

RECORDS OF RADIO AURORA AT SYOWA STATION,
ANTARCTICA IN 1993 and 1994

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1. Introduction

This report presents a summary of data obtained in the period of 1993 and 1994 with the auroral radar at Syowa Station, Antarctica.

Two kinds of data are available: a) chart records of the time variation of echo intensity and b) digital MT.

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2. Location

Syowa Station			
Geographic		Geomagnetic	
Latitude (Deg.)	Longitude (Deg.)	Latitude (Deg.)	Longitude (Deg.)
69.00 S	39.58 E	-70.13	82.04

3. Observers

Kyoji IWASAKI and Takashi YAMAGUCHI (Communications Research Laboratory)

4. Equipment

The main parameters of the auroral radar at Syowa Station are shown in Table 1. The three antenna beams with half power width of about 4 degrees are directed toward the geomagnetic south, 32.8° west from the geomagnetic south, and 47.0° east from the geomagnetic south, respectively. In 1992 two antenna beams directed

to the geomagnetic south and 32.8° west from the geomagnetic south were used. These two antenna beams were switched alternately. Details of the data processing and the radar system are described in references.

Table 1. Specifications of the auroral radar at Syowa Station

Site	Syowa Station (69°00' S, 39°35' E)
Type	Coherent pulse radar
Frequency	50, 112 MHz
Peak power	15 kW
Pulse width	100 μ s
Puls repetition frequency	50 Hz (333 Hz for spectrum observation)
Antenna	Three sets of 14-element coaxial collinear array
Antenna gain	25 dB
Antenna beam width	4° (half power width) in horizontal plane
Receiver bandwidth	10 kHz
Receiver noise figure	less than 4 dB
Display and recorders	A - scope display, A' - scope display, pen recorder and digital MT

5. Explanation of Diagrams

Backscattered power intensities observed with the 50 MHz auroral radar were sampled every 1 second and stored by a digital data logger and plotted by a chart recorder. A series of figures show correlation plots of radio auroral intensities, magnetogram and riometer observed in the years of 1993 and 1994.

Reference

Igarashi, K., Ogawa, T., Ose, M., Fujii, R. and Hirasawa, T. (1982): A new VHF Doppler radar experiment at Syowa Station, Antarctica. Mem. Natl Inst. Polar Res., Spec. Issue, 22, 258-267.

Bibliography relevant to
RECORDS OF RADIO AURORA AT SYOWA STATION, ANTARCTICA (1)

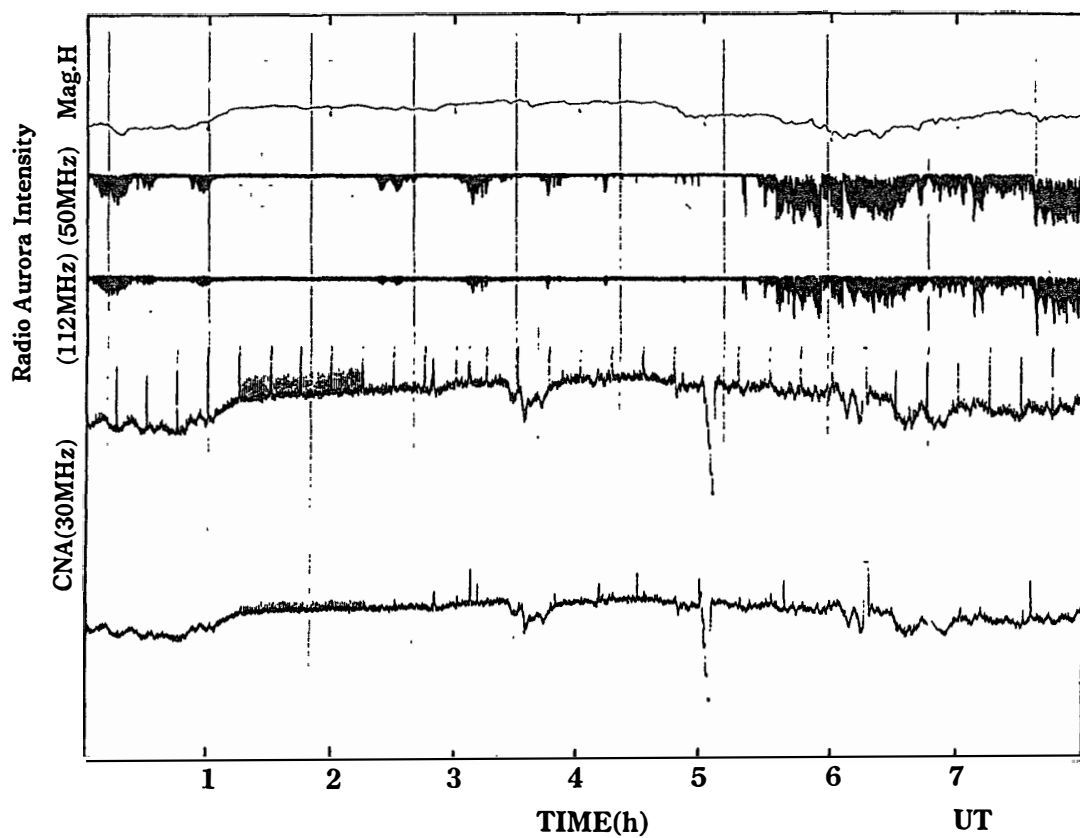
Observing Period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
Mar. 1966 - Jan. 1968	Ose, M Hasegawa, S. Takeuchi, T. Nishimuta, I. Isobe, T.	5 (Ionosphere 2)	64	1969
Apr. 1970 - Feb. 1971	Shiro, I. Sakamoto, T.	15 (Ionosphere 6)	34	1972
Feb. 1972 - Dec. 1972	Isozaki, S. Miyazaki, S.	23 (Ionosphere 10)	22	1974
Feb. 1973 - Jan. 1974	Nishimuta, I. Yabuuma, H.	26 (Ionosphere 12)	23	1975
Mar. 1974 - Dec. 1974	Shiro, I. Yamazaki, I.	33 (Ionosphere 14)	89	1976
1975	Shiro, I. Sugiuchi, H. Komiya, N.	37 (Ionosphere 16)	105	1977
1976	Shiro, I. Yamakoshi, A. Sasaki, T.	42 (Ionosphere 18)	105	1978
Apr. 1978 - Dec. 1978	Igarashi, K. Tsuzurahara, S.	53 (Ionosphere 21)	23	1980
Jan. 1979 - Dec. 1979	Igarashi, K. Ojima, S. Komiya, N.	58 (Ionosphere 23)	28	1980
1980	Igarashi, K. Nozaki, K.	68 (Ionosphere 24)	28	1982
1981	Ose, M. Kurihara, N.	81 (Ionosphere 28)	28	1983
(cont.)				

Bibliography relevant to
RECORDS OF RADIO AURORA AT SYOWA STATION, ANTARCTICA (2)

Observing Period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
1982	Igarashi, K. Kuratani, Y	88 (Ionosphere 30)	28	1984
1983	Igarashi, K. Tanaka, T. Yamazaki, I.	100 (Ionosphere 32)	64	1985
1984	Igarashi, K. Tanaka, T. Yamamoto, S.	113 (Ionosphere 34)	33	1986
1985	Igarashi, K. Maeno, H. Ogawa, T.	123 (Ionosphere 36)	56	1987
1986	Igarashi, K. Maeno, H. Suzuki, A.	134 (Ionosphere 38)	59	1988
1987	Maeno, H. Inamori, K.	146 (Ionosphere 40)	33	1989
1988	Maeno, H. Ohtsuka, A.	154 (Ionosphere 41)	34	1990
1989	Maeno, H. Yamamoto, S.	167 (Ionosphere 43)	42	1991
1990	Ohtaka, K. Igarashi, K.	175 (Ionosphere 46)	34	1992
1991	Nozaki, K. Igarashi, K.	188 (Ionosphere 48)	25	1993
1992	Kamata, M. Igarashi, K.	195 (Ionosphere 51)	151	1994

