EISCAT

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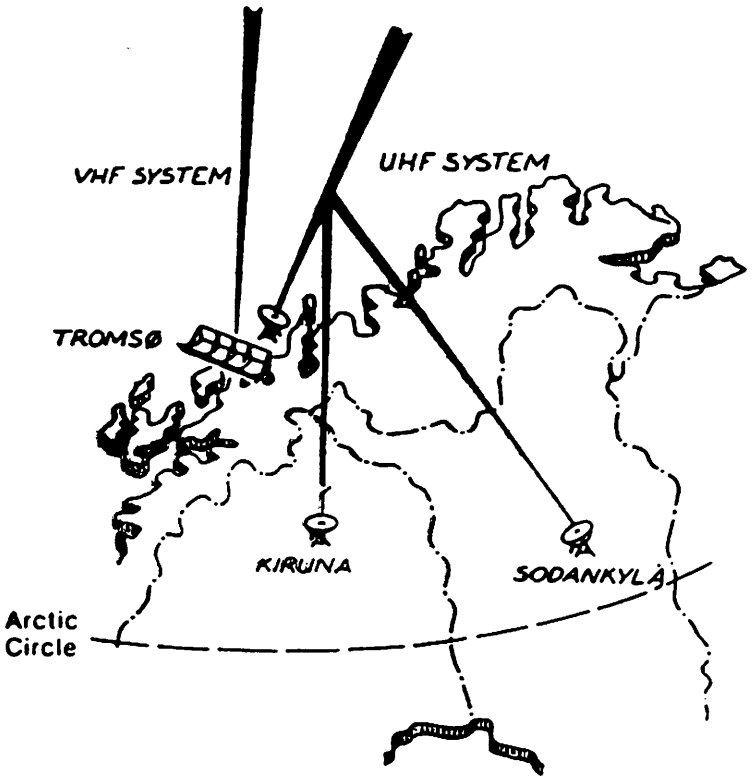
EISCAT Scientific Association



The EISCAT Radar Systems - Operating Parameters 1990

	UHF Radar	VHF Radar
Centre operating frequency:	931.5 MHz	224.0 MHz
Tuneable bandwidth:	8 MHz	3 MHz
Pulse peak power:	1.5 MW	1.5 MW
(Nominal):		(5 MW)
Average power:	280 kW	140 kW
(Nominal):		625 kW
Pulse duration:	1 μs - 10 ms	1 μs - 1 ms
	(phase/frequency coded)	(phase/frequency coded)
Minimum pulse interval:	1 ms	1 ms
Antennas:	Parabolic dishes	Parabolic cylinder
	32 m diameter	40 m x 120 m
Feed systems:	Cassegrain	128 Crossed dipole line
Gain:	48.1 dB	43.1 dB
Polarization:	Circular (Tromsø)	Circular, Linear
	Any (Receiving sites)	
System Temperature:	90-110 K (Tromsø)	250-300 K
	30-35 K (Receiving sites)	
Geographic coordinates:		
Tromsø:	69.59° N, 19.23° E	
Kiruna:	67.86° N, 20.44° E	
Sodankylä:	67.36° N, 26.63° E	
Invariant Latitude (Tromsø):	66.26° N	
L-shell (Tromsø):	6.17	

The cover illustration shows the first direct analysis of the hydrogen component in EISCAT's VHF Common Programme Seven, CP-7, high altitude data. The horizontal scale covers the period 0000-0200 UT on 27 September 1990 and the vertical scale runs from zero to 1700 km on each panel. The upper panel shows the conventional analysis of the oxygen ion density component of the ionospheric plasma, the middle panel shows the percentage composition of hydrogen ions (dark red being ≥8%) and the lower panel shows the corresponding hydrogen ion velocity (dark blue to dark red corresponding to -200 ms^{-1} to +600 ms^{-1}). These data were produced using a specialized integration program, to remove unwanted satellite echoes, and a modified version of the standard analysis software.

