

RECORDS OF RADIO AURORA AT SYOWA STATION,

ANTARCTICA IN 1990

Kazuhiro OHTAKA and Kiyoshi IGARASHI

(Communications Research Laboratory, Koganei-shi, Tokyo 184)

1. Introduction

This report presents a summary of data obtained during the period of 1990 with the auroral radar at Syowa Station, Antarctica. Three kinds of data are available; a) chart records of the time variation of echo intensity, b) digital MT, c) 35 mm film records of radio auroral echo intensity (A-scope) and range-time intensity (A'-scope).

Inquiries about details of the data should be addressed to:

Antarctic Research Section  
Communications Research Laboratory  
Ministry of Posts and Telecommunications  
2-1, Nukui-Kitamachi 4-chome, Koganei-shi  
Tokyo 184, Japan

TEL:+81-423-27-6886, FAX:+81-423-27-7618, TELEX:2832611 DEMPA J

2. Location

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Syowa Station

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Geographic		Geomagnetic	
Latitude	Longitude	Latitude	Longitude
69° 00' S	39° 35' E	70.0° S	80.2° E

### 3. Observer

Kazuhiro OHTAKA (Communications Research Laboratory)

### 4. Equipments

The main parameters of Syowa Station auroral radar are shown in Table 1. The three antenna beams with the half power width about 4 degrees are directed toward the geomagnetic south,  $32.8^\circ$  west from the geomagnetic south, and  $47.0^\circ$  east from the geomagnetic south respectively. In 1990 two antennas directed to the geomagnetic south and  $32.8^\circ$  west from the geomagnetic south were used mainly. These two antennas are switched alternately. The details of the data processing and radar system are described in the reference.

Table 1. Parameters of the Syowa Station Auroral Radar

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Site	Syowa Station ( $69^\circ 00' S$ , $39^\circ 35' E$ )
Type	Coherent pulse radar
Frequency	50, 112 MHz
Peak Power	15 kW
Pulse width	100 $\mu s$
PRF	50 Hz (333 Hz for spectrum observation)
Antenna	Three 14-element coaxial collinear (three-way)
Antenna gain	25 dB
Antenna beamwidth	$4^\circ$ (half power) in horizontal plane
Receiver bandwidth	10 kHz
Receiver noise figure	less than 4 dB
Display and recorder	A - scope display, A <sup>-</sup> - scope display, pen recorder and digital MT

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### 4. Explanation of Diagrams

The backscattered power intensities observed with the 50 MHz auroral radar were sampled every 1 second and stored by the digital data logger. Figure 1 shows radio auroral intensities obtained from the records with this data logger during the the period of 1990.

The blank shows a lack of observations caused by the recording troubles and so on.

Figure 2 shows a summary plot of intensity and spectrum records with the 50 MHz auroral radar.

#### 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
1982	Igarashi, K. Kuratani, Y.	88 (Ionosphere 30)	28	1984
1983	Igarashi, K. Tanaka, T. Yamazaki, I.	100 (Ionosphere 32)	64	1985
(cont.)				

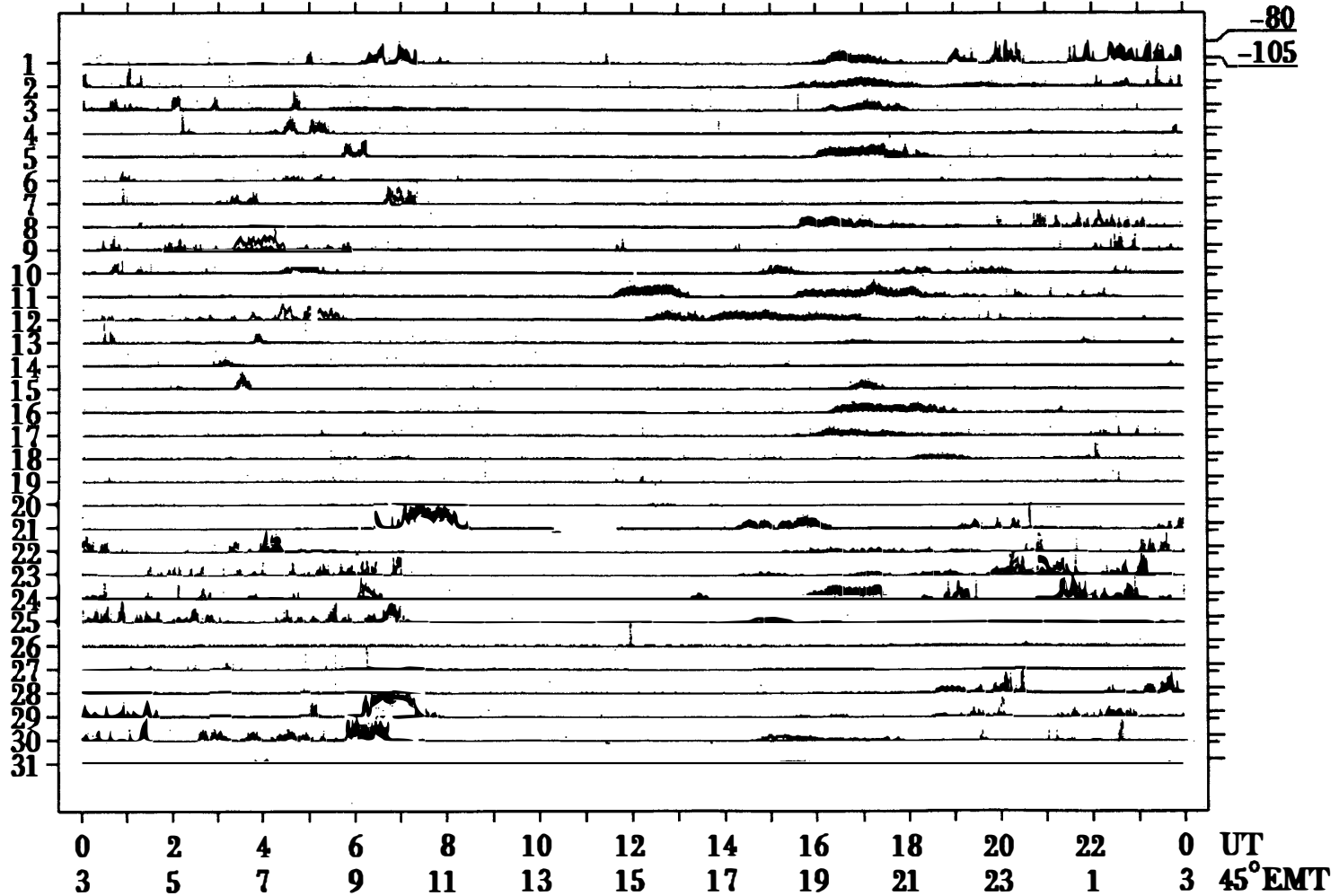
Bibliography relevant to  
RECORDS OF RADIO AURORA AT SYOWA STATION, ANTARCTICA (2)

Observing Period	Observers	Literature		
		JARE Data Reports		
		Volume	Pages	Year
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

CRL Syowa Station Auroral Radar (50MHz) January 1990

Date

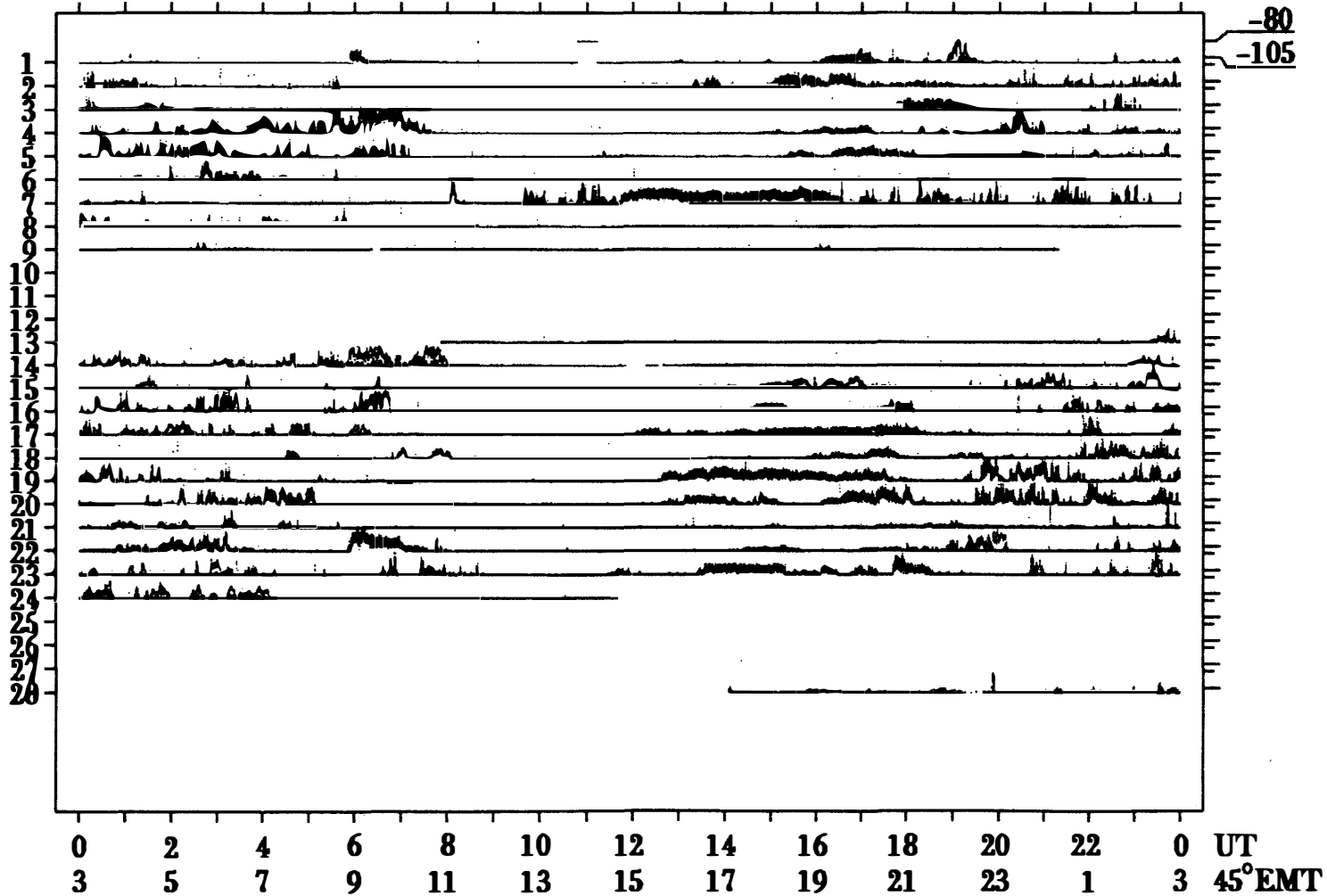
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# CRL Syowa Station Auroral Radar (50MHz) February 1990

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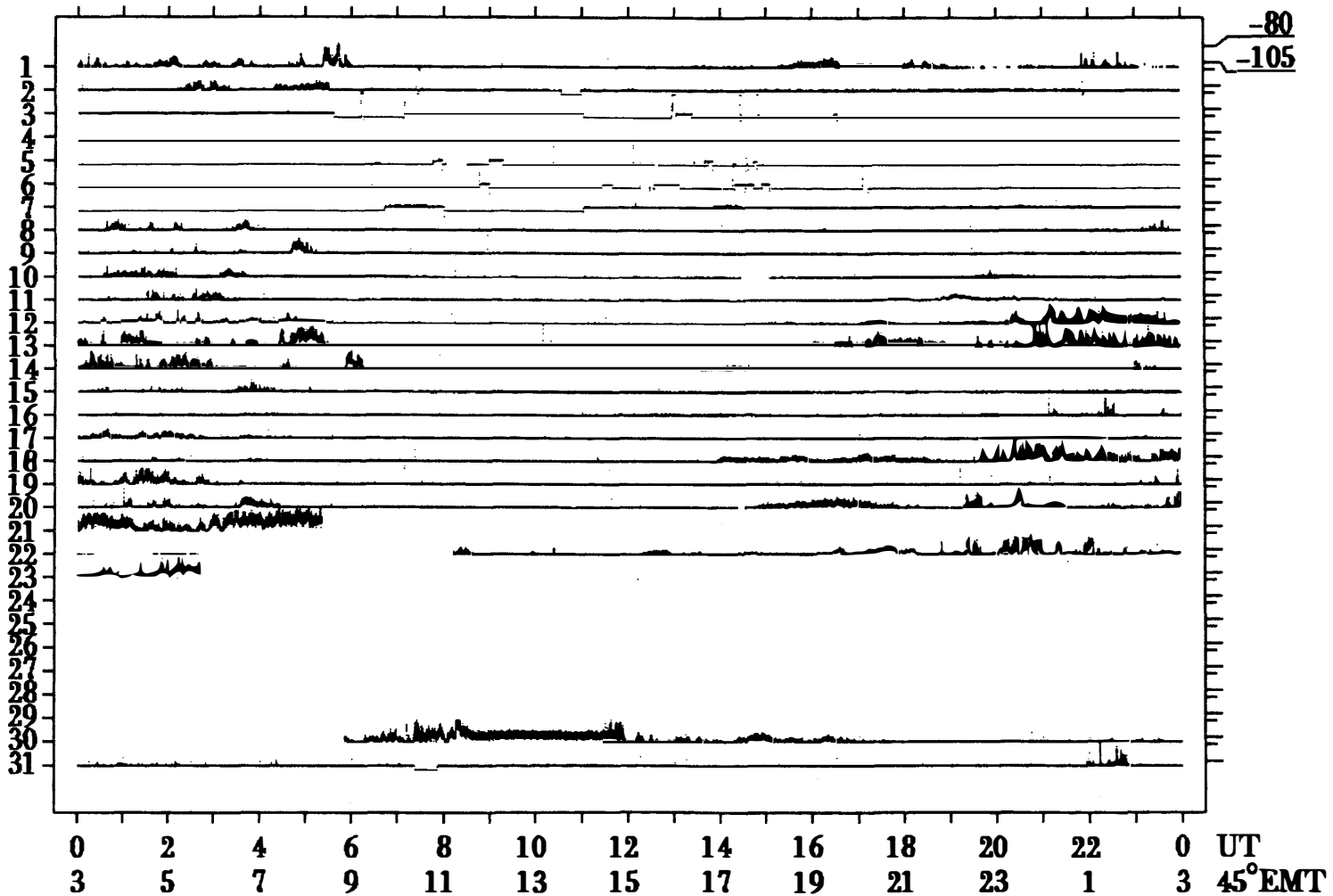


