

IONOSPHERIC DATA IN JAPAN

FOR NOVEMBER 2001

VOL. 53 NO. 11

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INTRODUCTION

This Series contains data on ionosphere (I), solar radio emission (S) and radio propagation (P) obtained at the

following stations under the Communications Research Laboratory, Independent Administrative Institution in Japan.

Station	Geographic		Geomagnetic		Technical Method
	Latitude	Longitude	Latitude	Longitude	
Wakkanai	45°23.5'N	141°41.2'E	35.3°N	206.5°	Vertical Sounding (I)
Kokubunji	35°42.4'N	139°29.3'E	25.5°N	205.8°	Vertical Sounding (I)
Yamagawa	31°12.1'N	130°37.1'E	20.4°N	198.3°	Vertical Sounding (I)
Okinawa	26°40.5'N	128°09.2'E	16.5°N	161.7°	Vertical Sounding (I)
Hiraiso	36°22.0'N	140°37.5'E	26.3°N	206.8°	Solar Radio Emission (S)
Inubo	35°42.2'N	140°51.5'E	25.6°N	207.0°	Radio Receiving (P)

A. IONOSPHERE

Ionospheric observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes. The ionosonde produces ionograms, which are recorded digitally on computer storage medium. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled as well by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five factors of ionospheric characteristics are published for the present. The reliability of these factors has been ascertained by comparison of the automatically-scaled parameters with the manually-scaled values of large amounts of test ionograms.

The published data consist of tabulations of hourly values of three factors ($foF2$, fEs , $fmin$) and monthly medians of two factors ($h'Es$, $h'F$), daily Summary Plots and monthly medians plot of $foF2$.

a. Characteristics of Ionosphere

$foF2$	Ordinary wave critical frequency for the $F2$ layer
fEs	Highest frequency of the Es layer whether it may be ordinary or extraordinary
$fmin$	Lowest frequency which shows vertical ionospheric reflections
$h'Es$ $h'F$	Minimum virtual height on the ordinary wave for the Es and F layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

- A Impossible measurement because of the presence of a lower thin layer, for example Es (for $foF2$).
- C Impossible measurement because of any failure in observation.
- G Impossible automatic scaling because of too small ionization density of the layer (for fEs).
- N Impossible automatic scaling because of complex echoes.
- Blank No digital record because of trouble in the automatic data processing system, but existence of film record.

c. Definitions of the CNT, MED, UQ and LQ

Median count (CNT) is the number of numerical values from which the median has been computed. In addition to numerical values, the count may include a descriptive letter G.

Median (MED) is defined as the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of

values.

Upper quartile (UQ) is the median value of the upper half of the values when they are ranked according to magnitude; the **lower quartile (LQ)** is the median value of the lower half.

If CNT is less than 10, there are blank spaces left.

d. Reliability of Automatic Scaling

The results of the comparison between automatically-scaled values and manually-scaled ones showed that hourly values of $foF2$, fEs and $fmin$ were scaled within a difference of 1 MHz from about 90, 90 and 99%, respectively of the test ionograms.

e. Summary Plot

Daily Summary Plots which are made from quarter-hourly digital ionograms are published to present general ionosphere conditions. The upper and middle parts of a Summary Plot show the diurnal variation of the frequency range of the echoes reflected from the F and E regions, respectively. The two solid arcing lines indicate the predicted values of fxE and foE calculated by the method described in the CCIR report 340. The lower part shows the diurnal variation of the virtual height where the echo traces become horizontal.

A2. Manual Scaling

The published data consist of tabulations of hourly values of the ionospheric characteristics and figures of daily f -plot.

All symbols and terminology in the tables or figures of ionospheric data are used in accordance with the "URSI Hand-book of Ionogram Interpretation and Reduction (Second Edition) 1972" and its revision of chapters I-4, published in July 1978.

a. Characteristics of Ionosphere

fxl	Top frequency of spread F trace
$foF2$ $foF1$ foE $foEs$	Ordinary wave critical frequency for the $F2$, $F1$, E and Es including particle E layers, respectively
$fbEs$	Blanketing frequency of the Es layer, e.g. the lowest ordinary wave frequency visible through Es
$fmin$	Lowest frequency which shows vertical ionospheric reflections
$M(3000)F2$ $M(3000)F1$	Maximum usable frequency factor for a path of 3000 km for transmission by $F2$ and $F1$ layers, respectively
$h'F2$ $h'F$ $h'E$ $h'Es$	Minimum virtual height on the ordinary wave for the $F2$, whole F , E and Es layers, respectively
Types of Es	See below b. (iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replace a numerical value on the monthly tabulation sheets, if necessary.

- A** Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.
B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.
C Measurement influenced by, or impossible because of, any non-ionospheric reason.
D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.
E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.
F Measurement influenced by, or impossible because of, the presence of spread echoes.
G Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.
H Measurement influenced by, or impossible because of, the presence of a stratification.
K Presence of particle *E* layer.
L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
N Conditions are such that the measurement cannot be interpreted.
O Measurement refers to the ordinary component.
P Man-made perturbations of the observed parameter; or spur type spread *F* present.
Q Range spread present.
R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
S Measurement influenced by, or impossible because of, interference or atmospheric.
T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
V Forked trace which may influence the measurement.
W Measurement influenced or impossible because the echo lies outside the height range recorded.
X Measurement refers to the extraordinary component.
Y Lacuna phenomena, severe layer tilt.
Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets, if necessary.

- A** Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.
D Greater than.
E Less than.
I Missing value has been replaced by an interpolated value.
J Ordinary component characteristic deduced from the

extraordinary component.

- M** Mode interpretation uncertain.
O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
U Uncertain or doubtful numerical value.
X Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace is indicated after the type letter.

The types are:

- f** An *Es* trace which shows no appreciable increase of height with frequency.
l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.
c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)
h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)
q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.
r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.
a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.
s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.
d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.
n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

c. Definitions of the CNT, MED, UQ and LQ

Median count (CND) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

Median (MED) is the middle value when the numerical values are arranged in order of magnitude, or the average of the two middle values if there is an even number of values.

Upper quartile (UQ) is the median value of the upper half of the values when they are ranked according to magnitude; the **lower quartile (LQ)** is the median value of the lower half.

B. SOLAR RADIO EMISSION

Solar radio observations at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of three parabolic antennas, one with 10-meter diameter for 200 MHz Measurement, one with 6-meter diameter for 500 MHz measurements and one with 2-meter diameter for 2800 MHz measurements, each being equipped with a pair of crossed doublet antennas as a primary radiator, and three appropriate receivers. Each pair of the crossed doublet antennas is used as a polarimeter. Observations are continuously carried out almost from sunrise to sunset.

B1. Daily Data at Hiraiso

The three-hourly mean and daily mean values of the solar radio emission intensities are tabulated for 500 MHz measurements. The intensities are expressed by the flux

density in $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$ unit.

The following symbols are used in the tables, when interference or radio bursts prevented measuring the base-level flux densities or determining the variability indices:

- * Measurement impossible because of interference.
B Measurement impossible because of bursts.

Daily data within parentheses mean that the observation time does not exceed one third of the period.

B2. Outstanding Occurrences at Hiraiso

The table is a list of outstanding occurrences of solar radio emission bursts observed at 200, 500 and 2800 MHz during a month.

Listed in the table are the date, frequencies, the type of event, the start time and the time of maximum, both in U.T.

expressed in hours, minutes and tenths of a minute, the duration in minutes, the peak and mean flux densities in 10^{22} $Wm^{-2} Hz^{-1}$ unit, and the polarization.

The type of event is expressed by a combination of a numerical code and a letter symbol in accordance with the "Descriptive Text of Solar Geophysical Data, NOAA" as defined by H. Tanaka in the "Instruction Manual for Monthly Report of Solar Radio Emission, WDC-C2" in January 1975:

SGD Code	Letter Symbol	Morphological Classification
1	S	Simple 1
2	S/F	Simple 1F
3	S	Simple 2
4	S/F	Simple 2F
5	S	Simple
6	S	Minor+
7	C	Minor+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts

SGD Code	Letter Symbol	Morphological Classification
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

The polarization is expressed by the polarization degree and sense as follows:

R or L	right or left-handed polarization,
W, M or S	weak, moderate or strong polarization,
0	almost zero or unable to detect polarization due to small increase of flux,
00	polarization degree of less than 1

One of the following symbols may be attached after numerical values, if necessary.

D	greater than, or later than,
E	less than or earlier than,
U	approximate, or uncertain.

B3. Summary Plots of F10.7 at Hiraiso

The 10.7 cm solar radio flux at Hiraiso is plotted over a one month period. The 10.7 cm flux ($F_{10.7}$) is determined by adjusting the 10.7 cm radio flux measured at Hiraiso to the Pentincton 10.7 cm radio flux. The figure on the right-hand side shows the $F_{10.7}$ index estimated at Hiraiso.

The following symbols are used in the $F_{10.7}$ index:

*	Measurement made not at 3h U.T..
B	Measurement affected by bursts.

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

The phase values of eight OMEGA radio signals as received at Inubo are depicted for an interval of one month, along with the phase deviation defined as a deviation from a value averaged over the six quietest day within the month. Particulars of the received signals are given in the table below.

In each of the four panels of the figure, the phase (ϕ) is shown in the lower part and the phase deviation ($\Delta\phi$) is shown in the upper part. The phase data are sampled every 30 min, so the curves of the phase and phase deviation are composed of 48 data points per day. The phase delay is measured as a positive value.

The polar cap phase anomaly (PCPA) caused by the solar protons are well detected on the Norway signal. The start, end and maximum times of the PCPA are listed in the table next to the figure, where the times are expressed as day/hour & minute in U.T.. The maximum phase deviation in the list is defined as a phase advance (negative values in the figure) in degrees.

C2. Sudden Phase Anomaly (SPA) at Inubo

Data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio waves received at Inubo. The transmitting stations are listed in the following table.

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by -, an indistinguishable record is spaced out, and a multi-peak event is marked by *. The most remarkable or distinct phase advance is underlined and listed in the column of *Time*.

In table (b) SPA, *date* indicates the day to which the *start-time* of the event belongs.

The following letters may be attached to the value, if necessary.

D	greater than,
E	less than,
U	uncertain or doubtful.

Transmitting Stations					
Name	Location (Geographic Coordinates)	Call Sign	Frequency (kHz)	Radiation Power (kW)	Arc Distance from Inubo (km)
Norway	66°25'N 013°08'E	/N	13.6	10	7820
Liberia	06°18'N 010°40'W	/L	13.6	10	14480
Hawaii	21°24'N 157°50'W	/H	13.6	10	6100
North Dakota	46°22'N 098°20'W	/ND	13.6	10	9140
La Reunion	20°58'S 055°17'E	/LR	13.6	10	10970
Argentina	43°03'S 065°11'W	/AR	13.6	10	17640
Australia	38°29'S 146°56'E	/AU	13.6	10	8270
Japan	34°37'N 129°27'E	/J	13.6	10	1040
North West Cape	21°49'S 114°10'E	NWC	22.3	1000	6990

HOURLY VALUES OF f_oF₂ AT Wakkanai

NOV. 2001

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69	47	40	42	39	44	50	91	112	147	150	150	146	146	145	137	125	119		80		95		
2		50		44	43	46		94	114	112			95	97	93	104	113	91	74	57	57			
3		48	44	59	41	46		97	127	142	140	145	140		115	125	122	115	92	52				
4		75	58	54	60	46	54	93	95	130	134	137			127	124	91		82	74	72			A
5	43	48	58	69	59	45	56	97	127	151	141	148	137	140		126		99	80	59	65			
6	70	59	50	58	52			94	116	150	148	147	123	94	95	141			78	77	70		71	
7	63		51	48	37	44		96		135	147	146		142	122	123		96	83		63			A
8	61	60	55	57	50	50	63	84	128	149	141		141		92	92	114	84		55	58			
9			37	36	35	37	55	94		127	142	145		124	131	136	114		93		70	48		59
10	69	58	48	42	42	44		94	136	134	140	140	140	126	124	126	130	84	82	64	58	56		64
11		57	57	55	60	56	54	84	94	128	141	150	127	122	125	126	114	88	80	53	69	58	50	57
12	70	52	57	59	56	54	61	79		126	135	127			95	95		98	78	85	63	58		43
13	42	52	52	58	54	60	50	94	95	116	125		104	126		100		88	74	61	72			
14	43	49	50	50	56	47		85	89	126	125	113	126				116	83	83	58	58			
15	57	69	54	69	70	49	54	93		121	137	128	124	125	125		115	114	56		48			
16	42	49	46	57	37	43	53	96	99		138	141	138	133	118	125	119	93	83		58			
17	60	58	57	58	60	56	52	95	115	139	142		100	90		125		84	55	61	56			
18	48	44	59		37	35	54	94	123	115	135	142			124	115	115	80	74	69	57			
19	49	50			56	44	53		94	143	140	144	145	127	136	132	118	93			57			
20	44	34	43	47	54	48	54		109	150	150	147		140		140	93	90	87		69	58	46	49
21	49	58	43	46	56		44	94	93	117		132	126	92	120	89	91	83	83	60	48	48		
22	69	48	47	41	43	60	47		96	115			152	120	122	98	92	84	49		48	46	52	
23	53	50	64	48	38	51		84	94		117	127	122	106	119	105	93	78	66		57	47	47	A
24	45	49	43	47	48	58	48	80	94	94	115	100	122	126		121		55		59	60			
25						A	A			115	133	136	124	124		115	83	80	83		71			
26	46	43	40		41	42		75	83	116			127	100	97	115	87	75		54	58			
27		43	38	35	40	35		54	82	95		121	82	76		91	56	60	53		38			
28	47	49	58		49	35	49	65	84	94		105	87	105	92	92	70	67	54		48			
29		45			43	47		79	93	94	92		126	124	100	98	83	64	53	59	46			
30		41	40	56	40	46	46		98	115	114	98	102	115	116	82	82	58	48	57	43			
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	27	26	24	29	27	19	25	26	28	24	23	24	23	22	28	23	27	25	19	28	9	5	5
MED	49	49	50	52	48	46	53	93	97	126	139	140	126	124	120	118	113	84	78	59	58	56	50	57
U Q	66	58	57	58	56	51	54	94	115	140	141	146	139	127	125	126	116	93	83	69	67	58	61	61
L Q	44	47	43	45	40	44	49	82	94	115	129	124	113	100	97	98	87	78	55	57	52	47	46	46

HOURLY VALUES OF fEs AT Wakkanai

NOV. 2001

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	G	G	G	G	G	G	G	G	N	G	G	G	G	G	G	28		G	G	G	G	G	
2		G		G	G	G		39	50	68	76	42	40	G	G	40	G	G	G	G	31	G	G	41	
3	38	40	G	G	26	G		G	G	G	G	G	G	G	G	41	G	G	42		60		G	48	
4	33	28	30	27	G	G	G		G	G	42	43		G	G	G	39	32	G	G	26		G	G	
5	27	40	30	24	G	26	39	31	G	G	40	43	G	G		G	38	27	G	G	G	G	G		
6	26	G	37	29	G	G	G	G	G	G	G	43	G	G	G	G	30		G	G	G	G	G	G	
7	G	G	G	G	G	G		34		41	39	41		G	G		32	31	G	40			G	G	
8		31	30	G	G	G	G	G	G	G	60	G	G	G	G	G	31	G			32	71	54	62	
9	68		26	25	28	G	G		36	41	42		39	G	G	G	45	32		G	G	G		G	
10	G	G	G	G	G	G		G	33	G	G	G	40	G	G	42	G	G	G	G	G	G		G	
11		39	29	29	27	G	G	G	G	G	G	G	G	G	G	39	42	48	G	G	G	G	G		
12	G	G	G	27	G	G	G	G	G		40	46	G		G	32	29		G	G	G	G	G	G	
13	G	G	G	G	G	G	G	G	G	G	G		G	39	36	G		44			G	G		G	
14	G	G	28	29	G	G	G	G	G	G	G	44	G				G		G	G	G	G	G	G	
15	G	G	G	G	G	25	G	G	G	G	G	72	42	G	43		32	33	G	G	G	G	G	G	
16	G	30	G	G	G	G	G	G			43	G	G	G	G	G	44	32			G	G		G	
17	26	27	28	25	G	G	30	G		G	G	G	G			40	32	G	G	G	G	G	G	G	
18	G	27	28	33	26	G	G	G	G	N	G	53	42		G	G	28	42	49	48	29	G	G	G	
19	G	28	32	40	75	G	28	72	59		64	62	G	67	41	33	60							G	
20	G	26	36	31	25	G	27	G	G		40	45	42	G	64	46	40	32	43		G	G	G	G	
21	G	G	G	G	G		G	G	G	G	G	G		G			48		32	49	32	48		G	
22	G	G	27	24	G	G	G		G	G		42	39	G	G	G	G	G	G		54	G	G	G	
23	G	G	G	G	G	G	G	G	G			G		G	G	G	G		G	G	G	G	G	G	
24	G	G	G	G	G	G	G	G			44	40	63	G		G	G	25		G	G			27	32
25						38	48	59		62	G	G	G		G		G	G	G		G	G	G	G	
26	G	27	G	G	G	G	G	G	G	G		G	G	42	37	G	G	G		G	G	G		G	
27	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G		28	G	G	G	G	G	G	
28	G	G	G	G	G	G	G		G	G		G	G	G		G	G		G		G	G	G		
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		44		31	G	G	G	G	
30		G	G	G	G	G	G		G	G		41	41	G	G	G	G		G	G	G	G		G	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	25	28	28	29	29	28	26	25	26	26	25	29	27	25	26	27	27	23	20	21	29	25	23	27	
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	25	G	G	G	G	G	G	
U Q	13	27	28	27	G	G	G	G	G	40	42	43	39	G	G	39	38	33	G	G	G	G	G	G	
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Wakkanai

NOV. 2001

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	17	20	20	20	20	20	15		17	20	20	22	23	18		27	22	18		16	21	18	15	
2		18		17	20	20		18	22	23	32	34	23	21	22	17	20	16	16	16	16	28	17	16
3	15	17	20	16	18	20		23	18	21	21	20	20	20	18	17	21	15	14	14	17	15	17	17
4	17	15	16	20	20	18	17	21	20	23	20	23		20	17	15	15	18	18	16	17	18		32
5	20	17	16	18	16	20	15	15	17	17	18	18		20		16	15	15	16	15	20	15	18	
6	15	18	16	15	18	17	15	23	17	18	20	20	23	20	17	18	17	15	16	17	20	20	16	18
7	20	20	20	17	21	20		15		16	17	22		20	20	15	15	15	17		15		16	18
8	18	16	15	15	16	17	16	16	17	17	17	18	20	21	18	27	15	15		14	18	16	15	18
9	15	15	18	17	16	16	14	15	17	20	20	20	20	20	16	18	15	15	15	14	20	18		18
10	20	20	21	15	20	18		26	16	17	23	21	20	17	17	16	21	15	15	15	17	17		16
11		16	15	18	17	16	15	15	17	18	20	20	16	18	16	15	15	17	17	17	18	20	17	16
12	17	15	17	17	17	20	15	23	18	21	18	18	21		16	16	16	15	15	16	20	15	20	18
13	18	20	15	16	20	18	15	18	17	18	20		18	17	17	17		15	15	15	18	18		23
14	16	17	17	18	18	20	15	17	16	20	20	21	20				20	15	15	14	18	28	18	
15	17	16	15	15	17	18	16	23	18	18	20	21	18	17	15		15	15	15	15	17	17	21	18
16	18	17	18	20	18	20	15	23	17		20	20	18	18	16	15	15	15	15	15	16		24	17
17	15	17	16	15	17	16	16	16	21	18	20	21	20	20		18	15	15	15	15	17	18	16	
18	17	20	15	17	18	20	15	21	18	20	20	23	20		18	24	18	14	14	15	17	17	17	17
19	18	17	18	15	15	18	15	15	18	20	20	20	18	18	18	16	15	15			18	17	18	21
20	20	17	15	15	18	16	15	21	17	20	20	21	16	16	16	16	14	15	15		21	20	20	21
21	20	20	22	16	16		15	15	17	17	20	20	20	20	20	16	15	15	15	15	16	17	16	24
22	21	20	18	17	17	16	15		18	18	20	20	20	21	18	16	18	15	14	15	18	20	16	
23	17	18	17	21	21	18	15	22	20		22	21	18	21	16		18	15	18	15	17	16	17	17
24	15	20	17	17	20	20	15	20	16	16	17	20	20	16	18	26		15	16	15	21	20	17	15
25						18	14	15	16	18	18	17	18		17	27	18	15	14		17	20	17	16
26	18	17	18	18	17	18	14	20	15	17	18	16	17	16	16	18	18	15		15	17		20	
27	20	17	18	20	18	18	15	15	16	18		17	20	21	20	20	18	18	15	18	18		18	
28	18	17	16	18	20	20	15	20	20	21		22	20	20	18	27	17	14	15		17		32	35
29	17	20	18	20	18	16	15	20	18	18	20	22	21	20	18	24	17	15	15	15	15		22	30
30	20	17	18	21	18	15	15		32	21	24	22	21	22	30	20	20	16	14	14	17	16		
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	28	29	29	29	26	27	29	28	28	29	27	26	26	27	28	30	26	25	30	24	25	22
MED	18	17	17	17	18	18	15	20	17	18	20	20	20	20	18	17	17	15	15	15	17	18	17	18
U Q	20	20	18	19	20	20	15	22	18	20	20	22	20	20	18	24	18	15	16	16	18	20	20	21
L Q	17	17	16	15	17	16	15	15	17	17	19	20	18	18	16	16	15	15	15	15	17	16	16	17

HOURLY VALUES OF fof2 AT Kokubunji

NOV. 2001

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1MHZ TO 25MHZ AUTOMATIC SCALING

D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	57	46	43		42	48	66	108	126	150	148	150			152	138	126		114	115	97	92		94	
2	75	57	59	34	45	57		138	148	152	142	151		154	154	131	122	129	84	95	69	75	69	71	
3	59		51	53		37		114	148	154	151	139	153	150	136		122	114	94	81	81			67	
4	69		59	75	39			126	139	154	150	125	152	152	153	137	132	116	82	82	93	86	70	70	
5	54	62	56	57	48	43		113	135	171	152	152	138	141	136		116	116	94	94	93	81	69	70	
6	59	69	61	71	49	46	62	99	140	153	140	132	145	148	150	148	123	126	93	90		93		94	
7	76		62	74	54	58		132	134	151	151	151	152	150	151	143	139	117	114		92	69	68		
8	69	74	59	34		44		125	156	153	152	147	150	152	174	149	143	139	117	93	95	67	75	43	
9	30	49	43	48		39		107	133	150	146	132	154	152	149	131	126	114	83	91	95	72	60	64	
10	57	67	46	49				98	127	140	152	152	150	138	152	122		112	90		94	75	58	61	
11	73	69	58	60	49	43		104	130	131	132	133	141		151	133	124	110	93	82	95	65	70	82	
12	70	71	69		57	59		125	118	129	139	136	136	139		130	124	118	91	91	82	92	59	62	
13	70	63	59	63	63	48	60	98	124	121	133	124	133		133	131	124	119			95		58	51	
14	59	34		57				98	117	126			132	133	128	118	125		94	75	68	61	59	64	
15	48		59	48	44			97	124	127	137	131	140	152	134	126	128	125		61	58	58		48	
16			60	61		48			99	114			150	141	153	152	126	111	94			92		60	
17	59	51		49	47			97	128	146	148	155	136	153	152	137	126	109	82	80	67	70		99	
18				43				106	155	152	137	153	153	134		126	124	100	77		71	59	55		
19	50	48						105	127	125	141	138		129	155	123	119	114	86	83	69	60			
20				46		49		91		148		140	155		148	140	133	124	115	87	94	58	53		
21		59	69		39			92	104	128	132	126	136	137		124	126	96		83	70	64			
22			47	43		50		94	126	131	149		132		155	124	113	118	94	56					
23	61		49					95	117		142	129	127	122	116	116	107	115	94	95	67		57		
24					47			96	108	133		132		118	131	124	121	83	73		48				
25				34		61		122		166	174	153	140	126	121	113	98	87	82	85	70	68			
26	72	60	49	39		41		99	98	137	140	123	126	115		113	118	83	64	72	81				
27			36		35			94	106	125	133		152	116	122	117	100	81	63	57		60			
28		89			189			84	116	117		123		118	126	126		91	73	59	59		71		
29	89		59	37	38			92	114	116	126	124	123	125		126				68	64	44			
30			68			34		82	116	118	123	112	115				98	67	67	64	57	47			
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	20	16	22	21	15	18	3	29	28	29	25	26	25	24	24	27	27	27	26	24	26	23	16	15	
MED	60	61	59	49	47	48	62	99	126	137	142	134	140	138	150	126	124	114	90	82	76	68	64	64	
U Q	71	69	60	60	54	50	66	113	134	152	150	151	152	151	152	137	126	118	94	91	94	81	69	82	
L Q	57	50	49	41	39	43	60	94	116	125	135	126	132	125	132	123	118	96	82	70	67	60	58	60	