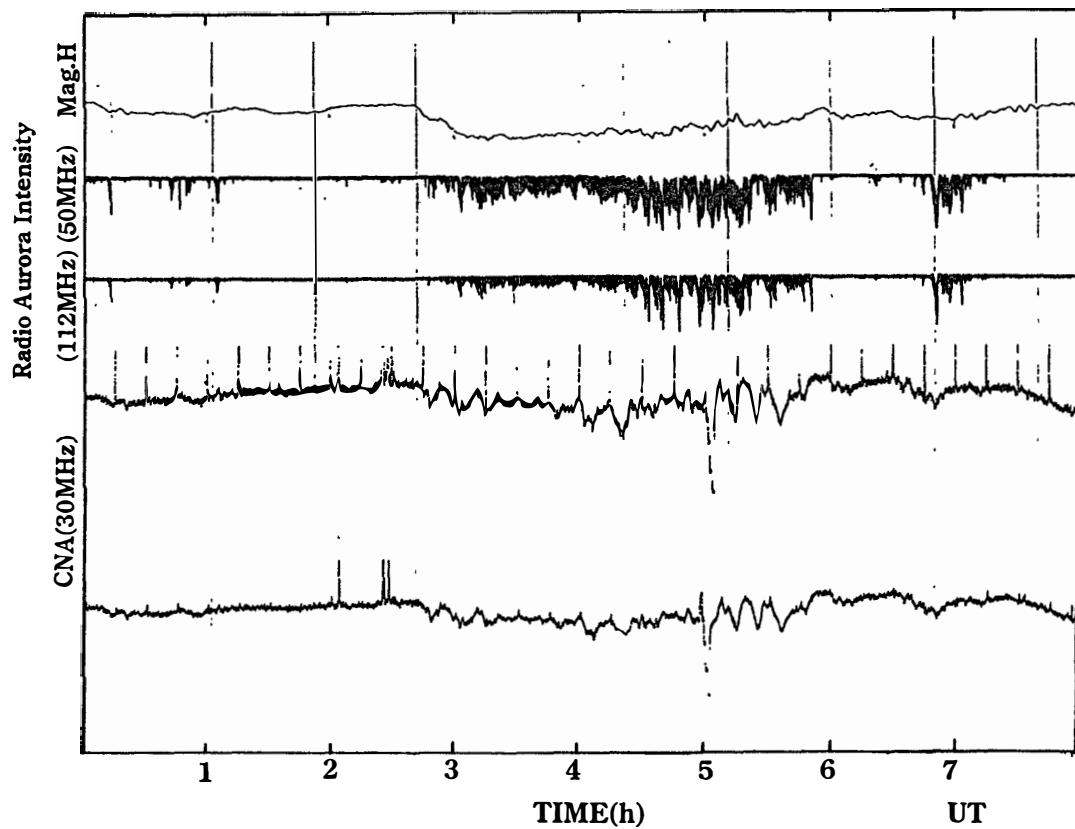
Syowa Station Auroral Radar

January 31. 1993



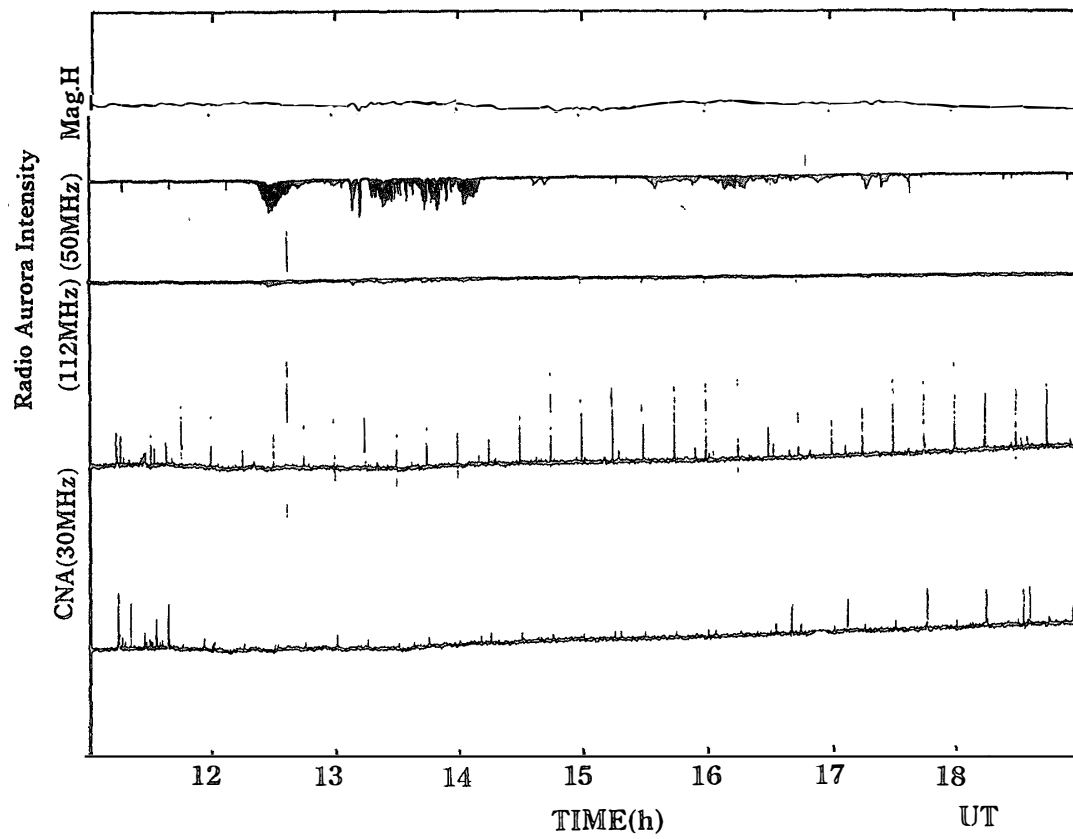
Syowa Station Auroral Radar

February 8. 1993



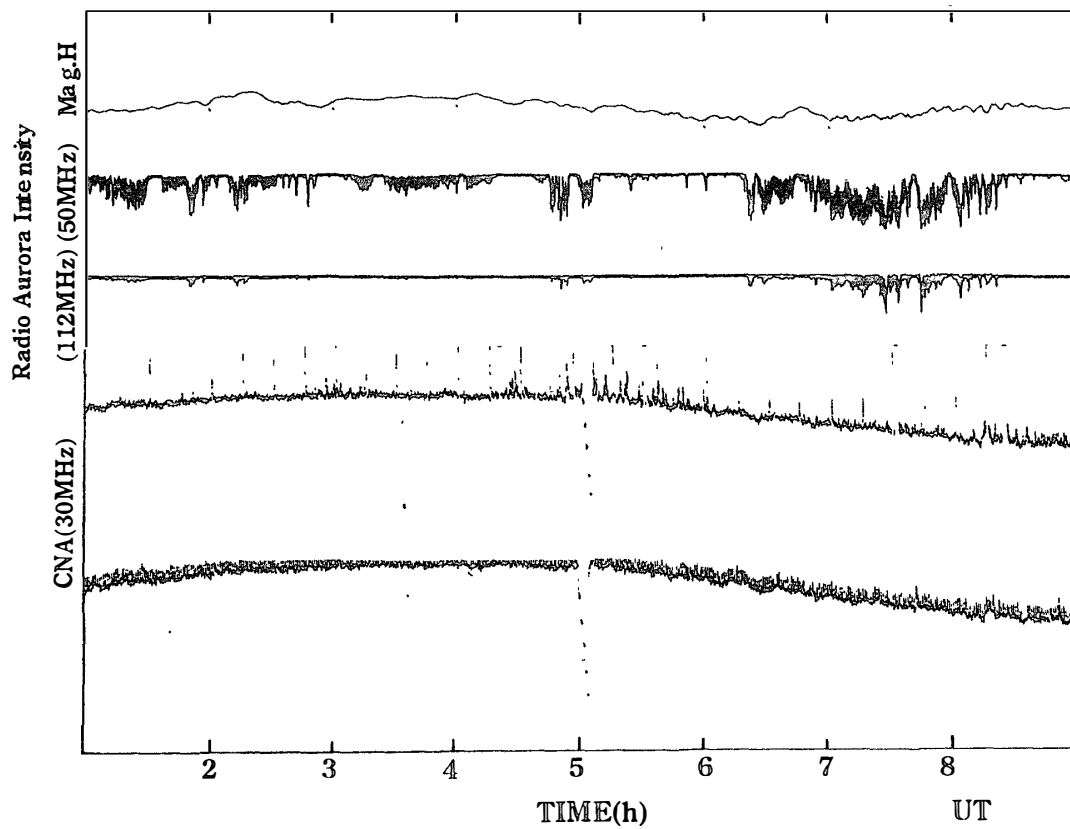
Syowa Station Auroral Radar

February 17. 1993



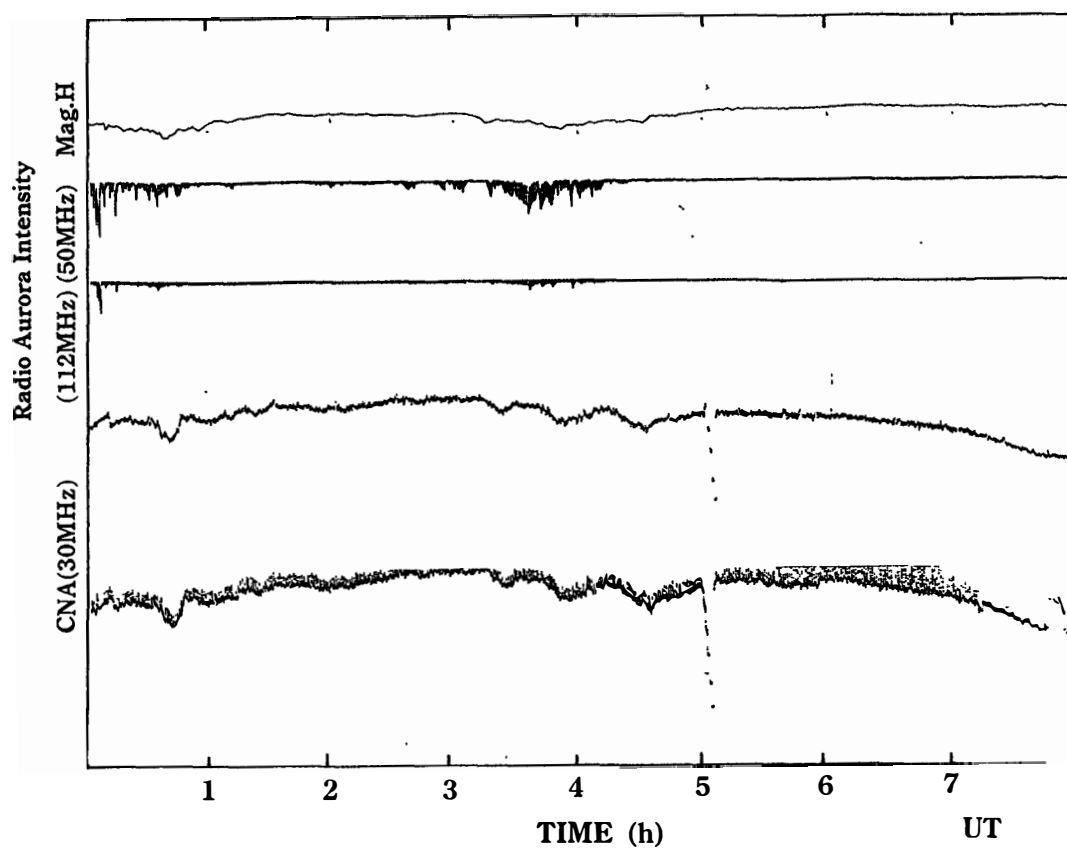
Syowa Station Auroral Radar

March 9. 1993



