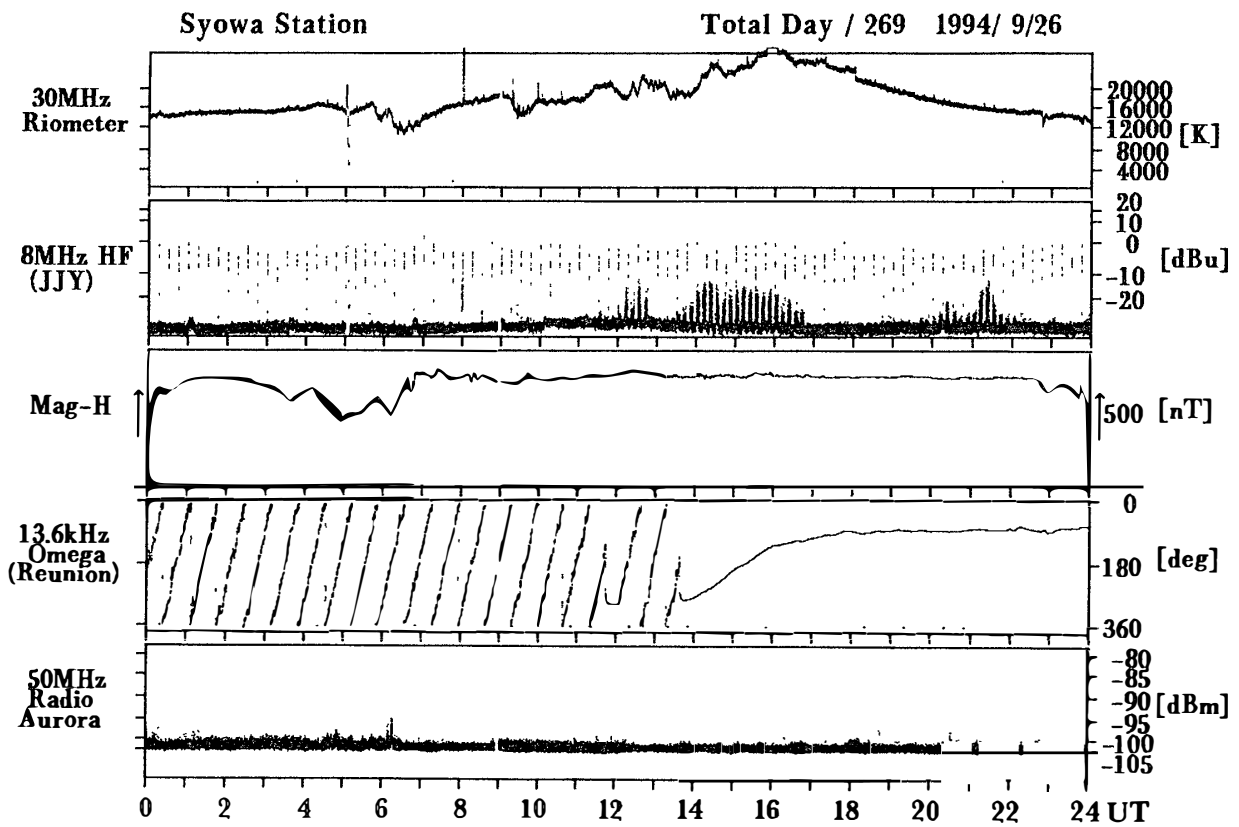
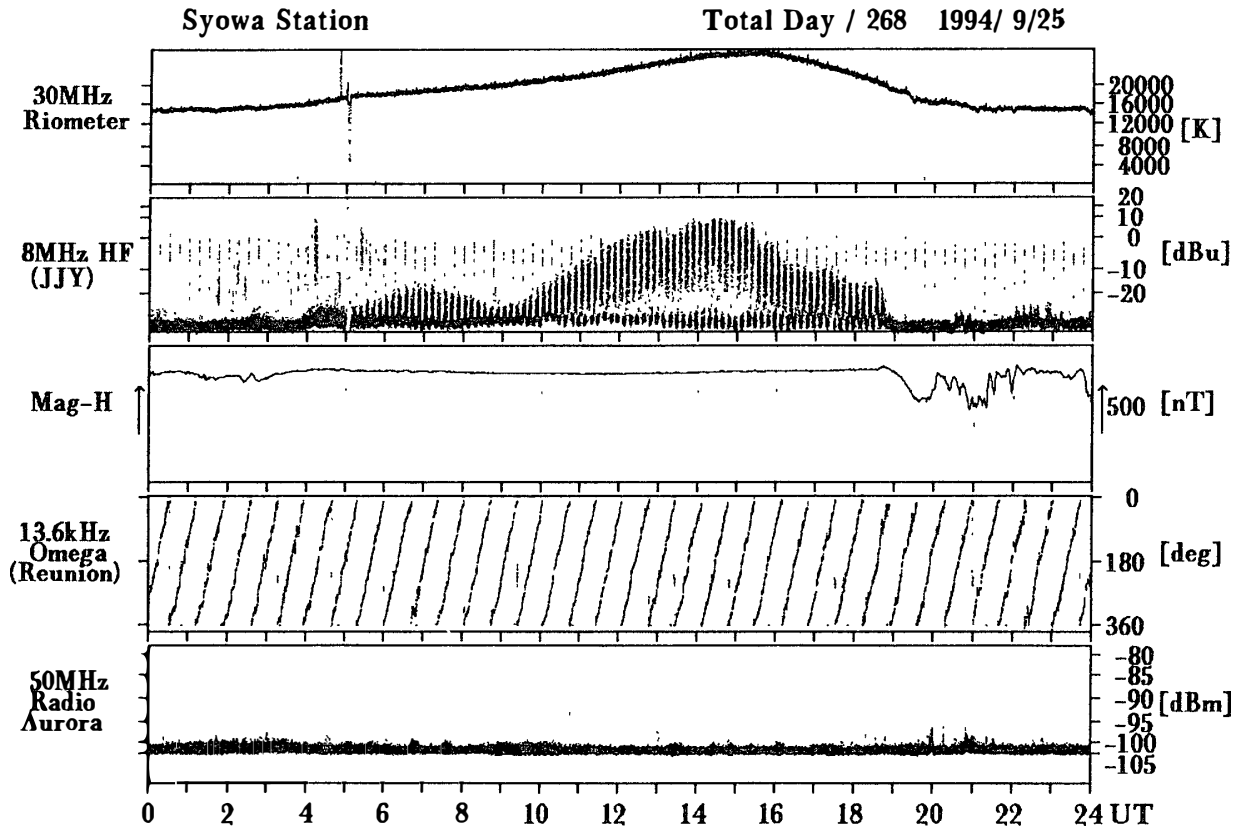


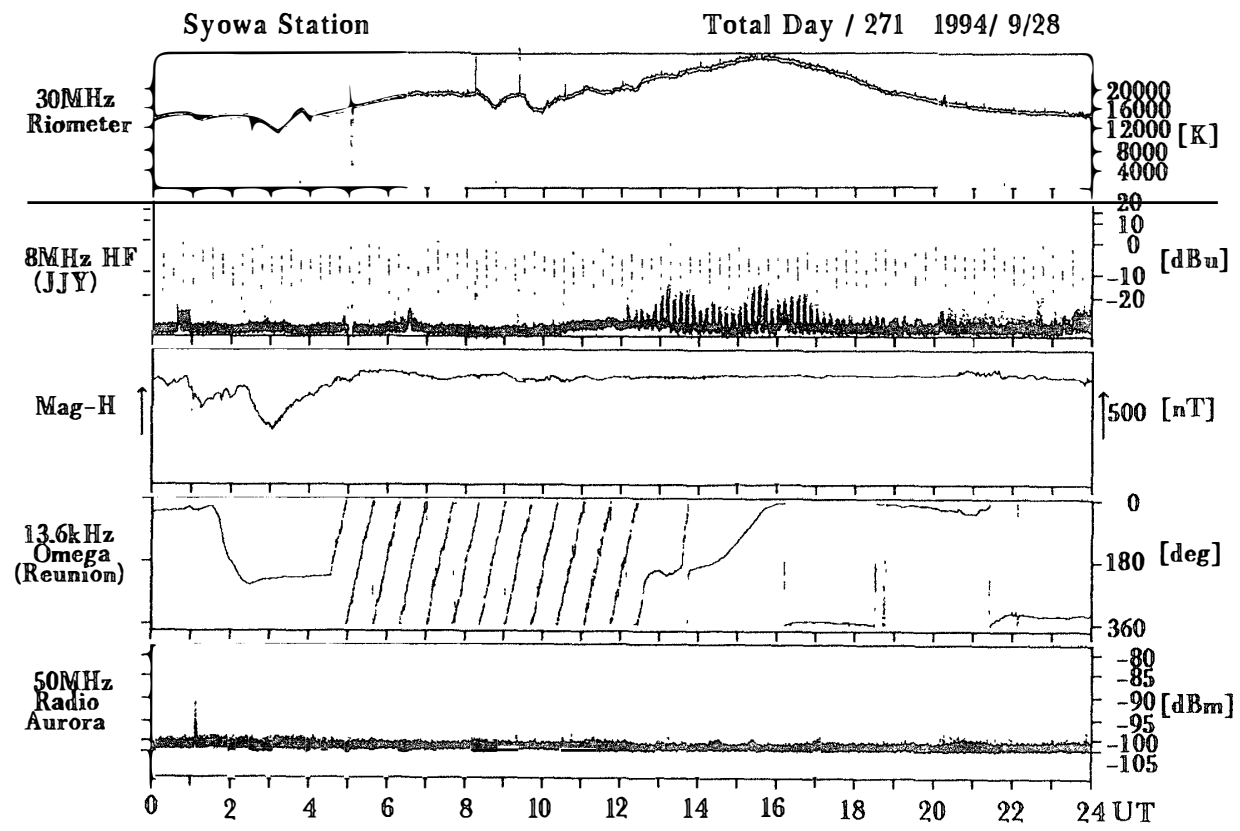
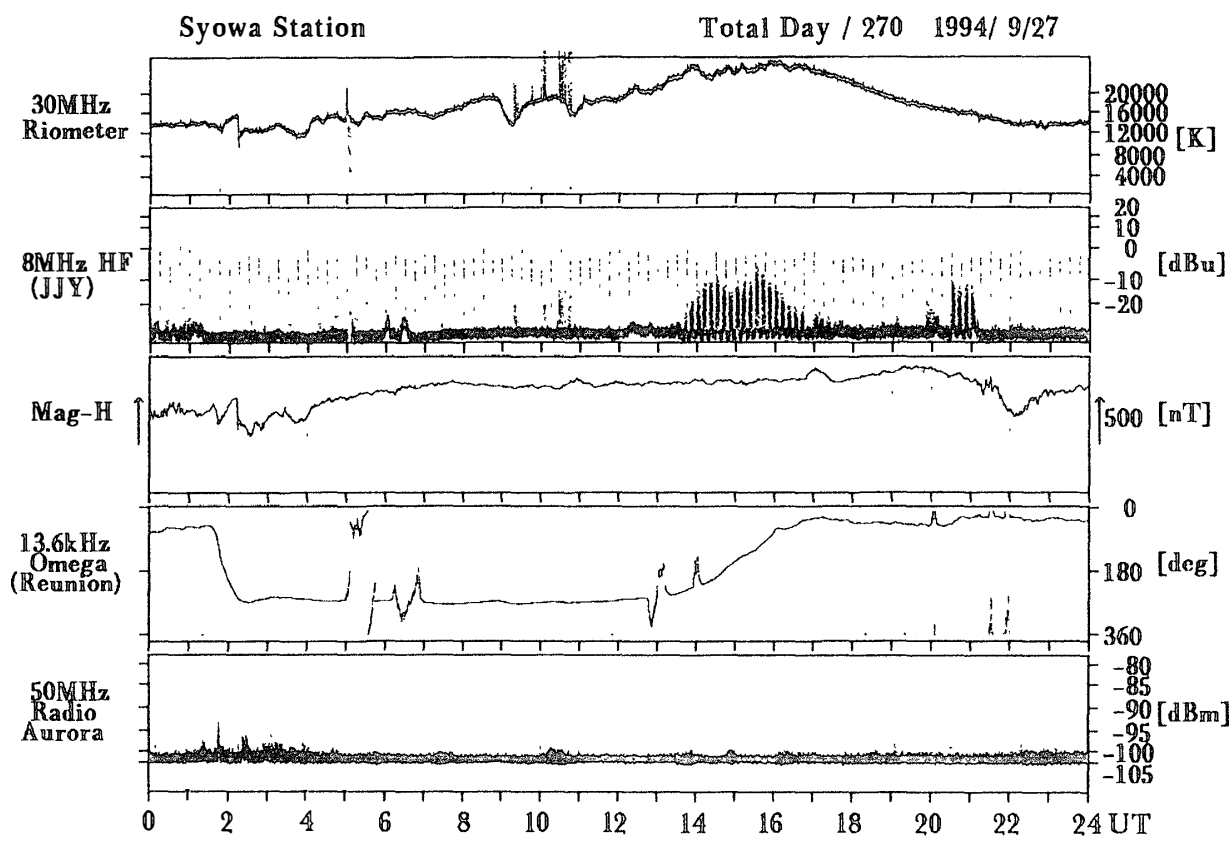