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March 1990

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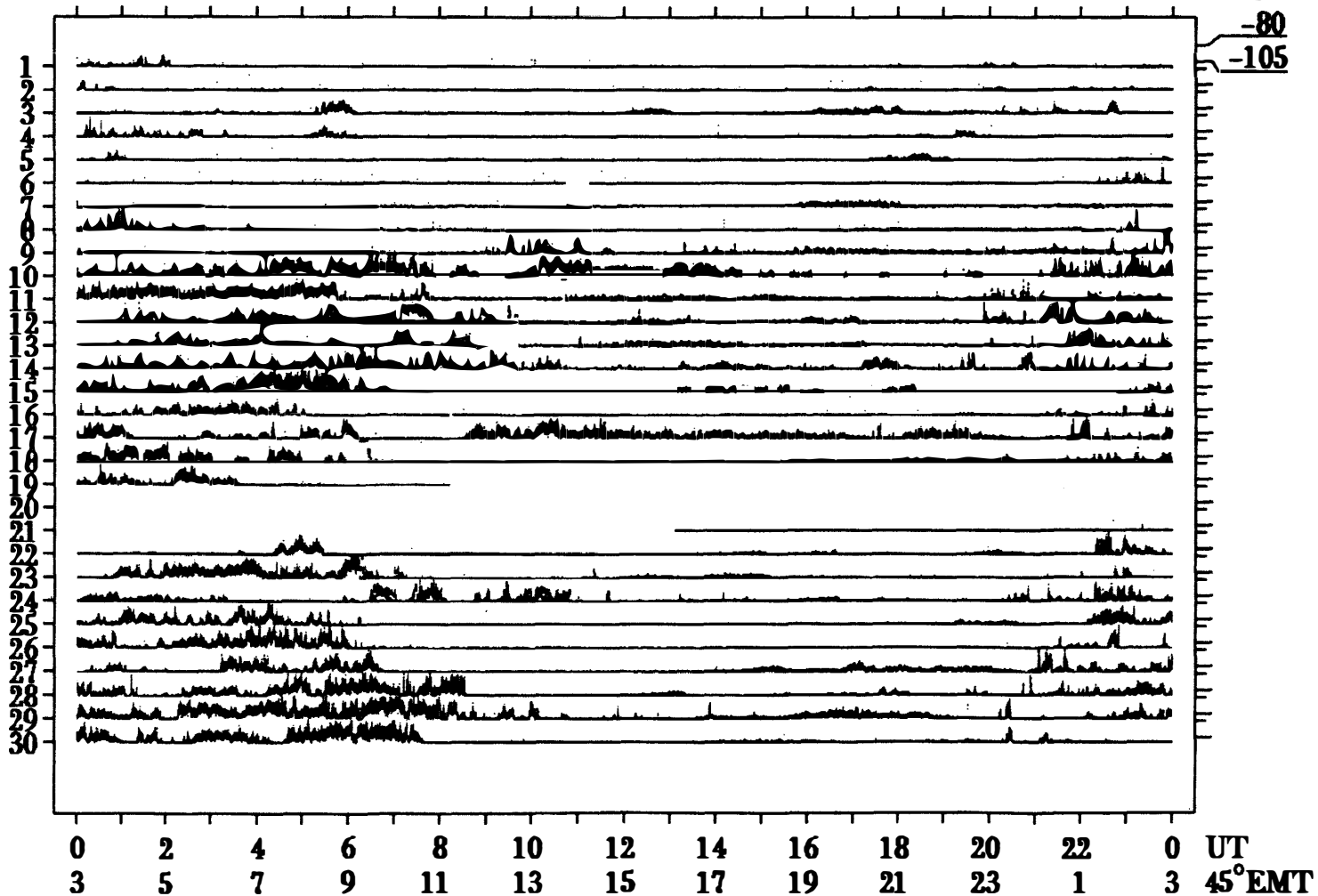


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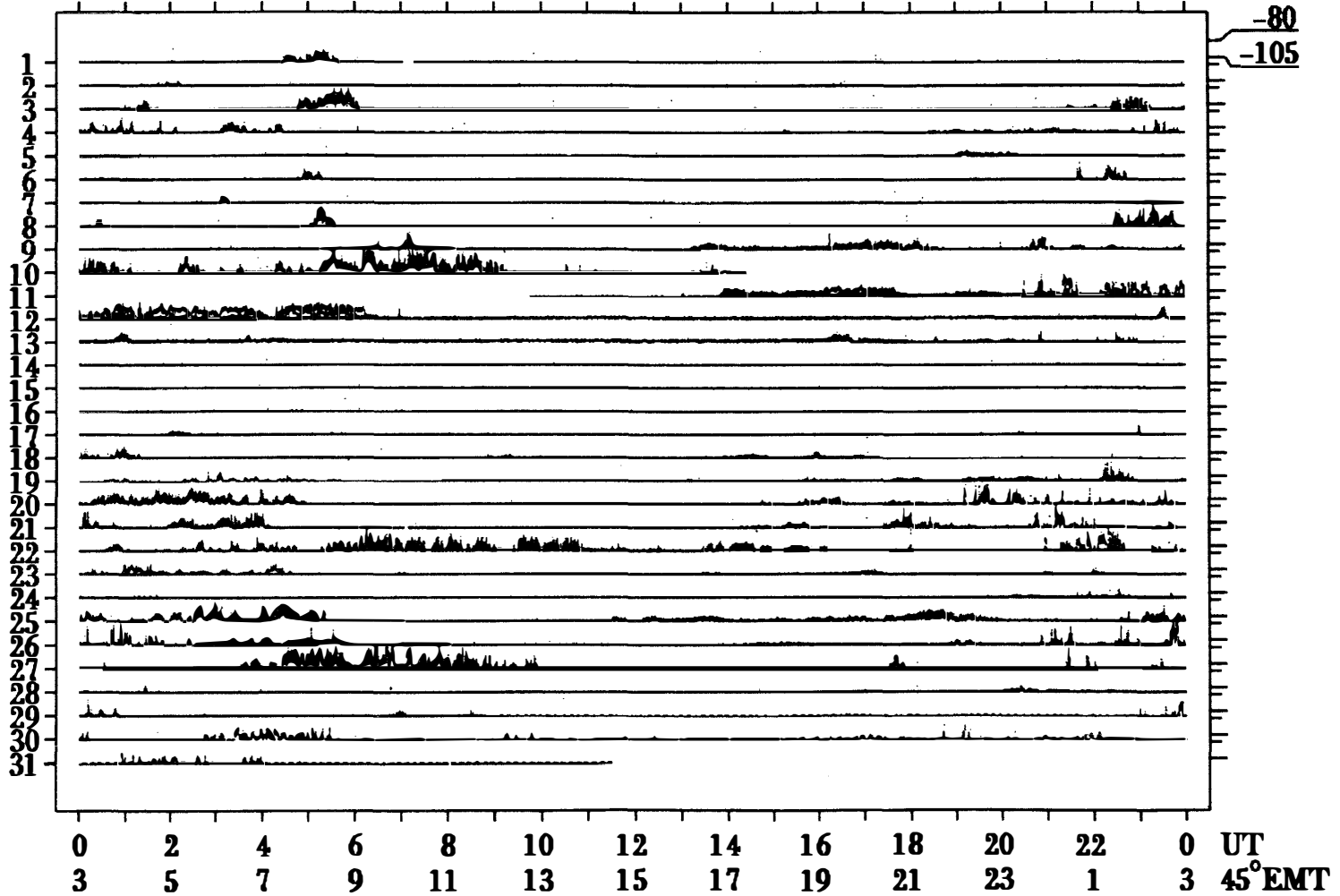


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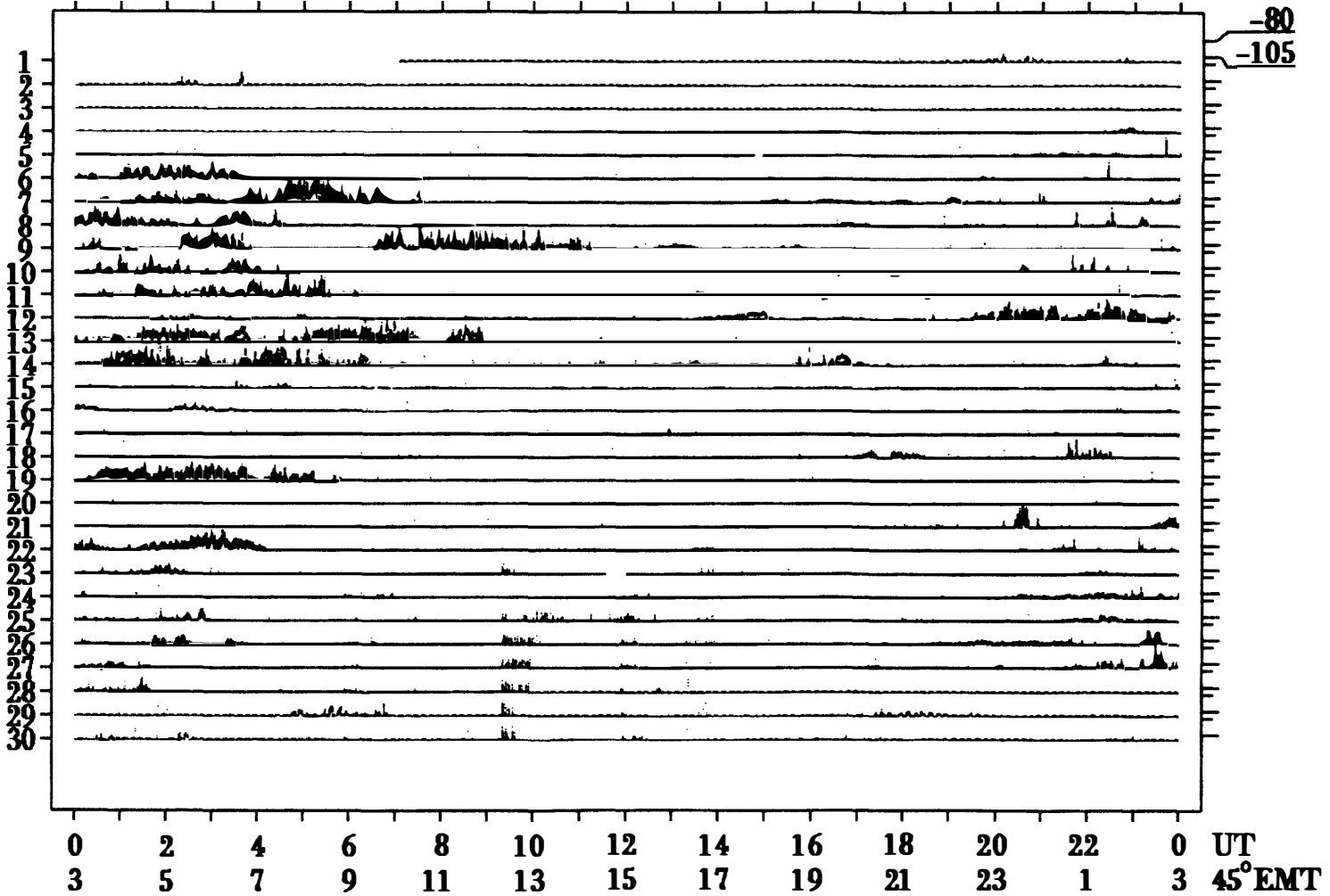


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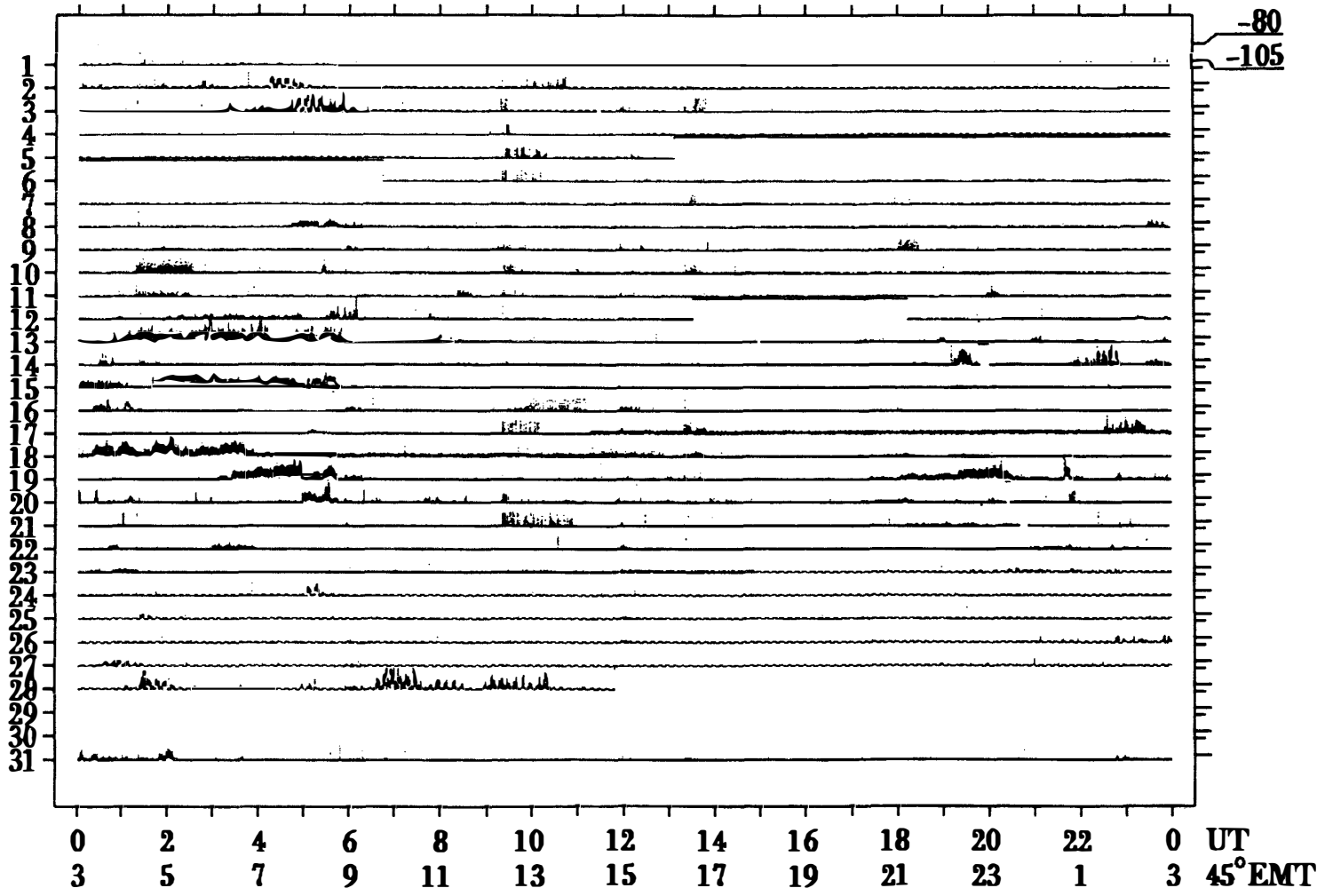


