

**Summary of the November/December 2000  
and January 2001 EISCAT campaigns.**



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| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                       |                                                                         | Form Approved OMB No. 0704-0188                                     |                     |                                         |  |                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------|-------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------|-----------------------------------------|--|-----------------------------------|
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| <b>1. REPORT DATE (DD-MM-YYYY)</b><br>07-01-2002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    | <b>2. REPORT TYPE</b><br>Final Report |                                                                         | <b>3. DATES COVERED (From - To)</b><br>17 November 2000 - 04-Apr-02 |                     |                                         |  |                                   |
| <b>4. TITLE AND SUBTITLE</b><br><br>High Latitude Disturbances: Combined Svalbard EISCAT Radar, Optical and Magnetic Observations for Polar Cusp/Cap Research                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                                       | <b>5a. CONTRACT NUMBER</b><br>F61775-01-WE014                           |                                                                     |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       | <b>5b. GRANT NUMBER</b>                                                 |                                                                     |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       | <b>5c. PROGRAM ELEMENT NUMBER</b>                                       |                                                                     |                     |                                         |  |                                   |
| <b>6. AUTHOR(S)</b><br><br>Professor Alv Egeland                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                                       | <b>5d. PROJECT NUMBER</b>                                               |                                                                     |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       | <b>5d. TASK NUMBER</b>                                                  |                                                                     |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       | <b>5e. WORK UNIT NUMBER</b>                                             |                                                                     |                     |                                         |  |                                   |
| <b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b><br>University of Oslo<br>PO Box 1048 Blindern<br>Oslo N-0316<br>Norway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                    |                                       |                                                                         | <b>8. PERFORMING ORGANIZATION REPORT NUMBER</b><br><br>N/A          |                     |                                         |  |                                   |
| <b>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b><br><br>EOARD<br>PSC 802 BOX 14<br>FPO 09499-0014                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       |                                                                         | <b>10. SPONSOR/MONITOR'S ACRONYM(S)</b>                             |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       |                                                                         | <b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b><br>SPC 01-4014        |                     |                                         |  |                                   |
| <b>12. DISTRIBUTION/AVAILABILITY STATEMENT</b><br><br>Approved for public release; distribution is unlimited.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                    |                                       |                                                                         |                                                                     |                     |                                         |  |                                   |
| <b>13. SUPPLEMENTARY NOTES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                    |                                       |                                                                         |                                                                     |                     |                                         |  |                                   |
| <b>14. ABSTRACT</b><br><br>This report results from a contract tasking University of Oslo as follows: The contractor will investigate disturbances in the polar ionosphere caused by fluctuating solar winds. In particular, he will attempt to accurately locate the boundary between open and closed magnetic field lines and then determine which processes occur on each of the field lines. These measurements will be made during quiet and disturbed conditions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                    |                                       |                                                                         |                                                                     |                     |                                         |  |                                   |
| <b>15. SUBJECT TERMS</b><br>EOARD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                    |                                       |                                                                         |                                                                     |                     |                                         |  |                                   |
| <b>16. SECURITY CLASSIFICATION OF:</b><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 2px;">a. REPORT UNCLAS</td> <td style="width: 33%; padding: 2px;">b. ABSTRACT UNCLAS</td> <td style="width: 33%; padding: 2px;">c. THIS PAGE UNCLAS</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                    |                                       | a. REPORT UNCLAS                                                        | b. ABSTRACT UNCLAS                                                  | c. THIS PAGE UNCLAS | <b>17. LIMITATION OF ABSTRACT</b><br>UL |  | <b>18. NUMBER OF PAGES</b><br>160 |
| a. REPORT UNCLAS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | b. ABSTRACT UNCLAS | c. THIS PAGE UNCLAS                   |                                                                         |                                                                     |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       | <b>19a. NAME OF RESPONSIBLE PERSON</b><br>David M. Burns, Lt Col, USAF  |                                                                     |                     |                                         |  |                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                    |                                       | <b>19b. TELEPHONE NUMBER (Include area code)</b><br>+44 (0)20 7514 4955 |                                                                     |                     |                                         |  |                                   |

## **Contents:**

1. Overview of the campaigns
2. Summary plots from the Nov/Dec 2000 campaign, day by day
3. Summary plots from the January 2001 campaign, day by day

July 19, 2001  
Plasma and Space Physics Group  
Department of Physics  
University of Oslo

## Campaign: November/December 2000

Joint campaign during POLAR overpasses.

The VHF in Tromsø was also running.

All data is tau0 12.8 seconds, and both antennas were used.

| Date              | Time started | Time stopped | Notes                                                                                                                                                                                                                                                                                                                     |
|-------------------|--------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| November 24, 2000 | 17:01:26 UT  | 22:02:21 UT  | Antenna 1 is pointing north (Az-14.5, El 30), along Tromsø VHF.<br>No optics                                                                                                                                                                                                                                              |
| November 25, 2000 | 16:59:53 UT  | 22:02:00 UT  | Antenna 1 is pointing north (Az-14.5, El 30), along Tromsø VHF.<br>No optics                                                                                                                                                                                                                                              |
| November 27, 2000 | 17:06:47 UT  | 22:00:09 UT  | Antenna 1 is pointing north (Az-14.5, El 30), along Tromsø VHF.<br>Some optical coverage from the beginning but increasing cloud cover (CLUSTER/POLAR).<br>Airport interlock from 17:23 to 17:43.<br><u>From 19:00</u> Antenna 1 is pointing along the Ny Ålesund meridian (Az-45, El 30), due to good optical conditions |
| November 28, 2000 | 18:25:23 UT  | 23:31:46 UT  | Antenna 1 is pointing along the Ny Ålesund meridian (Az-45, El 30).<br>Some optics from LYR through cloud cover.<br>Got nice aurora in the beam looking north, and were allowed to run longer                                                                                                                             |
| December 1, 2000  | 16:59:19 UT  | 22:00:21 UT  | Antenna 1 is pointing along the Ny Ålesund meridian (Az-45, El 30).<br>No optics.<br>Field aligned dish: Nice ionization below 200 km between 17:00 and 17:10, due to a strong green arc                                                                                                                                  |
| December 4, 2000  | 17:05:40 UT  | 23:01:29 UT  | Antenna 1 is pointing north (Az-15, El 30), along Tromsø VHF.<br>No optics.<br>Jøran got extra time to see if the expansion phase of the substorm was coming                                                                                                                                                              |
| December 7, 2000  | 17:00:11 UT  | 22:00:03 UT  | Antenna 1 is pointing south (Az135, El 30), towards Tromsø VHF.<br>No optics.<br>Airport interlock from 17:00 to 17:10.<br><u>Missing data:</u> Sudden stop in the recording from 17:15 to 17:27                                                                                                                          |

## CAMPAIGN: January 2001

### At the radar site:

- Kjellmar Oksavik
- Jøran Moen
- Herb Carlson

All data is tau0 3.2 seconds

### Herb Carlson's scanning modes:

|                                                                                                                                                                                                                   | <u>Scan Width</u> | <u>Direction</u> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------|
| 1. <b>Windshield wiper scan between 15 and 105 az at 30 el</b><br>Slew speed = 0.703 deg/sec<br>Dwell = 128 sec ( <i>cycle = 4 * 64 sec</i> )                                                                     | 90°               | East             |
| 2. <b>Windshield wiper scan between 30 and 150 el at -45 az</b><br>Slew speed = 0.938 deg/sec<br>Dwell = 128 sec ( <i>cycle = 4 * 64 sec</i> )                                                                    | 120°              | Meridian         |
| 3. <b>Windshield wiper scan between -165 and -75 az at 30 el</b><br>Slew speed = 0.703 deg/sec<br>Dwell = 128 sec ( <i>cycle = 4 * 64 sec</i> )                                                                   | 90°               | West             |
| 4. <b>Windshield wiper scan between -75 and 15 az at 30 el</b><br>Slew speed = 0.703 deg/sec<br>Dwell = 128 sec ( <i>cycle = 4 * 64 sec</i> )<br>> Set up 18 * 6.4 s on 32m antenna and 2 * 6.4s on 42m antenna   | 90°               | North            |
| 5. <b>Windshield wiper scan between 105 and 195 az at 30 el</b><br>Slew speed = 0.703 deg/sec<br>Dwell = 128 sec ( <i>cycle = 4 * 64 sec</i> )<br>> Set up 18 * 6.4 s on 32m antenna and 2 * 6.4s on 42m antenna  | 90°               | South            |
| 6. <b>Windshield wiper scan between 30 and 90 az at 30 el</b><br>Slew speed = 0.313 deg/sec<br>Dwell = 192 sec ( <i>cycle = 6 * 64 sec</i> )                                                                      | 60°               | East             |
| 7. <b>Windshield wiper scan between 45 and 135 el at -45 az</b><br>Slew speed = 0.469 deg/sec<br>Dwell = 192 sec ( <i>cycle = 6 * 64 sec</i> )                                                                    | 90°               | Meridian         |
| 8. <b>Windshield wiper scan between 210 and 270 az at 30 el</b><br>Slew speed = 0.313 deg/sec<br>Dwell = 192 sec ( <i>cycle = 6 * 64 sec</i> )                                                                    | 60°               | West             |
| 9. <b>Windshield wiper scan between -60 and 0 az at 30 el</b><br>Slew speed = 0.313 deg/sec<br>Dwell = 192 sec ( <i>cycle = 6 * 64 sec</i> )<br>> Set up 26 * 6.4 s on 32m antenna and 4 * 6.4s on 42m antenna    | 60°               | North            |
| 10. <b>Windshield wiper scan between 120 and 180 az at 30 el</b><br>Slew speed = 0.313 deg/sec<br>Dwell = 192 sec ( <i>cycle = 6 * 64 sec</i> )<br>> Set up 26 * 6.4 s on 32m antenna and 4 * 6.4s on 42m antenna | 60°               | South            |
| 11. <b>Windshield wiper scan between 90 and 210 az at 30 el</b><br>Slew speed = 0.469 deg/sec<br>Dwell = 256 sec ( <i>cycle = 8 * 64 sec</i> )                                                                    | 120°              | Southeast        |

| Date             | Time started | Time stopped | Mode | Notes                                                                           |
|------------------|--------------|--------------|------|---------------------------------------------------------------------------------|
| January 15, 2001 |              |              |      | First day using scanning modes, late start due to operating problems            |
|                  | 09:09:37 UT  | 11:14:51 UT  | 3    | Mode 3, but with Dwell=126 sec.                                                 |
| January 16, 2001 | 06:03:12 UT  | 07:38:24 UT  | 4    |                                                                                 |
|                  | 07:47:41 UT  | 08:25:42 UT  | 7    |                                                                                 |
|                  | 08:34:22 UT  | 11:02:06 UT  | 3    | Airport interlock from 09:10 to 09:21                                           |
| January 17, 2001 |              |              |      | Clear skies, nice aurora in the north                                           |
|                  | 06:01:05 UT  | 07:15:53 UT  | 1    |                                                                                 |
|                  | 07:19:44 UT  | 09:08:41 UT  | 2    | Airport interlock from 09:05 to 09:15                                           |
|                  | 09:14:56 UT  | 10:52:04 UT  | 4    |                                                                                 |
|                  |              |              |      | Airport interlock from 10:52 to 11:00                                           |
| January 18, 2001 |              |              |      | Bad weather, strong winds                                                       |
|                  | 06:05:09 UT  | 07:34:46 UT  | 6    | High system temperature in AC2                                                  |
|                  | 07:38:55 UT  | 11:00:29 UT  | 2    |                                                                                 |
| January 19, 2001 | 06:00:46 UT  | 07:58:10 UT  | 1    | Wrong slew speed before 06:03                                                   |
|                  | 08:02:24 UT  | 09:17:02 UT  | 2    | Airport interlock from 08:50 to 09:10                                           |
|                  |              |              |      | Airport interlock from 09:18 to 09:30                                           |
|                  | 09:31:35 UT  | 11:59:52 UT  | 4    | Got extra time because of good geophysical conditions                           |
| January 20, 2001 |              |              |      | Clear skies, some clouds in the north                                           |
|                  | 06:03:02 UT  | 07:17:33 UT  | 1    |                                                                                 |
|                  | 07:21:48 UT  | 09:51:07 UT  | 2    | The weather got cloudy                                                          |
|                  | 09:55:21 UT  | 11:00:07 UT  | 4    |                                                                                 |
| January 25, 2001 | 18:00:29 UT  | 23:00:06 UT  | 11   | Huge velocity shear in ion velocity, is that due to error in the transmitter??? |

**Contents, November 24, 2000 :**

-IMF-ACE plot

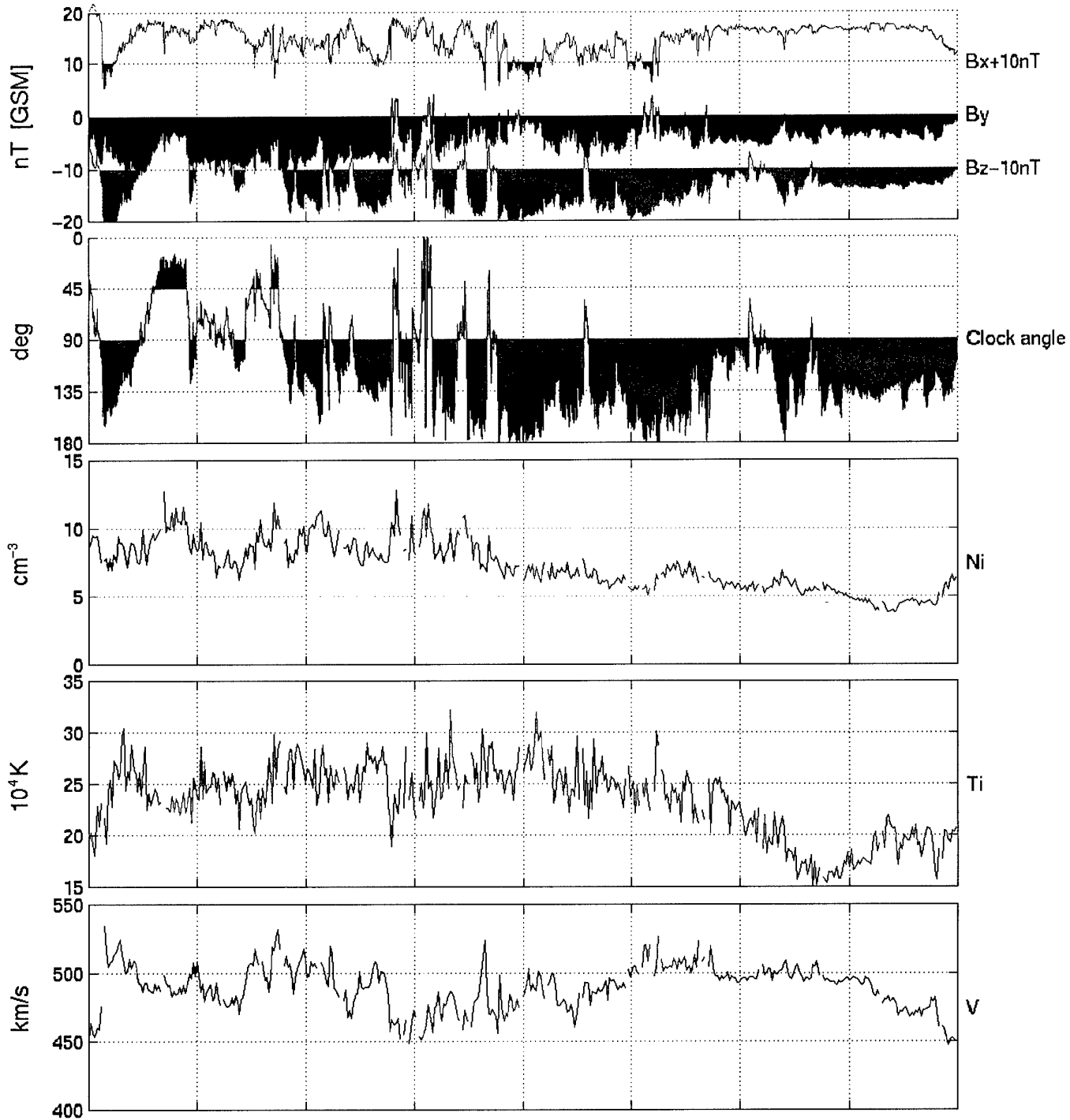
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

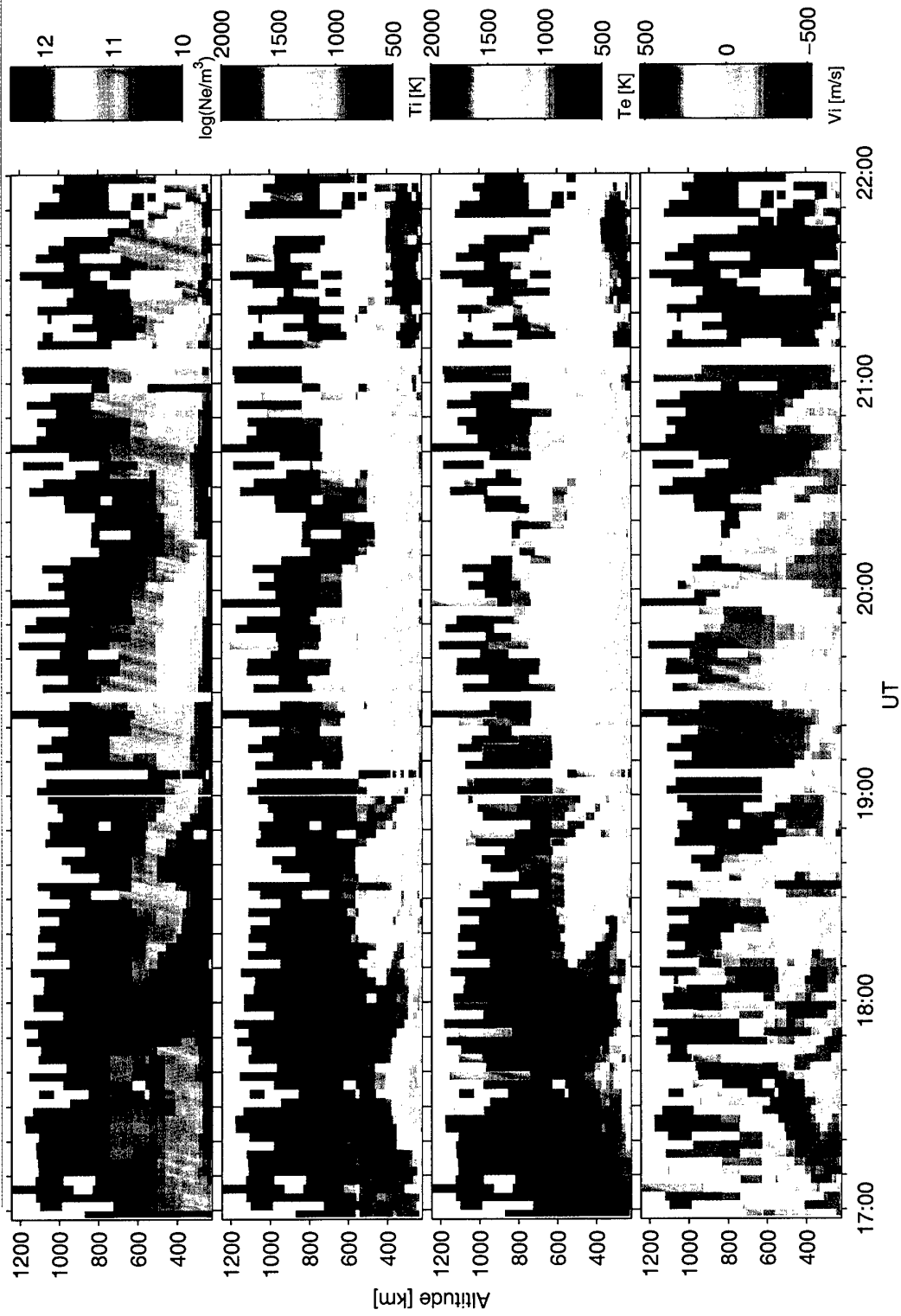
-CUTLASS Finland, Range-Time-Parameter plot

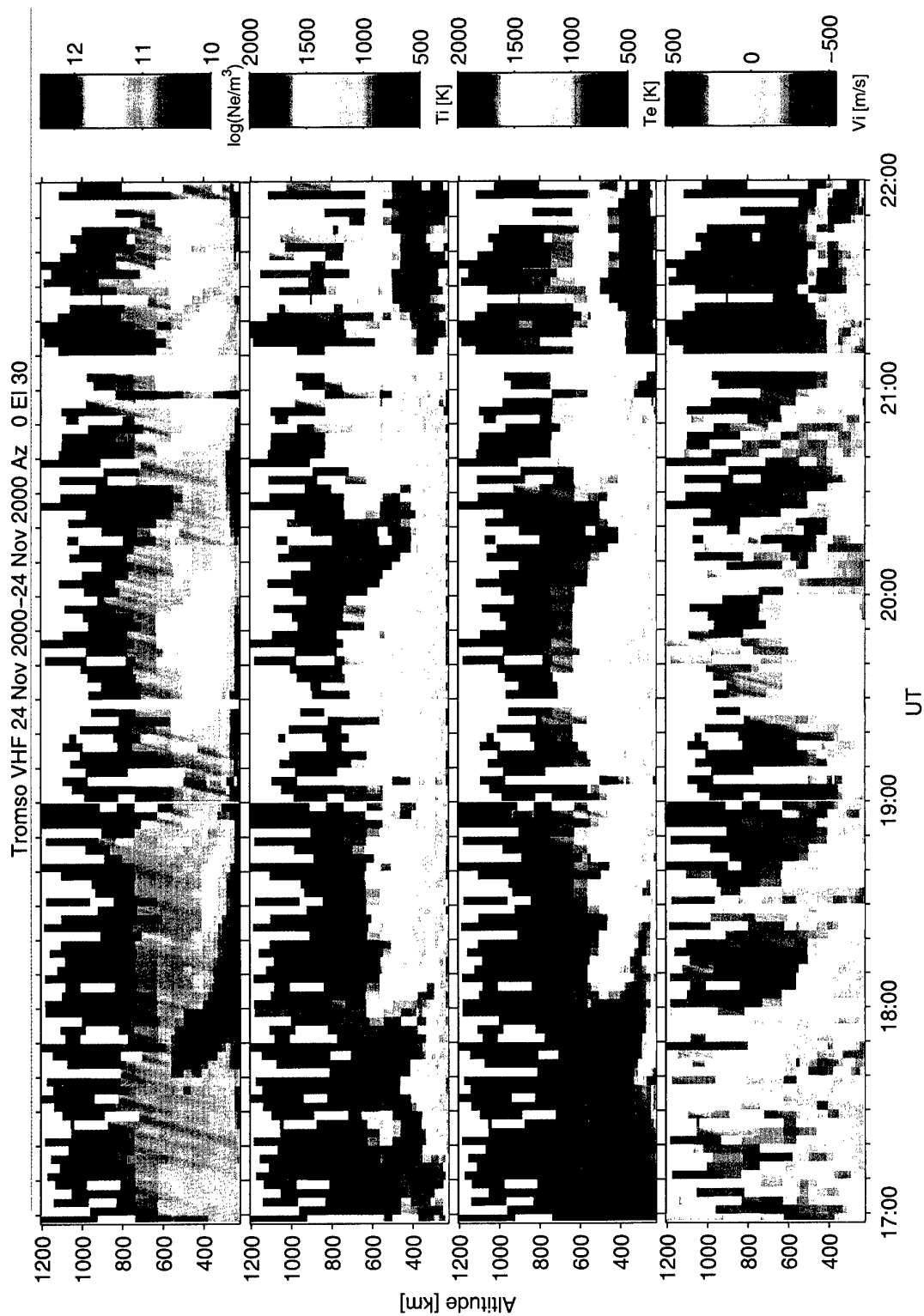
# ACE: Solar Wind Parameters, Nov 24 2000



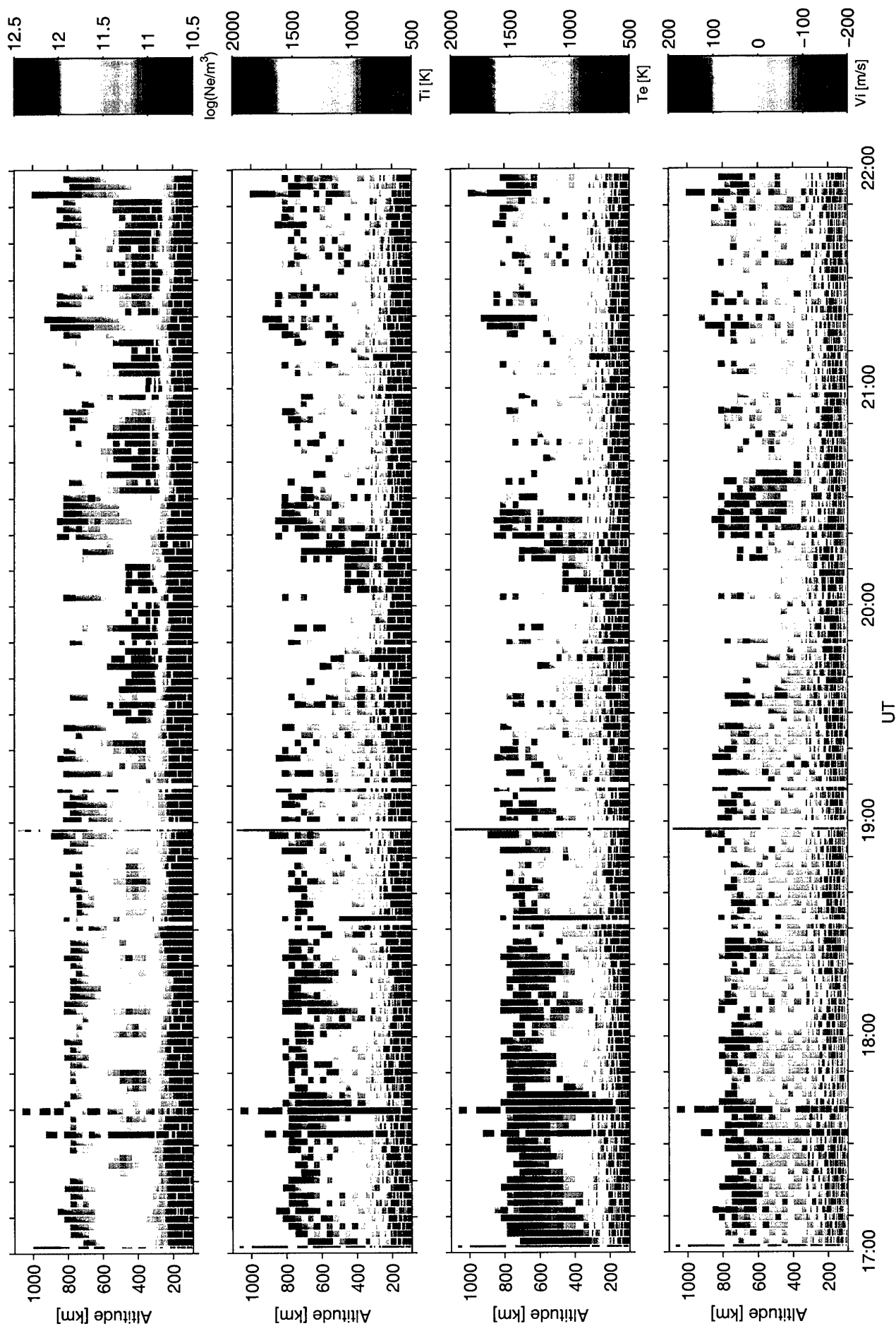
| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 224.4 | 224.4 | 224.4 | 224.4 | 224.5 | 224.5 | 224.5 | 224.5 | 224.5 |
| Y [GSM] | 29.7  | 29.7  | 29.8  | 29.8  | 29.9  | 29.9  | 29.9  | 30.0  | 30.0  |
| Z [GSM] | -24.1 | -24.2 | -24.1 | -24.1 | -24.1 | -24.1 | -24.0 | -24.0 | -24.0 |

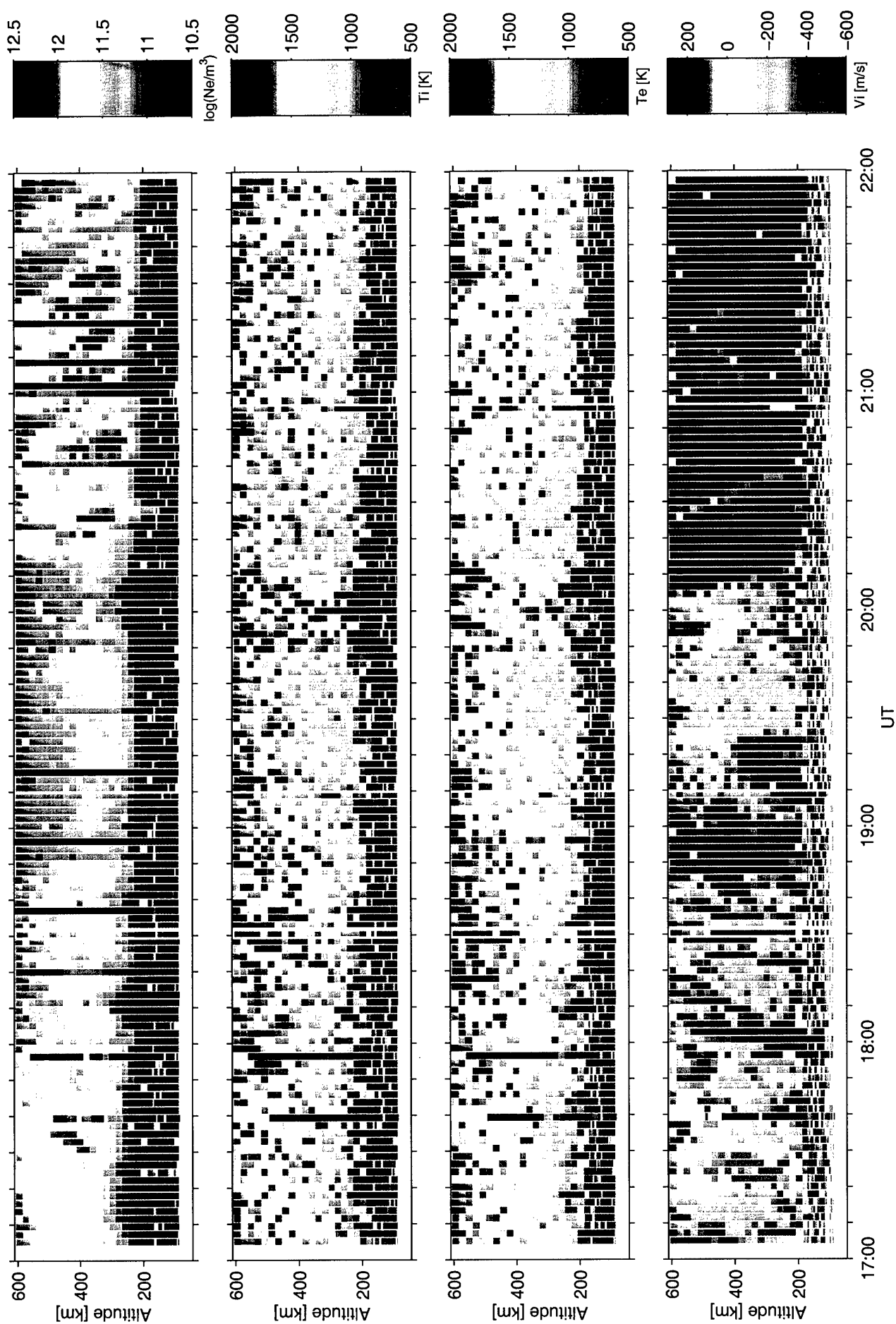
Tromsø VHF 24 Nov 2000-24 Nov 2000 Az 0 El 30





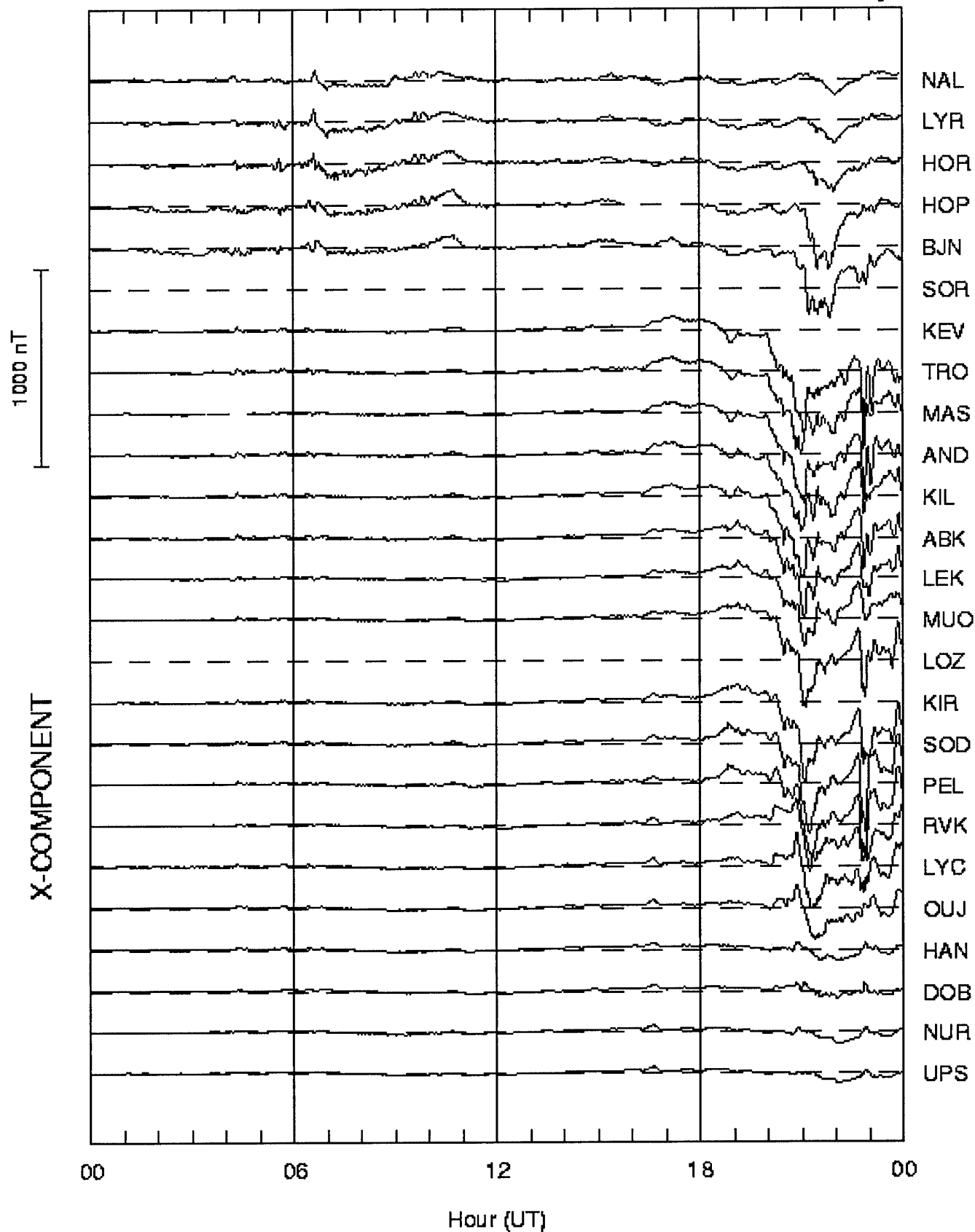
NOTE: THE AZIMUTH ANGLE IS -15, NOT 0 AS INDICATED BY THE LABEL





# IMAGE magnetometer network 2000-11-24

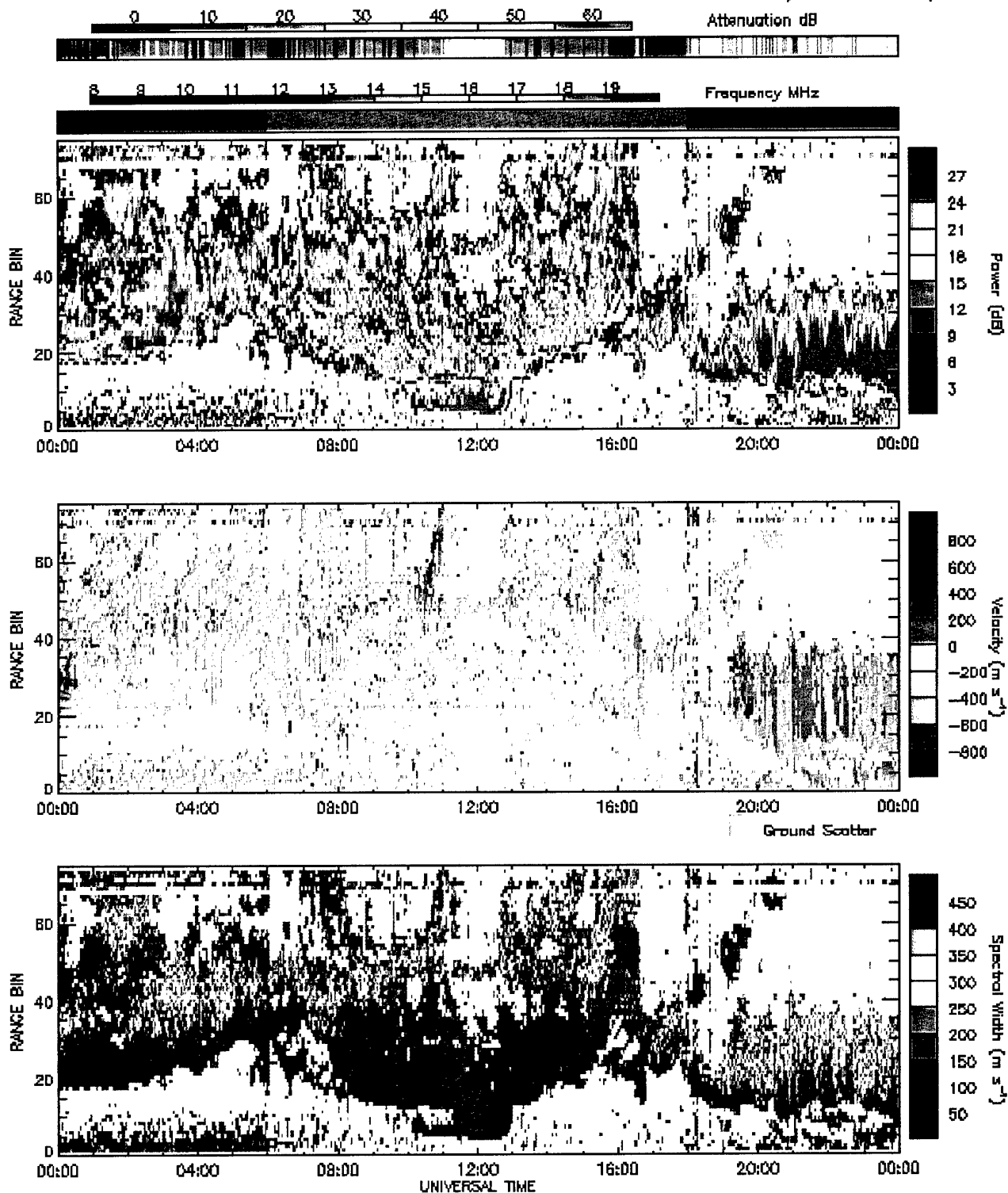
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 24/November/2000