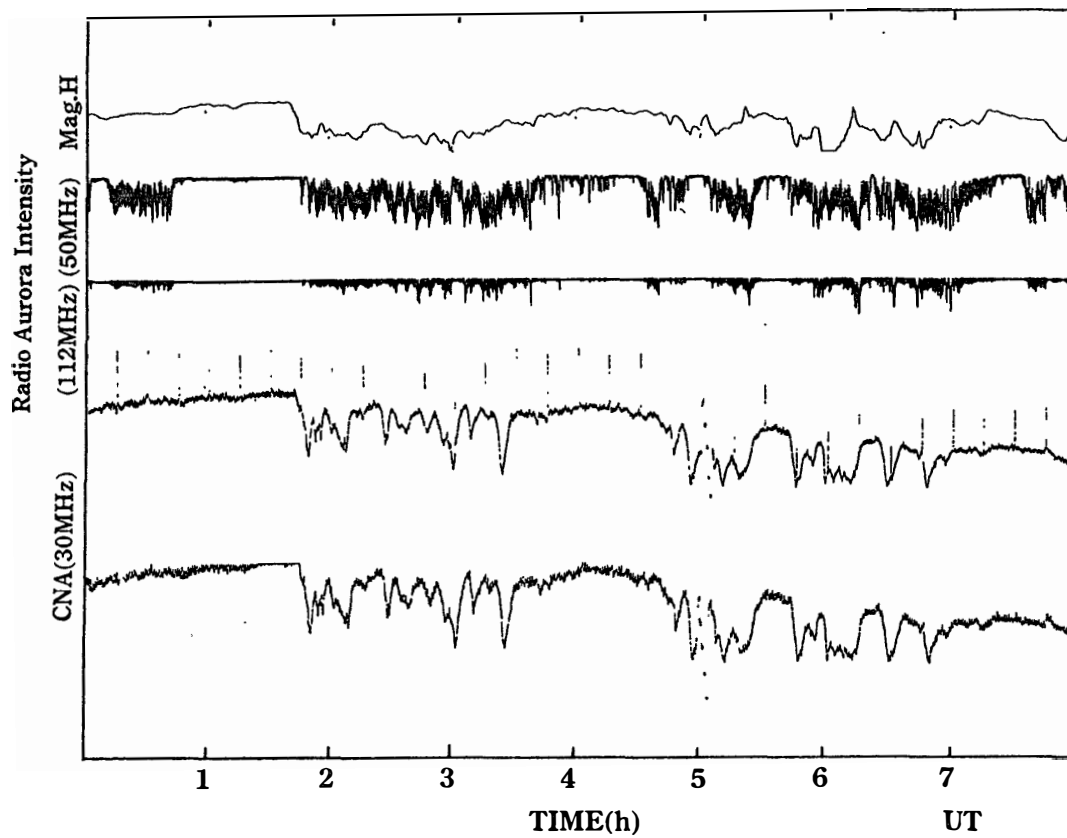
Syowa Station Auroral Radar

March 17. 1993



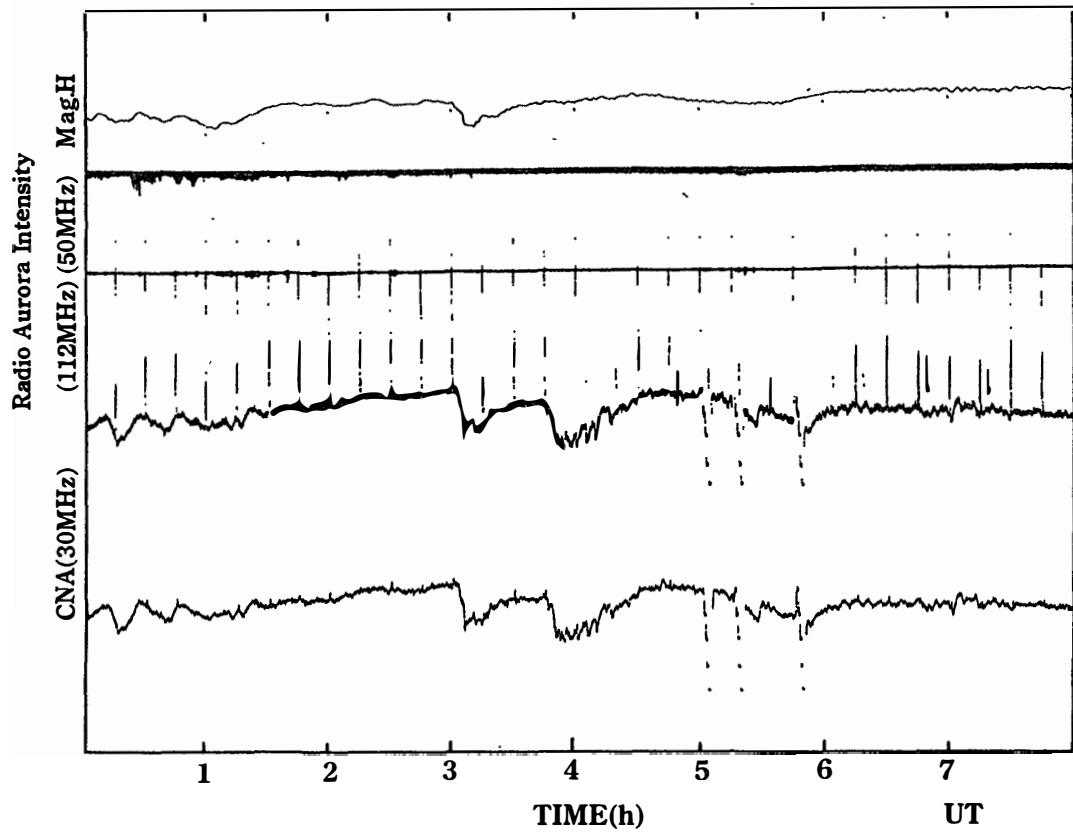
Syowa Station Auroral Radar

April 5. 1993



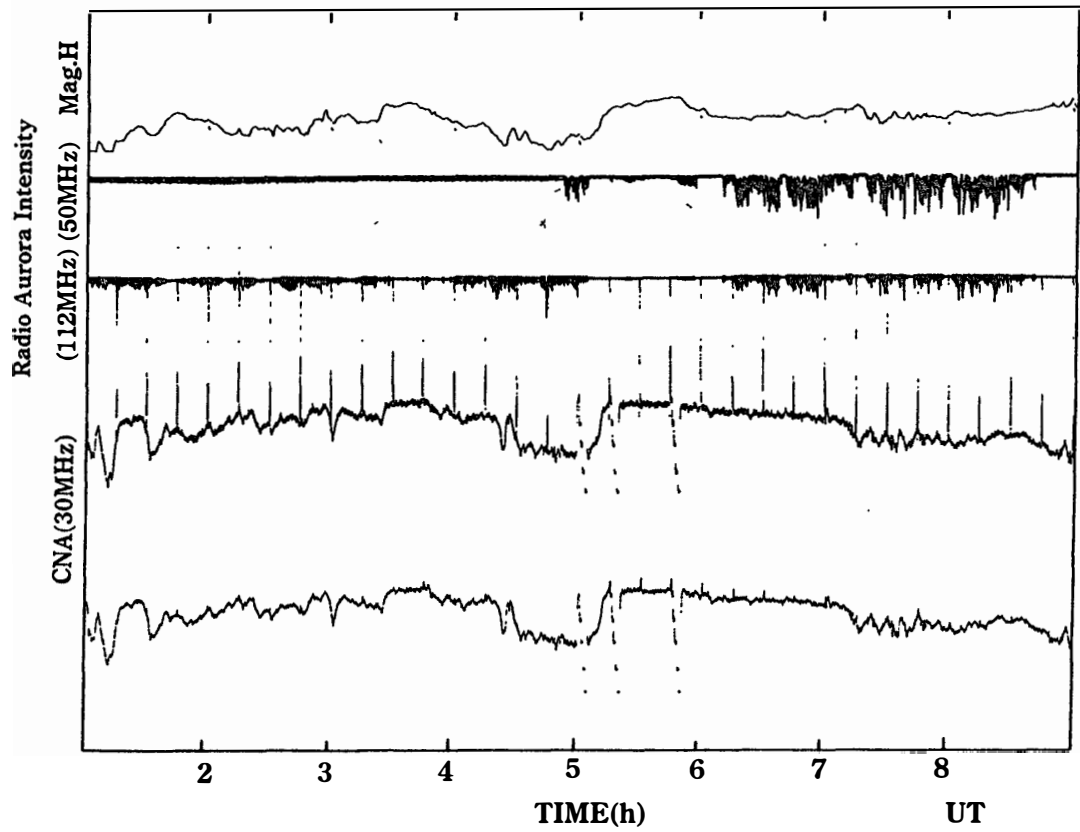
Syowa Station Auroral Radar

February 16. 1994



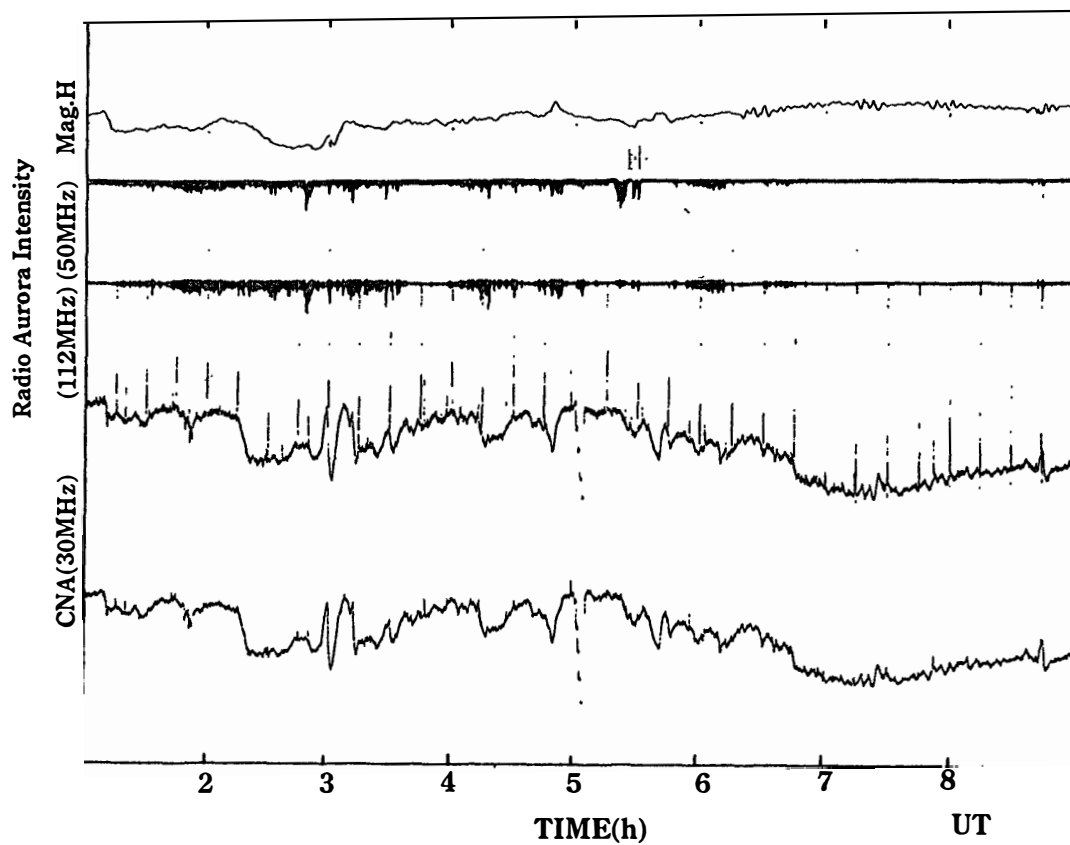
Syowa Station Auroral Radar

February 22. 1994



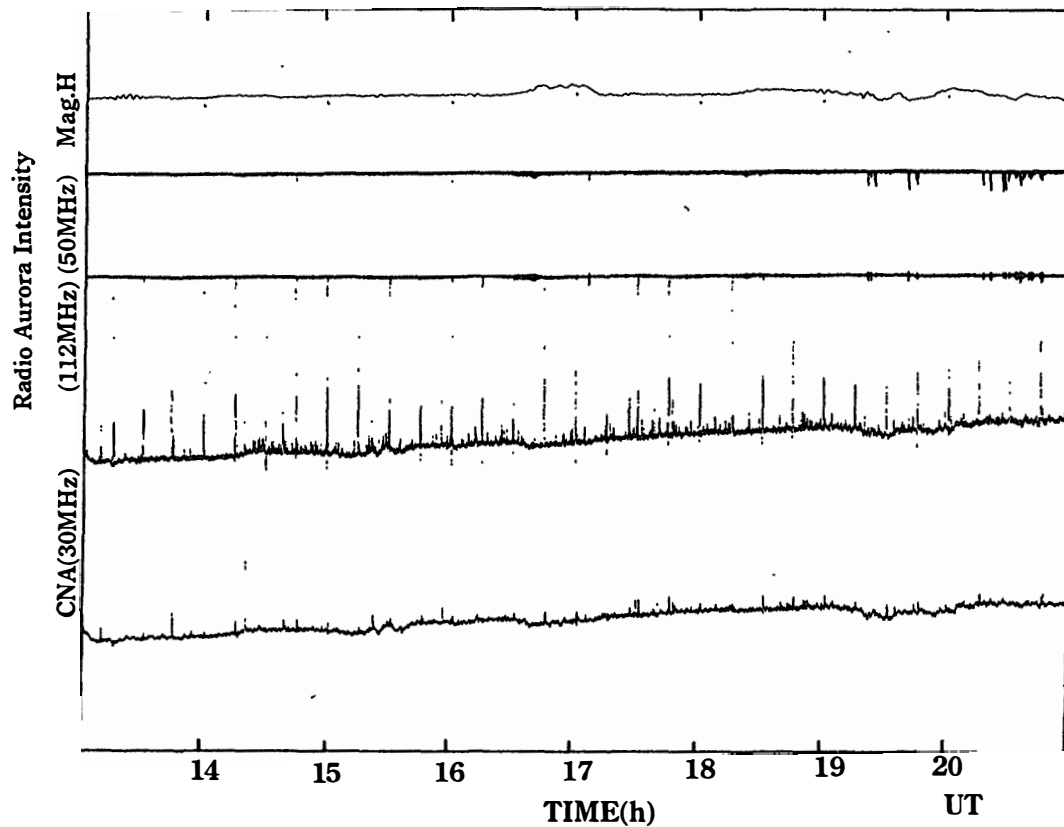