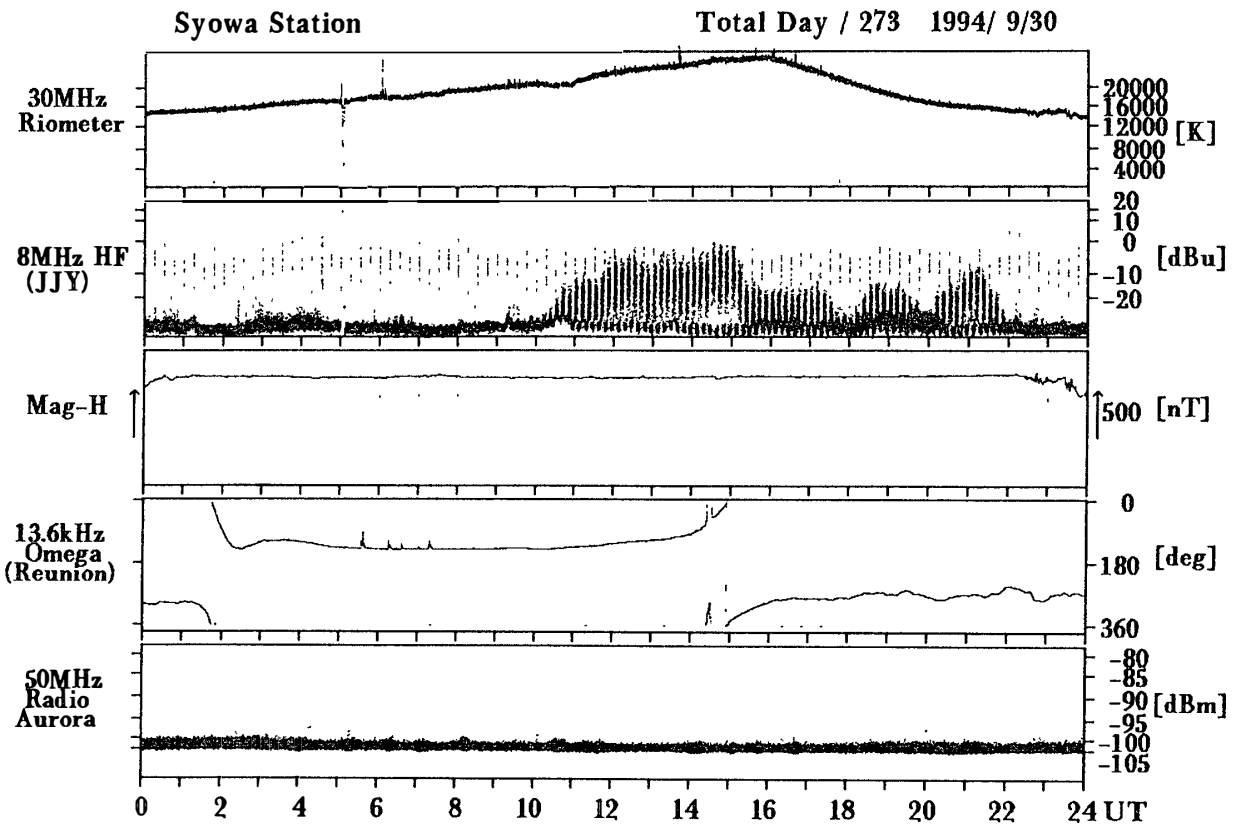
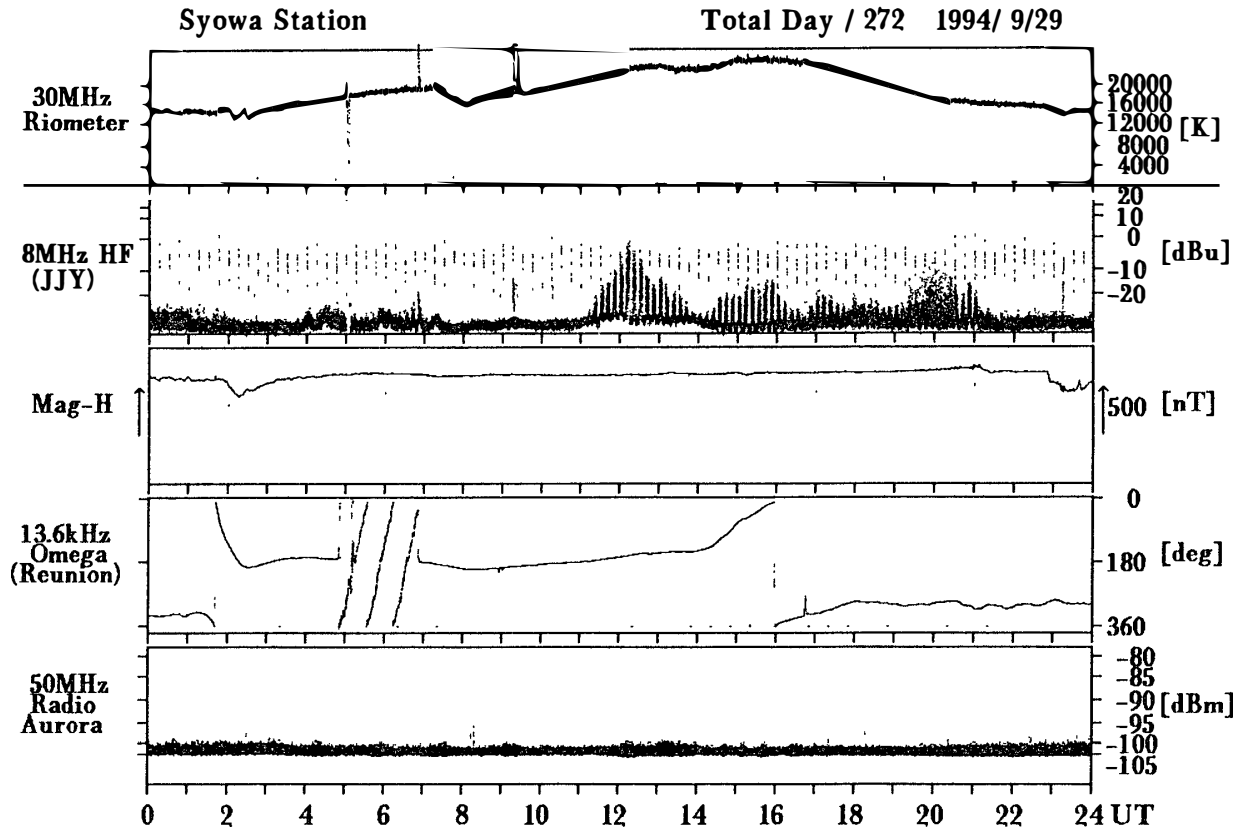


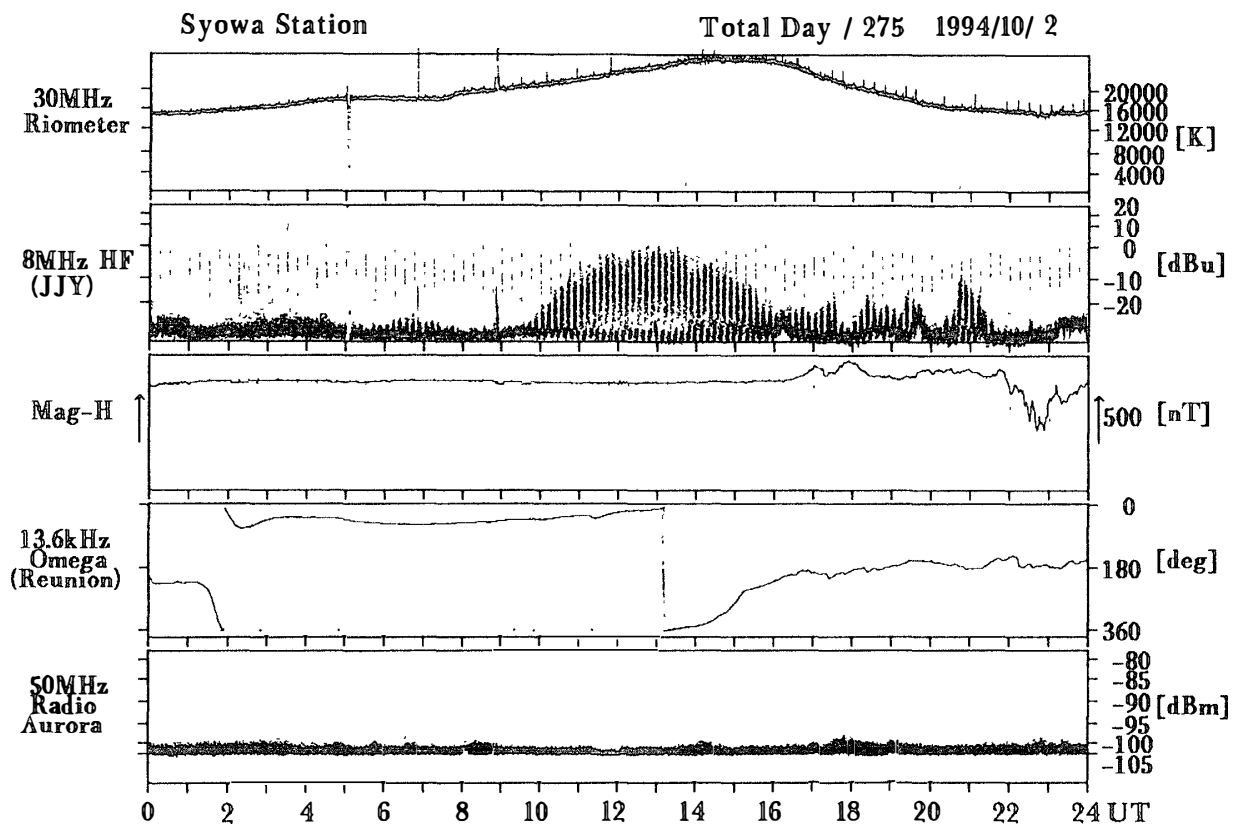
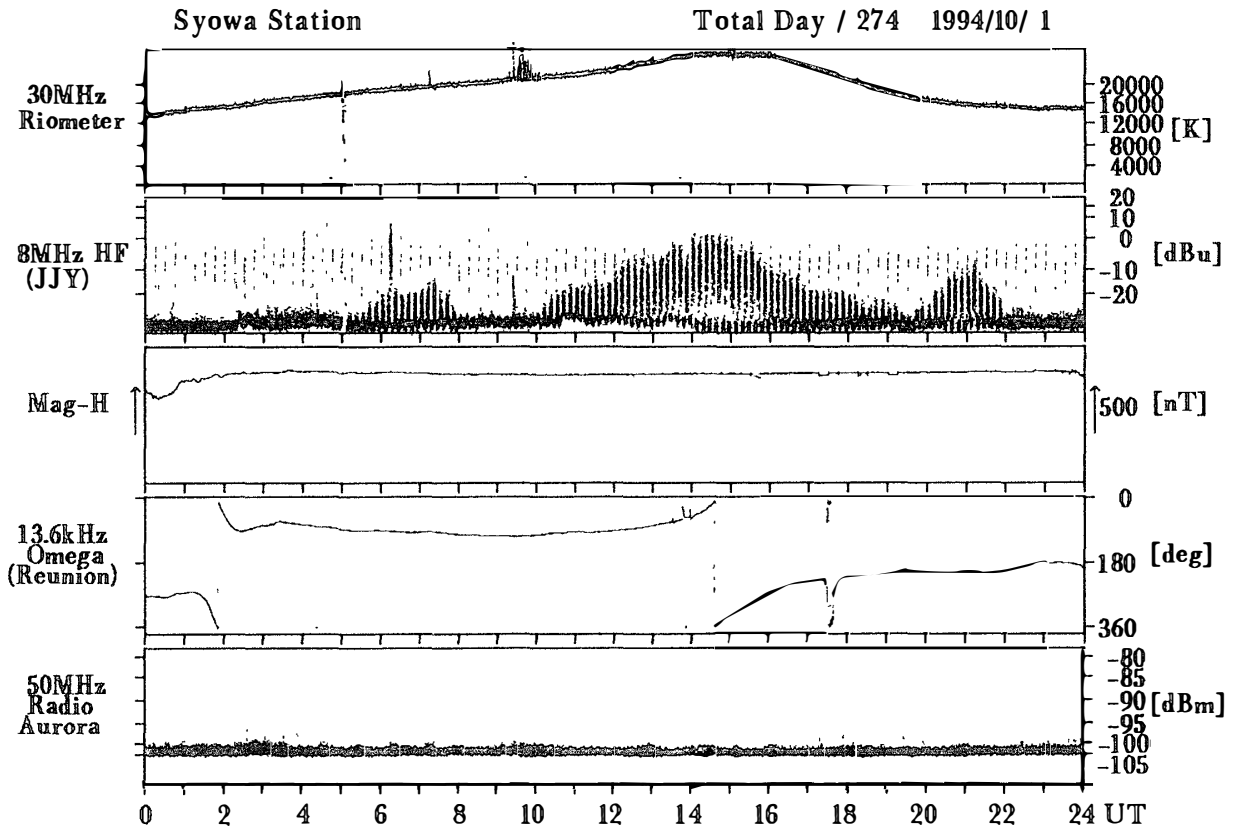


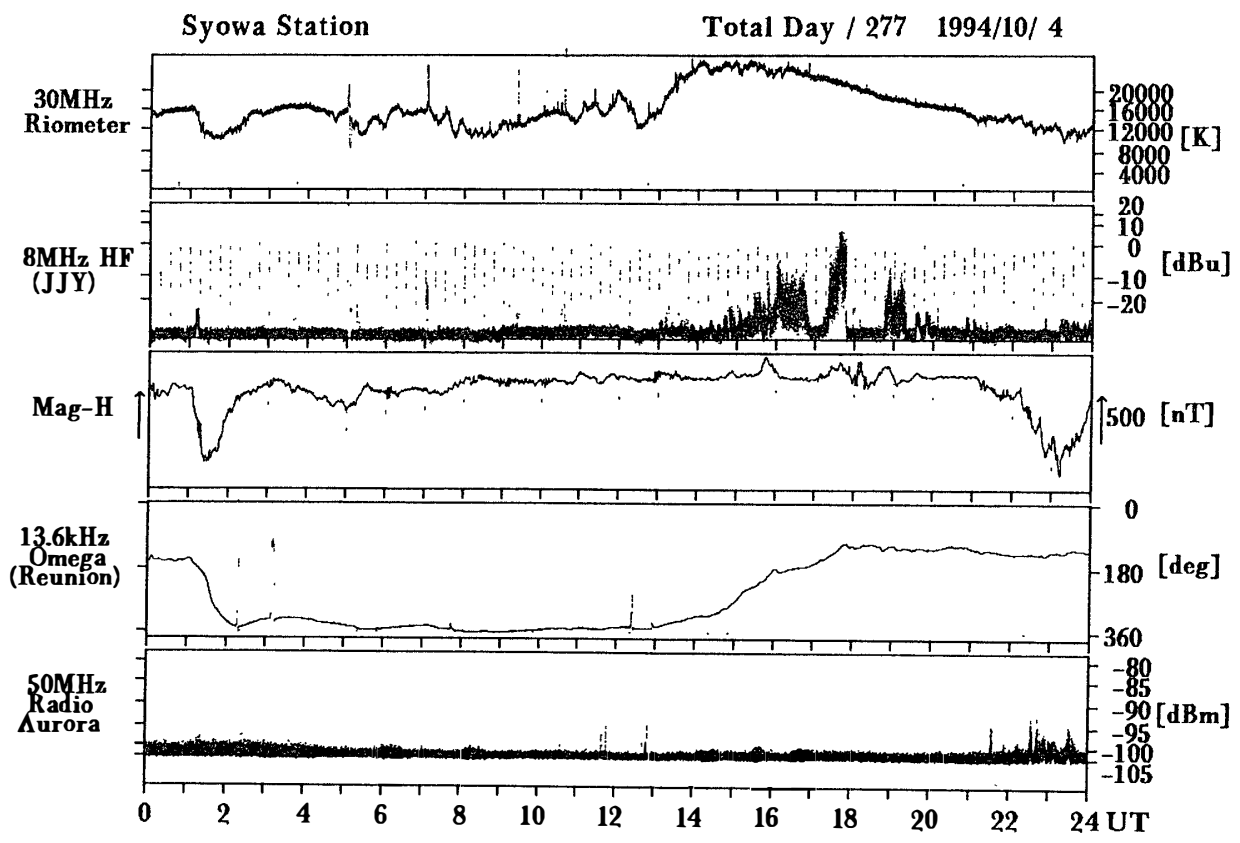
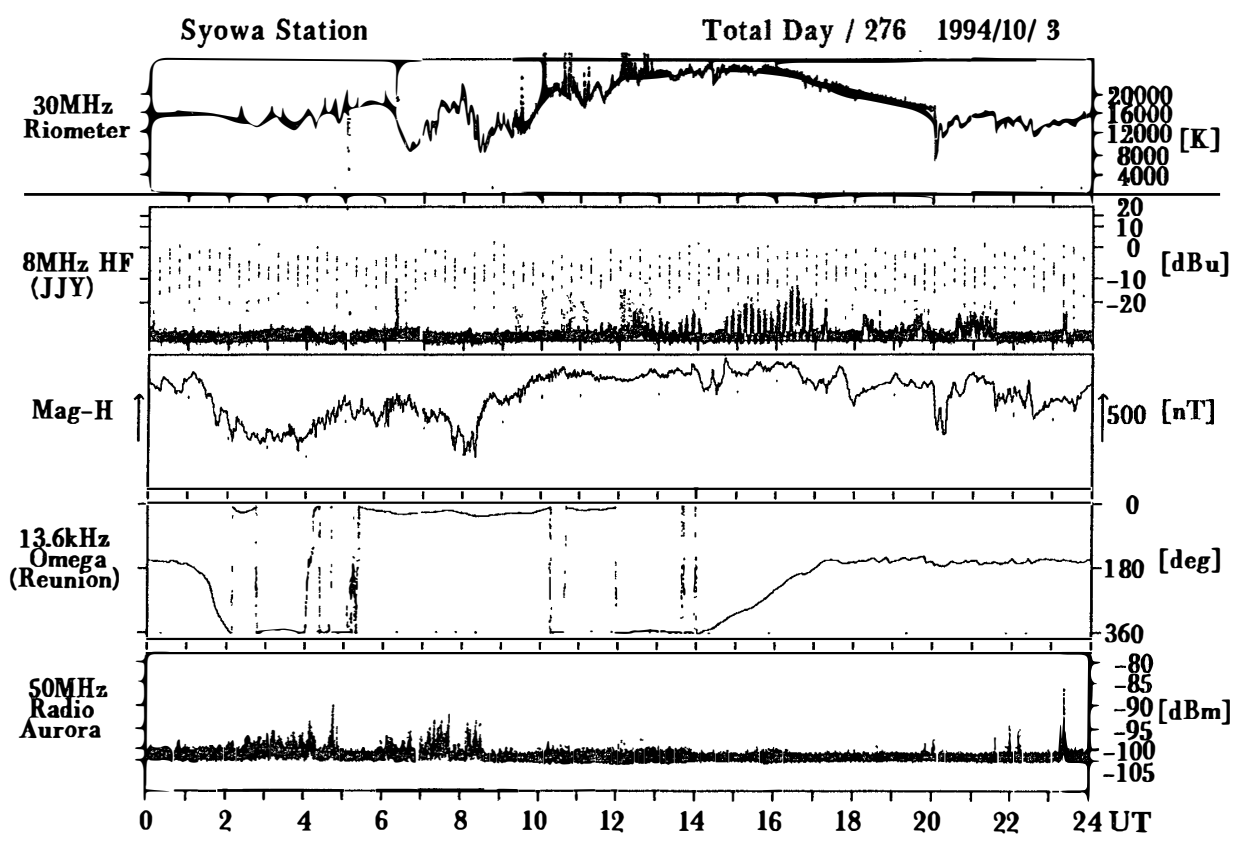