**Contents, November 25, 2000 :**

-IMF-ACE plot

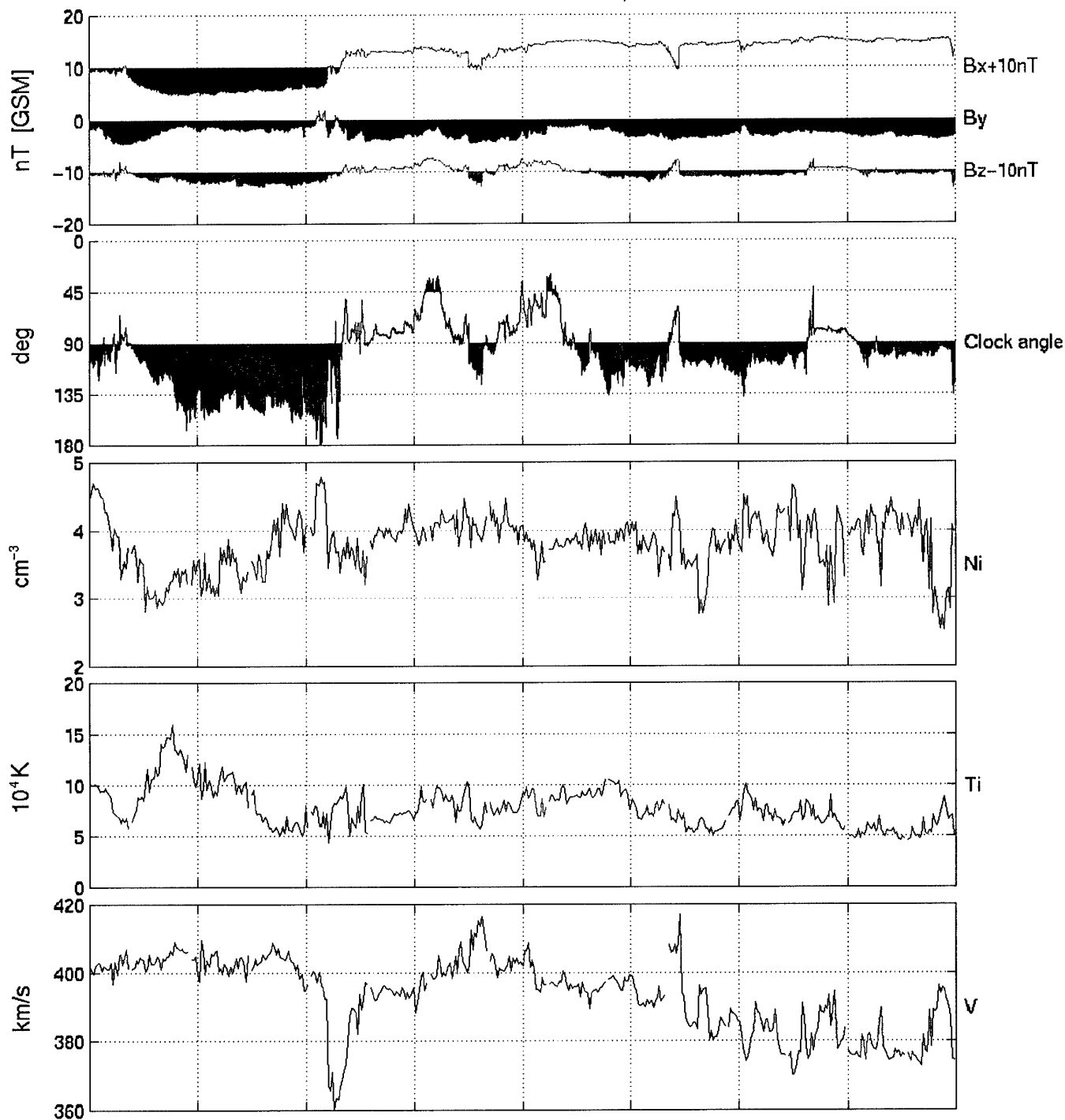
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

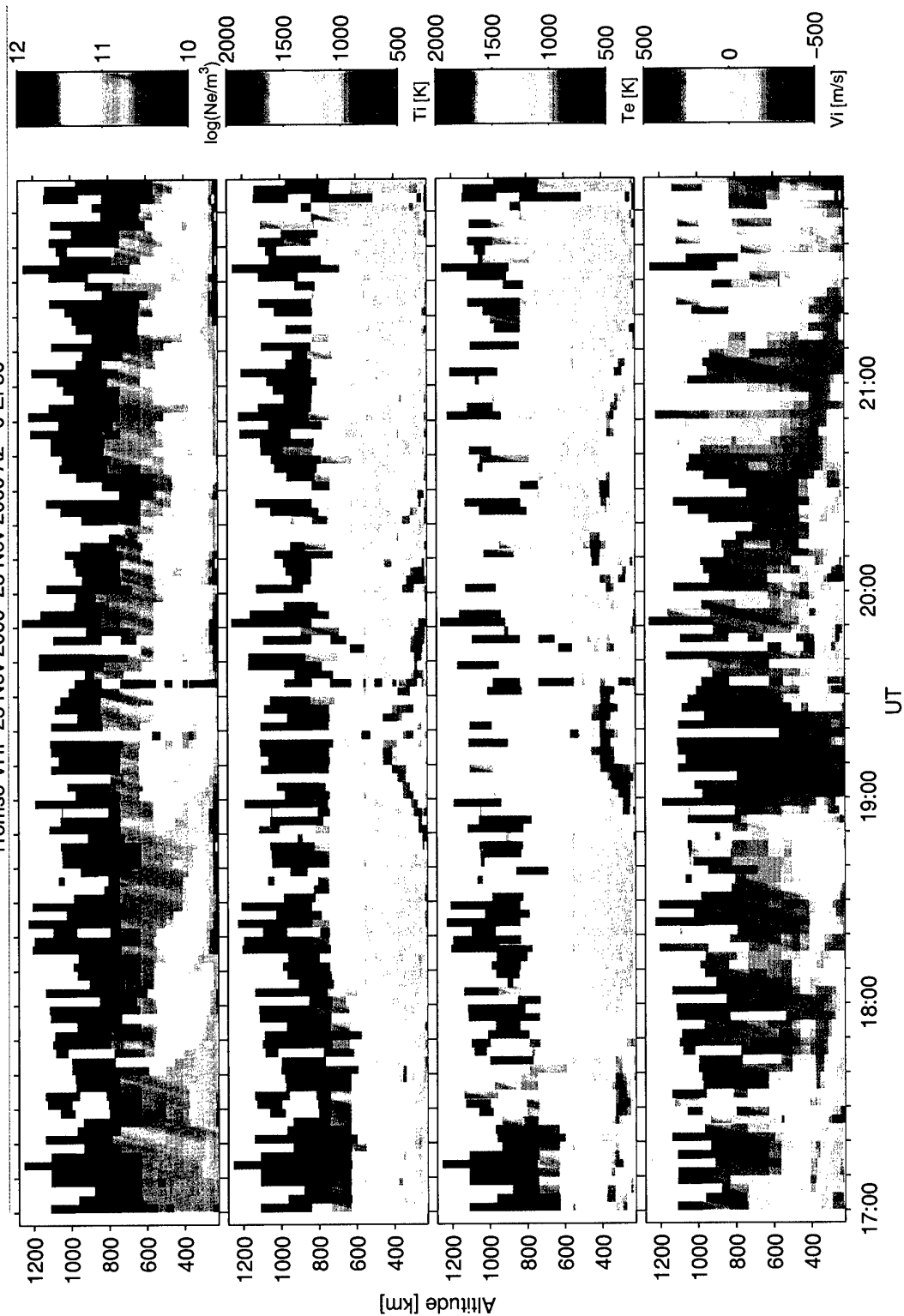
-CUTLASS Finland, Range-Time-Parameter plot

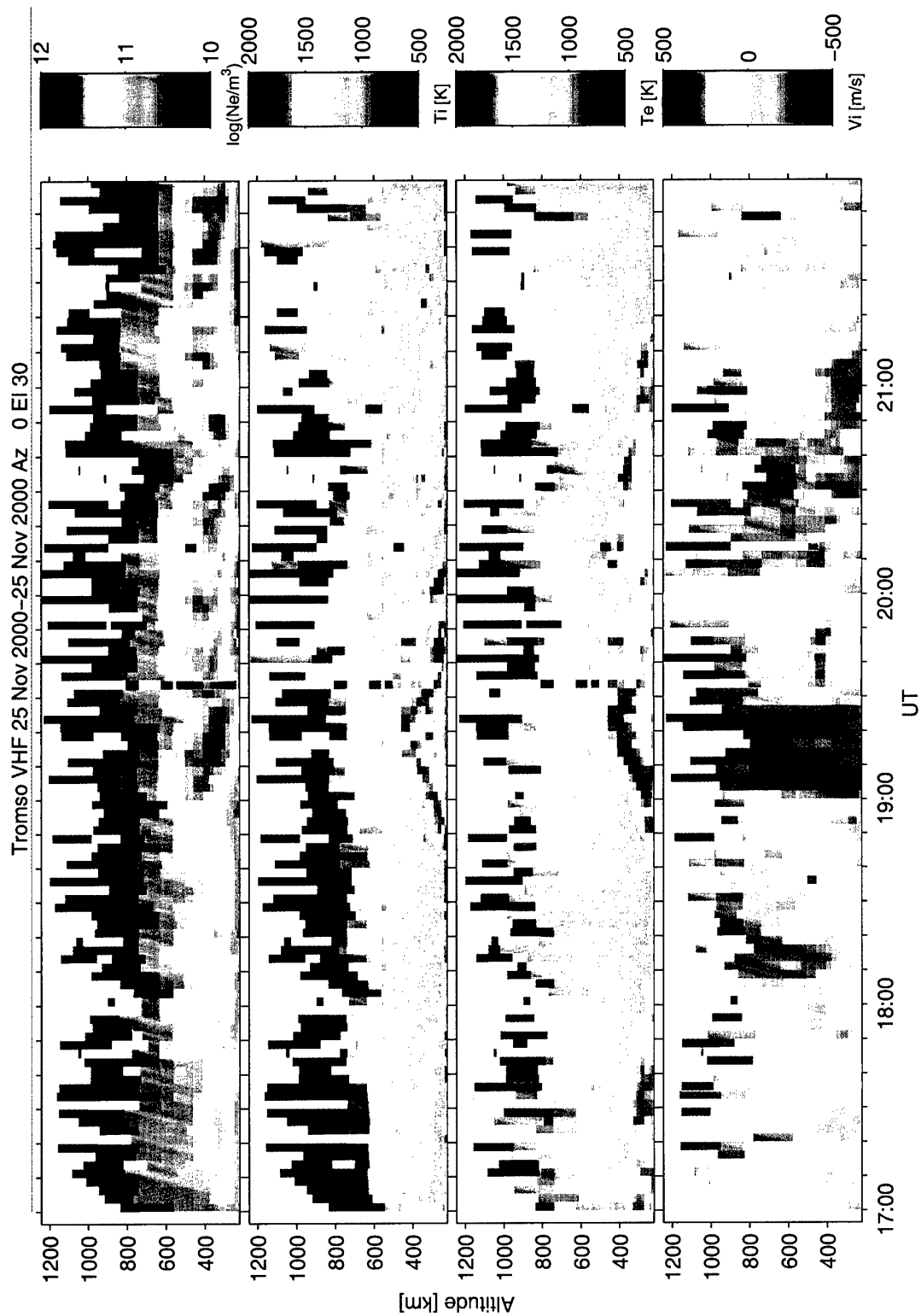
# ACE: Solar Wind Parameters, Nov 25 2000



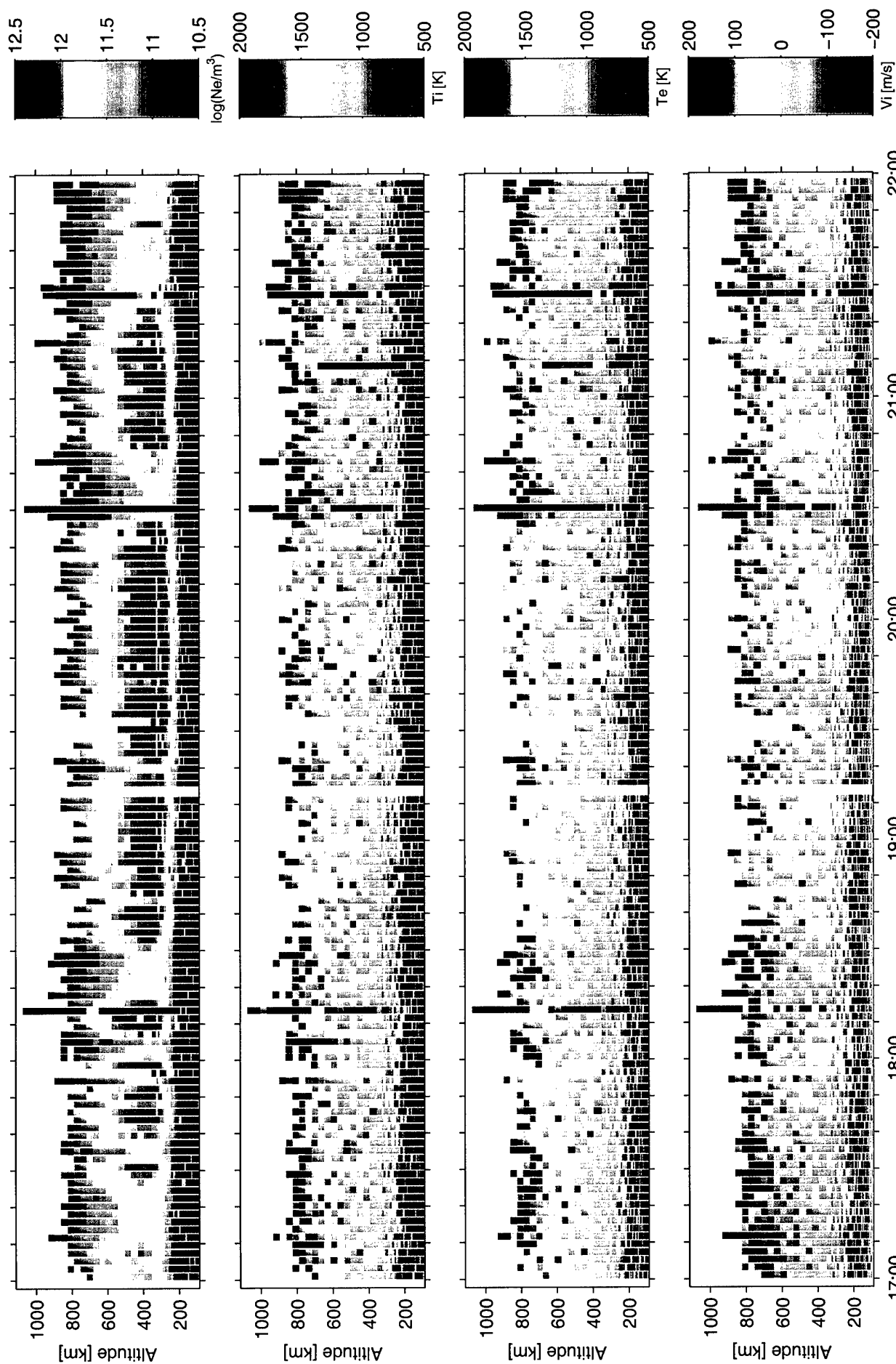
| UT                 | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X <sub>[GSM]</sub> | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.8 | 224.9 | 224.9 |
| Y <sub>[GSM]</sub> | 30.6  | 30.6  | 30.8  | 30.9  | 30.9  | 31.0  | 31.1  | 31.2  | 31.2  |
| Z <sub>[GSM]</sub> | -23.8 | -23.8 | -23.6 | -23.5 | -23.5 | -23.4 | -23.3 | -23.3 | -23.2 |

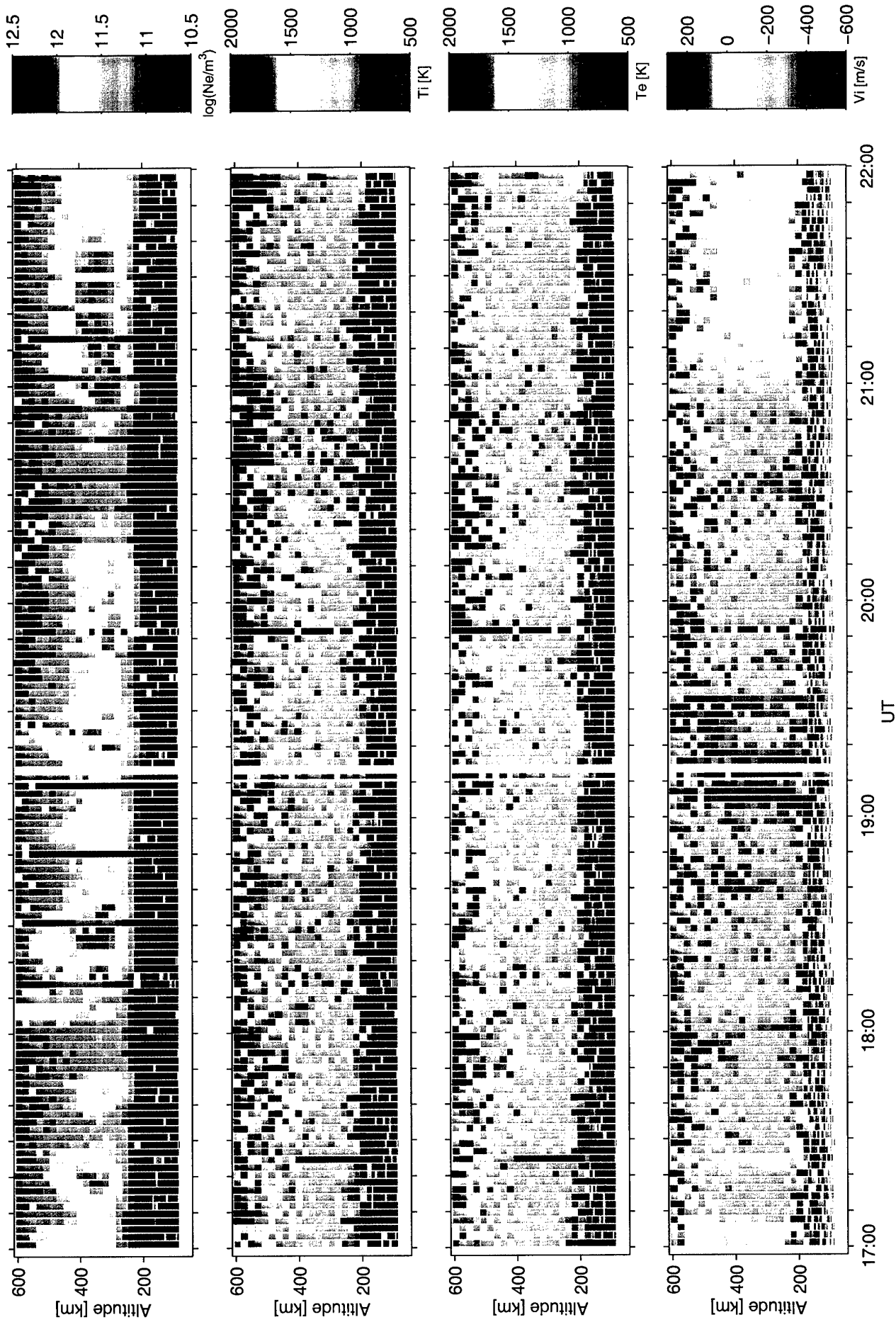
# Tromsø VHF 25 Nov 2000–25 Nov 2000 Az 0 El 30





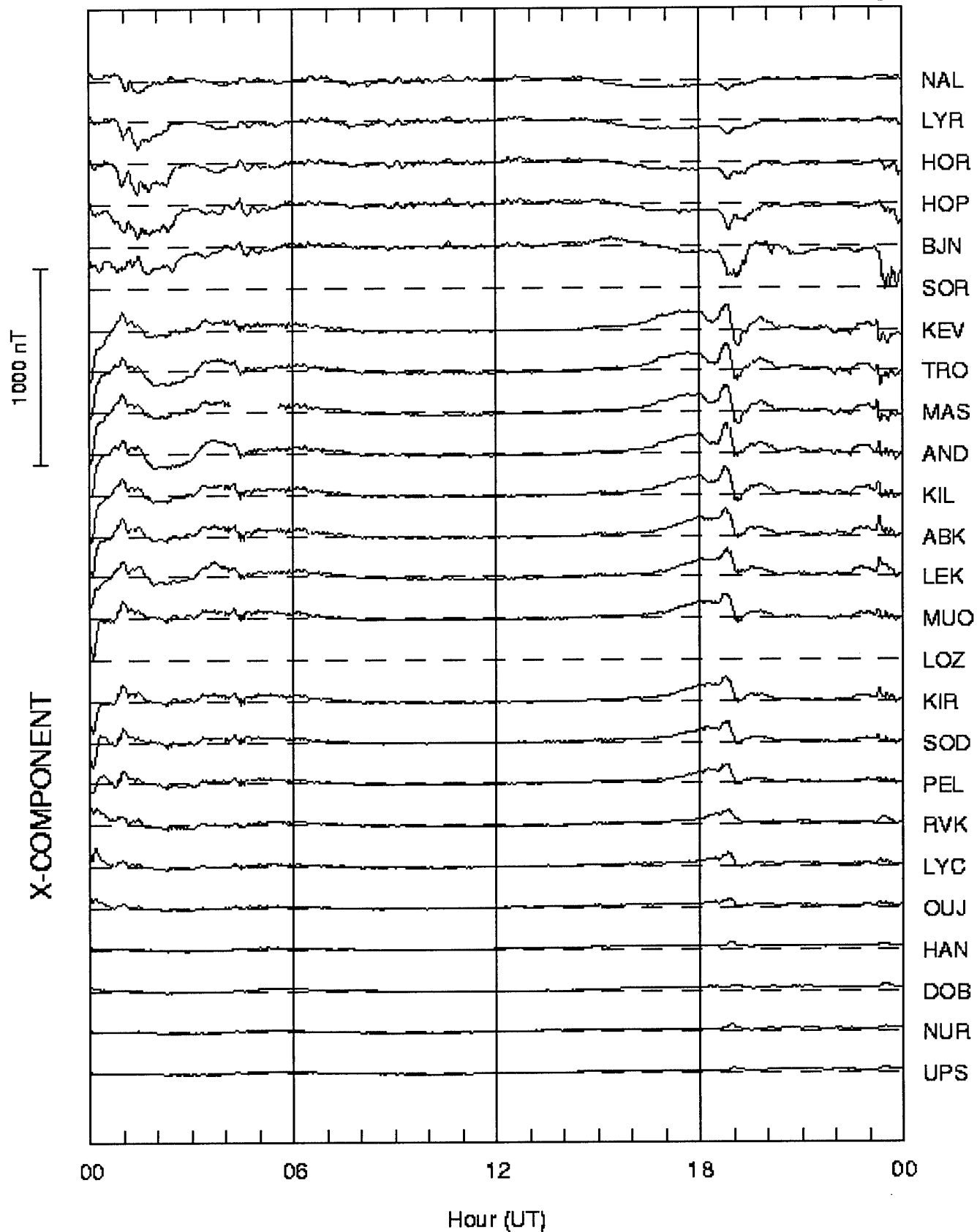
NOTE: THE AZIMUTH ANGLE IS NOT 0, AS INDICATED BY THE LABEL, BUT -15





# IMAGE magnetometer network 2000-11-25

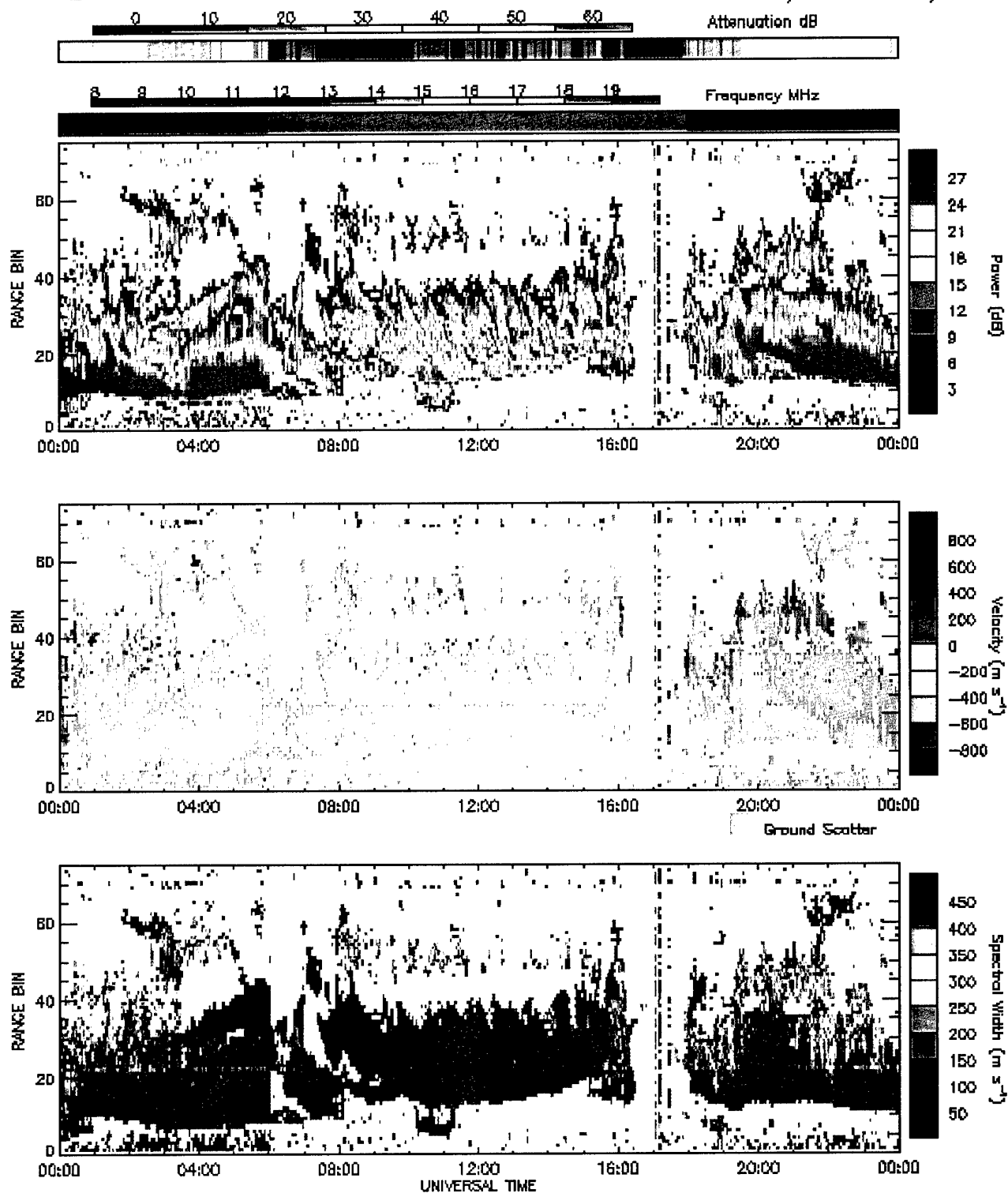
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

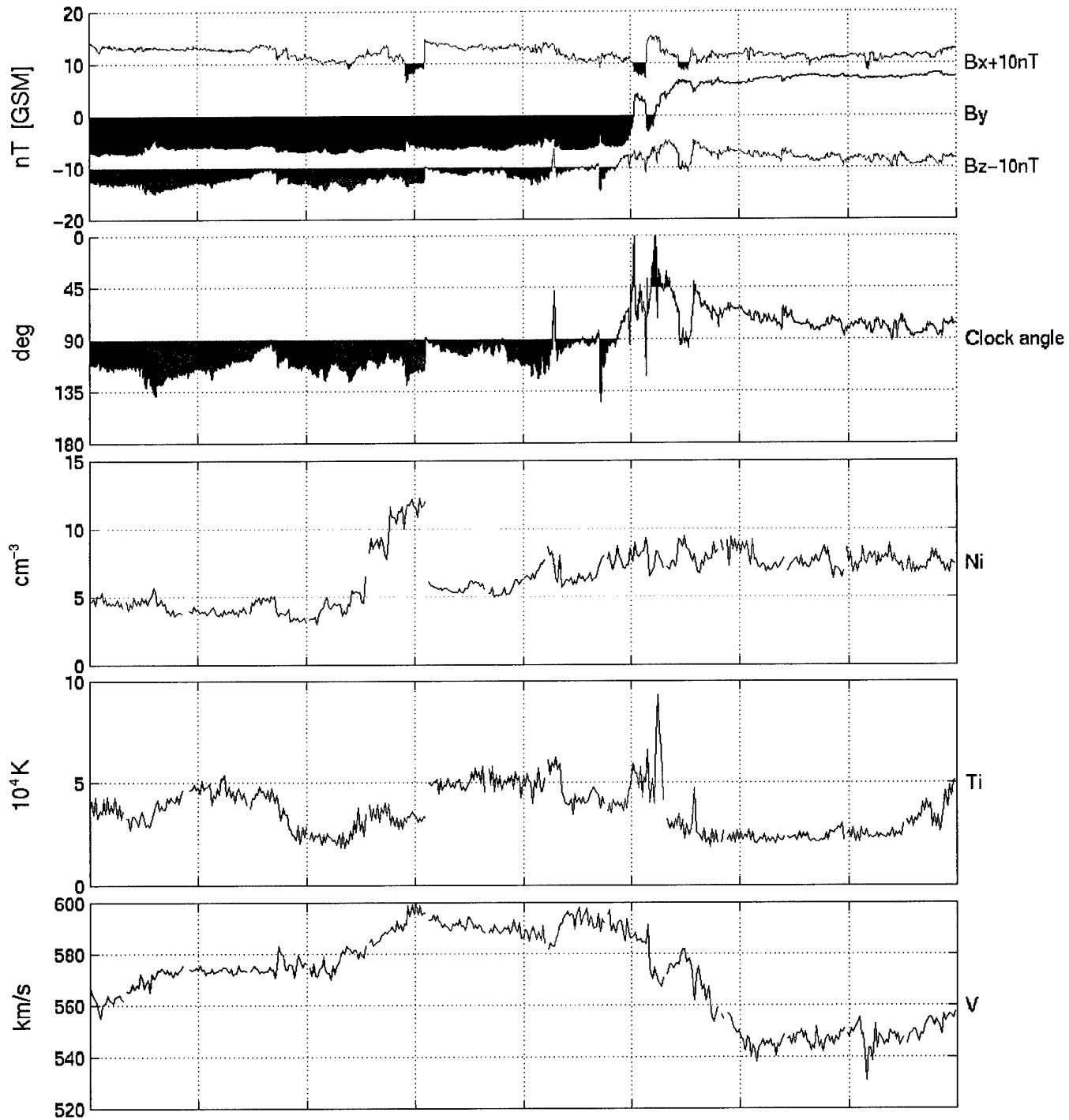
DATE: 25/November/2000



**Contents, November 27, 2000 :**

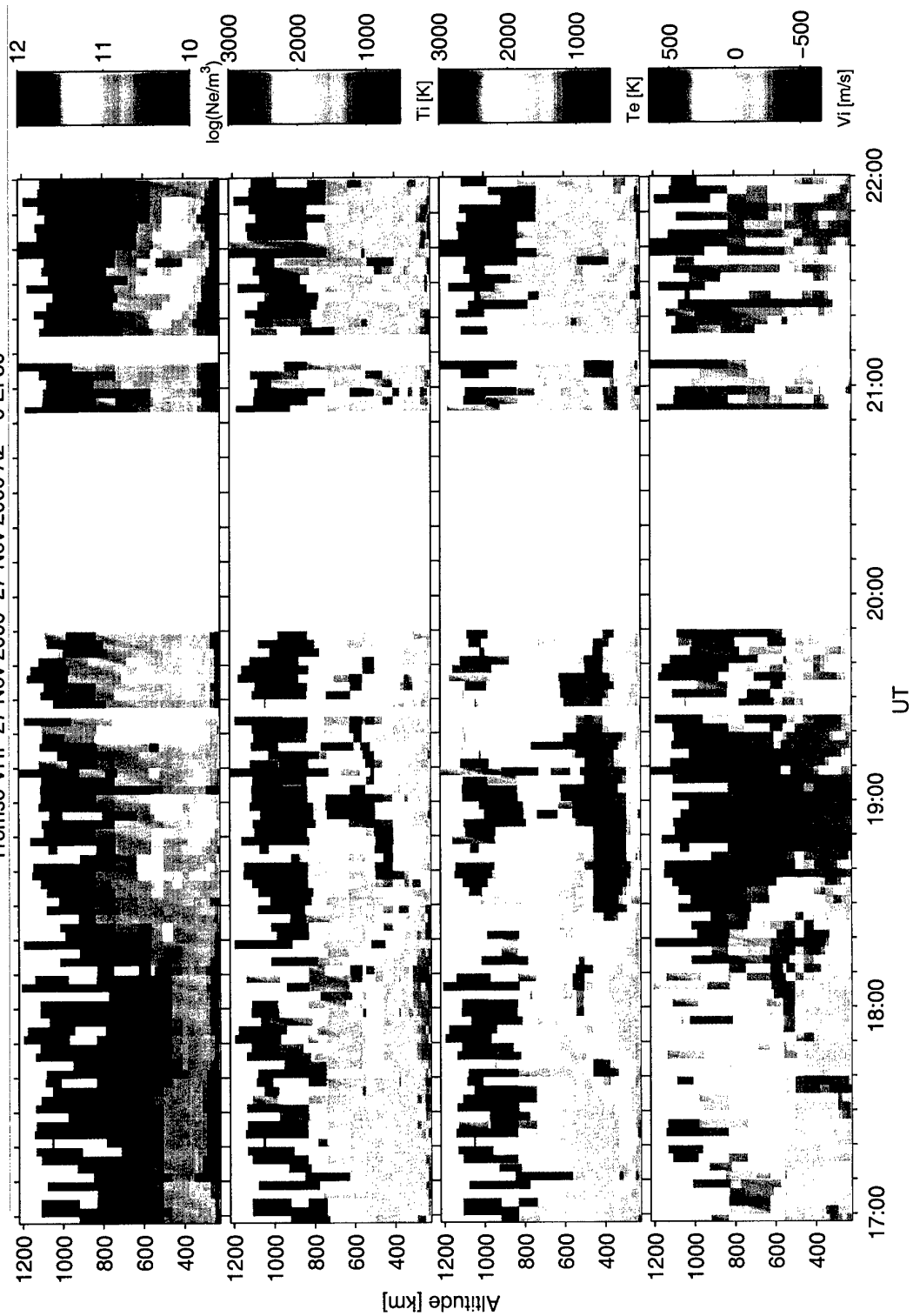
- IMF-ACE plot
- EISCAT VHF(Tromsø) radar summary plots
- EISCAT Svalbard summary plots
- IMAGE magnetometer data
- CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Nov 27 2000