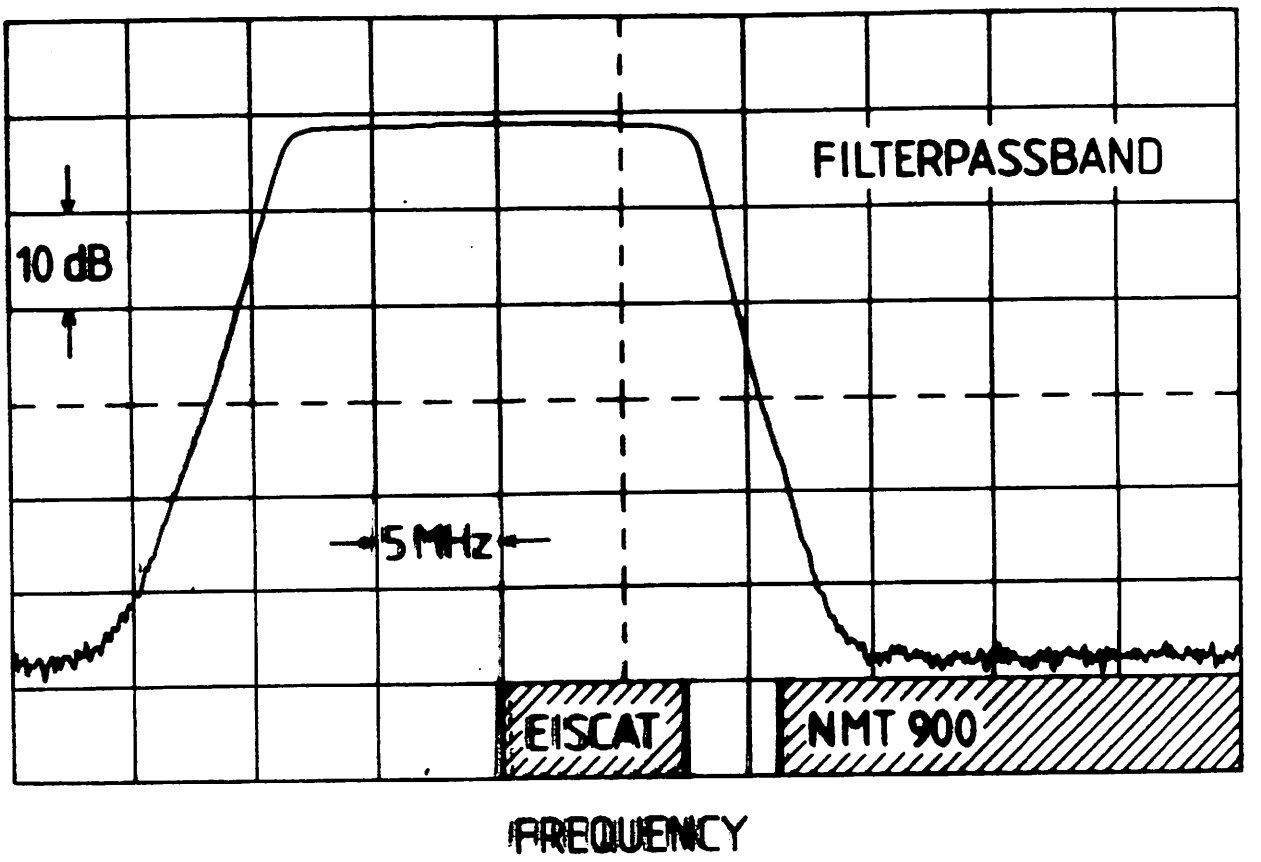
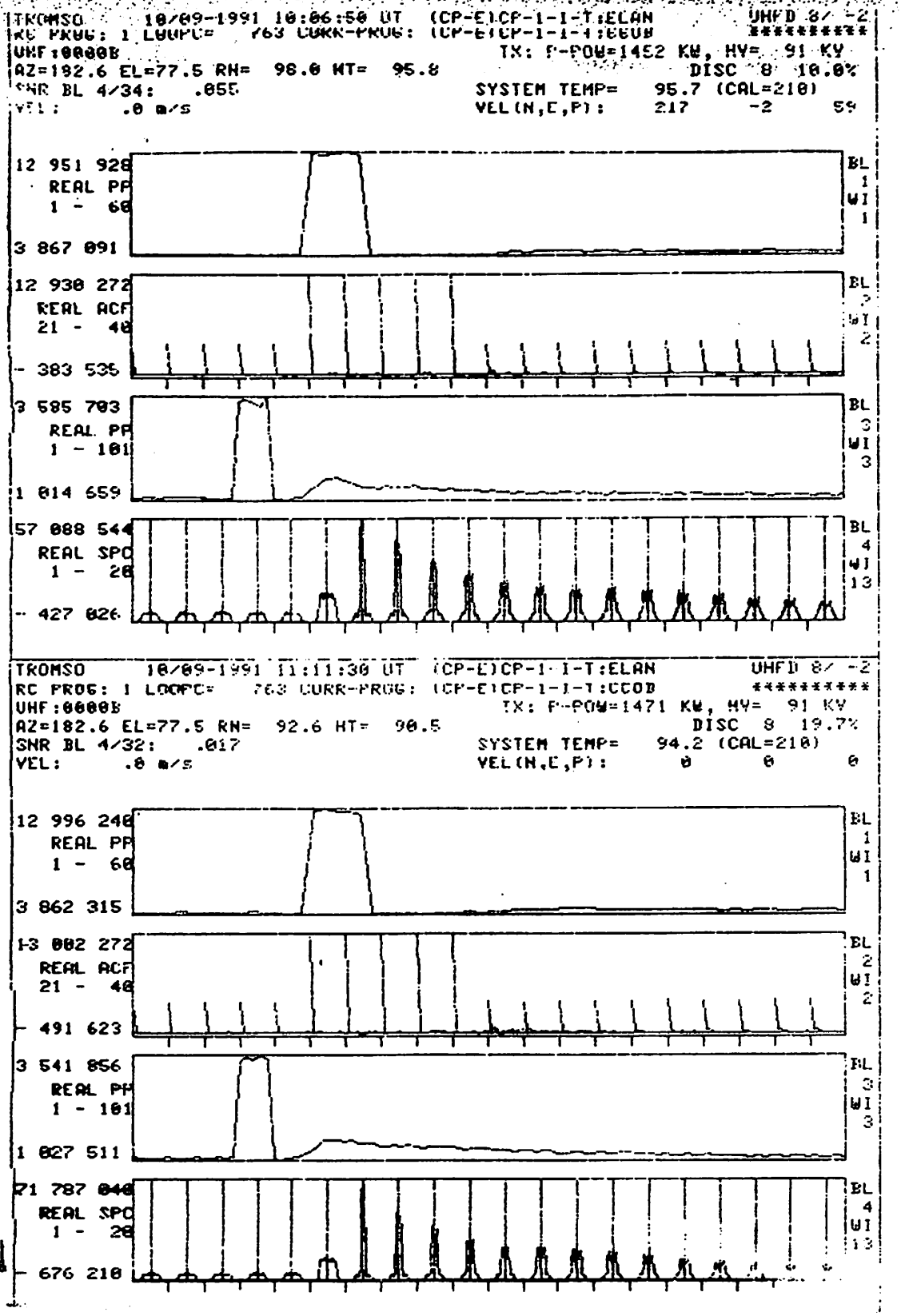


Fig. 60. Passband of the EISCAT intermediate frequency (IF) filter.