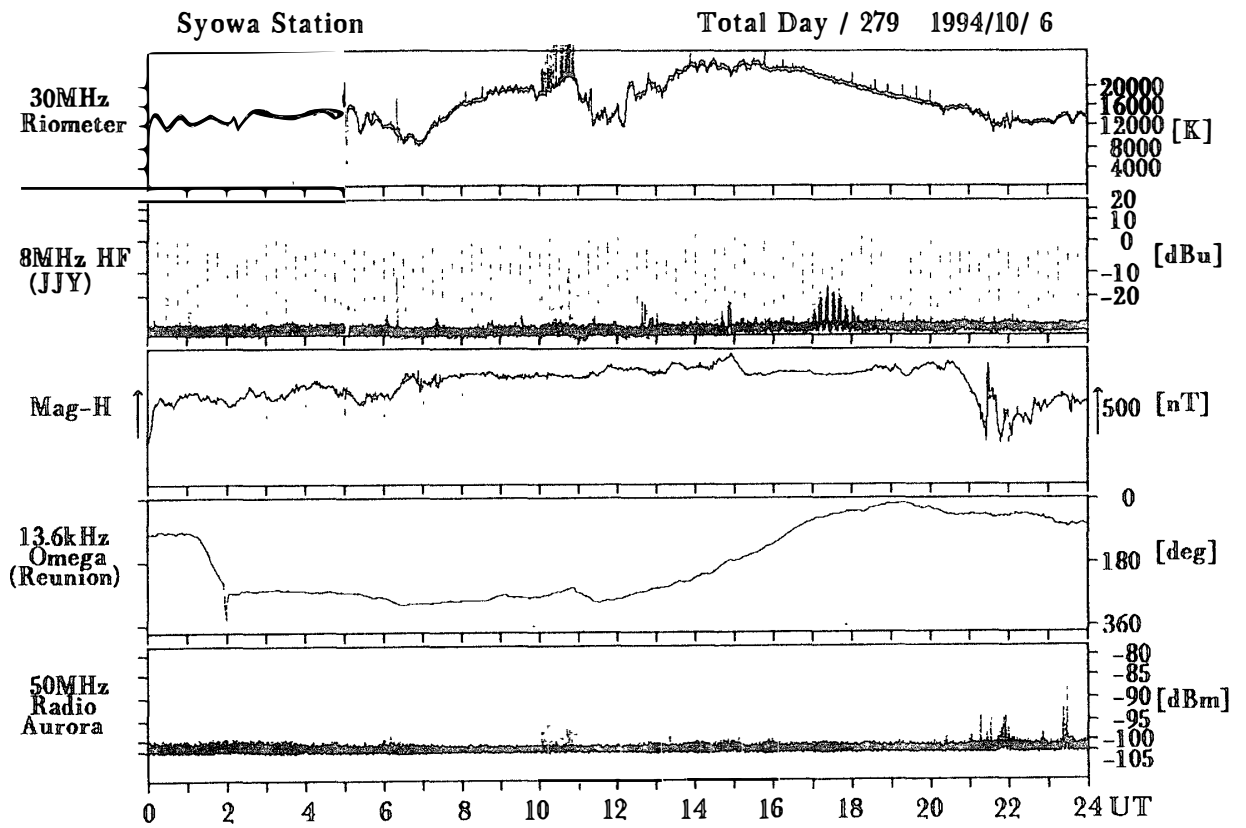
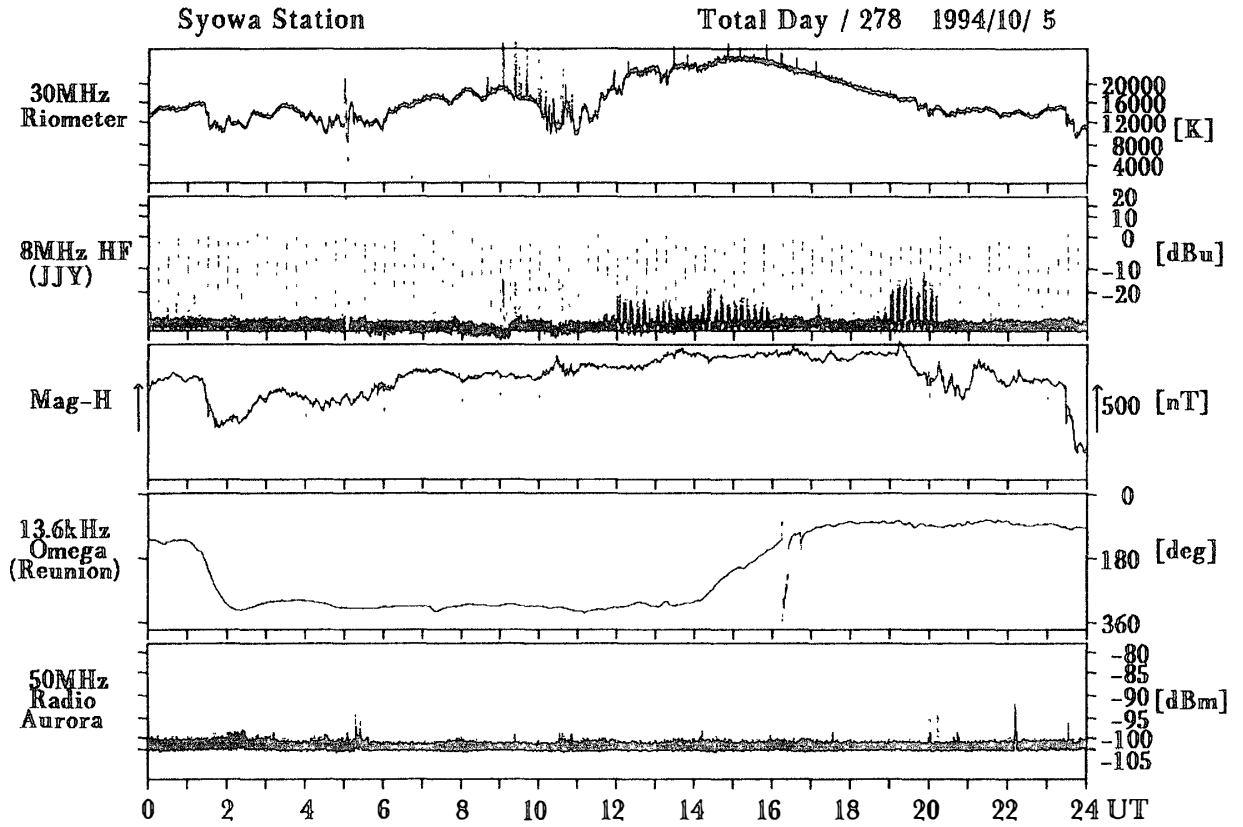


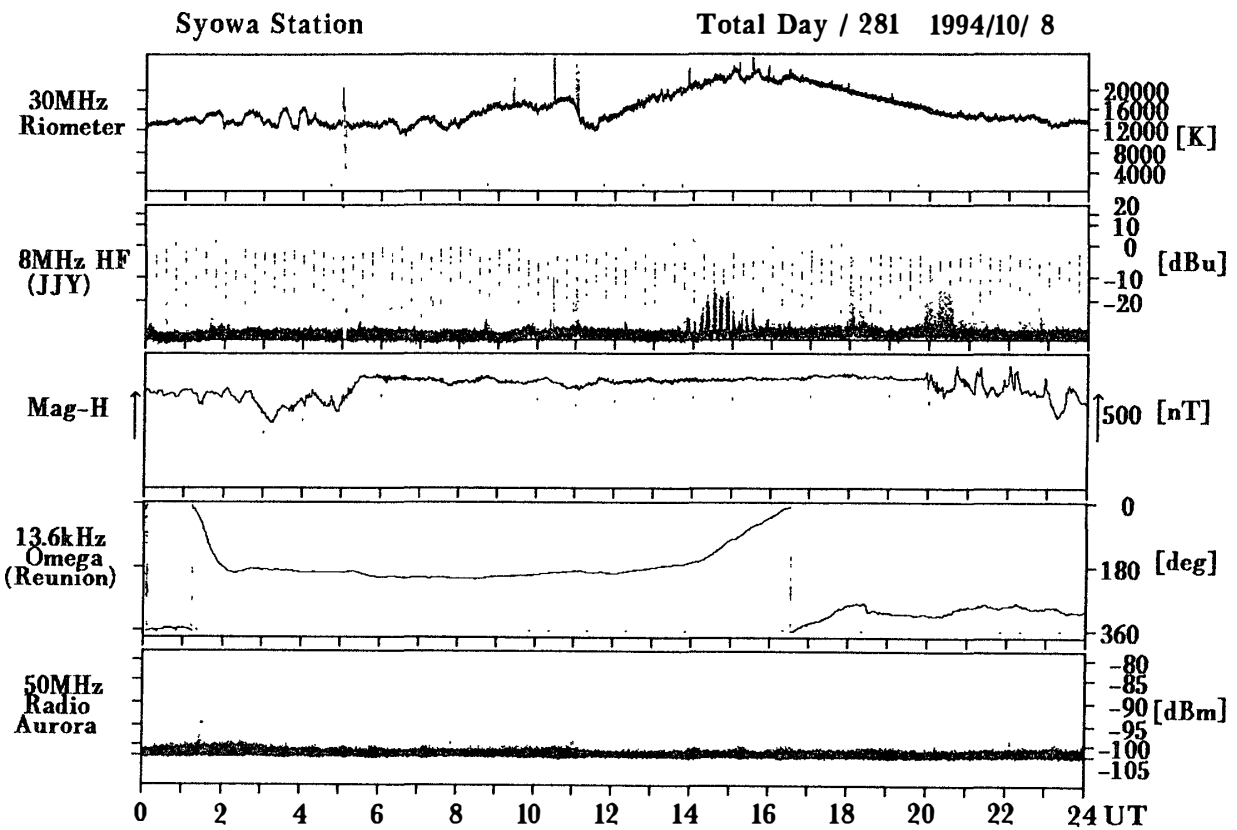
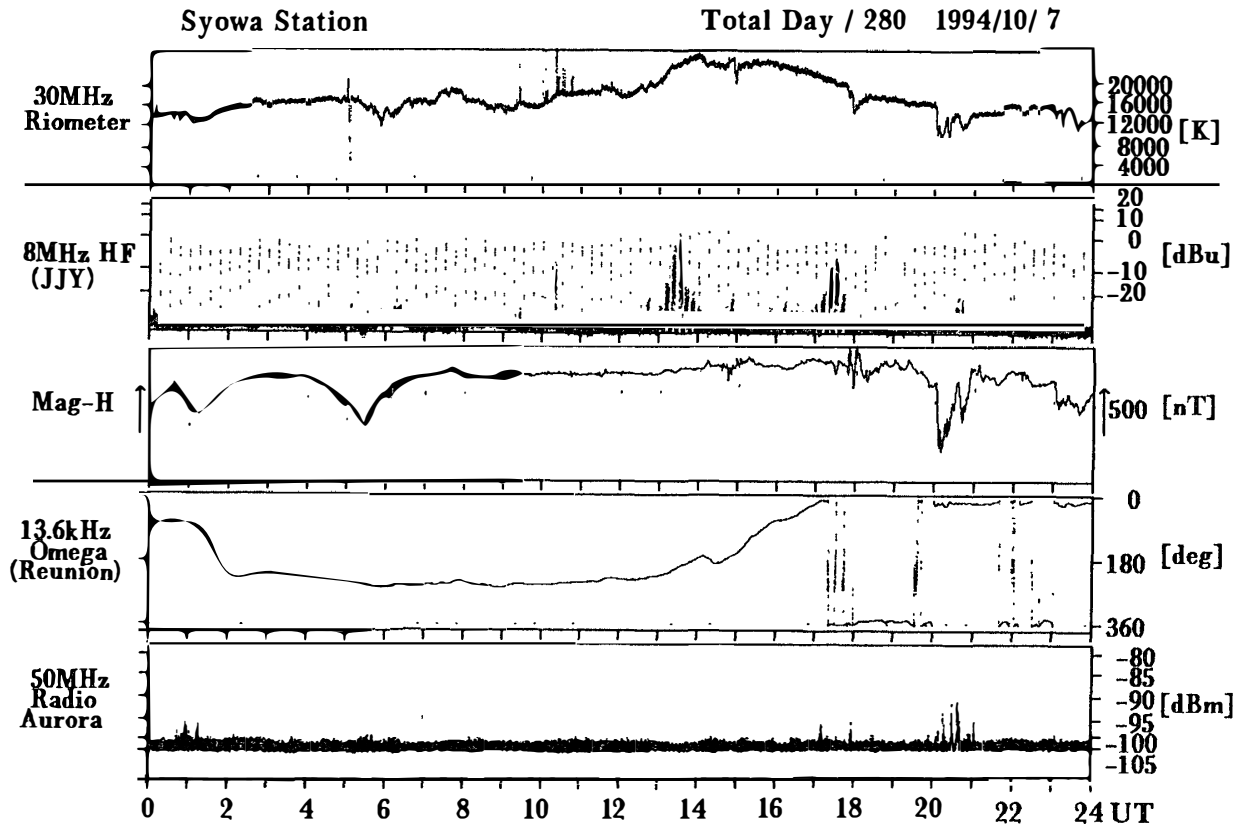