HOURLY VALUES OF fEs AT Kokubunji

NOV. 2001

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	29	28	G	G	G	G	G	32	G	G	43	G	G		G	G	31	41	38	37	29	24		G
2	31	G	G	G	27	G	G	G	G	G	G	G	G	G	G	G	52	G	G	26	28	34	54	32
3	27	32	34	G	G	G	G	G	G	55	49	G	45	50	53	G	G	30	G	36	G		G	G
4	G	45	40	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	G	G	G	G	G	36		29
6	G	G	G	G	G	G	G		G	G	G	48	G	G	G	G	G	G	G	G	G	G	G	
7	G	G	G	G	G	G	G	31	G	39	60	G	56	G	G	G	41	38	30	28	G	G	G	
8	G	G	G	G	G	G		34	G	G	G	50	42	G	G	G	G	G	G	G	G	G	G	G
9	G	G		G	G	G		31	45	G	G	G	G	G	G	52	48	G	G	G	G	G	G	G
10	G		G	G	G	G		35	G	G	48	G	G	G	G	G		G	G		G	G	G	G
11	G	G	G	G	G	G		30	G	G	G	G	61	G	G	47	40	43	G	G	G	G	G	G
12	G	G	G	G	G	G		G	G	G	G	G	G	G	G	37	G	G	29		G	G	G	G
13	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	34	G			G		G	G
14	G	G	27		G	G	G	G	G	G	G		42	45	G	57	79		G	31	G	G	G	G
15	G	G	G	G	G		G	G	41	G	50	47	53	56		G	32	38		G	G	G	G	G
16	G		G	G	G	G		G	G	G	51	55	60		G	G	G	33	G	G	G	G	33	G
17	G	G	G	G	G	G		G	G	G	G	G	G	G	47	G	G	G	G	G	G	G	G	G
18	29	G		G	G	G		G	G	G	G	G	G	G	G	43	55		40	30	27	24	G	52
19	G	G	28	45	36		G	G	G	71	50	46	51	59	72	75	61	45	G	G	G	G	G	G
20	G	32	G	G		G	G	G	G	G	G	58	45	G	G	G	G	55	G	G	G	25	G	50
21	G	G	G		G		G	G	G	G	G	G	G	G	G	42	G	G		G	G	G	G	G
22	G	G	G	G	22	G	G	G	G	G	49		G	G	G	G	G	G	G	G	G	25	G	G
23	G	G	G		G	G	G	G	G	G	G	G	G	G	39	G	G	G	G	G	G	G	G	G
24	G	G	G	G	G	G		G	G	G	52	43	G	G	G	G	G		G		G		33	G
25	G		G	G		G	38	43		G	54	47	43	G	G	G	32		40	G	G	G	G	G
26	G	G	G	G	G	G		34	G	G	52	G	G	G	G	G	G	G	G	G	G	29	G	G
27	G	G	G	G	G	G		G	43	G	G	G	G	G	G	G	G	G	29	G	G	G	G	G
28	G	G	G		G	G	G	G	G	G	G	G	G	G	G	41		G	G	33	G	26	G	G
29	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G				33	G	G	G	G
30	G	G	G	G	G	G		G	G	G	G	G	45				G	103	G	G	G	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	27	29	25	27	28	28	27	29	29	30	28	29	28	26	29	27	25	26	27	30	25	28	26
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	31	G	G	48	46	45	G	G	41	40	38	G	28	G	24	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

NOV. 2001

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1MHZ TO 25MHZ AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	14	13	13	14	17	13	14	18	20	14	15		18	17	13	13	14	13	13	14		14
2	14	14	13	18	14	13	18	14		20	42	26		17	14	17	14	13	15	14	15	15	14	14
3	13	13	13	13	14	20	17	18	14	15	15	17	18	18	15	17	15	14	15	13	15		13	14
4	13	14	13	14	13	14	15	18	15	18		43	23	21	18	18	18	13	13	14	13	14	13	13
5	13	13	13	13	13	14	17	13	15	15	22	21		24	20	18	17	14	13	14	13	13	14	13
6	13	14	14	13	13	14	14	18	15	13		14		30	20	17	24	14	14	15	14	13	13	14
7	17	13	14	14	14	14	15	18	15	18	20		25		42	17	15	14	13	13	14	14	13	
8	14	13	14	14	15	13	15	14	17	15	17	17	21		15	20	25	14	13	14	13	13	14	13
9	14	13	14	14	13	14	15	14	17	15	15	40	42	39	20	17	14	13	13	14	13	14	14	13
10	14	14	13	14	14	13	15	14	15	18	22		18	14	17	14		15	14		14	13	13	13
11	14	13	14	13	13	15	15	15	14	17	20	22	31	28	20	14	13	13	13	13	13	13	14	13
12	13	14	14	13	13	14	14	15	18	15	18		29	15	17	15	15	13	13	14	14	13	18	13
13	13	13	13	13	13	13	14	14	15	17	17	17	18	13	15	14	15	14			14		13	14
14	14	14	14	13	15	18	14	18	15	15	20		18	20	15	13	14		13	14	13	14	14	13
15	13	13	13	13	14		15	13	14	15	20		24	14	20	14	14	15		14	13	15	15	14
16	13		13	13	14	13	13		20	22	14	20	20	15	20	13	13	14	15	13	13	14	14	15
17	13	14	15	13	14	14	15	15	14	15	15	18	14	14	15	15	14	18	13	17	13	15	14	13
18	13	14		15	13	14	15	18	13	14	13	15	15	15	18	18	14	14	14	13	13	13	14	13
19	14	14	14	14	14	13	15	13	20	21	17	15	20	15	13	13	15	13	13	15	14	13	14	13
20	14	14	13	13		17	20	14	15	14	14	20	15	14	15	13	18	14	13	13	13	15	13	13
21	13	15	13		13	14		14	18	15	14	15	15	13	21	13	14	14		14	14	13	13	
22	14	14	13	15		14	13	15	13	20	17		15	22	21	15	15	15	14	14	13	15	15	21
23	17	14	13		18	21	17	25	18	47	44	21		20	13	15	17	15	14	15	13		14	15
24	13	13	14	13	13	13	18	20	15	14	20	17	15	15	20	18	14	14	13		13		13	
25	18		13	13		13	13	14		18	22	23	15	15	13	17	13	15	13	15	13	13	14	17
26	13	13	14	13	15	14	18	22	14	18	21	15	21	14	13	20	20	18	13	13	13	15	14	14
27	14	18	13	13	15	14	15	13	18	17	20	15	13	18	15	21	13	13	13	15	14	13	17	13
28	14	13	13		13	18	21	13	17	20	23	17		17	15	17		14	13	13	14	15	15	14
29	14	14	13	14	14	20	14	24	18	20	14	31	18	18						14	13	14	14	14
30	18	13	14	13	14	14	14	21	18	17	20	13	13				14	14	15	15	14	13		14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	27	27	29	29	29	28	30	28	24	25	26	28	28	27	28	26	27	30	26	28	27
MED	14	14	13	13	14	14	15	15	15	17	20	17	18	16	17	17	14	14	13	14	13	14	14	14
U Q	14	14	14	14	14	14	17	18	18	18	20	21	22	20	20	17	17	14	14	15	14	15	14	14
L Q	13	13	13	13	13	13	14	14	14	15	15	15	15	14	15	14	14	13	13	13	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

NOV. 2001

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1			51	48		59	58		125	165	171	152		155	174	152	138	159	159	119		115	109	94	
2	72		99	48		61	52	126	138	151	152	172	152	138	174		121	124					109	99	
3	89	70		61	61		45	87	129			153		155	173	154		146	87		109			94	
4		60	99	69	71		48	119		125	169	153	150	151	152	178	171	131	96		83	119	97	60	
5	67	60		64		40	69	88	134	159	151	149		152	155	140		134	109	109	82	88		82	
6	82	89	89	69	71	69	40	96	140	137		169	138	153	158	156	127	139	159		109	109	94	81	
7	99			72		59	67	97	155	151	154	151		152	156	152		133	93		149		109		
8	71		71	69	48	59	50	119	125	122	172	153	152		181	172	179	152	152	97	119			84	
9	71	71	45	48	48	49	49	99	116	126	153	135		150	151	154		175	119		119	89		70	
10		89	89	69	50	47	47		100			169	131	155	169	159	155	127	124			119	81	77	
11	92	89	79	72	69		58		134			151			155		120	115				109	96		
12	81	89		50	57	60		82	115	139	137	148		159	154	156		133			159	115		99	
13	116	96	96	93	80			87		125	152	161		159	169	142	121	123		99	109	81		68	
14	70		49		60	60	50		105							121			109	81			82		
15	74					40		81			159	169		138	159	140	124					81	92	81	78
16		59	C	C	C	C	C	C	C	C			119		136	139		114	109	119		109	96	99	
17	68	70	60					94	97	120		123					116	119	95		149	92	94	89	
18		99		71	60	49	57	99	119	117	179				95	169	159	159		74	109		89	69	
19		99	62	57				93		159	159			159	159		115	82	80	119	74	109	99		
20			49	51	69	69	47	99	119	151		179		155		159	115	119	109	116			99		
21				50	60		41	99					159	159			179	122	96		119	90			
22	56	32	58	48		57	58	72		149				159		149	159	151		109	109	70		43	
23	60	51	48	63	55	56	44										82			70					
24	57		58	50	50				98	93	119	119	119			114	149	119	81		109		69		
25		46	38	57			72	95	151	150	159	172	159		117		119	115		109	119		99		
26	61			48	35	38	41				119	119				153	149	124	69	92		95	78	64	
27		44	46	35	38		69	68	109		119	125				115	127	119	93	81	98		71	59	
28	49	57	49	56		49		72	92		119					149	122	115	109	94	99			58	
29				57	56	49		58		98	115					149	159	119	95		95				
30	50			58	42		59	72	119		127	115	83			109		119	109	109			89		
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	19	18	19	26	19	18	21	22	20	18	18	22	10	15	18	24	21	27	21	16	20	19	17	19	
MED	71	70	58	57	57	56	50	94	119	138	152	152	144	155	157	152	127	124	109	98	109	92	94	78	
U Q	82	89	89	69	69	60	58	99	134	151	159	169	152	159	169	157	159	139	114	109	119	109	104	94	
L Q	60	57	49	50	48	49	46	81	107	122	119	135	119	151	152	140	120	119	93	81	98	88	81	64	

HOURLY VALUES OF fEs AT Yamagawa

NOV. 2001

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D	H																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	G	G	44		G	46	G			G		48	58		44	56	62		G		28		G	15	
2			G	G	26	G	G				G		G	G	G		62	44						G	
3	G	G	G	G	G	G	G	49	G	G		G	47			57	G	G			42	44	G		
4		G	48		G		G		G	G	G	G		G			G		30	28	G		G	G	
5	G	G		G	G		G			G	G	G			G				G		G	54			
6	G		45	G	G		G	44		G	64	86	G	129	G	G	G		G				G		
7			G		G	G			50		55	G		75					32			G	G	G	
8	26	55	47		G		G	G	36	G	G	G		G		76		G	G		46		G	43	
9		G	48	G	G		G			51		G	56		52	63	36			65		G	G		
10	G			G	G	G	G		G	G	58	63	71		52	G	40		G	G		62			
11	G			G	G	G	G		48		G	G	G	G	G	G			G			G	G	G	
12			G	G	G	G	G		G	G			G		50	G	G		45	45	42		G	G	
13		G			G		G					G	G	G			60	42			47	G	G	G	
14			G	G	G	G	G			44		G	45	80	67		53		47			35			
15	G		G			G	G	48	C	G	G	G	G	76		77	G		33	65	74	35	G	G	
16	G		C	C	C	C	C	C	C	C		G	61		G	G	G		G			G			
17	42	G	G	G	G	G	G	44	G	G	G	G	G			G		56	28	47	G	G		G	
18	58	50	56	G	G	45	61		52		G	G	C	G	60	43	75		30		G	G	G	G	
19	49			47		35	26		G	79			G	G	G	43			G	G	G	45	77	44	
20	G		G	G		G	G	26		26		G	G	G	G		59	42			G	G		G	
21	48	G		45	35	G		G		G	G		44	52	51	58	G	G		G	G		G	G	
22	G	G	G	G		G			G	G		G		G		G	G		46		G		G	G	
23	G	G		G	G	G	G	G		G	G	G	G		G	G		50		G	G				
24	G	G	G	G		G	G	G	G	G	G	G	G	57		G	G			G	G	44		G	
25	G		G	G	G	26		28				G		G	G				34		G	G		44	
26		G	G	G	G	G	G		G	G		G	G	48	63	64		G	G	G	G	48		G	
27	G	60	61	G	G	G	G	G	G		G	G	G	57		G	G	G	G	G			26	G	
28	G	G	G	G	G	G	G				52	54	53		G		G		42		G		G	G	
29			44		G	G	G	G	36	G	G	G	G	G		44	41			G		G		G	
30		G	G	G	G	G	G		G		G	G	G		G					G				G	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	20	17	23	22	23	21	27	14	17	19	18	28	21	20	23	23	20	14	23	18	16	14	16	17	
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	18	32	G	G	14	G	G	G	
U Q	13	G	47	G	G	G	G	28	42	G	G	G	52	57	52	59	51	44	30	G	44	44	G	G	
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Yamagawa

NOV. 2001

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	14	14	14	14		14	14	14	14	14	24	32	14		14	14	18	14	22	16	14	14	15	14	
2	14	14	17	22	14	15	15	14		42		45	45	54	23	15	14	14	14	14	14	14	14	29	
3	15	15	14	14	14	15	14	14	21	14	44	14	30		15	18	14	14	14	17	15	14	15	14	
4	16	17	14	21	21	14		14	18		46		14	30	14	14	14	14	15	16	16	14	15	18	
5	18	15	14	15	14	20	14	14	18	14	44	32		50		26	14	14	18	15	14	14	22	14	
6	14	17	15	14	14	28	20	14	18		44		52	46	48	14	15	14	14	15	14	15		14	
7	14	15	17	16	14	14	14	14	14	14	14	51	14			15		14	14	14	14	14	14	15	
8	14	14	16	14	17	15	14	14	14		14	44	14			39	20	30	14	14	14	15	14	14	
9	15	15	21	17	15	14	14	14	18		40	14			30	18	14	14	14	14	14	14	16	16	
10	14	14	15	14	14	14	14	14	18	39	42	42	38	36	14		14	14	14	14	14	14	16	14	
11	14	14	15	14	14	20	16	14	14	26		14	44	49	14	23	14	14	15	15	16	14	14	16	
12	14	14	26	14	16	14	16	14	14	14	27		45		14	22	14	14	14	14	15	14	14	14	
13	14	14	15	22		14	20	14	18	14	46	42			38	18	14	14	14	14	14	26	14	14	
14	14	14	15	14		15	14	14	14	14	14	14	14	39	14	14	14	14	14	14	14	14	14	14	
15	14	14	14	14	14	18	14	15	C		14				35	32	16	14	15	14	14	15	14	14	
16	16	14	C	C	C	C	C	C	C	C	53	51	41		18		32	24	18	30	16	23	14		
17	14	14	21	18	14	20	22	28	34	44	51	55					35	14	14	14	26	24	21	15	
18	14	14	14	17	15	14	14	28	30				C		40	26	18	14	14	55	16	14	14	20	
19	14	16		14	16		15		29	36					22	14	36	14	14	26	15	15	16	14	
20	23	20	27	15	21	14	14		32							26	21	24	14	15	14	14	17	14	
21	14	15	17	14	15	16	14	26	18	21		38	40	37	38			14	14	18	23	20	14	14	
22	15	14	16	14	14	15	16	24	34	36			39		24			14	14	15	15	15	15	15	
23	15	15	14	15	16	14	15	21	44	62	55	55		49	42	18	18	15	16	14	14	20	17	14	
24	18	18	26	15	15	18	18	26	29	34				39	49	18	17	14	21	14	15		22		
25		16	14	16	22	16	14	15	28	46						26		20	17	20	14	15	18	14	
26	15	16	15	14	18	21	14	16					24	27			14	27	18	21	14	17	14	16	
27	15	14	14	14	15	15	18	23	33								35	15	24	15	14	22	14	16	
28	14	14	14	16	15	18	18	23								35		14	16	14	15	14	15	15	
29	14	14	14	23	18	22	24	22		16	45	56				29	22	27	23	23	15	14	14	18	
30	14	16	14	14	16	21	22	27	15							26		14	14	14	18	28	14	18	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	30	28	29	26	28	28	27	24	18	17	16	15	11	19	23	24	30	30	30	30	29	29	28	
MED	14	14	15	14	15	15	14	14	18	24	44	42	38	39	23	18	16	14	14	15	14	14	14	14	
U Q	15	16	17	16	16	19	18	23	29	39	46	51	44	49	38	26	20	15	17	17	15	18	16	16	
L Q	14	14	14	14	14	14	14	14	14	14	19	23	14	36	14	15	14	14	14	14	14	14	14	14	

HOURLY VALUES OF foF2 AT Okinawa
 NOV. 2001
 LAT. 26°16.9'N LON. 127°48.4'E SWEEP 1MHZ TO 25MHZ AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	117	117	70	79			89		124	134	151		149	173		174		172	150	150		115		115	
2	97			C	58		59	119	169	152	153	149	173	152	173	154	151		151				152	116	
3	90	80	C		89		46	98	127	137		175	139	159			C	151	152	152					
4	122	70		70	79	89		C	133		150	153	165	173			179	175	152	154				117	
5	116	90	92	96		56	C	95	154	150		150		174			134	149	149	152				152	
6	114	116	80	82	69	59		92	140	151	110	115			C		151	150	115	159	81	100		116	
7	85	83	C	98	99	99	99	C	159	155	153	149	161			169				154			C	98	
8		111	70	C	89	89		94	132	153	150	172	149	150	174	176	181	182	139	152	152	116	151	122	
9	122	C	95	109	99	70	48		97	112	124	151	149	138	152	169	151		172					133	
10			95	95	73	45	89	98	108	125	135	142	142	150	153		154	151	152		C				
11	151	119	94	99	99	61	60	94	139	115	152	136	138	141			133	C	159		118		125	124	
12	109	109	99	69			C	C	C		126	150	155	135		154	150	162	151	151					
13	134		124	116	125	114	72				159	136	152	143		154	159	135		123	119	123		116	
14	109	109	115		89	56	45	99	126	139	132	134		151	153	136	133	130		115				134	
15		111	96	100	61		41			122	153	138	147	133	150	152	135			116	109	116	100	119	
16	115	83	94	99	99		68		109	101				155			139					132		116	
17	109	99	88				99	72	115	120	150	150	148			142		152	149						
18	119	96	99	96	89	56	54	94	126	117	141	133	138	148	141	152	143	139	116	133	139			115	
19	116	95	96	76	71	79		96	124	152	133	140	130		141	153	151		159	129		132	96	98	
20	71	109	59	99	79				125	152	152	152	152	152	150	142		157	159	127	116		99	109	
21			58	59	59			89	124	C		149	142	126	153	174	143	140	116	109	99		116	82	
22		99	99	68	69	62	63	94		120	124	115	107	132	131	138	129	134						94	97
23	71	99	92	94	99	89	89	94	116	149		126			133	C	C	C		124		121	93	109	99
24	99	99	99	89	70		99	70	117	124	C	121	115	124			149	154	114	122	109				
25			58	62	60		95	109		151	149			139	132	122	149	115	116	109		94		119	
26	116	96	96	99	89	99	99	89	116	155	136	149	115	150	159	152			152						
27	71		72	71	48	99		70	115	115	151	123	116		115	161						159		93	
28			89	99	45				115	115	121	115	132		124	134	152	150	116	109	109	115	119	109	
29	109	78	89	79		45	69		95		159	148		133			150							109	109
30		71	89	99			99	70	114	115	159		152	130	151			149		119		92	115	71	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	22	23	26	25	24	17	19	20	25	26	24	26	23	22	18	19	20	20	20	18	11	12	15	21	
MED	112	99	93	95	76	62	72	94	124	130	150	145	142	150	150	152	150	150	150	128	116	116	115	115	
U Q	117	109	99	99	89	94	99	97	132	151	152	150	152	152	154	161	153	155	152	152	121	127	133	118	
L Q	97	83	80	73	65	56	59	89	115	120	135	133	132	133	133	142	137	139	116	116	109	97	100	98	

HOURLY VALUES OF fEs AT Okinawa

NOV. 2001

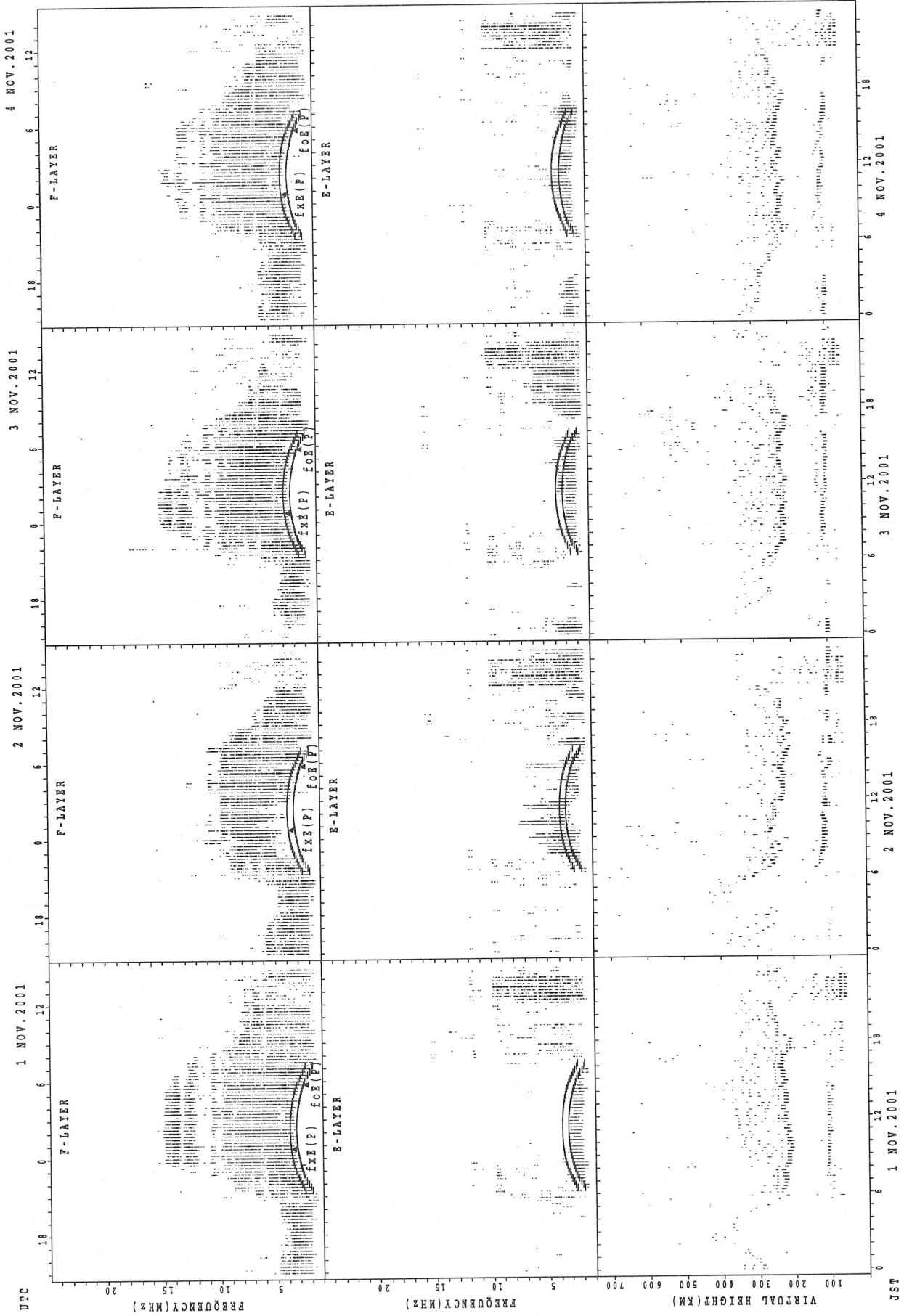
LAT. 26°16.9'N LON. 127°48.4'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		G		G	G	G	G		G	G	G	G	G	G	G	G	G		G		24					
2				C	G					G	G	G	G	G	G	G	G				50	32	G	G	G	
3		G	G	C	G	G		G	G		G		G	G	G	46	46	C		G	G			G	G	
4			G	G	G	G	G		C	G	G	G	G	G	G	G	G	G		G				G	G	
5		G	G		G			C	G	G	G		G	G	G	G	G	G	G	G				G	G	
6		G	G	G	G	G	G		G			G		G	G	C	G	G				44	G	G	G	
7			G	C			G	G	C				G		G	G							G	G	C	G
8		G	G		C		G	G	G	G	G	G	G	G	G	G		G		G			G		G	
9		G		G	G	G	G		G	G		G	G	G	G	G			G	G				G	G	
10			C	G	G	G		G	G		G	G	G	G	G	G			G				C		G	
11				G	G	G	G			G	G		G	G	G	G	G	G	C		G				G	
12			G	G	G	G		C	C	C	G	G	G	G	G	G	G	G	G		G		G	G		
13		G	G	G	G	G	G	G	G			G	G			49	48	47			G		G	G	G	
14		G		G	G	G	G	G	G		G	G	G	G							46	61			G	
15				G	G			G	G		G	G	G	G	G	G		45	62	49	48			G	G	
16		G		G				G				G	G	G	58		G	G					G	G	G	
17		G	G	G		G			G		G	G	G	G		66	G	G		G	76				G	
18				G	G			G	G	G		G	G	G	G	63							44			
19		G	G	G		G	G		G			G	G	G	G	G	G				G	G	50		48	G
20		G		G		G			G	G	G		G		G	G	G					G	36		G	
21					G		G			G	C	G	G		67	71	G	65	49	34		G	G	G	G	
22					G	G	G	G	G			G		G		G	G	G		G	G			G	G	
23		G		G	G		G	G	G			G	G	G	G	G	C	C	C	G			50	66	G	
24			G	G	G		G		G			C	G	G	G	G		75	58	G					G	
25		G	G		G	G	G	G		G	G	G	G		79	77	G	G		41					G	
26		G	G	G	G	G			G			G	G		68	G	G	G		G	G	G	G	G		
27		G	G		G	G		G	G	G	G		G	G	G	G	G			33	G	G		G	47	G
28			G		G	G	G			G	G	G	G	G	G	G	G				48		G	G	G	
29			G	G	G	G	G			G	G	G	G	G	G		G		38		49			G	G	
30				G		G		G	G			G	G	G	G	G	G			38	G		G	G	G	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		16	16	22	23	21	21	15	21	14	19	23	29	29	27	27	27	22	14	21	18	16	20	19	19	
MED		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
U Q		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	46	45	38	35	45	40	G	G	G	
L Q		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Okinawa
 NOV. 2001
 LAT. 26°16.9'N LON. 127°48.4'E SWEEP 1MHZ TO 25MHZ AUTOMATIC SCALING