short PP

multipulse ACF

medium PP

long pulse spectra + background

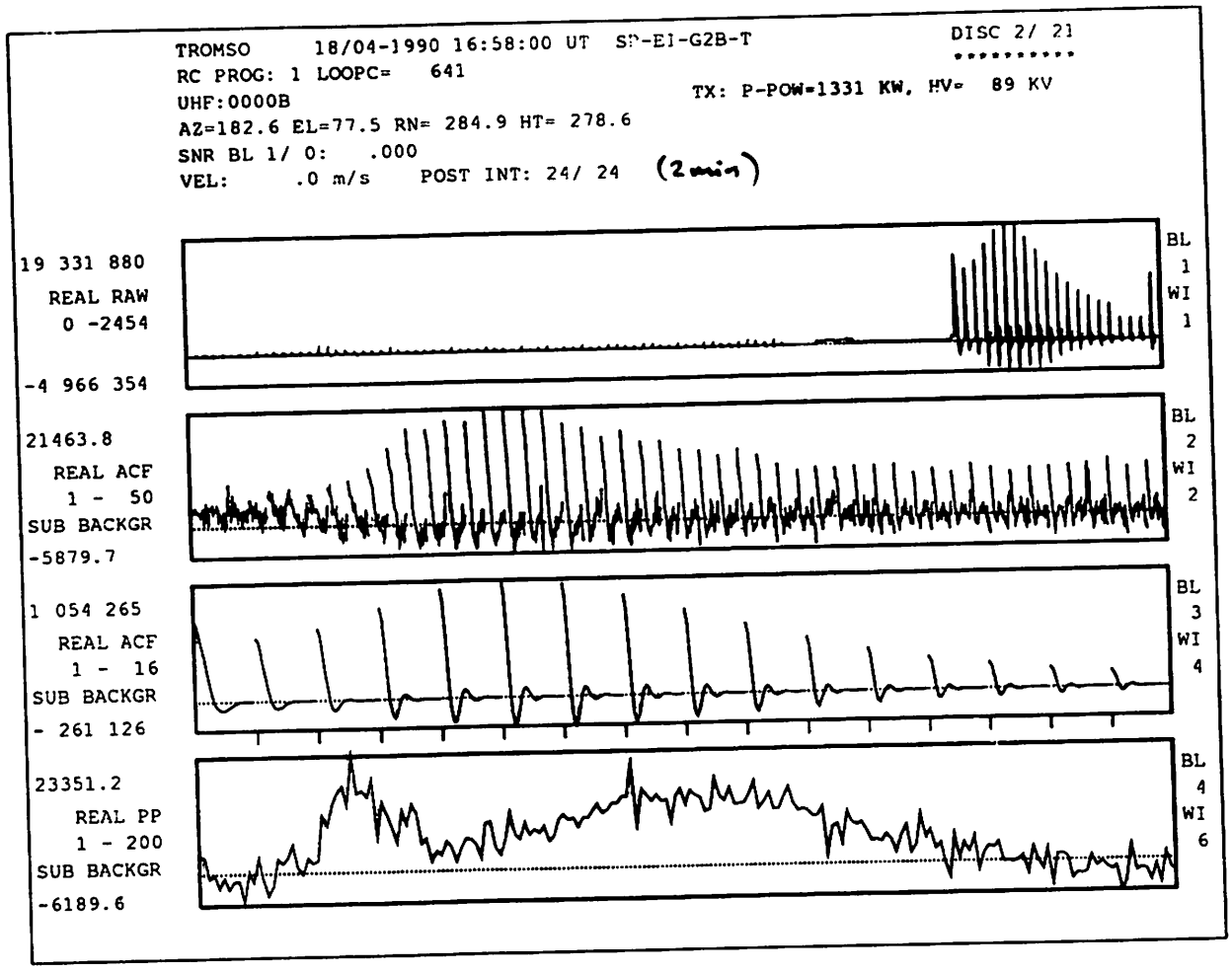
Channels 5+6+8

Channels 5+6+7+8

Channels 1+2

Channels 3+4

Default CP-1-I display



23 × 14 μs ALTERNATING CODE

$\Delta R = 2.1$ km
$R_{MIN} = 87.9$ km
$R_{MAX} = 230.7$ km
$N_G = 69$

14 μs SINGLE PULSE (PP)

$\Delta R = 2.1$ km
$R_{MIN} = 54.3$ km
$R_{MAX} = 462.2$ km
$N_G = 200$

350 μs LONG PULSE (ACF)

$\Delta R = 22.5$ km
$R_{MIN} = 150.0$ km
$R_{MAX} = 487.5$ km
$N_G = 16$

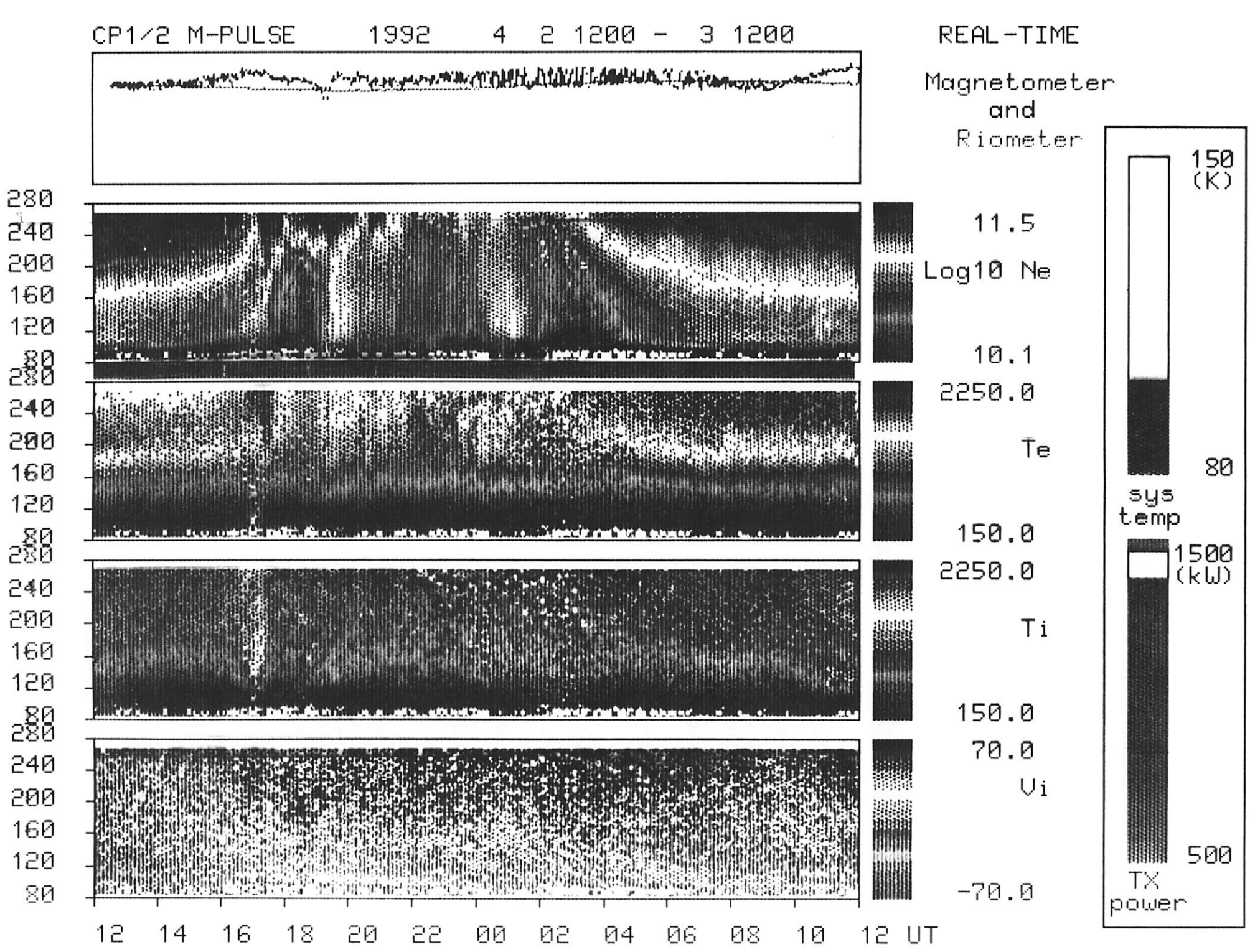
ELAN

TARLAN

CORLAN

GDEF

DESC


CP1/2 M-PULSE 1992 4 2 1200 - 3 1200
REAL-TIME
Magnetometer
and
Riometer
280
240
200
160
120
80
11.5
Log10 Ne
10.1
2250.0
Te
150.0
2250.0
Ti
150.0
70.0
Vi
-70.0
150
(K)
80
sys
temp
1500
(kW)
500
TX
power
12 14 16 18 20 22 00 02 04 06 08 10 12 UT