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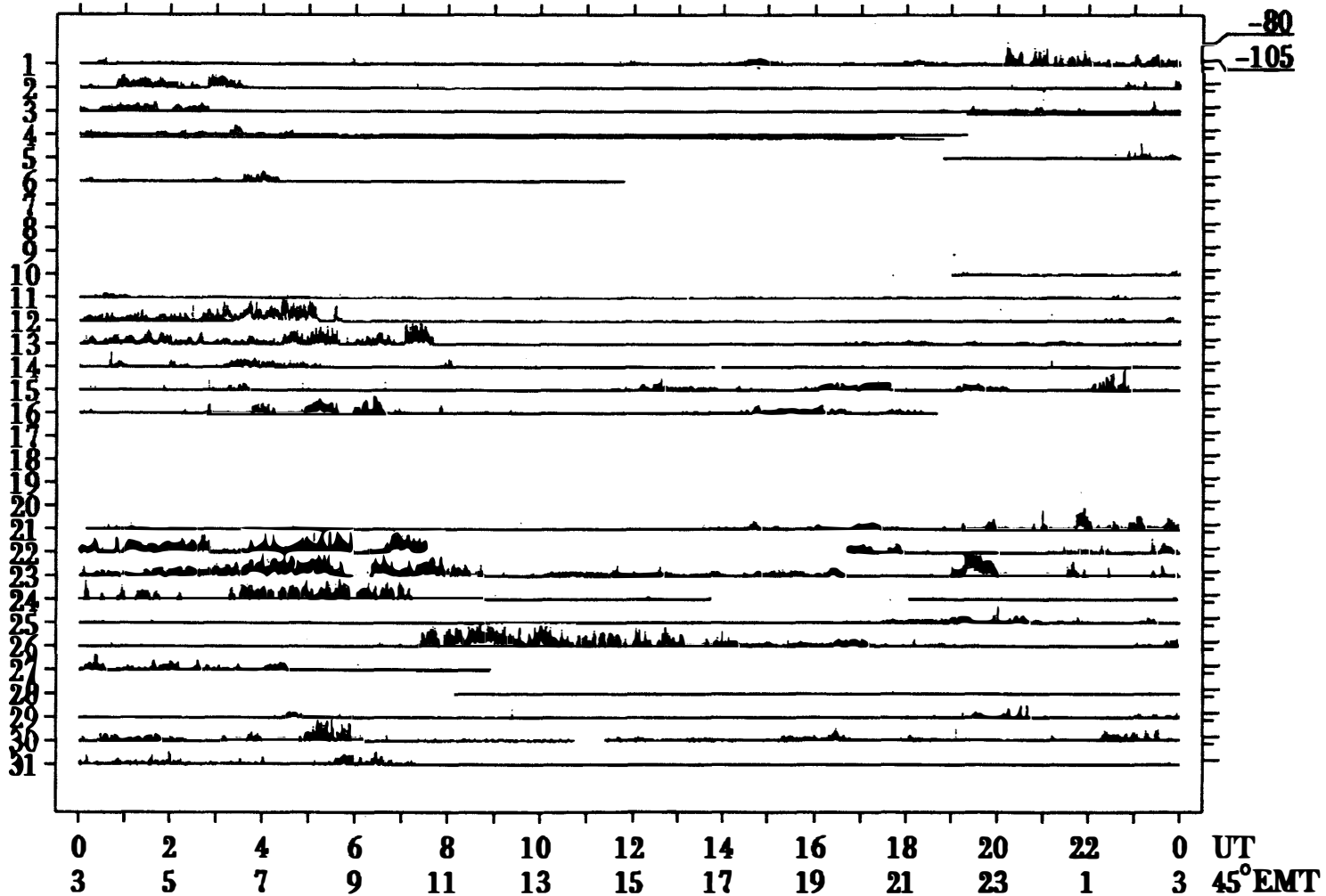
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Date

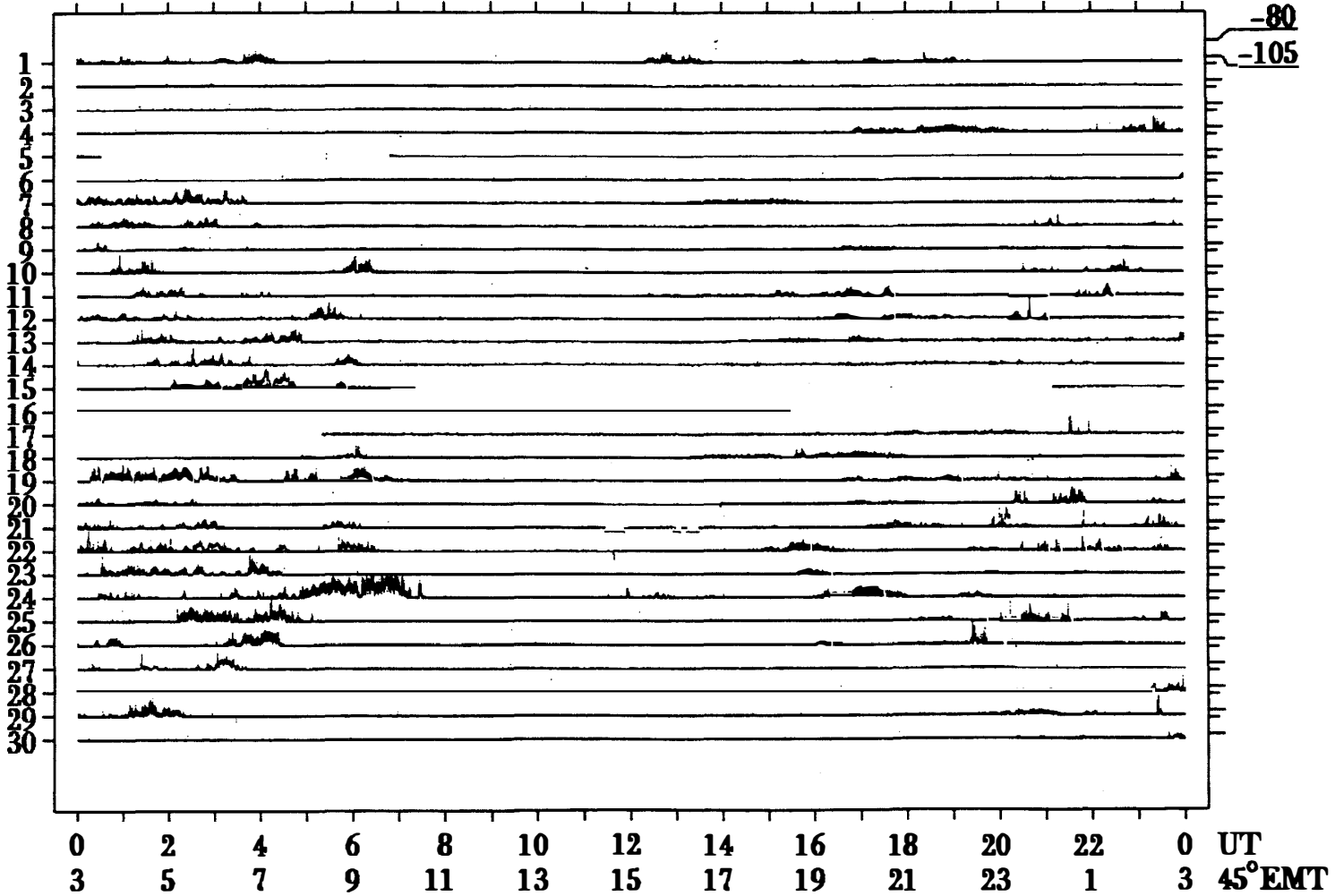
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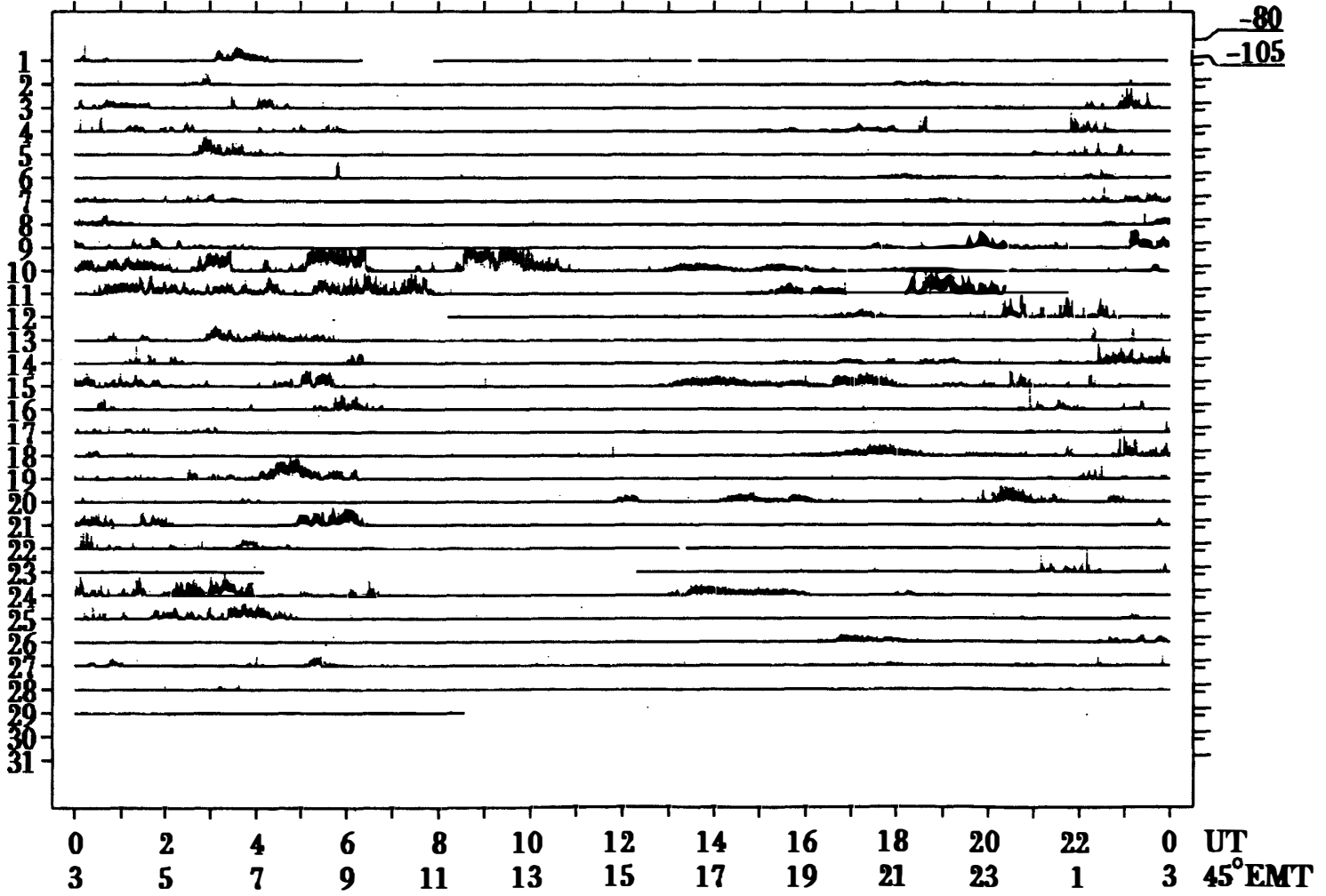
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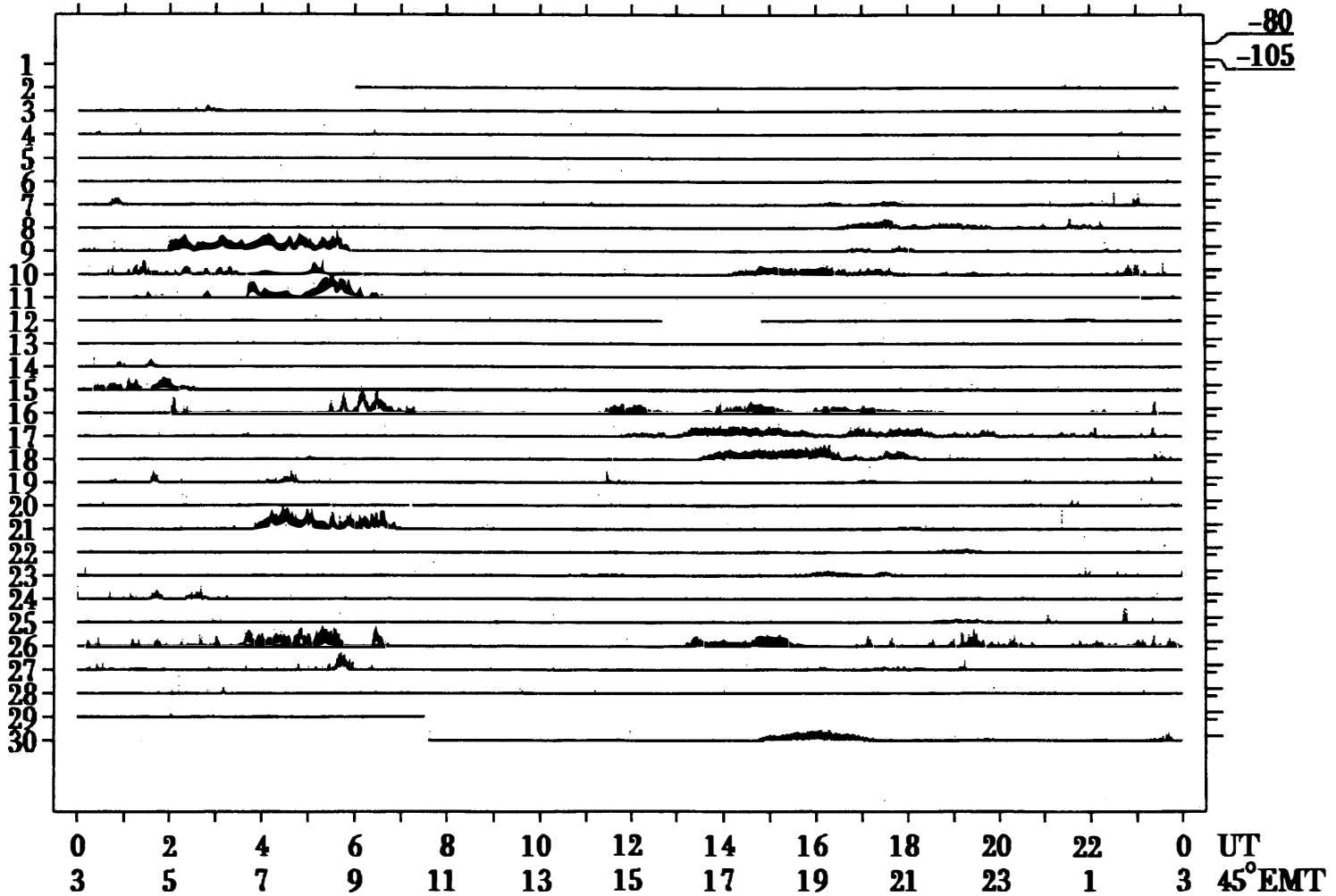
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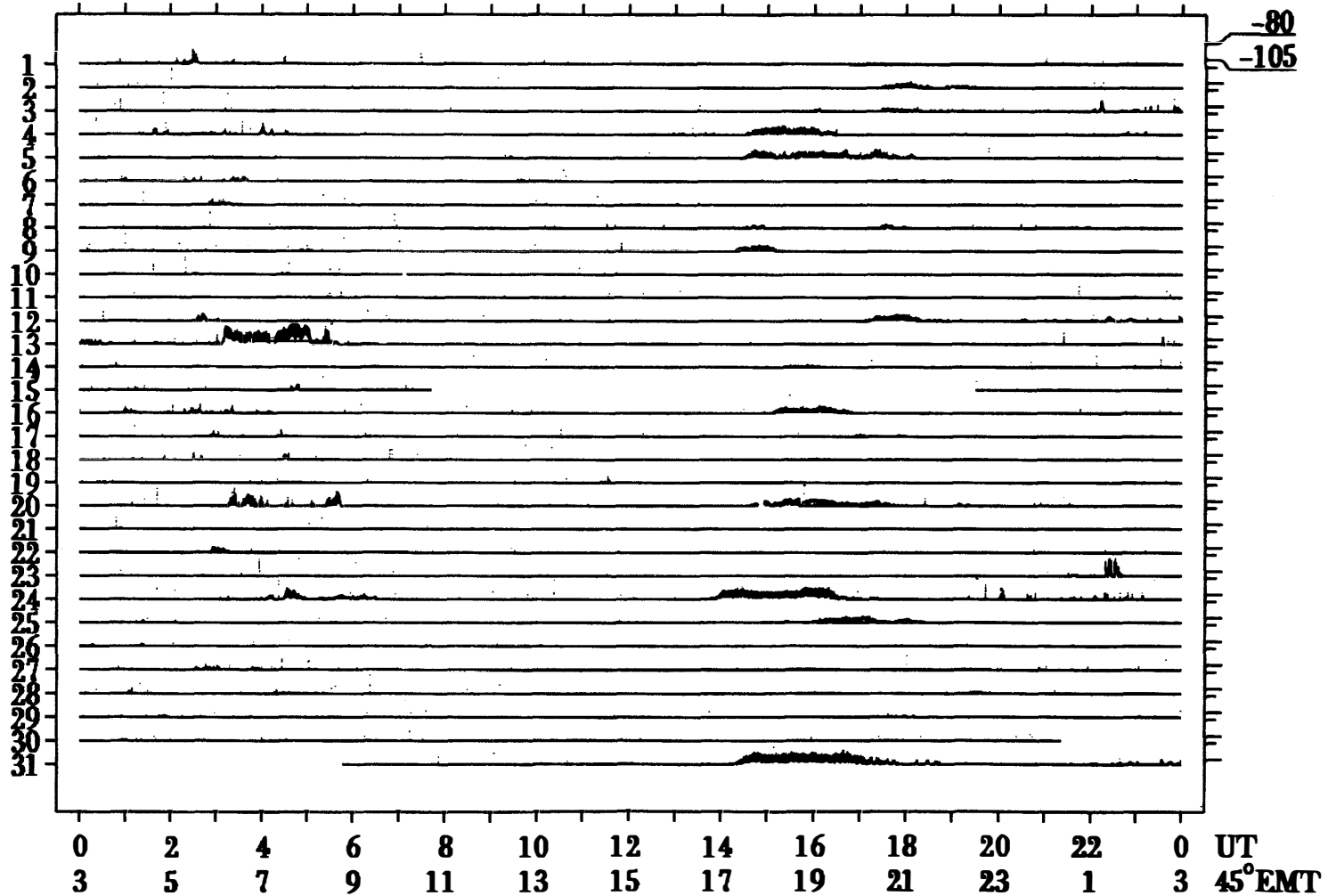