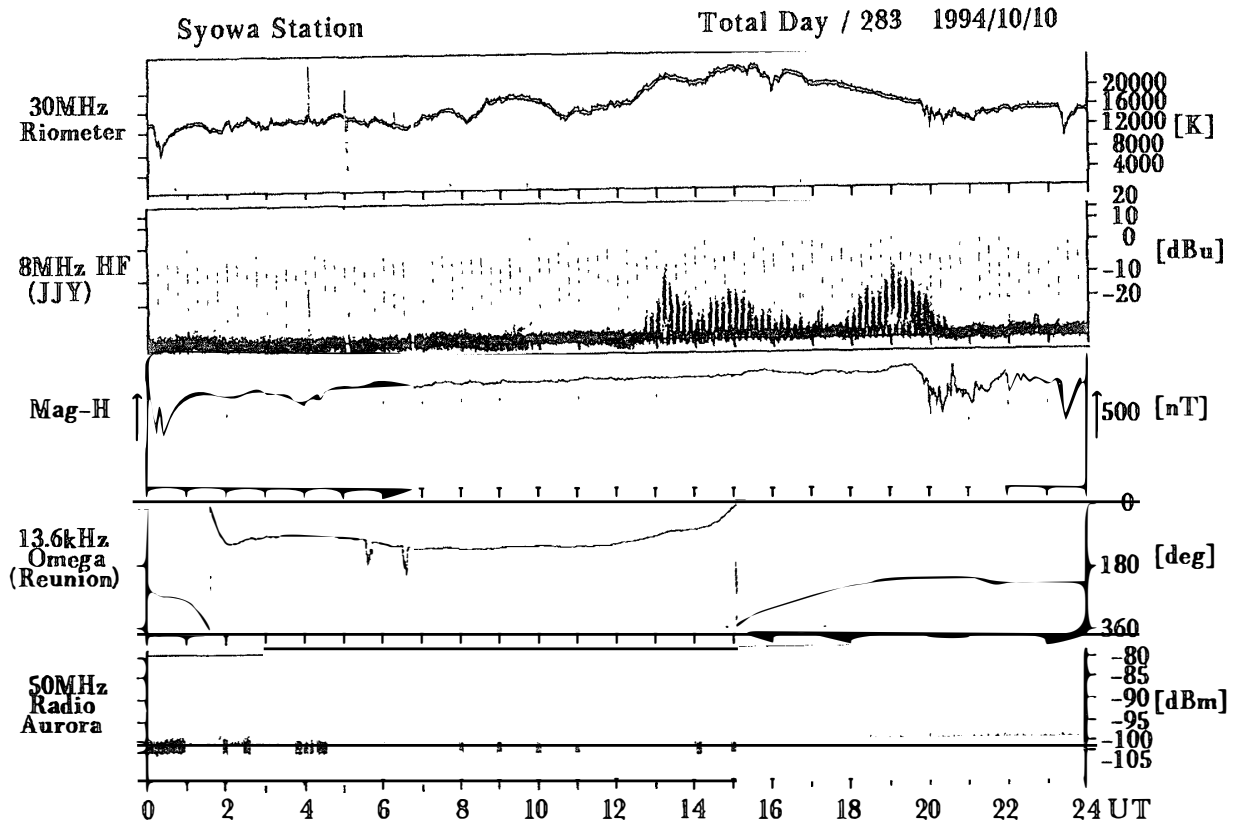
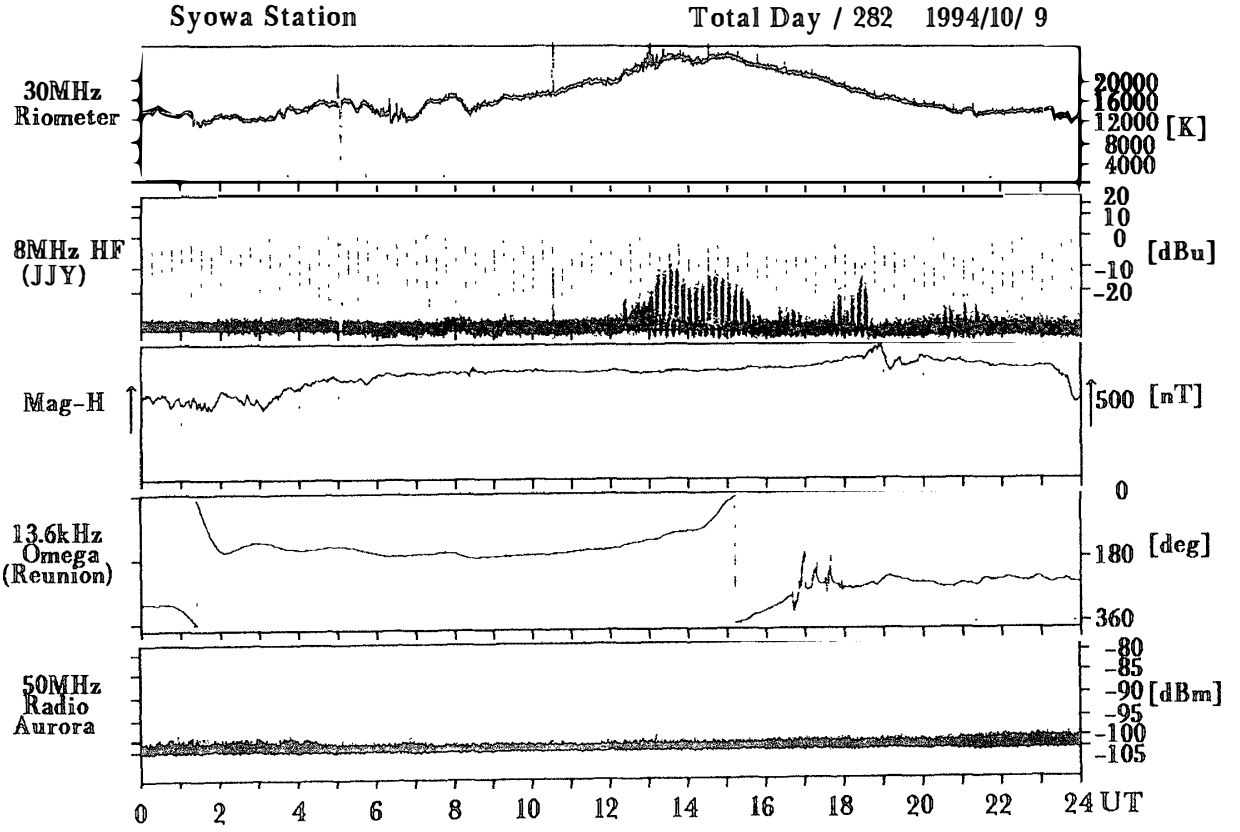


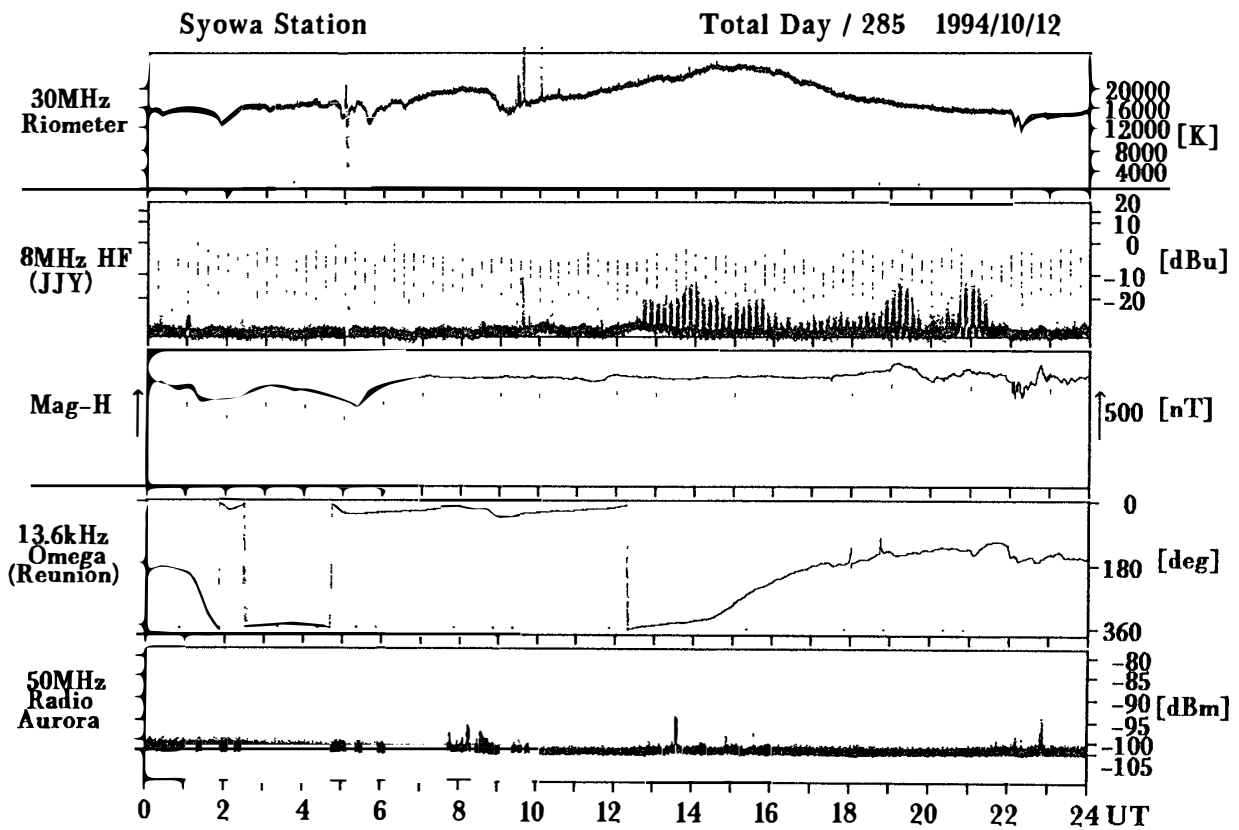
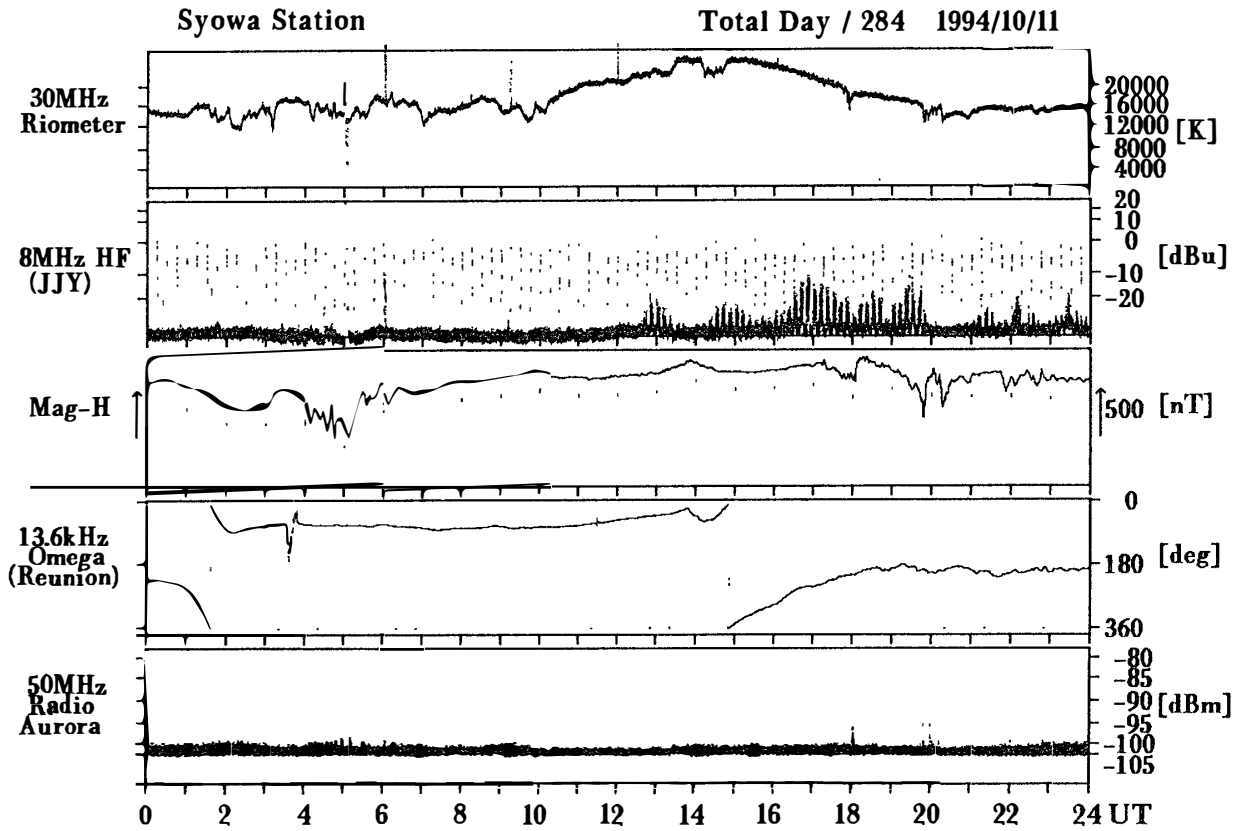


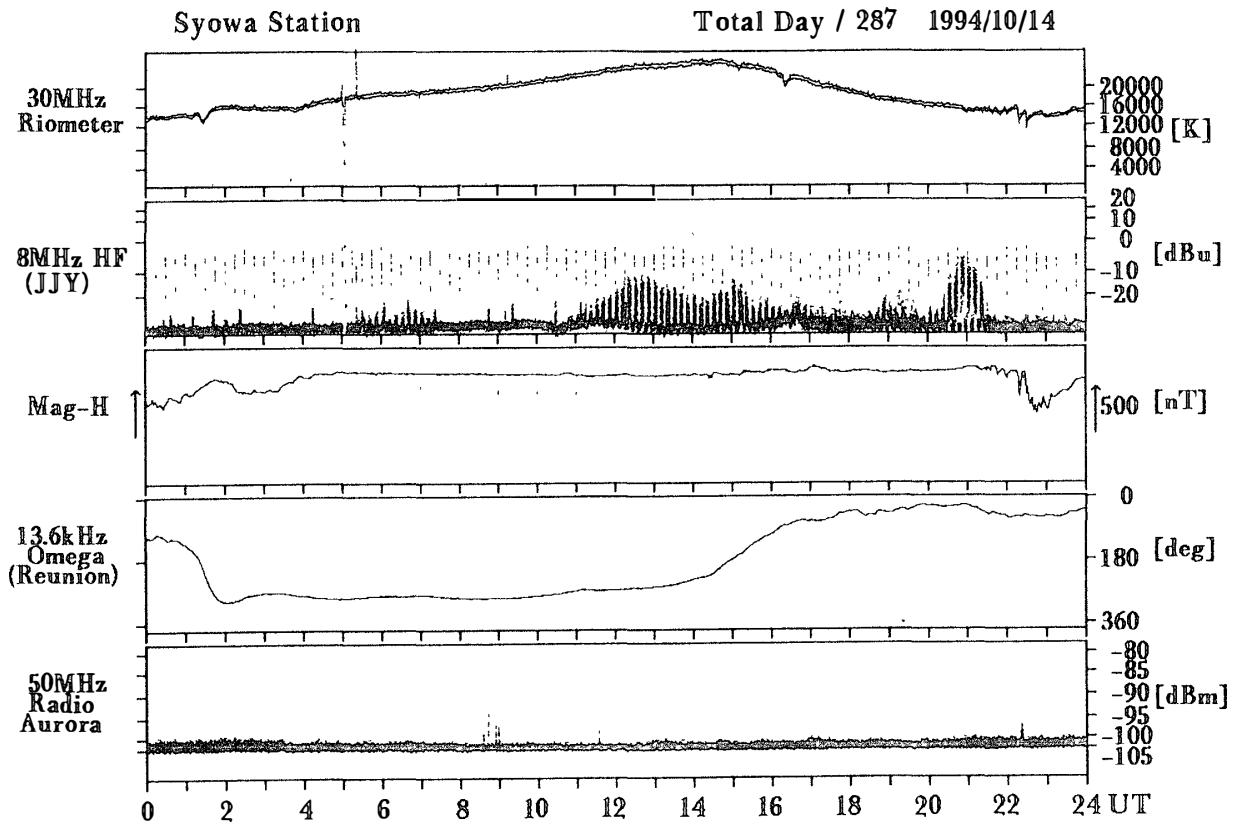
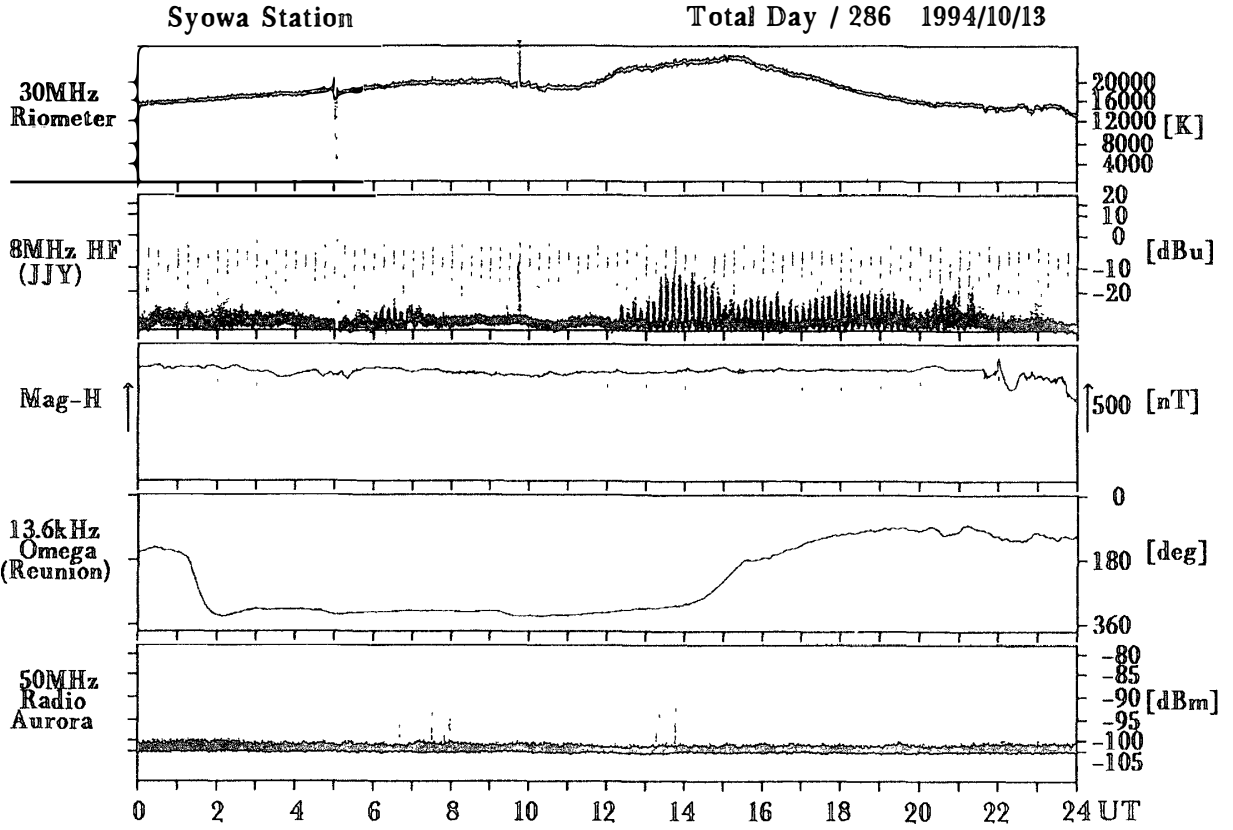