COMMON PROGRAMMES

1992	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot	%
CP1			28	63			32	112					235	30
CP2	54			30			30			54			168	21
CP3		29				54			54			54	191	24
CP4											78		78	10
CP5														
CP6						30			30				60	8
CP7		30			27								57	7
UP1														
UP2														
UP3														
Total	54	59	28	93	27	84	62	112	84	54	78	54	789	100 %
%	7	7	4	12	3	11	8	14	11	7	10	7	100	%

Achieved						Target						
CP1	CP2	CP3	CP4&CP5	CP6&CP7	UPs	CP1	CP2	CP3	CP4&CP5	CP6&CP7	UPs	%
30	21	24	10	15		25	20	25	15	15		

SPECIAL PROGRAMMES

1992	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Tot	%
EI	2		1		9		5	10					27	4
FI		57											57	8
FR		62	24		78								164	23
GE		73	58			20	54	10					215	31
NO		7	2			12							21	3
SW										33	33	33	99	14
UK	10		98									12	120	17
Total	12	199	183		87	32	59	20		33	33	45	703	100 %
%	2	28	26		12	5	8	3		5	5	6	100	%

EI	FI	FR	GE	NO	SW	UK		
4	8	23	31	3	14	17	100 %	(of 703 hrs)
3	7	21	27	3	12	15	88 %	(of 800 hrs)

CUMMULATIVE TOTALS

1992	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CP	54	113	141	234	261	345	407	519	603	657	735	789
SP	12	211	394	394	481	513	572	592	592	625	658	703
Total	66	324	535	628	742	858	979	1111	1195	1282	1393	1492

CP1			28	91	91	91	123	235	235	235	235	235
CP2	54	54	54	84	84	84	114	114	114	168	168	168
CP3		29	29	29	29	83	83	83	137	137	137	191
CP4&5											78	78
CP6&7		30	30	30	57	87	87	87	117	117	117	117
UPs												
EI	2	2	3	3	12	12	17	27	27	27	27	27
FI		57	57	57	57	57	57	57	57	57	57	57
FR		62	86	86	164	164	164	164	164	164	164	164
GE		73	131	131	131	151	205	215	215	215	215	215
NO		7	9	9	9	21	21	21	21	21	21	21
SW										33	66	99
UK	10	10	108	108	108	108	108	108	108	108	108	120