CRL Syowa Station Auroral Radar (50MHz) December 1990

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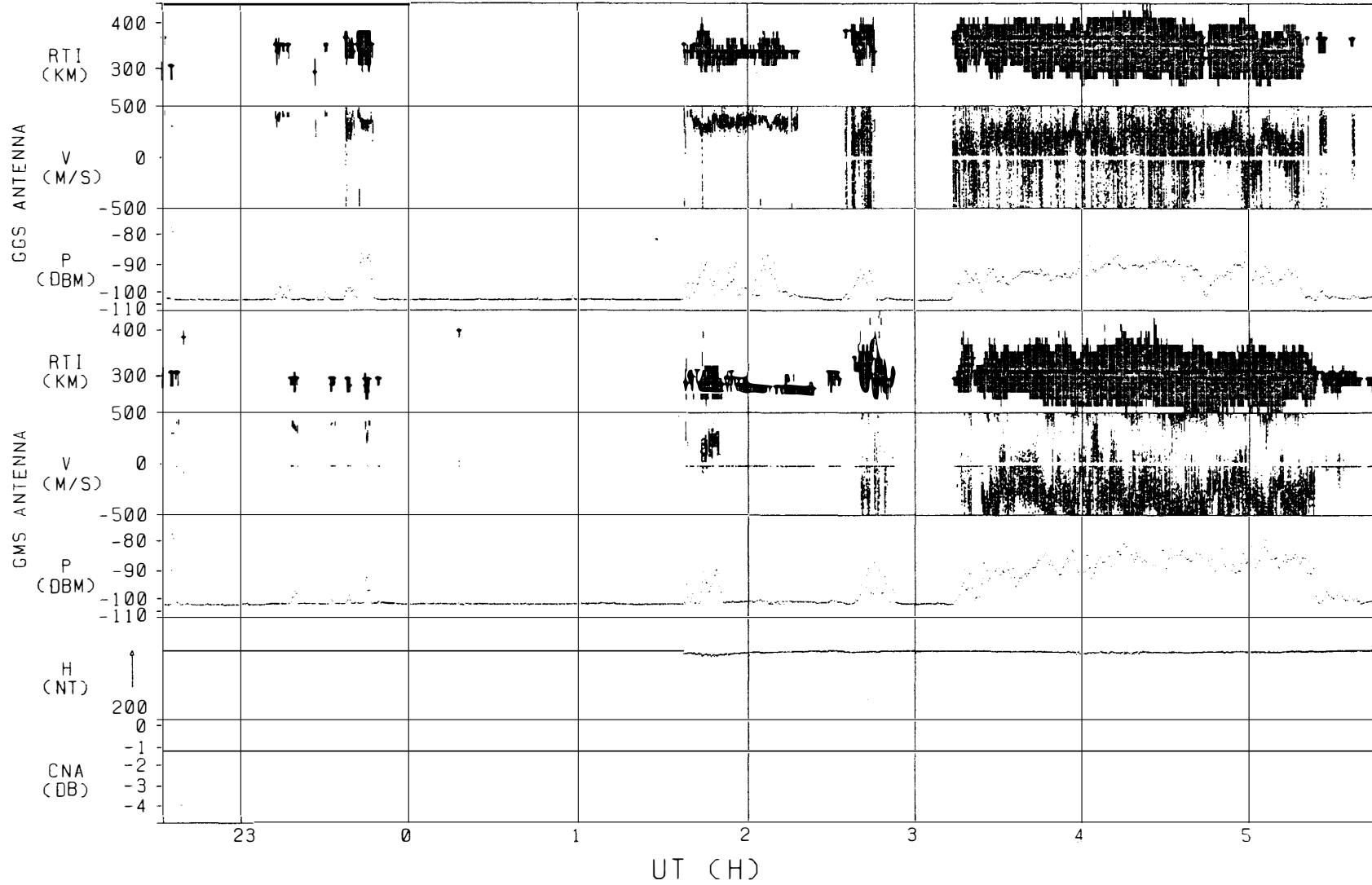


# AURORA RADAR/CRL, SYOWA STATION

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FEB. 12, 1990

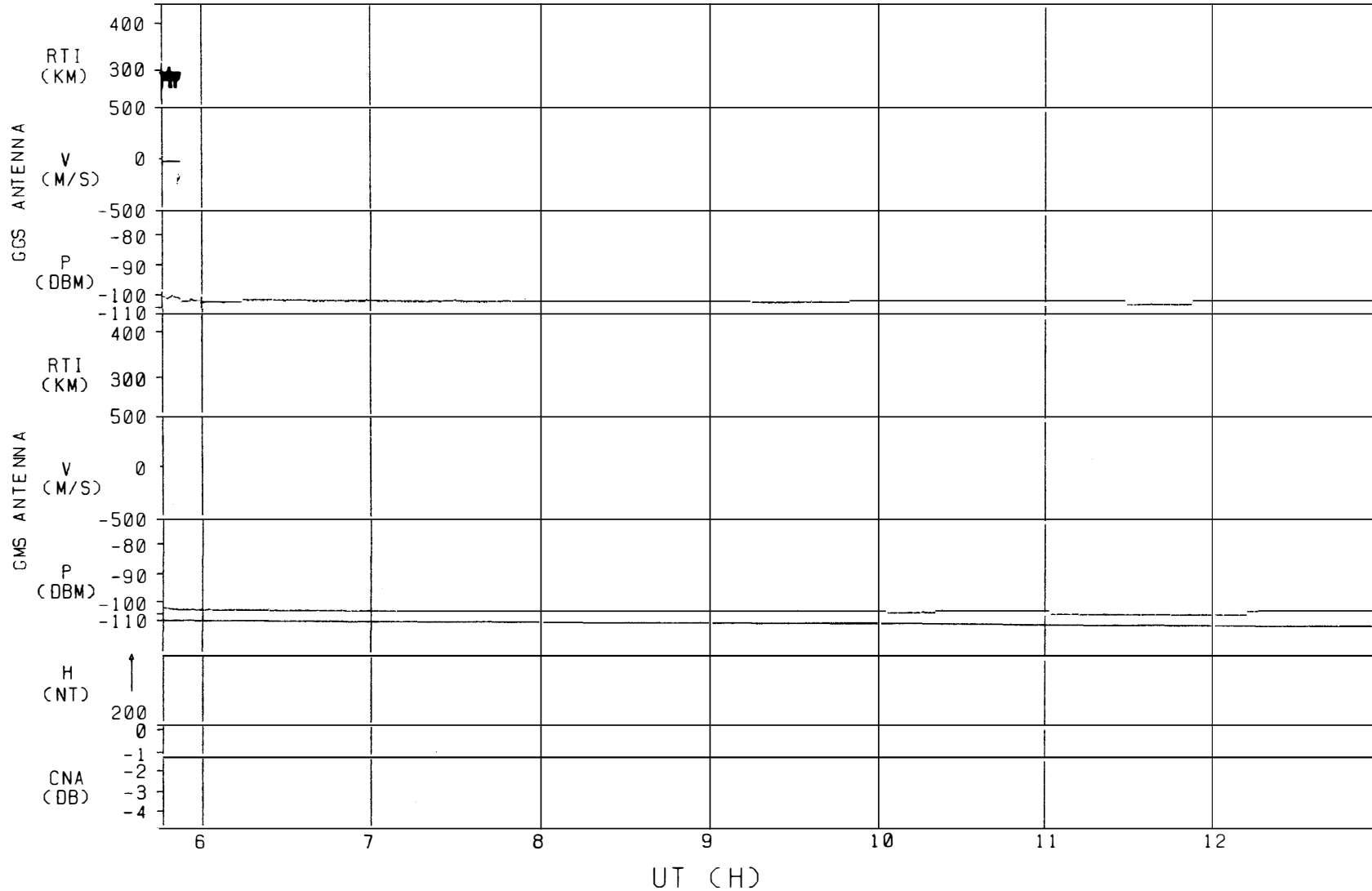
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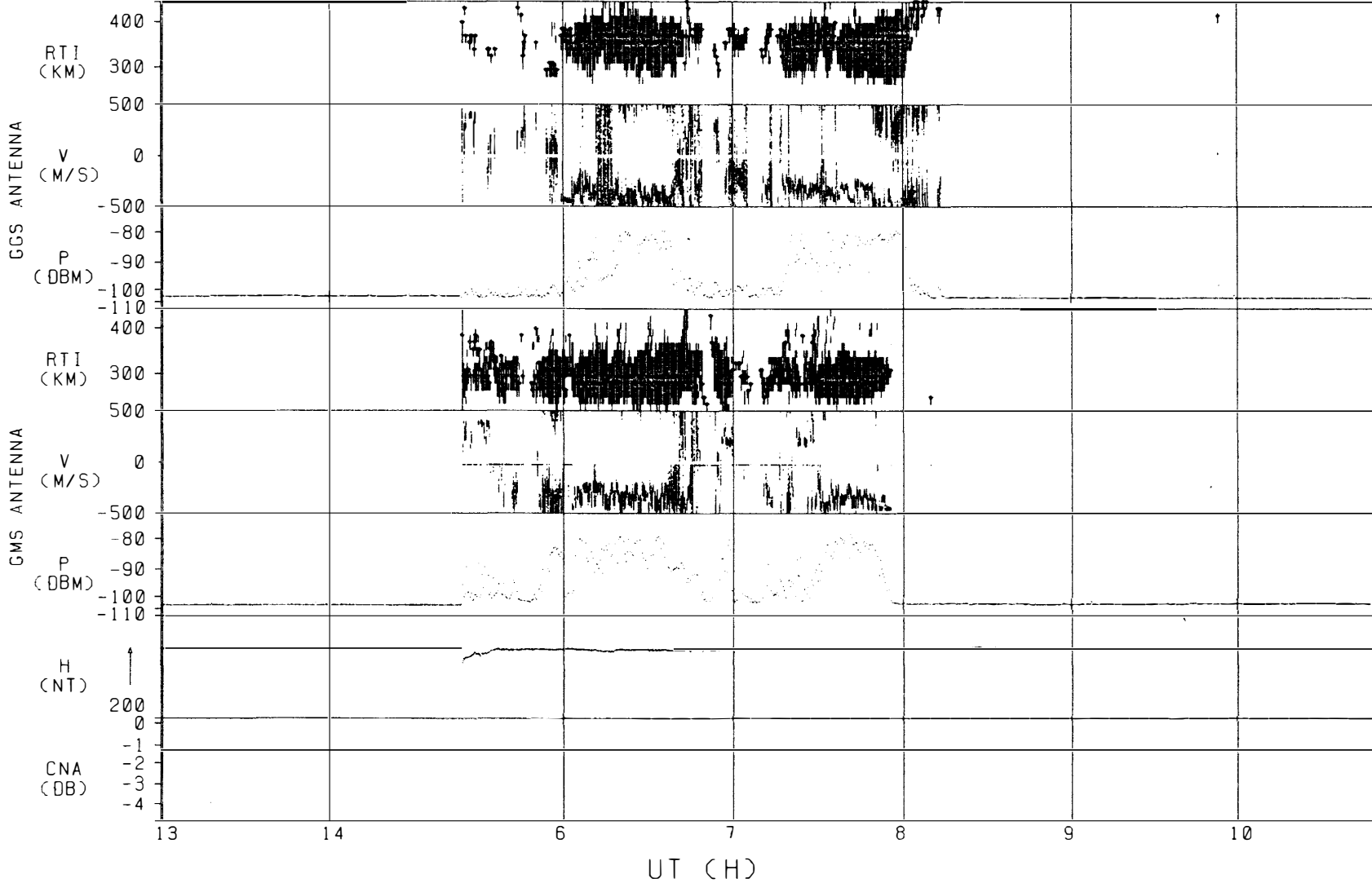