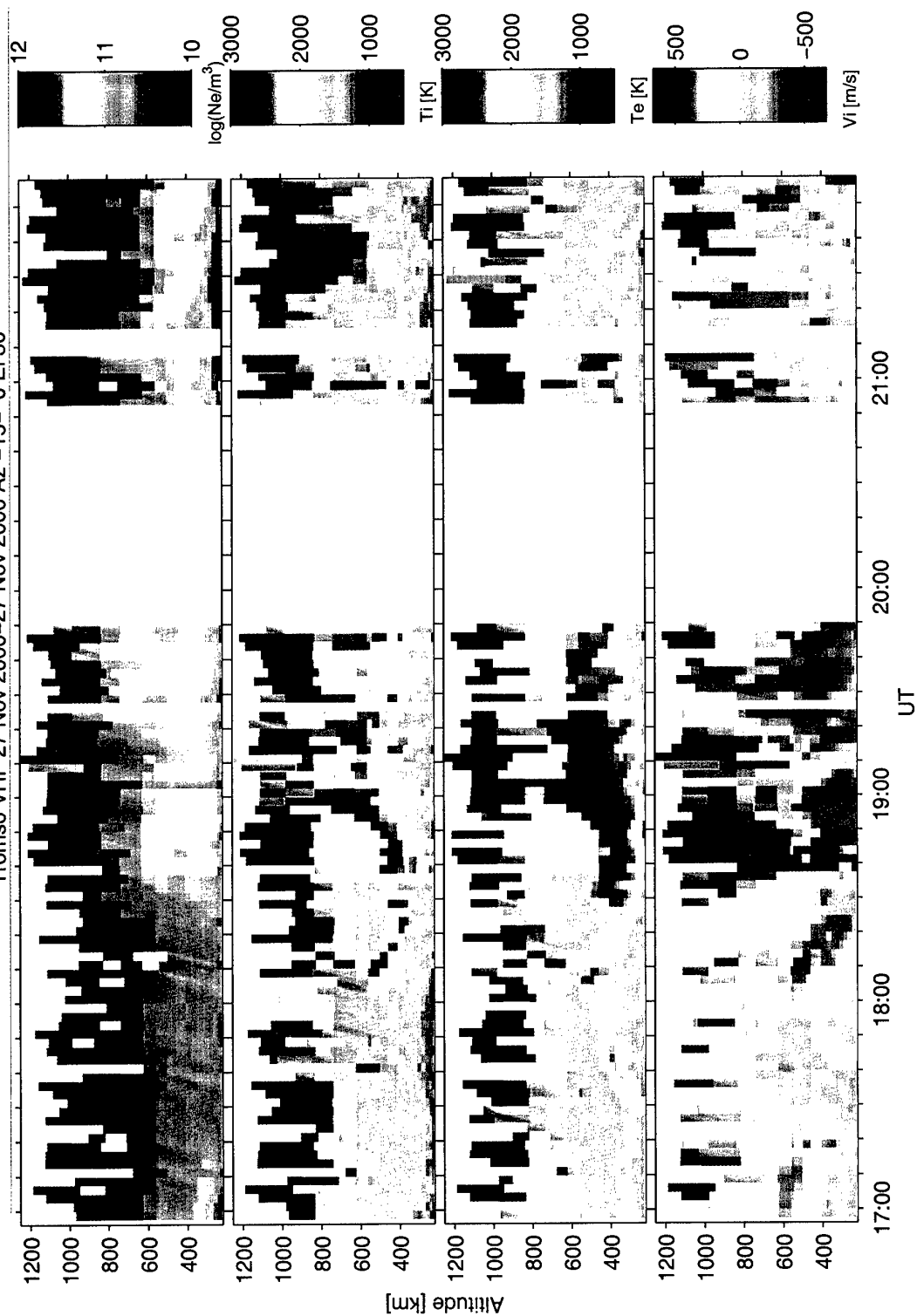


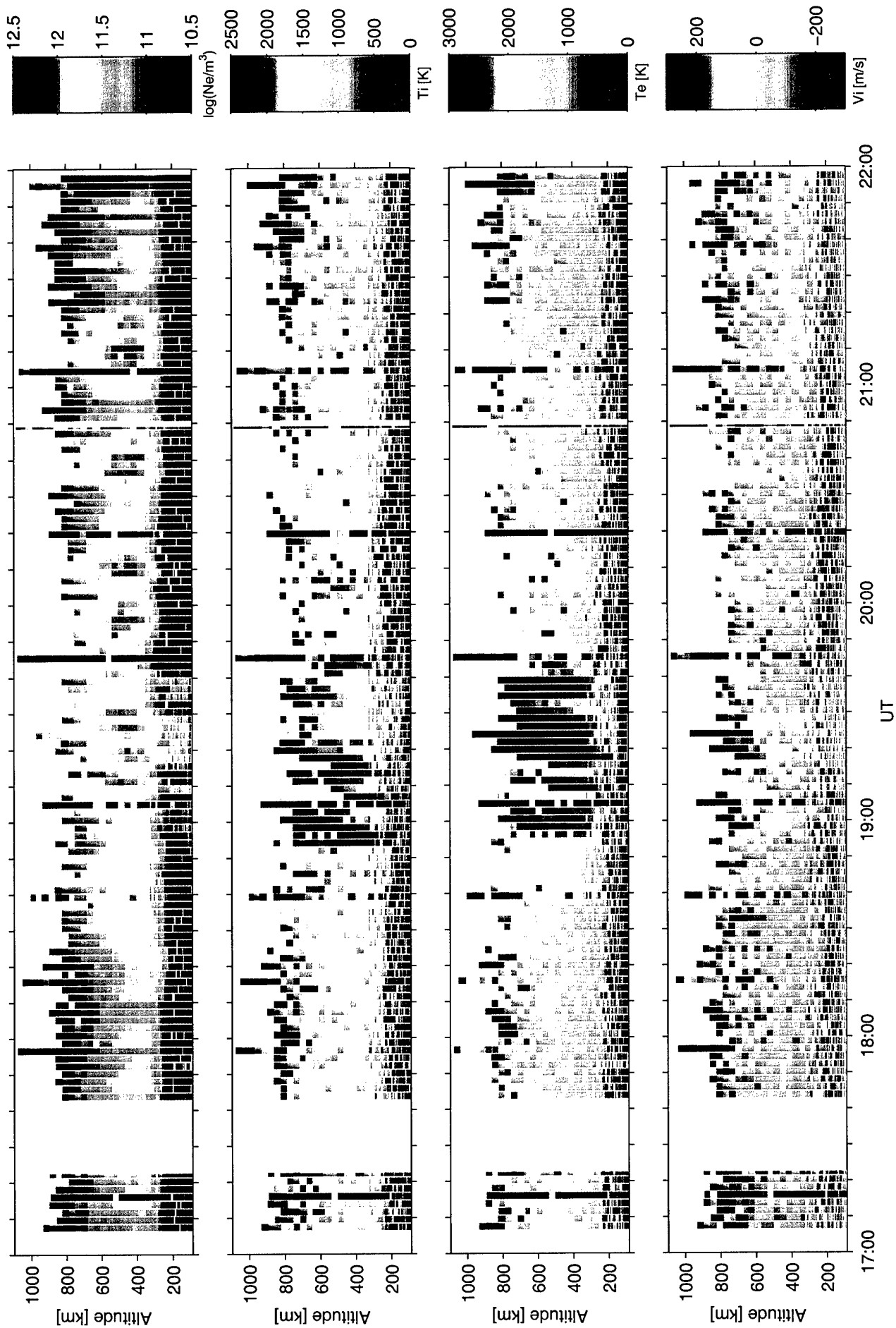
| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 225.4 | 225.4 | 225.5 | 225.5 | 225.5 | 225.5 | 225.5 | 225.5 | 225.5 |
| Y [GSM] | 31.7  | 31.8  | 31.9  | 32.0  | 32.2  | 32.3  | 32.4  | 32.5  | 32.7  |
| Z [GSM] | -23.8 | -23.8 | -23.6 | -23.4 | -23.2 | -23.1 | -22.9 | -22.7 | -22.6 |

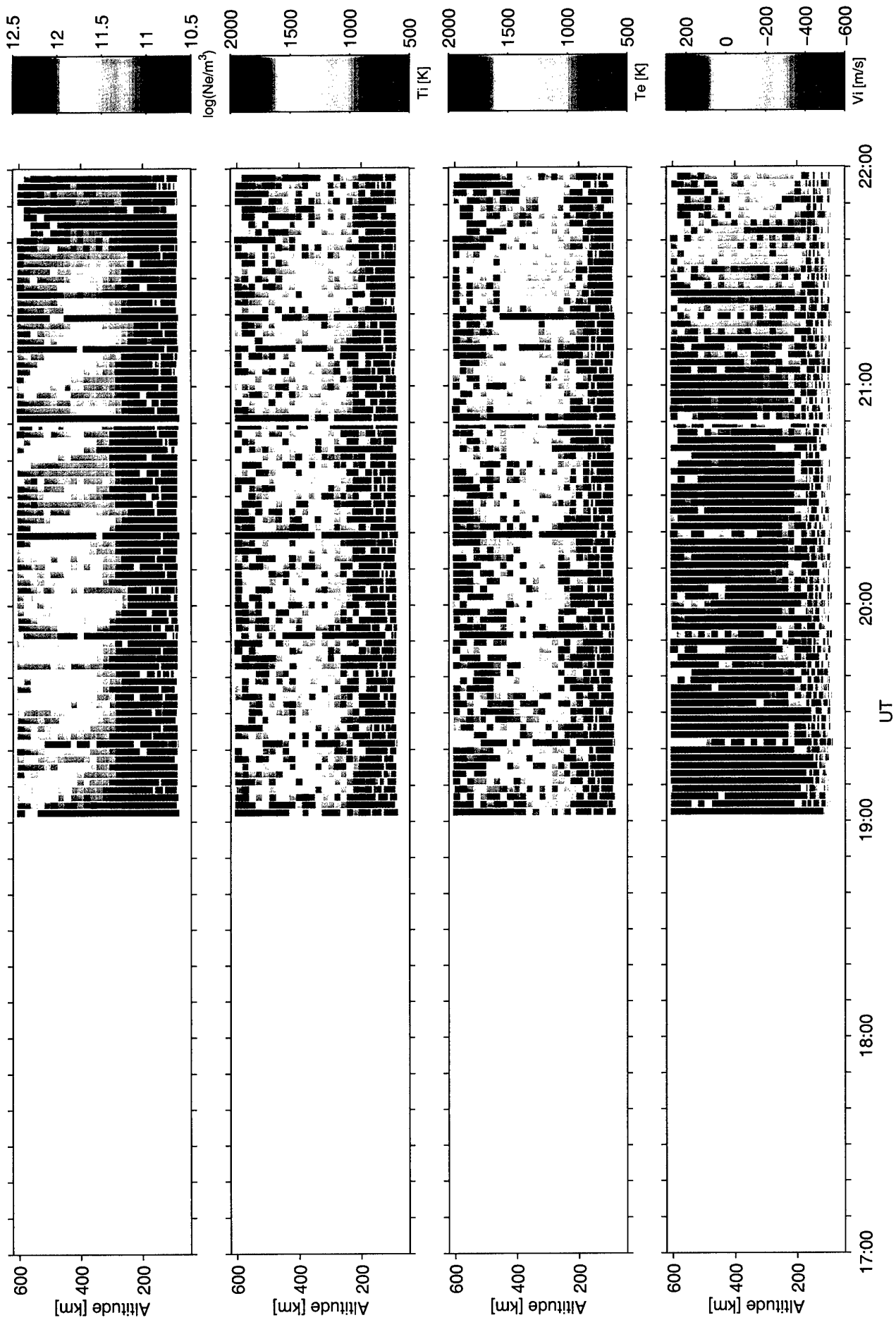
Tromsø VHF 27 Nov 2000–27 Nov 2000 Az -0 El 30

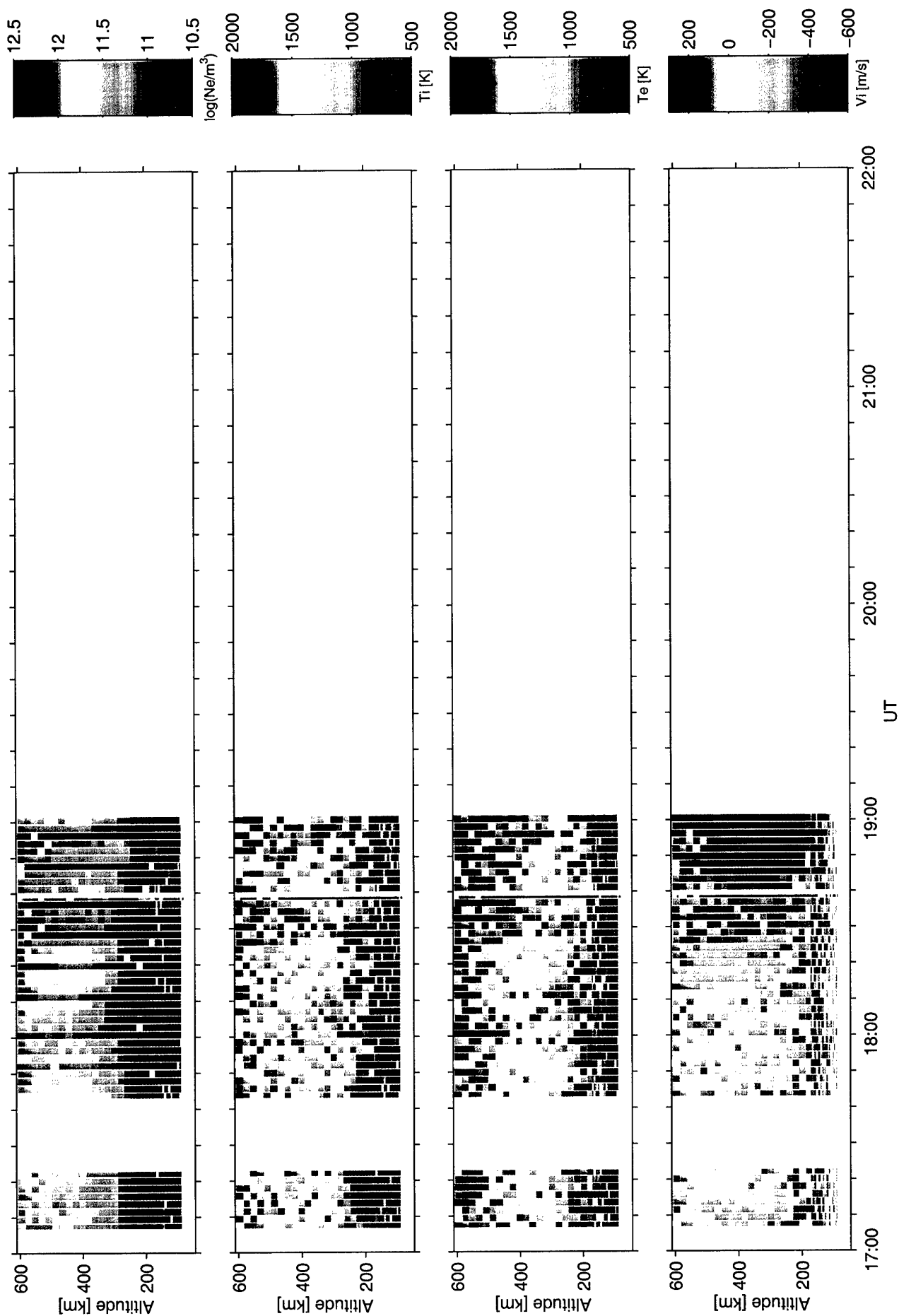


Tromsø VHF 27 Nov 2000-27 Nov 2000 Az -15- 0 El 30



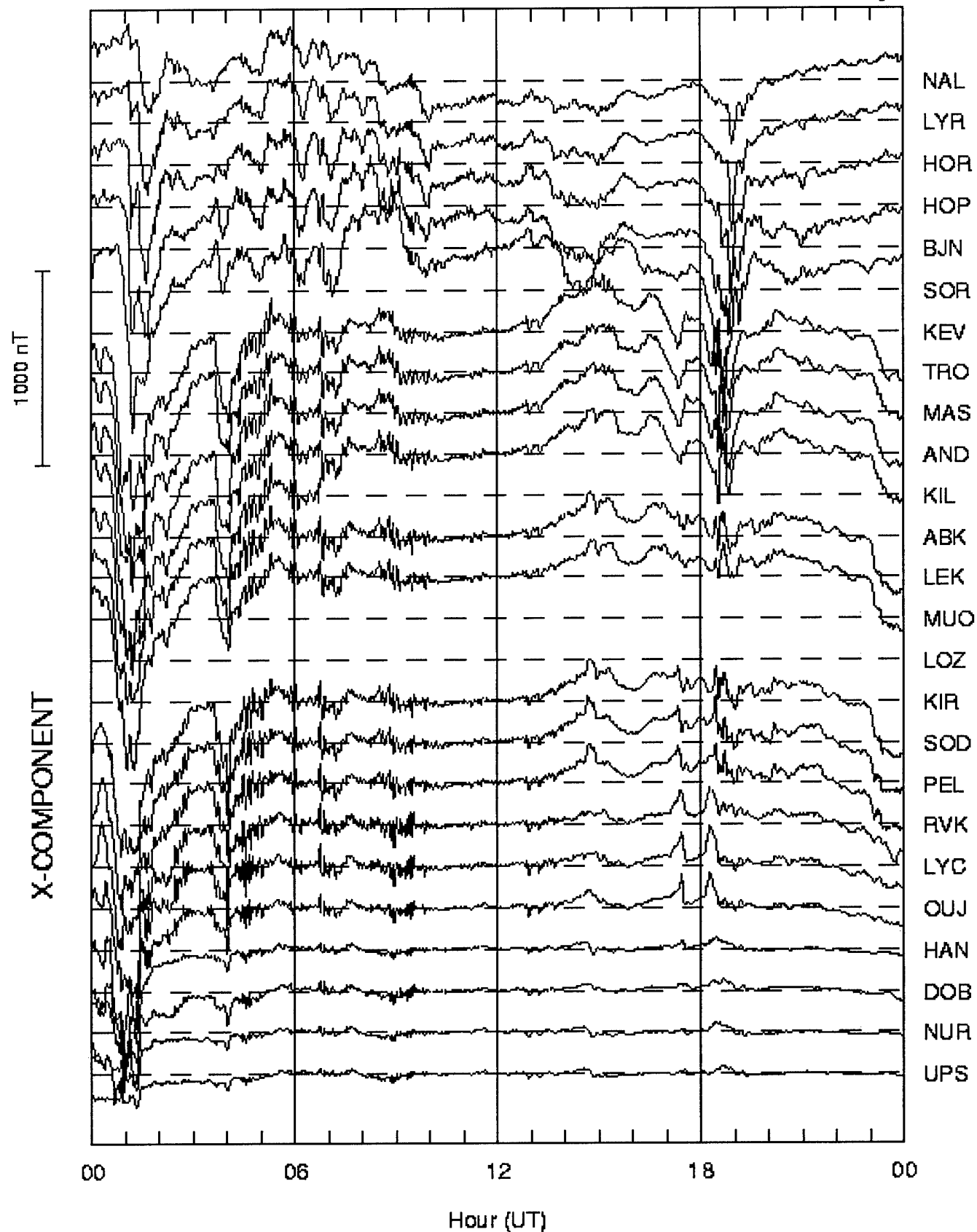






# IMAGE magnetometer network 2000-11-27

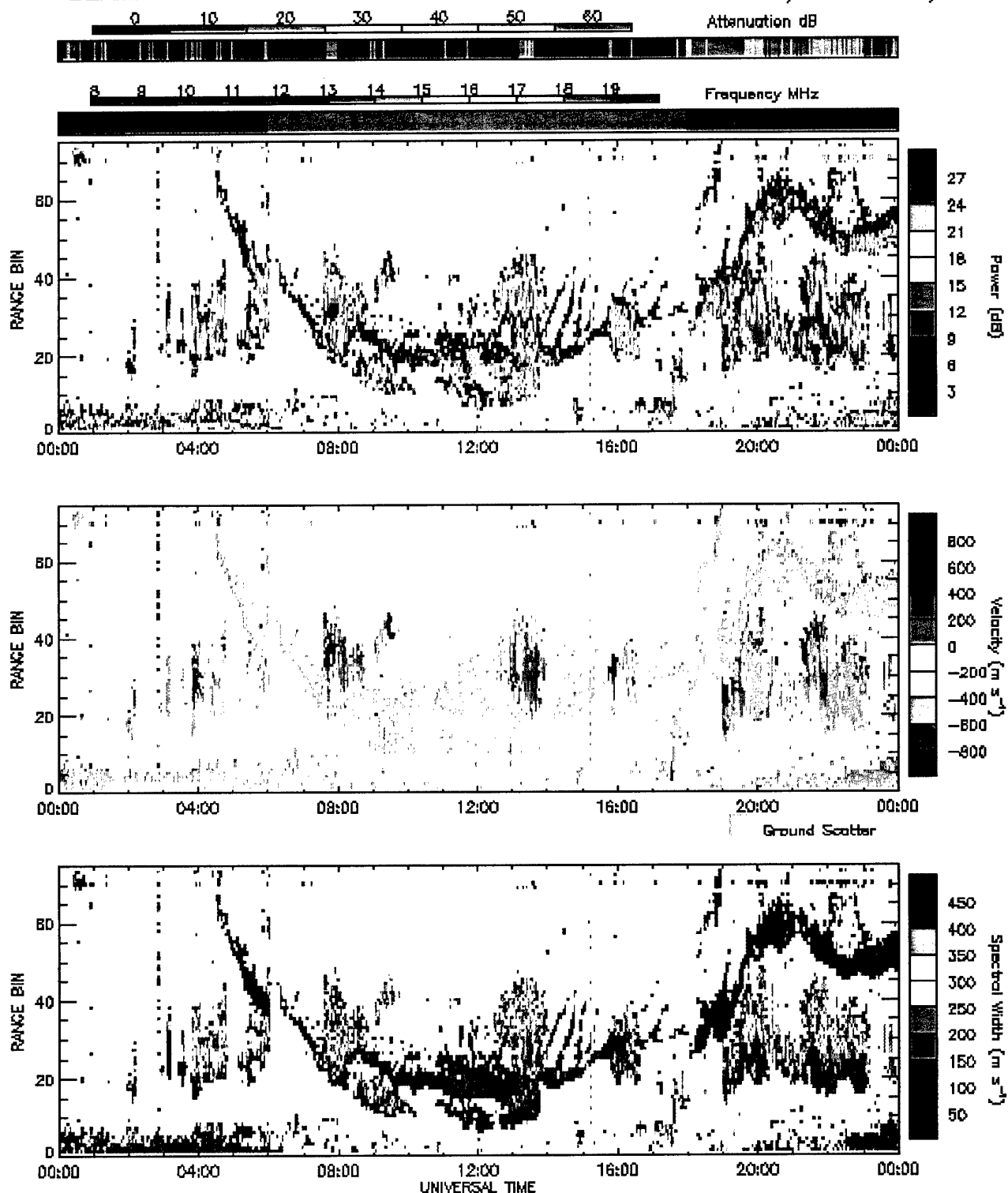
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 27/November/2000



**Contents, November 28, 2000 :**

-IMF-ACE plot

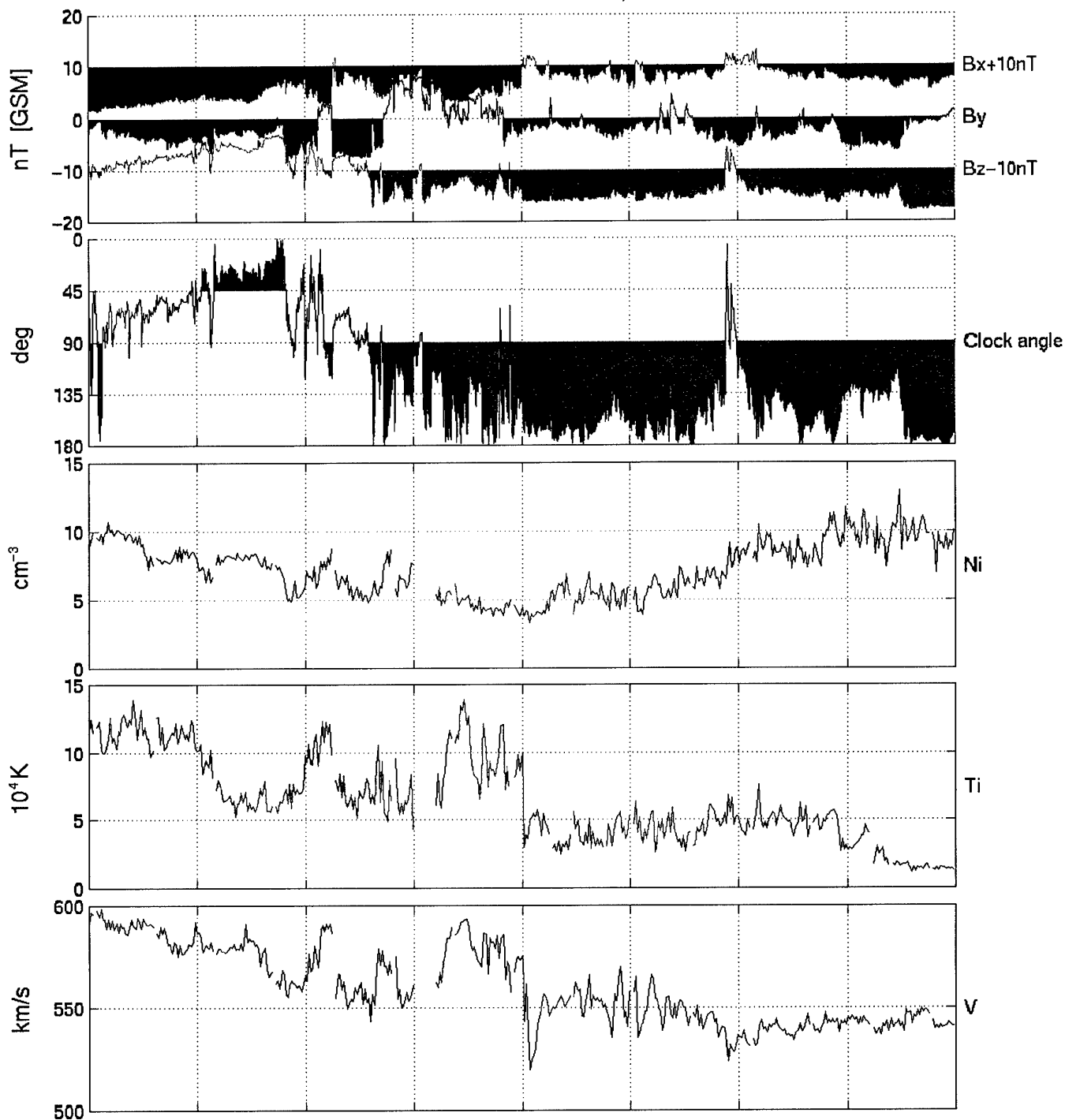
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

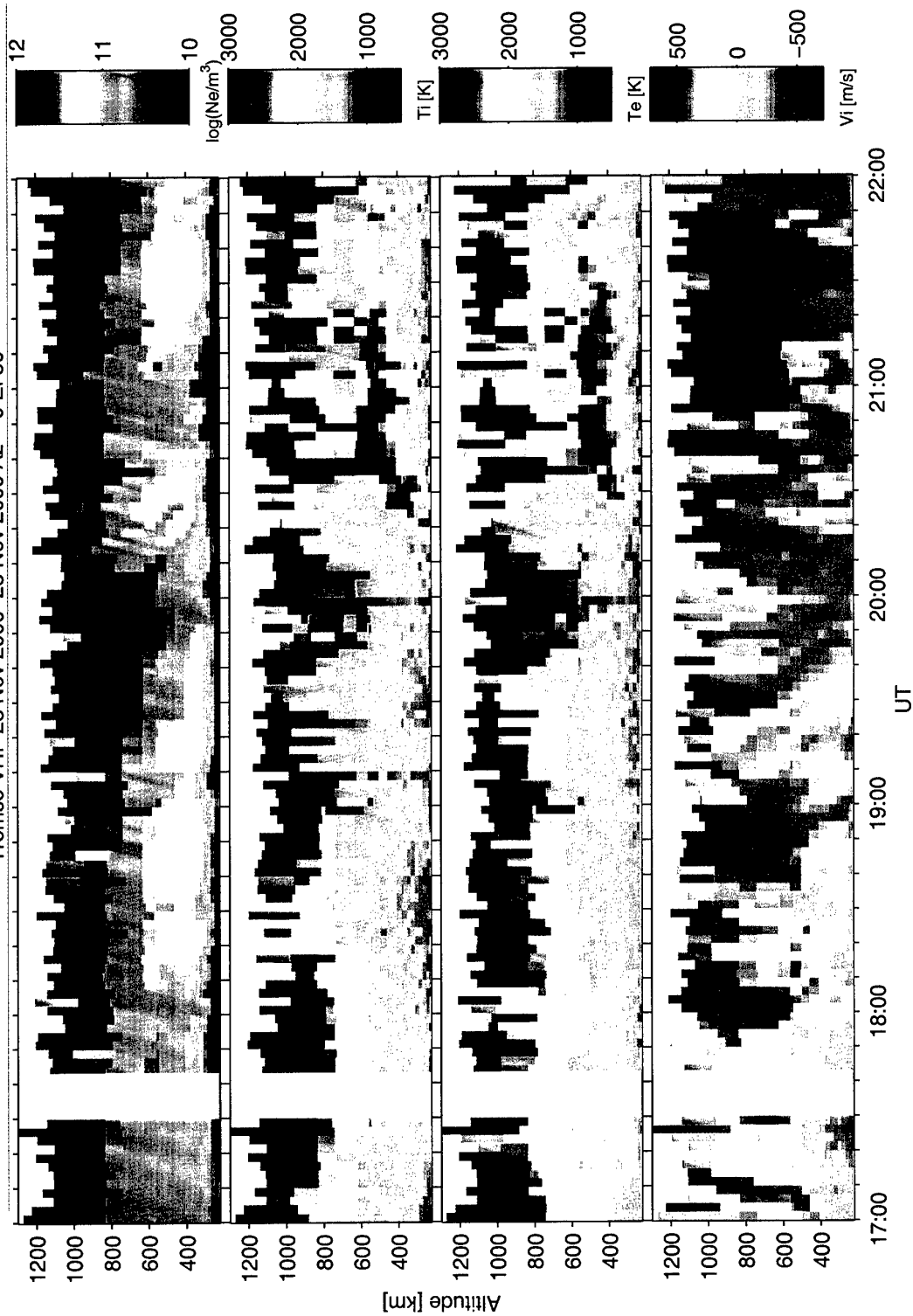
-CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Nov 28 2000

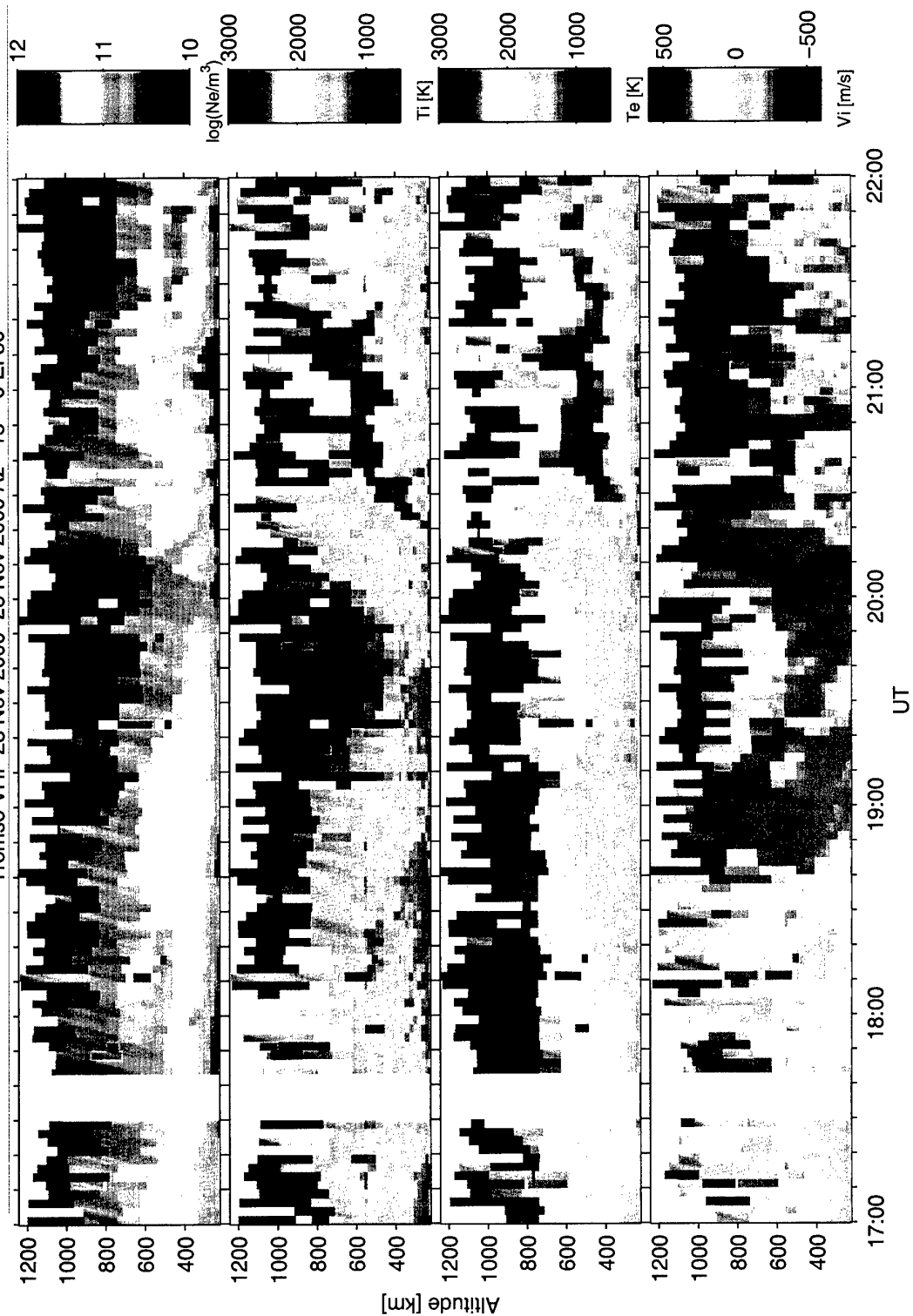


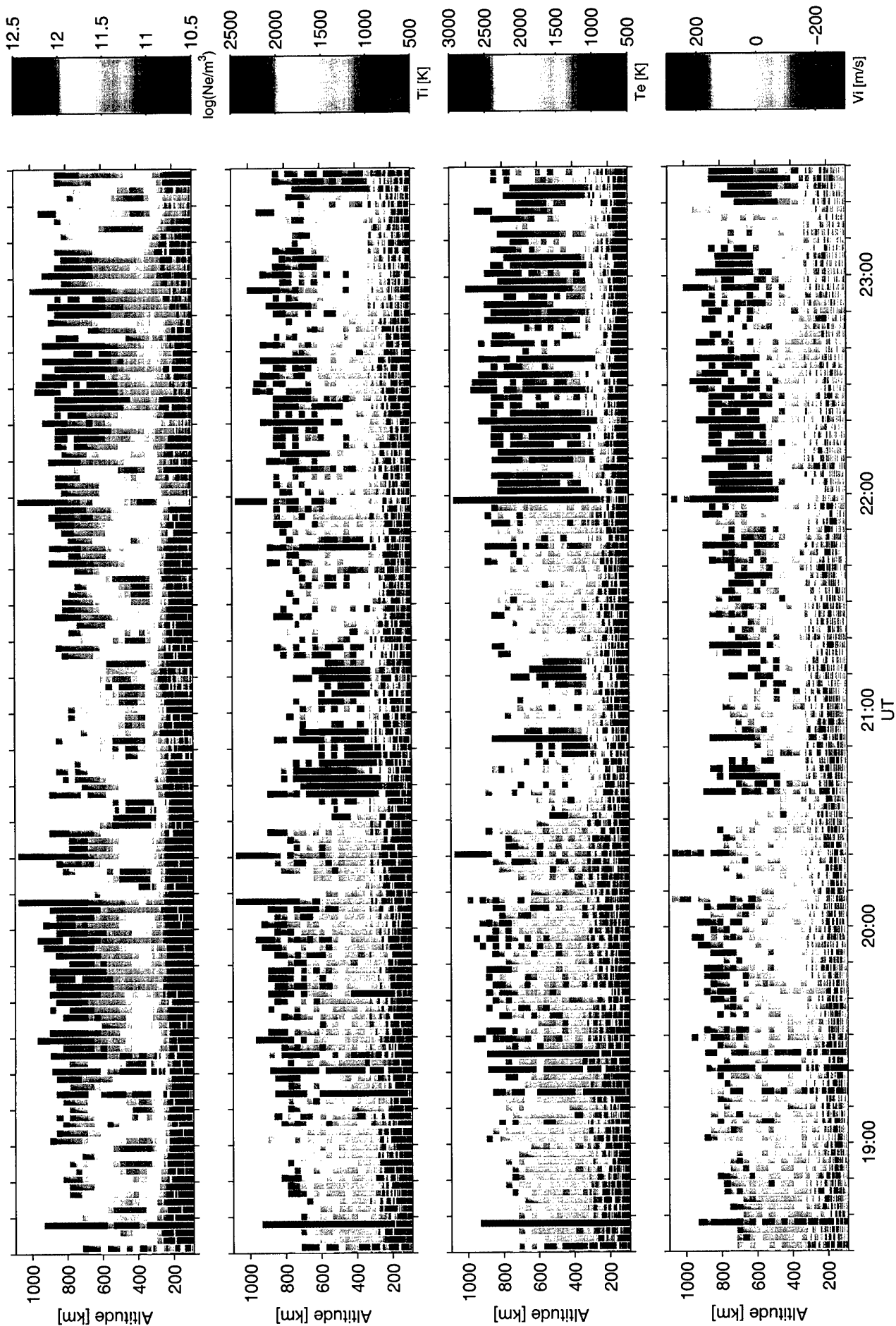
| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 225.7 | 225.7 | 225.8 | 225.8 | 225.8 | 225.8 | 225.8 | 225.8 | 225.8 |
| Y [GSM] | 34.7  | 34.9  | 35.0  | 35.3  | 35.4  | 35.2  | 35.0  | 34.8  | 34.5  |
| Z [GSM] | -19.8 | -19.7 | -19.5 | -19.0 | -18.7 | -19.1 | -19.5 | -19.8 | -20.2 |