Last updated: 18/6/92

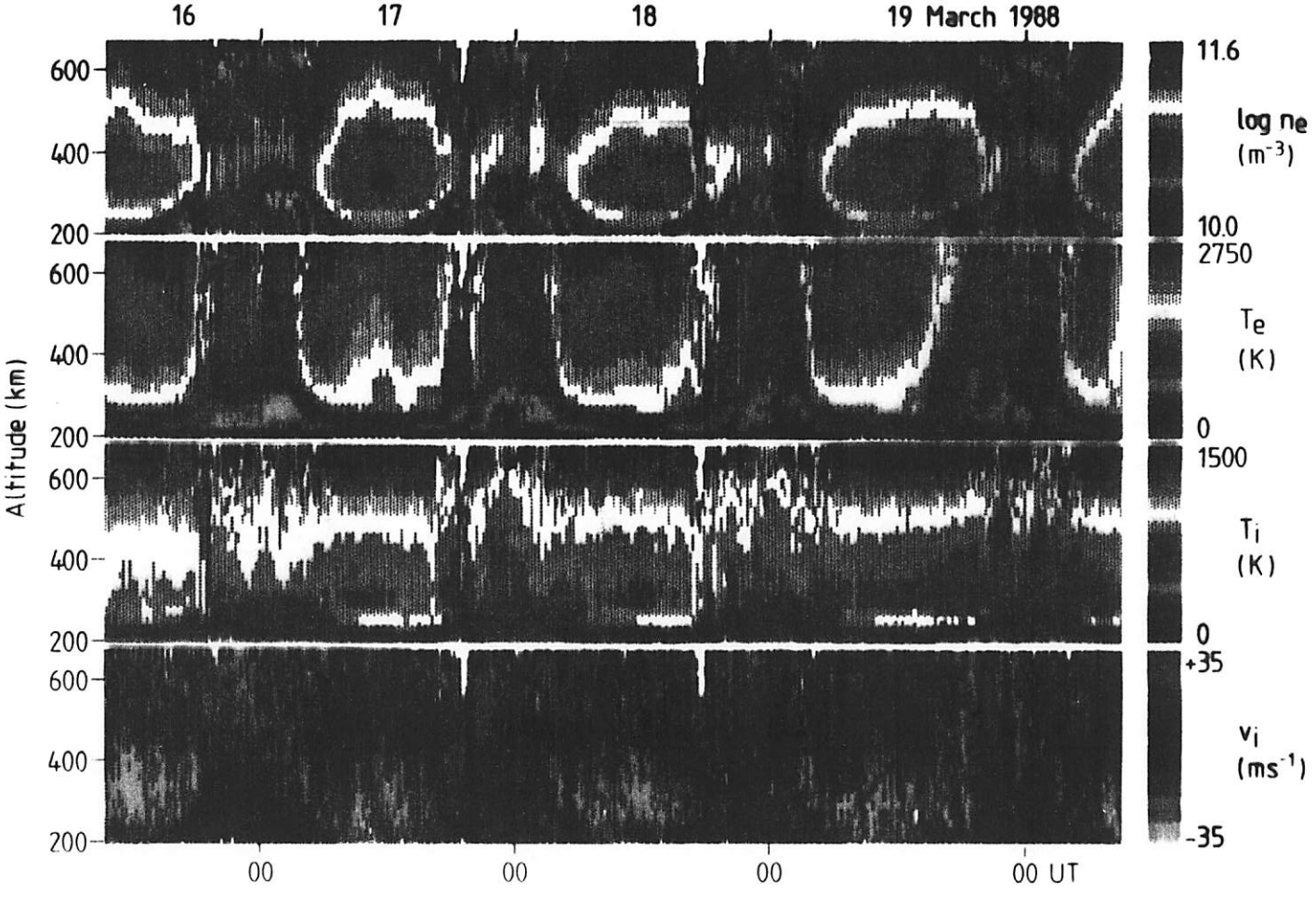
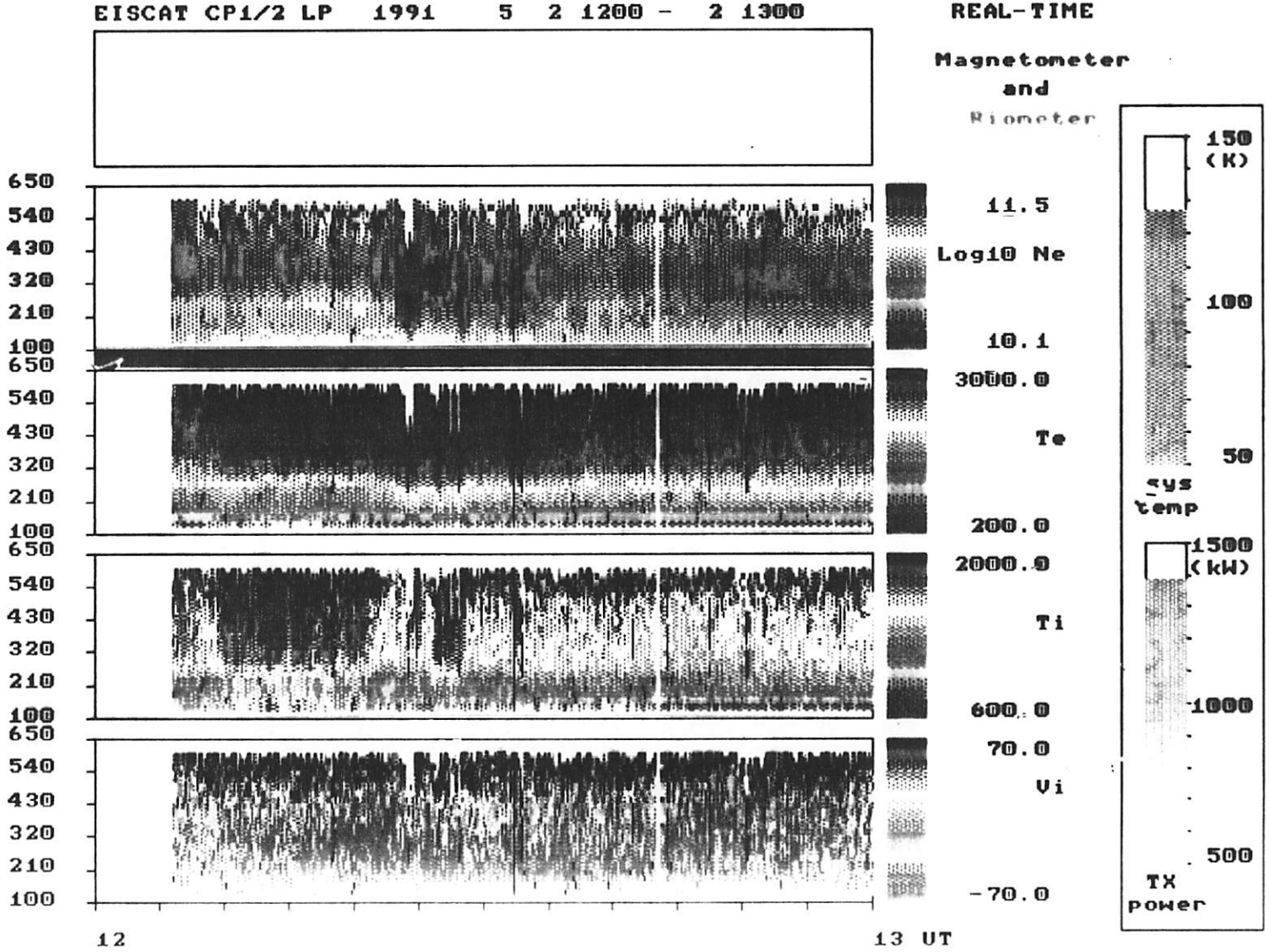


Fig. 18. Colour representation of long pulse results from an operation of Common Programme CP-1-H from 9 UT on 16 March to 9 UT on 20 March 1988. These results show the variations of (top to bottom) electron density (log n_e), electron temperature (T_e), ion temperature (T_i) and line-of-sight ion drift velocity (v_i) between 135 and 600 km altitude. Experiment CP-1-H also provides multipulse measurements from E-region heights and two sets of power profiles in this scheme with the transmitting antenna pointed permanently along the geomagnetic field direction.


EISCAT CP1/2 LP 1991 5 2 1200 - 2 1300
REAL-TIME
Magnetometer
and
Riometer
650
540
430
320
210
100
11.5
Log10 Ne
10.1
3000.0
Te
200.0
2000.0
Ti
600.0
70.0
Vi
-70.0
150
(K)
100
50
sys
temp
1500
(kW)
1000
500
TX
power
12
13 UT

EISCAT Scientific Association Received:

EISCAT Scheduling Request Form

(Send to the EISCAT Schedule Co-ordinator, Tromsø, with copy to the Director, by 10th of Month preceding first observations)

Title of Experiment:

Author(s):

Address for correspondence:

Telephone:
Telefax:
EMail:

Is this a new experiment?

Date submitted:

Associate Country:

Associate Reference:

ELAN filename(s):

Campaign reference:

Total Hours:

Time of Year:

Time of Day:

Related Experiments:

Person Responsible for operations:

Tromsø UHF:
Active/Passive?

Kiruna:

Sodankylä:

Tromsø VHF:
Active/Passive?

Heating

Geophysical conditions required and/or
Dependence on other equipment:

Backup experiments:

Impact of Interruptions:

Preparations Required:

Approved for Associate by:

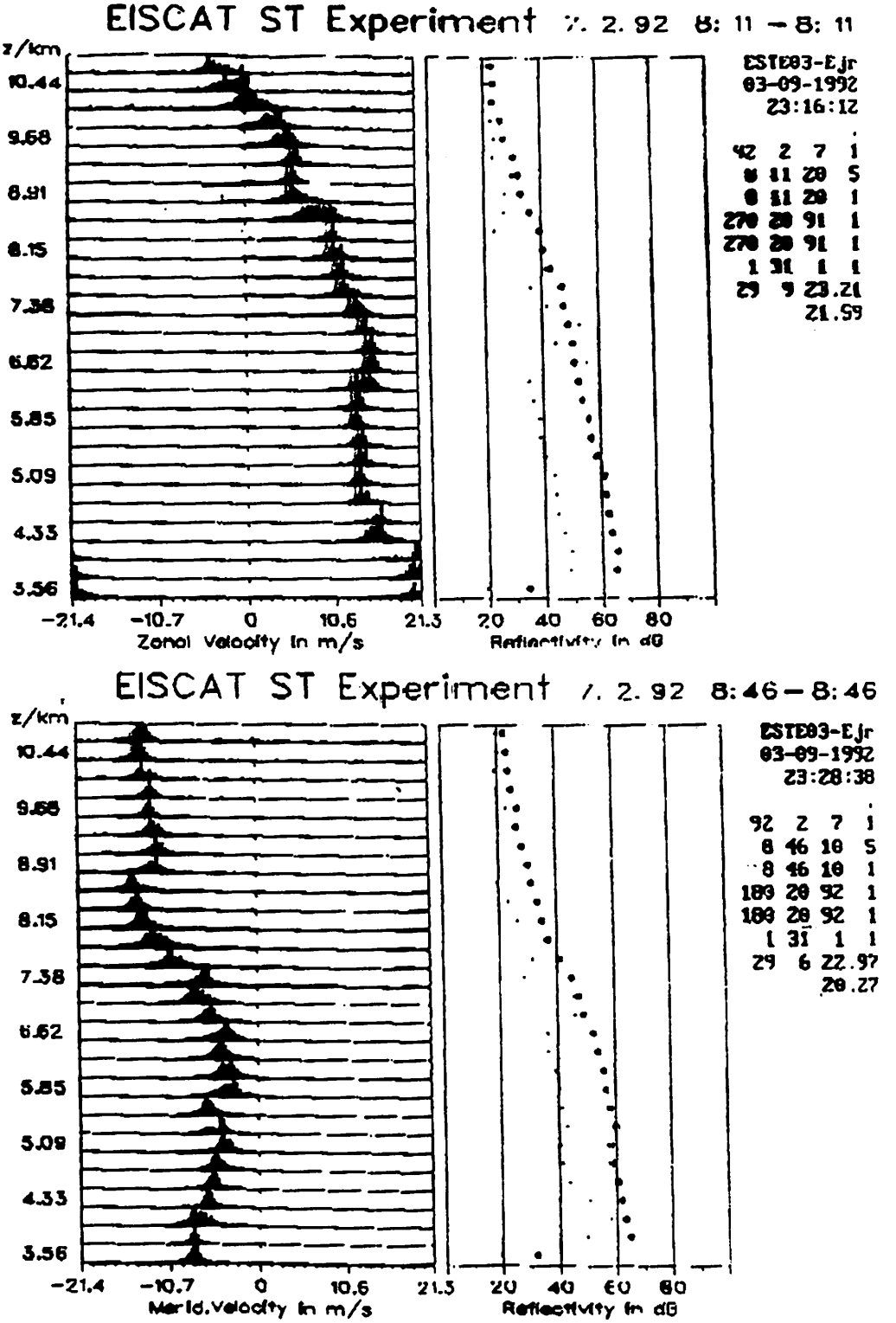
Date:

Signature:

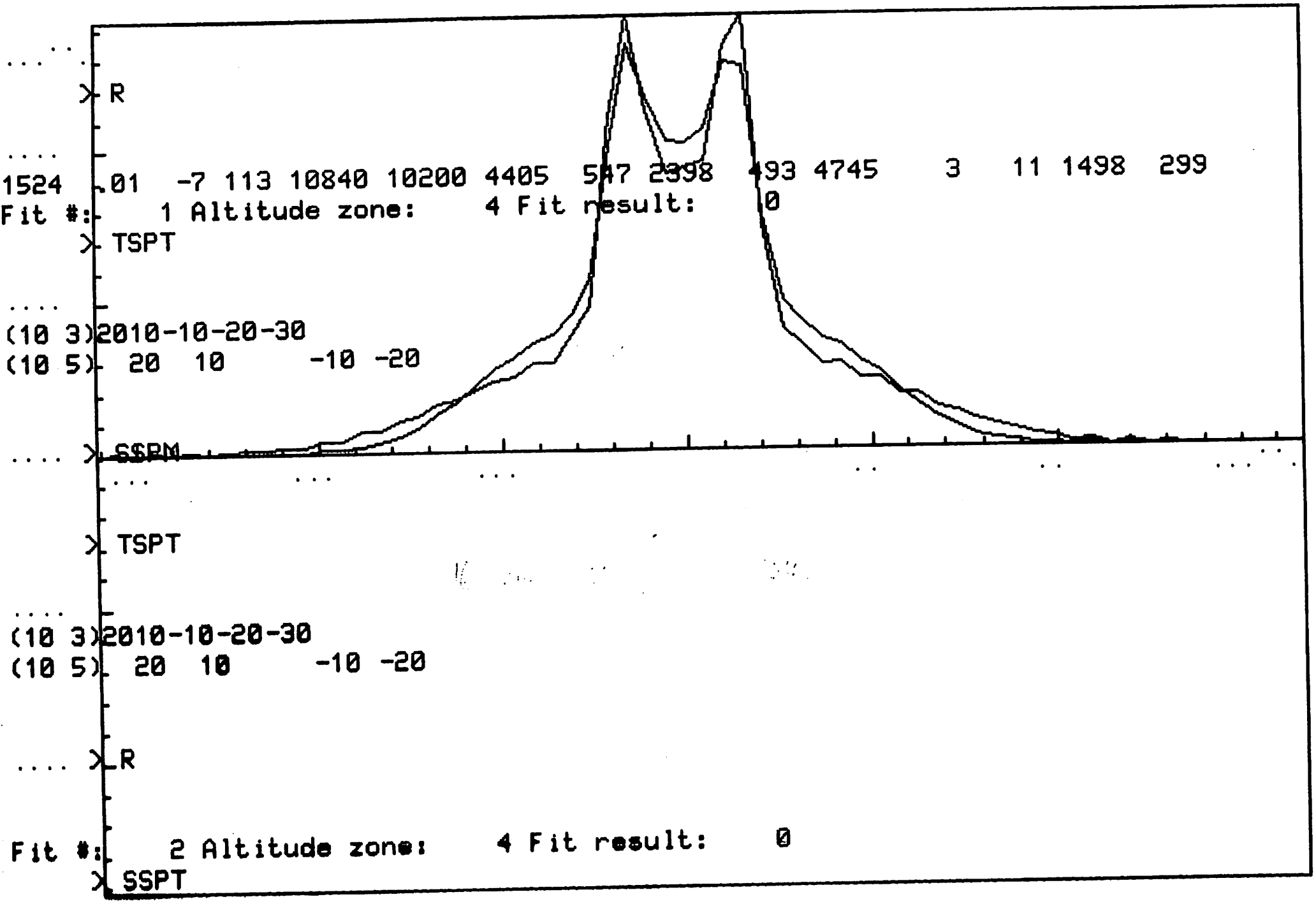
Scientific Objectives:

Special Requirements:

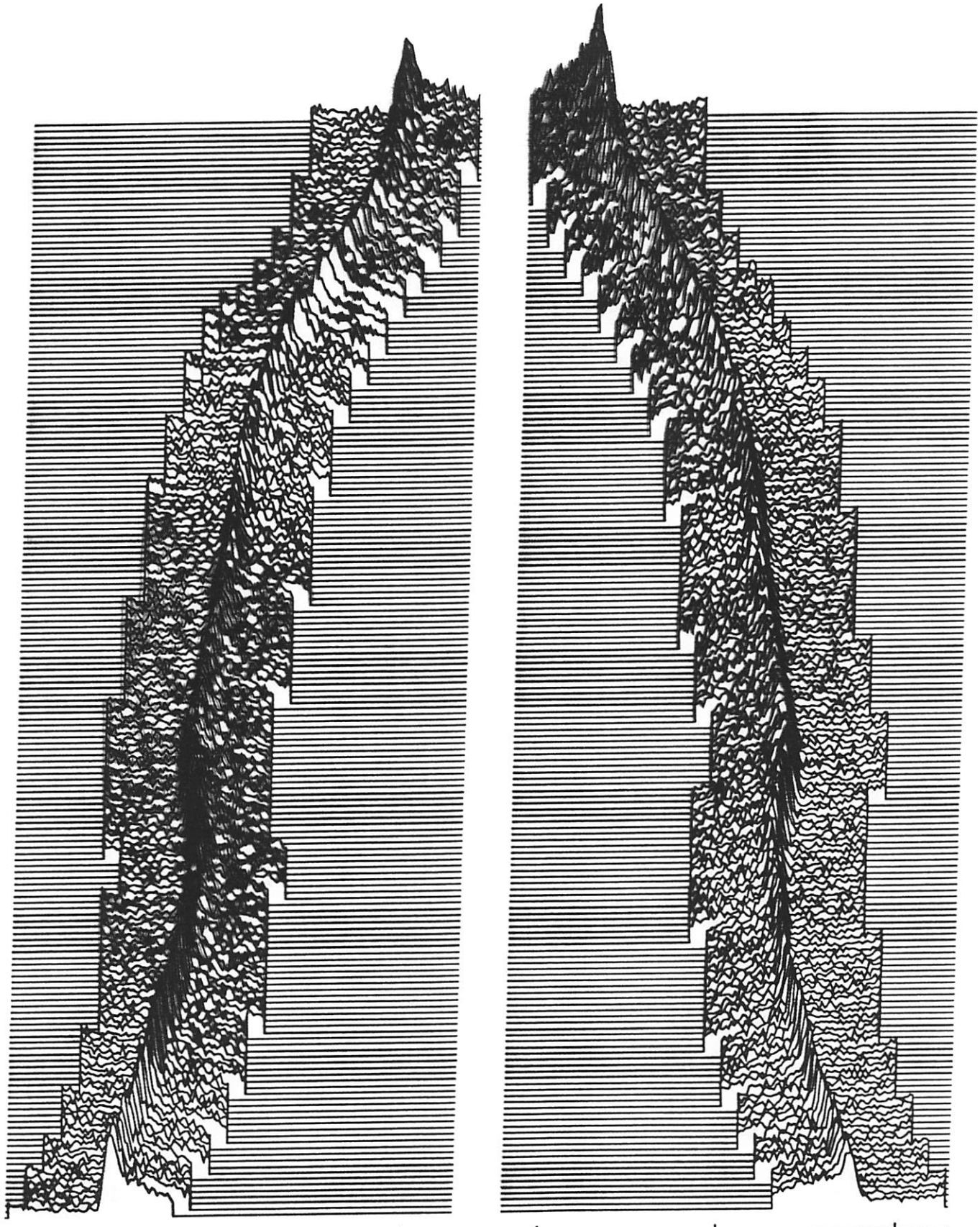
(Please attach additional pages if necessary)