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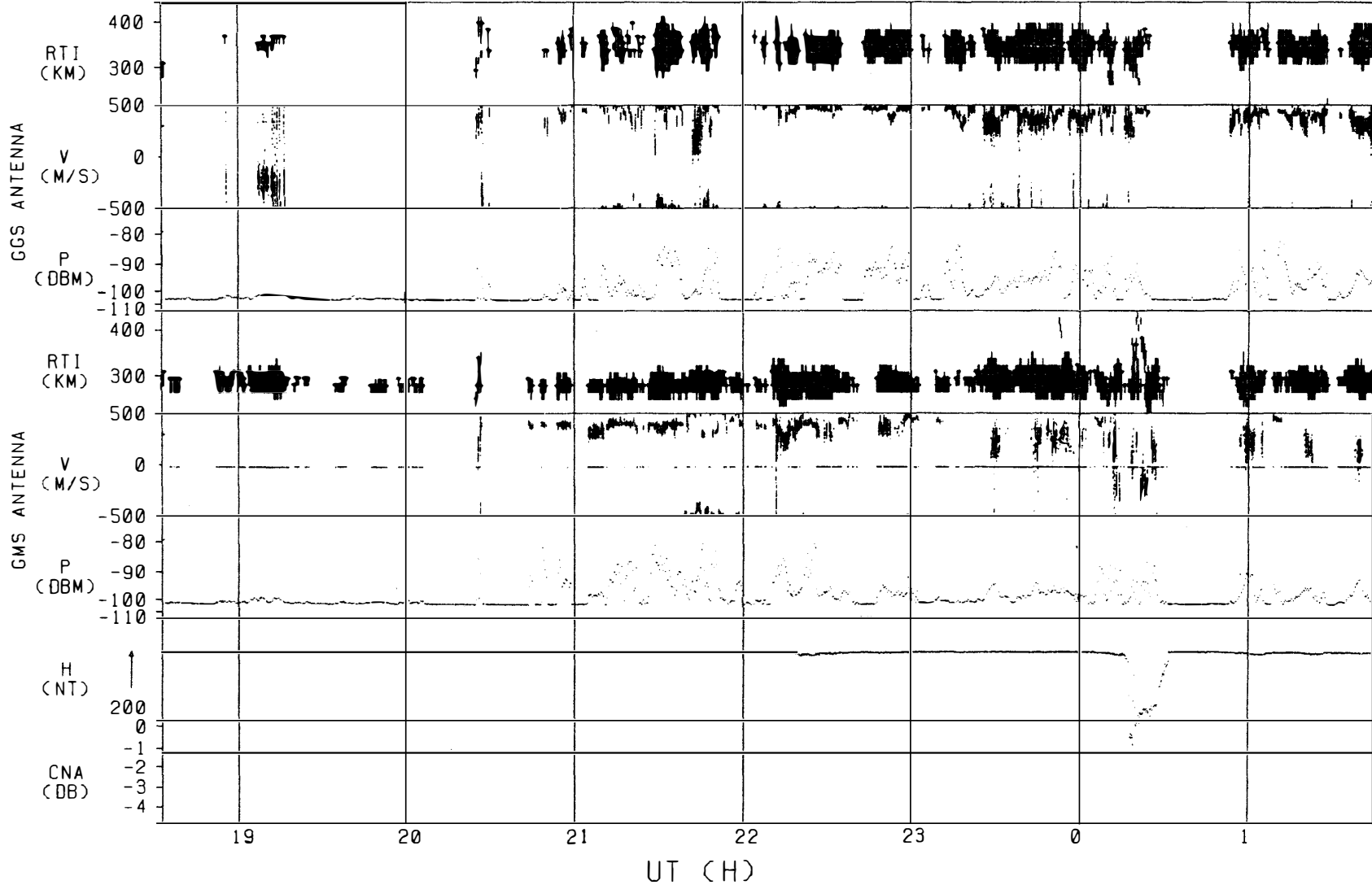


AURORA RADAR/CRL, SYOWA STATION

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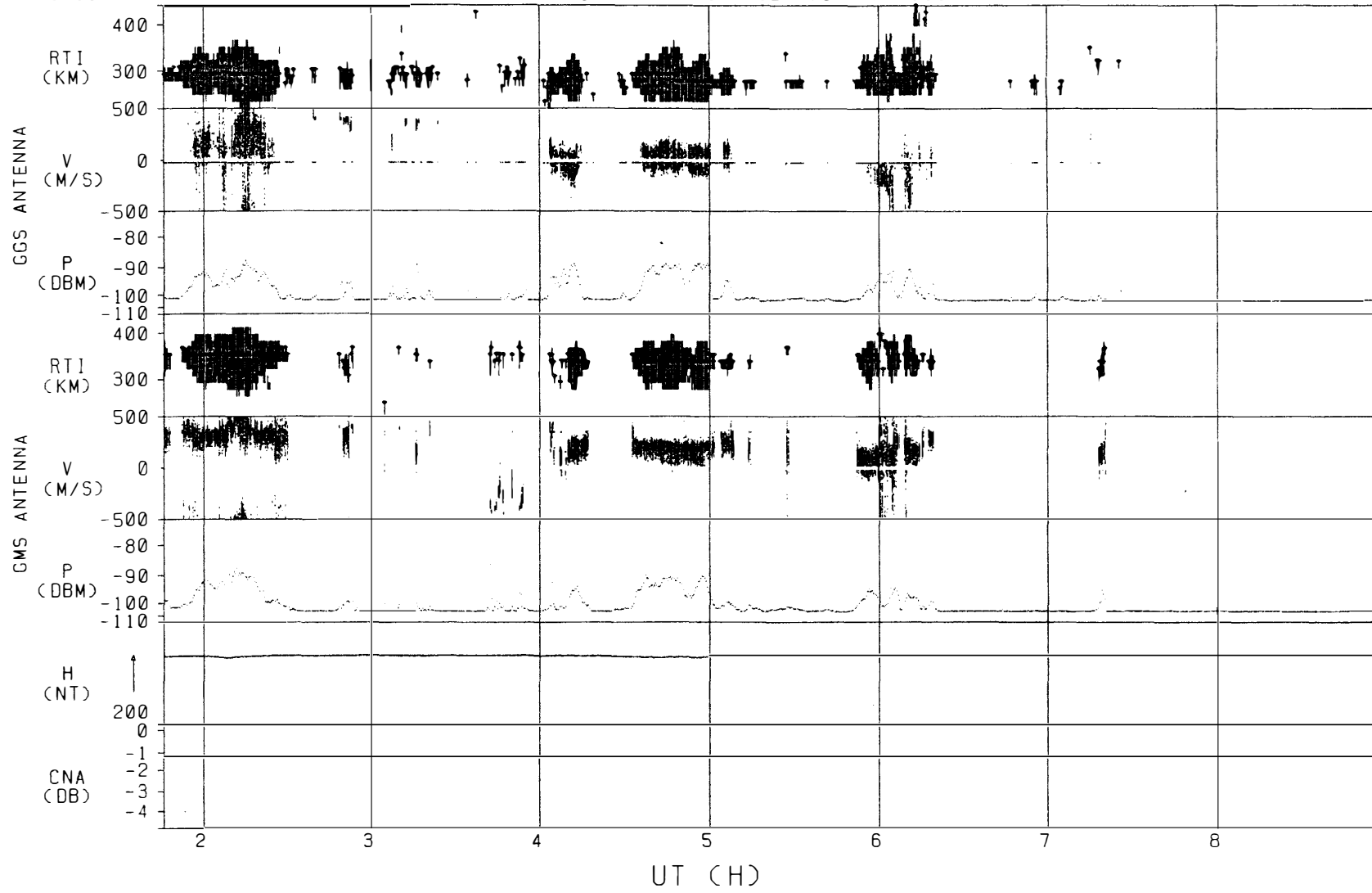
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AURORA RADAR/CRL, SYOWA STATION