Syowa Station Auroral Radar

March 15. 1994



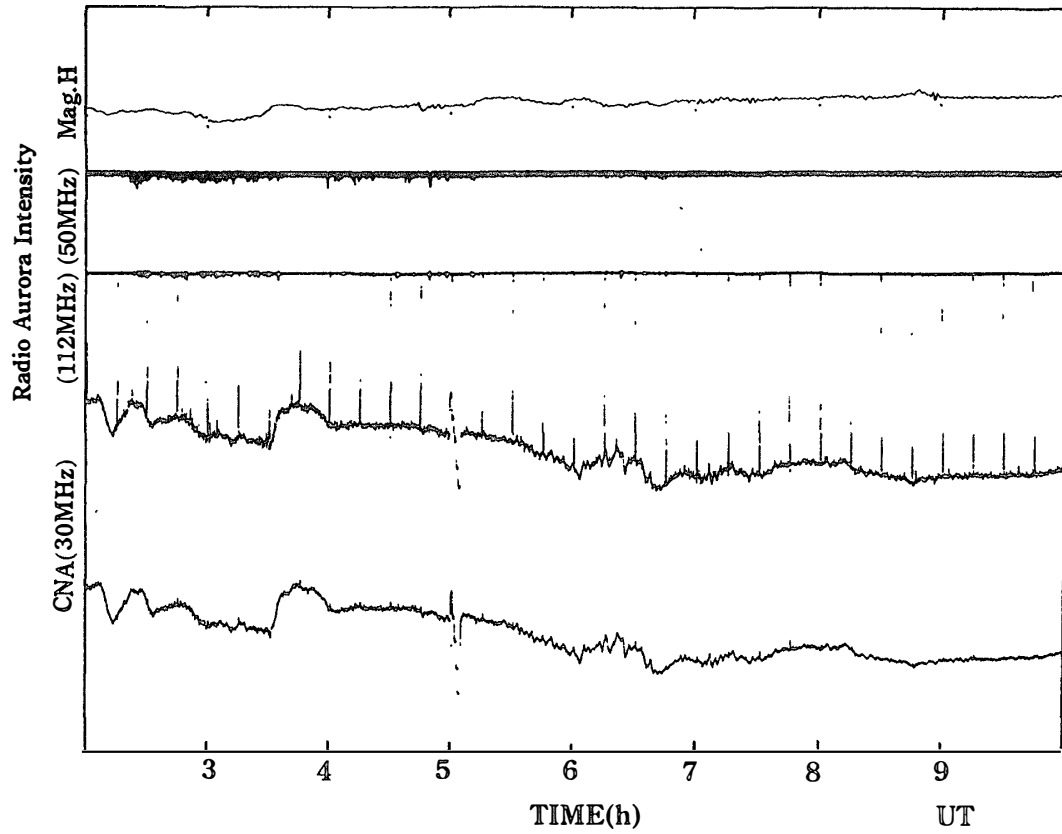
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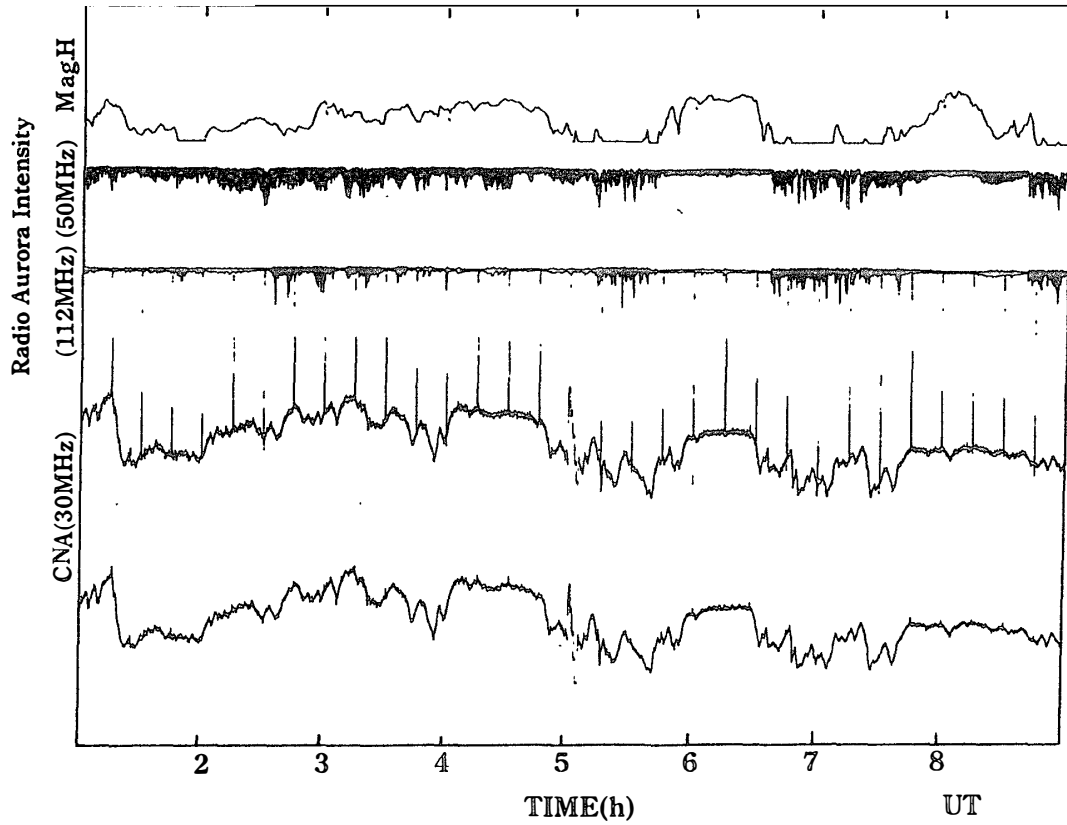
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April 13. 1994



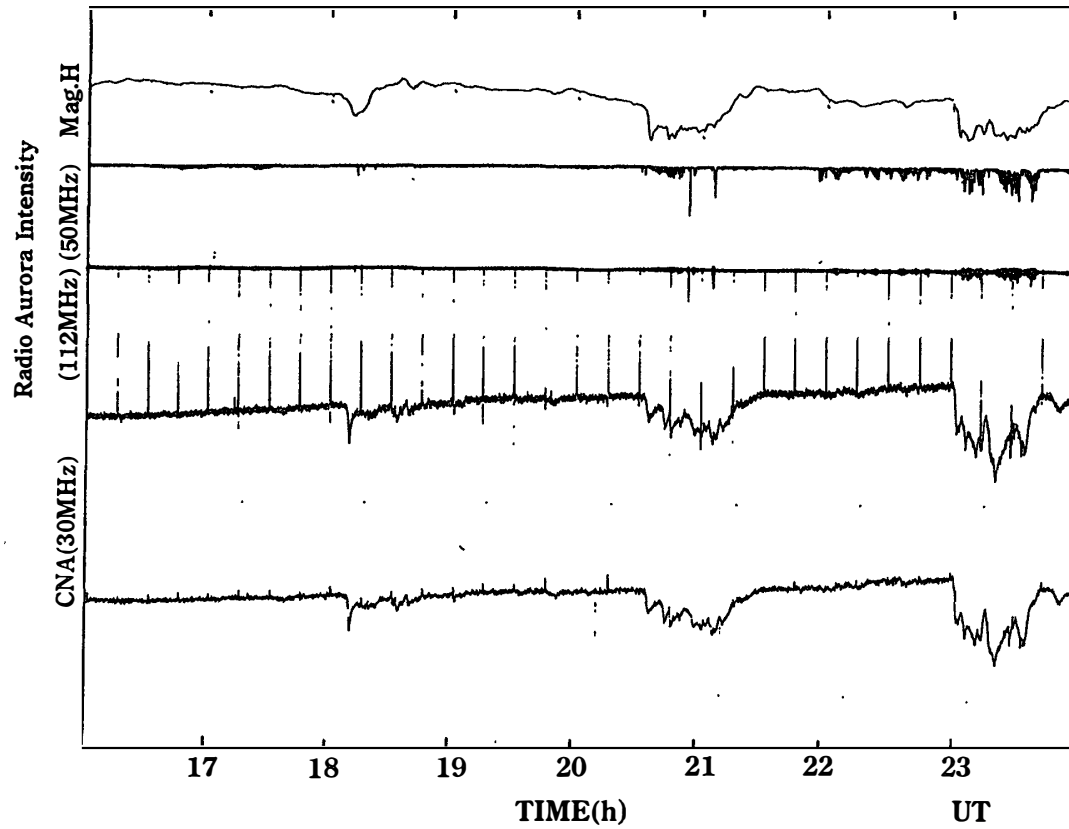
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April 17. 1994