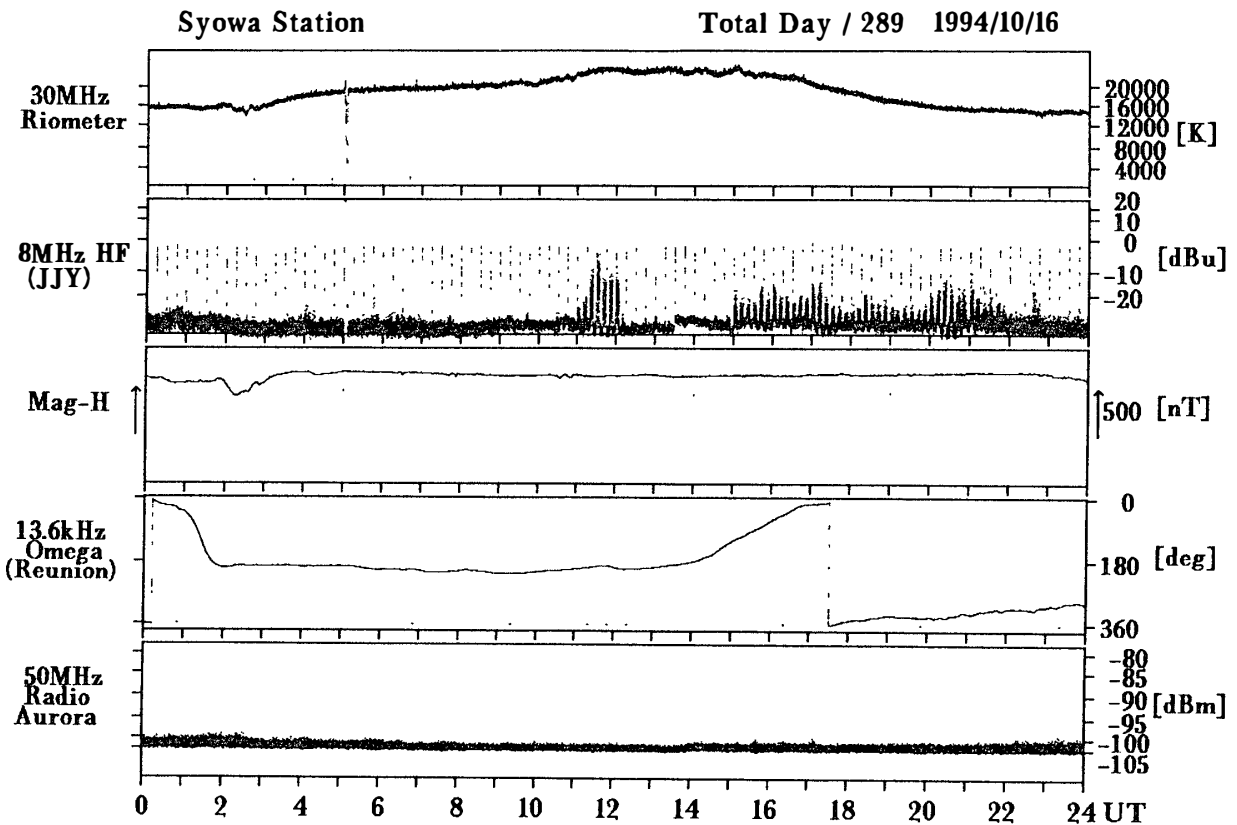
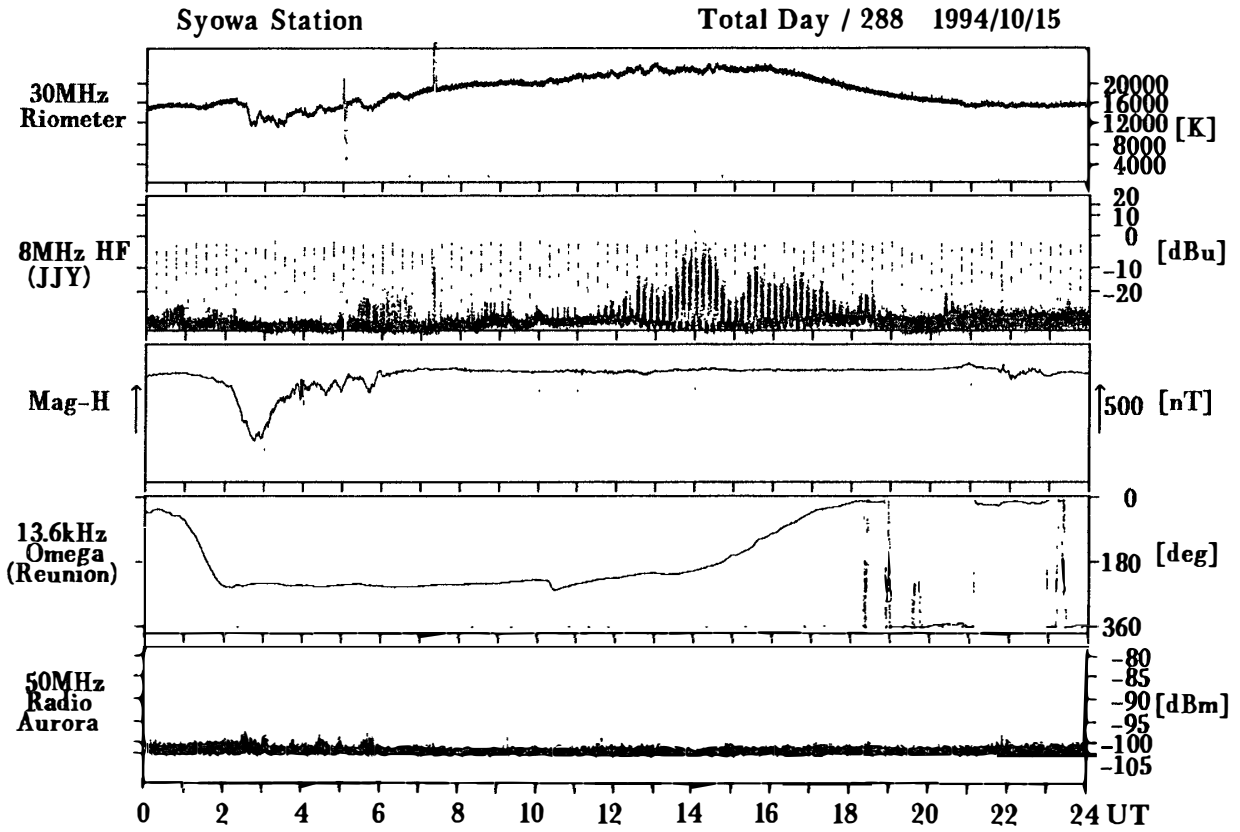


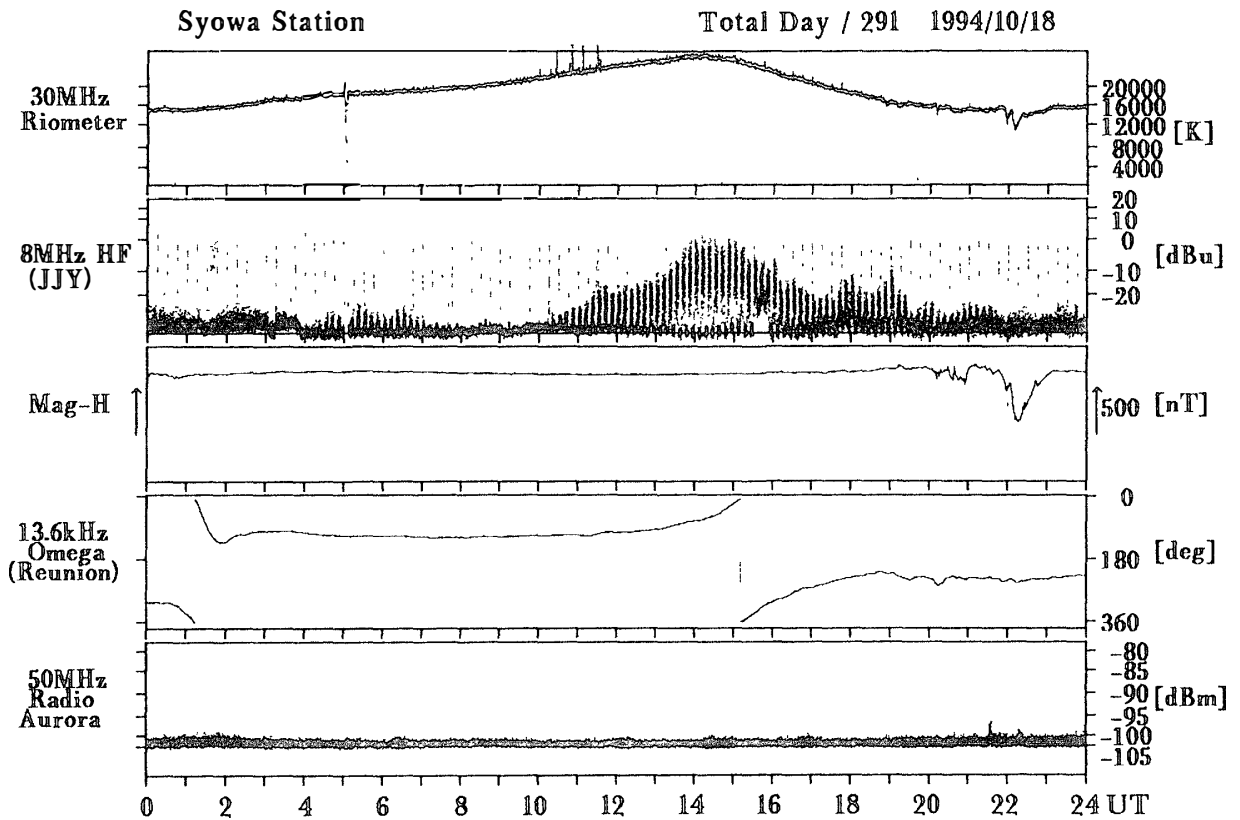
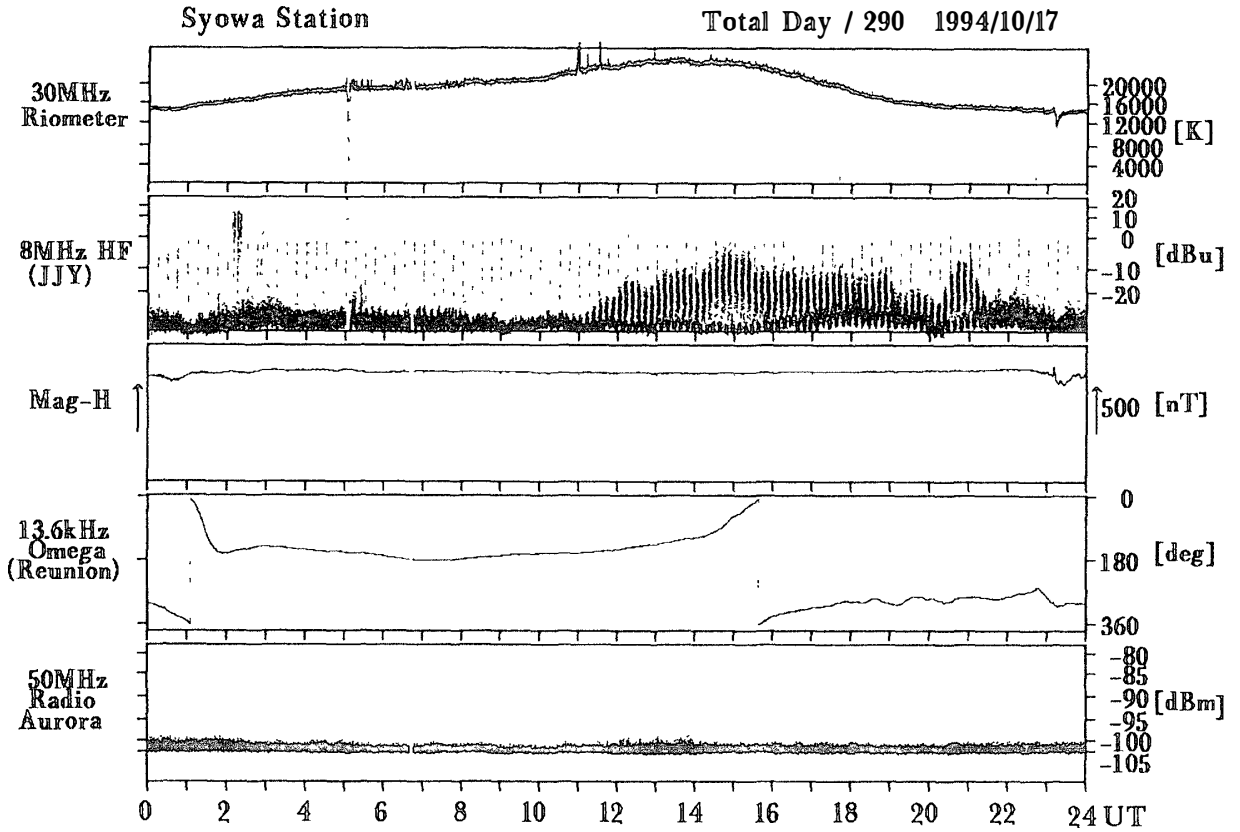