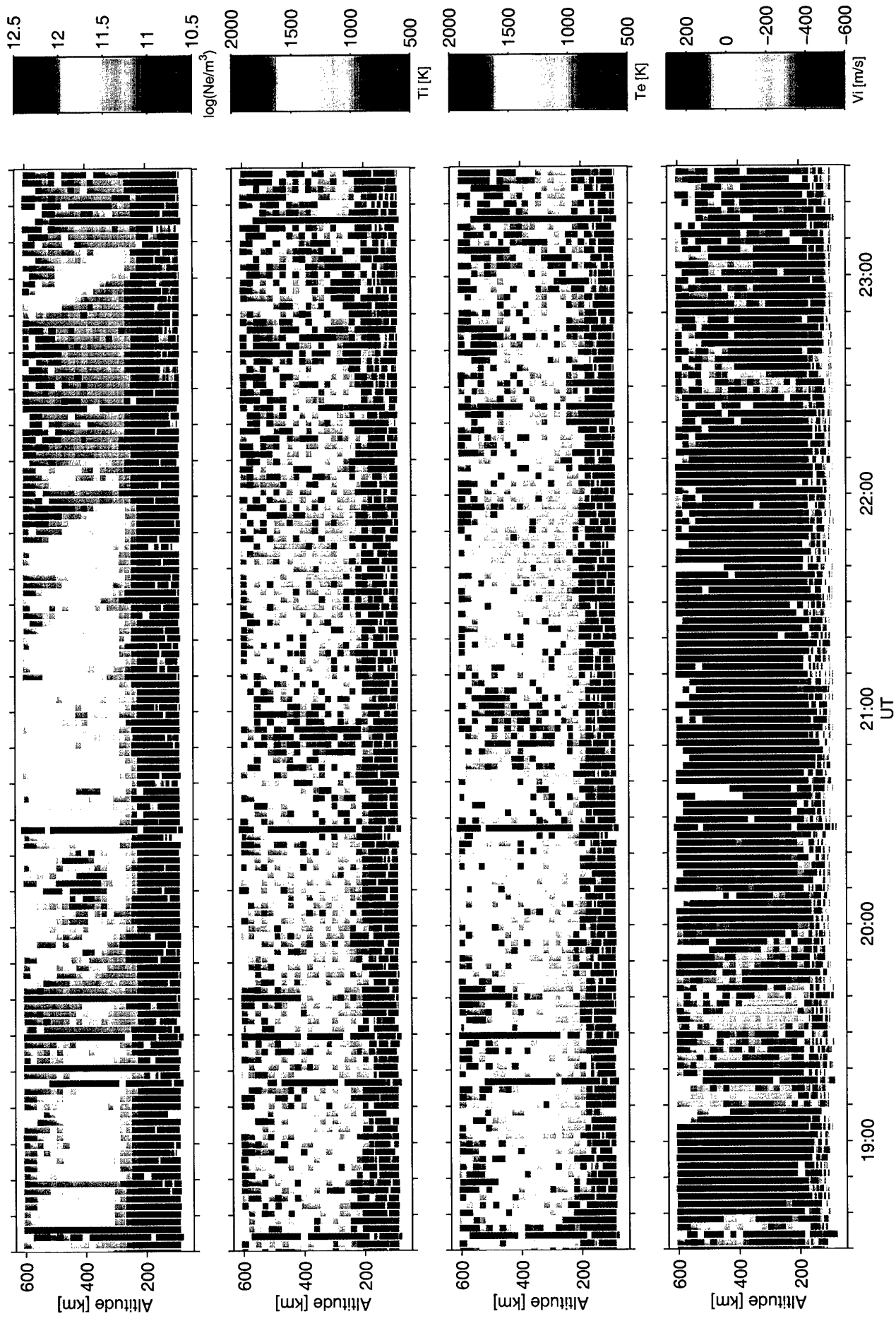
Tromso VHF 28 Nov 2000–28 Nov 2000 Az -0 El 30



Tromsø VHF 28 Nov 2000–28 Nov 2000 Az –15– 0 El 30

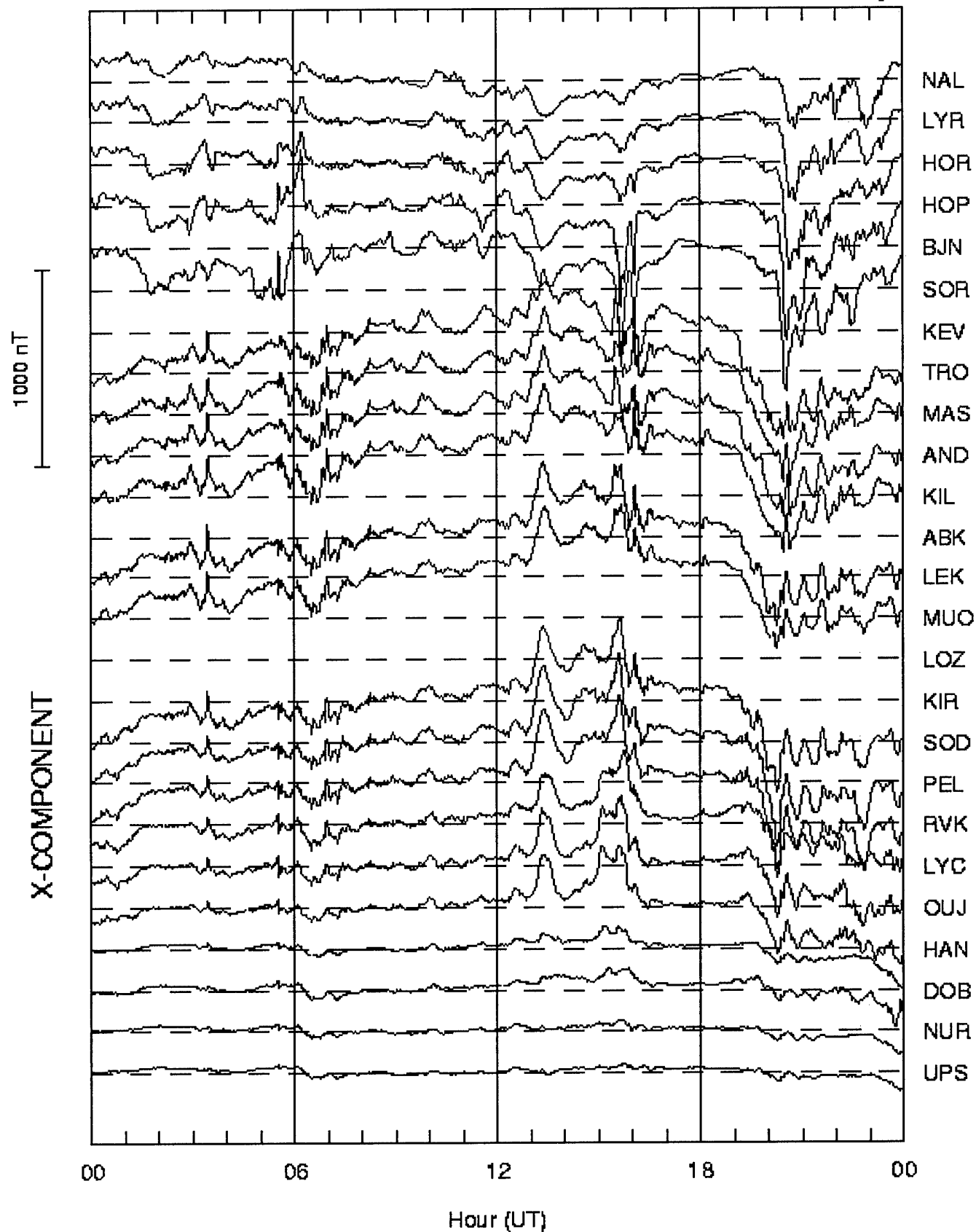






# IMAGE magnetometer network 2000-11-28

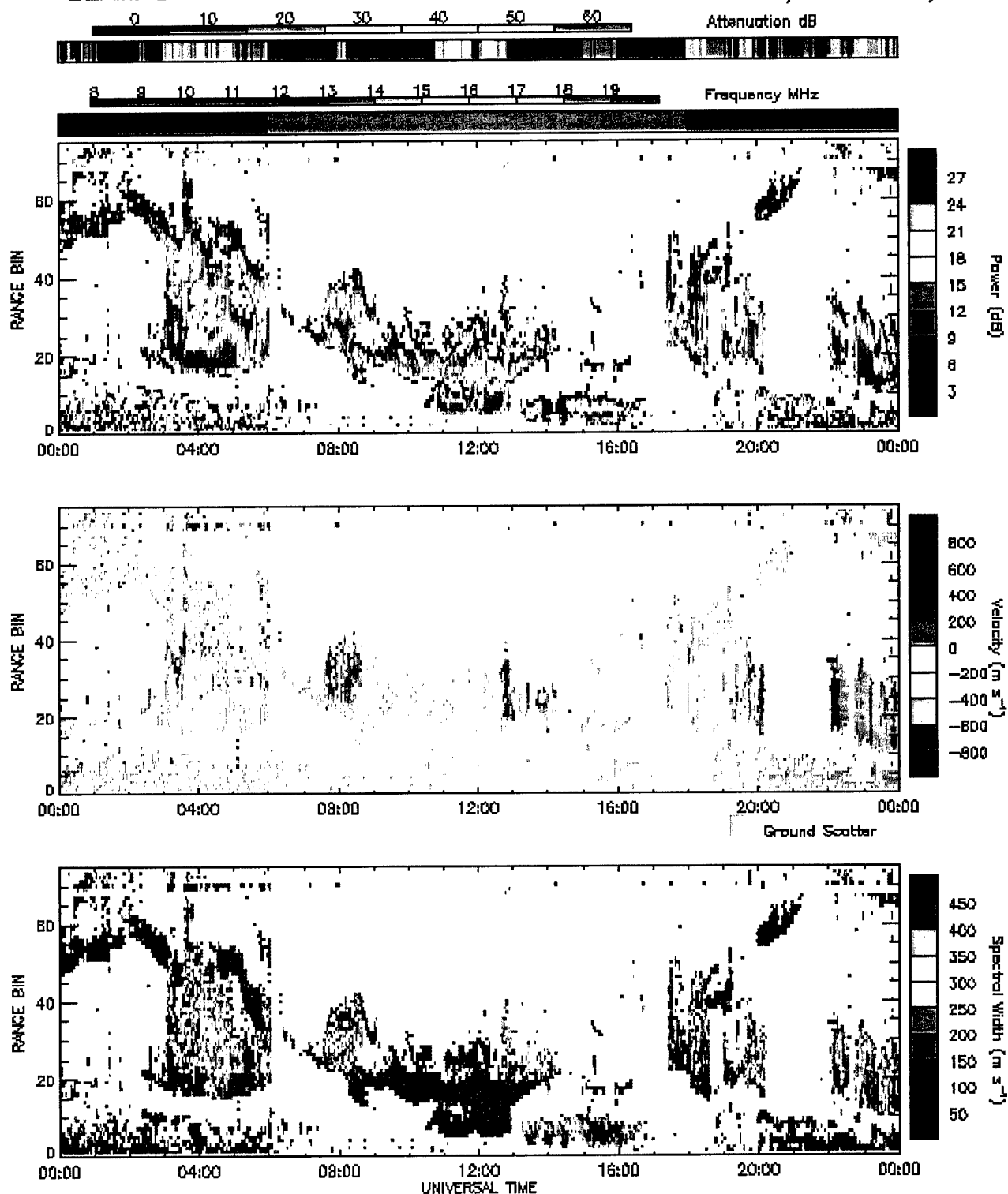
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 28/November/2000



**Contents, December 01, 2000 :**

-IMF-ACE plot

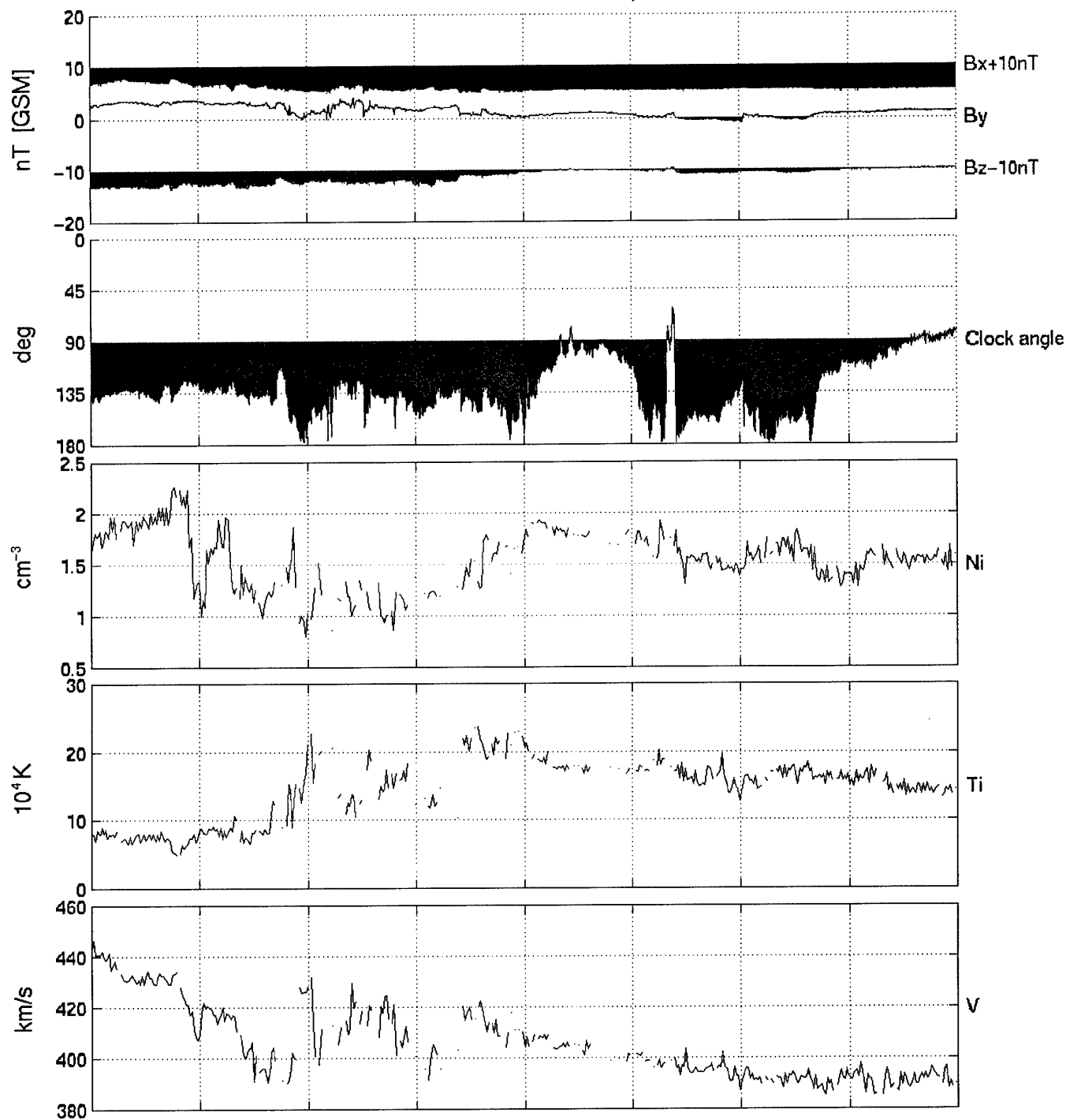
-EISCAT VHF(Tromsø) radar summary plots

-EISCAT Svalbard summary plots

-IMAGE magnetometer data

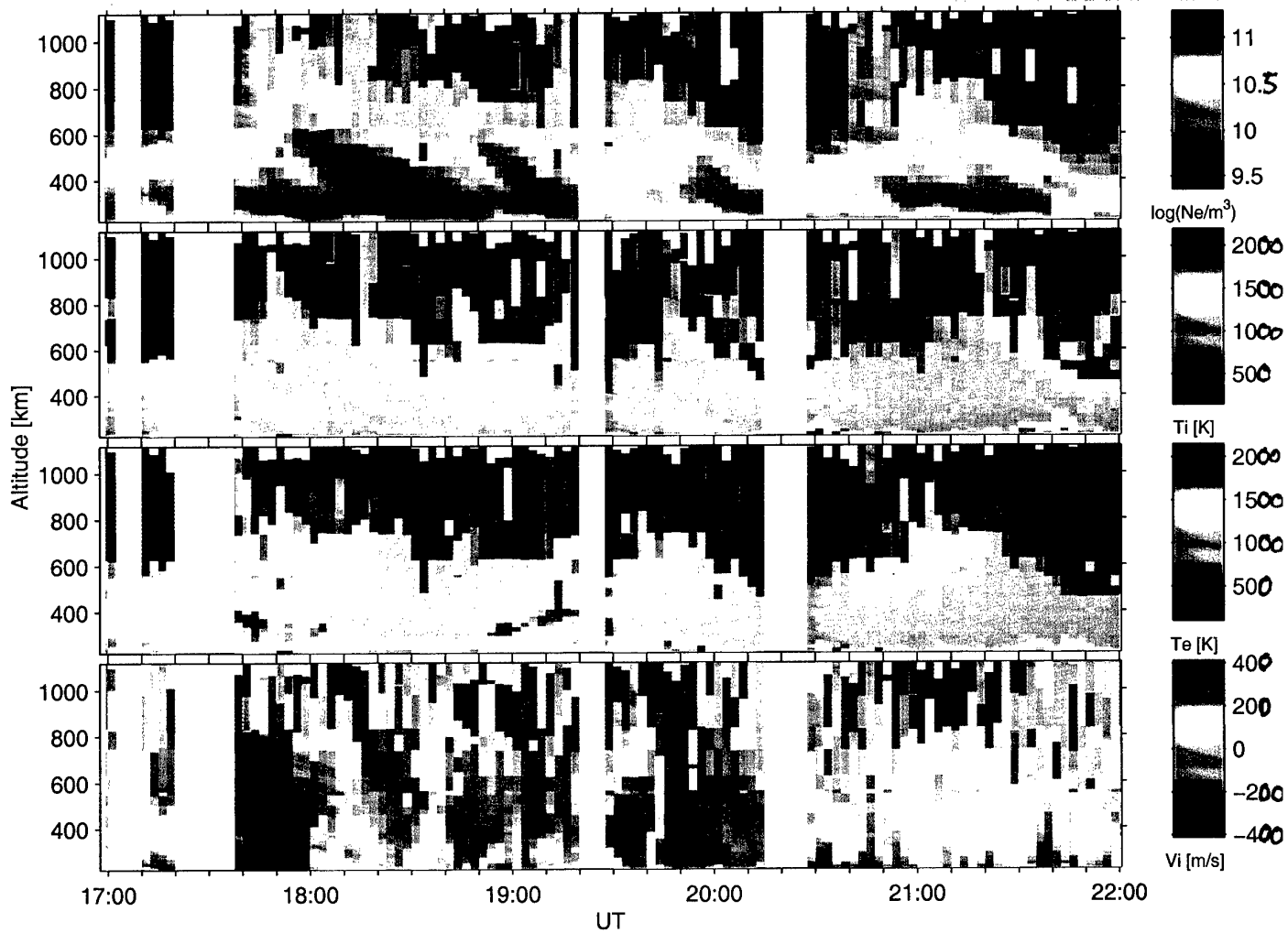
-CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Dec 1 2000

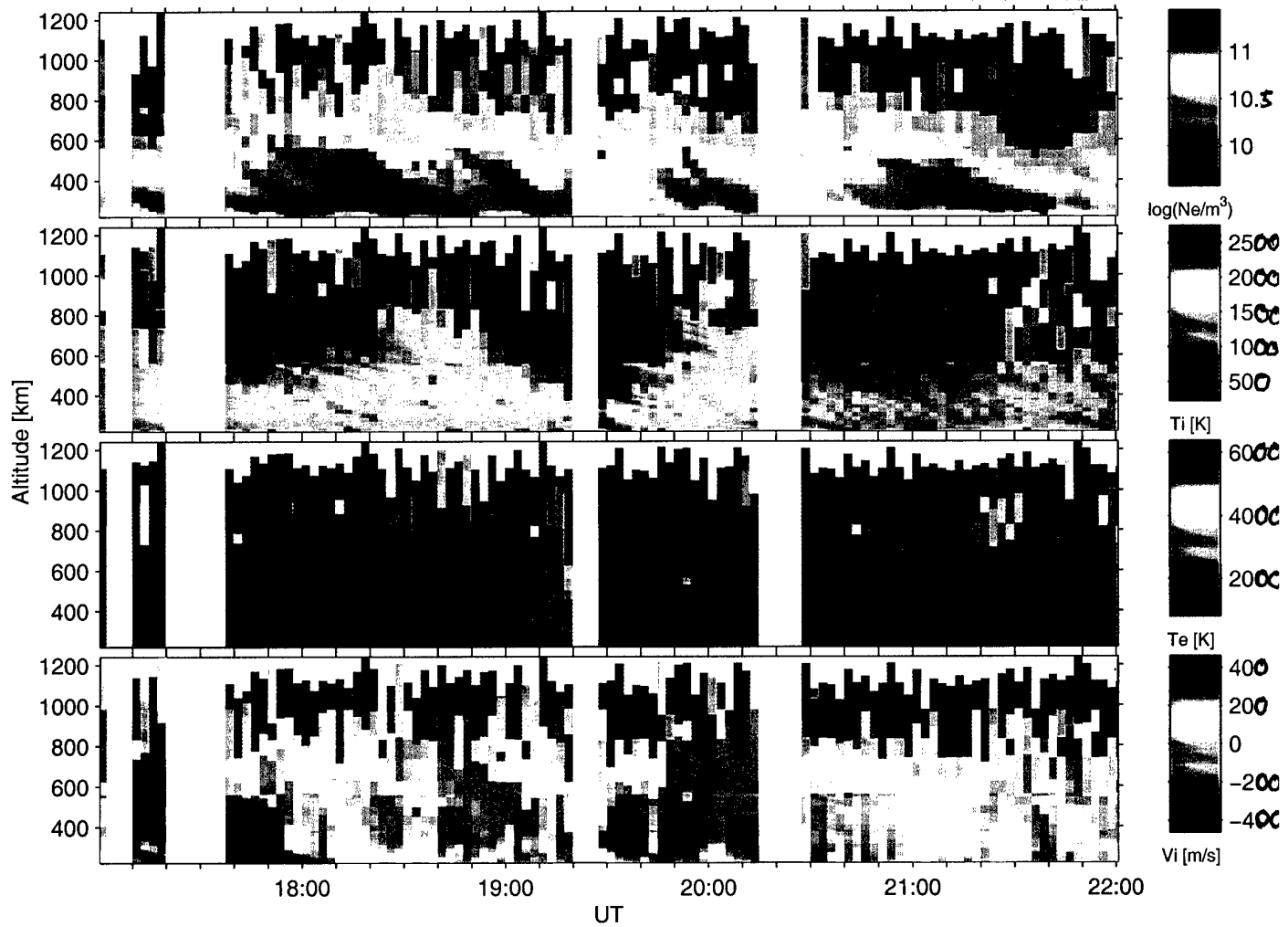


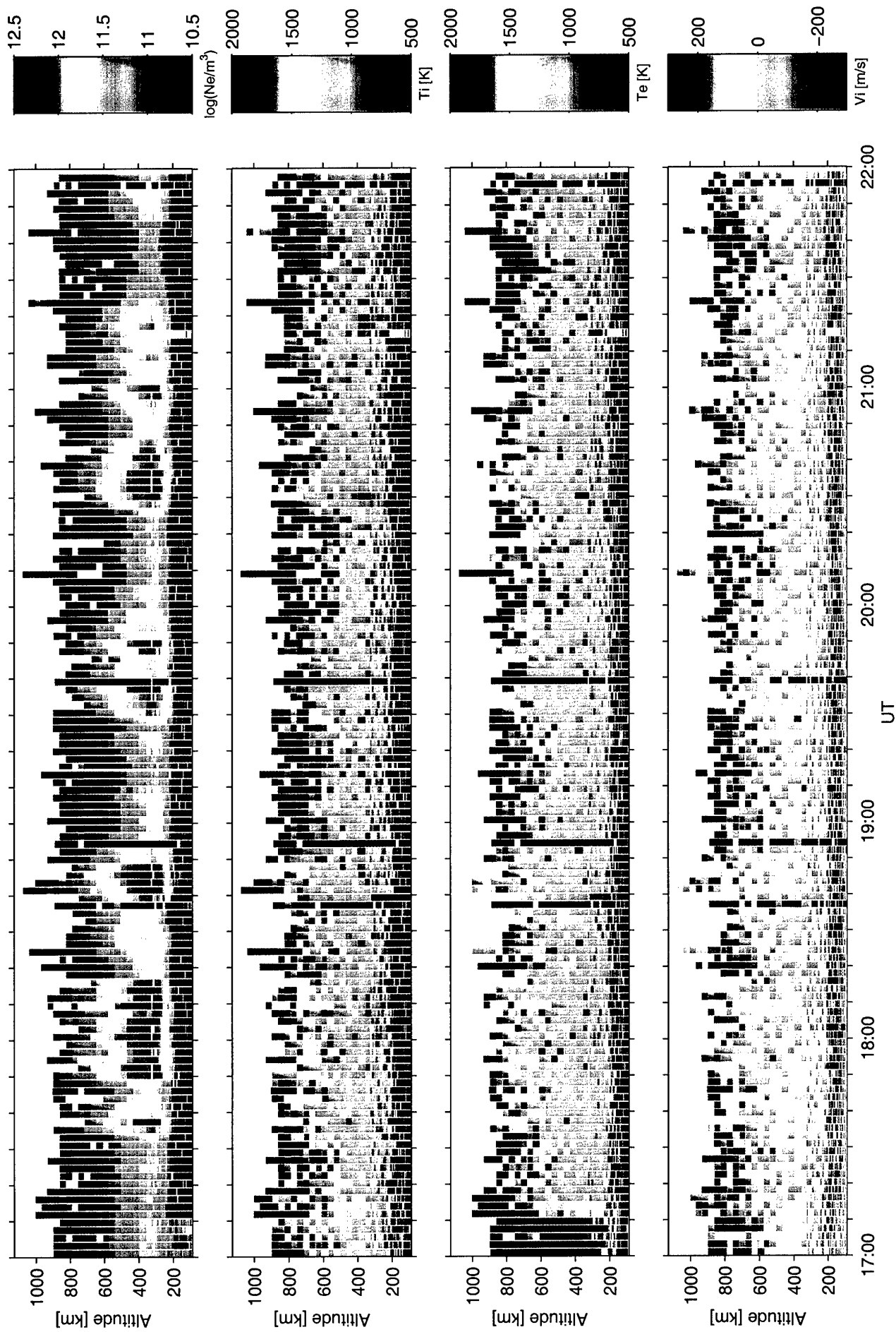
| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 226.6 | 226.6 | 226.6 | 226.6 | 226.6 | 226.6 | 226.6 | 226.6 | 226.7 |
| Y [GSM] | 36.4  | 36.4  | 36.5  | 36.5  | 36.6  | 36.6  | 36.6  | 36.6  | 36.7  |
| Z [GSM] | -18.6 | -18.5 | -18.4 | -18.4 | -18.3 | -18.3 | -18.2 | -18.2 | -18.1 |

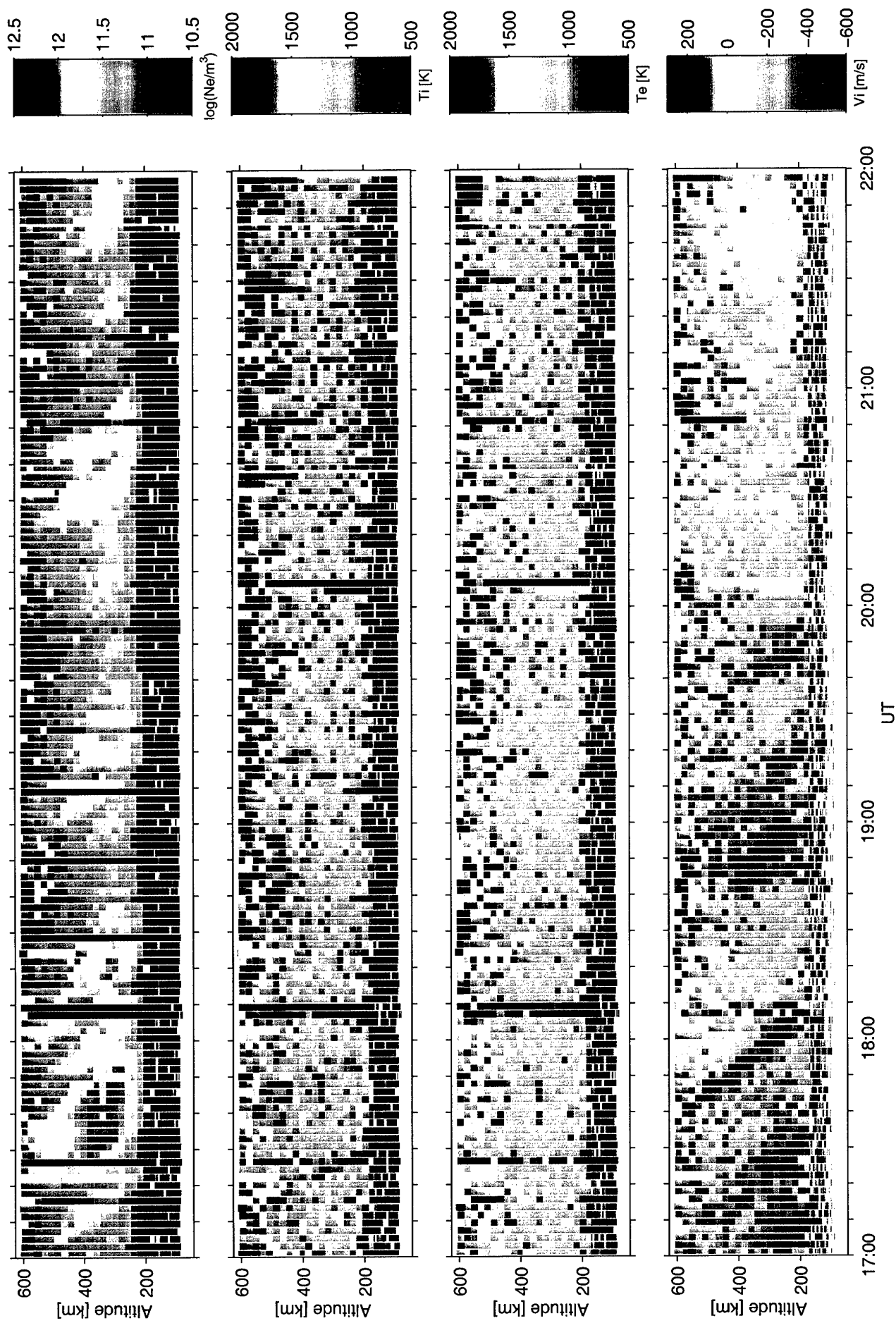
Tromso VHF 01 Dec 2000-01 Dec 2000 Az -0 El 30



Tromso VHF 01 Dec 2000-01 Dec 2000 Az -15- 0 El 30

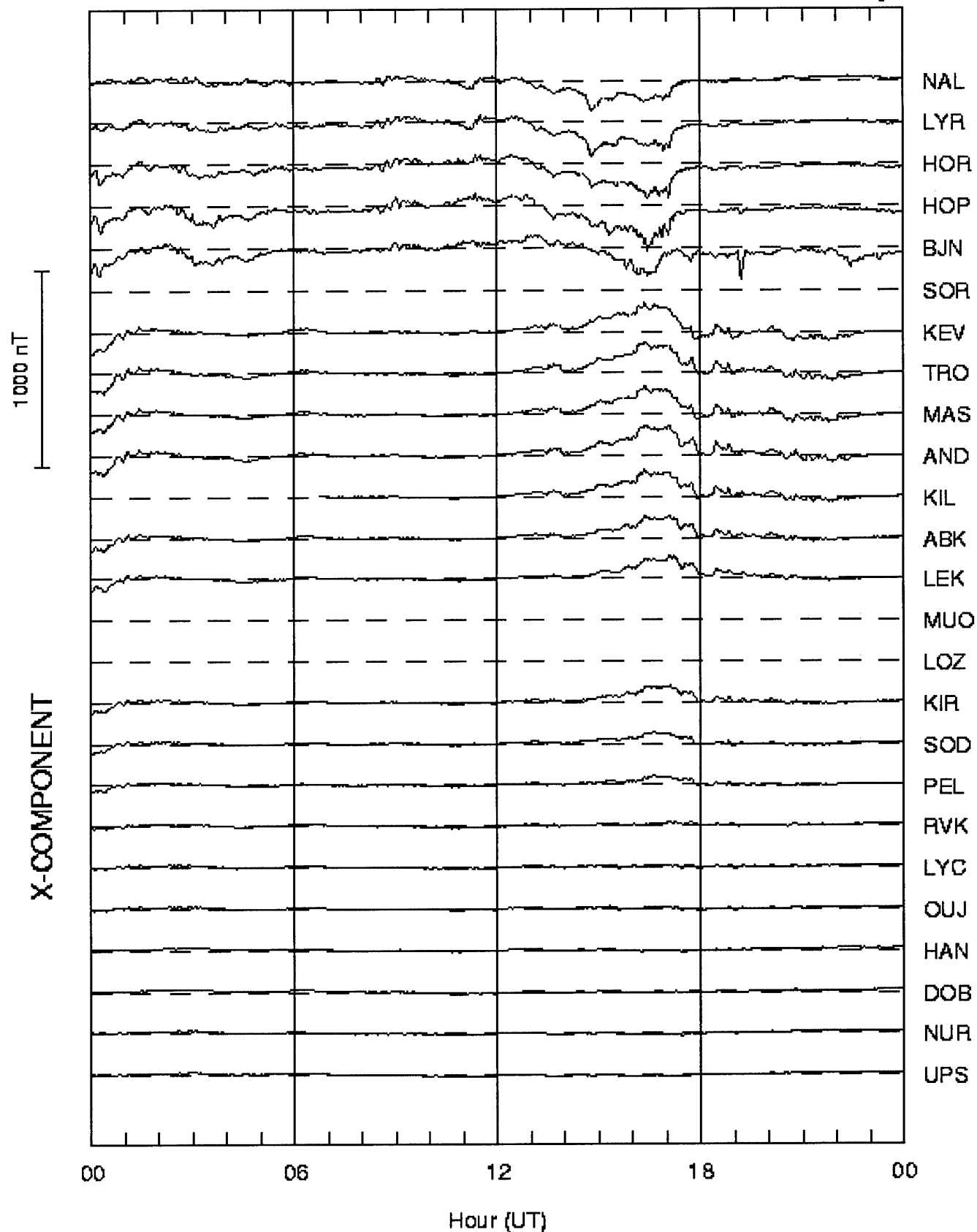






# IMAGE magnetometer network 2000-12-01

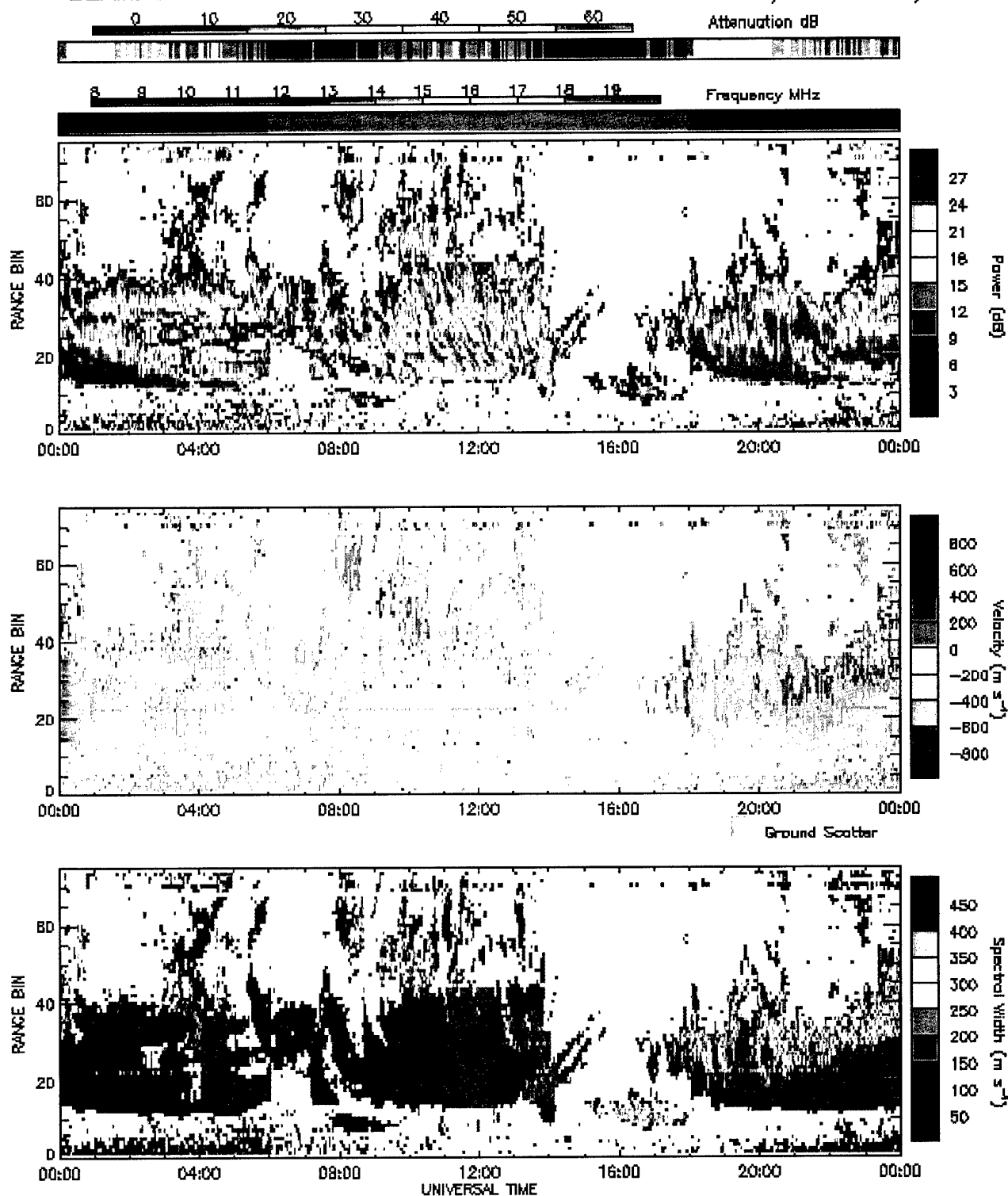
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 1/December/2000