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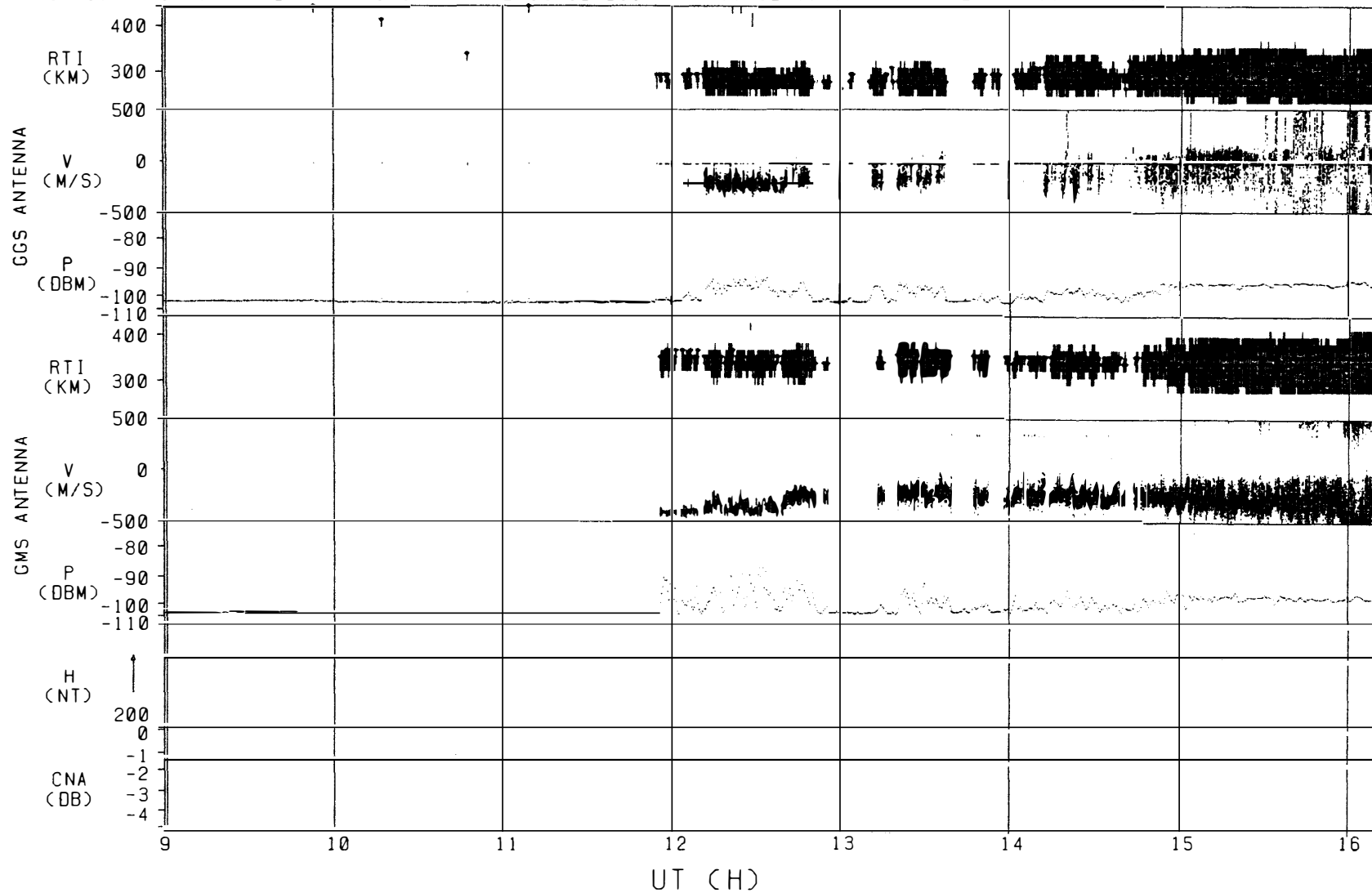
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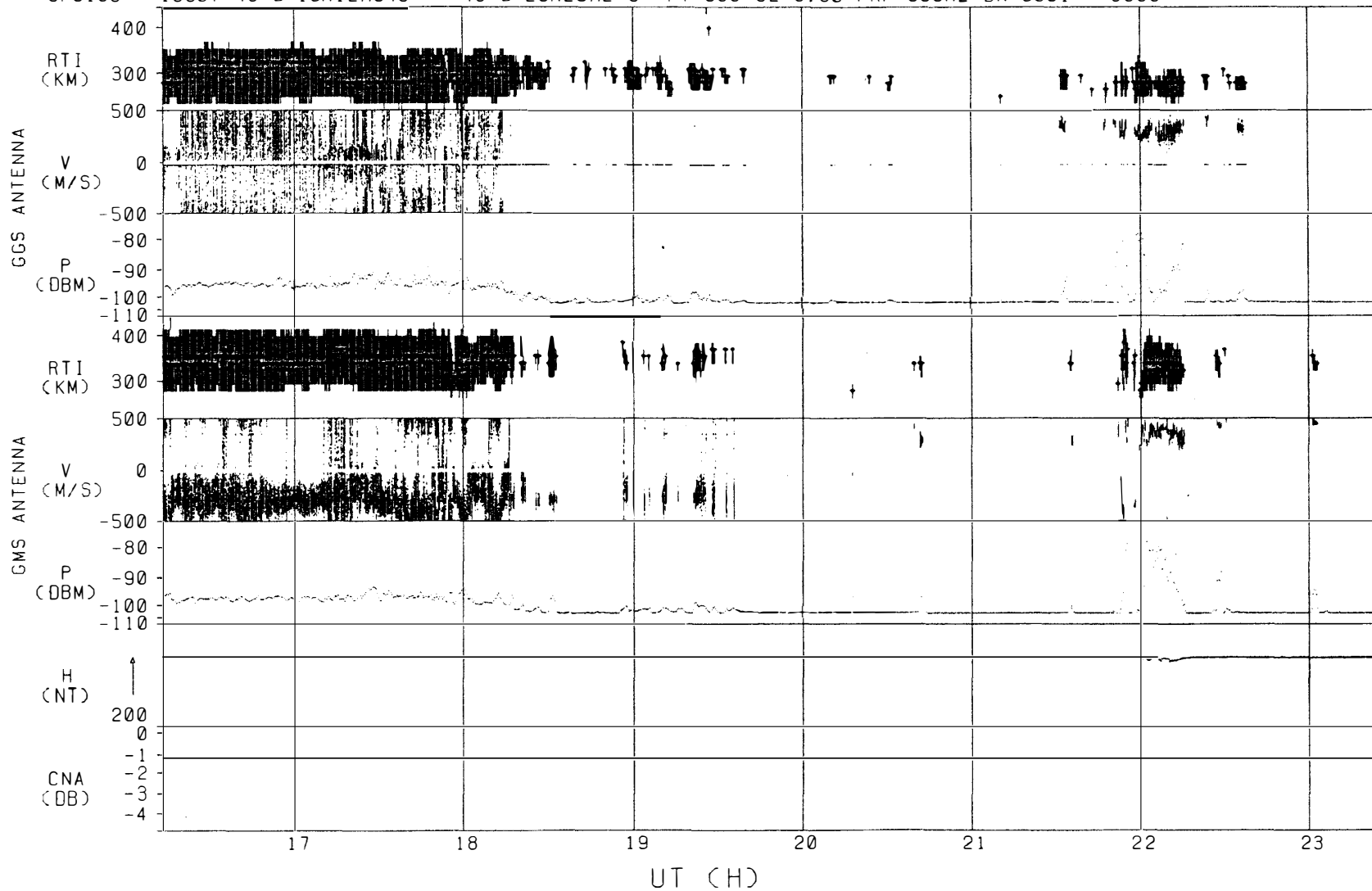
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AURORA RADAR/CRL, SYOWA STATION

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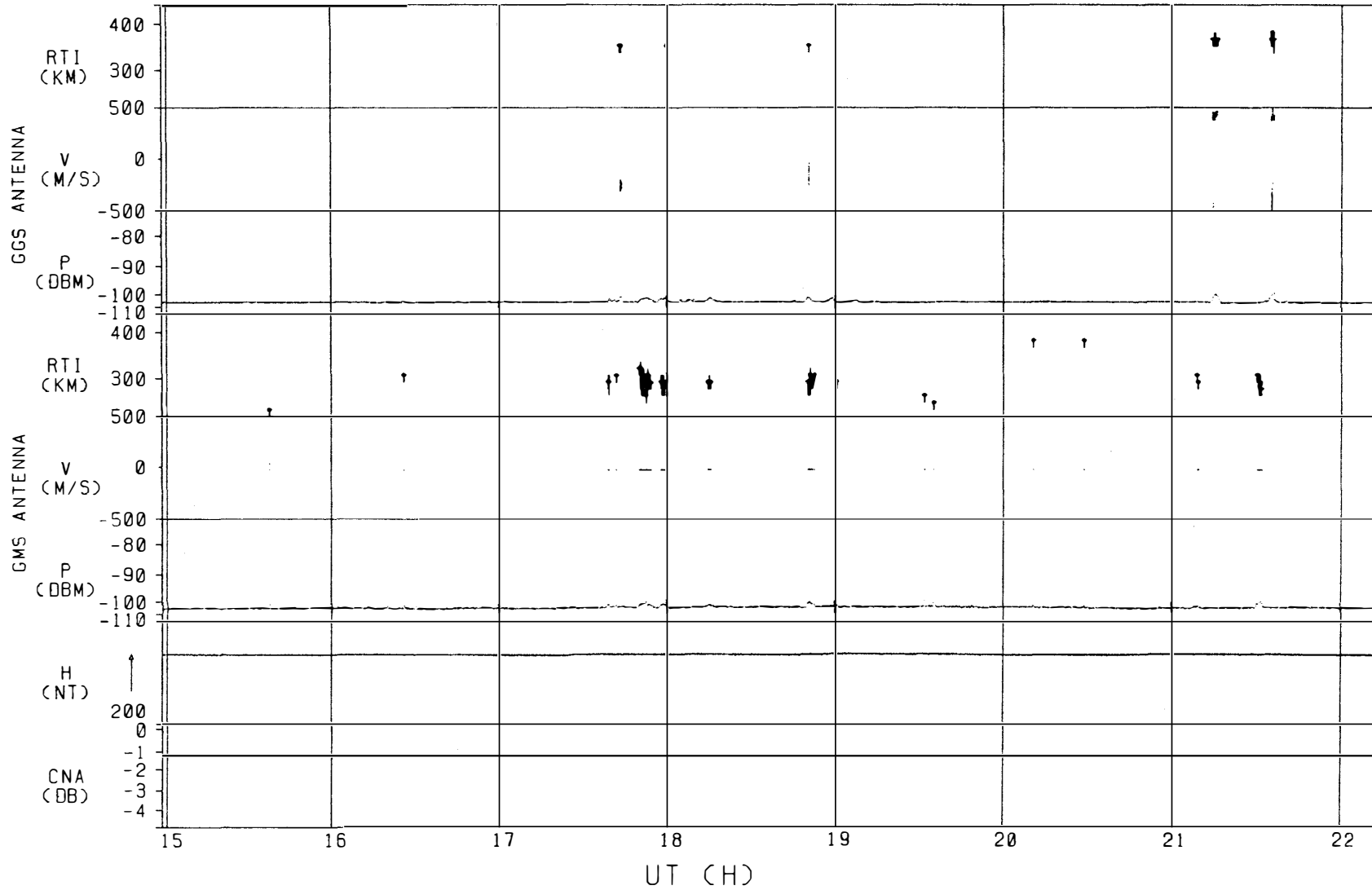




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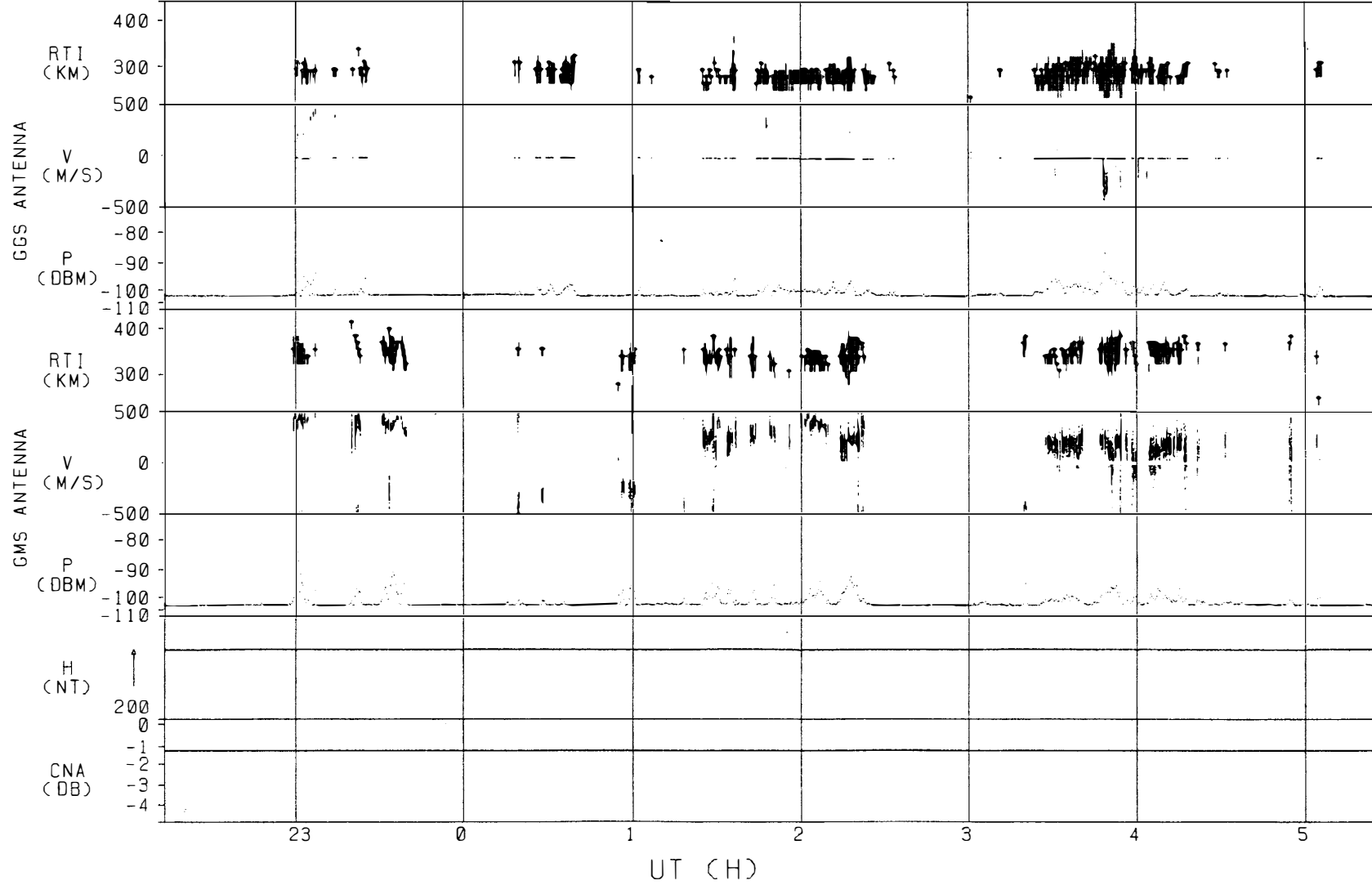