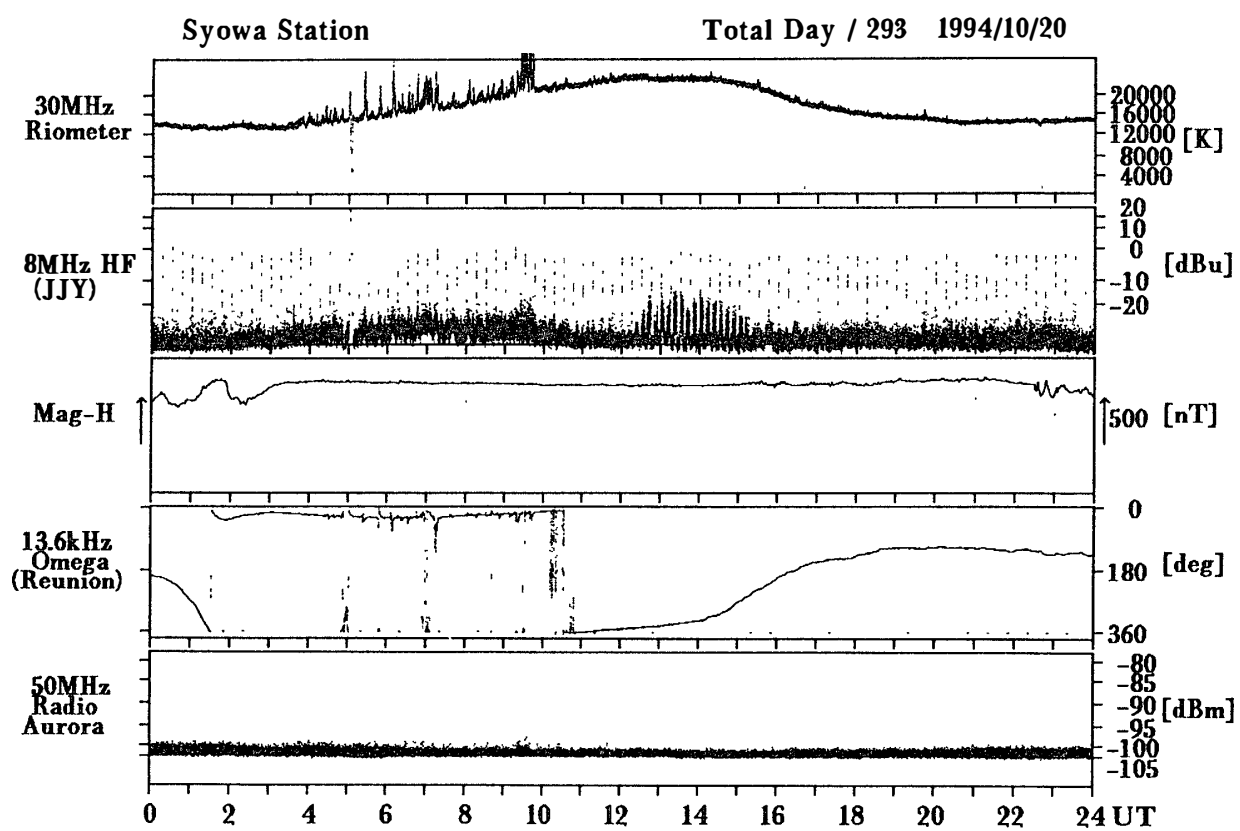
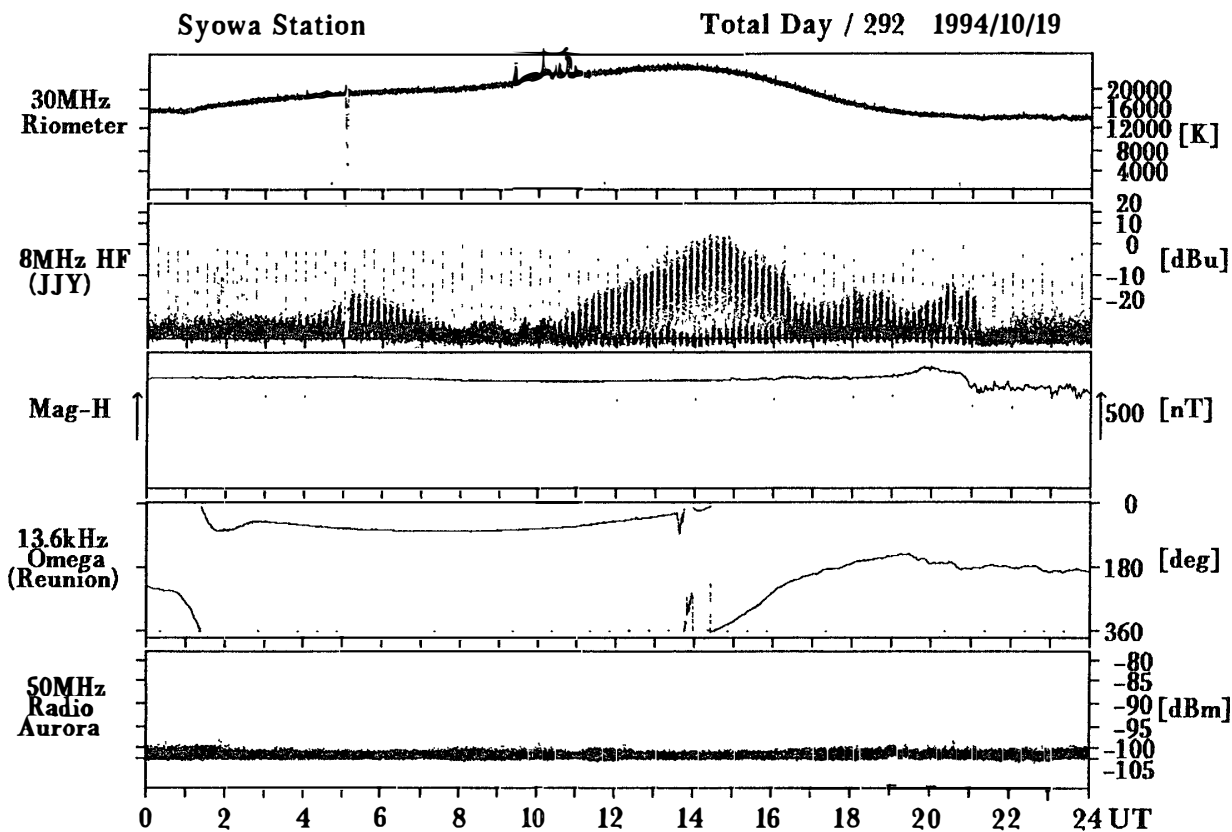


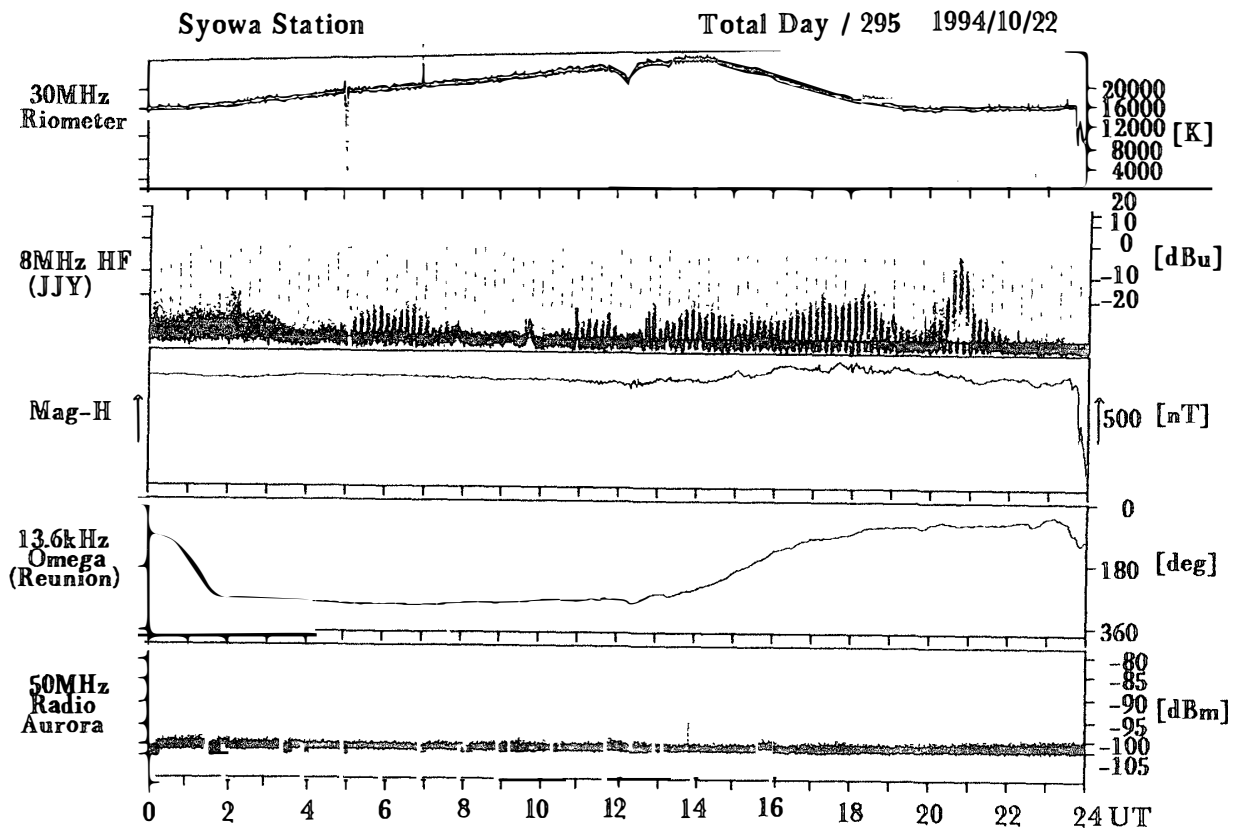
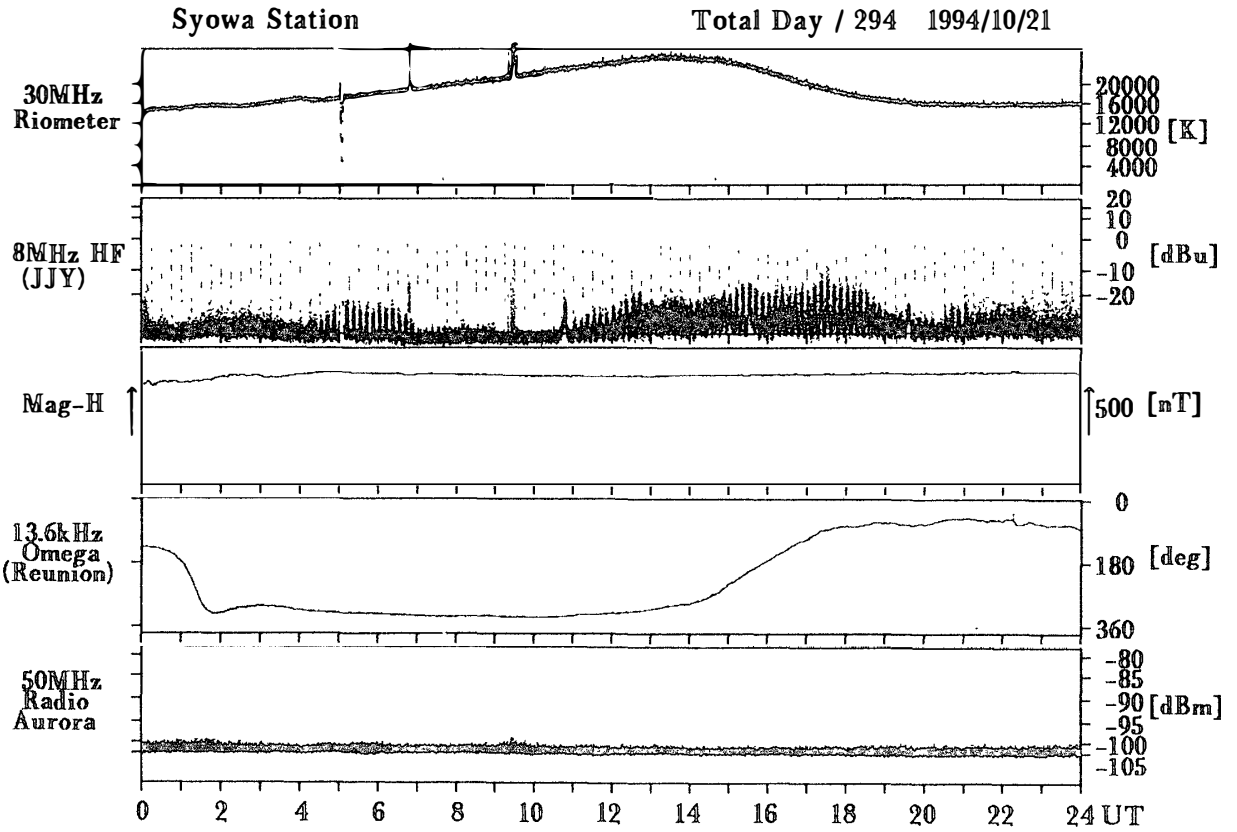