**Contents, December 04, 2000 :**

-IMF-ACE plot

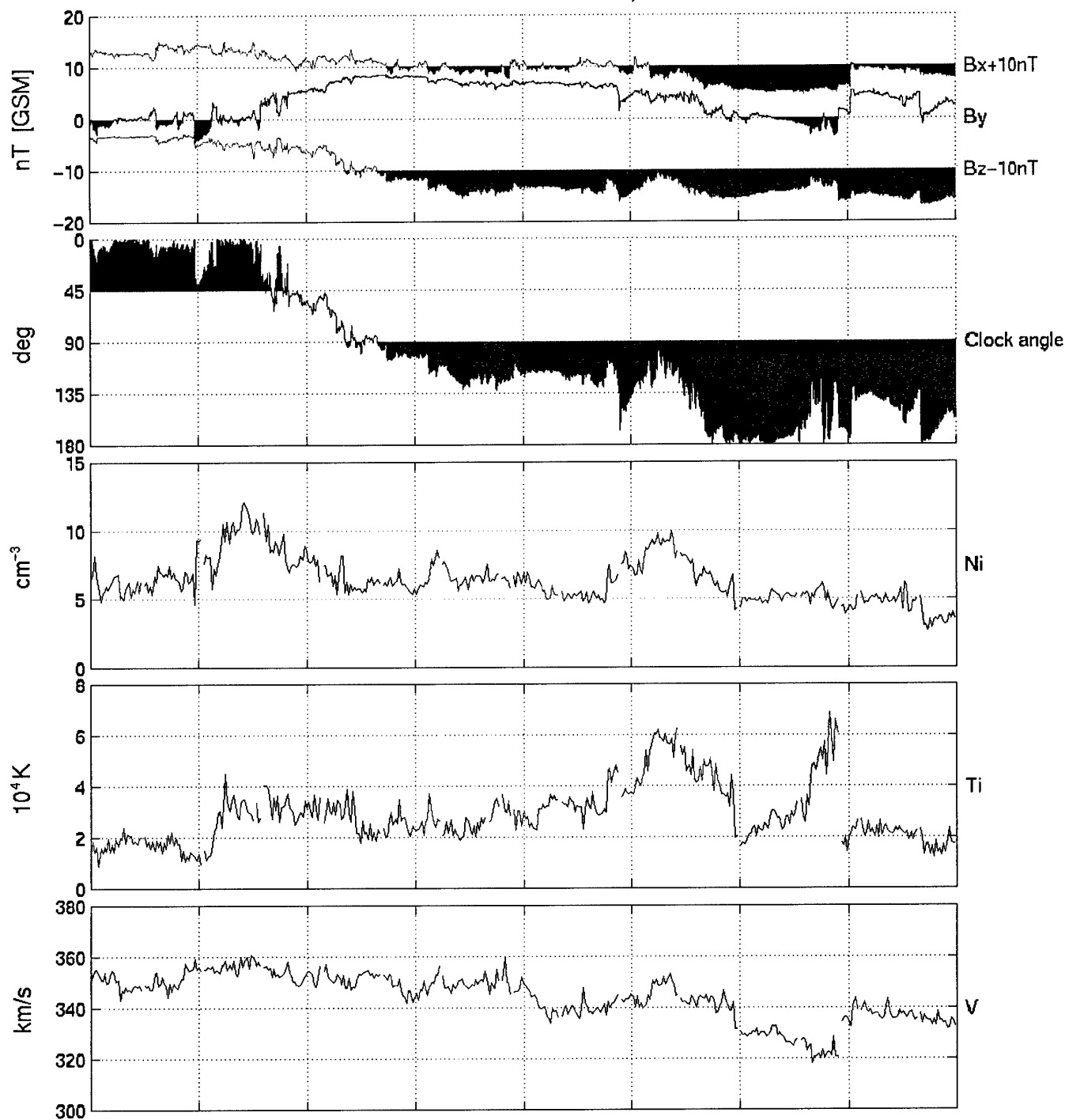
-EISCAT Svalbard summary plots

-IMAGE magnetometer data

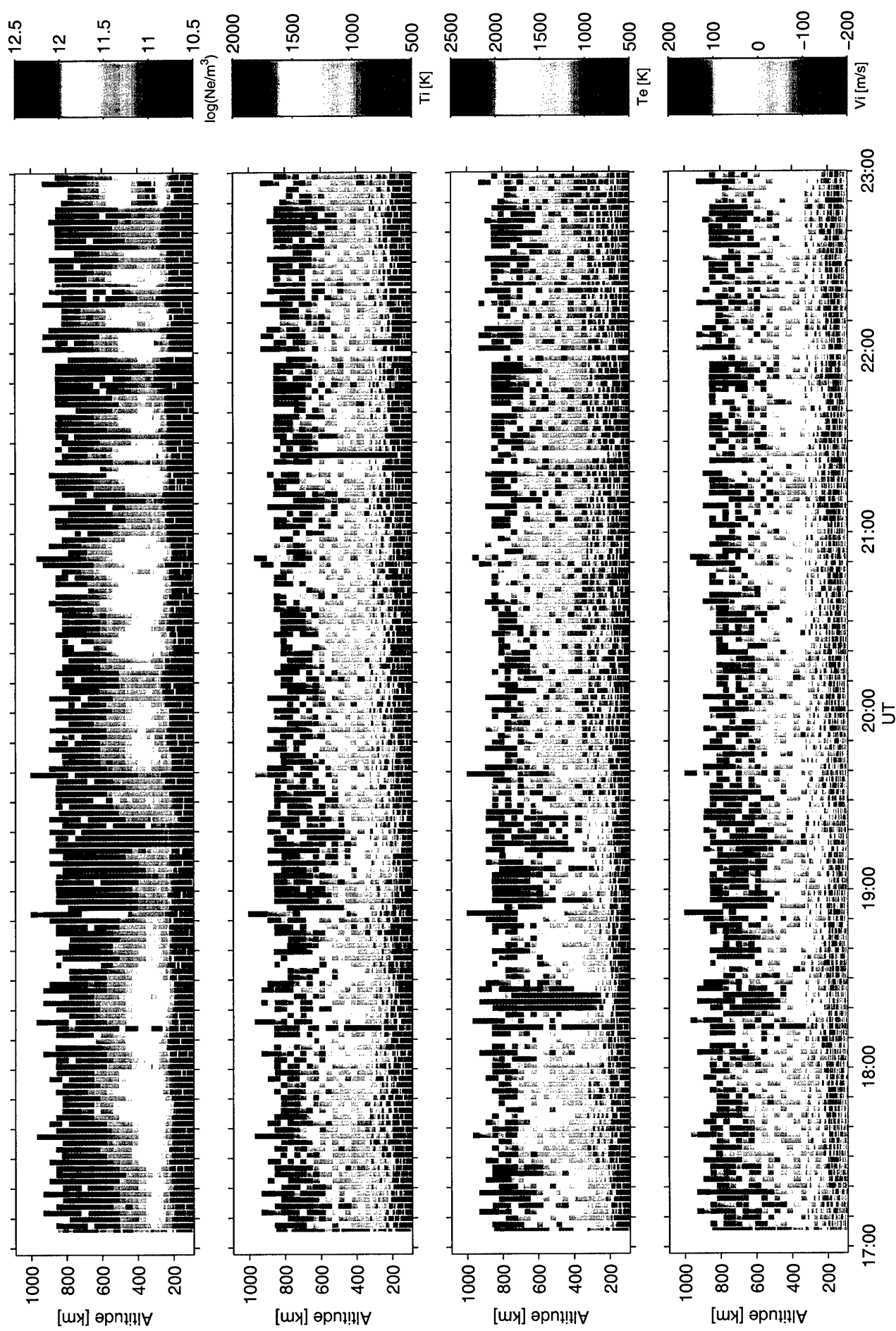
-CUTLASS Finland, Range-Time-Parameter plot

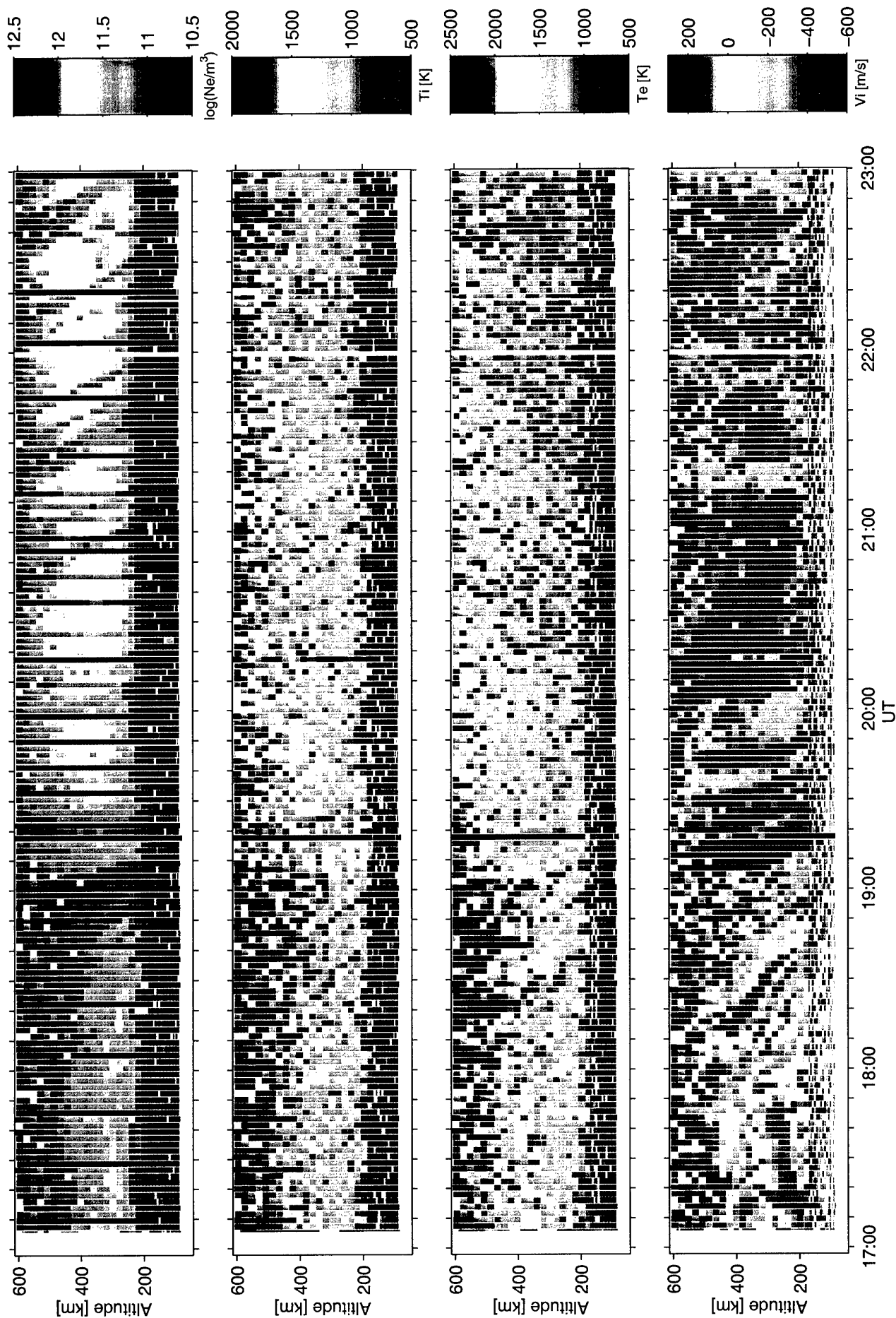
**Note:** EISCAT VHF(Tromsø) radar data for this date was not available at the time of this printing.

# ACE: Solar Wind Parameters, Dec 4 2000



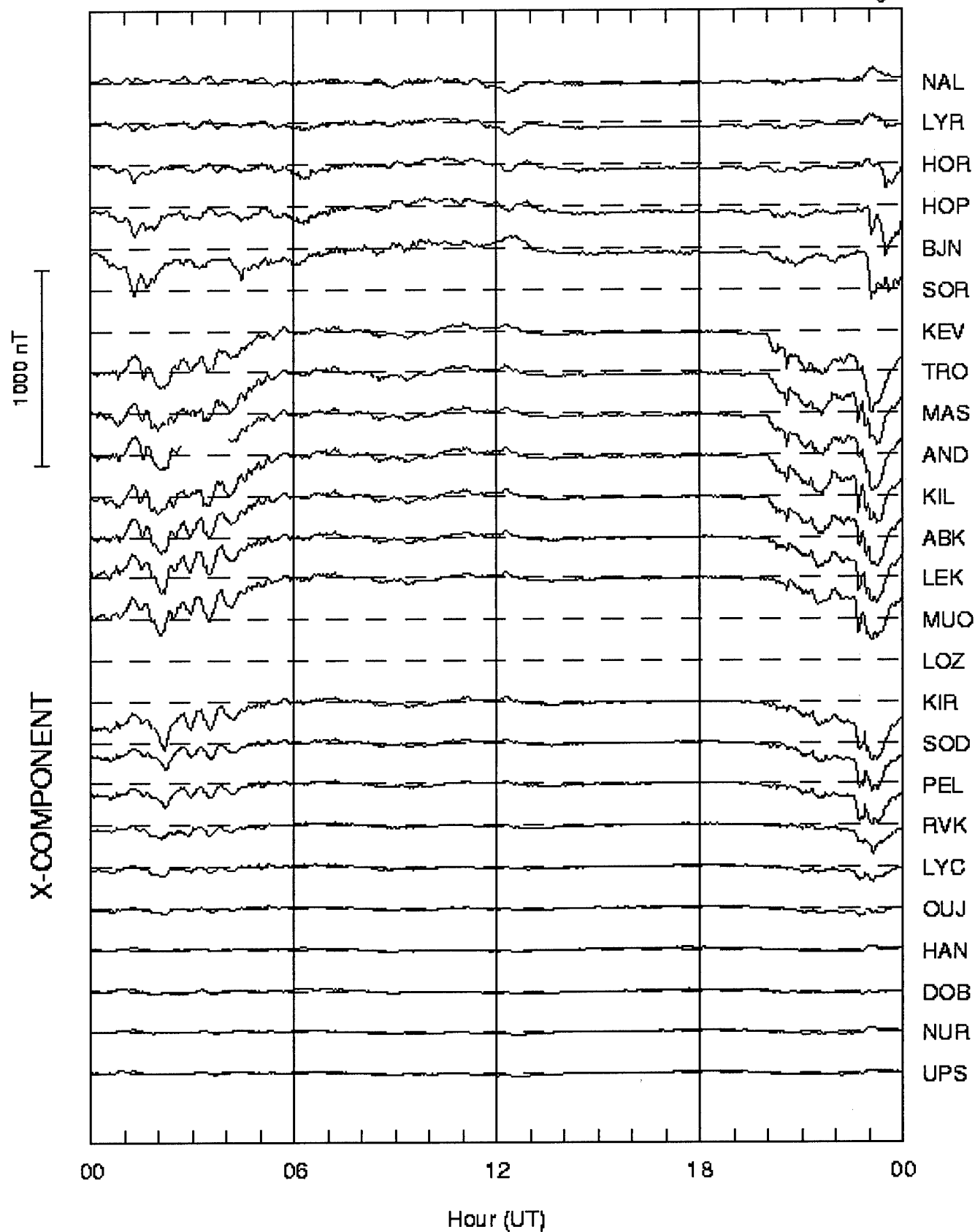
| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X       | 227.3 | 227.4 | 227.4 | 227.4 | 227.4 | 227.4 | 227.4 | 227.4 | 227.4 |
| Y       | 36.3  | 36.4  | 36.5  | 36.7  | 36.8  | 36.9  | 37.0  | 37.1  | 37.2  |
| Z [GSM] | -19.2 | -18.9 | -18.7 | -18.4 | -18.1 | -17.8 | -17.6 | -17.3 | -17.0 |





# IMAGE magnetometer network 2000-12-04

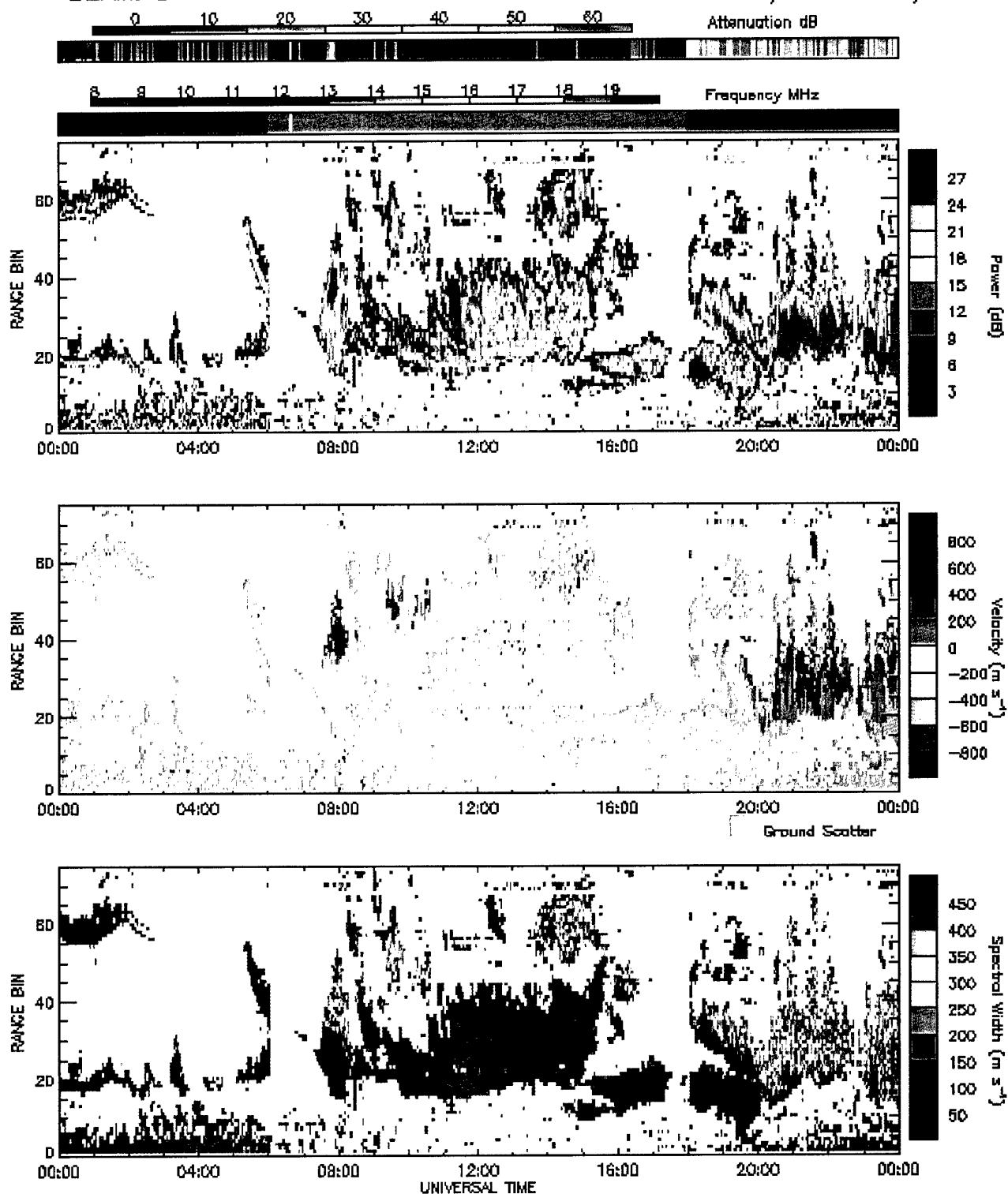
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 4/December/2000



**Contents, December 07, 2000 :**

-IMF-ACE plot

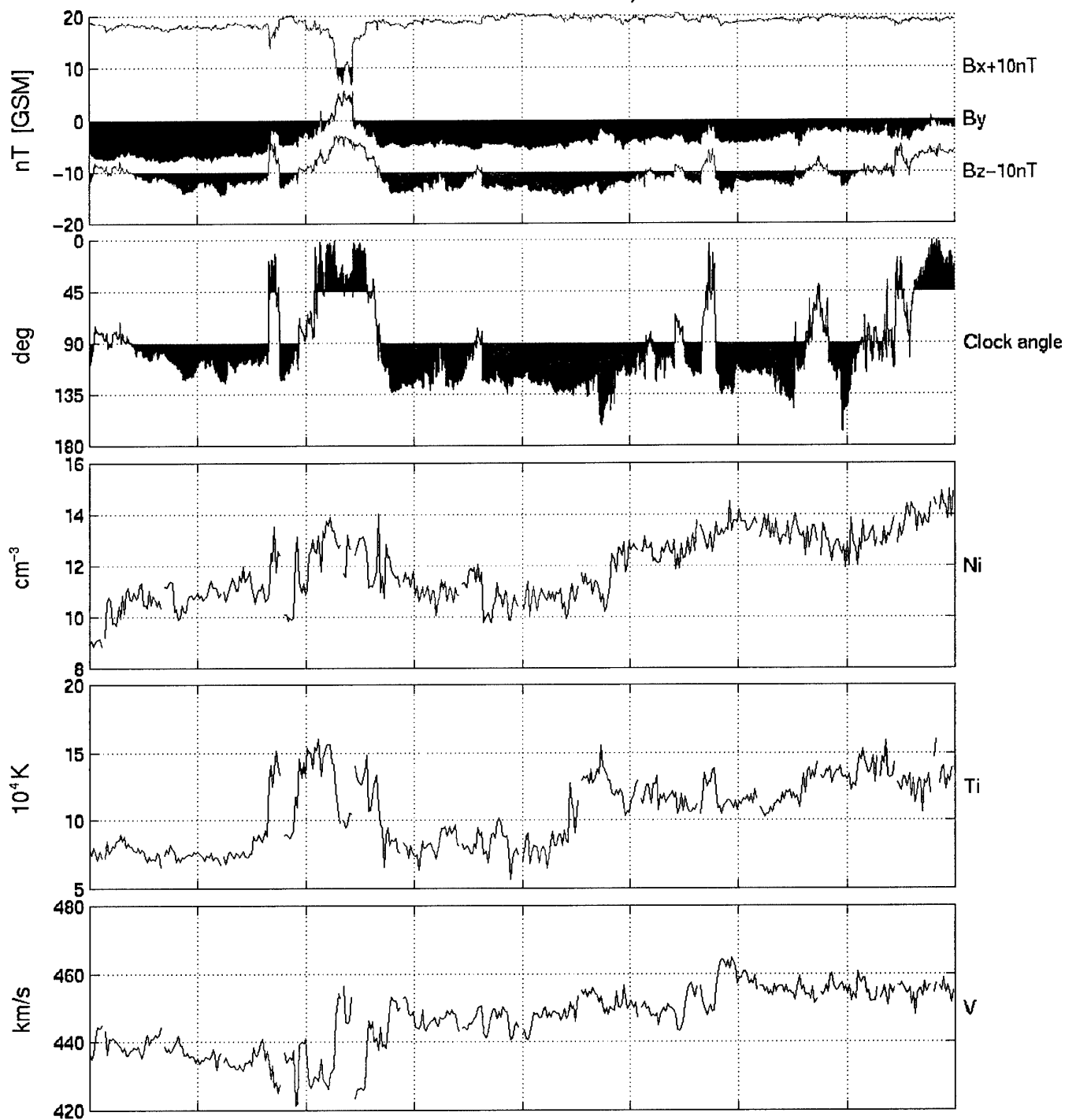
-EISCAT Svalbard summary plots

-IMAGE magnetometer data

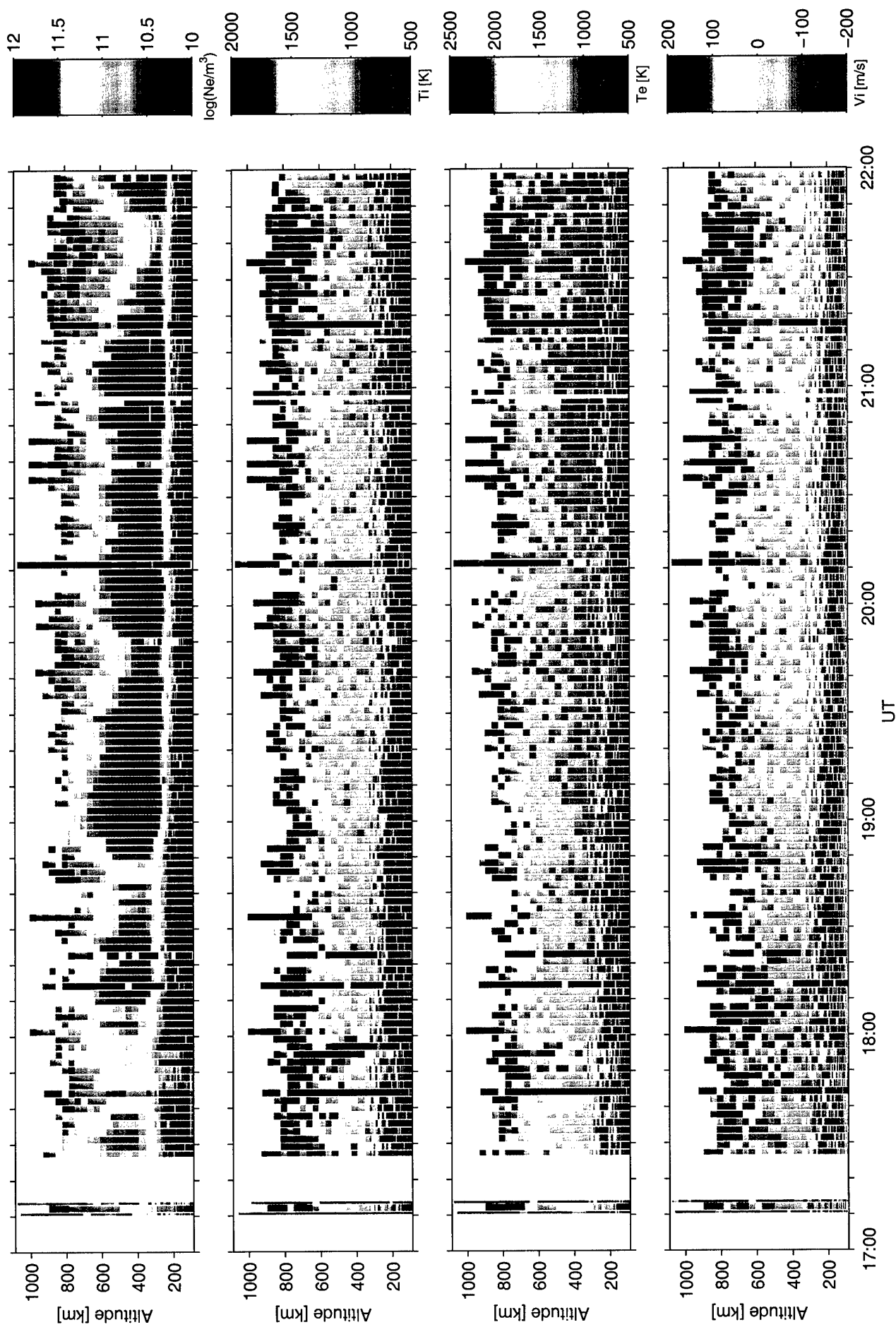
-CUTLASS Finland, Range-Time-Parameter plot

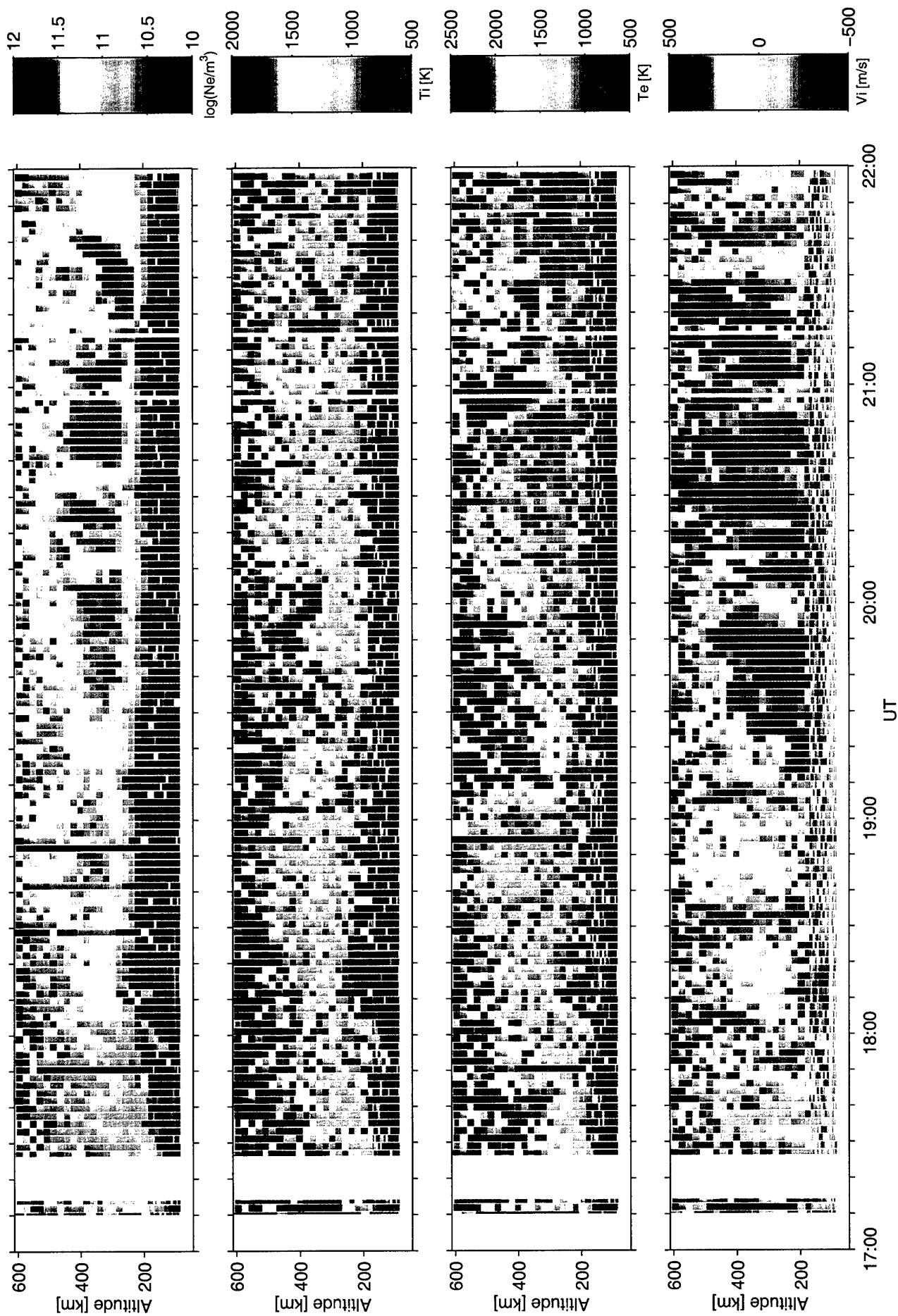
**Note:** EISCAT VHF(Tromsø) radar data for this date was not available at the time of this printing.