AURORA RADAR/CRL, SYOWA STATION

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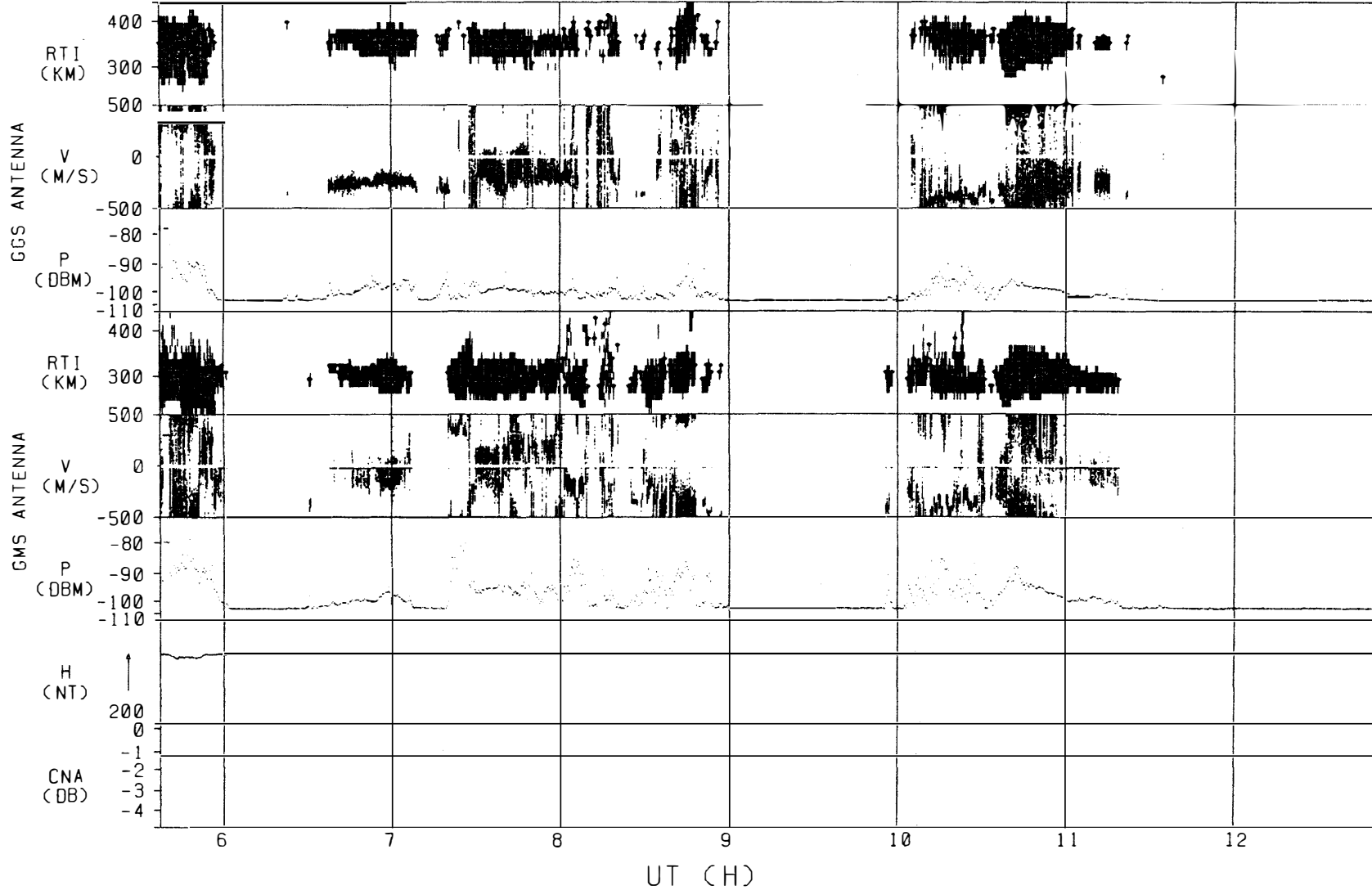
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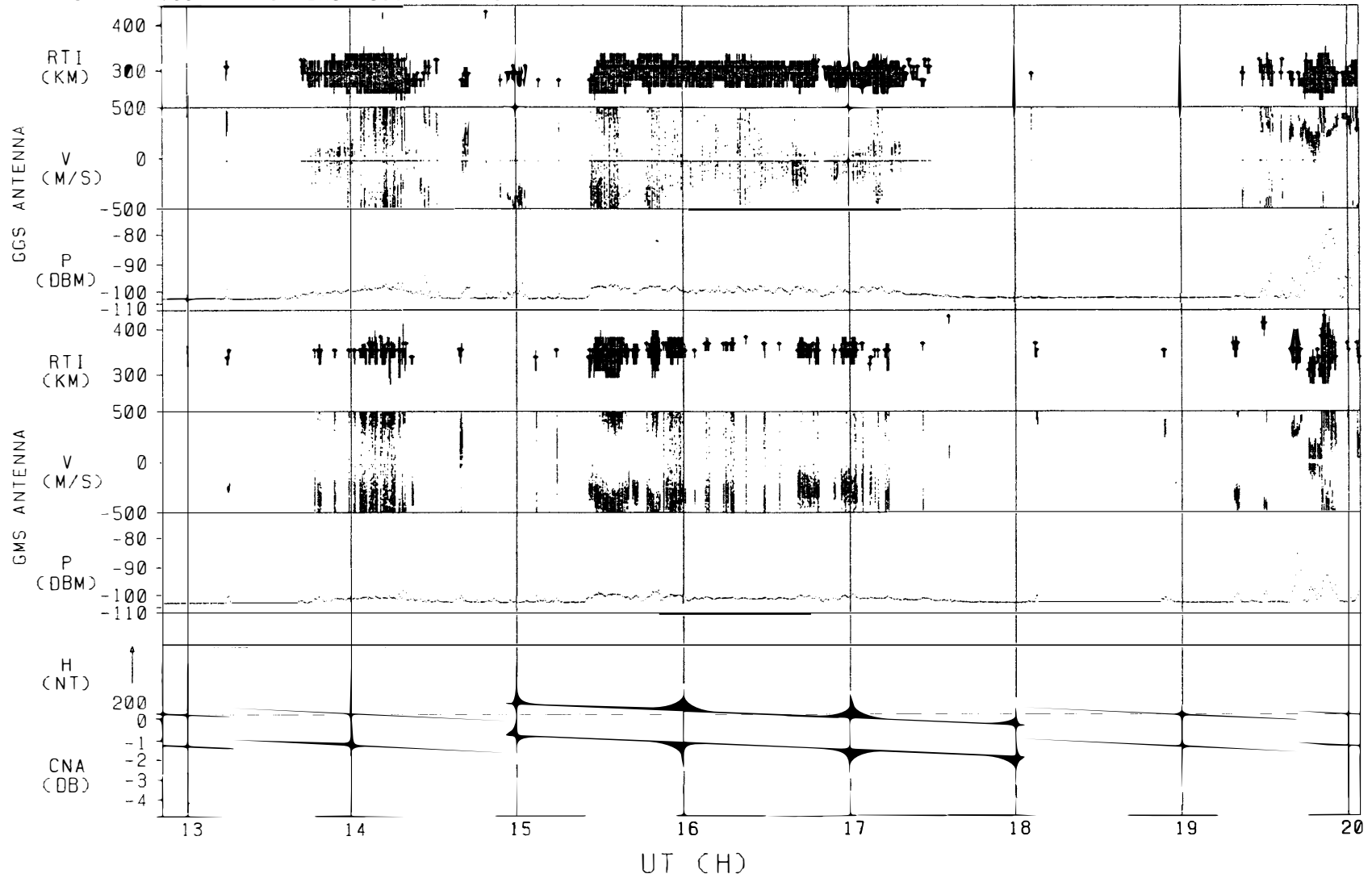
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# AURORA RADAR/CRL, SYOWA STATION

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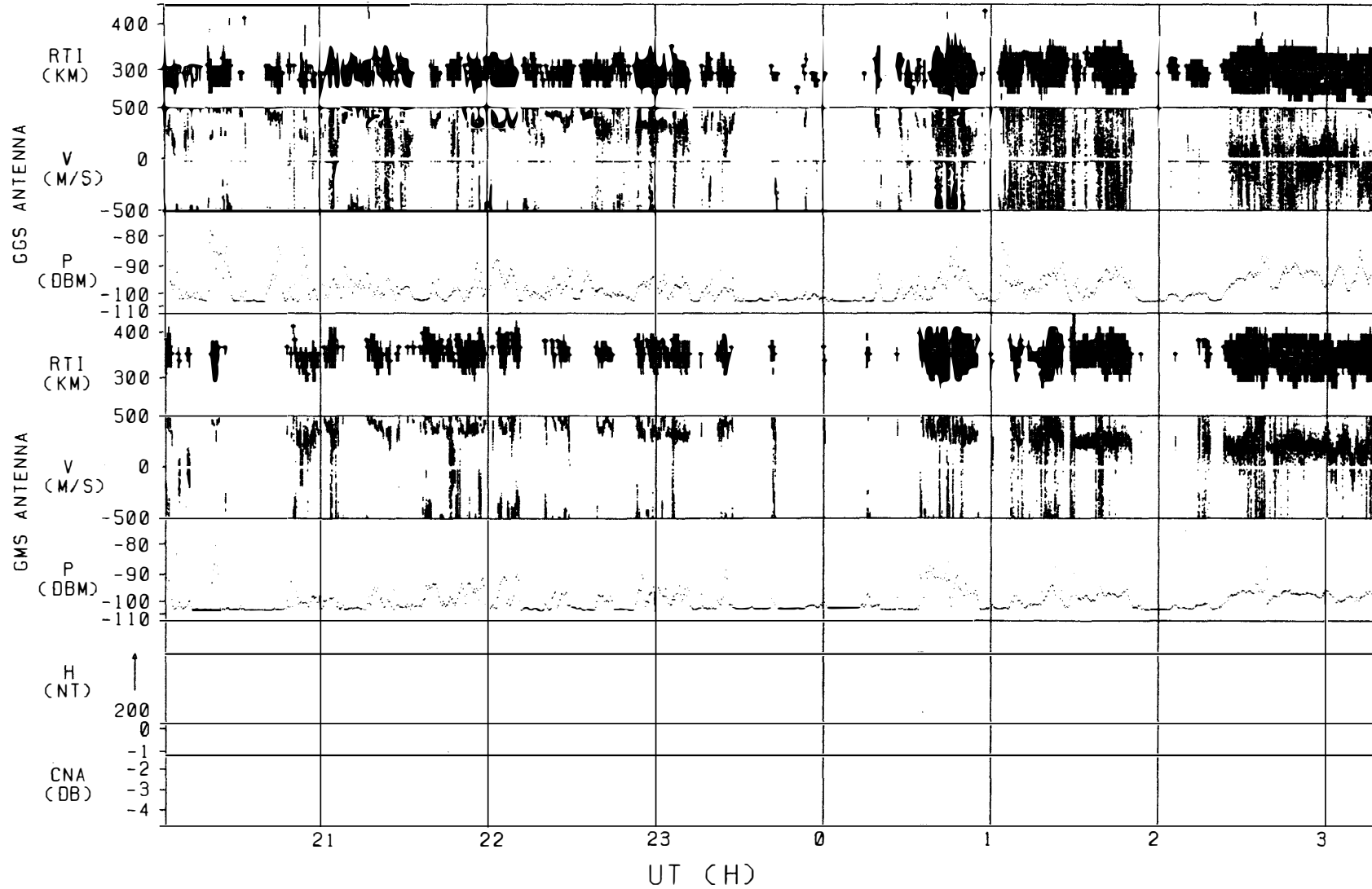