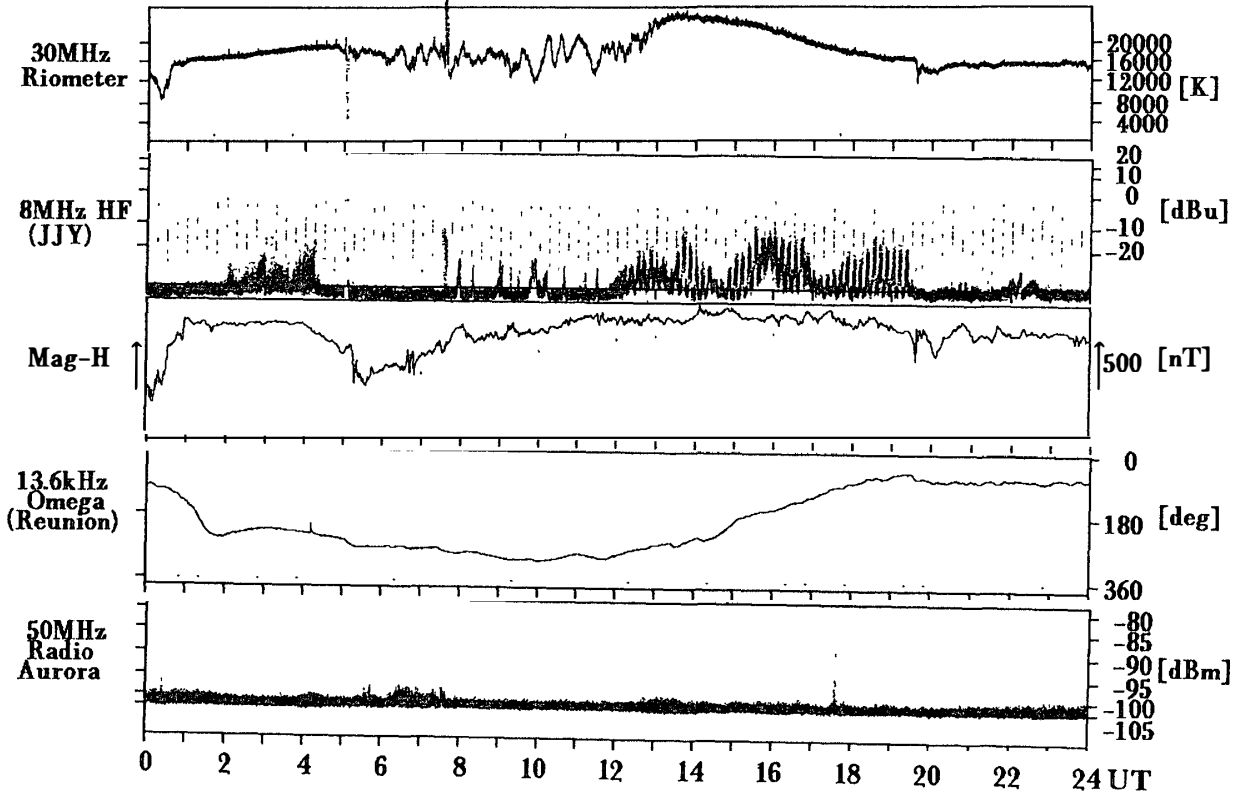






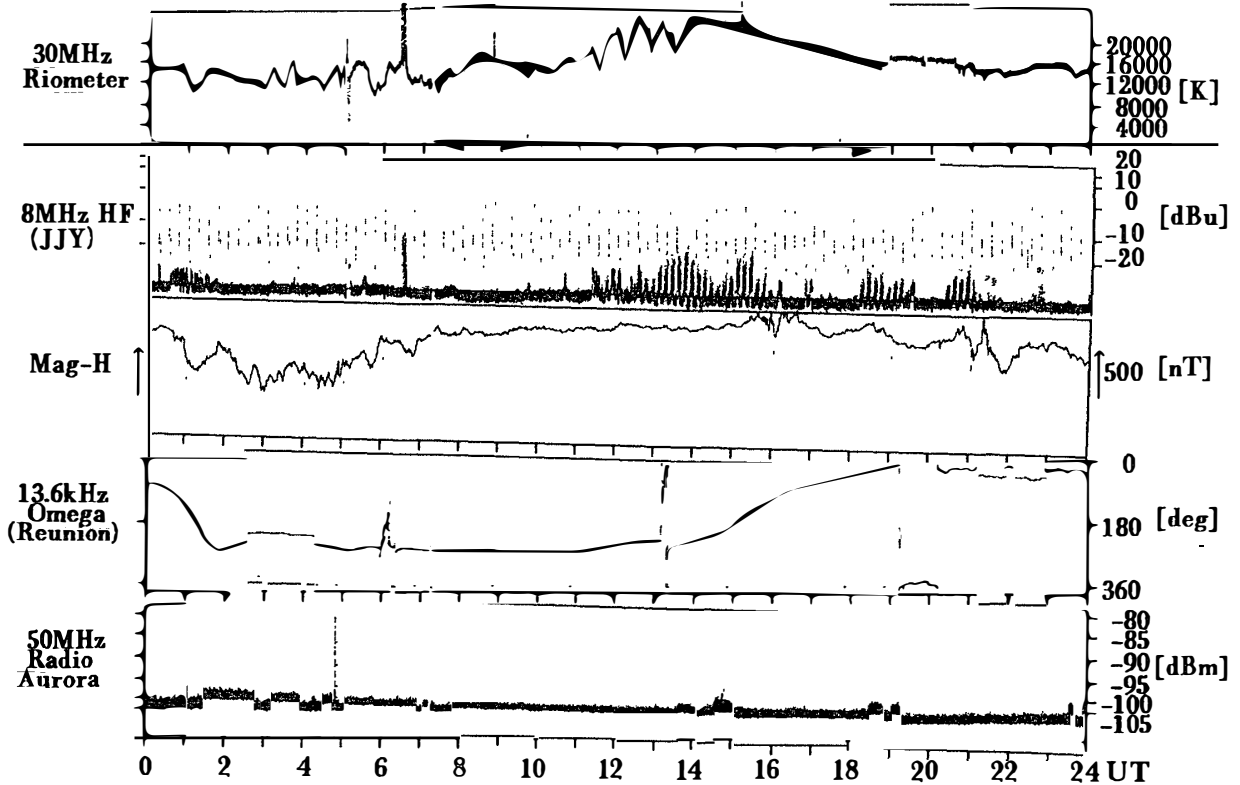
Syowa Station

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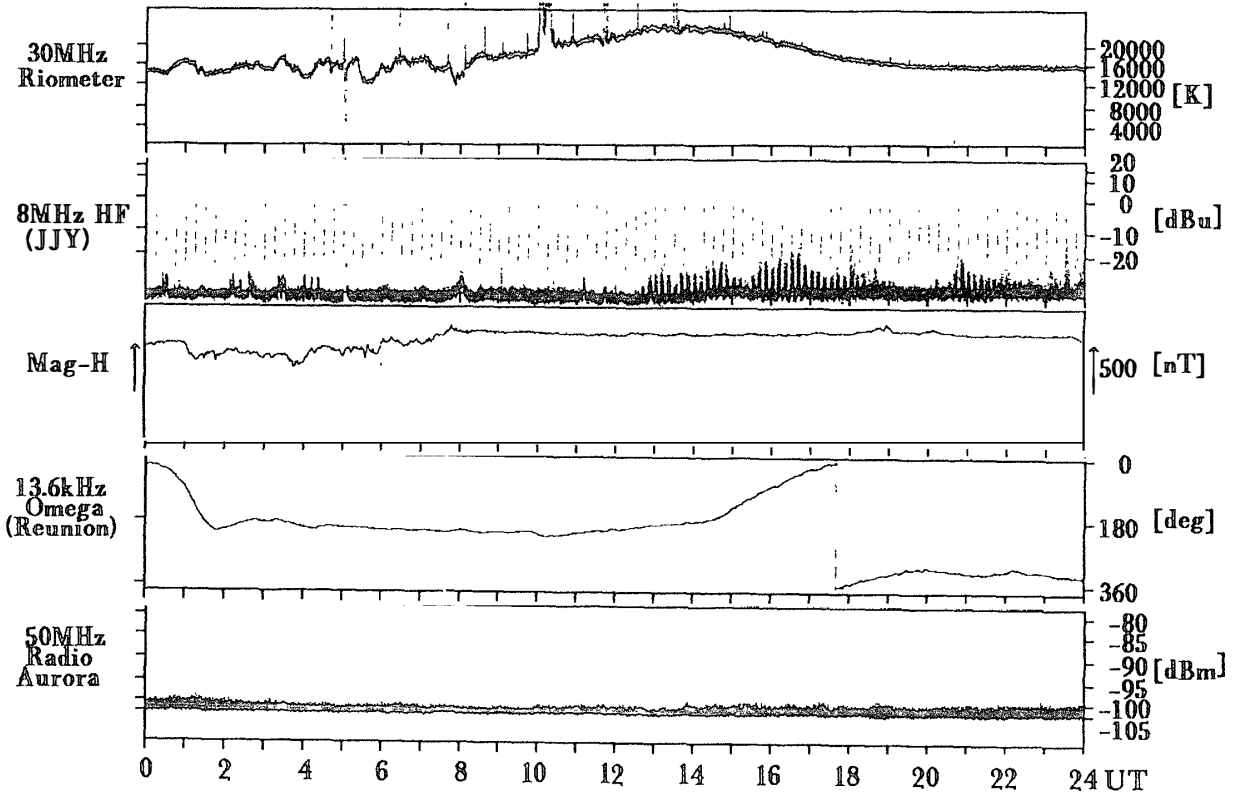
Syowa Station

Total Day / 297 1994/10/24



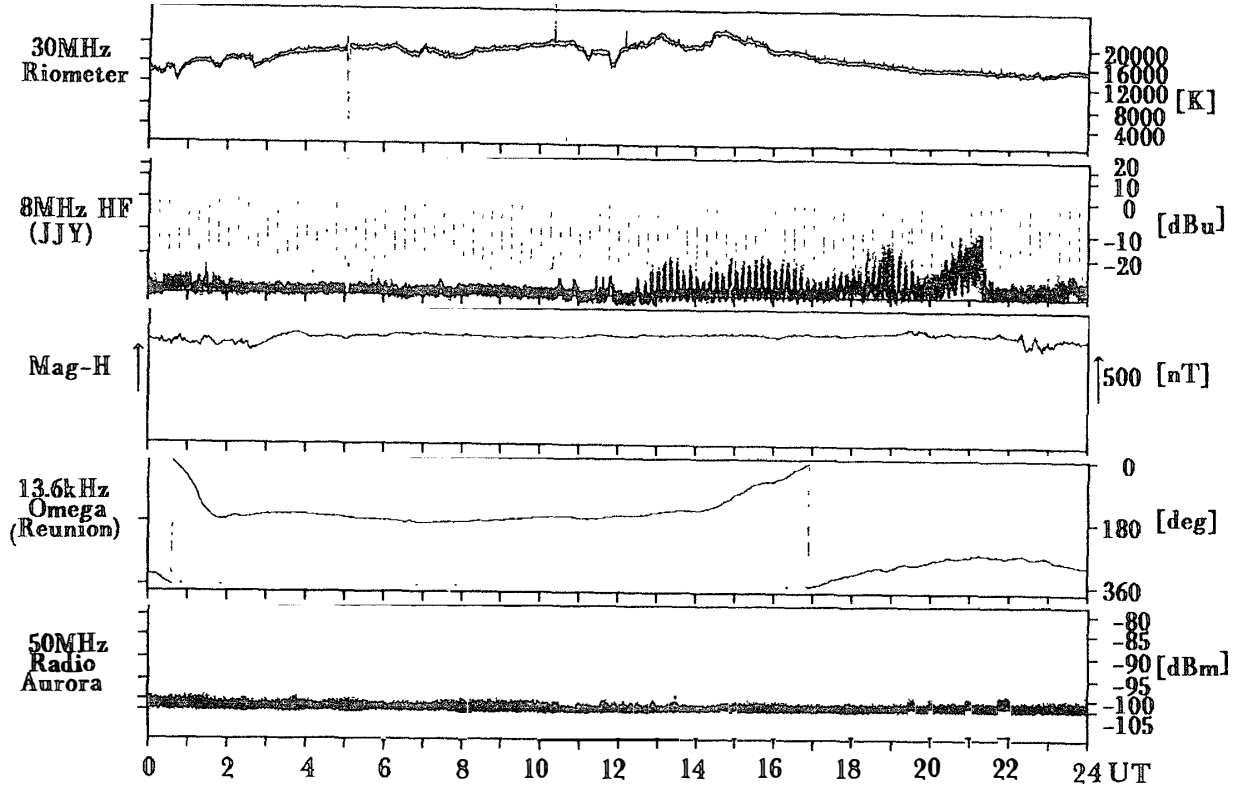
Syowa Station

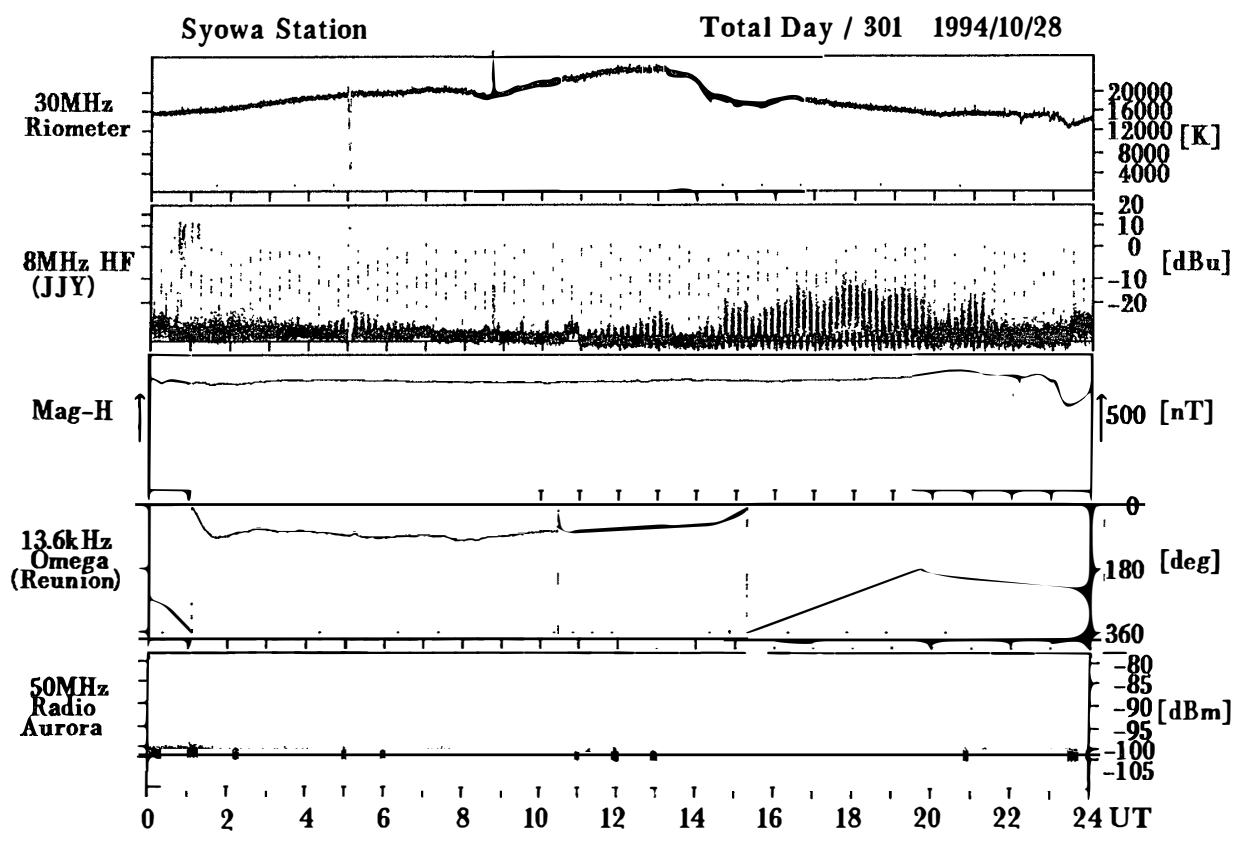
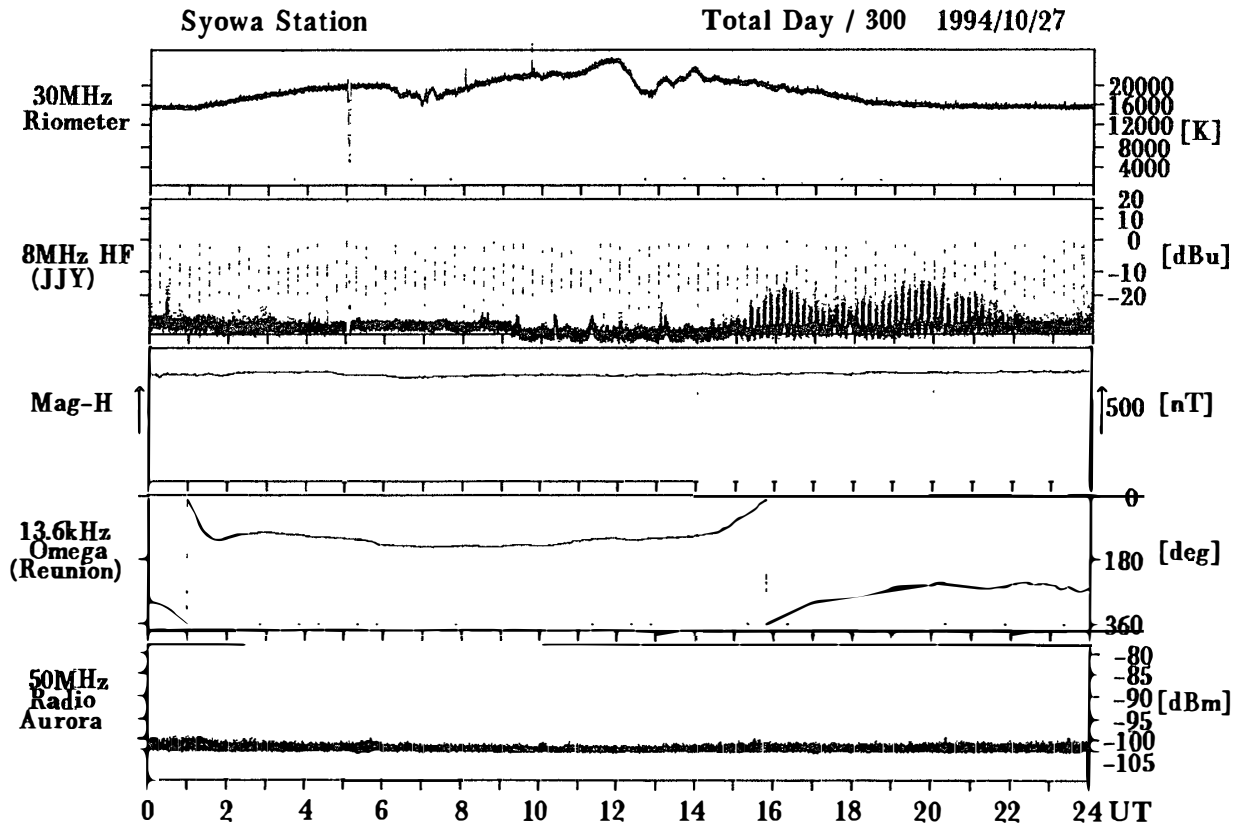
Total Day / 298 1994/10/25