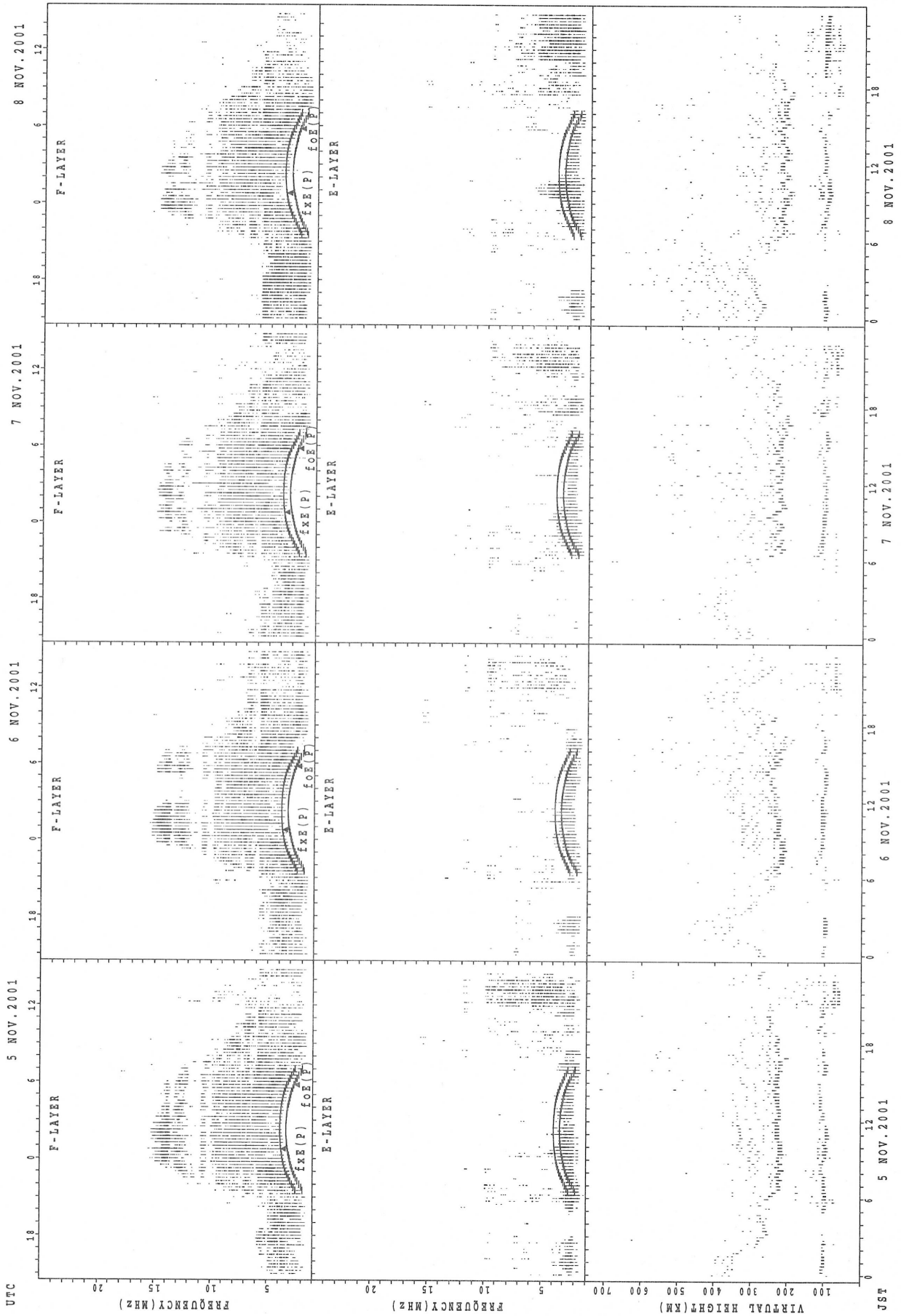
D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	18	21	16	23		33	14									27		18	20	14	18	15	17	15		
2	14	14	18	^C	17		17	24		46	55		53		47	41	42	18	14	14	14	22	18	15		
3	18	15	^C	16	21		16	27	33	38	42	45			42		^C	32	28	26	14	17	21	22		
4	16	20	17	16	22	20		^C	38	43	43			55		71		20	14	15	20	18	16	16		
5	14	21	21	16	16		^C	24	34	42			59	57				33	21	15	17	14	20	17		
6	15	21	16	21	16	15		24	34	39			61	48		43	37	29	18	14		20	17	17		
7	17	16	^C	23	16	24	21	^C	33	23			50			29	24	16	26	15	21	29	^C	14		
8	22	18	16	^C	14	21		23		45	50	58			56	40	39	28	20	14	14	16	15	14		
9	14	14	17	16		18	26	23	35	43	44	48	50	52	52	42	27	29	21	14	16	15	17	24		
10	17	^C	14	20	22	28	21	23		44						35	29	20	21	21	^C	21	24	17		
11	14	15	14	18	23	17	17	24	33		51	60	52	56	53	55	36	^C	20	14	21	15	18	14		
12	14	14	15	16	18	27	^C	^C	^C	42	44		60		45	43	51		22	20	29	22	22	21		
13	20		22		26	27	27	26	33		43	45		62	61		21	22	30	15	16	21	17	14		
14	16	18	21	21	15	15	17	23	29	39		59	56	58	49	40	32	21	15	15	16	21	14	15		
15	15	17	17	18	16		20	27		48	45		58	64	63	60	30	26	21	14		29	23	16		
16	16	14	23	24	22		21		40		45		61	57				28	30	28	30	38	41	16		
17	21		39	17			24	29	39	41		60	63		50		63		24	33	22	23	33	22		
18	28	17	20	22	29	16	15		40	45						43		29	33	17	14	17	18	16		
19	18	17	17	21		32	17	24	34					60	62	46	57	29	29	22	22		39	23		
20	29	28	18	16		15		39	35		55	58		46	44			35	14	27	28	20	22	30		
21	21	17	15	16		17	17		35	^C				44	42	36	46	21	16		36	26	28	17		
22	20	21	28	21	27	28	21	28	32		52	56						30	21	20	24	20	20	16		
23	14	16	23	18	26	16	21	28									^C	^C	^C		27	30	17	16	28	20
24	20	24	18	18	14	26	22		38	42	^C	42		58		32	27	29	24	15	17	37		29		
25		17	16		30		26		42	44	46	59	52	42	50	49	44	33	24	16			40	15		
26	29	21	17	24	26	18	20		35								38	41	28	20	23	14	20	18		
27	26		18	20	23	18	18	27		42	46	51	58	49			38	32		21	16	14	14			
28	26	16	26	15	17	26	18		34	40								21	34	22	27	20	18	21		
29	21		20	28	21		17	27	33			60	59						32	22	29	22		36		
30	29	32	20	29	14	26	18	28		42								21	26	27	33	21	17	21		
31																										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	29	25	28	26	24	22	24	19	21	19	14	13	14	15	14	17	18	25	29	29	26	28	27	29		
MED	18	17	18	19	21	20	19	26	34	42	46	58	58	56	50	42	38	28	22	17	20	20	20	17		
U Q	21	21	21	22	24	27	21	28	38	44	51	59	60	58	56	47	44	31	28	22	27	22	24	21		
L Q	15	15	16	16	16	17	17	24	33	40	44	46	52	48	45	35	29	21	20	14	16	16	17	15		

SUMMARY PLOTS AT Wakkanai



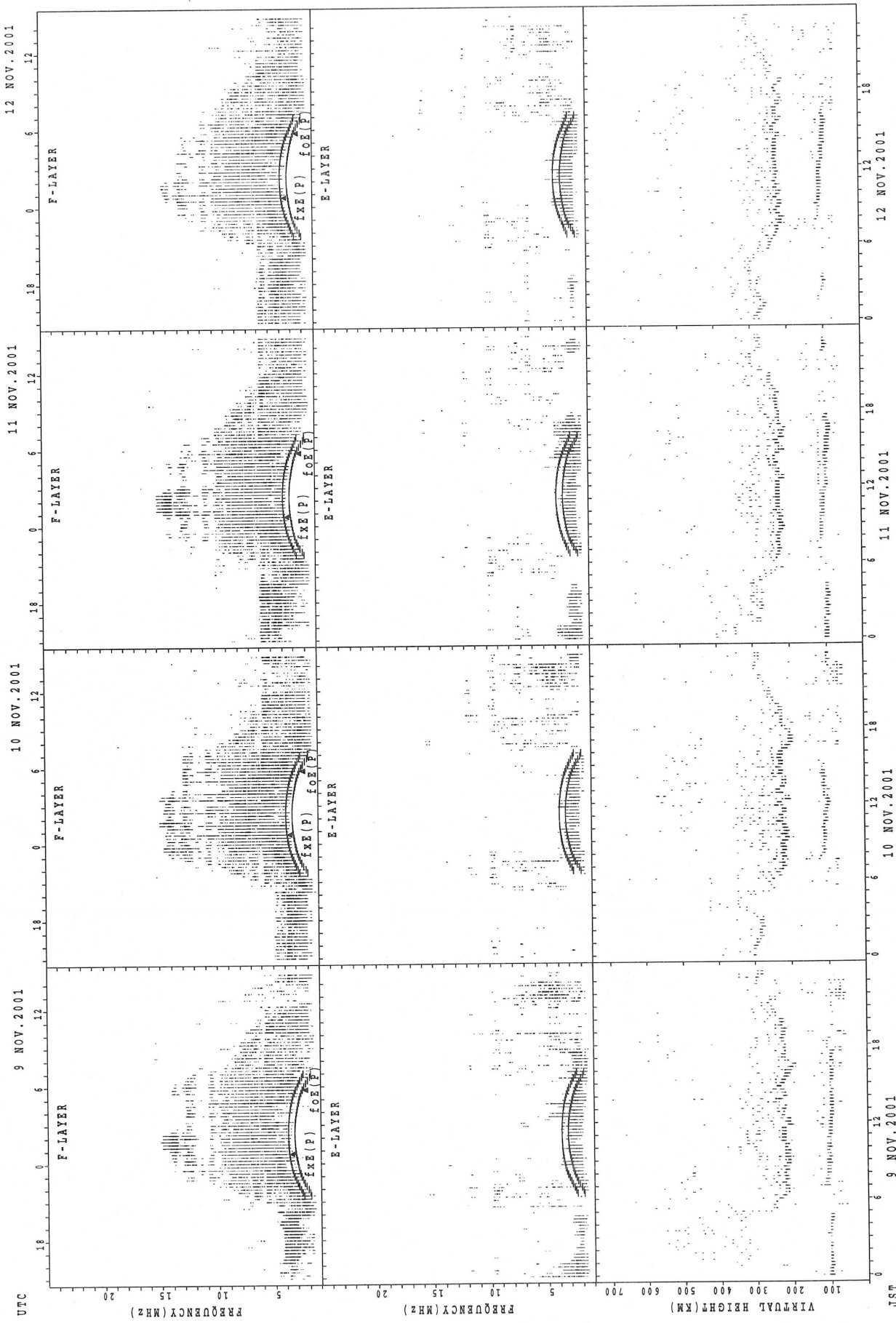
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai

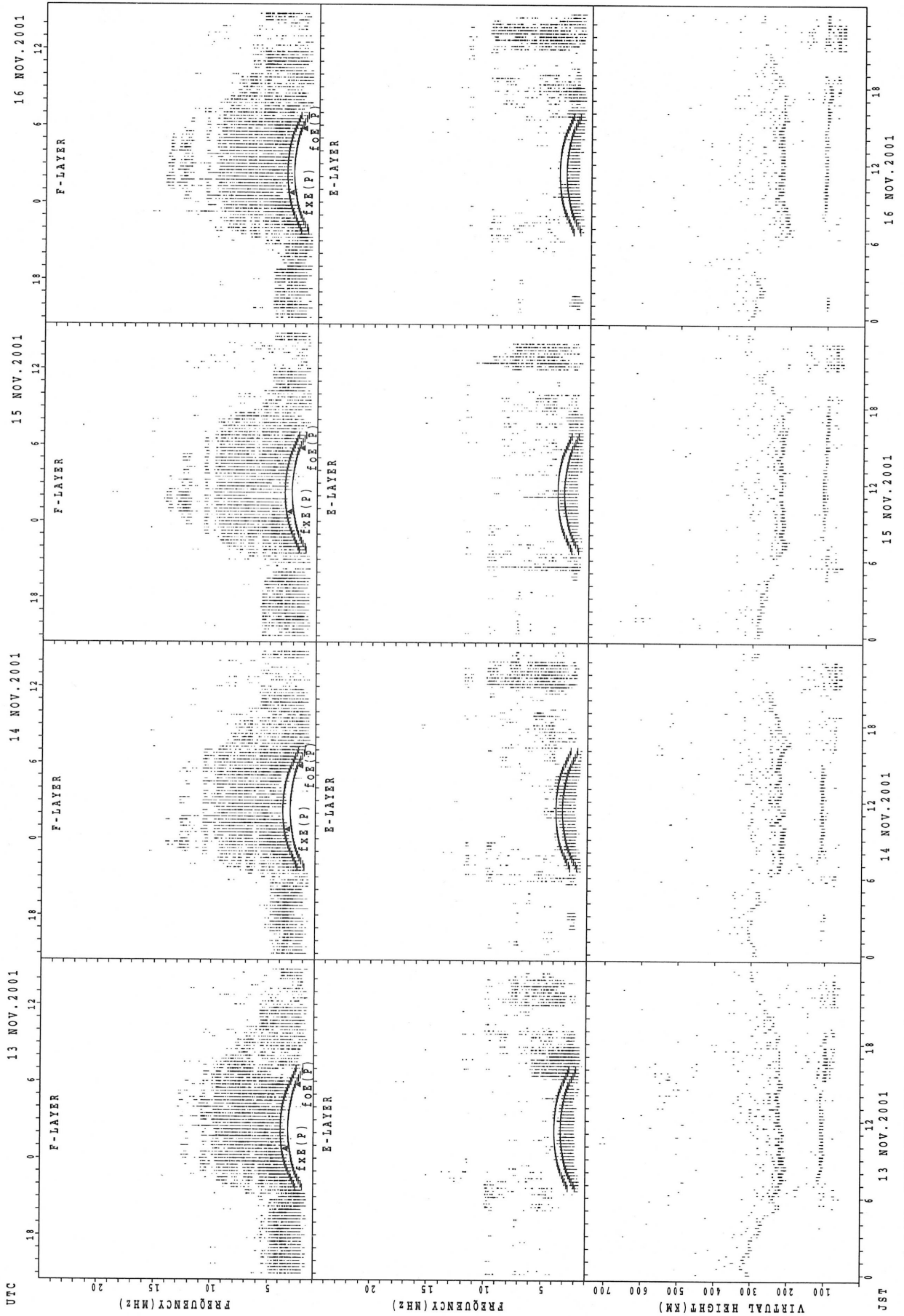


f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai

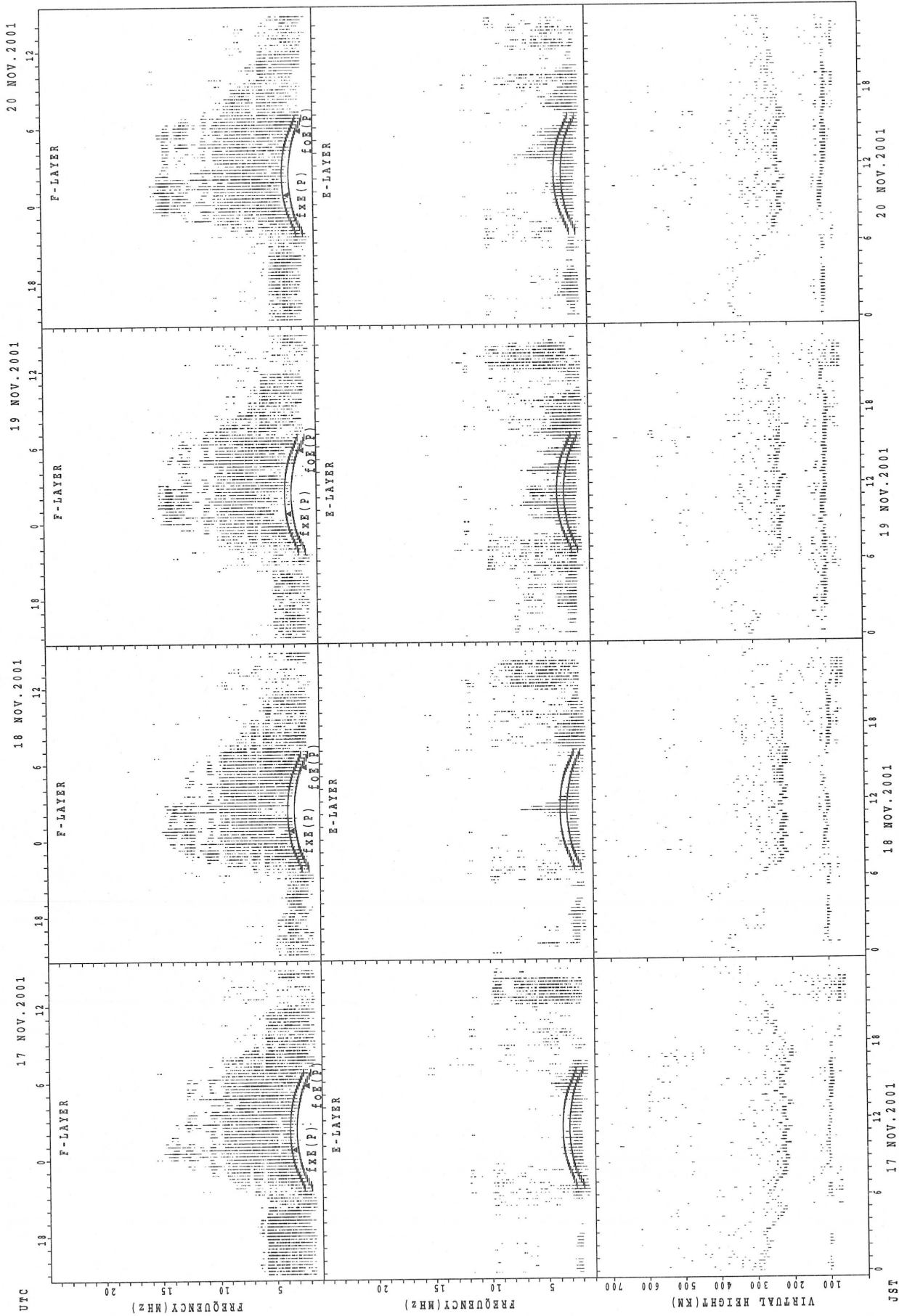


SUMMARY PLOTS AT Wakkanai



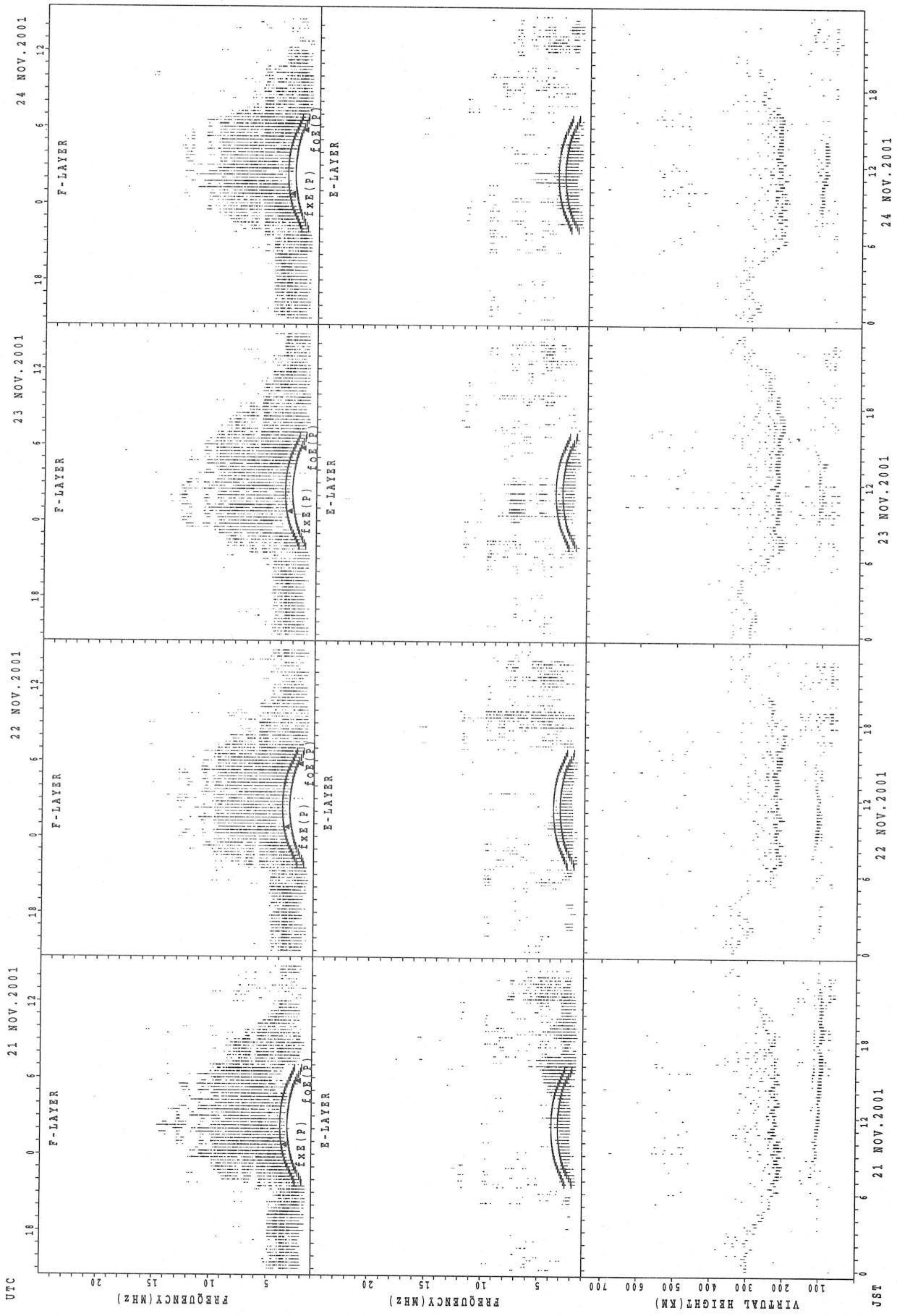
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



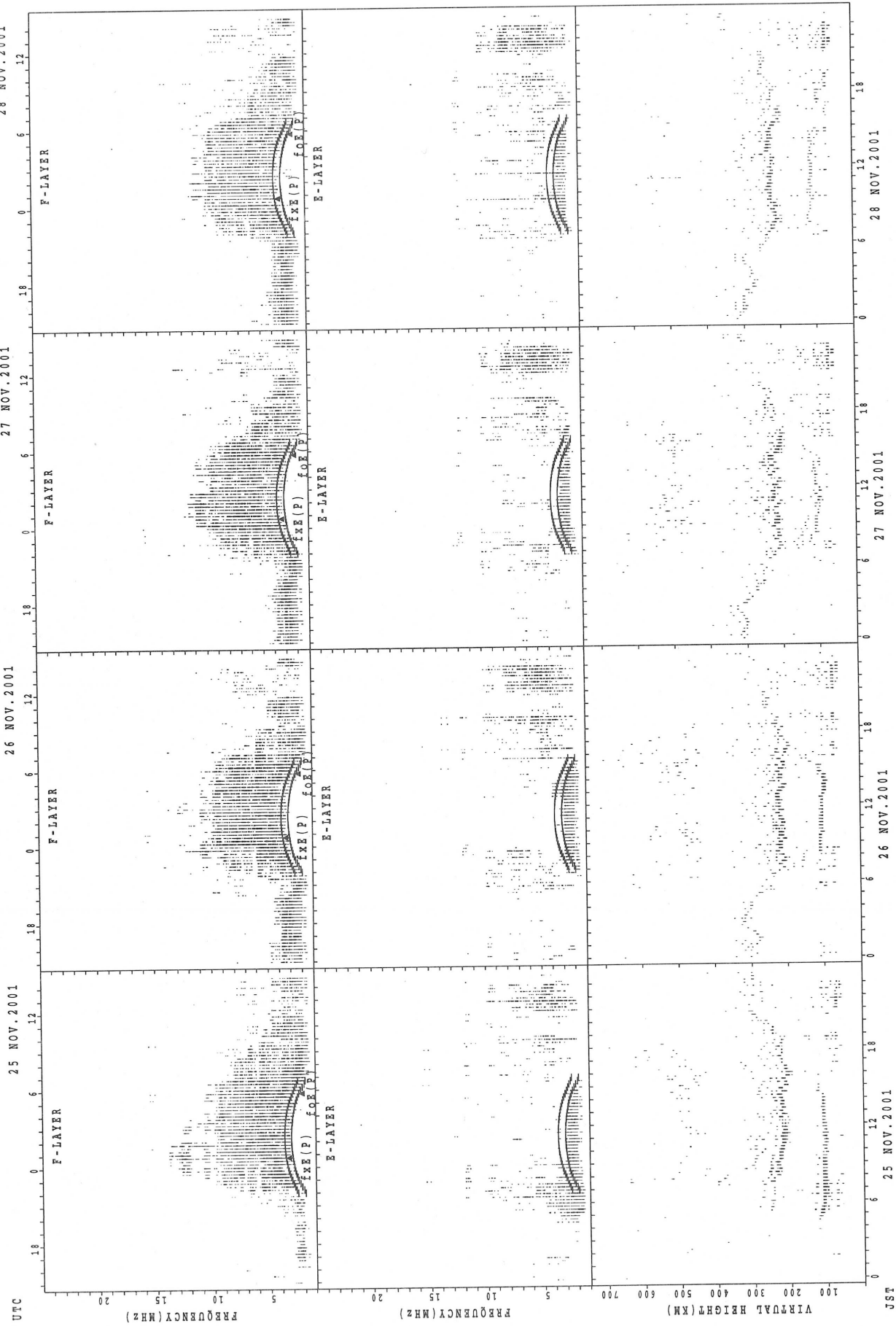
$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