# ACE: Solar Wind Parameters, Dec 7 2000



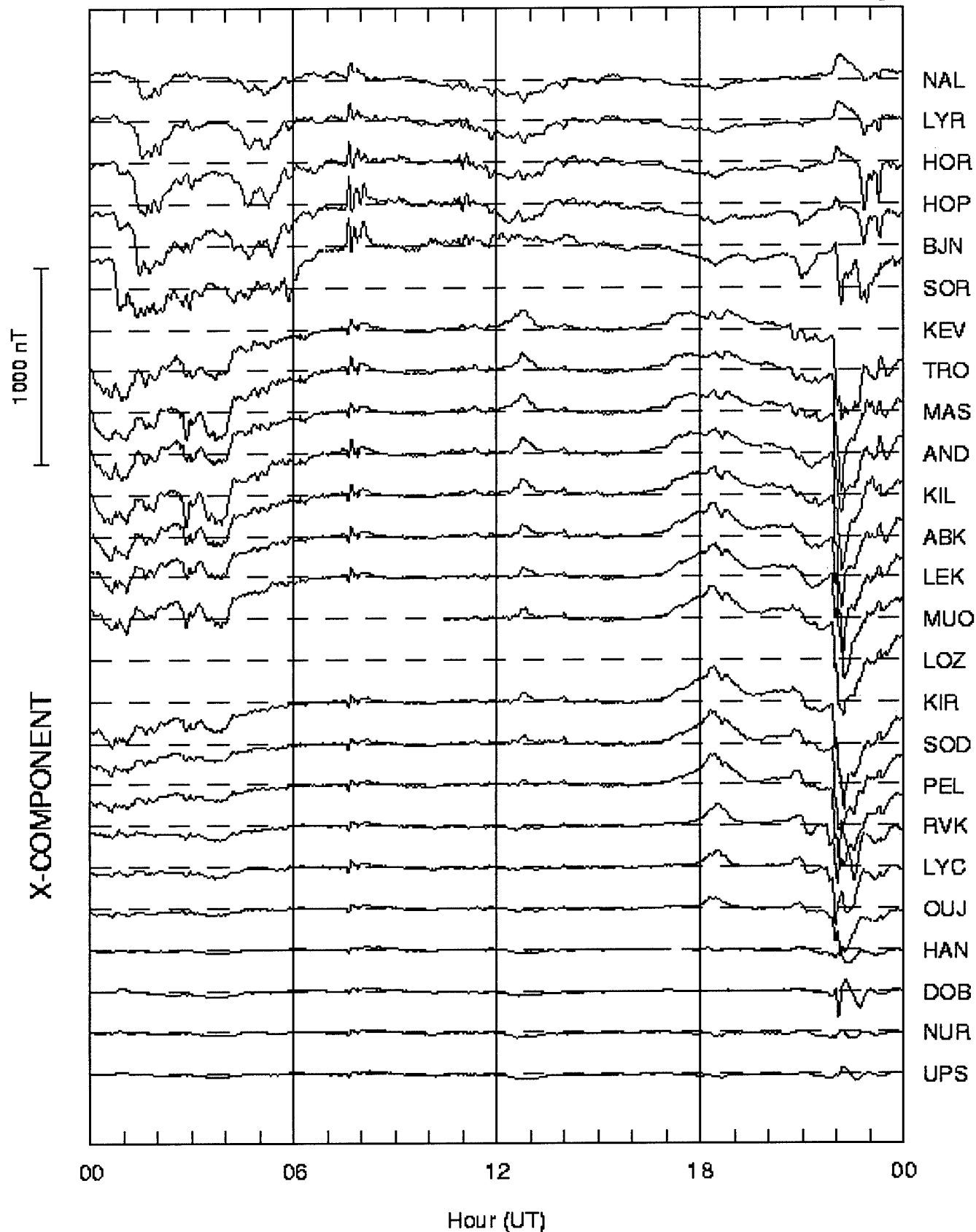
| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 228.2 | 228.2 | 228.2 | 228.3 | 228.3 | 228.3 | 228.3 | 228.3 | 228.3 |
| Y [GSM] | 38.4  | 38.3  | 38.4  | 38.4  | 38.4  | 38.4  | 38.4  | 38.5  | 38.5  |
| Z [GSM] | -13.6 | -13.7 | -13.6 | -13.5 | -13.4 | -13.3 | -13.2 | -13.1 | -13.0 |





# IMAGE magnetometer network 2000-12-07

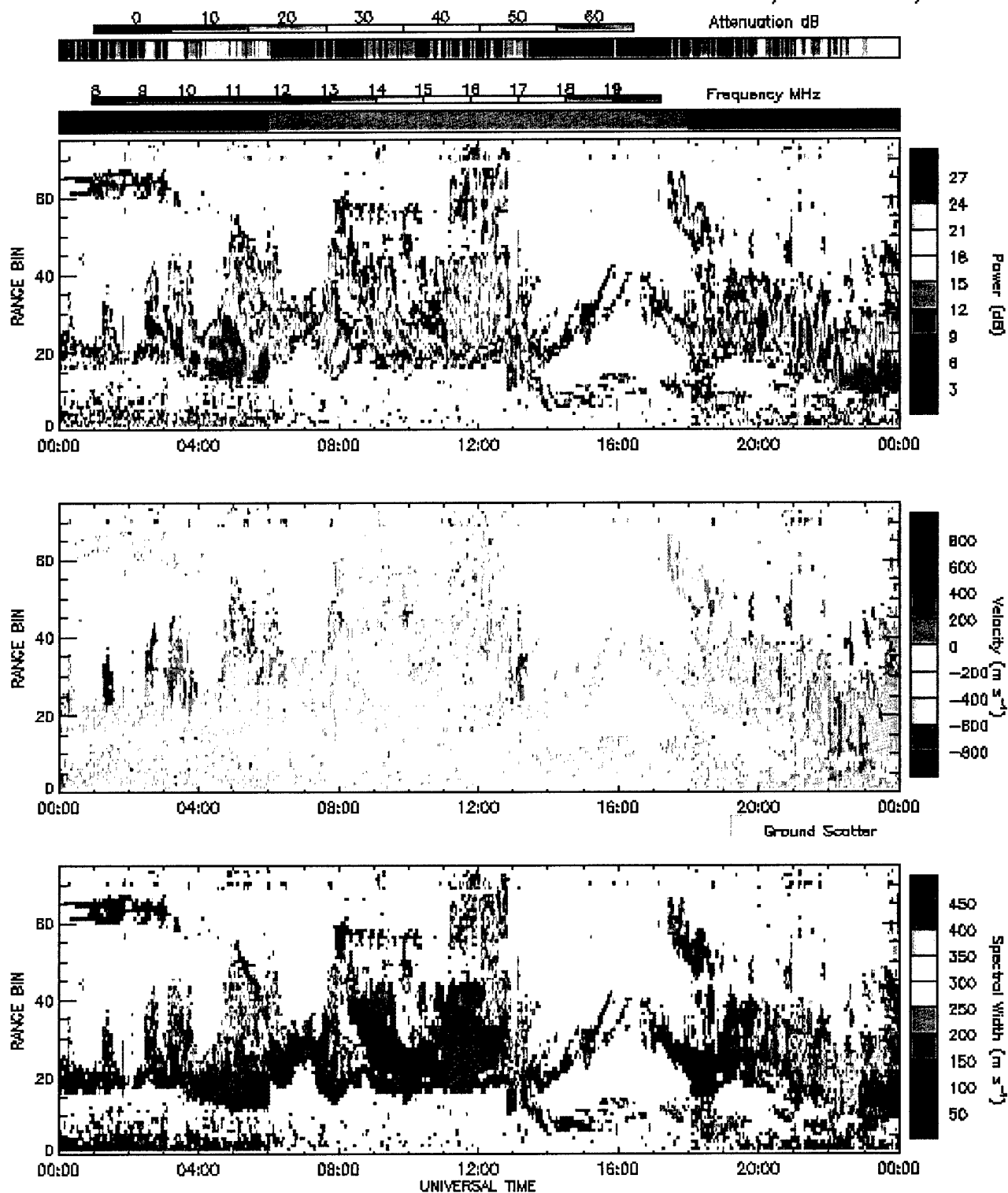
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 7/December/2000



**Contents, January 15, 2000 :**

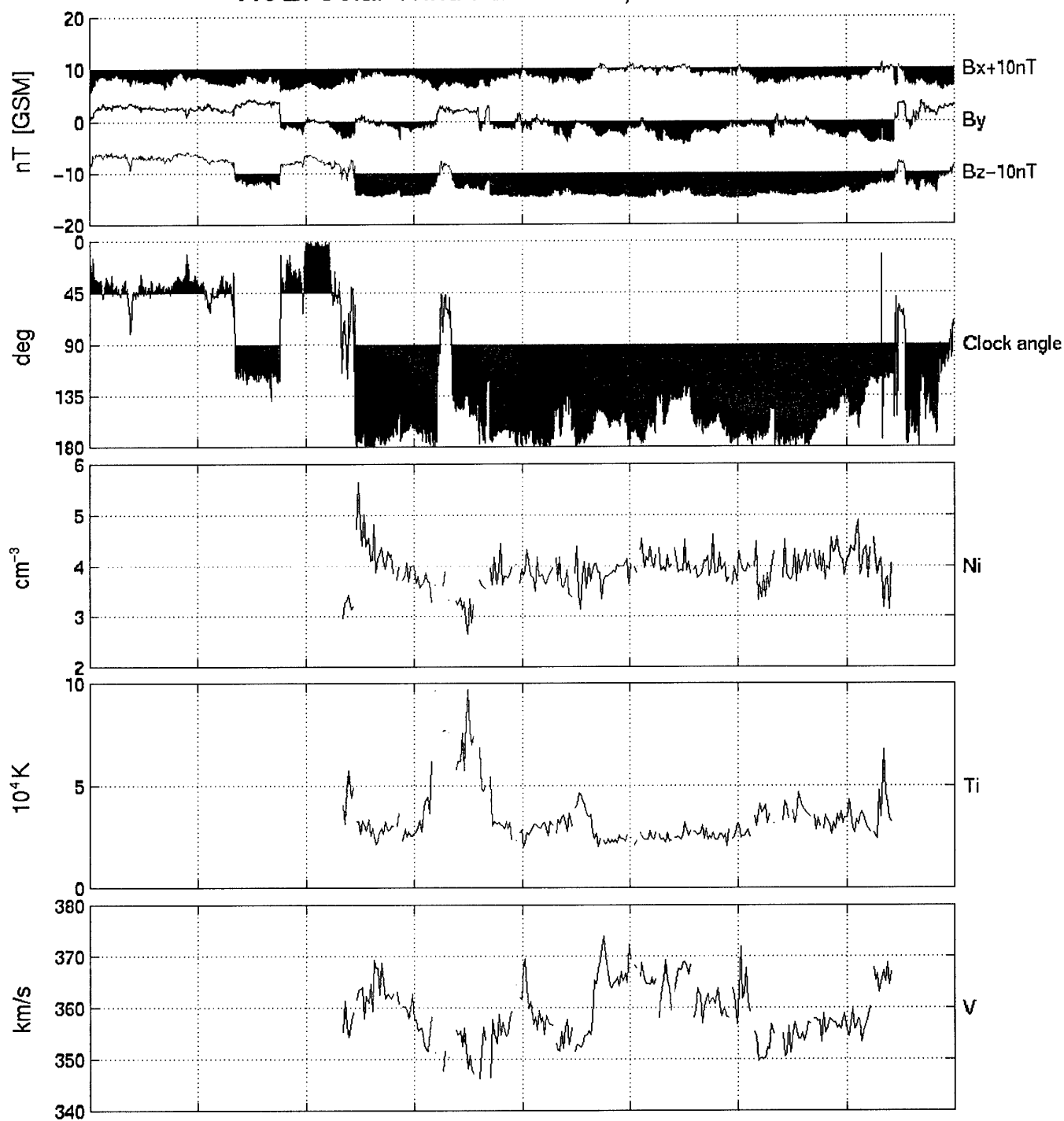
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Jan 15 2001



| UT      | 04:00 | 05:00 | 06:00 | 07:00 | 08:00 | 09:00 | 10:00 | 11:00 | 12:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 241.6 | 241.6 | 241.6 | 241.6 | 241.7 | 241.7 | 241.7 | 241.7 | 241.7 |
| Y [GSM] | 5.2   | 5.3   | 5.4   | 5.5   | 5.7   | 5.8   | 5.9   | 6.0   | 6.2   |
| Z [GSM] | 20.3  | 20.2  | 20.2  | 20.2  | 20.1  | 20.1  | 20.1  | 20.0  | 20.0  |



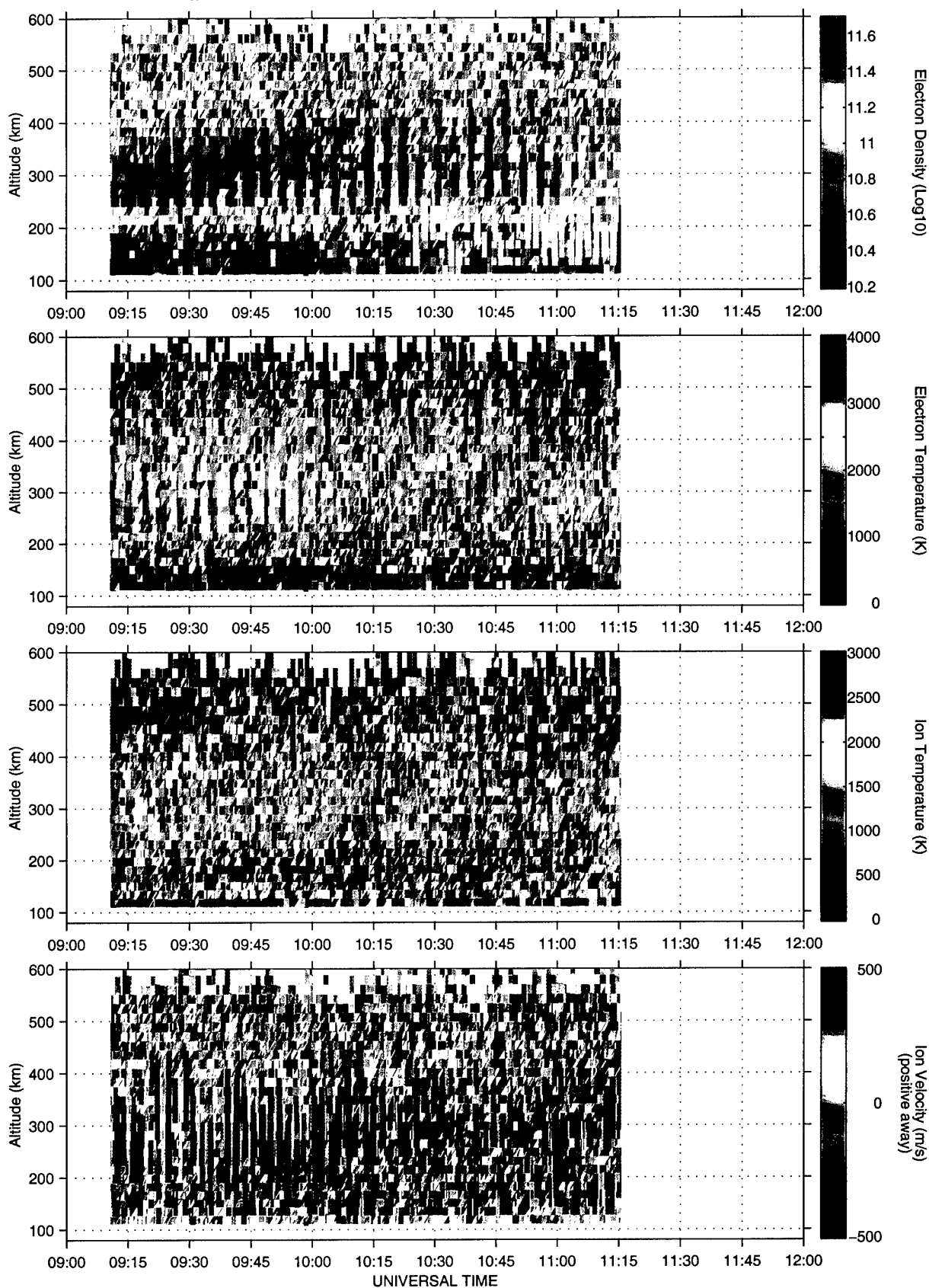
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 15, 2001

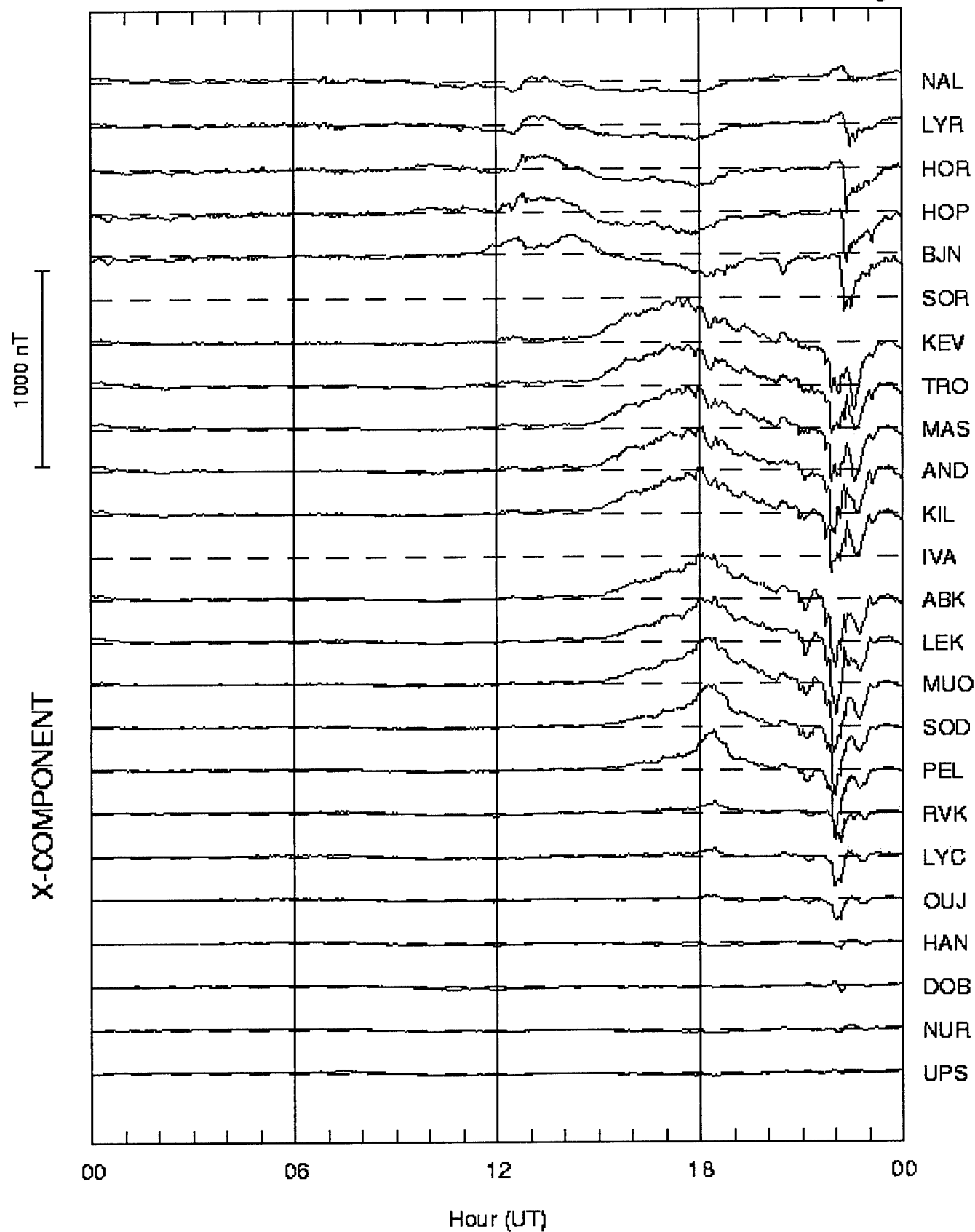
Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication – see Rules-of-the-road



# IMAGE magnetometer network 2001-01-15

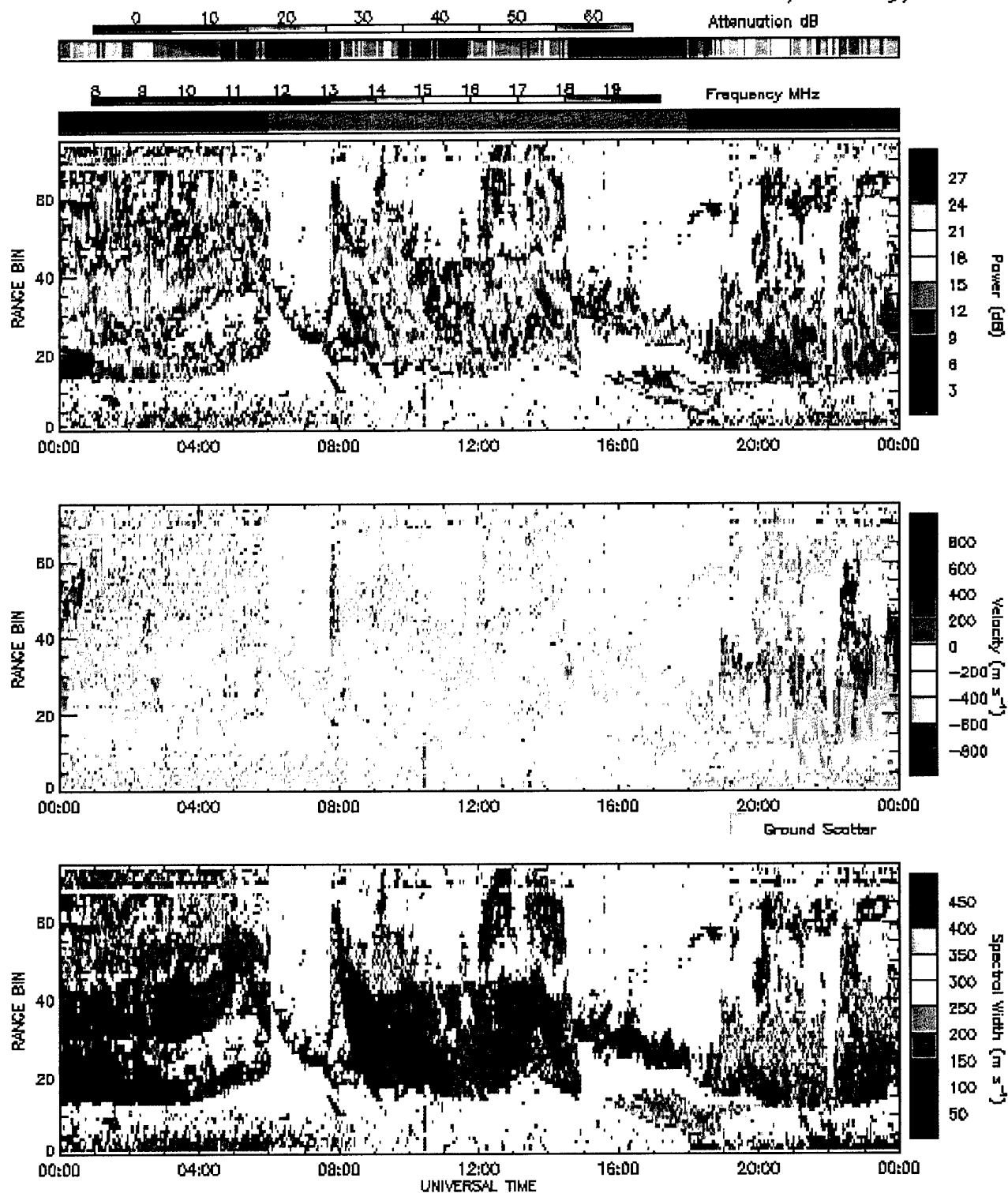
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 15/January/2001



**Contents, January 16, 2000 :**

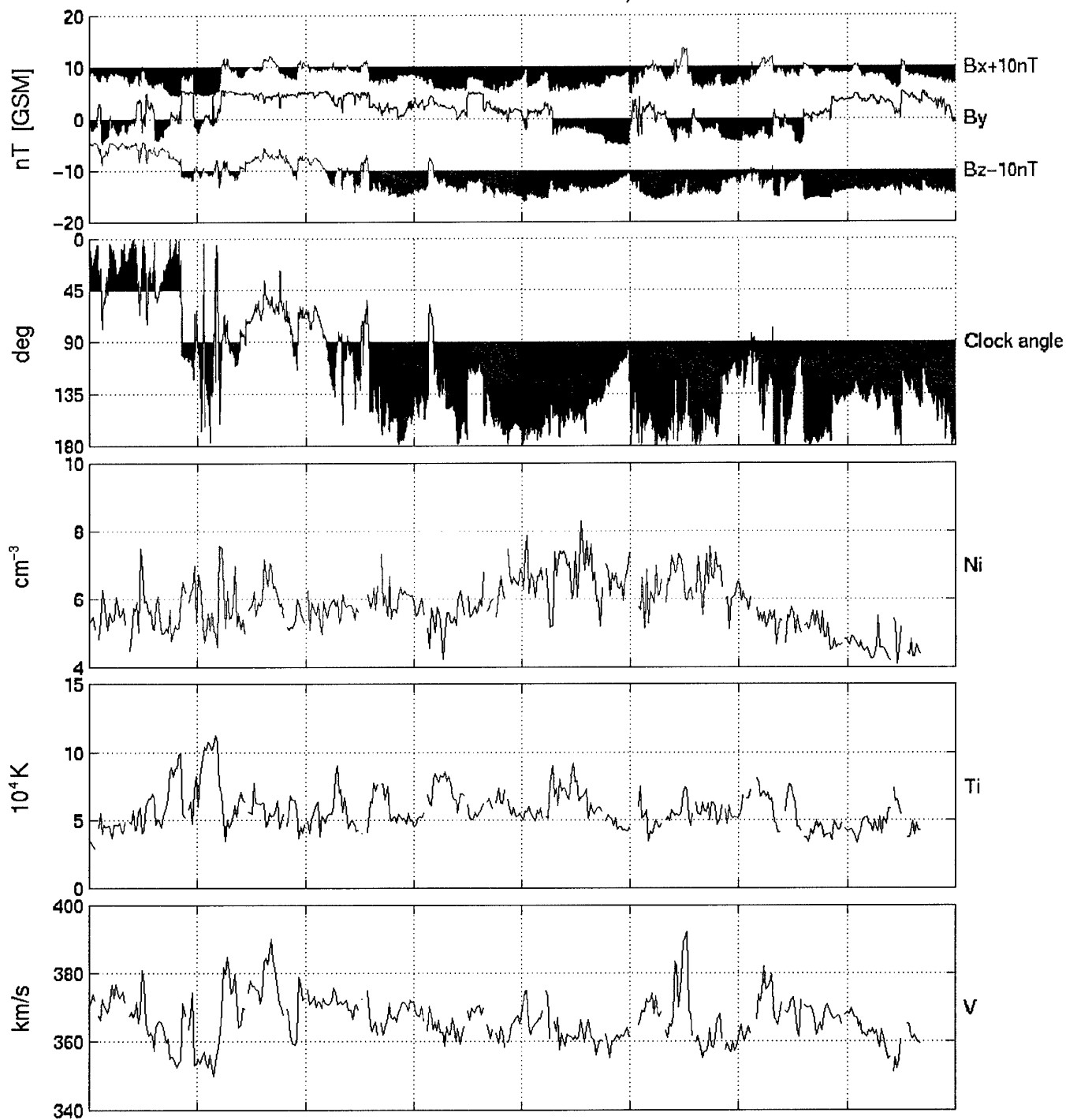
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Jan 16 2001



| UT      | 04:00 | 05:00 | 06:00 | 07:00 | 08:00 | 09:00 | 10:00 | 11:00 | 12:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 241.9 | 241.9 | 241.9 | 241.9 | 241.9 | 241.9 | 241.9 | 241.9 | 241.9 |
| Y [GSM] | 3.1   | 2.9   | 2.6   | 2.4   | 2.2   | 2.0   | 1.8   | 1.6   | 1.4   |
| Z [GSM] | 20.5  | 20.6  | 20.6  | 20.6  | 20.7  | 20.7  | 20.7  | 20.8  | 20.8  |



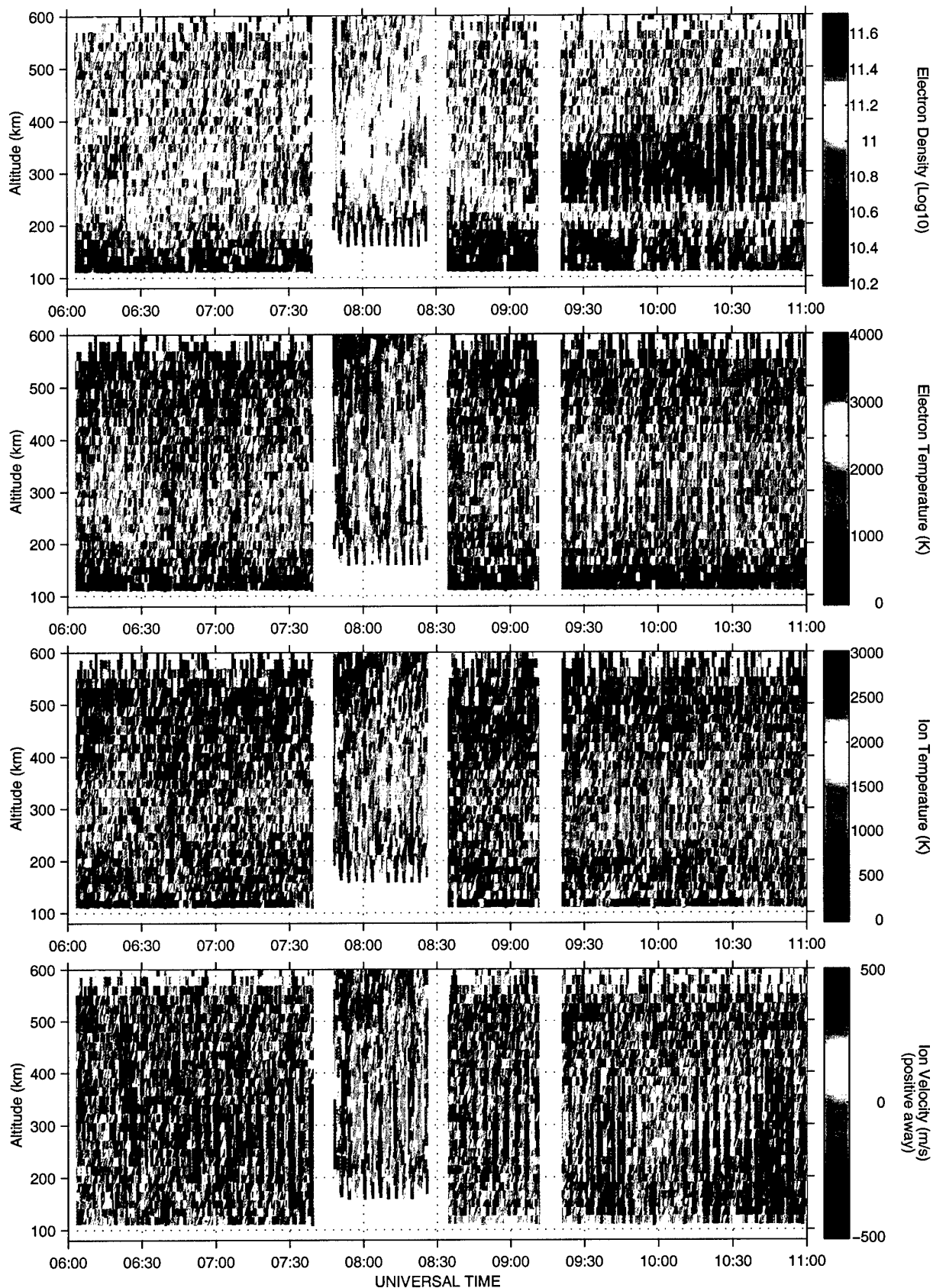
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 16, 2001

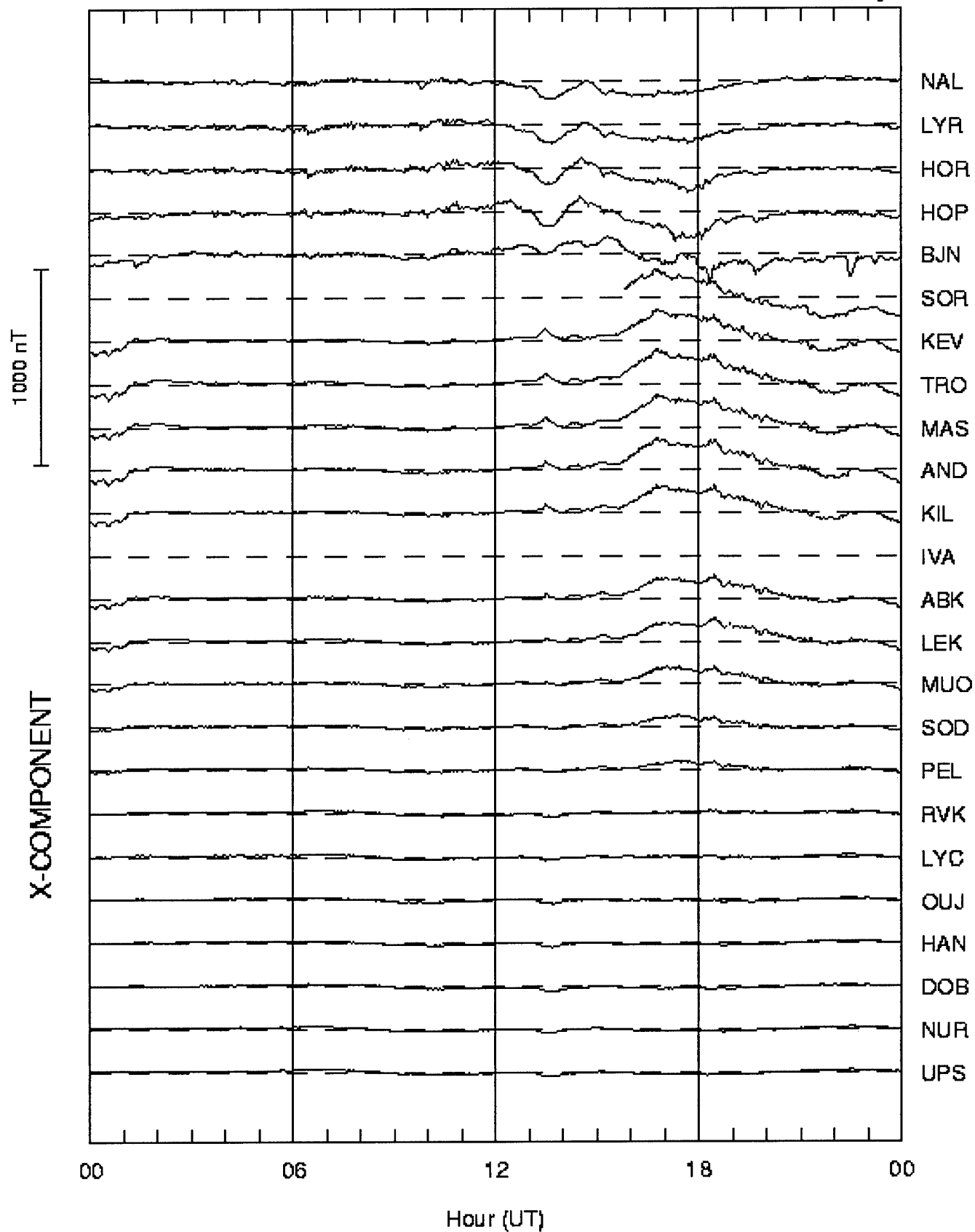
Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication – see Rules-of-the-road



# IMAGE magnetometer network 2001-01-16

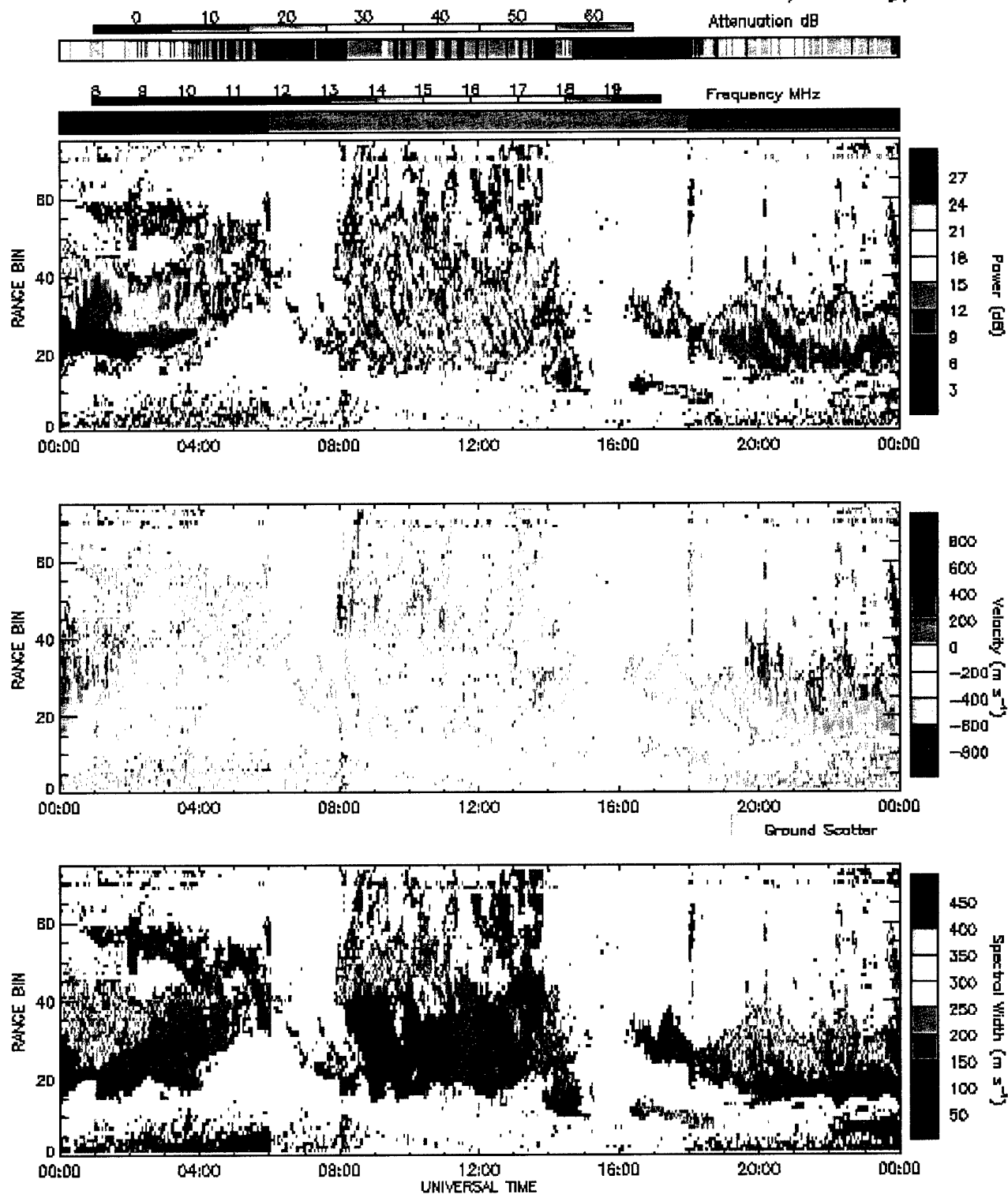
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 16/January/2001