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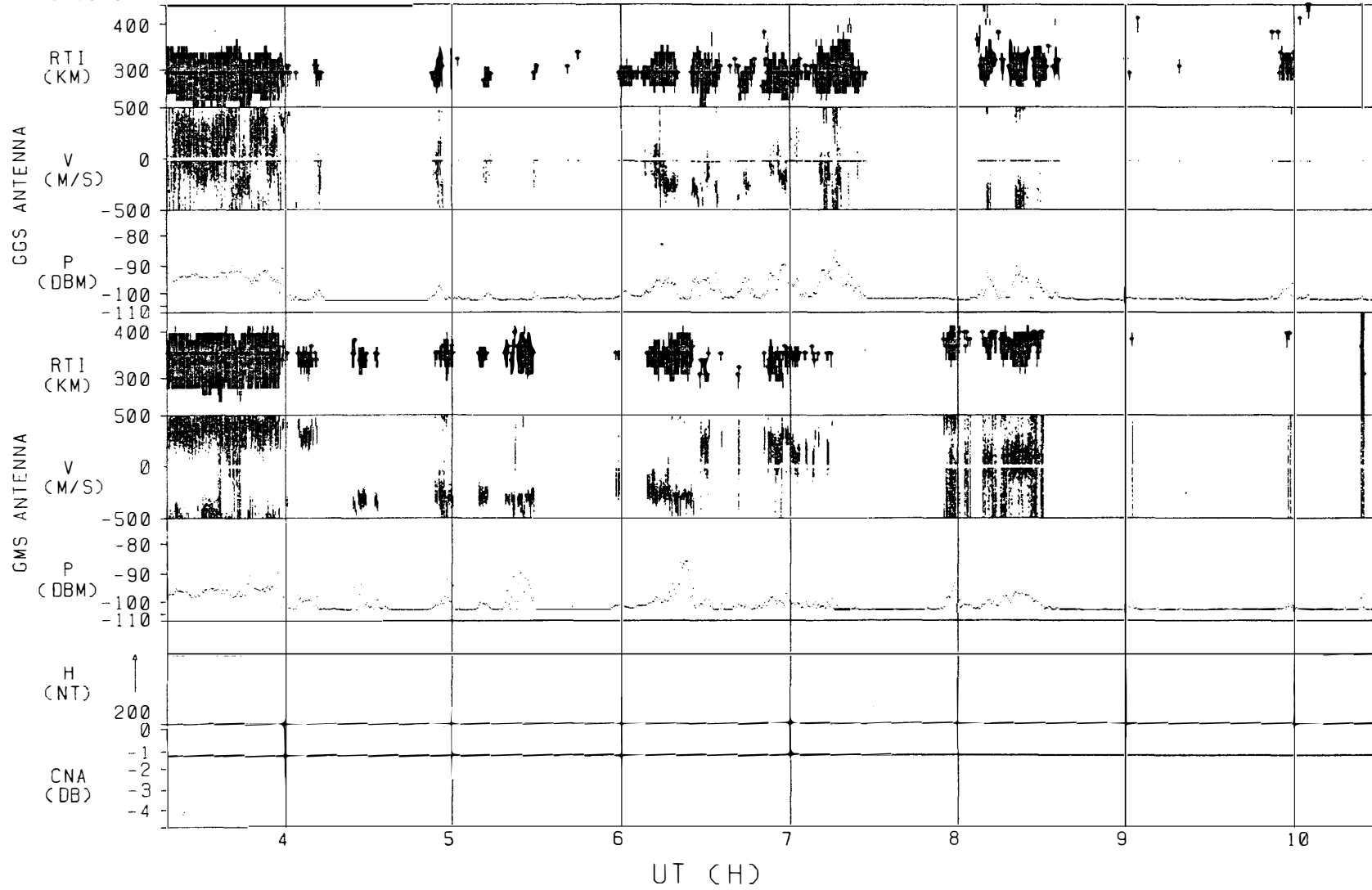
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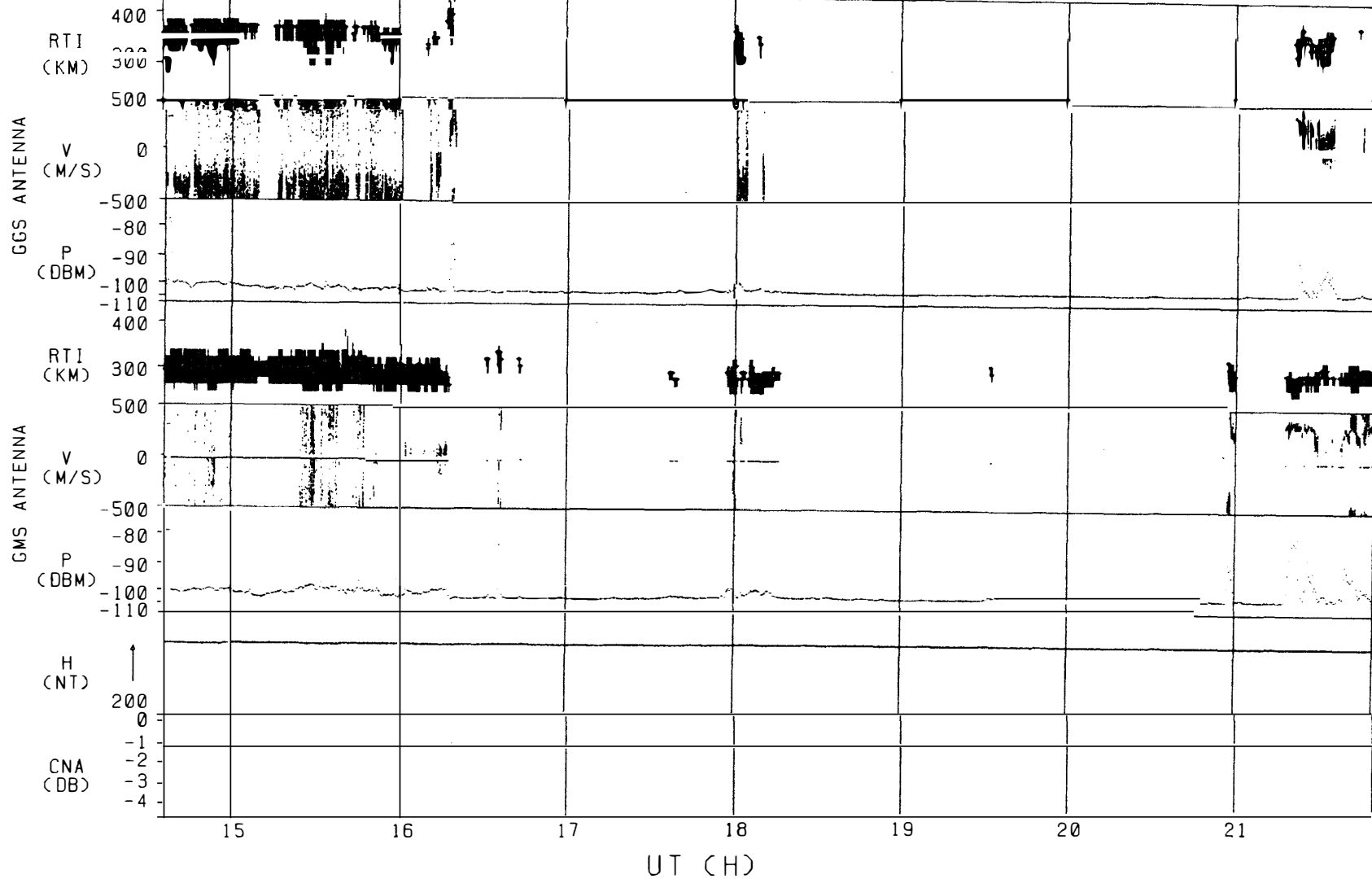
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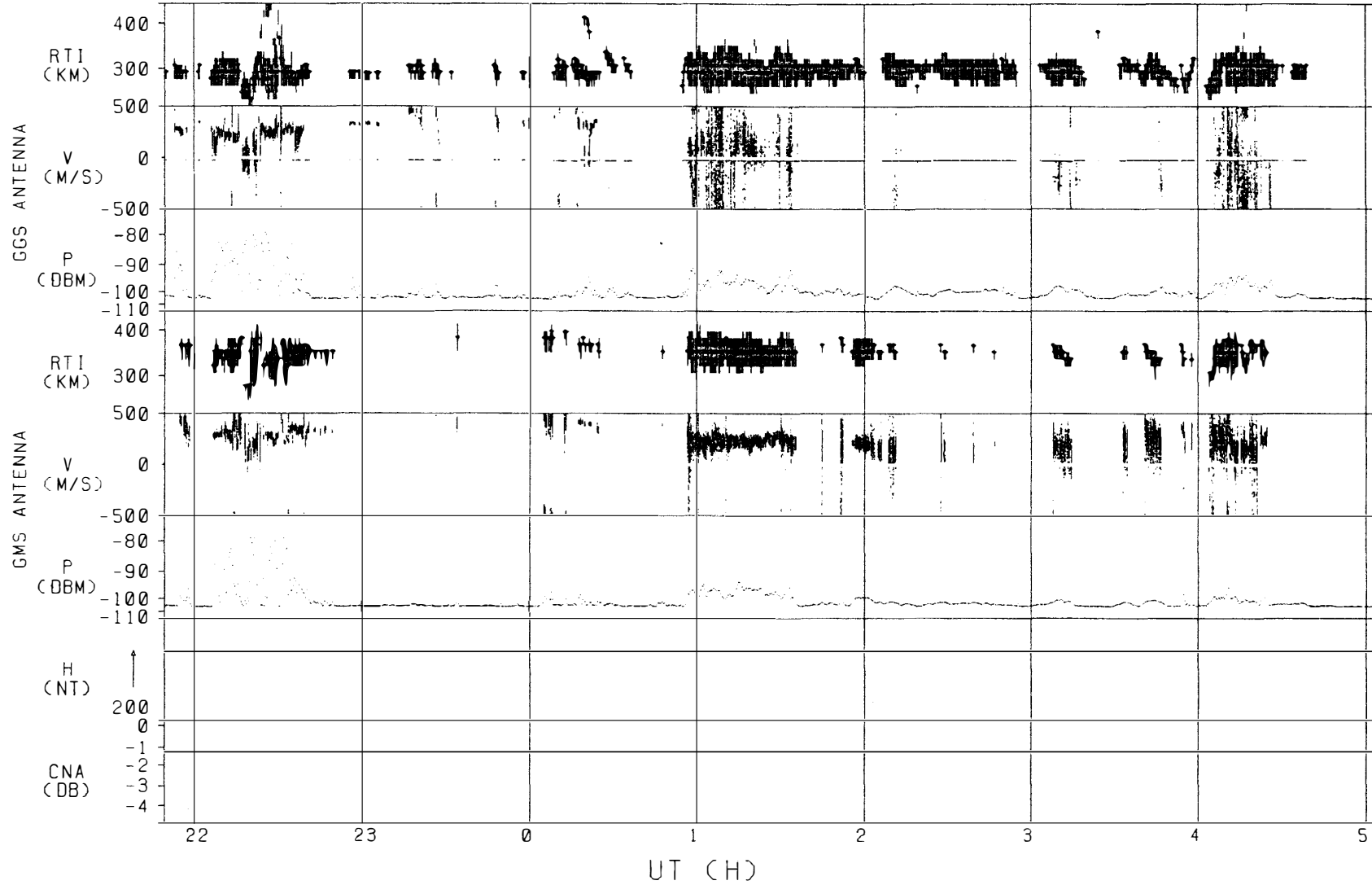


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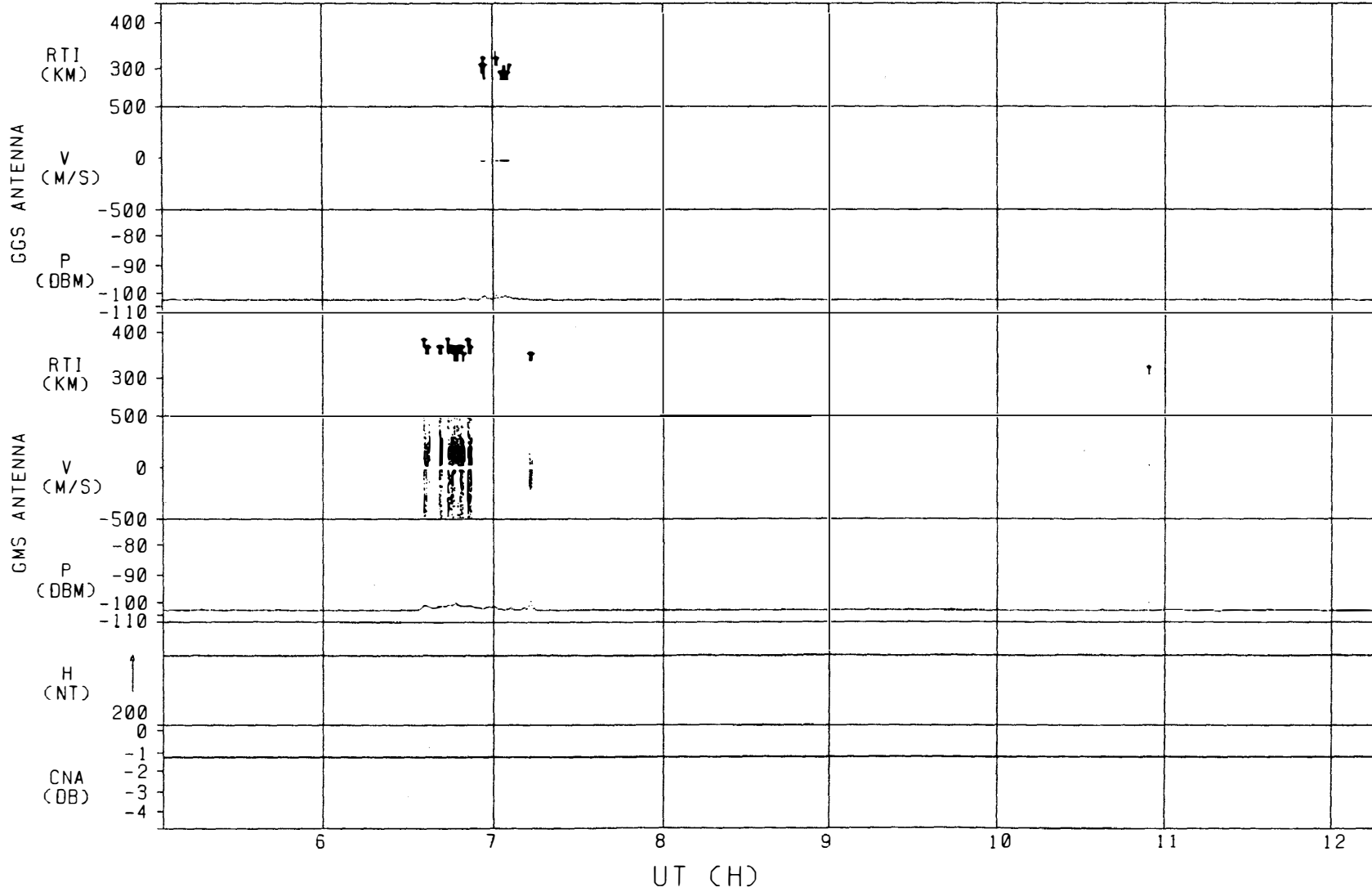




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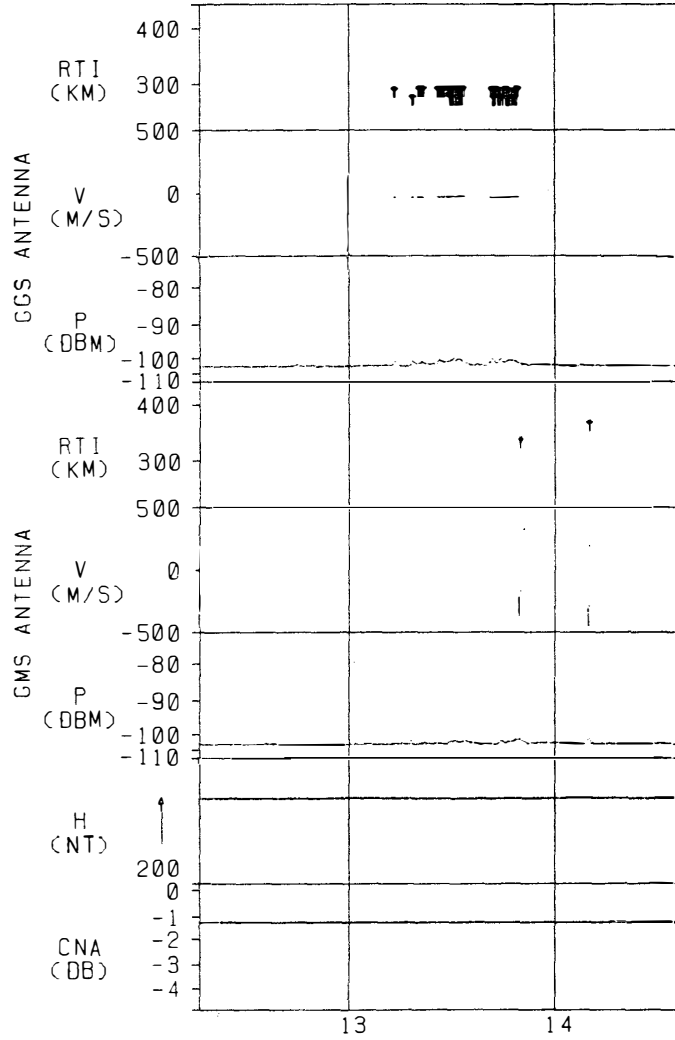
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UT (H)