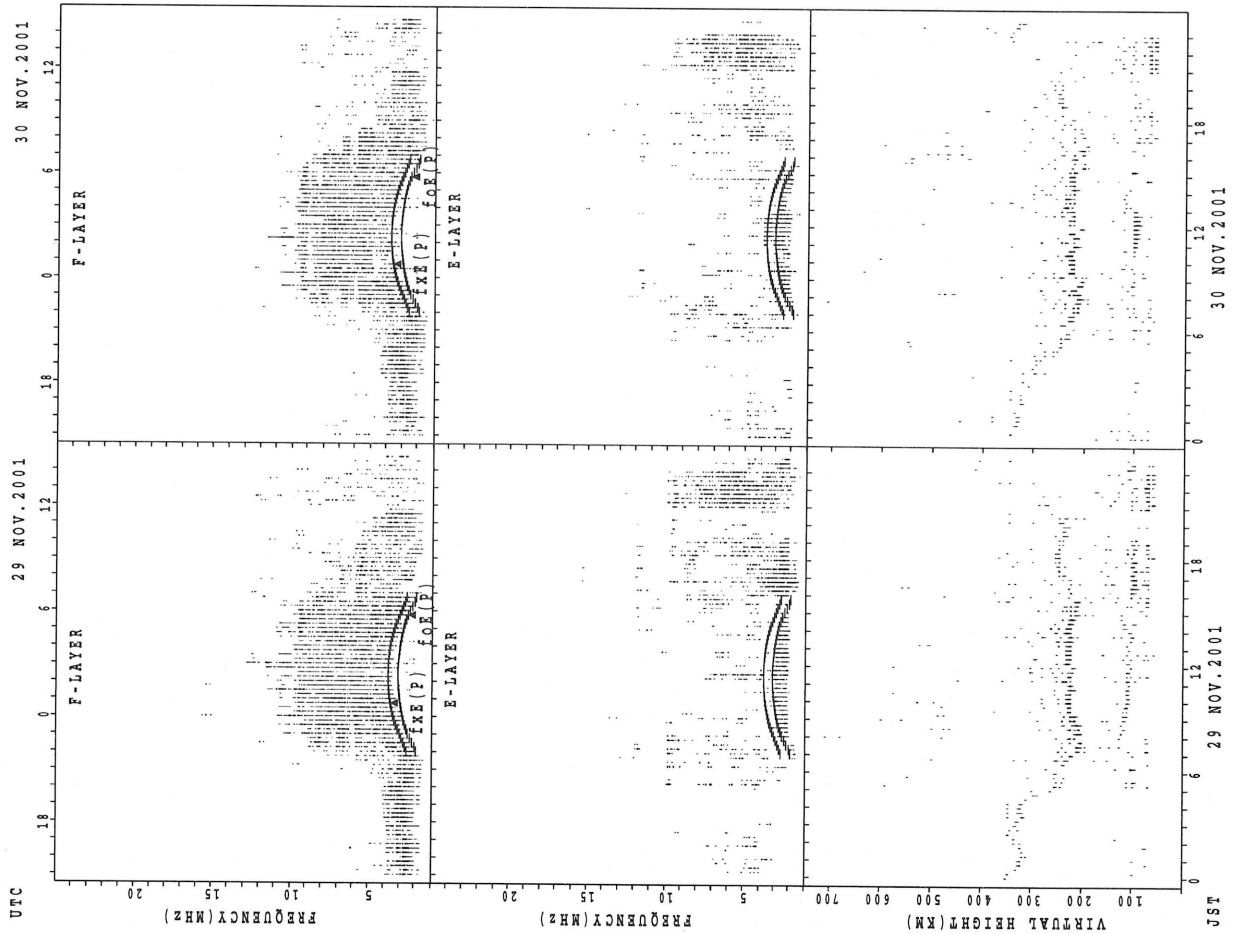
fxe(P); PREDICTED VALUE FOR fxe
foe(P); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Wakkanai



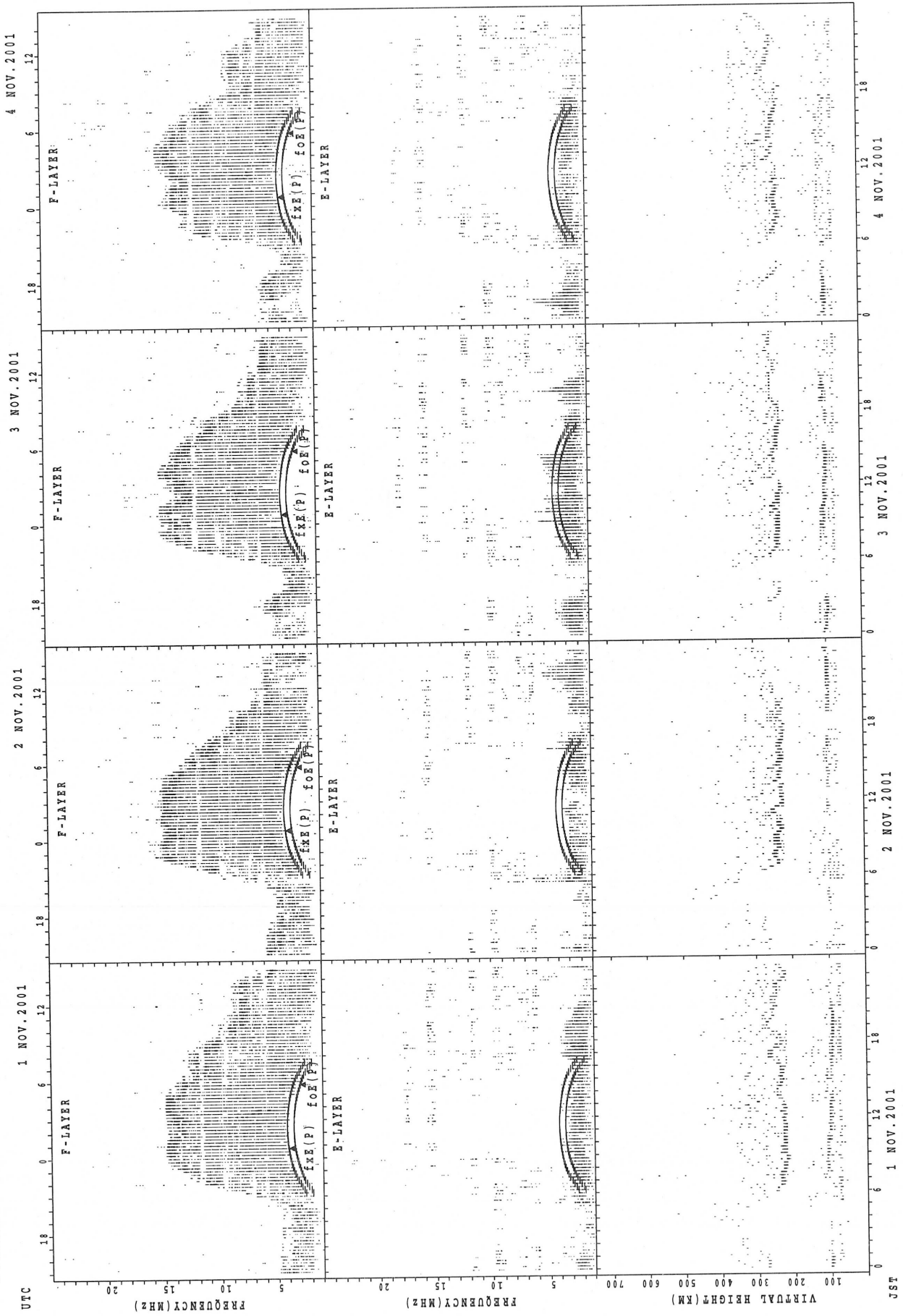
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Wakkanai



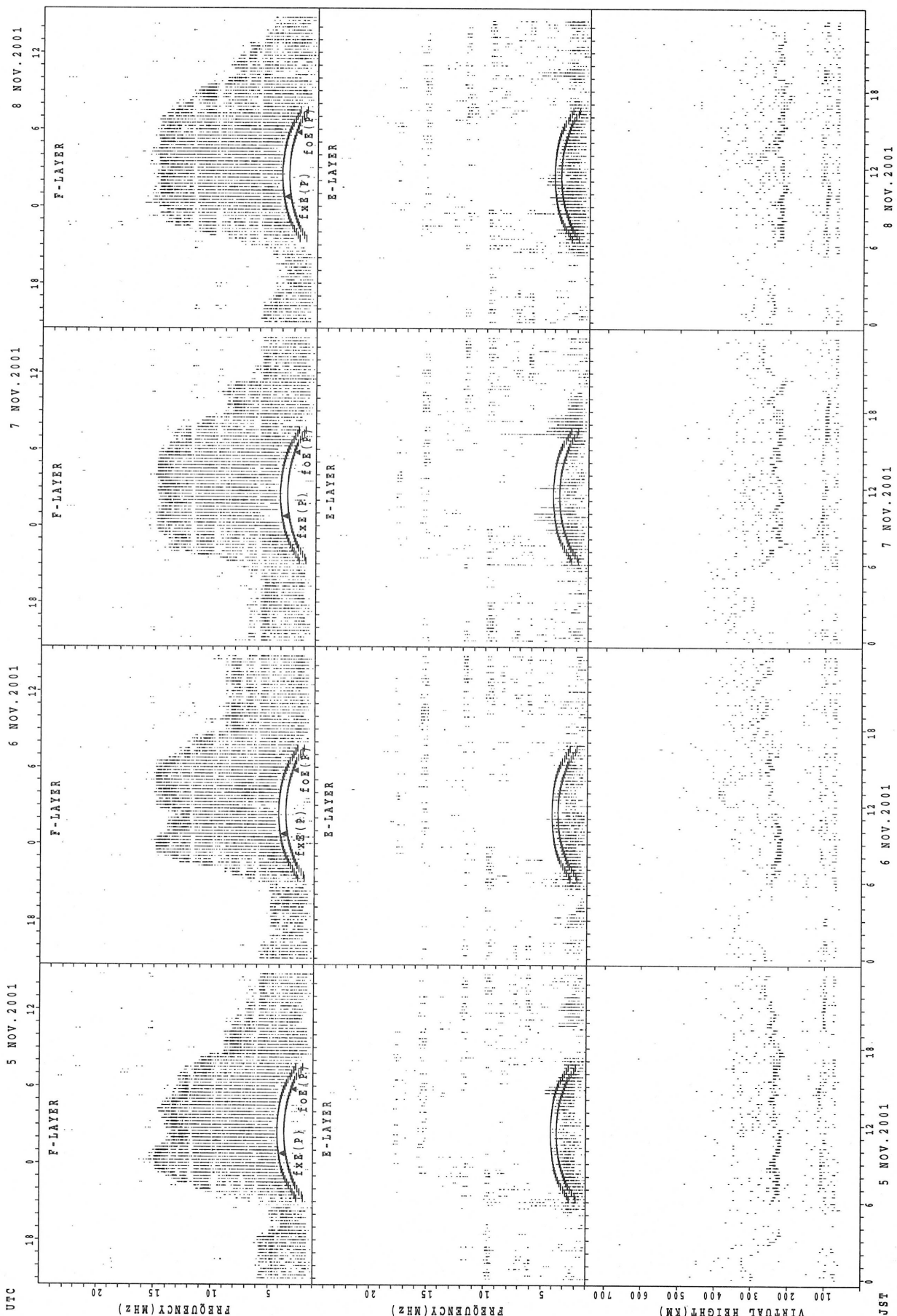
f_{xe}(P); PREDICTED VALUE FOR f_{xe}
 h'_{fof2}(P); PREDICTED VALUE FOR h'_{fof2}

SUMMARY PLOTS AT Kokubunji



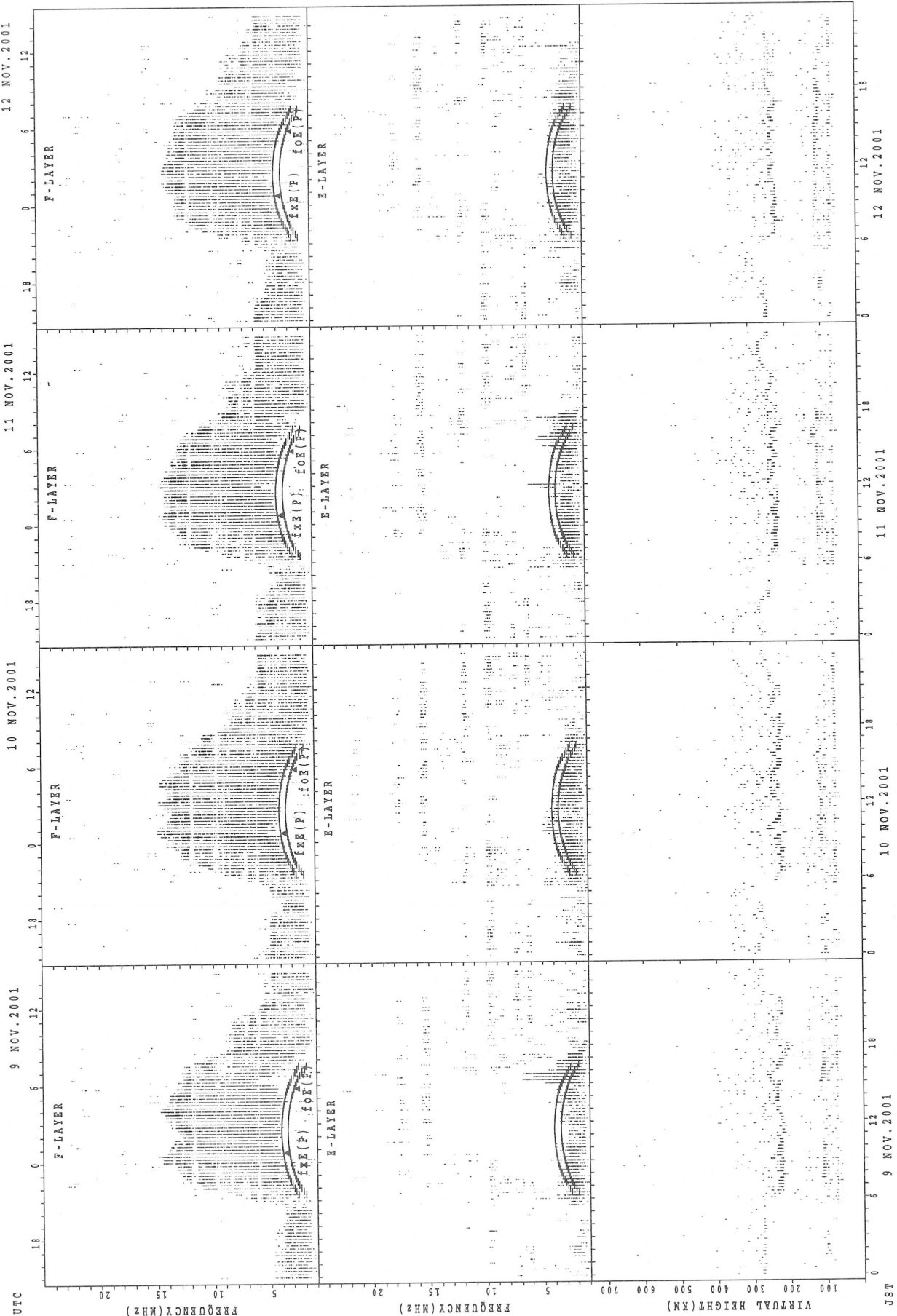
f_xE (P); PREDICTED VALUE FOR f_xE
f_oE (P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



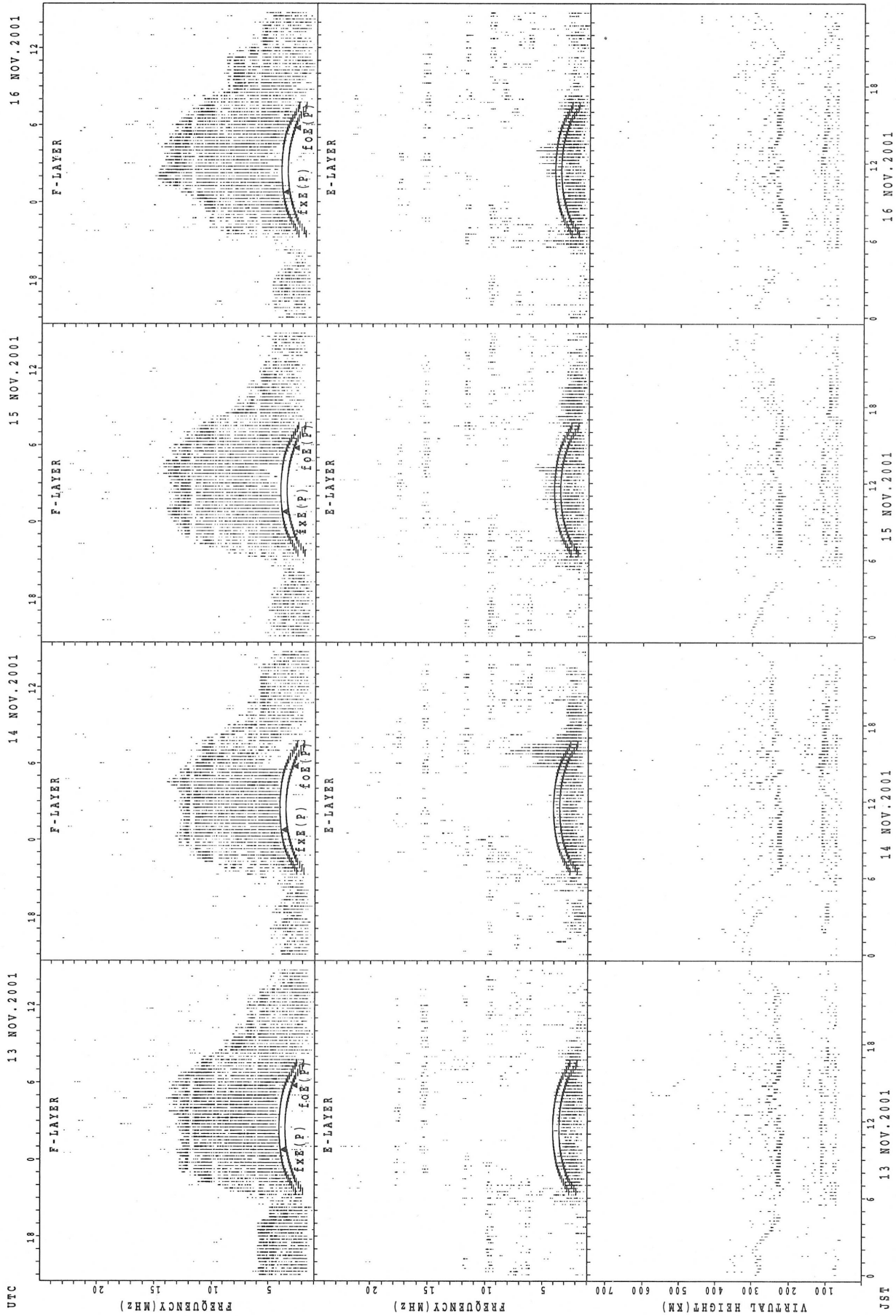
fxe(P); PREDICTED VALUE FOR fxe
foef(P); PREDICTED VALUE FOR foef

SUMMARY PLOTS AT Kokubunji



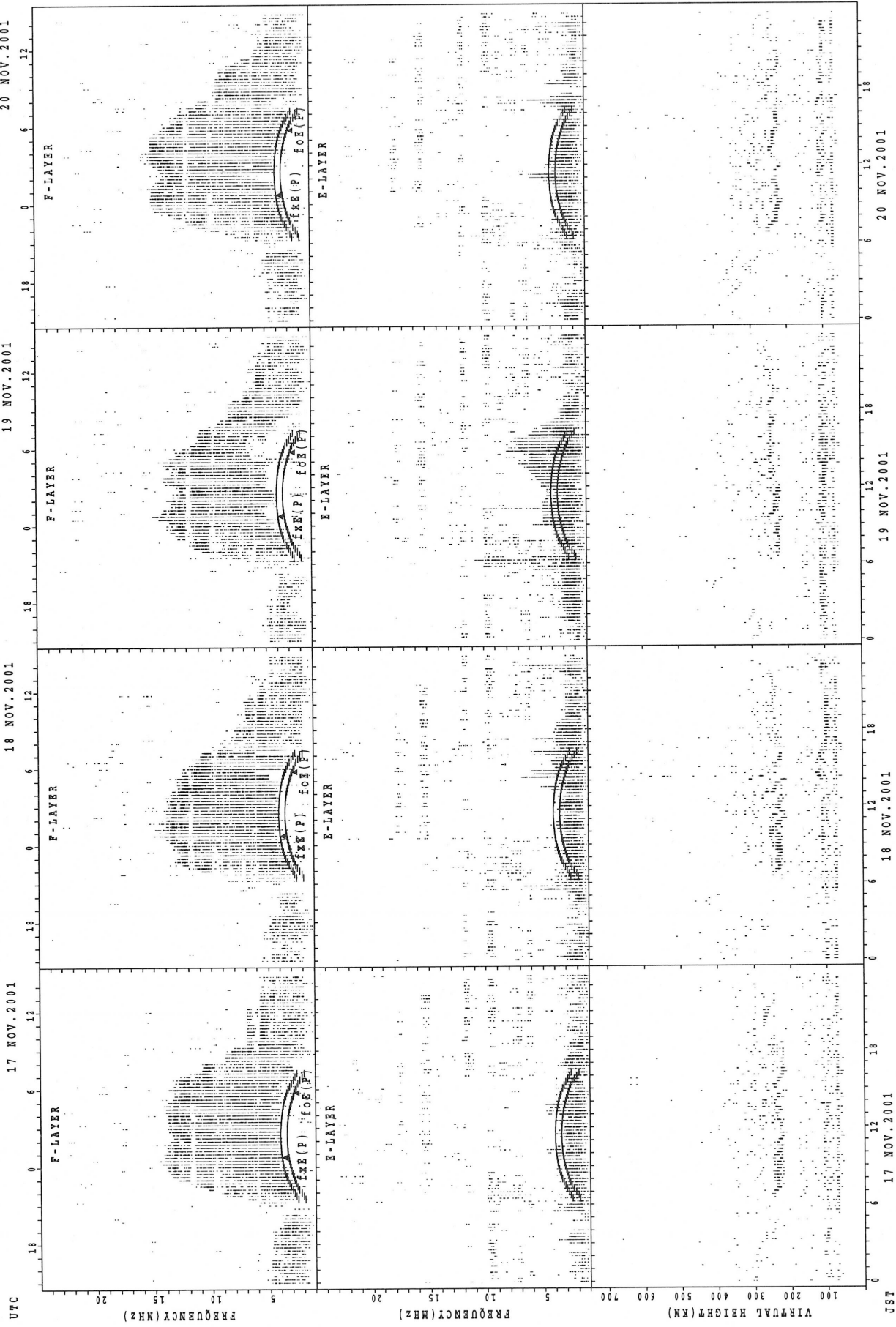
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