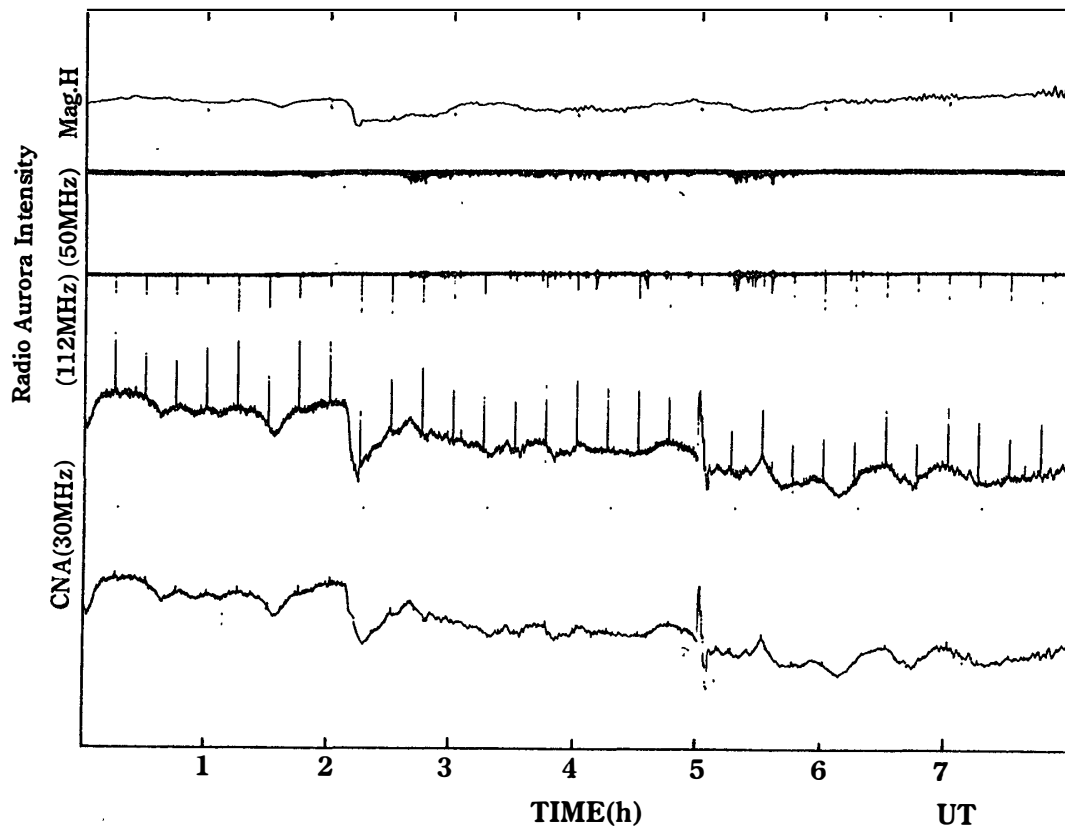
Syowa Station Auroral Radar

May 1. 1994



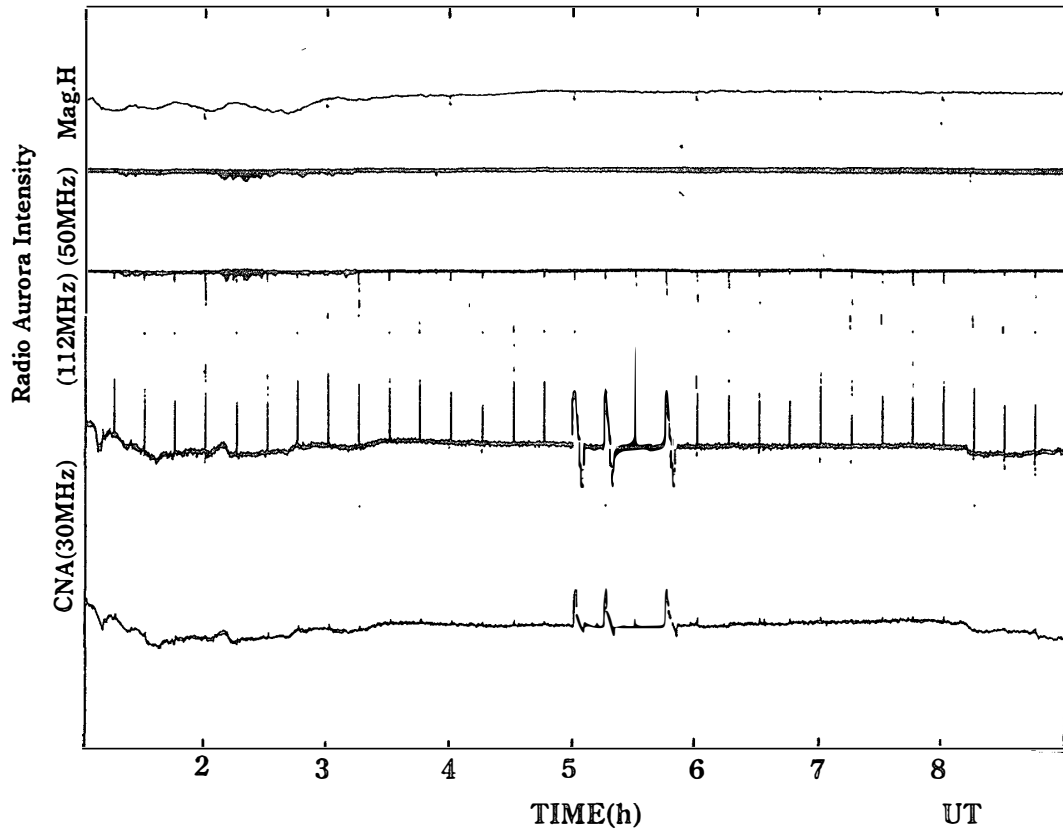
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May 11. 1994