**Contents, January 17, 2000 :**

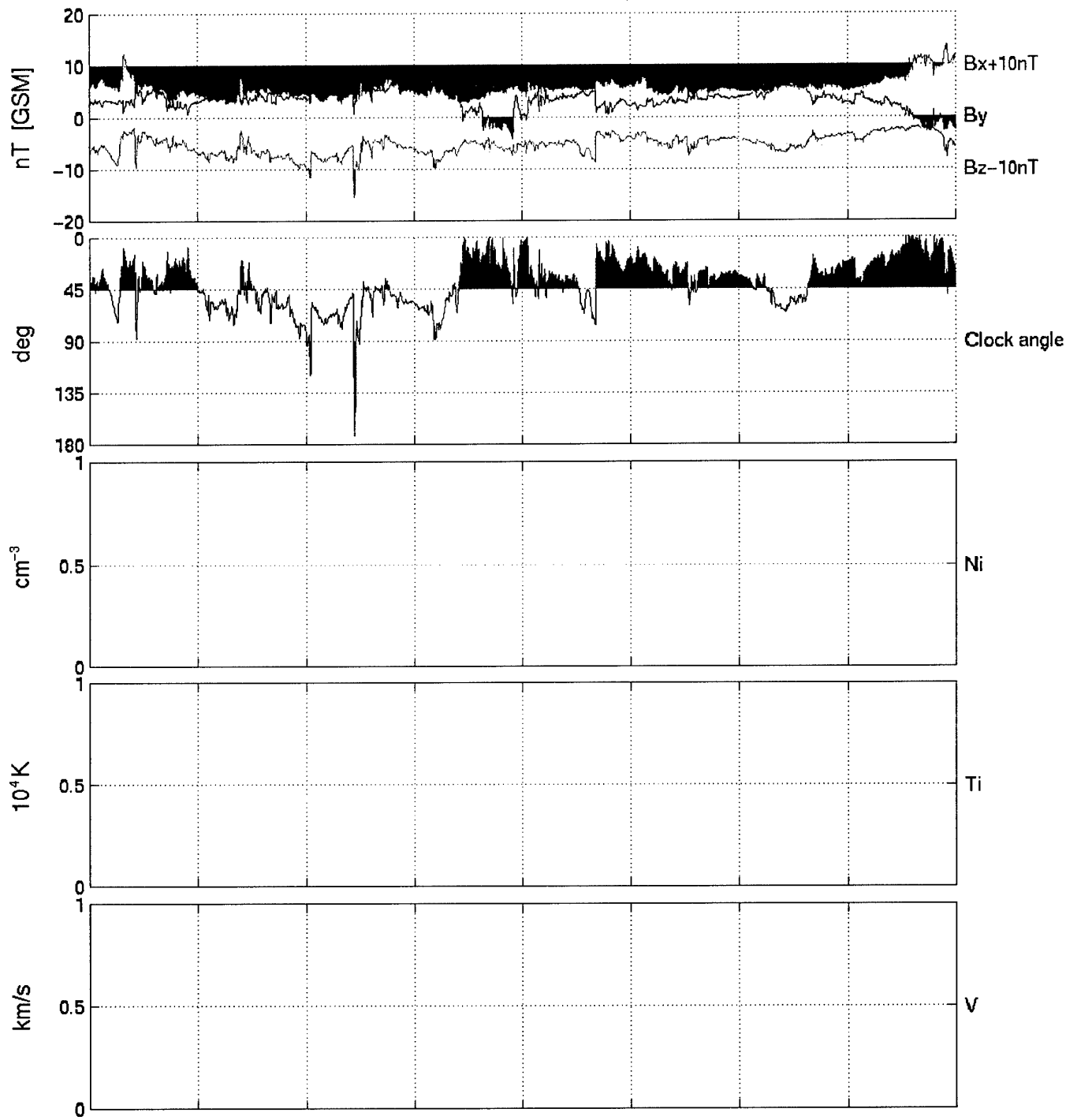
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

## ACE: Solar Wind Parameters, Jan 17 2001

[illegible]



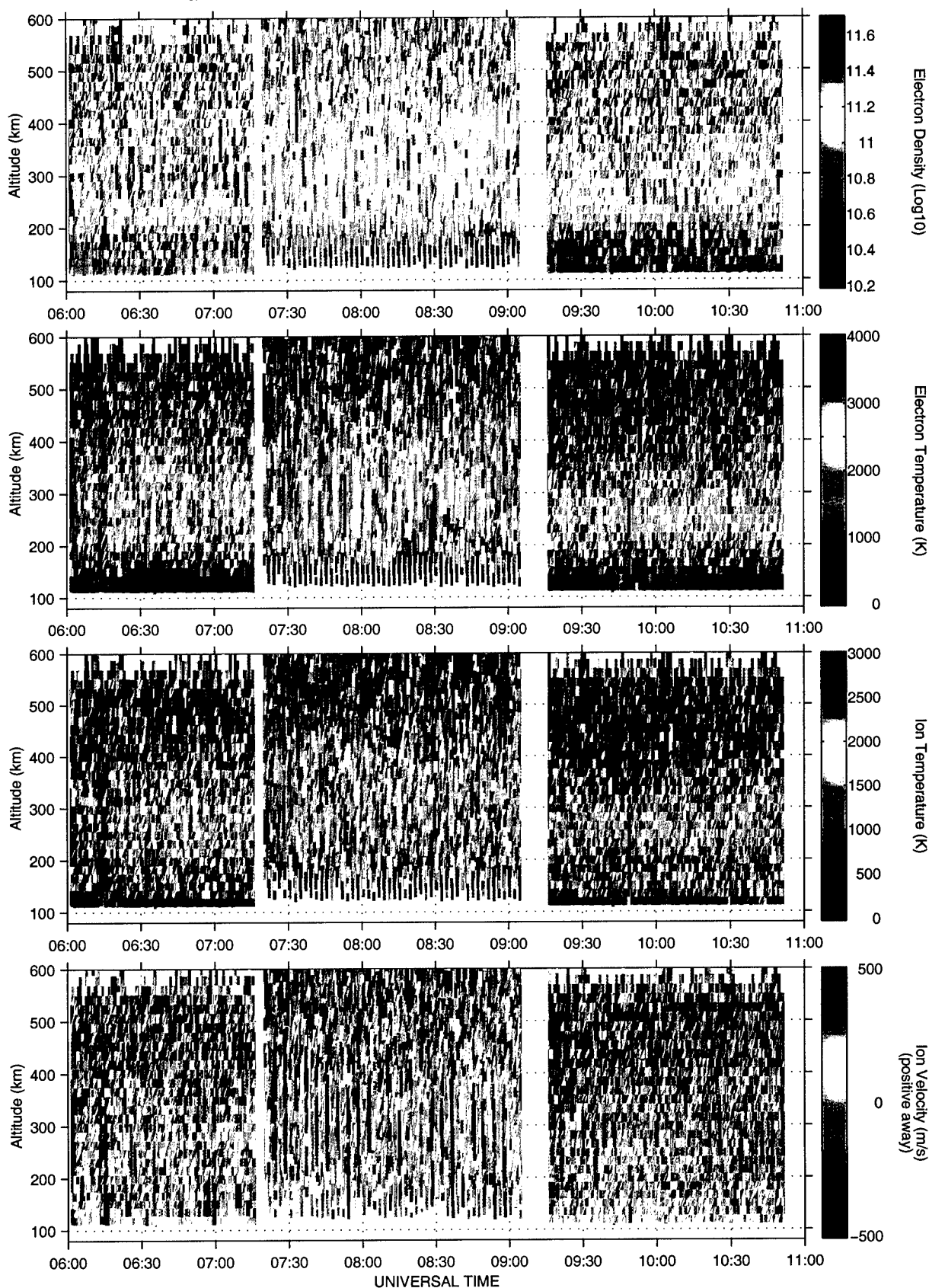
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 17, 2001

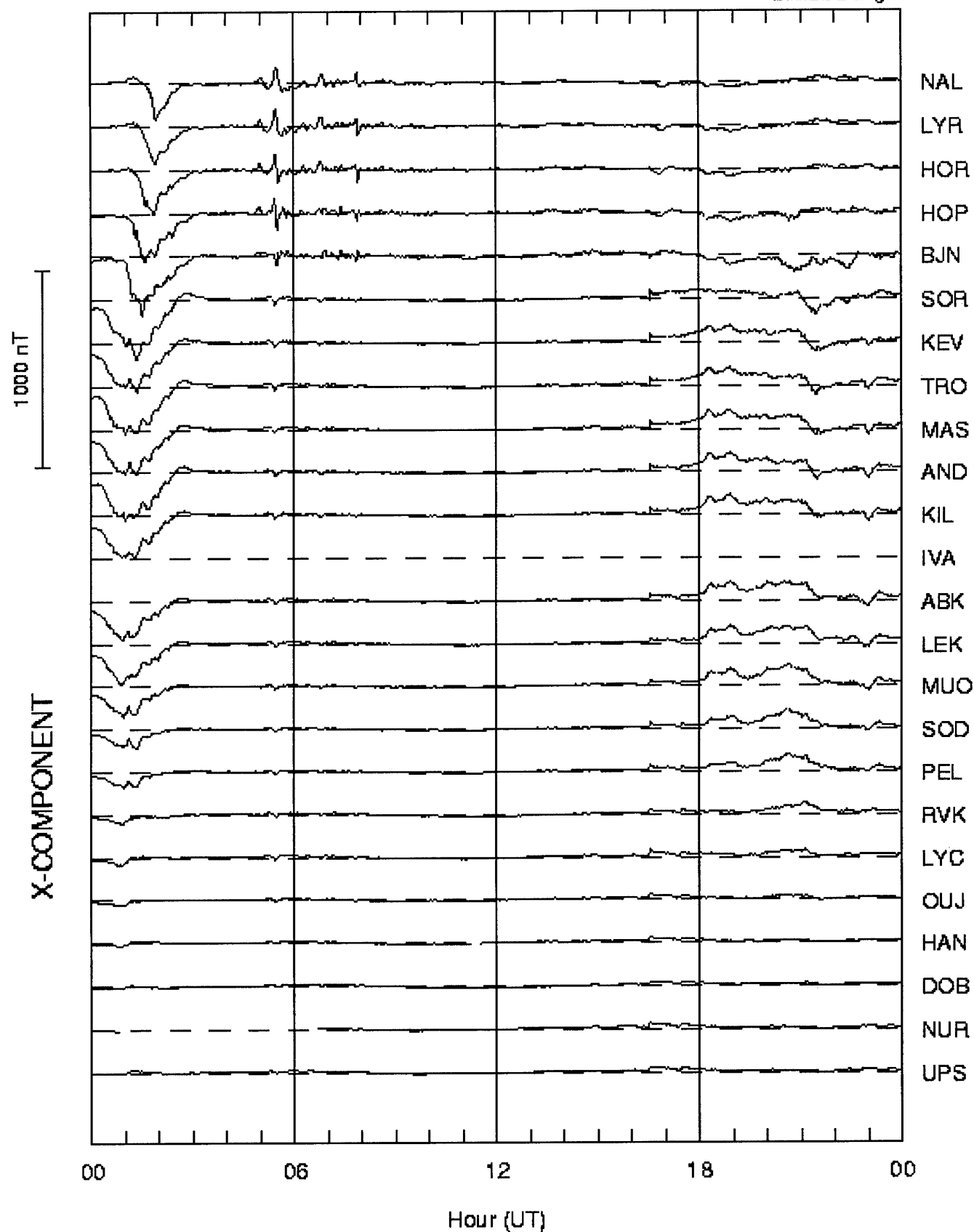
Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication – see Rules-of-the-road



# IMAGE magnetometer network 2001-01-17

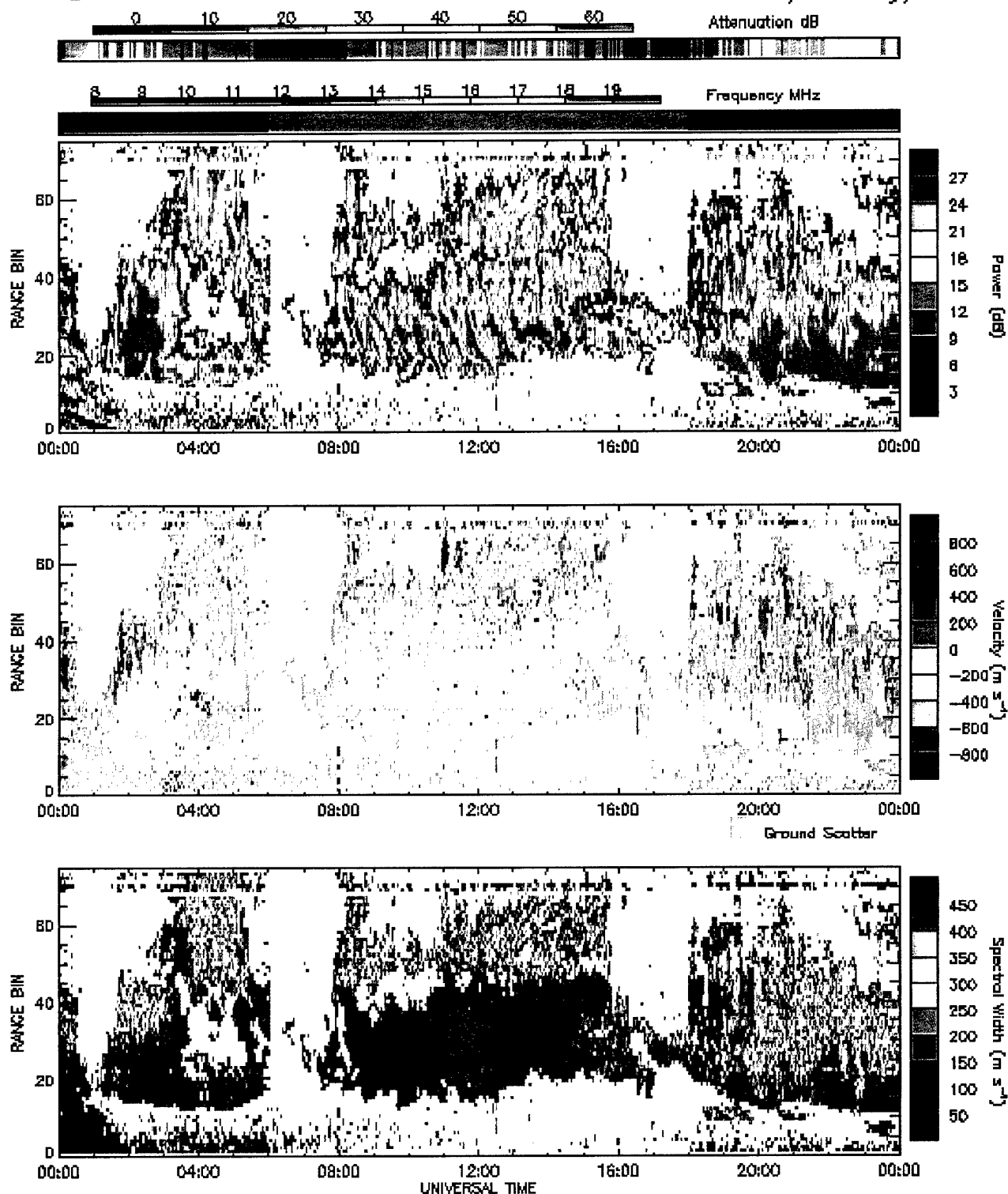
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 17/January/2001



**Contents, January 18, 2000 :**

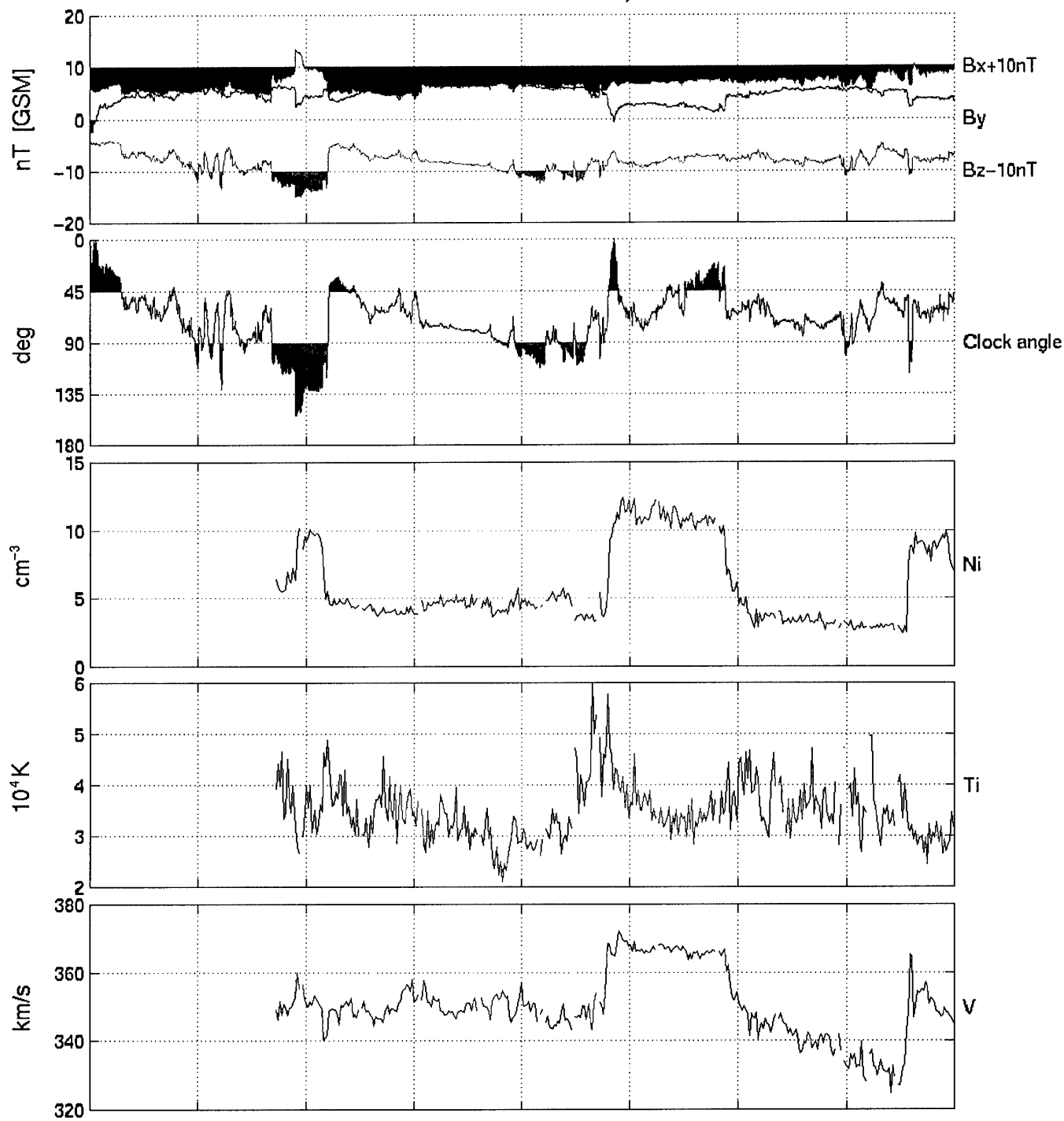
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

## ACE: Solar Wind Parameters, Jan 18 2001

[illegible]



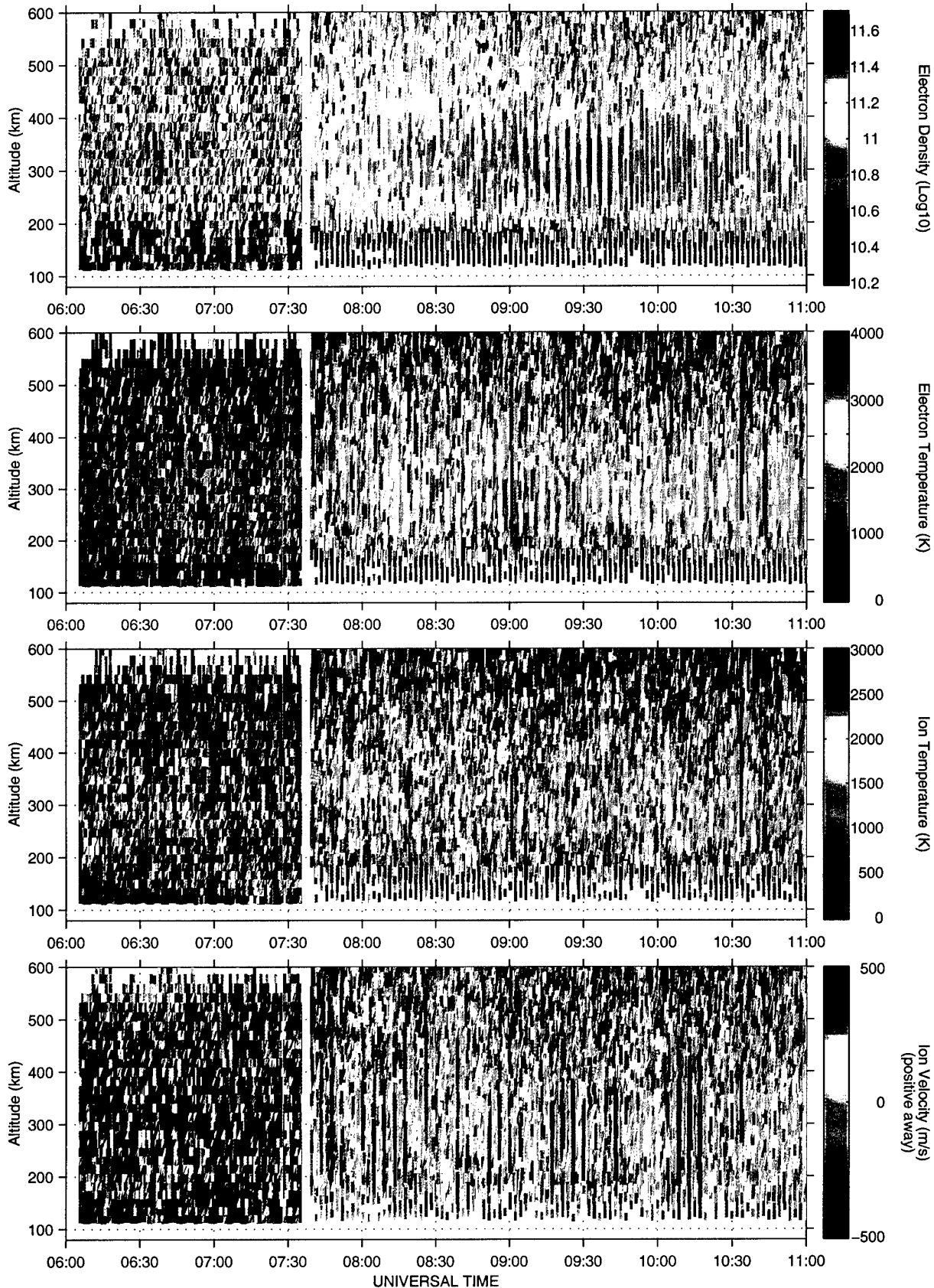
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 18, 2001

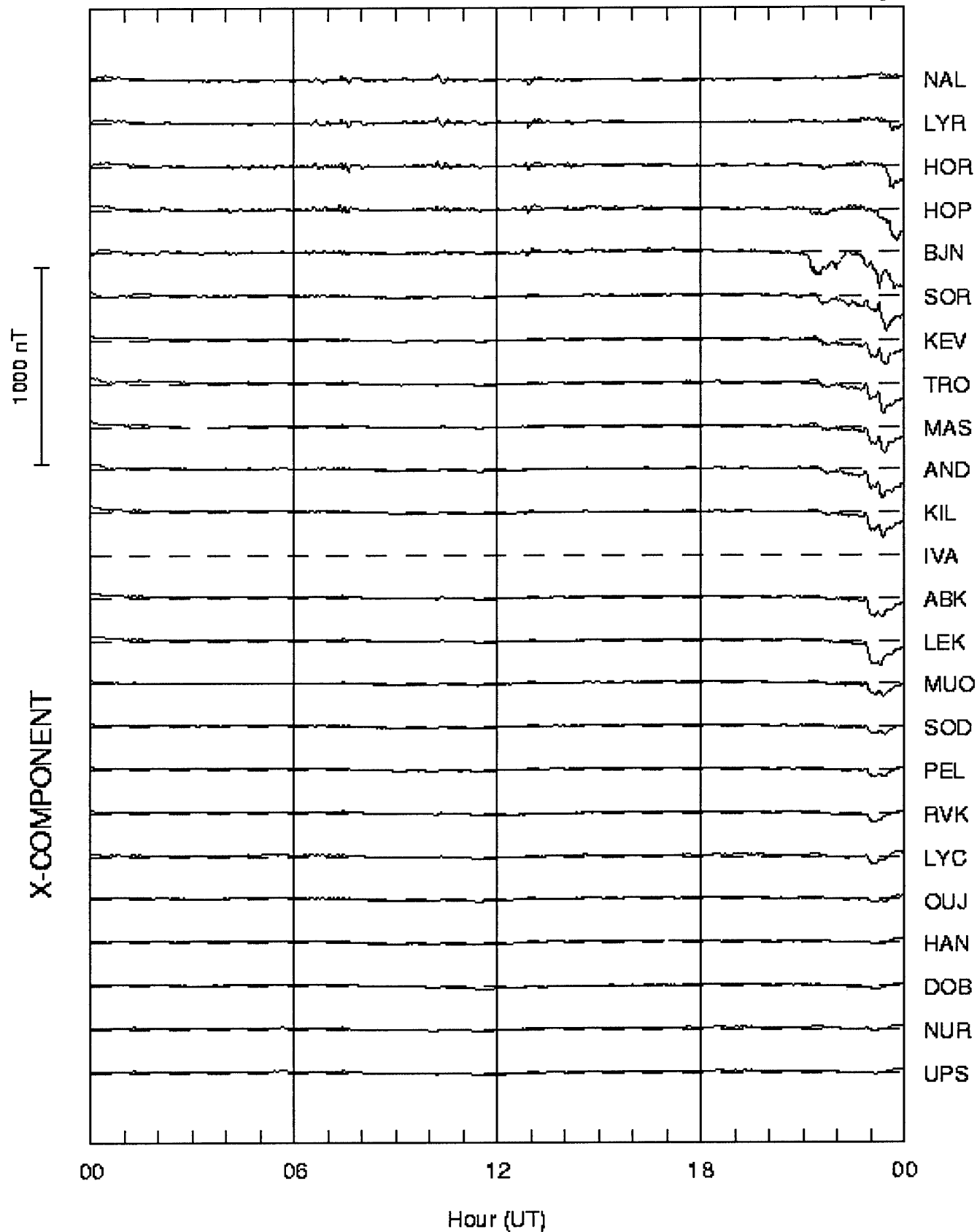
Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication – see Rules-of-the-road



# IMAGE magnetometer network 2001-01-18

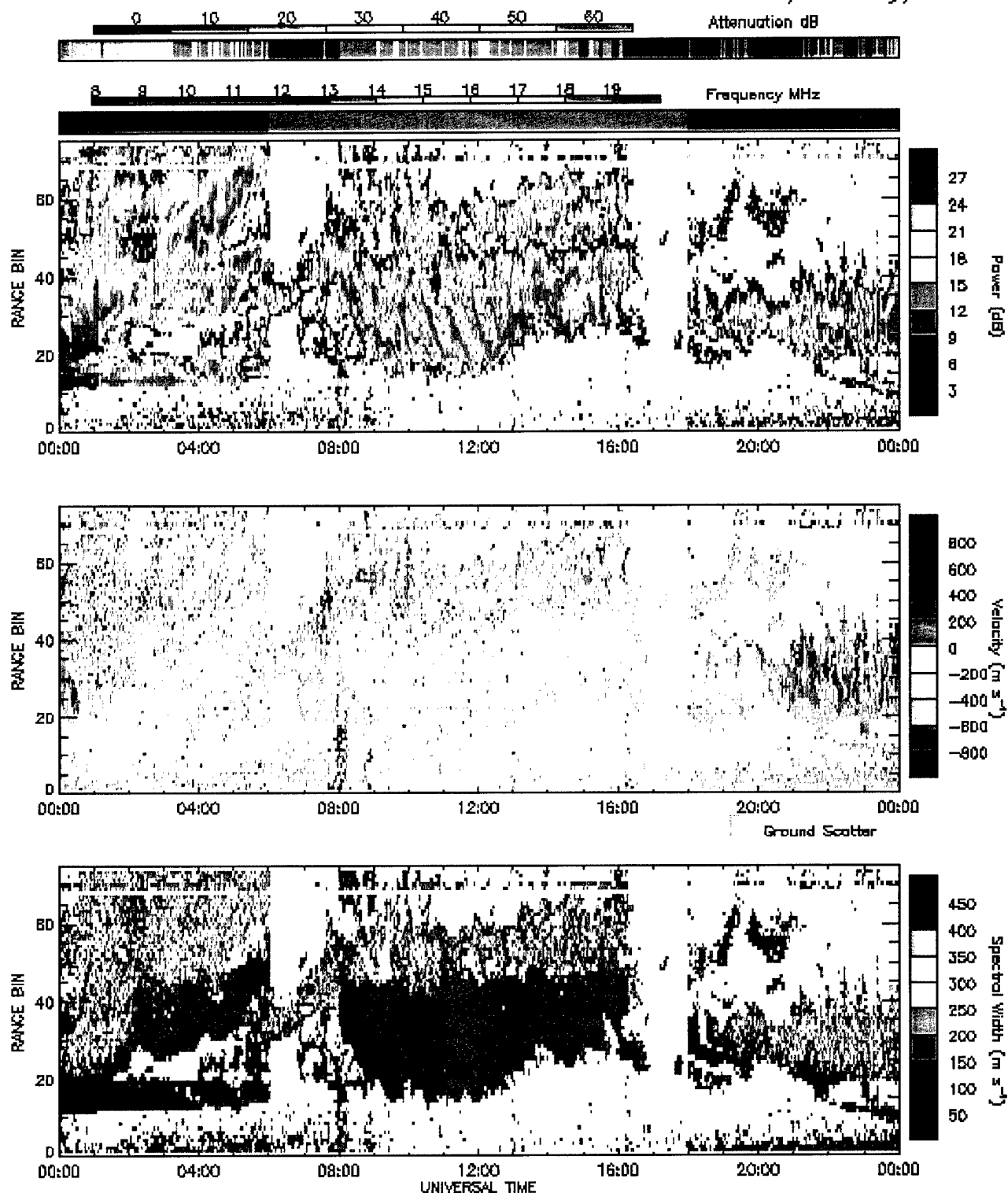
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 18/January/2001



**Contents, January 19, 2000 :**

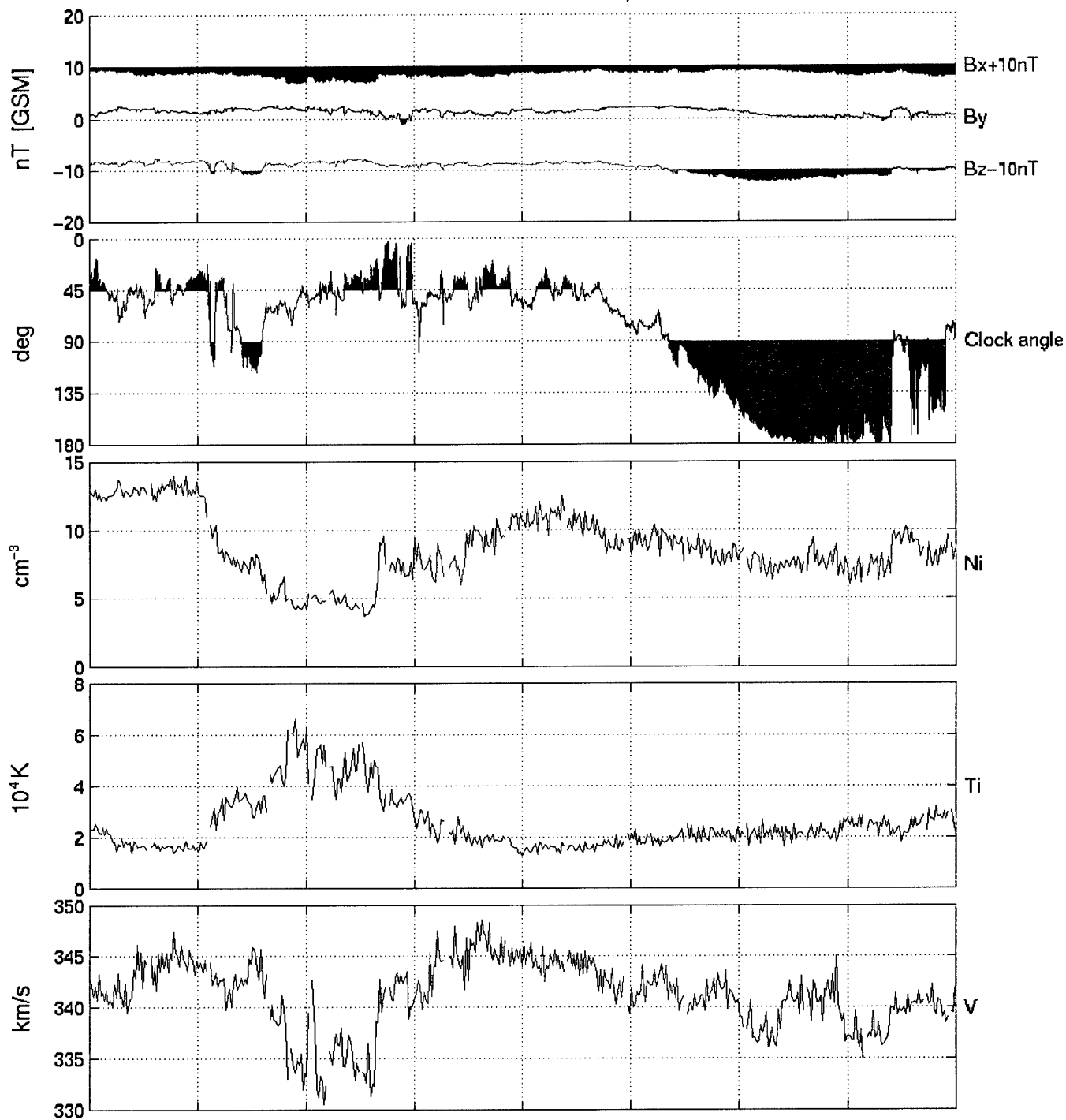
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Jan 19 2001



| UT      | 04:00 | 05:00 | 06:00 | 07:00 | 08:00 | 09:00 | 10:00 | 11:00 | 12:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 242.5 | 242.5 | 242.5 | 242.5 | 242.5 | 242.5 | 242.5 | 242.5 | 242.5 |
| Y [GSM] | -1.5  | -1.3  | -1.2  | -1.1  | -1.0  | -0.9  | -0.7  | -0.6  | -0.5  |
| Z [GSM] | 21.5  | 21.5  | 21.5  | 21.5  | 21.5  | 21.6  | 21.6  | 21.6  | 21.6  |



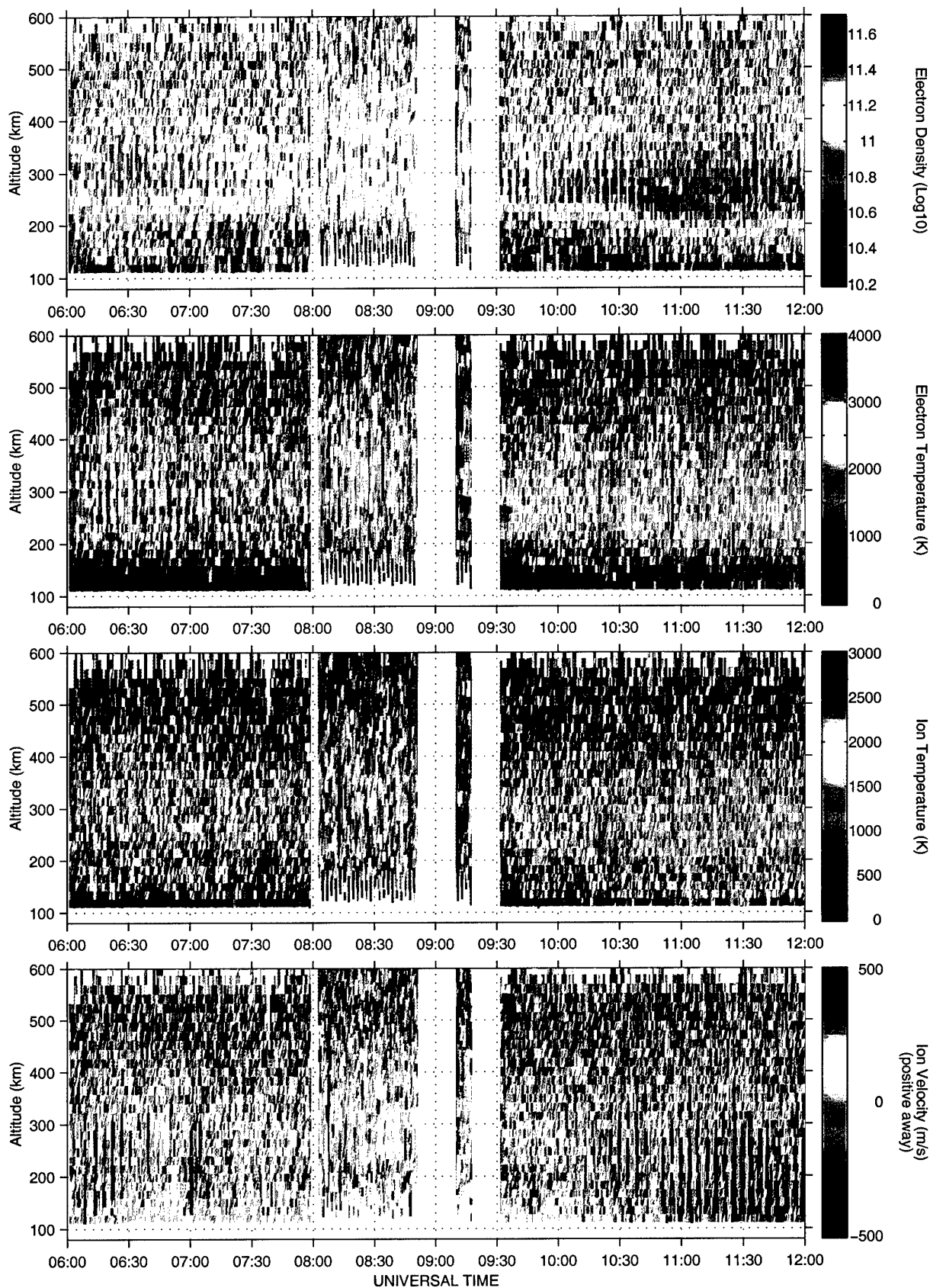
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 19, 2001