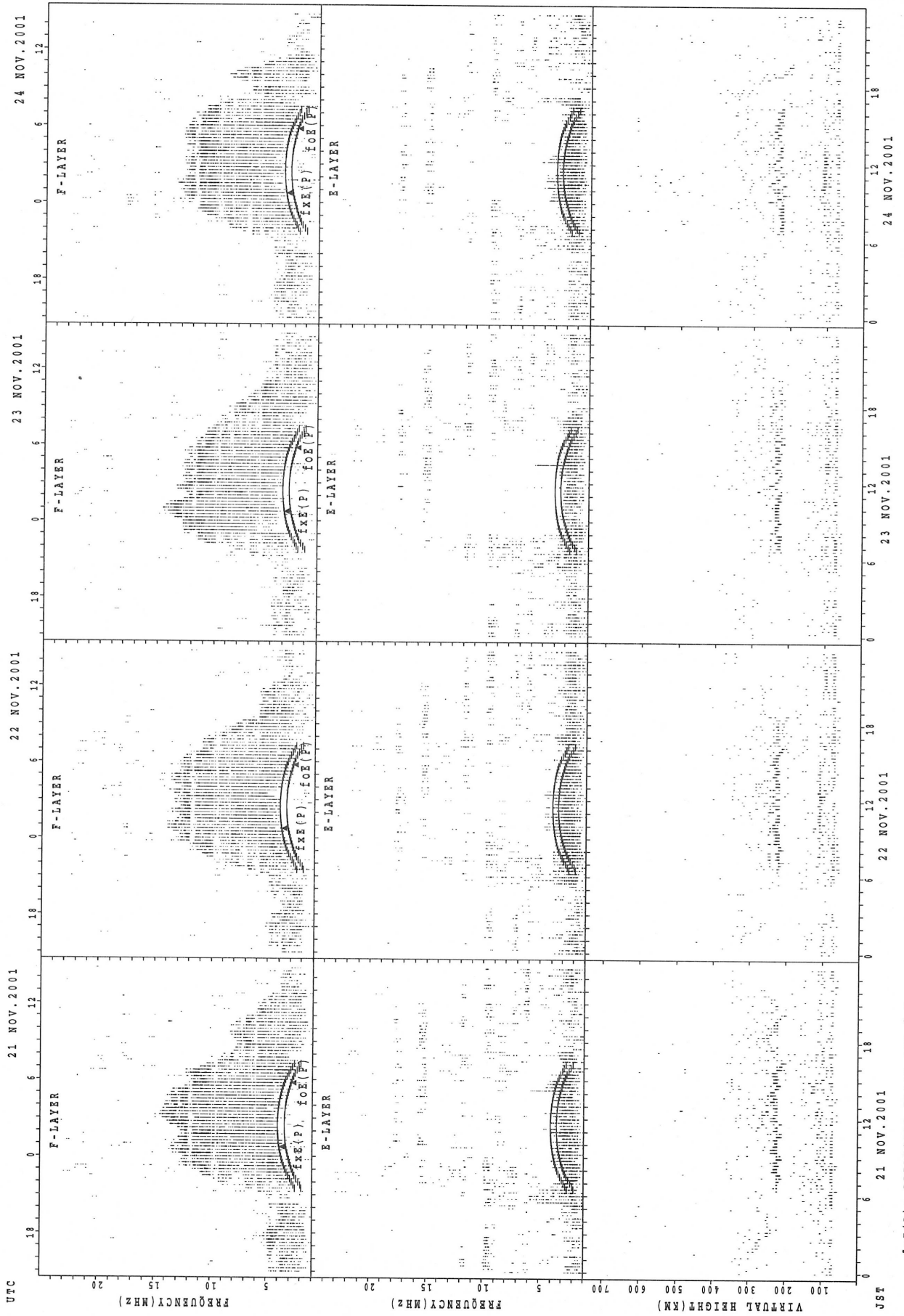
f_xE(P); PREDICTED VALUE FOR f_xE
f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Kokubunji



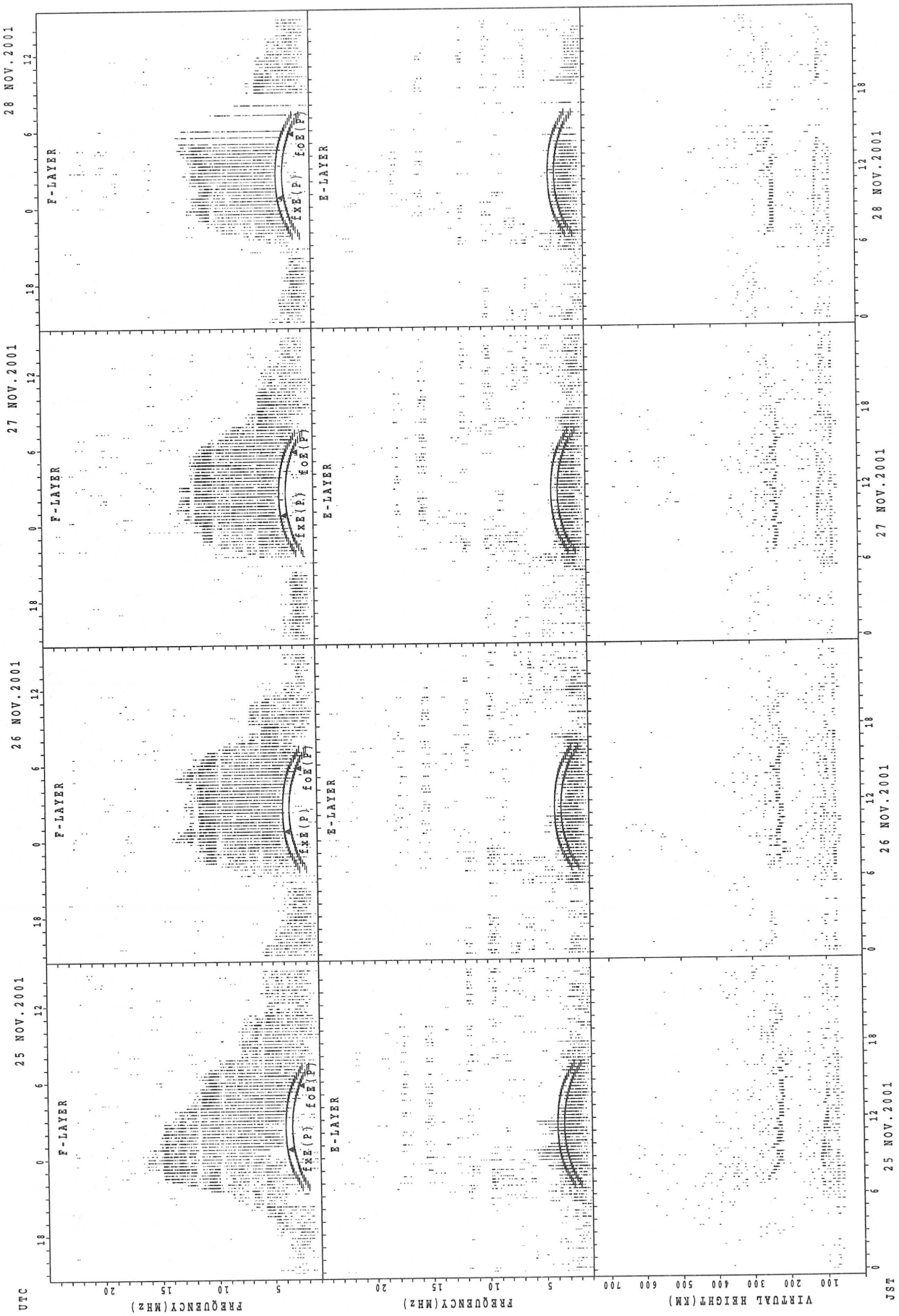
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



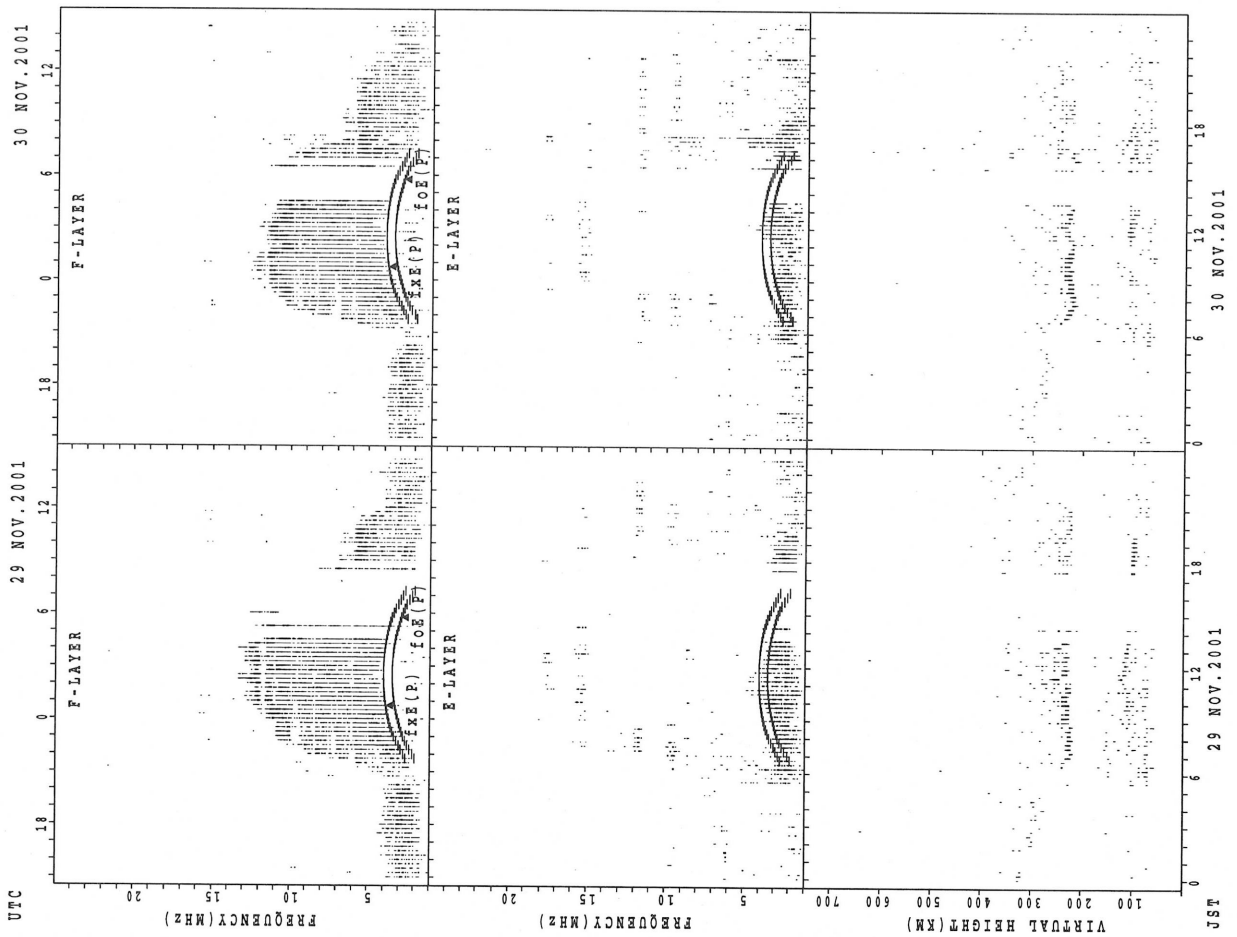
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



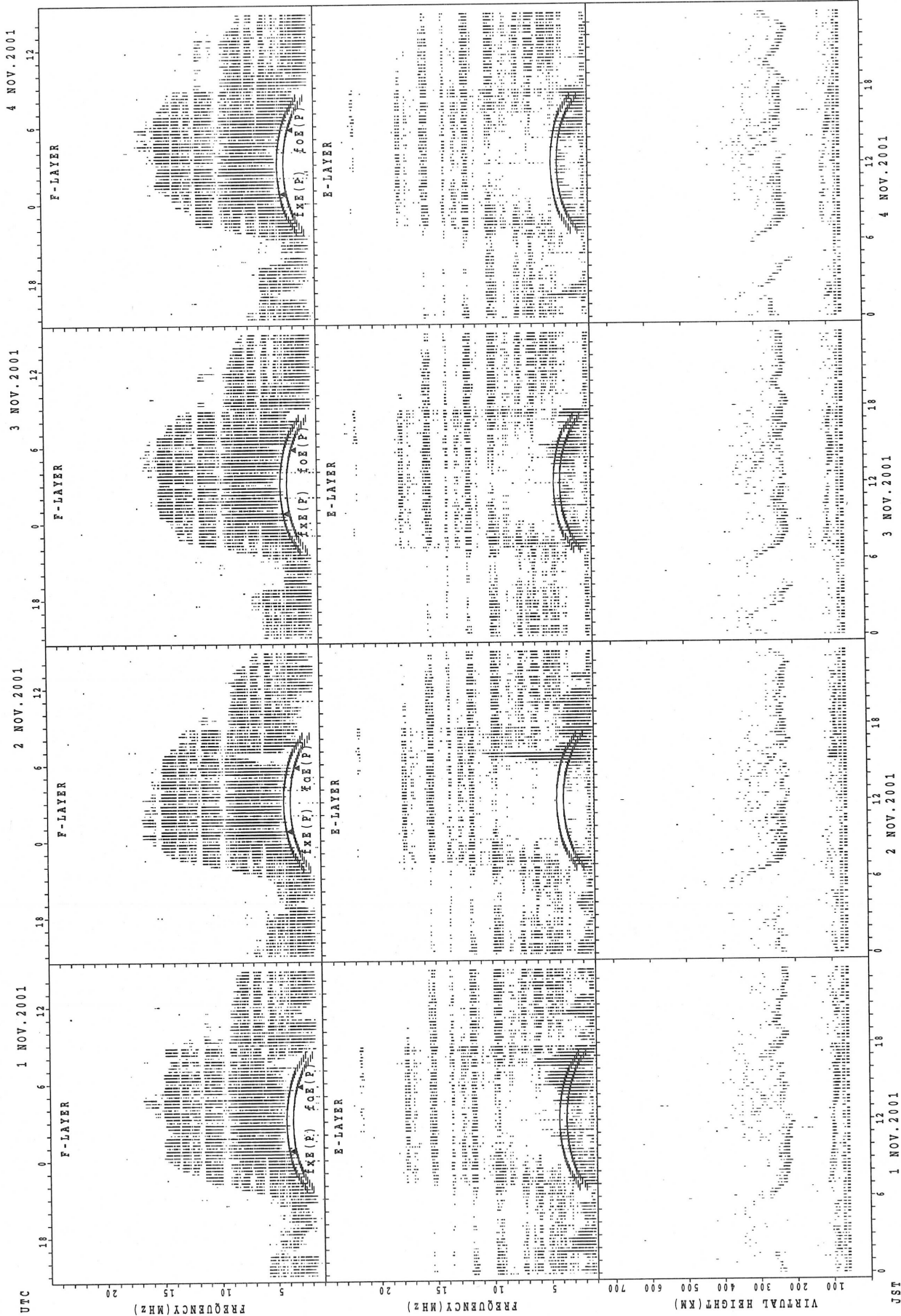
fXE(P); PREDICTED VALUE FOR fxe
fOE(P); PREDICTED VALUE FOR fofe

SUMMARY PLOTS AT Kokubunji



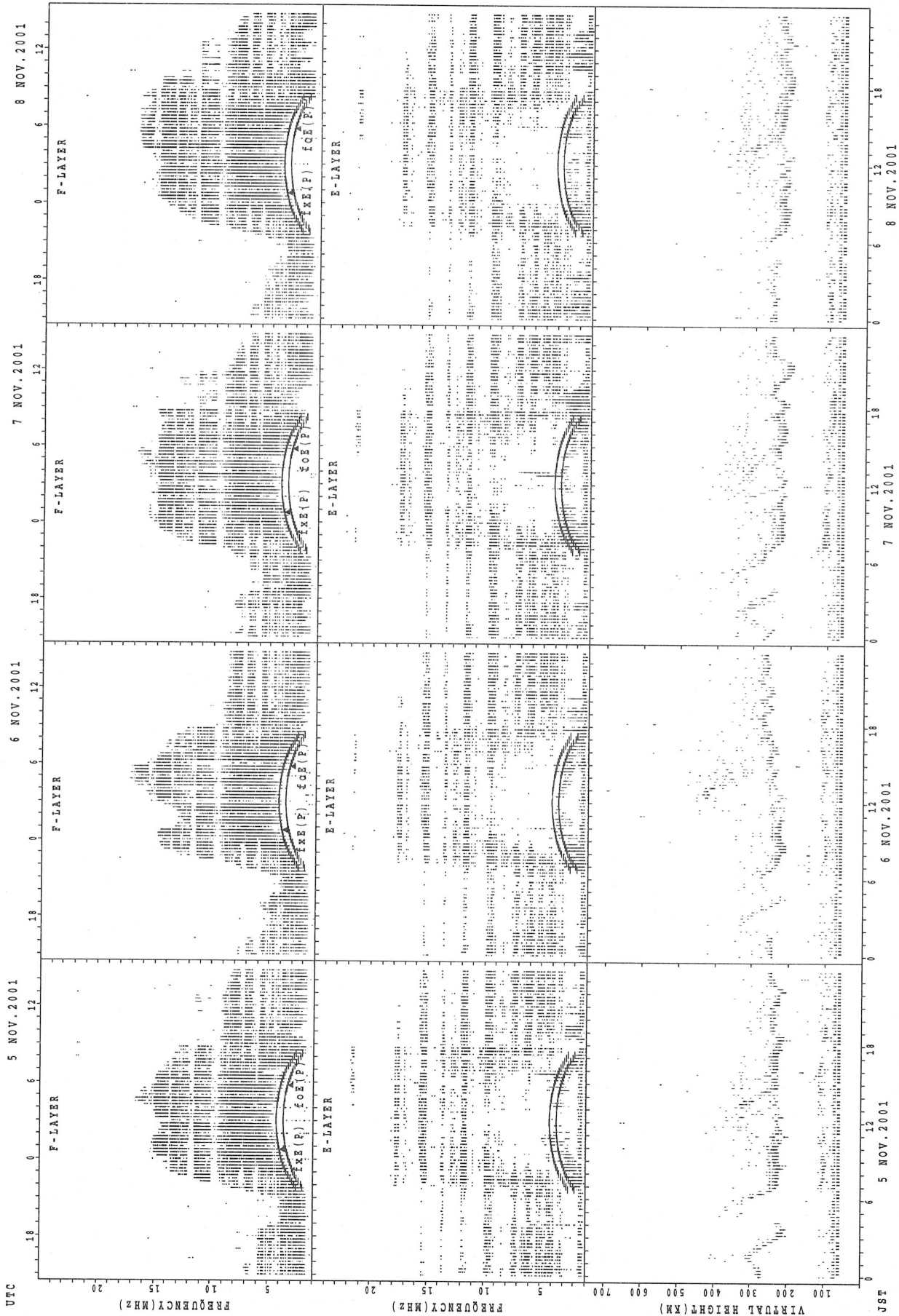
f_oF₂(P); PREDICTED VALUE FOR f_oF₂
f_oF₁(P); PREDICTED VALUE FOR f_oF₁

SUMMARY PLOTS AT Yamagawa



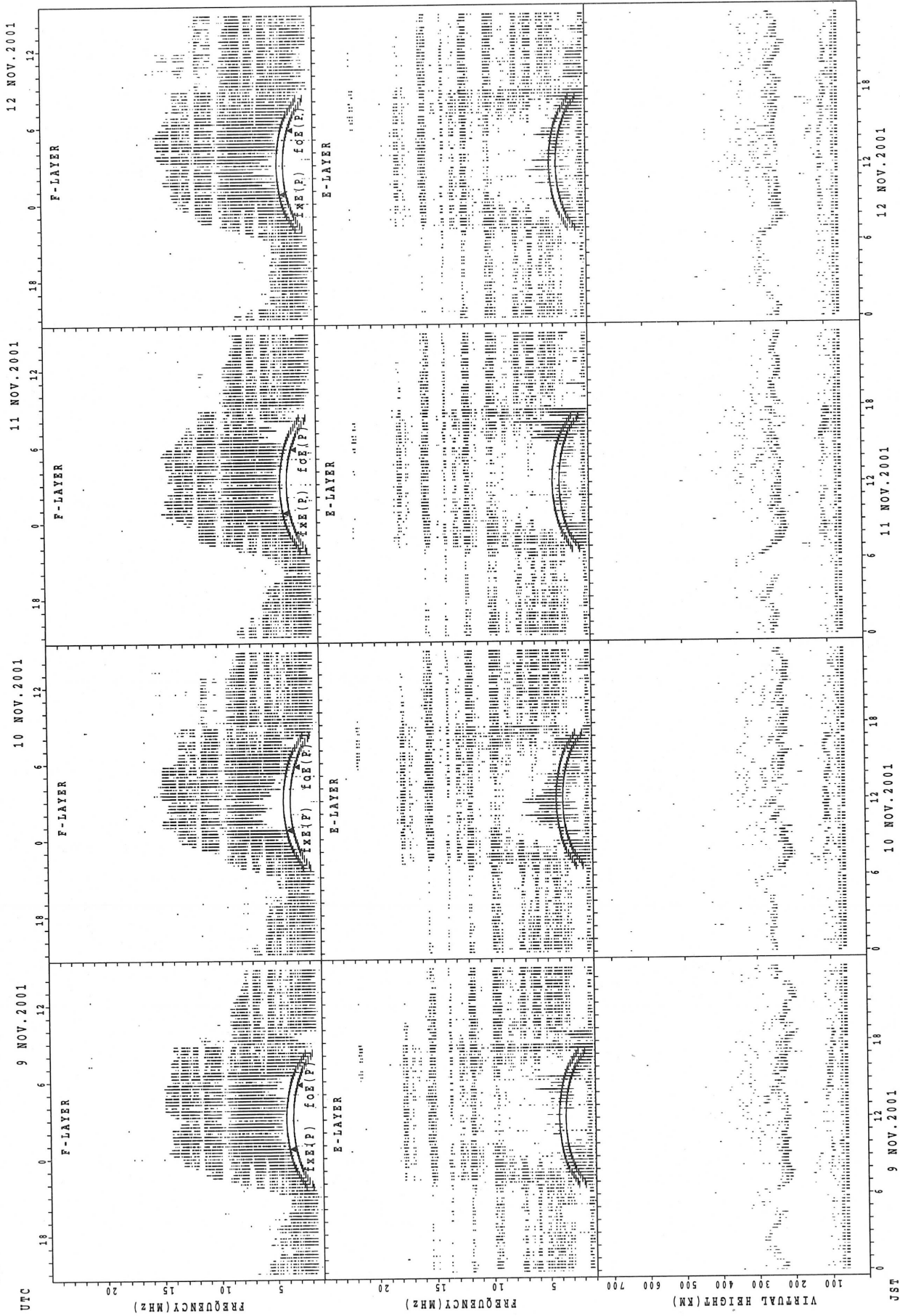
f_xE(P) ; PREDICTED VALUE FOR f_xE
 f_oE(P) ; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



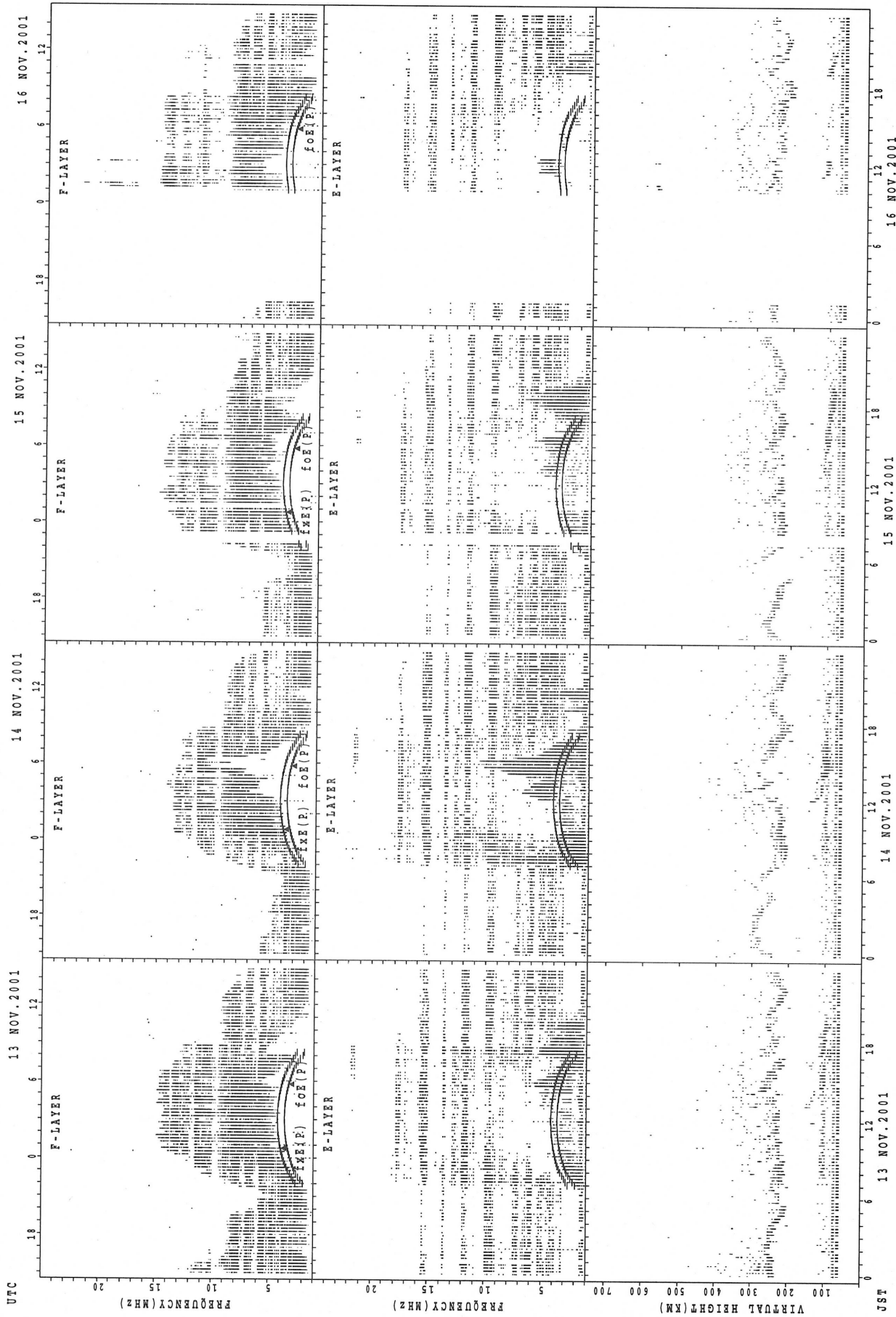
f_oF2(P); PREDICTED VALUE FOR f_oF2
f_oE3(P); PREDICTED VALUE FOR f_oE3