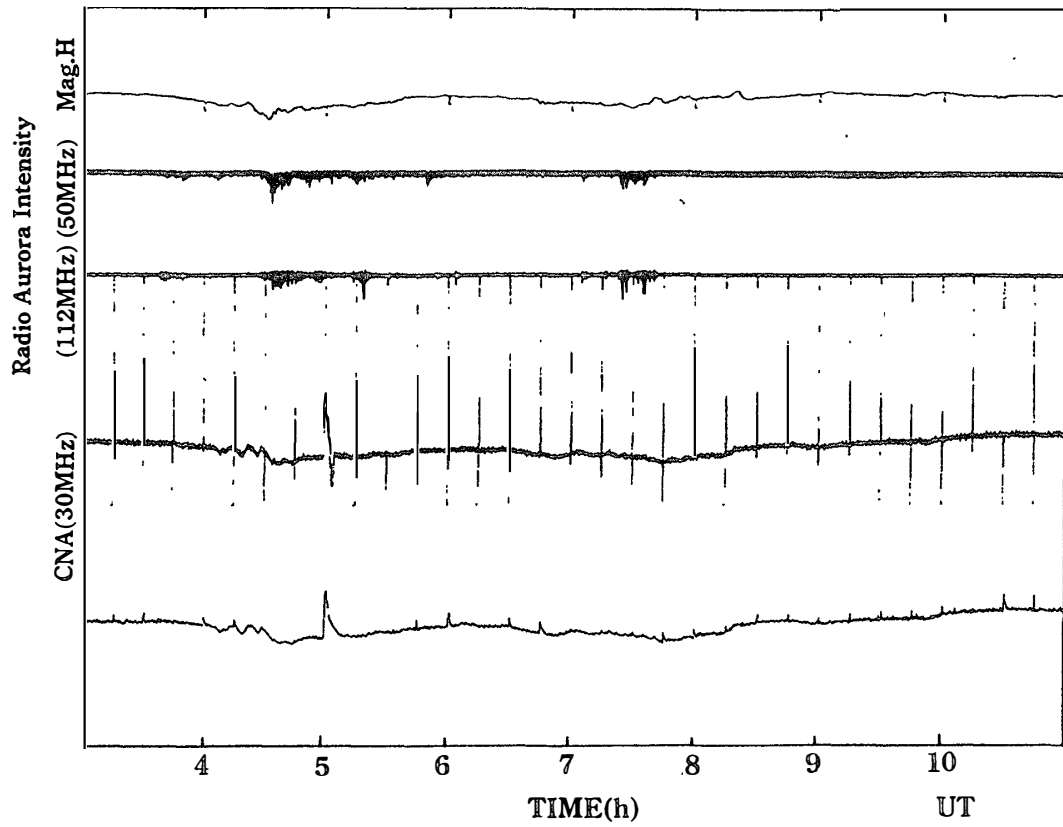
Syowa Station Auroral Radar

June 8. 1994



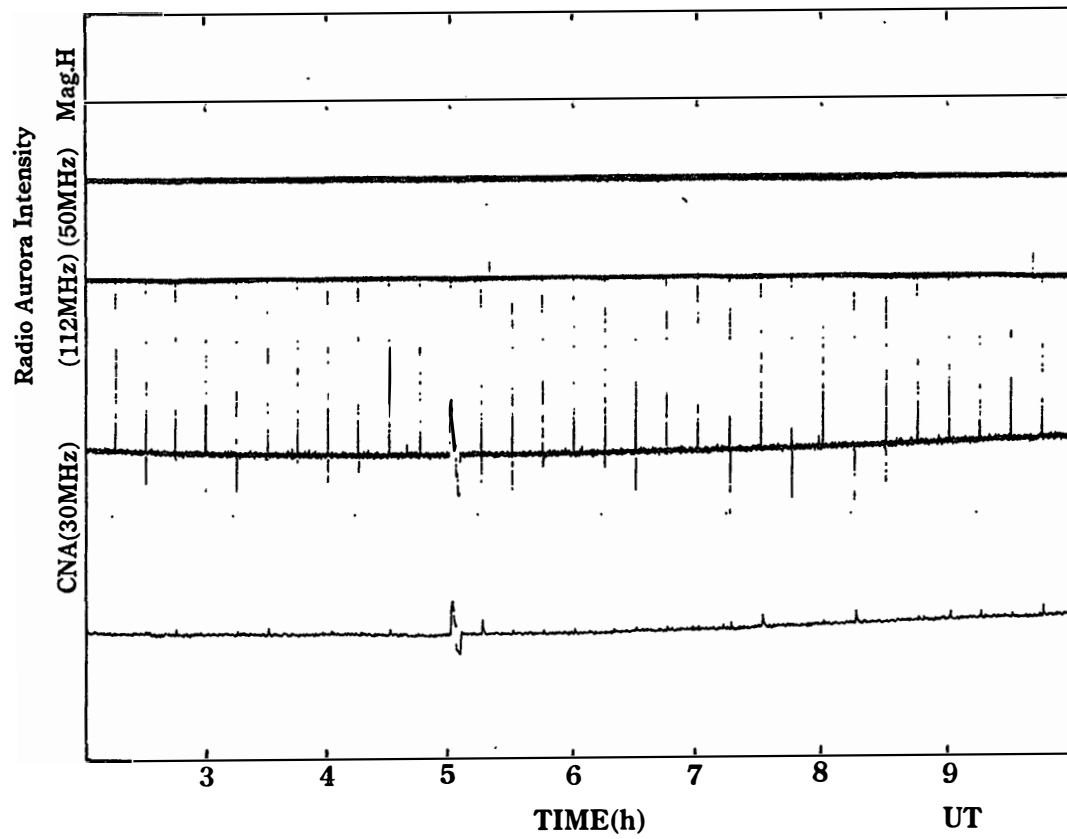
Syowa Station Auroral Radar

June 26. 1994



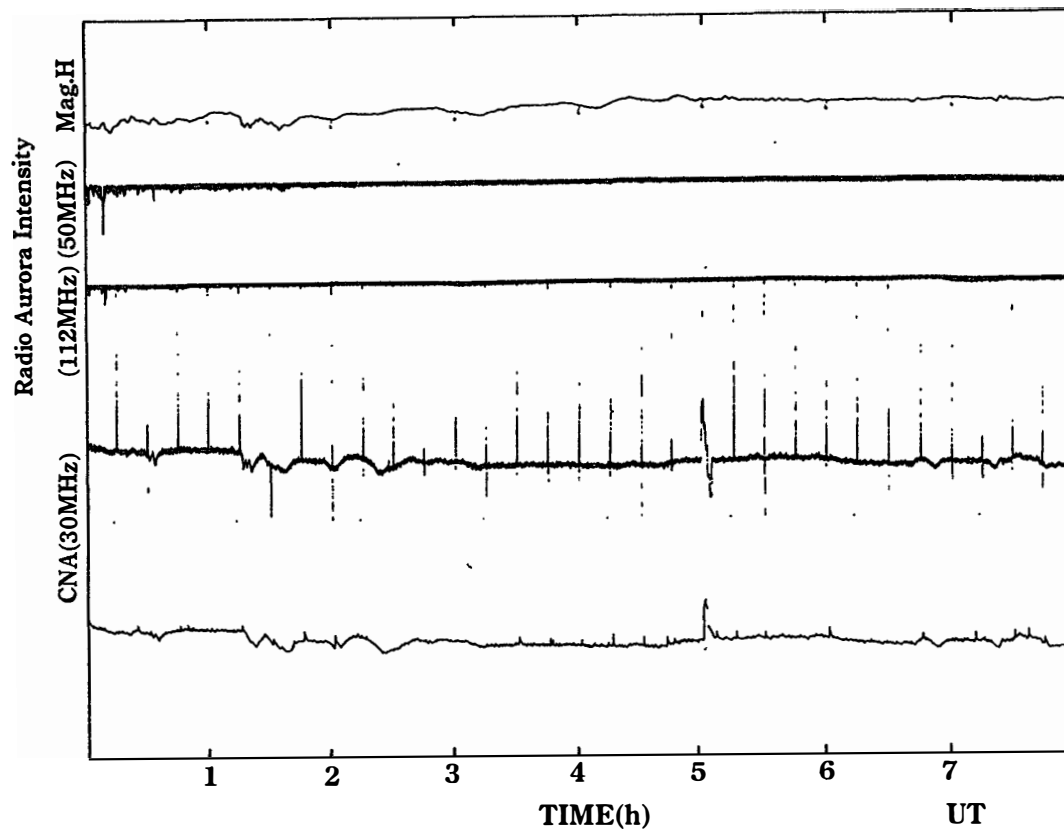
Syowa Station Auroral Radar

July 13. 1994



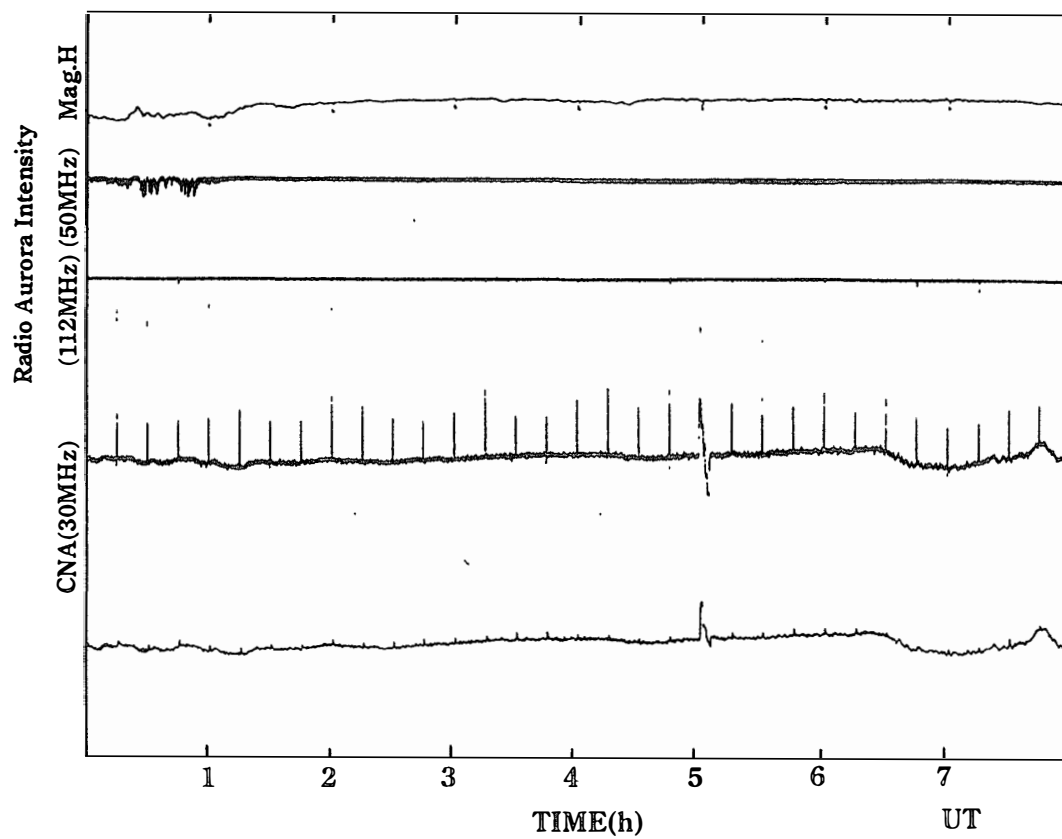
Syowa Station Auroral Radar

July 15. 1994