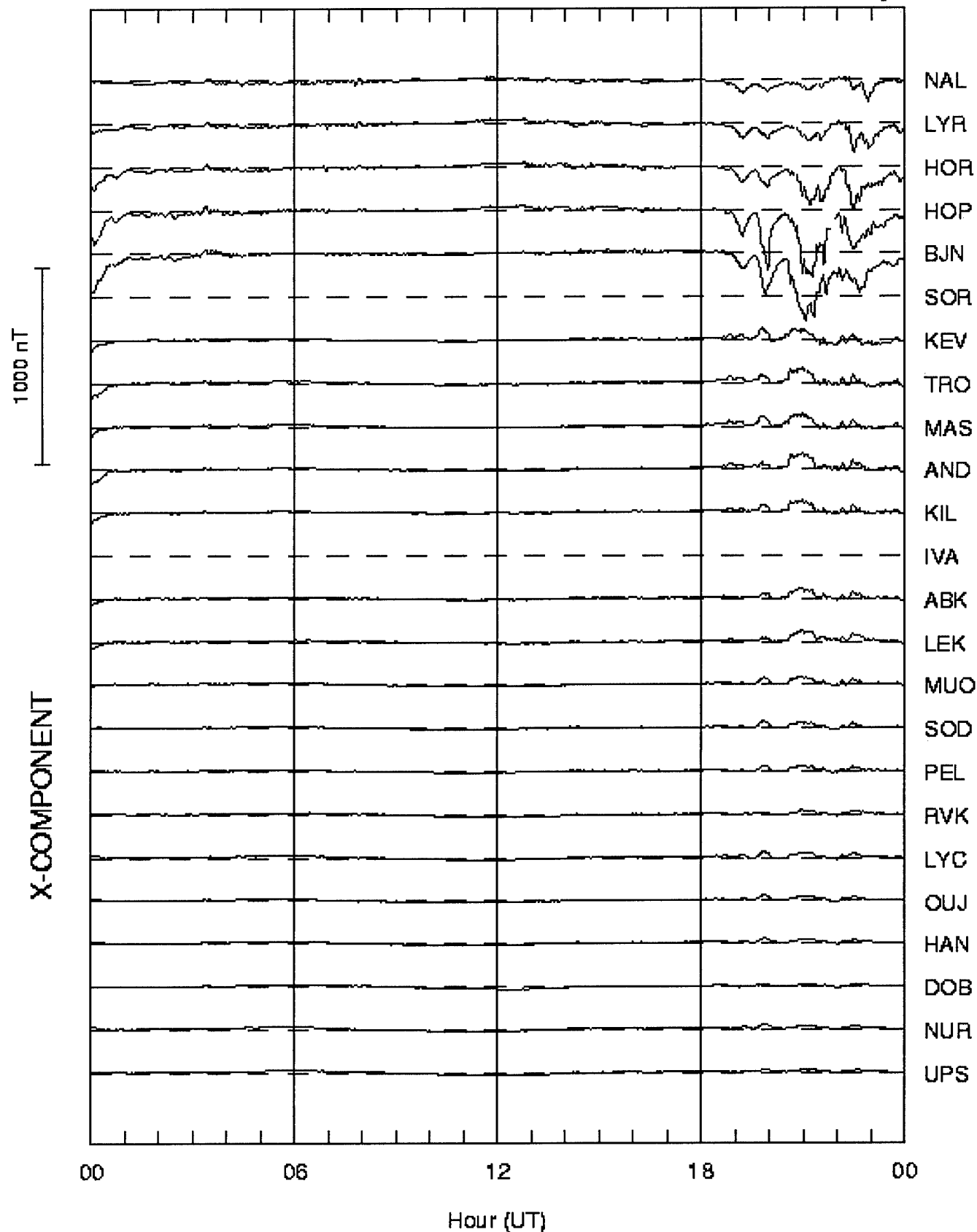
Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication – see Rules-of-the-road



# IMAGE magnetometer network 2001-01-19

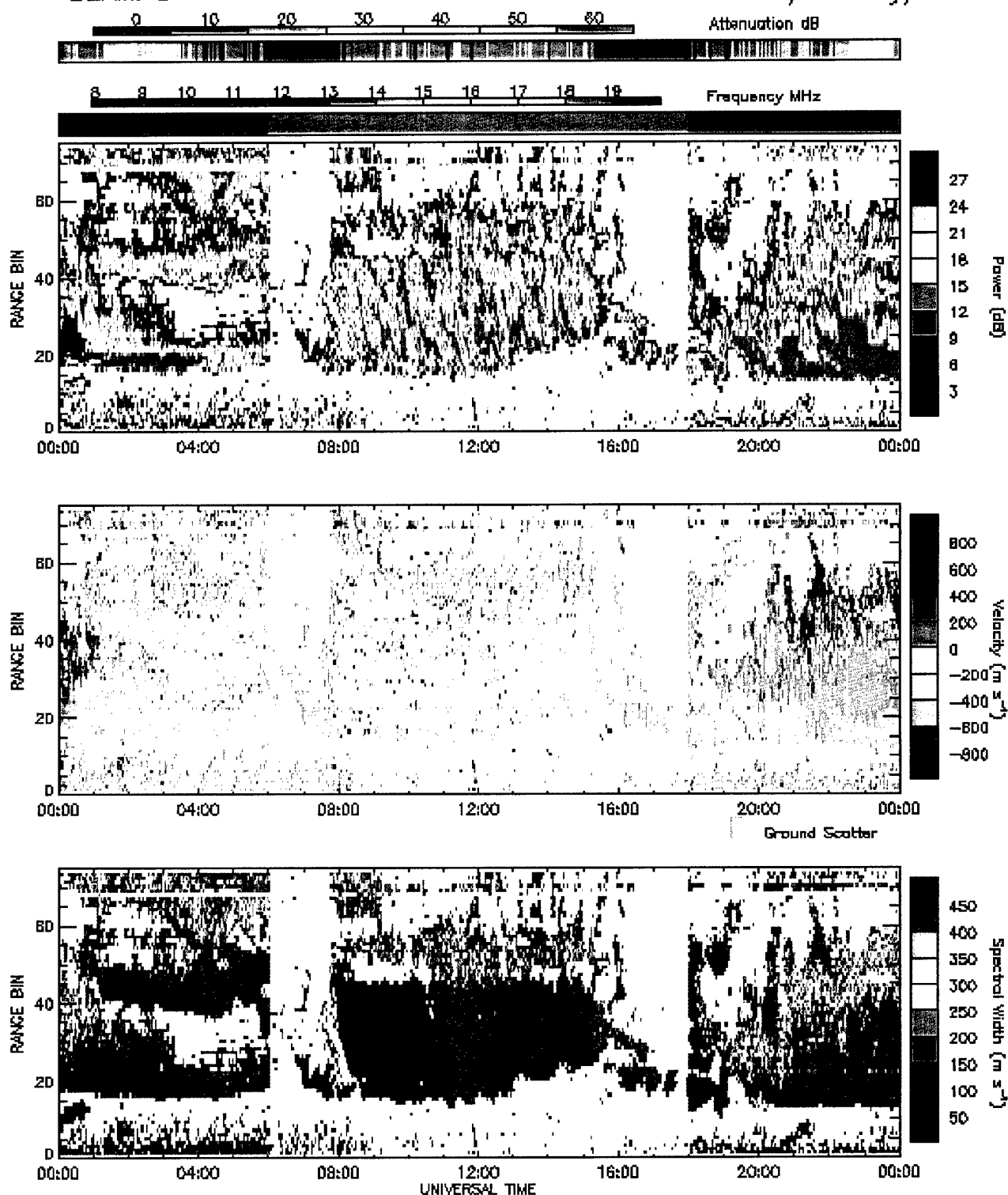
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 19/January/2001



**Contents, January 20, 2000 :**

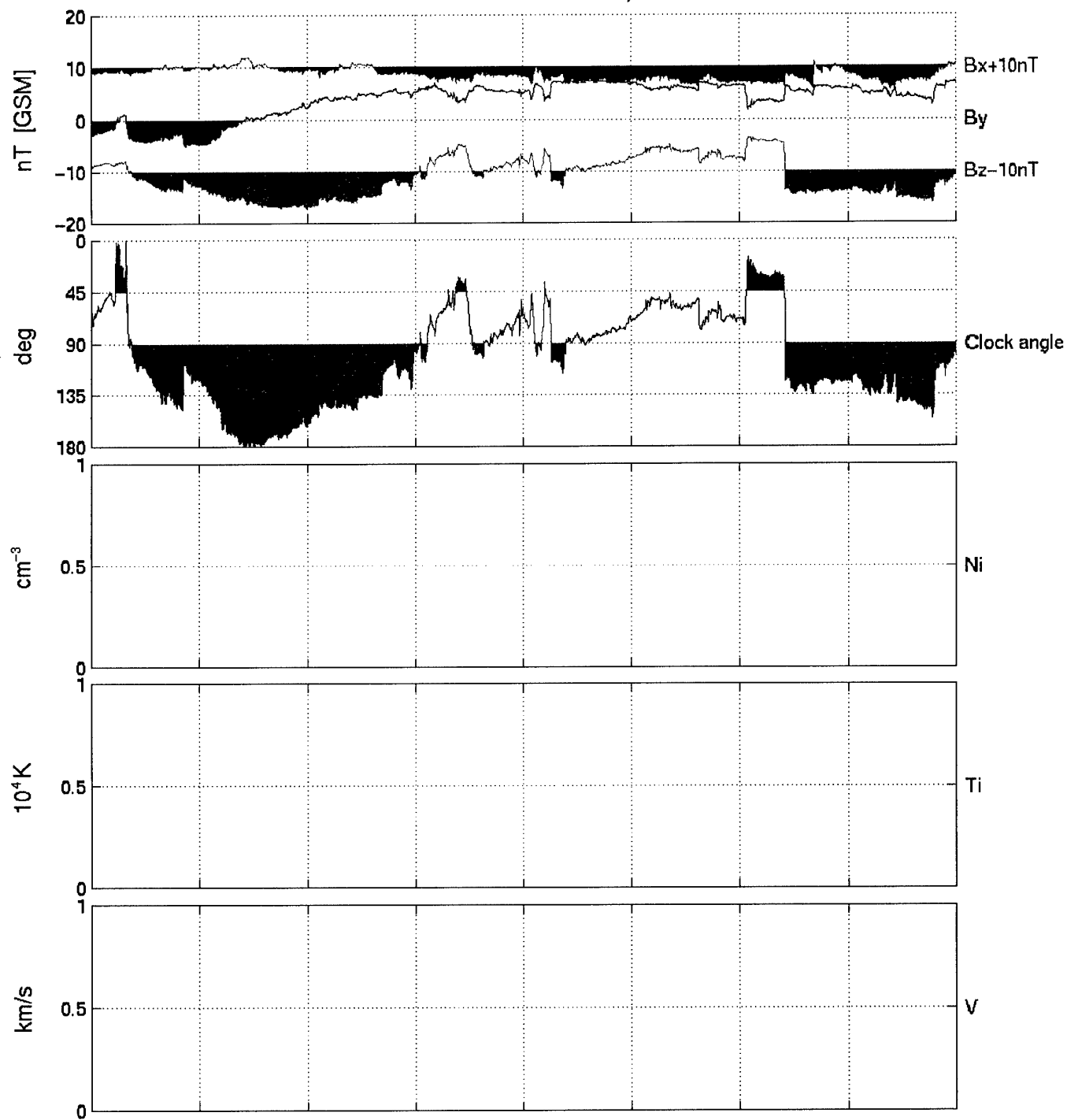
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

## ACE: Solar Wind Parameters, Jan 20 2001

[illegible]



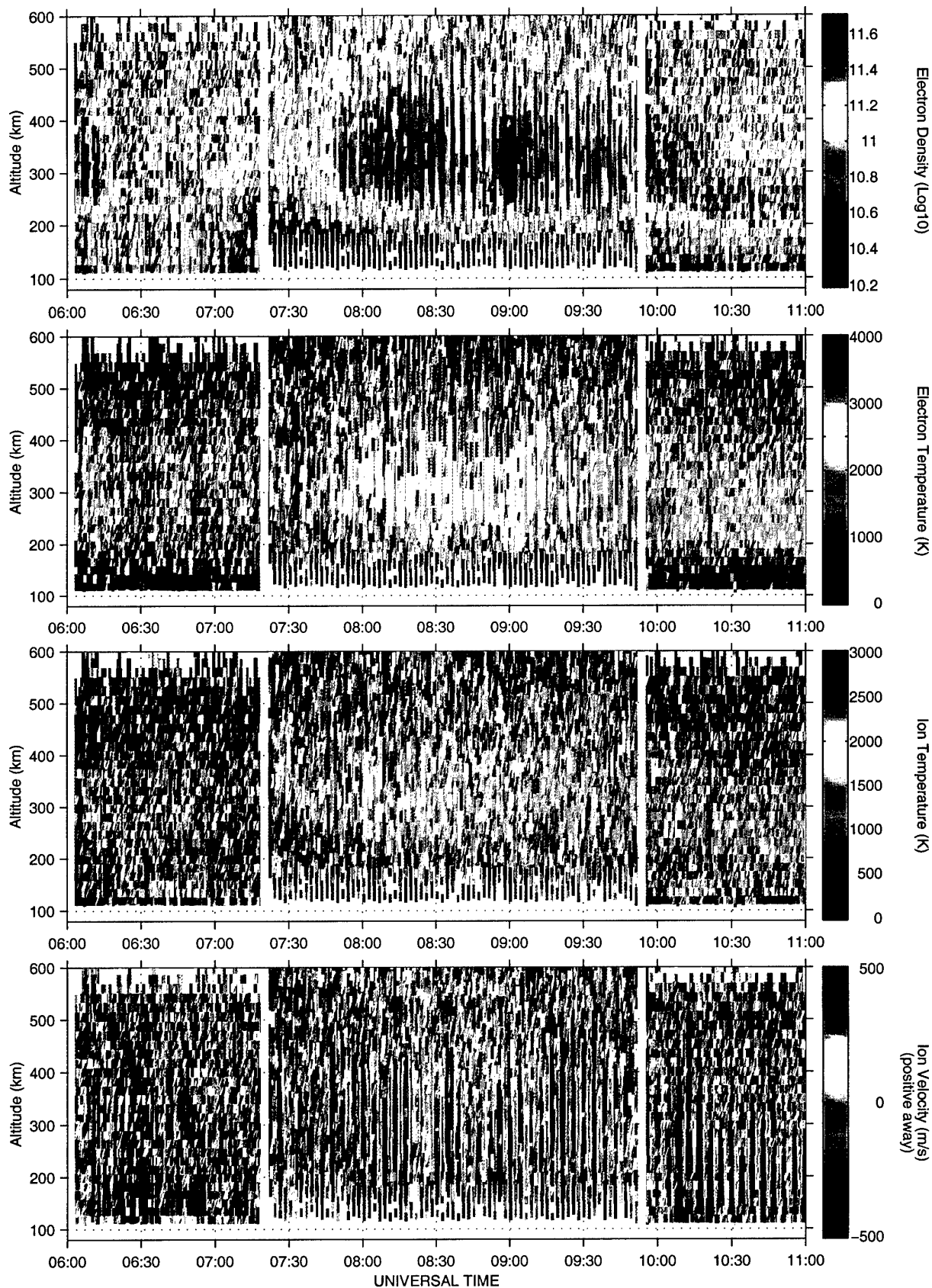
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN, 32m, tau0, January 20, 2001

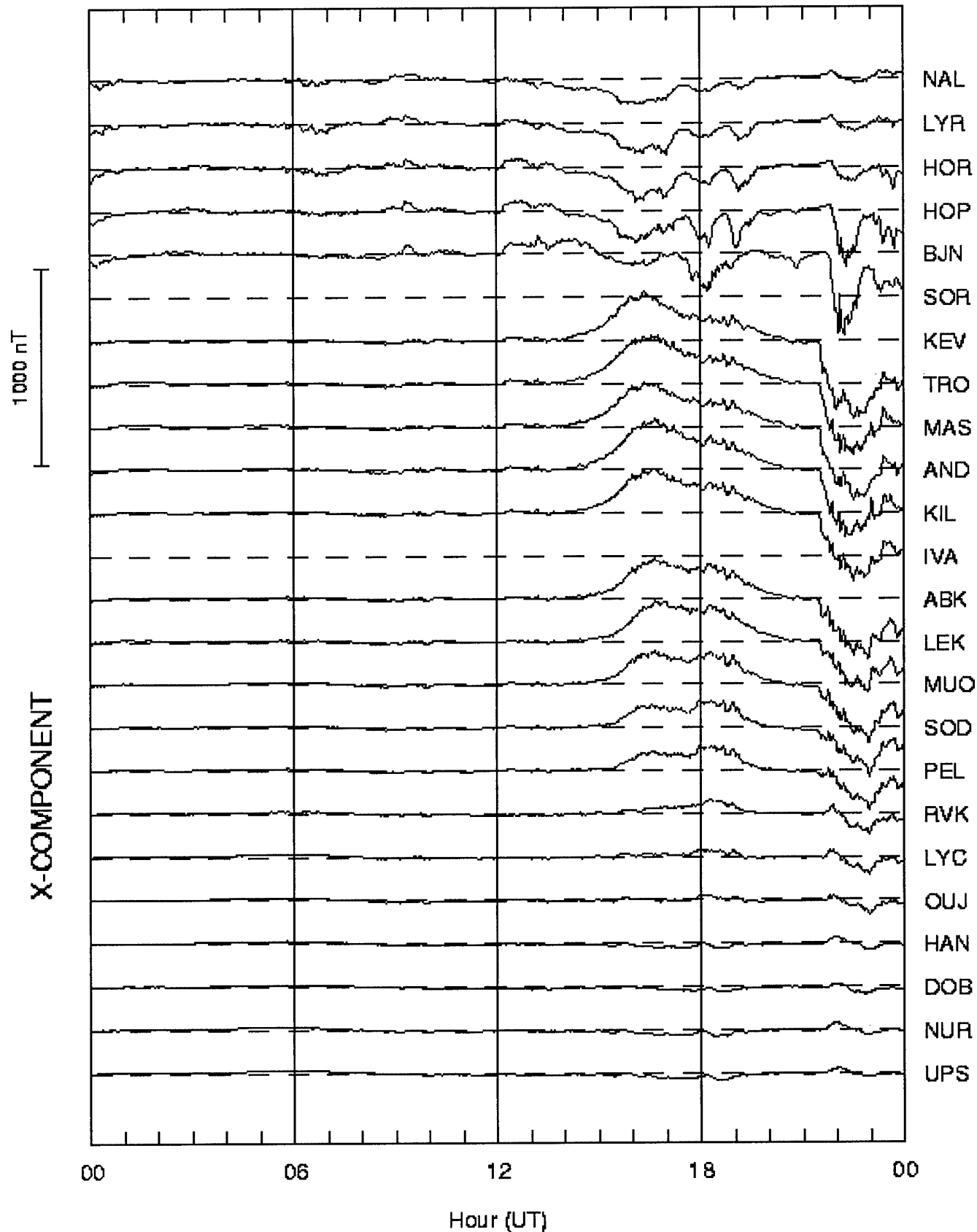
Produced at EISCAT Longyearbyen, 21-Jan-2001

Not for publication - see Rules-of-the-road



# IMAGE magnetometer network 2001-01-20

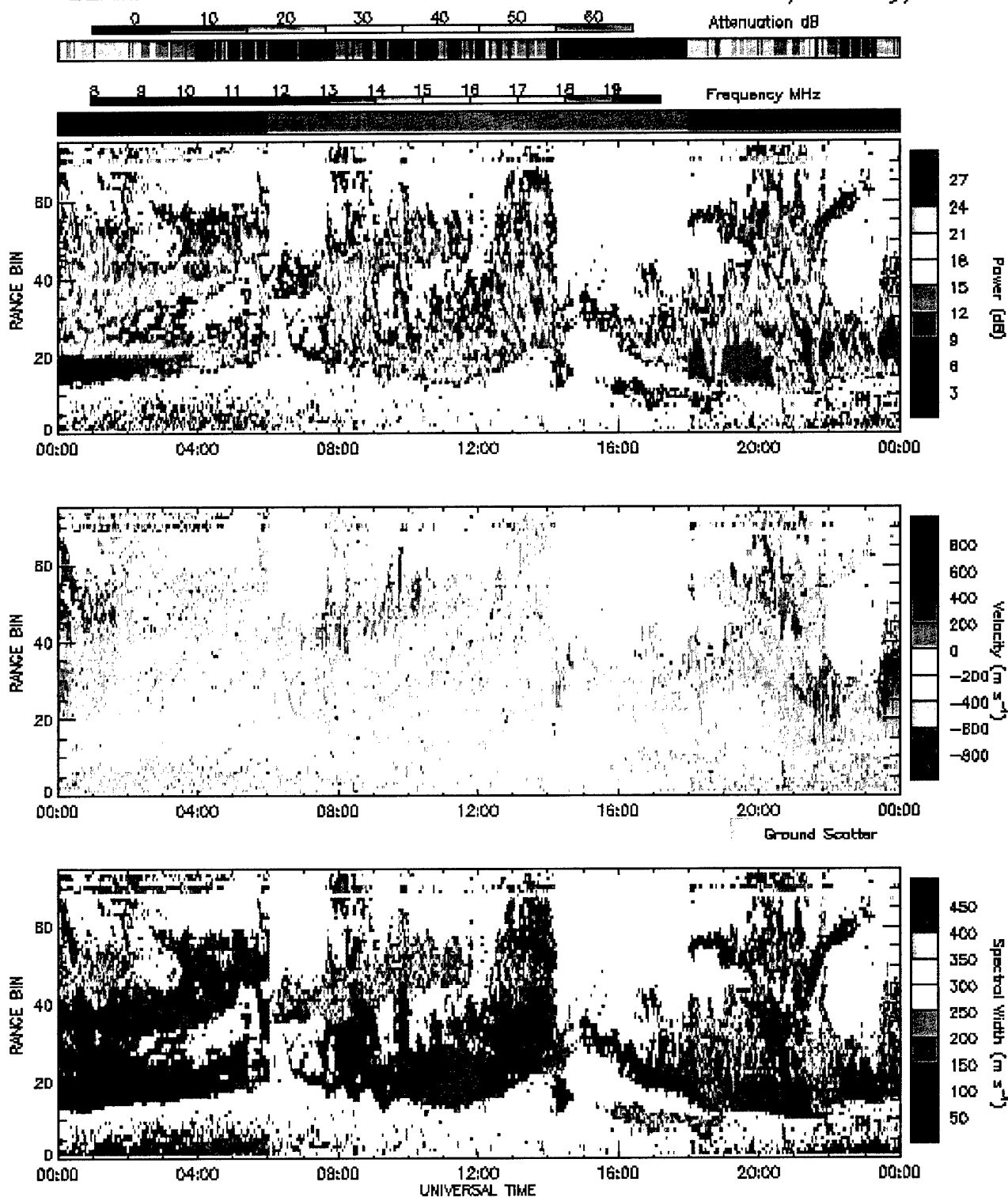
2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 20/January/2001



**Contents, January 25, 2000 :**

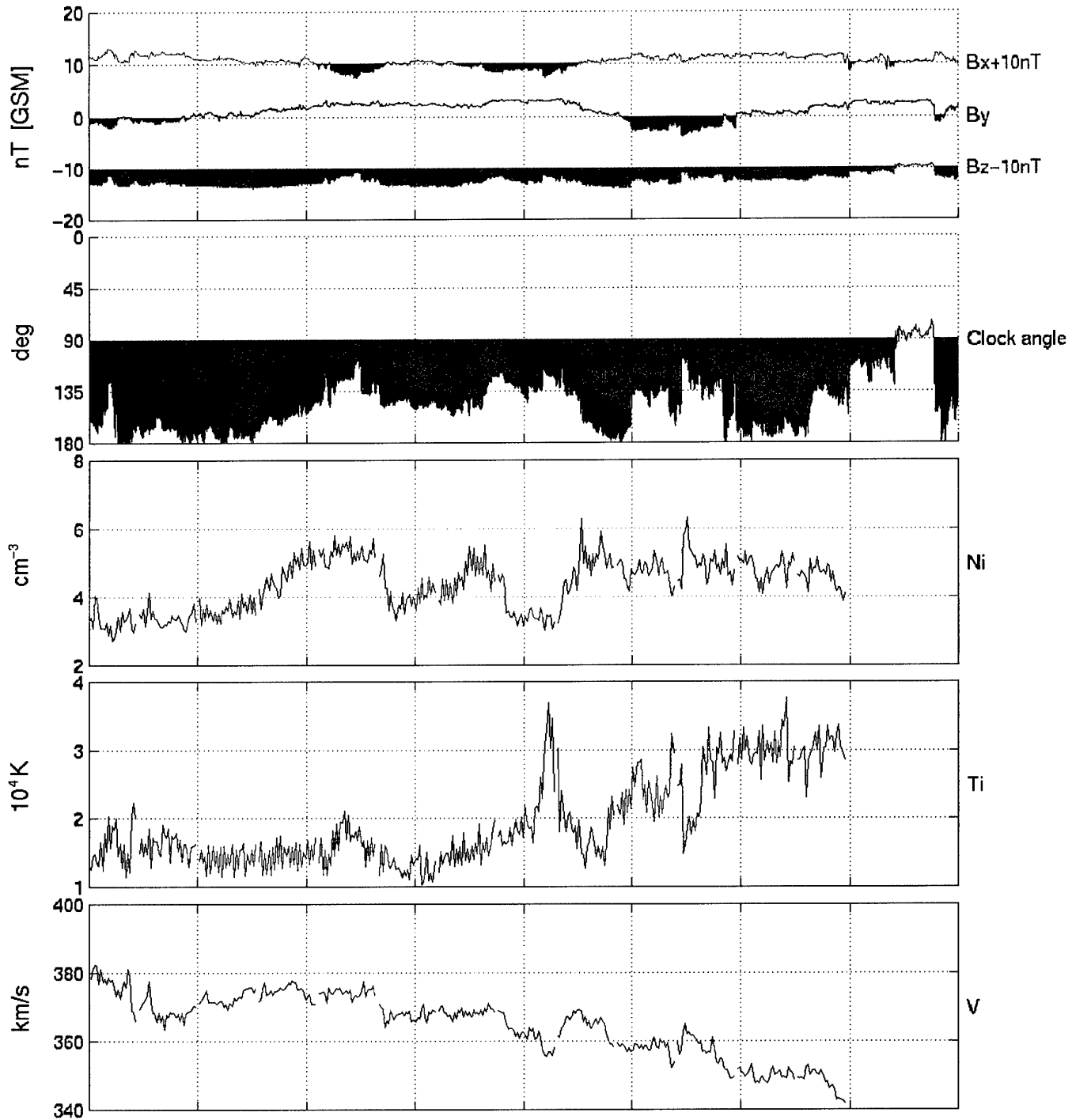
-IMF-ACE plot

-EISCAT Svalbard summary plots(64 sec. resolution)

-IMAGE magnetometer data

-CUTLASS Finland, Range-Time-Parameter plot

# ACE: Solar Wind Parameters, Jan 25 2001



| UT      | 15:00 | 16:00 | 17:00 | 18:00 | 19:00 | 20:00 | 21:00 | 22:00 | 23:00 |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X [GSM] | 242.7 | 242.7 | 242.7 | 242.7 | 242.7 | 242.7 | 242.7 | 242.7 | 242.7 |
| Y [GSM] | -10.9 | -11.0 | -11.1 | -11.2 | -11.3 | -11.5 | -11.6 | -11.7 | -11.8 |
| Z [GSM] | 21.9  | 21.9  | 21.8  | 21.8  | 21.7  | 21.7  | 21.6  | 21.6  | 21.5  |



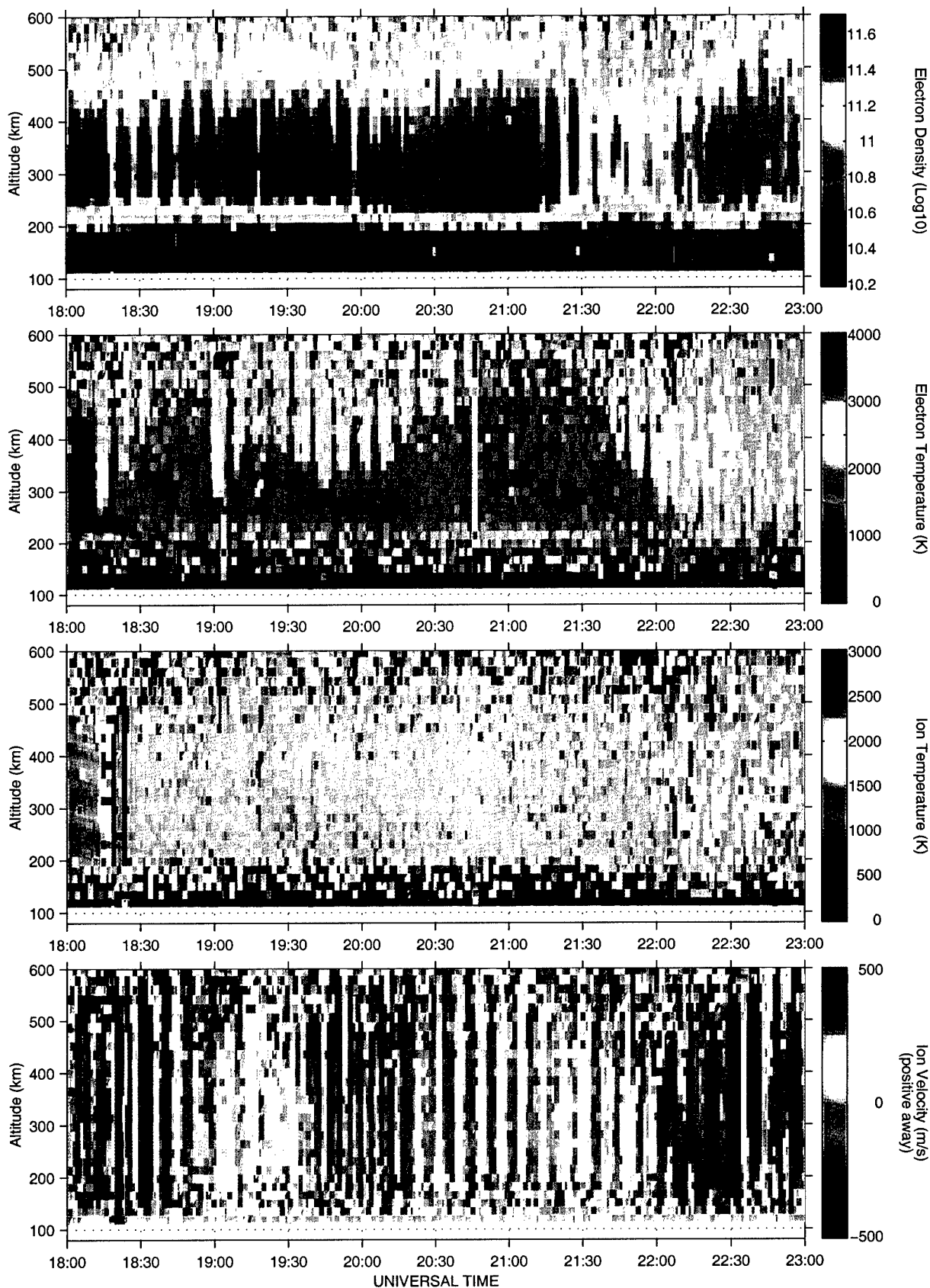
# EISCAT Scientific Association

## EISCAT SVALBARD RADAR

PCBDYN-NO, 32m, tau0, January 25, 2001

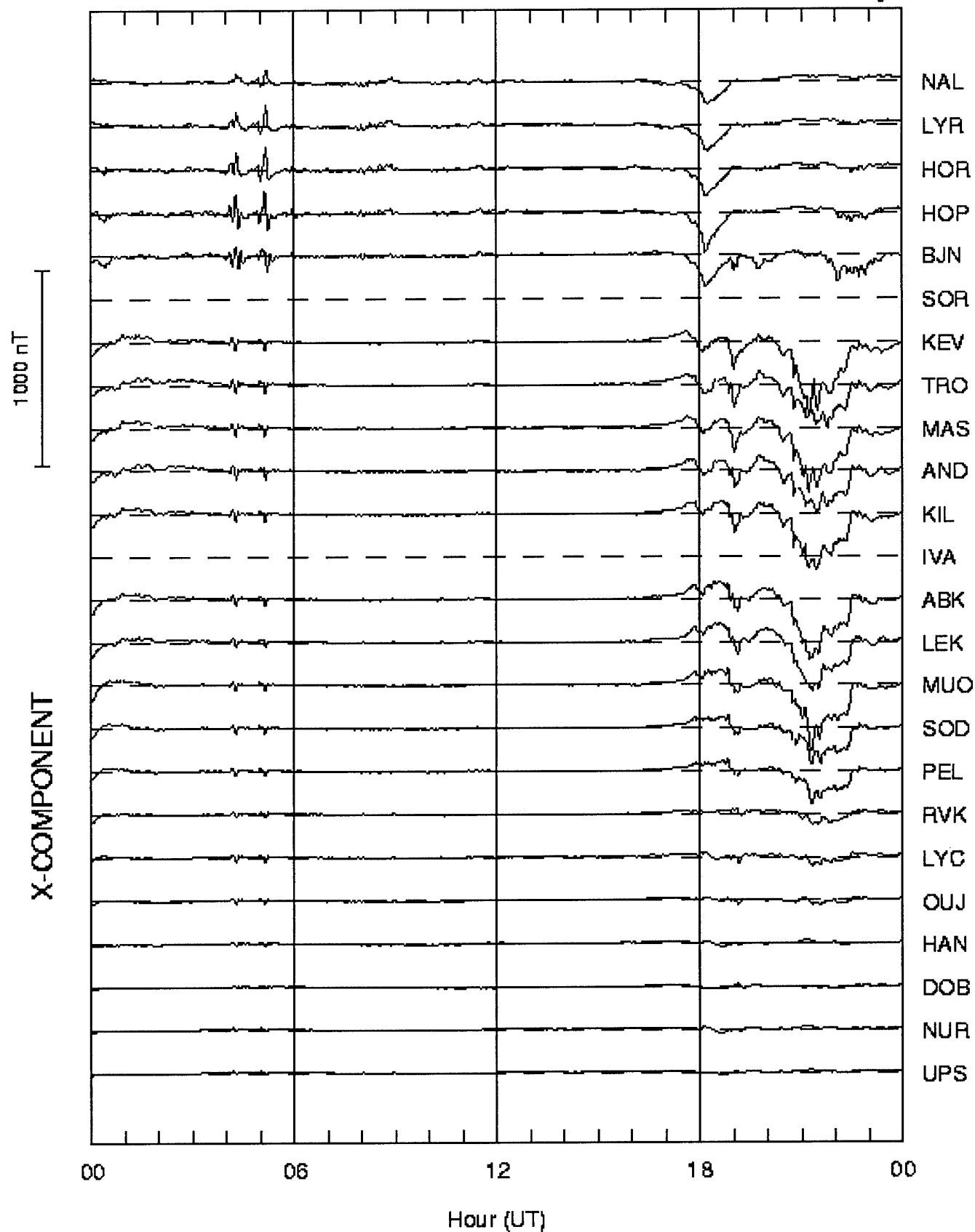
Produced at EISCAT Longyearbyen, 25-Jan-2001

Not for publication - see Rules-of-the-road



# IMAGE magnetometer network 2001-01-25

2 minute averages



# CUTLASS FINLAND RANGE-TIME-PARAMETER PLOT

BEAM: 5

DATE: 25/January/2001