SUMMARY PLOTS AT Yamagawa



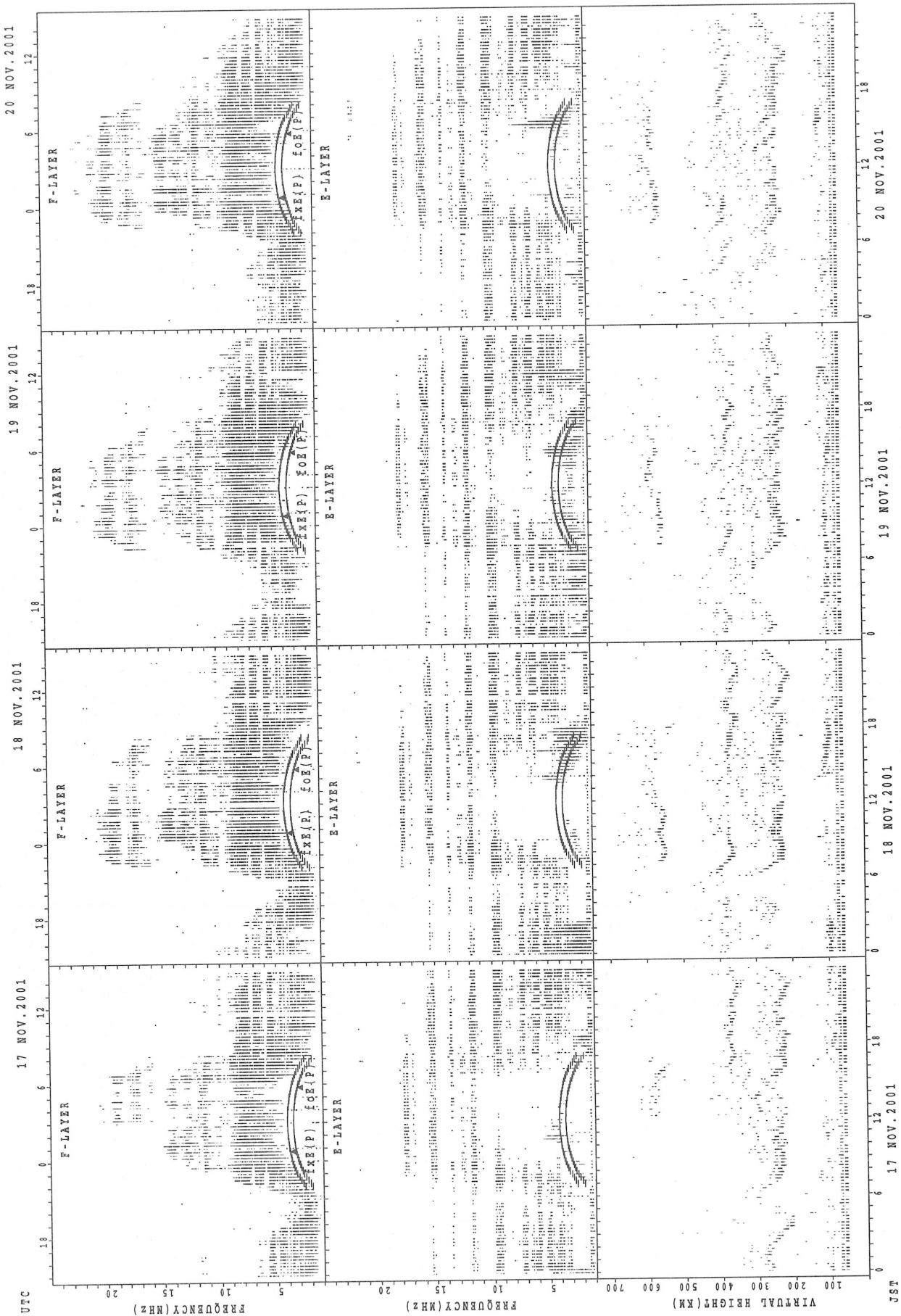
fxe(P); PREDICTED VALUE FOR fxe
fof(P); PREDICTED VALUE FOR fof

SUMMARY PLOTS AT Yamagawa



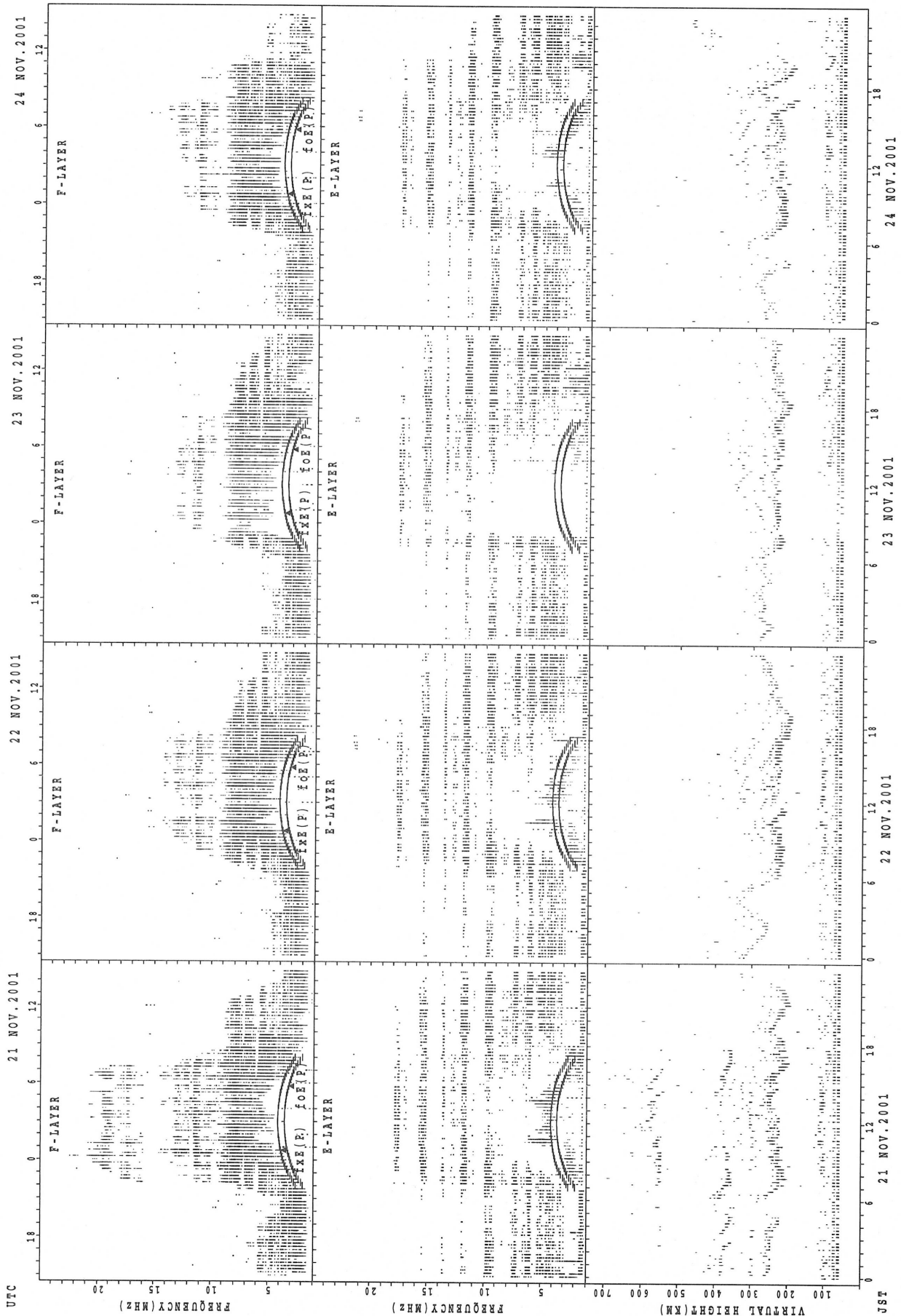
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



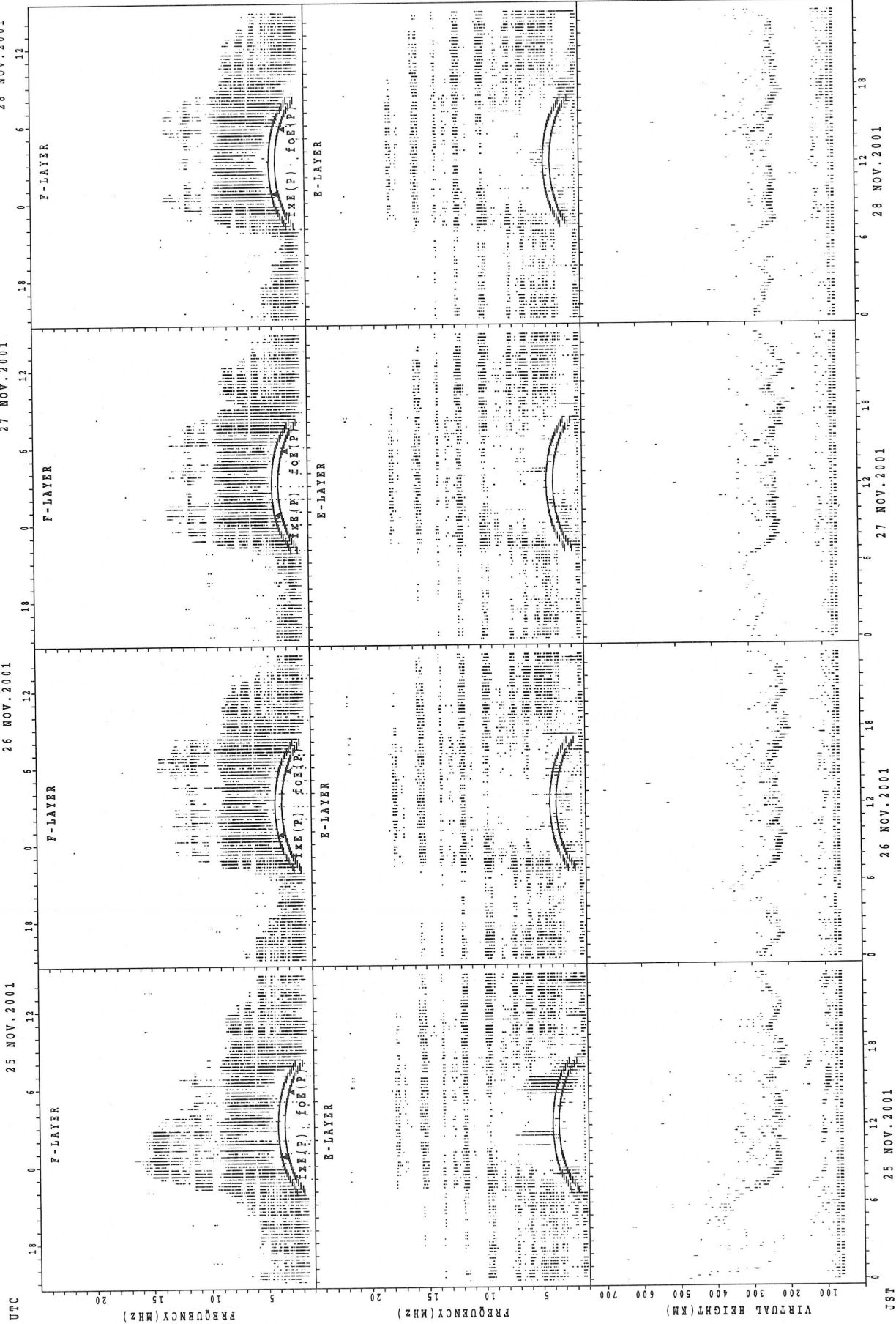
$f_xe(p)$; PREDICTED VALUE FOR f_xe
 $f_{oe}(p)$; PREDICTED VALUE FOR f_{oe}

SUMMARY PLOTS AT Yamagawa



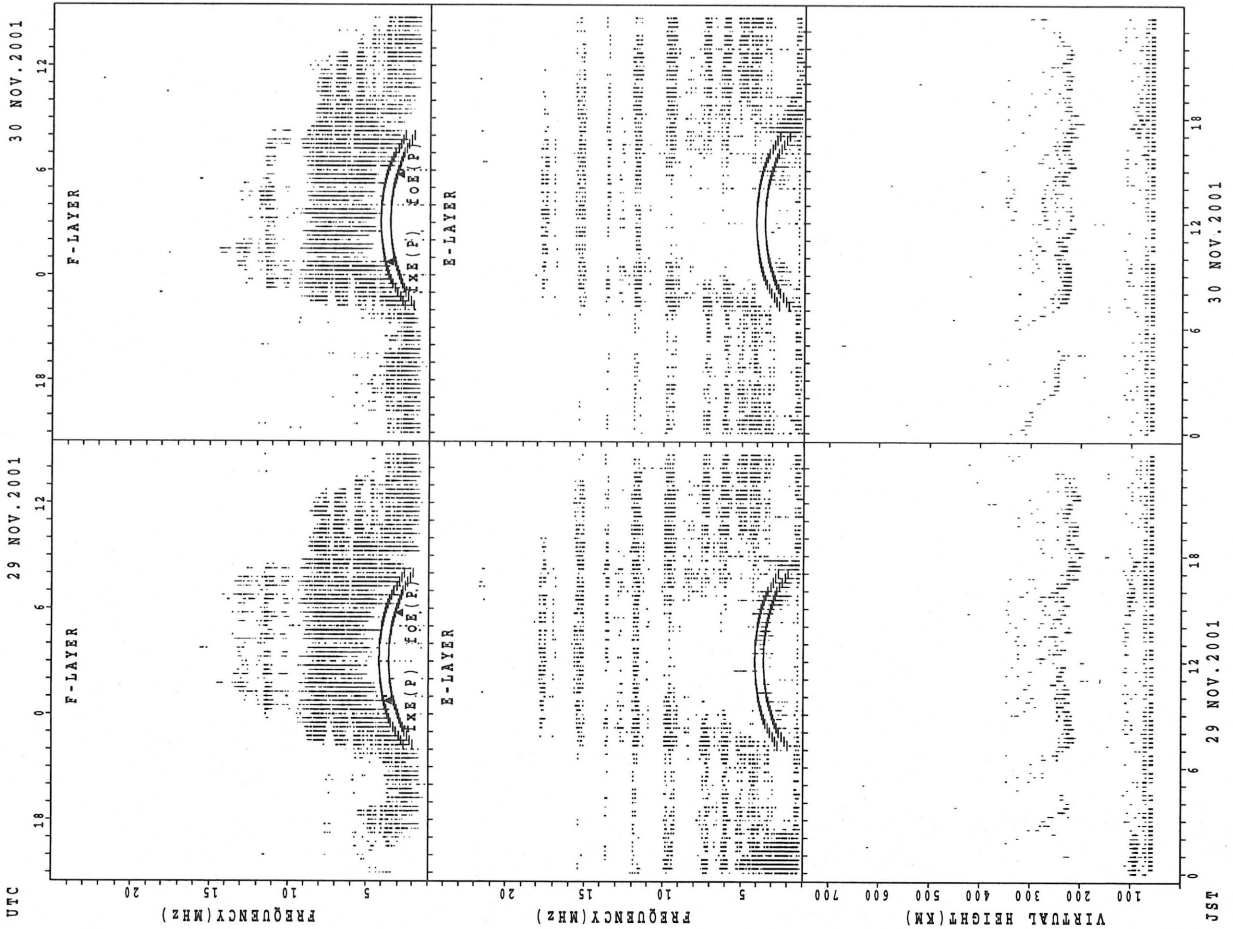
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



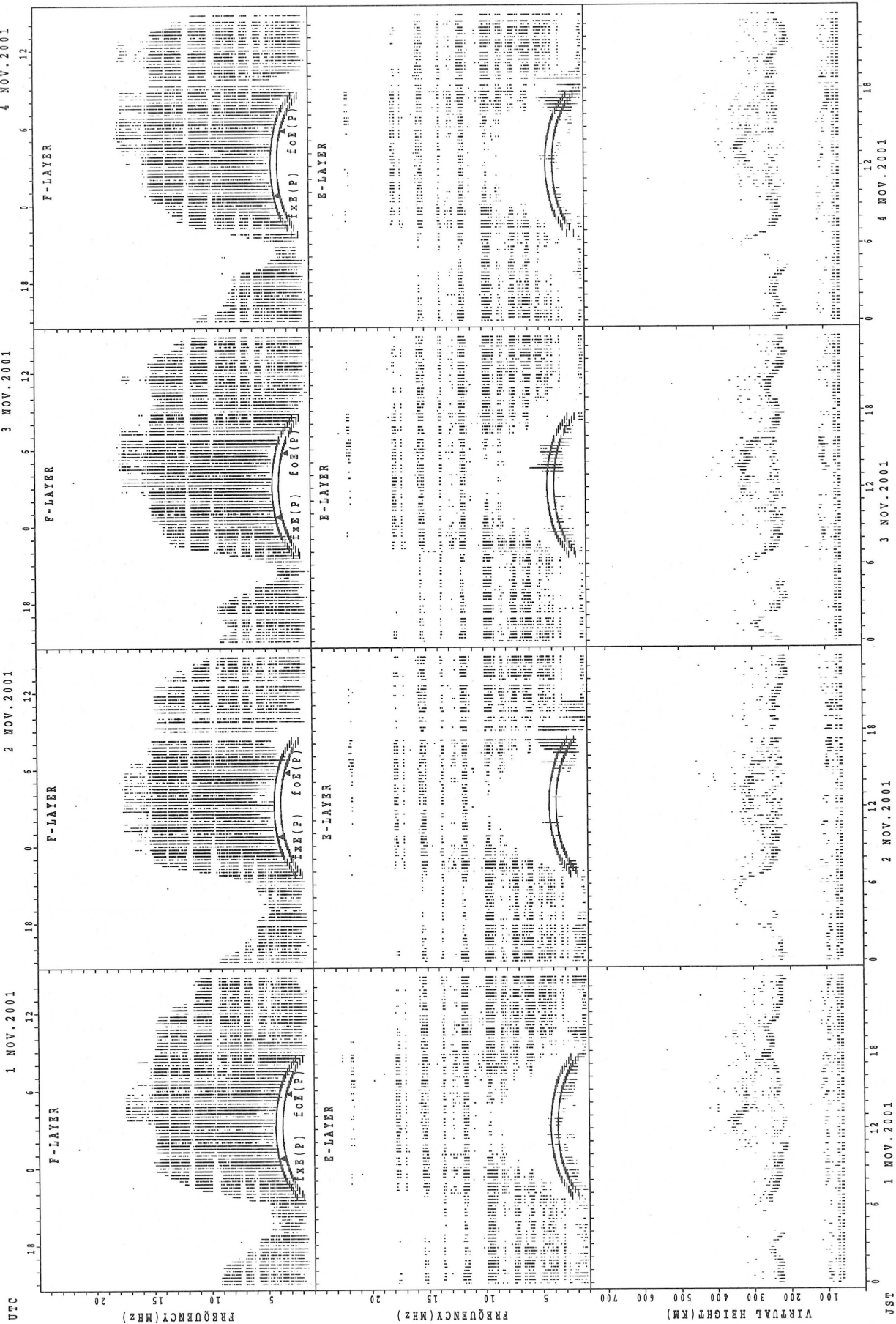
f_xE(P); PREDICTED VALUE FOR f_xE
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



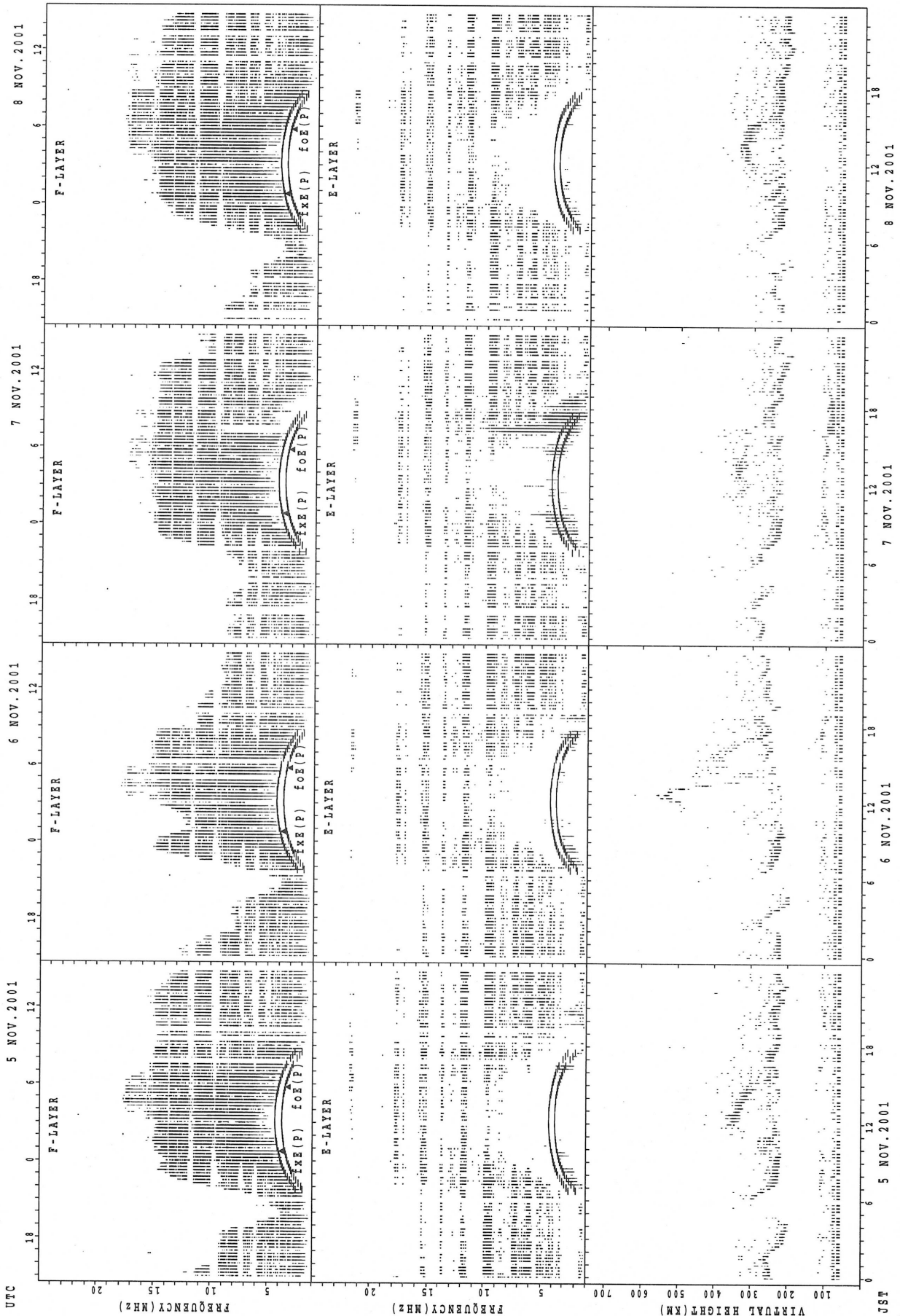
f_oF_2 ; PREDICTED VALUE FOR f_oF_2
 f_oE ; PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Okinawa