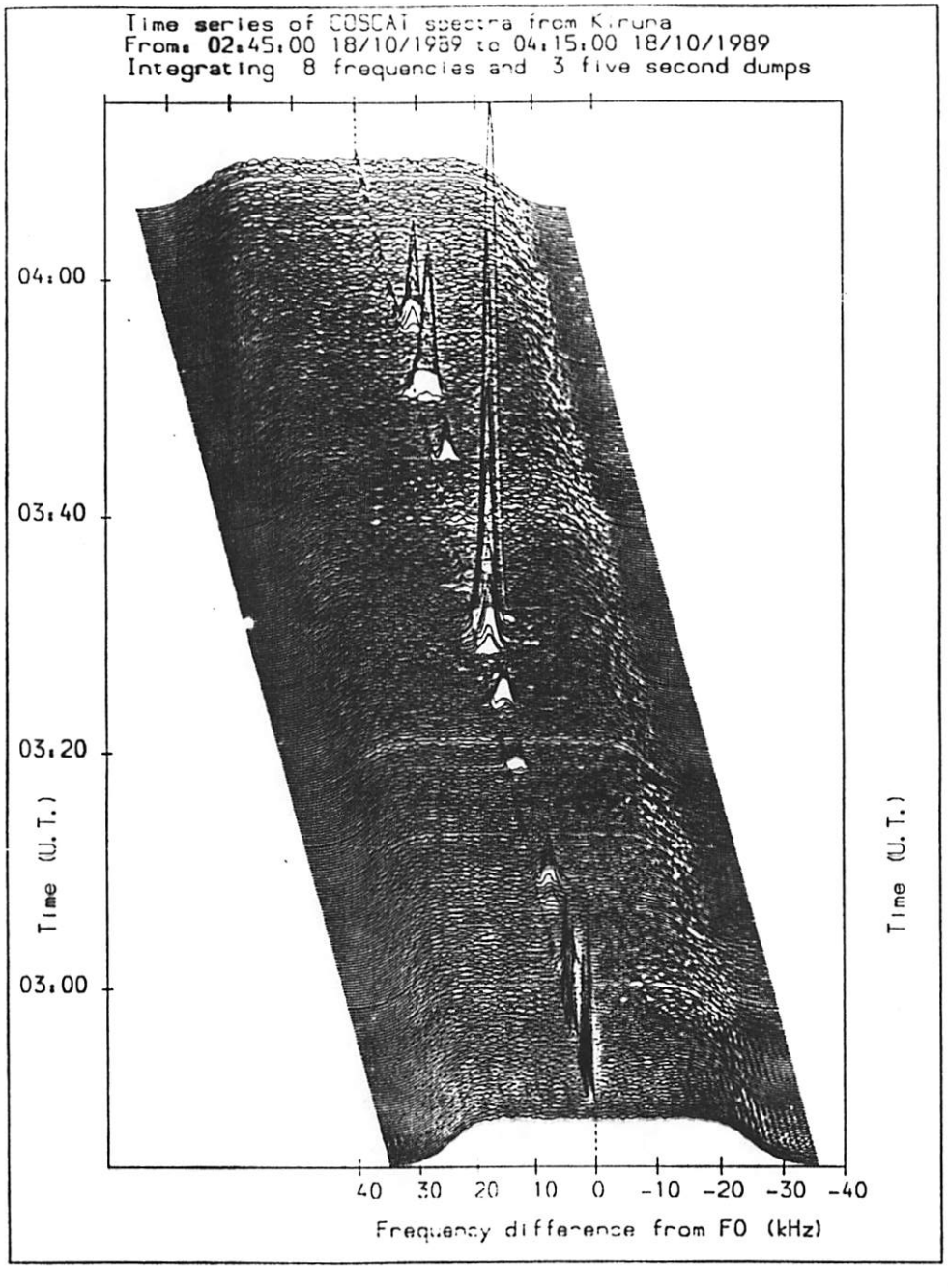


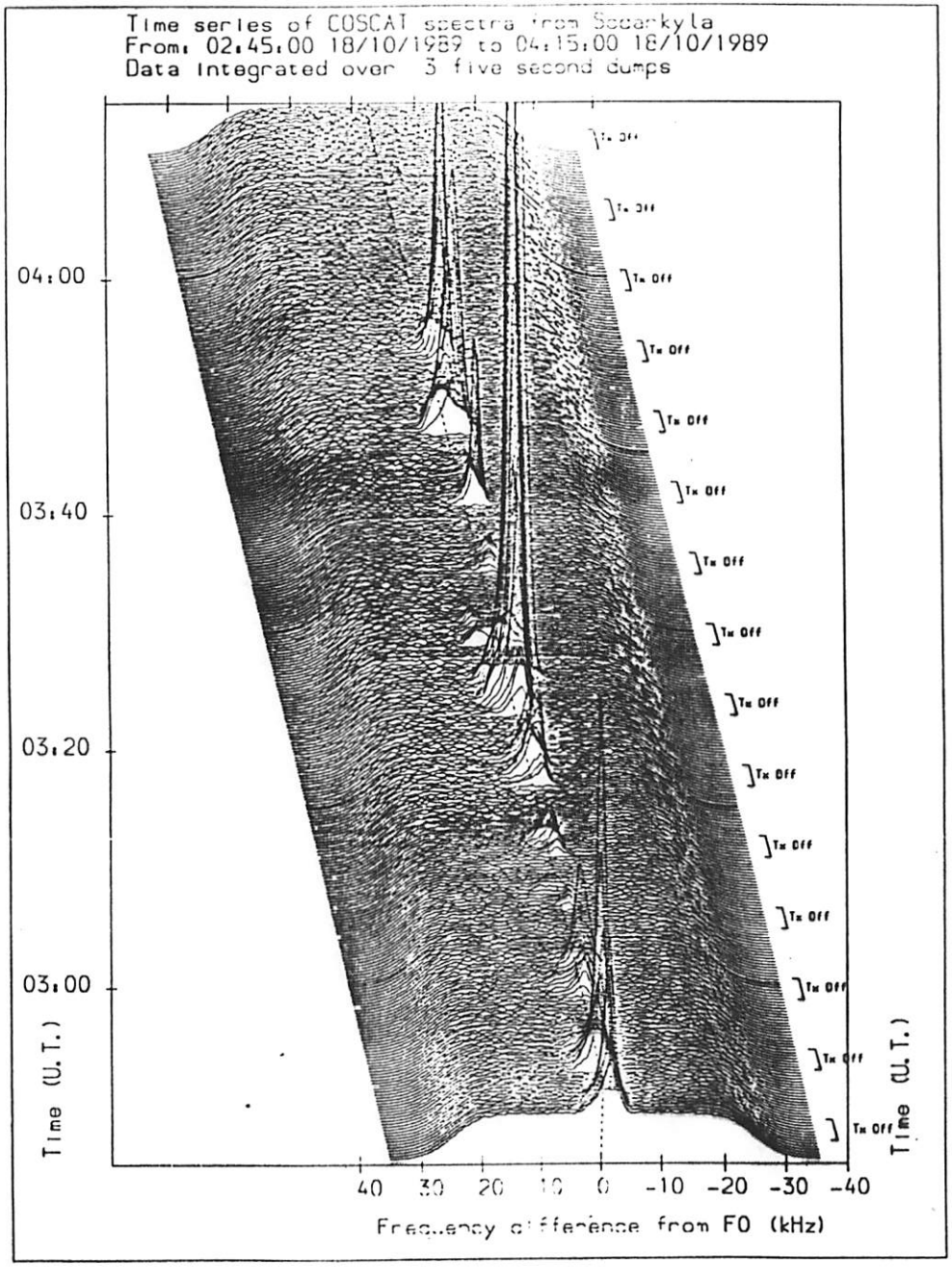
Figs. 2 and 3 Zonal and meridional velocity measured during a day when satisfactory echoes were detected throughout the troposphere, the tropopause and the lower stratosphere.


R
1524 01 -7 113 10840 10200 4405 547 2398 493 4745 3 11 1498 299
Fit #: 1 Altitude zone: 4 Fit result: 0
TSPT
(10 3)2010-10-20-30
(10 5) 20 10 -10 -20
SSRM
TSPT
(10 3)2010-10-20-30
(10 5) 20 10 -10 -20
R
Fit #: 2 Altitude zone: 4 Fit result: 0
SSPT

PLASMA LINES FROM 92- 5-16 18:11:10 TO 92- 5-16 18:41: 0




Time series of COSCAT spectra from Kiruna
From: 02:45:00 18/10/1989 to 04:15:00 18/10/1989
Integrating 8 frequencies and 3 five second dumps
04:00
03:40
03:20
03:00
Time (U.T.)
Time (U.T.)
40 30 20 10 0 -10 -20 -30 -40
Frequency difference from F0 (kHz)


Time series of COSCAT spectra from Sodankyla
From: 02:45:00 18/10/1989 to 04:15:00 18/10/1989
Data integrated over 3 five second dumps
04:00
03:40
03:20
03:00
Time (U.T.)
Tx Off
40 30 20 10 0 -10 -20 -30 -40
Frequency difference from F0 (kHz)
Time (U.T.)