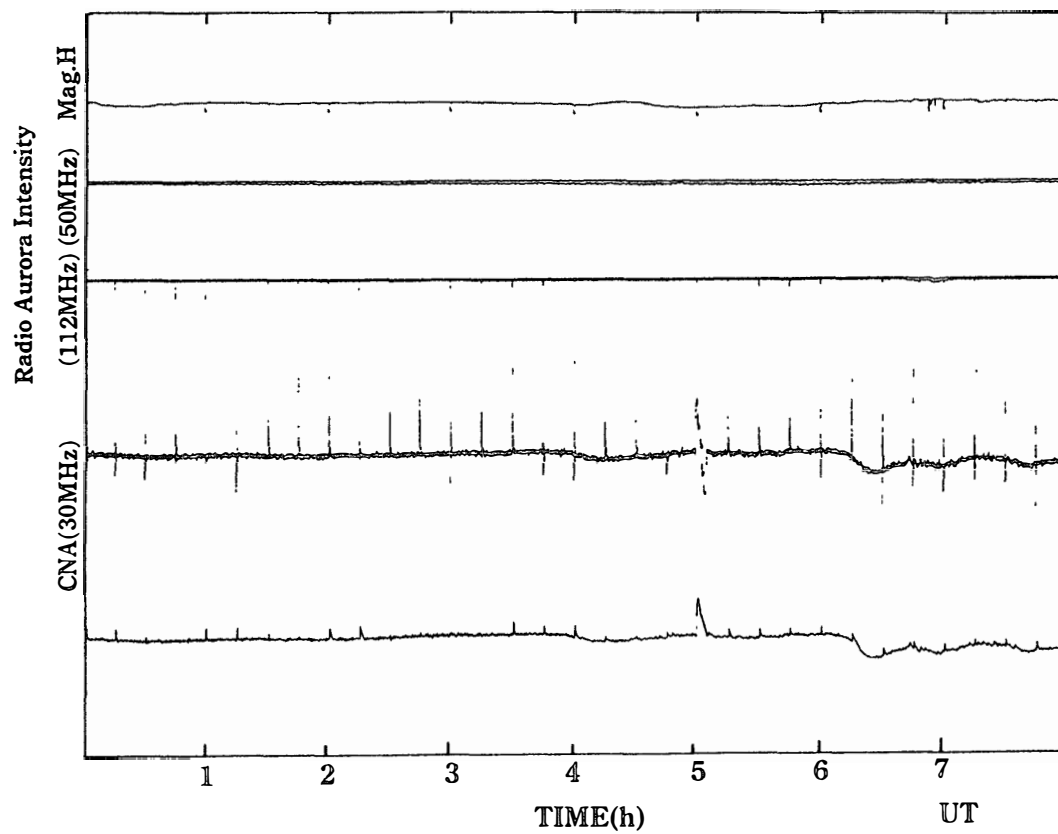
Syowa Station Auroral Radar

August 15. 1994



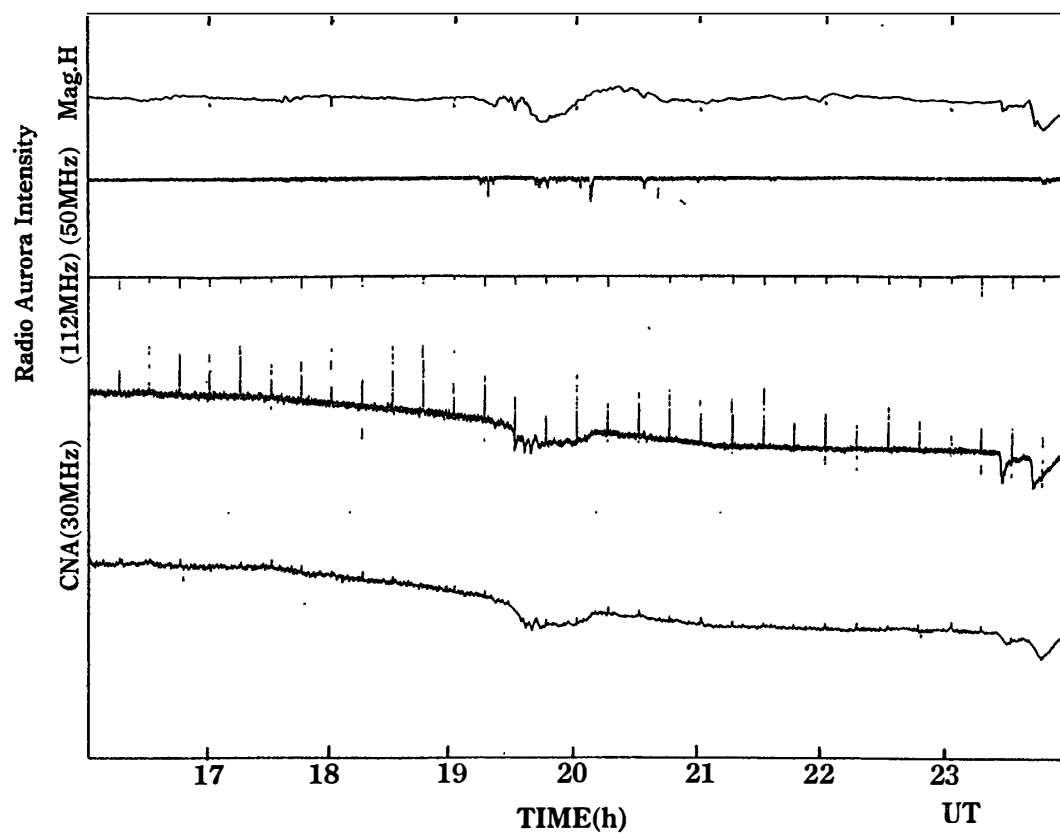
Syowa Station Auroral Radar

August 17. 1994



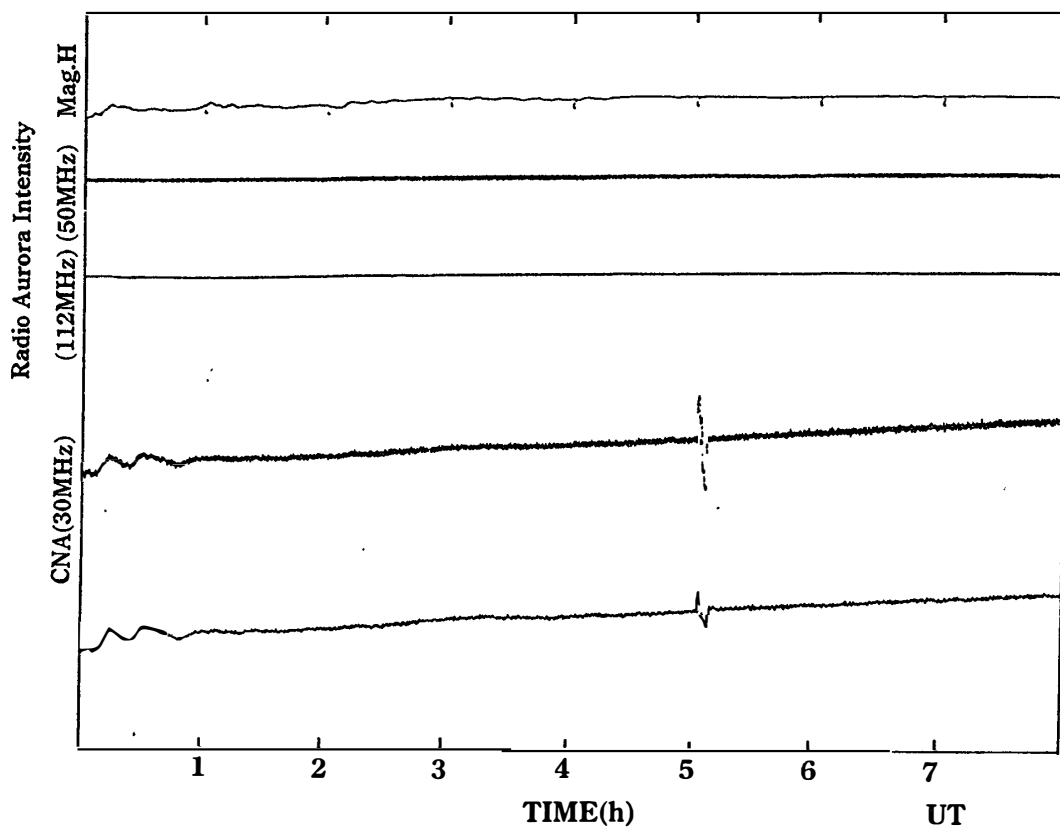
Syowa Station Auroral Radar

September 9. 1994



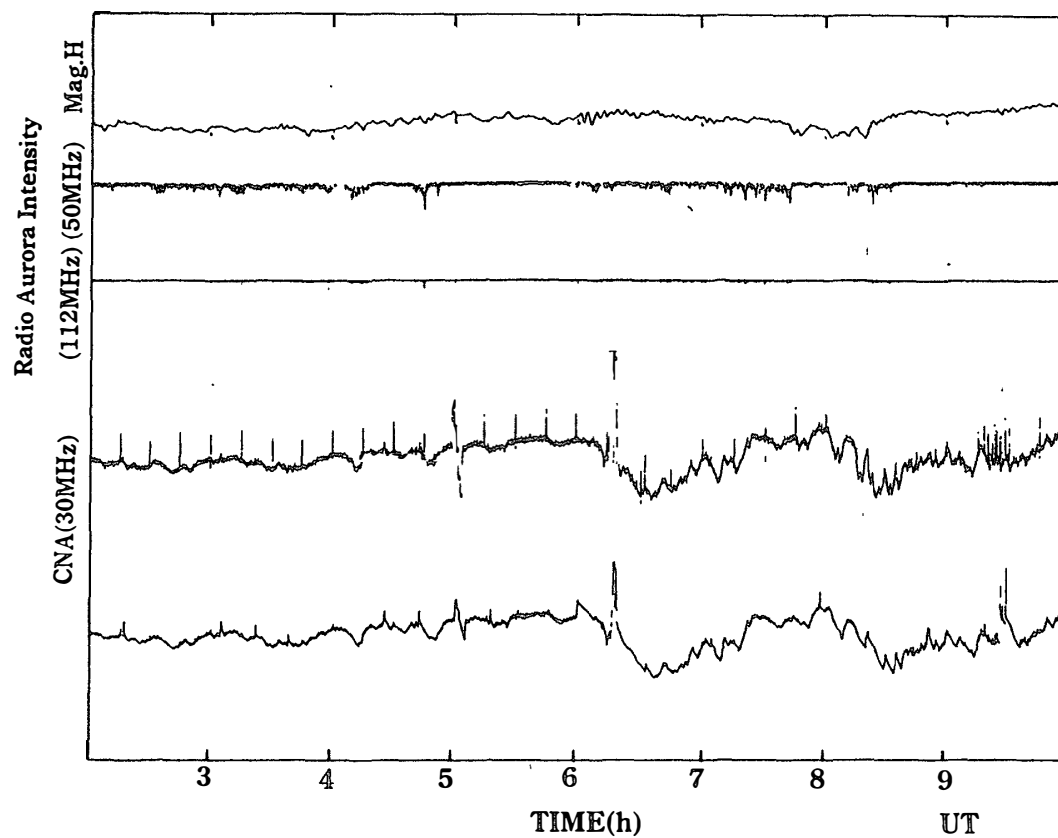
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September 14. 1994