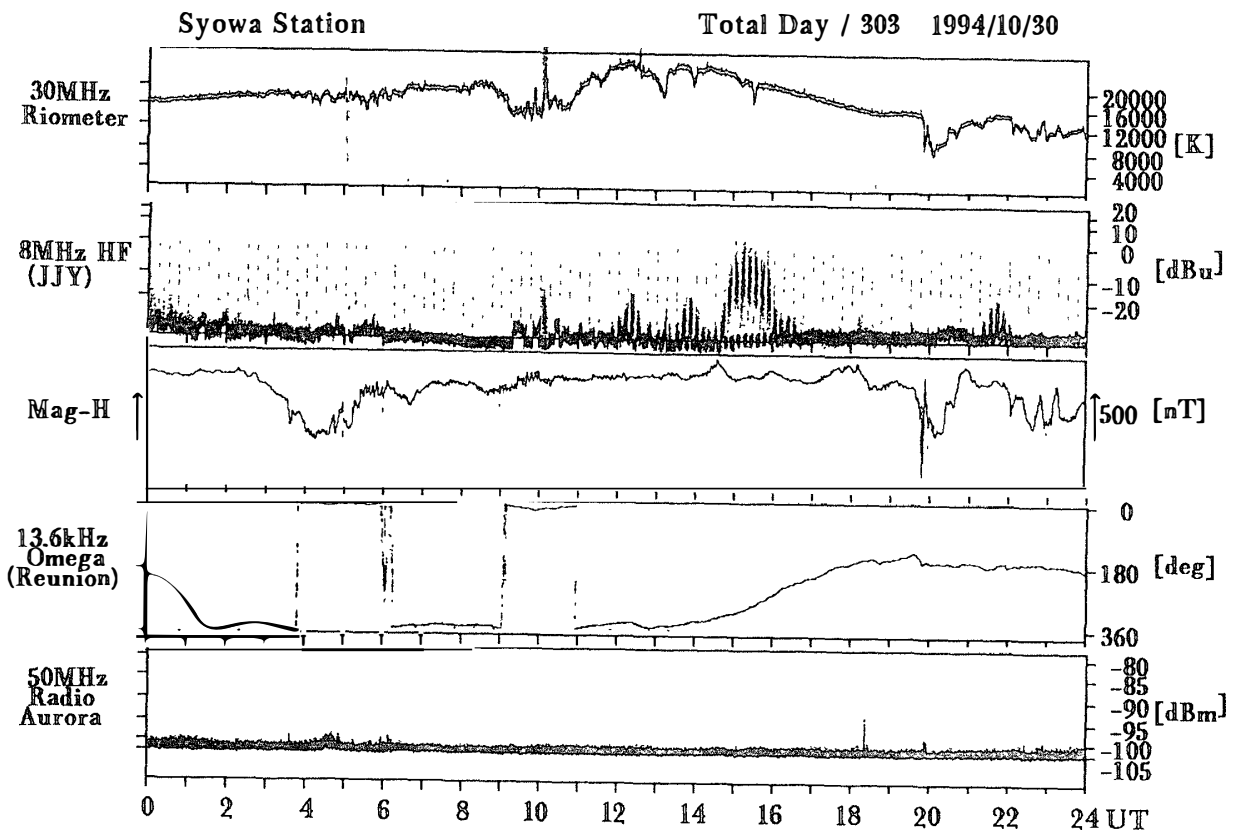
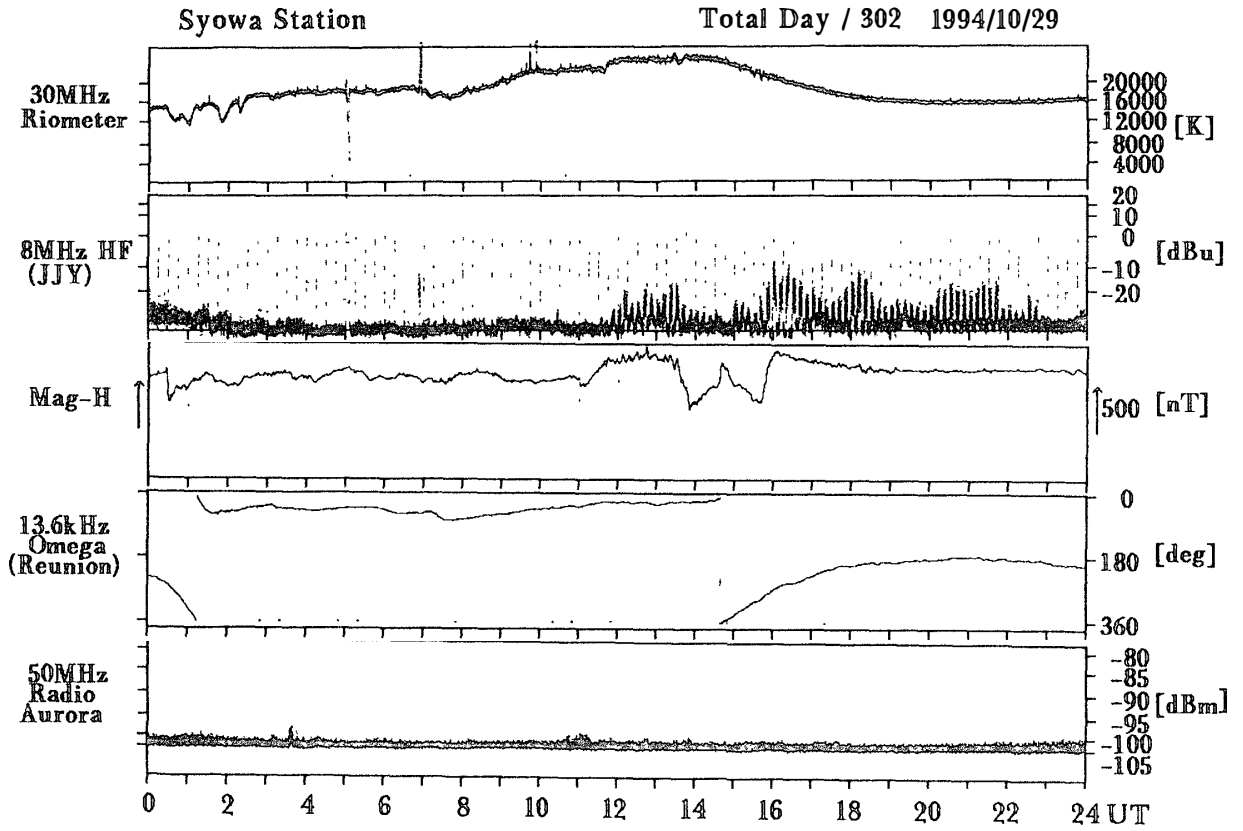


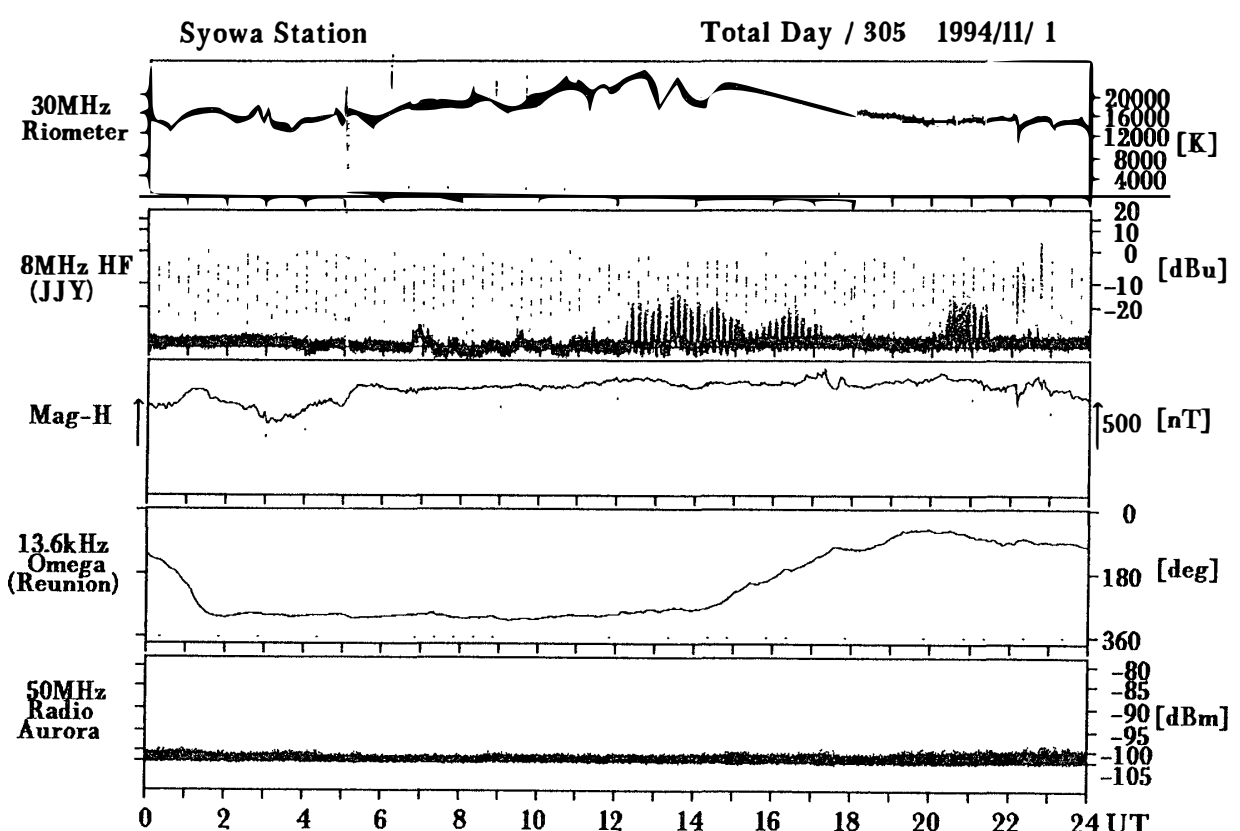
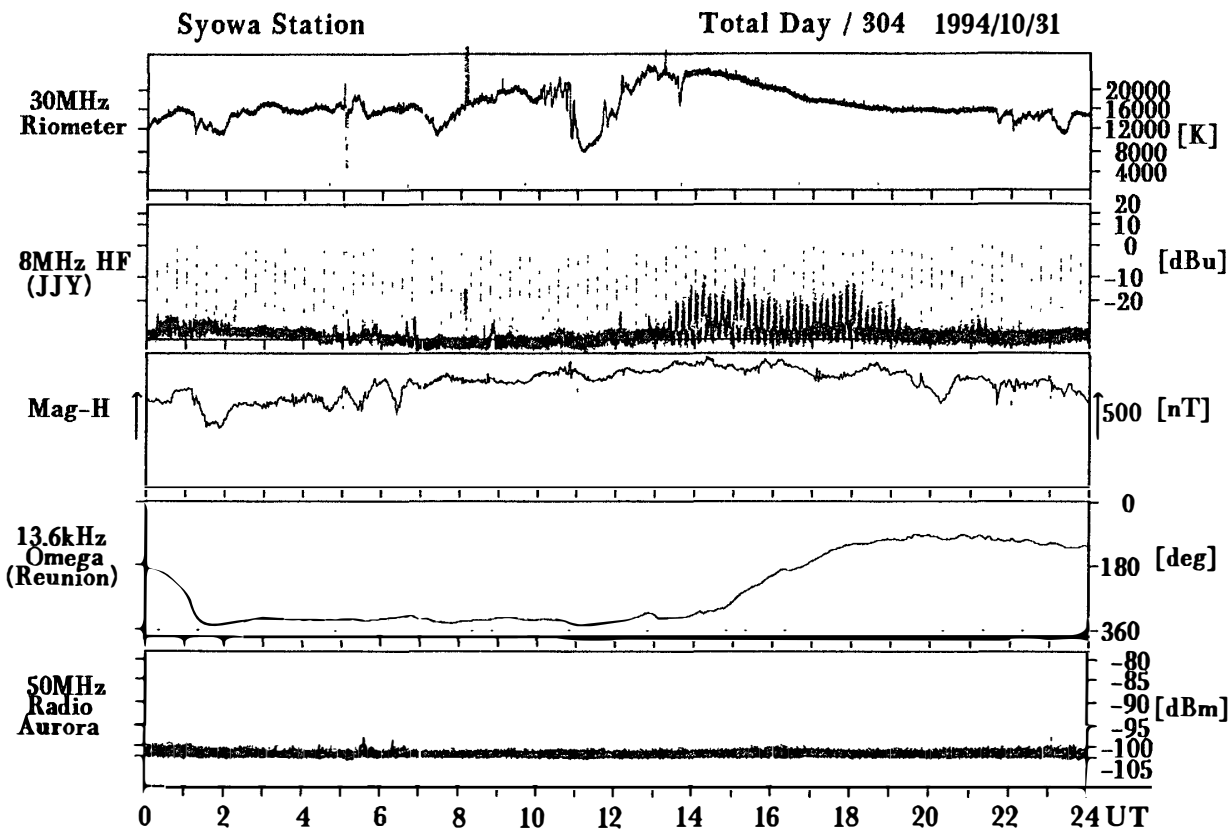
Syowa Station

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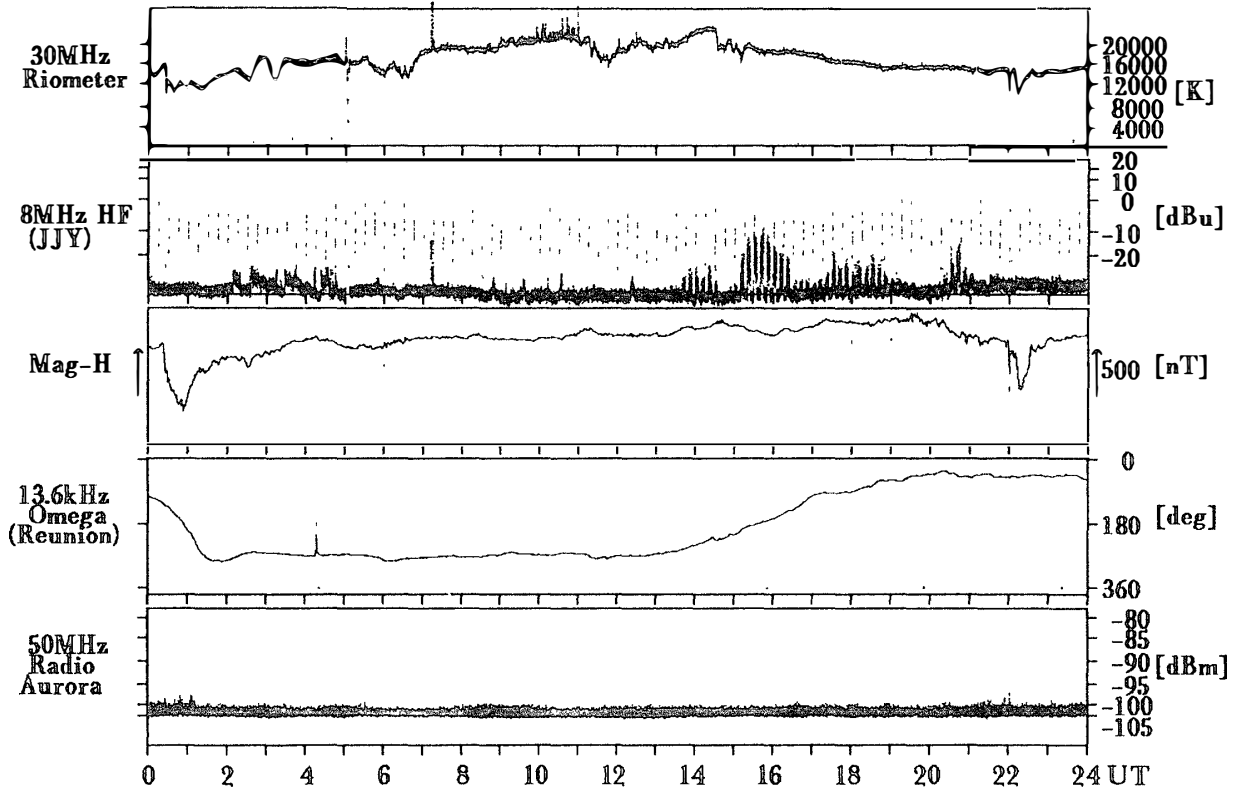






Syowa Station

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Syowa Station

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