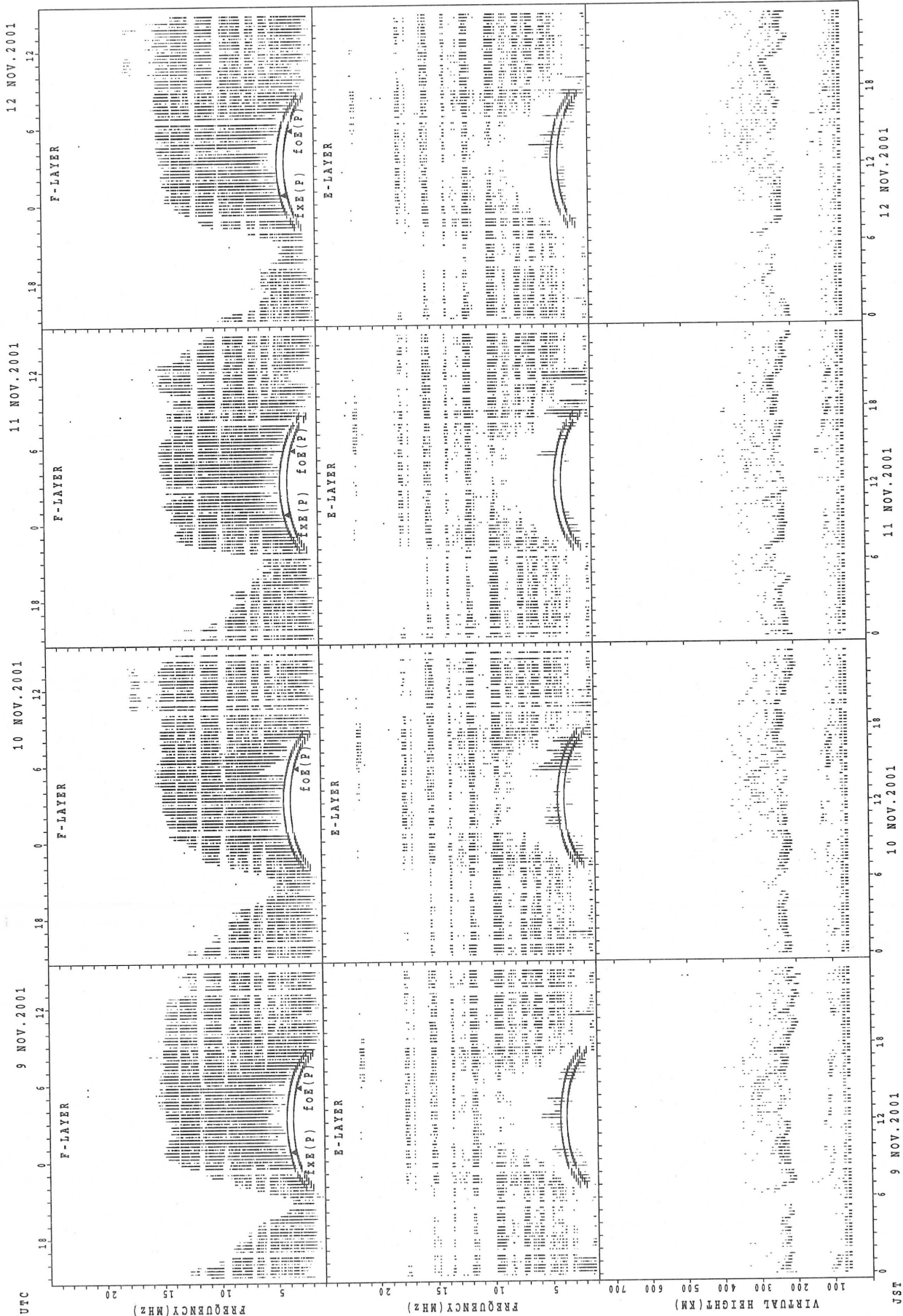
fXfE(P); PREDICTED VALUE FOR fXfE
fXfE(P); PREDICTED VALUE FOR fXfE

SUMMARY PLOTS AT Okinawa



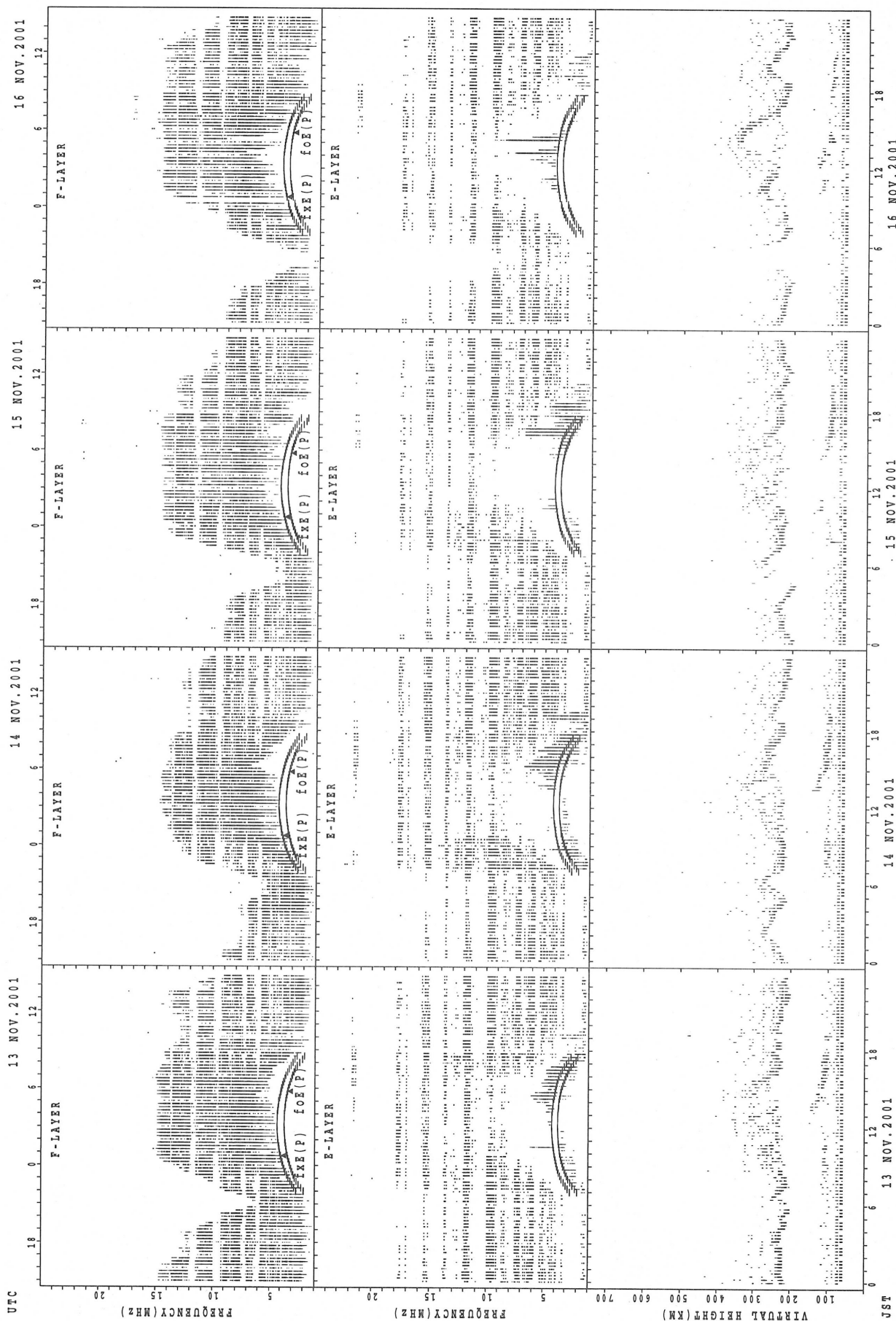
f_{xe}(P); PREDICTED VALUE FOR f_{xe}
 f_{oe}(P); PREDICTED VALUE FOR f_{oe}

SUMMARY PLOTS AT Okinawa



fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

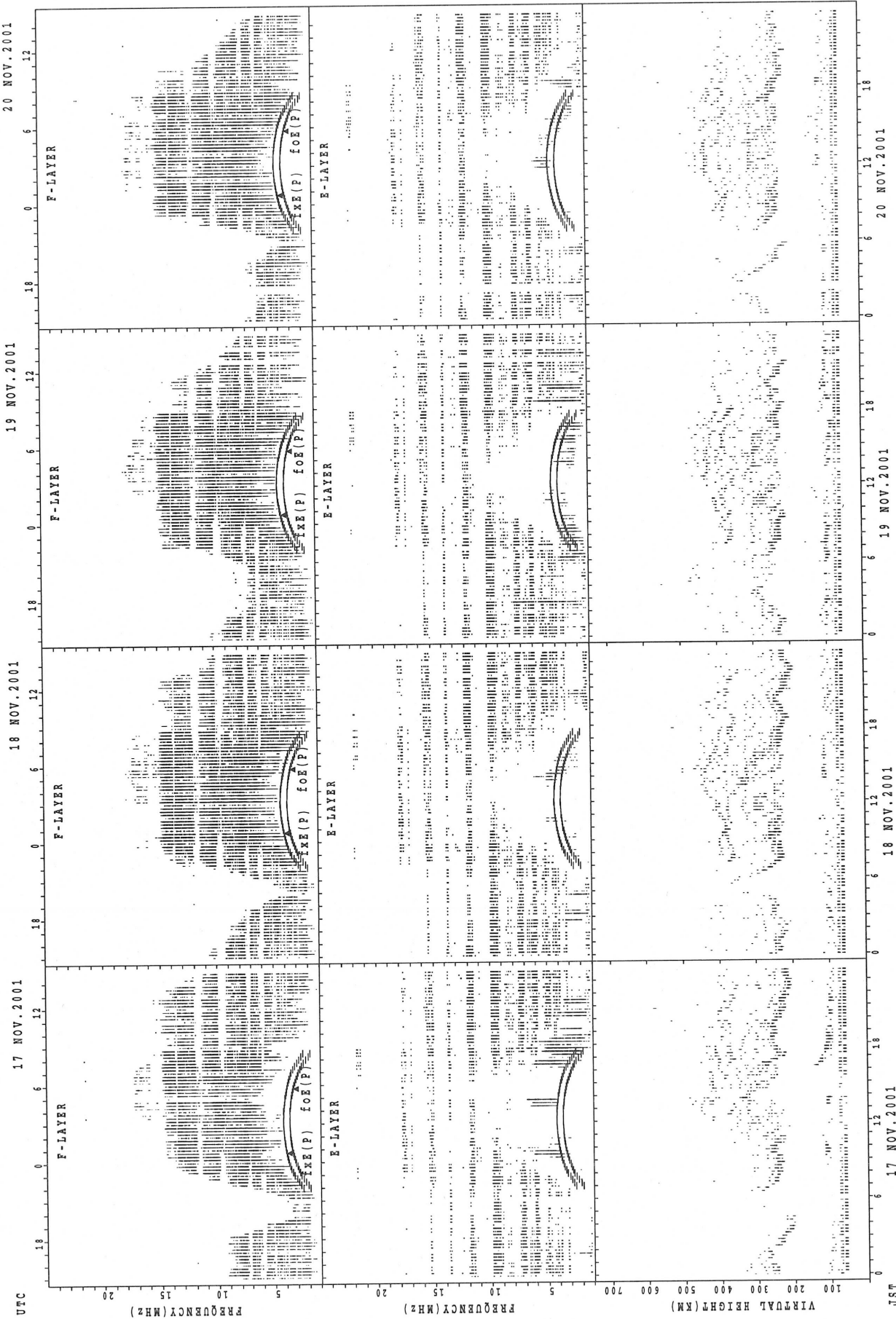
SUMMARY PLOTS AT Okinawa



foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

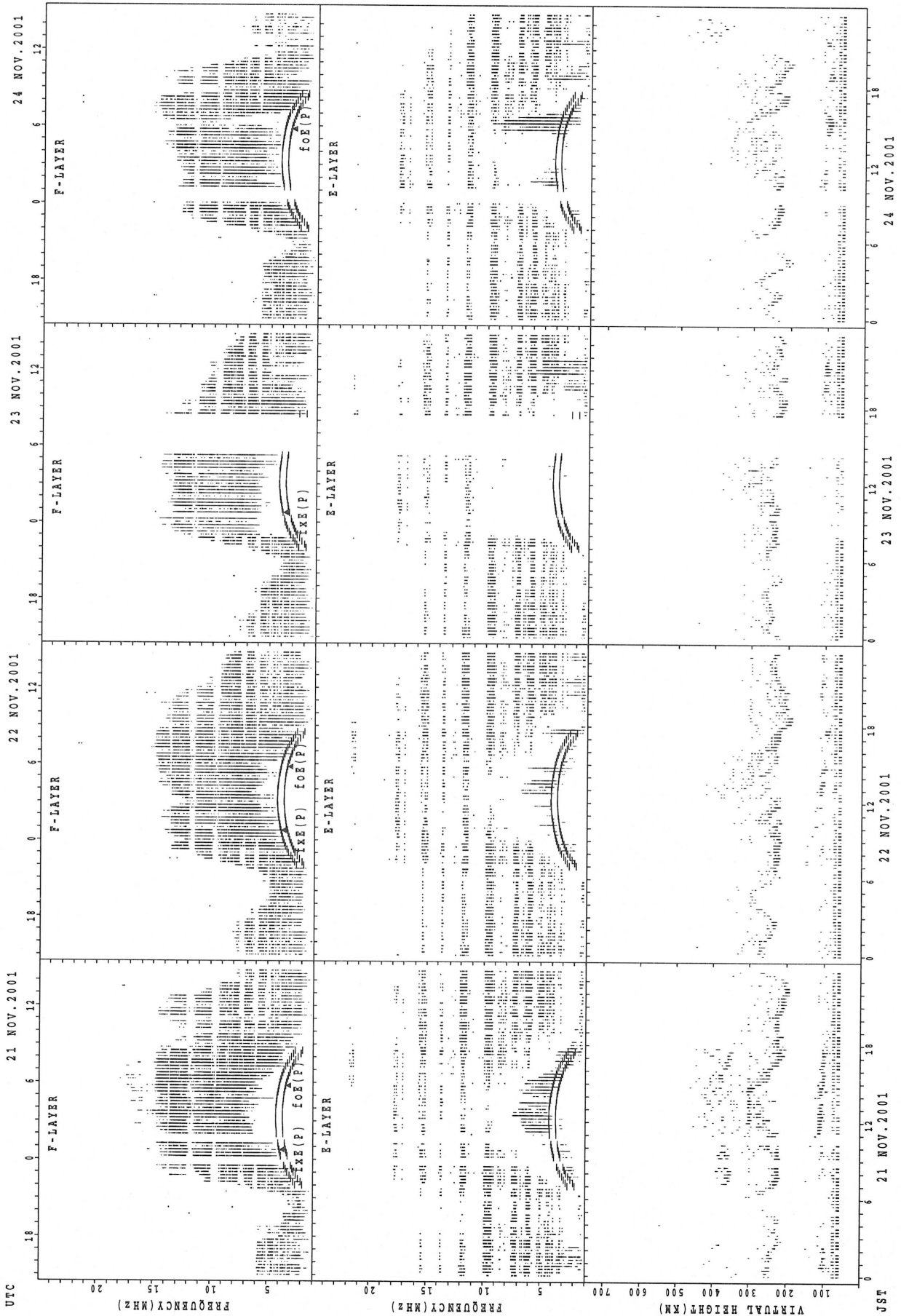
JST

SUMMARY PLOTS AT Okinawa



fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

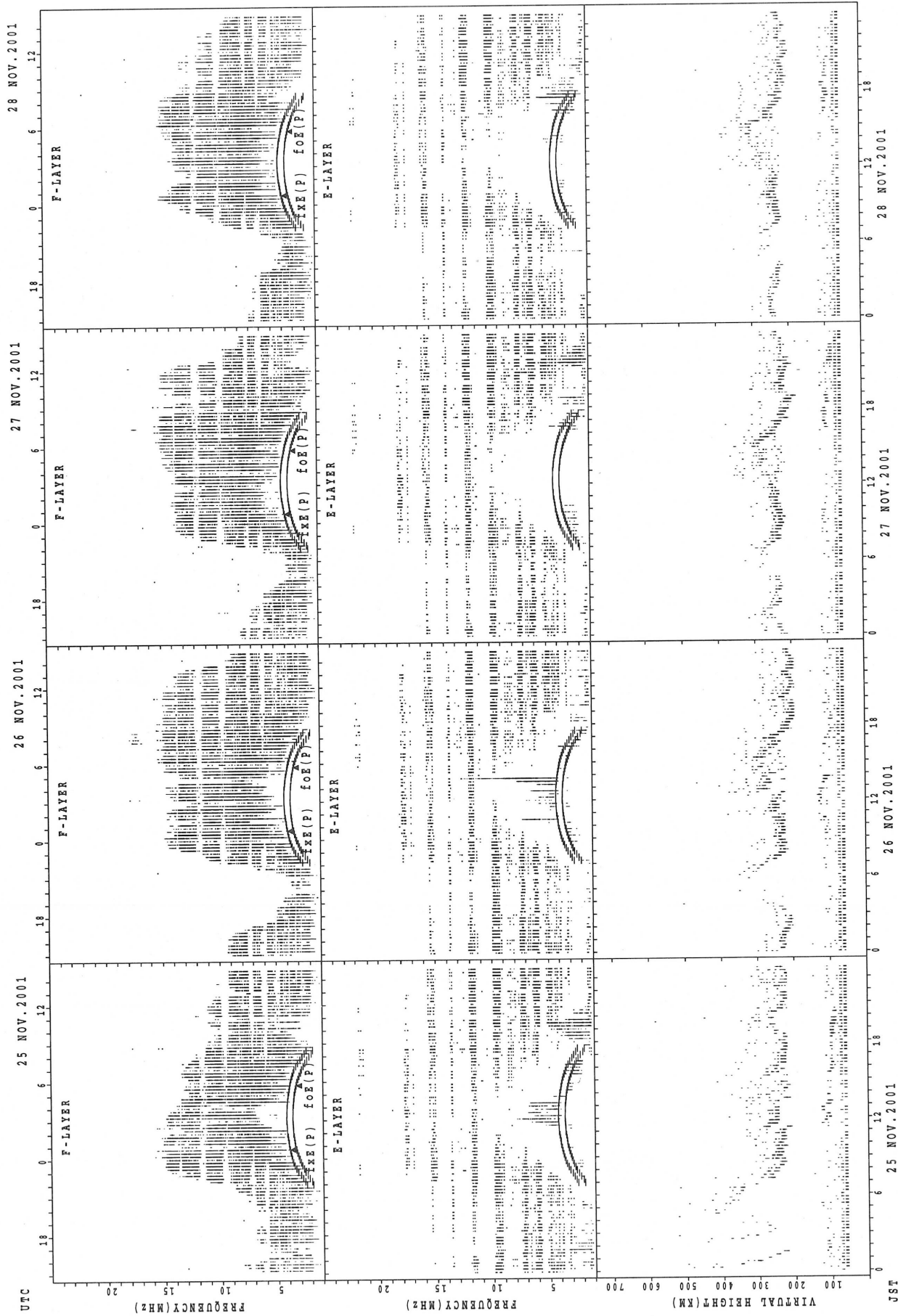
SUMMARY PLOTS AT Okinawa



foE(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

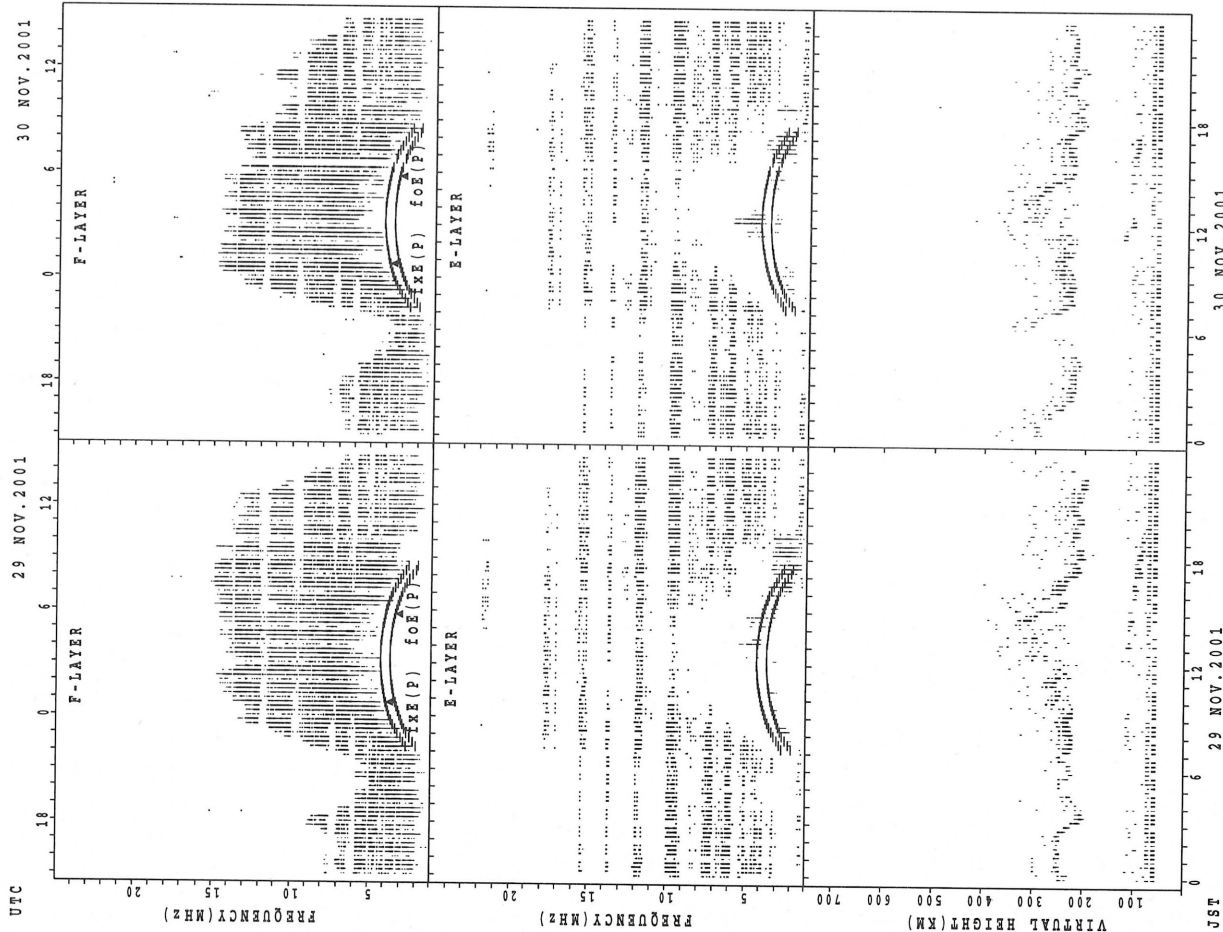
UTC 21 NOV. 2001 22 NOV. 2001 23 NOV. 2001 24 NOV. 2001
JST 21 NOV. 2001 22 NOV. 2001 23 NOV. 2001 24 NOV. 2001

SUMMARY PLOTS AT Okinawa



f_xe(p) ; PREDICTED VALUE FOR f_xe
 f_o_e(p) ; PREDICTED VALUE FOR f_o_e

SUMMARY PLOTS AT Okinawa



$f_xE(P)$; PREDICTED VALUE FOR f_xE
 $f_oE(P)$; PREDICTED VALUE FOR f_oE

MONTHLY MEDIANS OF h'F AND h'Es
 NOV. 2001 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°23.5'N LON. 141°41.2'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								24	29	28	28	29	28	26	27	28	28	24	20	14	3	1	1	3
MED								241	230	222	224	232	232	239	240	232	238	256	287	287	314	424	408	236
U Q								260	240	232	231	238	240	264	288	244	249	283	317	342	376	212	204	386
L Q								238	224	216	219	223	224	224	234	230	232	246	273	274	308	212	204	196

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	11	12	12	6	3	5	5	4	7	11	14	7	4	6	10	16	12	4	4	6	2	3	4
MED	104	105	104	102	104	105	103	109	112	113	107	107	103	102	102	99	98	97	101	98	99	99	119	96
U Q	107	107	107	105	107	115	109	119	124	113	111	121	105	112	107	103	99	102	107	100	105	103	161	109
L Q	99	103	100	98	97	103	97	105	107	107	103	103	101	98	99	97	95	96	91	94	95	95	95	92

h'F STATION Kokubunji LAT. 35°42.4'N LON. 139°29.3'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	8				1	3	29	29	30	30	22	24	28	28	28	27	28	23	23	24	18	10	5
MED	329	235				232	328	246	230	232	234	238	257	260	248	241	242	250	290	290	298	297	327	334
U Q	432	375				116	380	251	233	240	240	242	287	285	259	260	256	272	310	306	337	352	380	395
L Q	206	211				116	324	236	223	230	224	230	240	246	242	238	234	243	270	262	272	272	234	321

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	4	5	2	3		1	8	3	3	9	8	12	5	4	9	11	9	6	8	4	7	4	3
MED	102	90	103	102	97		101	118	111	113	111	112	106	111	100	107	103	95	98	98	96	95	102	95
U Q	105	93	106	105	103		50	127	113	115	117	117	111	111	114	118	107	101	105	99	100	99	117	103
L Q	92	86	95	99	97		50	104	101	105	105	107	101	99	89	104	99	92	97	96	92	91	96	89

h'F STATION Yamagawa LAT. 31°12.1'N LON. 130°37.1'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	11	2	6	3	2	1	26	28	29	28	28	18	27	29	29	30	30	30	30	29	28	26	16
MED	305	348	327	265	272	297	398	275	225	230	236	240	258	286	264	260	246	234	251	287	260	259	268	293
U Q	323	398	364	320	432	346	199	298	235	236	242	248	282	318	287	285	268	248	268	302	279	283	310	331
L Q	268	300	290	234	264	248	199	248	219	225	227	233	244	258	246	241	236	224	240	266	242	243	250	267

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	15	16	15	9	8	11	4	20	16	12	12	6	15	18	14	18	20	26	14	16	22	21	15	16
MED	95	95	89	107	95	101	88	112	105	132	124	109	113	106	118	99	107	92	92	113	89	91	109	86
U Q	113	120	113	140	140	125	124	134	134	146	152	121	125	117	137	125	131	125	119	139	101	127	149	125
L Q	89	86	83	89	87	71	75	89	86	107	101	101	105	95	109	91	98	83	89	83	83	80	77	75

MONTHLY MEDIANS OF h'F AND h'Es
 NOV. 2001 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

h'F STATION Okinawa LAT. 26'16.9'N LON. 127'48.4'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	25	24	20	15	2	1	21	29	29	28	25	10	15	29	28	28	28	30	30	29	29	27	28
MED	272	284	294	263	264	370	426	266	236	238	239	252	270	302	302	301	266	248	250	259	262	240	242	244
U Q	308	317	314	308	310	488	213	284	242	245	246	276	276	316	317	310	289	263	264	282	289	256	256	273
L Q	242	249	277	247	252	252	213	249	226	230	235	240	244	290	283	279	255	236	242	242	249	231	226	234