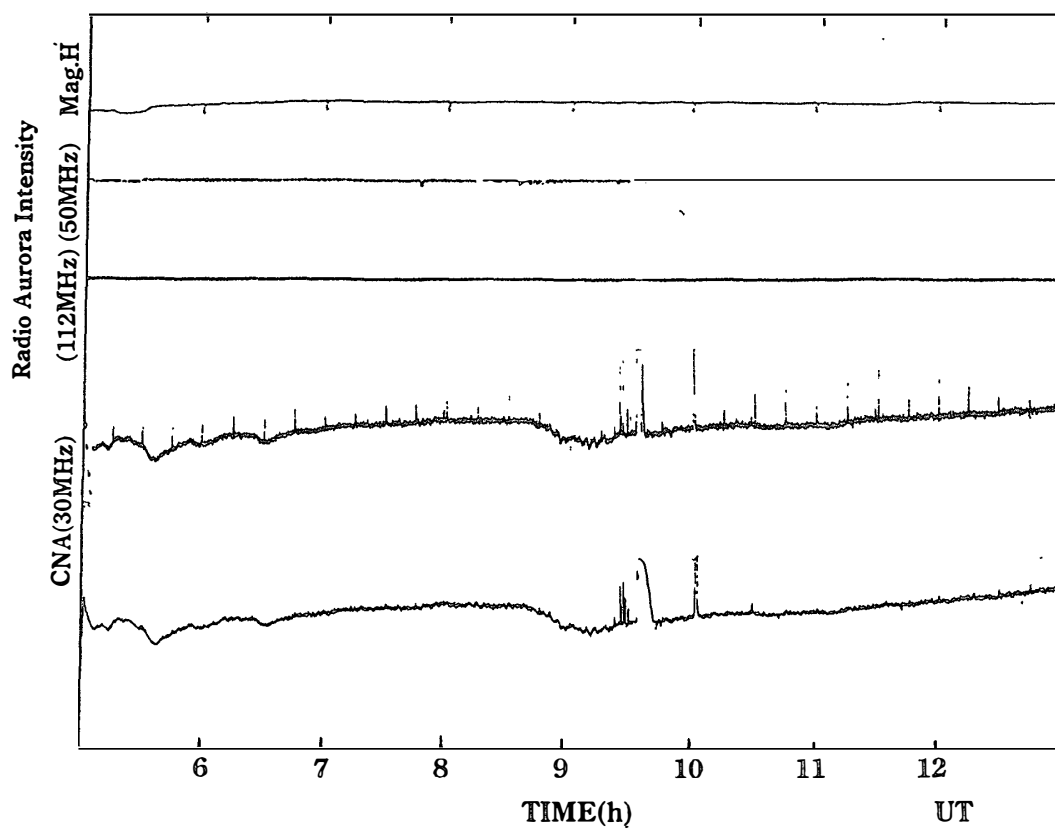
Syowa Station Auroral Radar

October 3. 1994



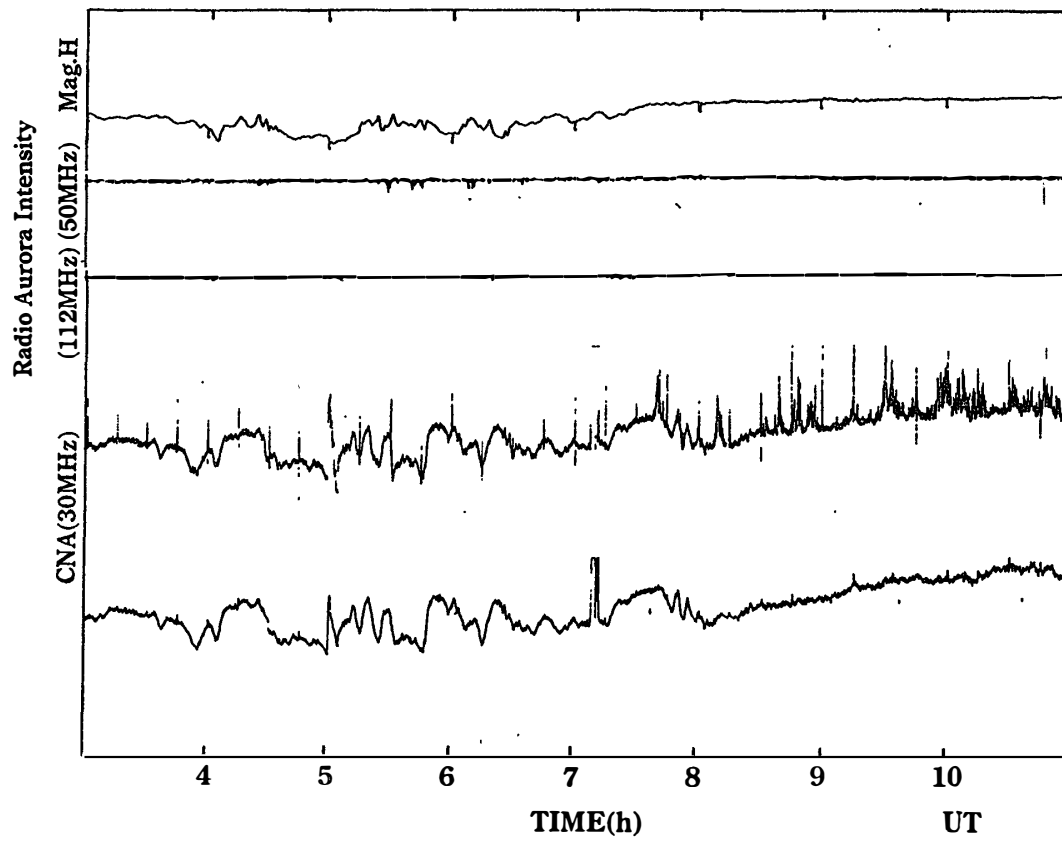
Syowa Station Auroral Radar

October 12. 1994



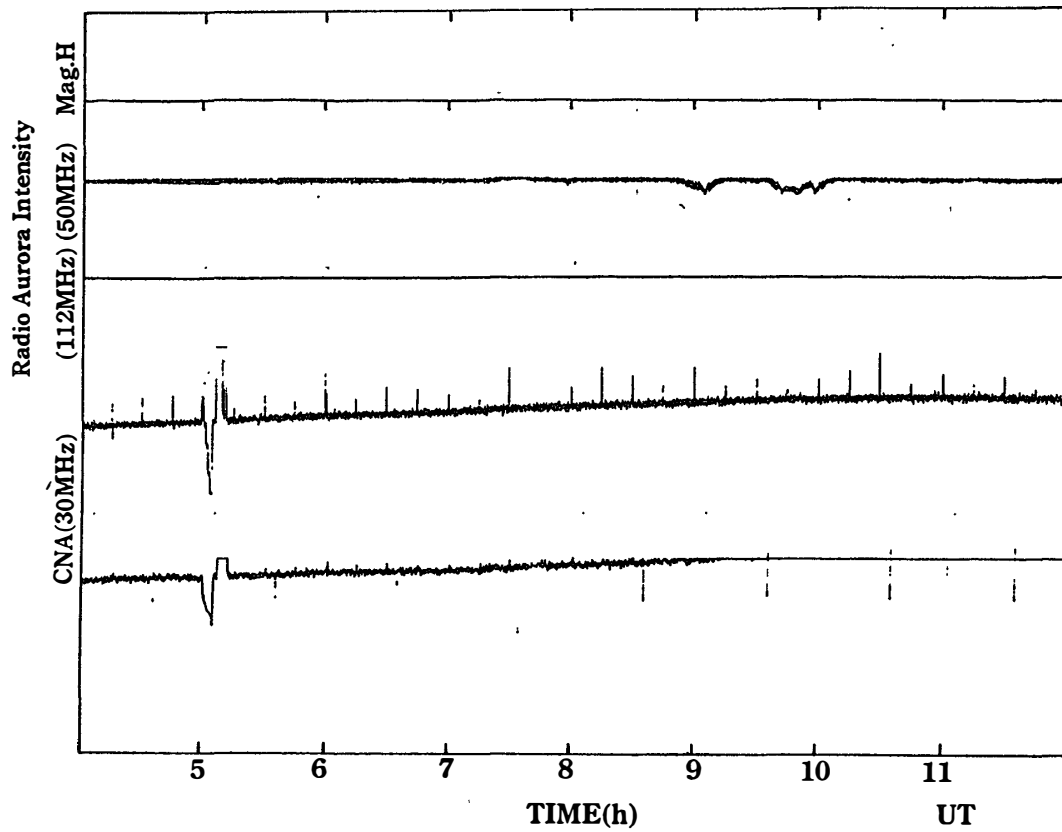
Syowa Station Auroral Radar

November 6. 1994



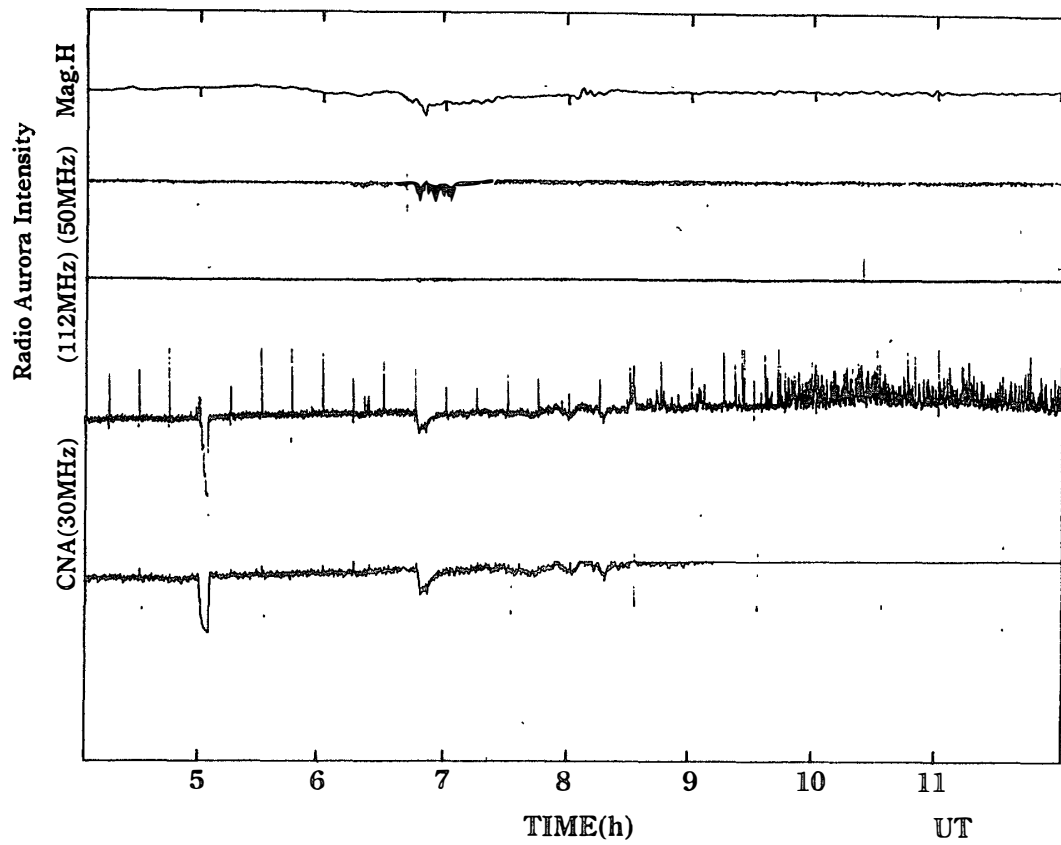
Syowa Station Auroral Radar

November 16. 1994



Syowa Station Auroral Radar

December 6. 1994



Syowa Station Auroral Radar

December 14. 1994