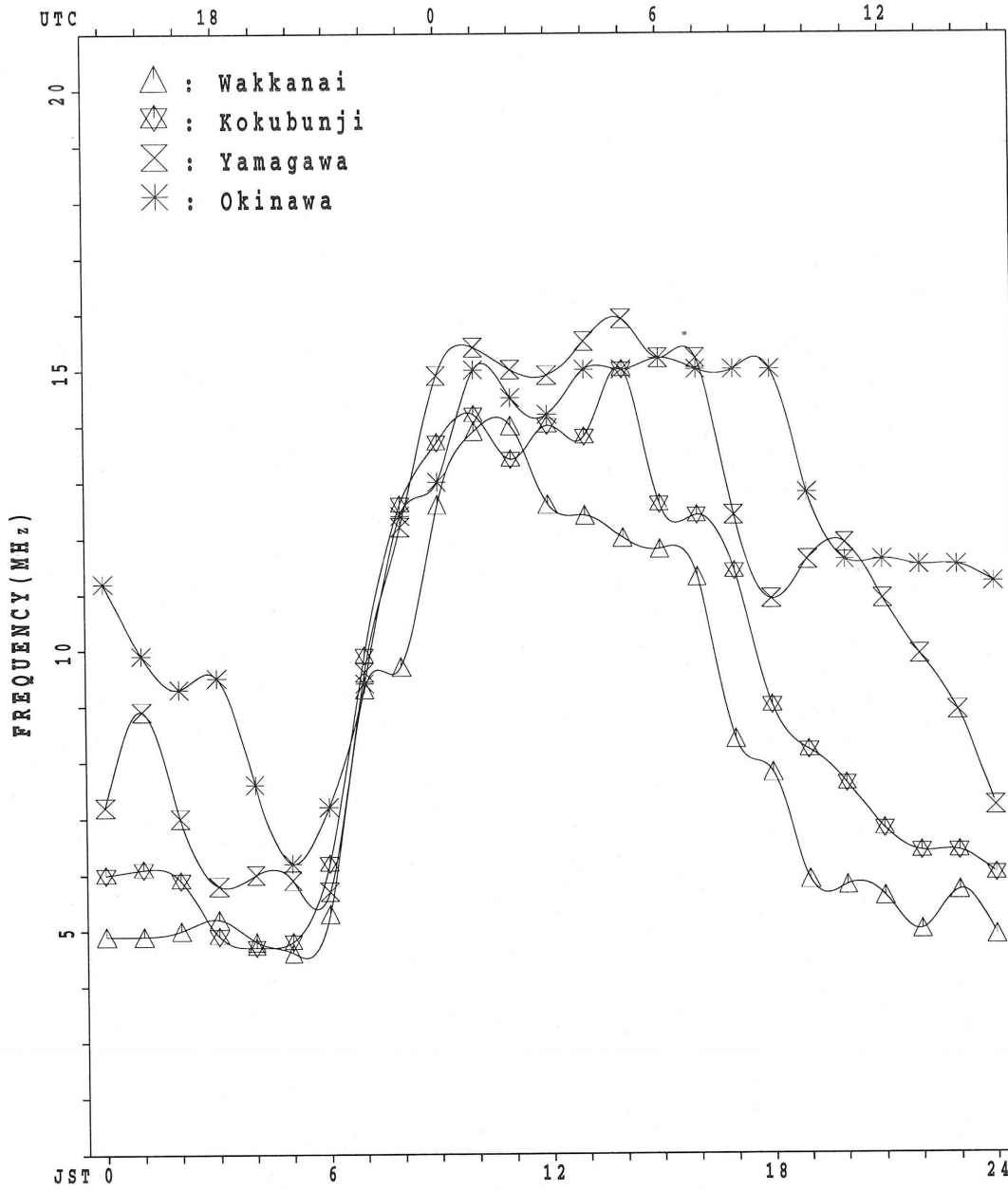
h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT			2	1	1	2	1				2		5	3	4	7	8	6	6	7	5	2	2	
MED			92	89	113	100	97				113		113	109	112	107	108	102	102	89	89	92	84	
U Q			113	44	56	101	48				115		121	141	122	115	110	103	107	91	97	95	85	
L Q			71	44	56	99	48				111		108	109	110	99	102	89	97	89	77	89	83	

MONTHLY MEDIANS PLOT OF foF2

NOV. 2001

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Kokubunji

 NOV. 2001 f_{XI} (0.1MHz)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X	X	X	X	X	X													X	X	X	X	X	X
2	X	X	X	X	X	X													X	X	X	X	X	X
3	X	X	X	X	X	X													X	X	X	X	X	X
4	X	X	X	X	X	X													X	X	X	X	X	X
5	X	X	X	X	X	X													X	X	X	X	X	X
6	X	X	X	X	X	X													X	X	X	X	X	X
7	X	X	X	X	X	X													X	X	X	X	X	X
8	X	X	X	X	X	X													X	X	X	X	X	X
9	X	X	X	X	X	X													X	X	X	X	X	X
10	X	X	X	X	X	X													X	X	X	X	X	X
11	X	X	X	X	X	X													X	X	X	X	X	X
12	X	X	X	X	X	X													X	X	X	X	X	X
13	X	X	X	X	X	X													X	X	X	X	X	X
14	X	X	X	X	X	X													X	X	X	X	X	X
15	X	X	X	X	X	X													X	X	X	X	X	X
16	X	X	X	X	X	X													X	X	X	X	X	X
17	X	X	X	X	X	X													X	X	X	X	X	X
18	X	X	X	X	X	X													X	X	X	X	X	X
19	X	X	X	X	X	X													X	X	X	X	X	X
20	X	X	X	X	X	X													X	X	X	X	X	X
21	X	X	X	X	X	X													X	X	X	X	X	X
22	X	X	X	X	X	X													X	X	X	X	X	X
23	X	X	X	X	X	X													X	X	X	X	X	X
24	X	X	X	X	X	X													X	X	X	X	X	X
25	X	X	X	X	X	X													X	X	X	X	X	X
26	X	X	X	X	X	X													X	X	X	X	X	X
27	X	X	X	X	X	X													X	X	X	X	X	X
28	X	X	X	X	X	X													X	X	X	X	X	X
29	X	X	X	X	X	X													X	X	X	X	X	X
30	X	X	X	X	X	X													X	X	X	X	X	X
31																			X	X	X	X	X	X
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30												21	30	30	30	30	30	30
MED	X	X	X	X	X	X												X	X	X	X	X	X	X
U Q	54	54	54	50	47	48												106	88	84	76	69	62	56
L Q	X	X	X	X	X	X												X	X	X	X	X	X	X
	63	59	56	54	50	51												110	96	91	87	77	68	65
	X	X	X	X	X	X												X	X	X	X	X	X	X
	50	51	50	47	44	42												90	82	77	67	57	49	51

 NOV. 2001 f_{XI} (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 foF2 (0.1MHz)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	48	46	45	44	41	44	65	113	131	146	150	143	146	158	147	138	125	127	114	100	96	91	87	79	
2	64	56	56	48	48	51	73	126	153	160	151	155	154	150	144	130	120	104	90	80	69	66	60	56	
3	48	48	52	51	37	37	60	114	140	142	147	135	139	146	138	131	120	107	86	78	75	67	62	59	
4	52	53	53	57	38	38	59	115	121	139	137	132	142	146	145	134	124	106	82	82	86	84	70	62	
5	57	53	54	57	42	46	64	110	136	158	151	134	137	141	135	128	123	111	90	87	80	74	69	64	
6	59	53	46	47	48	43	60	93	139	150	136	133	148	150	155	154	132	120	92	93	88	83	90	84	
7	76	69	69	68	65	64	80	131	136	156	153	146	151	163	152	142	130	115	90	89	88	64	61	56	
8	58	56	47	42	41	42	62	112	138	149	155	155	149	160	157	146	143	133	115	92	85	73	58	48	
9	44	43	41	41	37	35	56	105	126	141	138	129	136	143	136	130	126	108	82	82	78	63	51	51	
10	50	50	48	48	40	44	62	102	124	136	146	132	144	138	139	124	121	110	90	79	81	66	63	60	
11	58	54	52	51	43	43	60	101	125	136	136	133	140	133	129	126	120	102	84	83	79	69	61	65	
12	64	55	49	44	44	44	62	100	122	123	132	133	134	134	130	126	122	100	90	85	81	76	64	60	
13	62	59	58	58	55	46	56	96	122	124	122	124	124	128	132	130	118	103	85	74	74	71	57	45	
14	43	44	43	45	39	37	54	94	115	125	125	122	129	128	128	117	112	102	79	72	67	63	58	50	
15	47	48	47	46	38	36	54	99	126	131	137	129	133	136	134	132	119	101	80	71	66	54	49	49	
16	45	47	46	43	33	34	52	101	98	110	131	153	140	139	136	129	120	104	90	90	89	76	62	55	
17	50	48	48	46	42	36	47	93	126	140	140	134	135	136	137	134	122	104	82	69	69	69	57	52	
18	52	46	50	45	38	40	53	104	127	129	144	142	136	133	126	119	105	92	76	70	70	58	49	53	
19	48	47	45	41	41	42	58	100	124	128	141	134	126	132	137	121	106	95	80	75	61	61	53	49	
20	46	50	50	48	48	46	53	98	127	144	145	135	144	155	150	133	123	104	93	91	77	55	54	49	
21	46	45	50	50	45	43	52	92	116	122	127	124	138	136	131	116	108	86	74	78	64	51	40	39	
22	41	44	49	43	42	45	51	87	114	125	138	134	130	130	130	122	108	101	76	58	56	49	43	46	
23	45	46	45	43	42	42	52	91	119	124	142	120	125	124	120	113	104	98	83	68	54	50	48	49	
24	46	47	48	43	42	46	50	84	104	121	128	128	123	117	125	123	114	85	72	83	52	34	41	33	
25	34	26	38	28	51	64	84	124		162	152	151	141	127	116	111	103	84	78	77	65	54	52	55	
26	54	47	44	36	35	38	44	95	102	137	123	119	117	116	130	116	103	75	62	72	63	43	32	34	
27	36	34	34	32	30	32	38	81	103	112	121	124	127	114	116	108	90	71	63	56	51	50	42	38	
28	40	35	34	32	31	28	36	82	106	110	108	115	112	117	124	120		75	63	59	52	50	42	40	
29	37	36	38	39	38	35	43	83	104	114	122	124	122	130				70	62	56	42	37	40		
30	37	36	37	34	34	31	38	83	103	119	122	110	118	108				101	71	65	60	58	50	40	
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	29	30	30	30	30	30	28	28	28	29	30	30	30	30	30	30	
MED	48	47	48	44	41	42	55	100	124	134	138	133	136	135	134	127	120	102	82	78	70	63	56	50	
U Q	57	53	50	48	44	45	62	110	129	144	146	135	142	146	142	132	123	108	90	85	81	71	62	59	
L Q	44	44	44	41	38	36	51	92	110	123	127	124	126	128	128	120	107	89	76	70	61	50	43	45	

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1													L	L										
2													L	L	L									
3													L	L										
4													L	L										
5												L	L	L										
6													L	L	L	L								
7								L		L	L	L	L	L										
8											L		L											
9									L				L		L									
10										L			L	L										
11													L		L									
12										L			L	L										
13											L													
14													L	L										
15																								
16											L		L											
17													L		L									
18												L			L									
19												L	L		L									
20													L											
21														L										
22												L												
23																								
24															L									
25																								
26															L									
27													L		L									
28														L	L		C							
29												L		L	C	C	C							
30													L		C	C								
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								BU R	R	R	A	A	R	R	RU R	A	B							
2								B	264	332	348	B	372	R	R	RU R	A	B						
3								BU R	U R	A	A	U R	R	A	AU R	R	B							
4								BU R	U R	R	R	R	R	RU R	RU R	296	U A	B						
5								B	244		RU R	R	R	R	RU R	348	296	A	B					
6								B	A	AU R	A	A	B	AU R	RU R	RU R	220	B						
7								BU R	U R	U A	A	R	A	R	R	R	A	B						
8								BU R	U R	RU R	A	A	A	RU R	RU R	232	B							
9								BU R	A		R	B	R	RU R	RU R	U A								
10								B	236	308	U RU A	AU R	R	RU R	RU R	244								
11								BU A	A	R	R	R	A	R	R	300	220							
12								BU R		A	R	A	AU R	R	RU A									
13								BU R	AU A	R	R	R	R	U R	208									
14								BU R	U R	348	344	A	A	A	AU A	A								
15								BU R	U R	RU R	R	A	A	A	RU R	RU R								
16								BU R	U R	R	356	A	A	A	A	A								
17								BU R	U R	R	AU R	R	R	RU R	RU A	U A								
18								BU R	R	U RU A	R	R	R	RU R	RU A	180								
19								BU R	U R	A	A	A	A	A	A	A								
20								BU R	A	R	R	A	A	AU R	RU R	RU R								
21								BU A	A	RU RU A	A	AU A	AU R	RU R	RU R	236								
22								BU R	AU R	A	A	A	AU R	RU R	RU R	216								
23								BU R	R	B	R	R	R	RU R	RU R	180								
24								BU R	U R	RU R	A	AU R	372	AU R	RU R	RU R								
25								B	AU R	A	A	A	AU R	RU R	RU R	A								
26								BU R	A	A	A	A	AU R	A	R	A								
27								BU A	AU A	RU R	R	R	RU R	RU R	AU R									
28								B	U A	324	360	372	A	R	324	A	C							
29								B	200	272	324	360	372	R	C	C	C							
30								BU R	U R	RU R	R	R	A	A	C	C	A							
31								176	272	328														
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								28	18	18	11	5	2	10	15	21	17							
MED								U R	U R	U R	U R	U	U R	U R	U R	U R	U R							
U Q								248	328	348	368	380		364	340	296	230							
L Q								U R	U R	280	328	356	366		U R	U R	U R							

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 foEs (0.1MHz)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	J A	J A	J A	J A	E B	E B	E B	B	G	G	J A	J A	A	G	G	G	J A	J A	J A	J A	J A	J A	E B	E B	E B
2	J A	J A	J A	J A	E B	J A	E B	B	G	G	E B	J A	J A	G	G	G	J A	J A	J A	E B	J A	J A	J A	J A	J A
3	J A	J A	J A	J A	J A	E B	E B	E B	J A	G	J A	J A	A	G	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B
4	J A	J A	J A	J A	J A	E B	E B	J A	G	G	G	G	G	G	G	G	J A	J A	J A	E B	E B	E B	E B	E B	E B
5	E B	E B	E B	E B	E B	E B	E B	E B	G	G	G	G	G	G	G	G	J A	J A	E B	J A	J A	J A	J A	J A	J A
6	E B	J A	E B	J A	E B	E B	E B	B	G	G	E B	E B	E B	G	G	G	E B	E B	E B	E B	E B	E B	E B	E B	J A
7	J A	J A	E B	E B	E B	J A	J A	J A	G	J A	J A	J A	J A	G	G	G	J A	J A	J A	J A	E B	E B	E B	E B	J A
8	E B	E B	E B	E B	E B	E B	E B	B	G	G	J A	J A	J A	G	G	G	E B	E B	J A	E B	E B	E B	E B	E B	J A
9	E B	E B	J A	J A	E B	J A	J A	J A	J A	G	E B	E B	E B	G	G	J A	J A	J A	E B	E B	E B	E B	E B	J A	E B
10	E B	E B	E B	E B	E B	E B	E B	B	J A	G	J A	J A	J A	G	G	G	E B	J A	E B	E B	E B	E B	E B	E B	E B
11	E B	E B	E B	E B	E B	E B	E B	B	G	G	G	J A	J A	G	G	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
12	E B	E B	E B	J A	E B	E B	E B	B	G	G	G	J A	J A	G	G	G	J A	J A	E B	E B	E B	E B	E B	E B	E B
13	E B	E B	E B	E B	E B	E B	E B	B	G	G	G	G	G	G	G	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
14	E B	E B	J A	J A	J A	E B	E B	B	G	G	G	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
15	E B	E B	E B	E B	E B	E B	E B	J A	G	G	J A	J A	J A	J A	G	G	J A	J A	J A	J A	E B	E B	E B	E B	E B
16	E B	E B	E B	J A	E B	E B	E B	J A	G	G	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
17	E B	J A	J A	J A	J A	E B	E B	B	G	G	G	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
18	J A	J A	J A	J A	J A	J A	J A	J A	G	G	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	J A
19	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B
20	J A	J A	E B	E B	E B	E B	E B	B	G	G	J A	J A	J A	J A	G	G	J A	J A	E B	J A	J A	J A	J A	J A	J A
21	E B	E B	E B	E B	E B	E B	J A	J A	G	G	G	J A	J A	J A	G	G	J A	J A	E B	E B	E B	E B	E B	E B	E B
22	E B	E B	E B	E B	E B	E B	J A	J A	G	G	J A	J A	J A	J A	G	G	J A	J A	E B	E B	E B	E B	E B	E B	J A
23	E B	E B	E B	E B	E B	E B	E B	J A	G	E B	G	G	G	G	G	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
24	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	J A
25	E B	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
26	E B	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
27	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	J A
28	E B	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
29	E B	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
30	E B	E B	E B	E B	E B	E B	E B	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	E B	E B	E B	E B	E B	E B	E B
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	29	30	30	30	30	30	30	30
MED	E B	E B	E B	E B	E B	E B	E B	B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B	E B
U Q	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A	J A
L Q	E B	E B	E B	E B	E B	E B	E B	B	G	G	G	G	G	G	G	G	G	E B	E B	E B	E B	E B	E B	E B	E B

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23														
1		16	16	E	E	E	E	E	B	G	G	36	34	G	G	G	G	25	29	24	26	18	16	E	E	B	B												
2		E	B	E	B	E	B	E	B	G	38	E	B	G	G	G	G	42	19	E	B	18	18	20	22	21													
3		E	B	E	B	E	B	E	B	G	G	36	40	G	G	45	41	G	G	E	B	20	20	17	22	18	E	B	E	B	E	B							
4		E	B	E	B	E	B	E	B	G	G	G	G	G	G	G	G	27	17	15	15	E	B	E	B	E	B	E	B	E	B								
5		E	B	E	B	E	B	E	B	G	G	G	G	G	G	G	G	35	E	B	E	B	24	21	18	16													
6		E	B	E	B	E	B	E	B	G	34	42	40	44	E	B	U	Y	G	G	E	B	E	B	E	B	E	B	E	B	E	B							
7		E	B	E	B	E	B	E	B	G	25	37	45	39	46	33	G	G	27	18	15	17	E	B	E	B	E	B	E	B	E	B							
8		E	B	E	B	E	B	E	B	G	G	G	G	G	G	G	G	22	G	E	B	E	B	E	B	E	B	E	B	E	B	E	B						
9		E	B	E	B	E	B	E	B	G	32	30	31	42	G	G	G	40	23	15	15	E	B	E	B	E	B	E	B	E	B	E	B						
10		E	B	E	B	E	B	E	B	G	32	36	43	41	43	34	29	27	G	E	B	E	B	E	B	E	B	E	B	E	B	E	B						
11		E	B	E	B	E	B	E	B	G	31	31	34	31	47	32	28	40	33	18	14	16	16	15	15	15	15	15	15	15	15	15							
12		E	B	E	B	E	B	E	B	G	15	16	14	17	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B					
13		E	B	E	B	E	B	E	B	G	15	14	16	16	14	12	16	26	32	36	32	33	34	27	38	32	27	17	16	16	13	15	15						
14		E	B	E	B	E	B	E	B	G	15	16	16	13	15	15	16	G	G	31	39	39	41	39	34	49	64	21	16	13	14	16	16	16					
15		E	B	E	B	E	B	E	B	G	18	15	15	14	16	16	16	26	27	40	42	43	44	46	G	G	25	24	21	25	20	17	16	12					
16		E	B	E	B	E	B	E	B	G	14	16	15	16	15	16	16	25	33	G	37	44	40	46	34	31	23	20	19	15	16	16	19	16					
17		E	B	E	B	E	B	E	B	G	15	15	15	14	16	16	16	24	30	28	40	30	29	40	38	32	27	22	16	18	16	15	14	16					
18		E	B	E	B	E	B	E	B	G	15	13	16	16	15	16	17	24	22	36	40	30	20	27	37	38	25	25	25	18	18	15	16	15					
19		16	16	E	B	E	B	E	B	G	16	16	15	13	16	16	16	23	32	44	41	39	42	49	35	60	49	44	26	16	15	16	16	16					
20		E	B	E	B	E	B	E	B	G	15	17	E	B	E	B	E	B	26	24	28	45	36	38	27	30	23	34	16	15	12	17	16	28					
21		E	B	E	B	E	B	E	B	G	16	15	16	15	16	15	16	26	32	35	G	39	38	38	G	36	24	E	B	E	B	E	B	E	B				
22		E	B	E	B	E	B	E	B	G	14	13	16	16	16	14	16	24	34	30	36	40	U	Y	40	36	31	30	23	E	B	E	B	E	B	E	B		
23		E	B	E	B	E	B	E	B	G	15	15	16	15	16	14	15	26	G	E	B	G	40	28	30	28	23	24	16	16	17	13	15	16	16				
24		E	B	E	B	E	B	E	B	G	14	15	14	16	14	15	16	22	30	34	40	38	32	38	26	24	19	E	B	E	B	E	B	E	B				
25		E	B	E	B	E	B	E	B	G	15	16	16	14	13	15	28	23	30	40	37	43	37	26	27	32	22	16	19	16	16	16	12	16					
26		E	B	E	B	E	B	E	B	G	15	16	16	14	14	16	13	23	30	36	46	38	U	Y	38	38	31	29	24	18	14	15	16	15	16	15			
27		E	B	E	B	E	B	E	B	G	13	16	E	B	E	B	E	B	24	26	G	27	28	32	25	26	30	24	E	B	18	16	16	15	16	15			
28		E	B	E	B	E	B	E	B	G	16	13	12	14	15	15	13	24	29	35	30	33	37	28	34	31	C	E	B	E	B	E	B	E	B	E	B		
29		E	B	E	B	E	B	E	B	G	13	16	14	16	15	15	14	23	29	35	33	39	G	34	G	C	C	C	C	22	20	E	B	16	16	16	16		
30		E	B	E	B	E	B	E	B	G	13	15	13	14	12	12	18	23	30	G	G	G	26	24	41	38	C	C	22	18	20	E	B	E	B	E	B	E	B
31																																							
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23														
CNT		30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28	29	30	30	30	30	30														
MED		E	B	E	B	E	B	E	B	E	B	E	B	E	B	E	B	30	24	18	16	E	B	E	B	E	B	E	B	E	B	E	B	E	B				
UQ		E	B	E	B	E	B	E	B	G	16	16	16	16	16	16	17	26	33	36	40	41	41	38	34	34	27	22	19	18	16	16	16	16	16				
LQ		E	B	E	B	E	B	E	B	G	14	15	14	14	14	15	16	24	27	G	G	G	G	G	G	G	G	G	E	B	E	B	E	B	E	B	E	B	

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	13	11	14	14	16	16	17	16	13	16	14	14	17	16	19	20	14	16	16	14	14	12	14	16
2	15	16	15	16	15	14	16	15	23	26	41	26	23	19	14	14	14	16	16	16	16	16	12	15
3	14	15	14	15	14	16	15	18	14	18	15	15	20	16	14	20	14	13	17	14	15	13	16	15
4	14	14	13	15	12	16	16	16	15	18	28	27	21	17	17	16	17	11	11	13	11	14	12	16
5	16	12	14	14	14	13	16	16	14	13	18	21	22	27	18	19	16	16	12	16	14	15	15	14
6	12	15	14	15	16	15	15	15	14	24	18	23	47	24	21	14	16	16	15	15	16	15	14	13
7	16	15	12	16	15	16	13	16	15	20	21	31	26	20	22	20	15	14	13	12	16	15	16	15
8	15	16	13	16	14	15	16	16	15	17	18	19	23	19	23	19	15	16	15	16	16	15	14	15
9	14	17	13	14	14	16	15	16	18	20	18	42	24	20	19	14	14	14	15	15	15	16	14	15
10	14	16	16	16	15	12	14	15	15	21	21	22	22	15	17	17	14	15	12	15	16	14	15	14
11	16	16	15	16	15	15	16	14	12	20	20	24	22	24	18	16	13	16	14	16	16	15	15	15
12	15	16	14	13	14	14	12	17	18	12	21	23	27	21	19	16	12	14	16	16	16	16	12	15
13	15	14	16	16	14	12	16	16	16	16	19	16	20	22	19	15	15	11	10	15	16	13	15	15
14	15	16	14	13	10	15	16	13	15	15	16	16	22	17	17	15	15	16	16	13	14	16	16	16
15	18	15	15	14	16	16	16	13	16	20	19	24	24	22	23	13	13	16	16	12	14	17	16	12
16	14	16	15	16	15	16	16	17	18	22	24	23	18	15	20	16	13	16	16	15	16	16	16	16
17	15	12	11	12	12	16	16	12	16	15	19	24	23	19	19	23	12	17	13	15	16	15	14	16
18	15	13	12	16	11	11	16	16	17	14	17	20	14	16	21	17	16	16	11	15	12	15	16	11
19	14	14	15	13	16	13	16	13	15	16	17	18	16	13	14	13	15	16	13	12	15	16	16	16
20	15	16	14	15	12	16	15	13	13	15	16	20	19	14	20	14	12	16	16	15	12	16	16	15
21	16	15	16	15	12	15	16	15	14	20	21	20	14	26	20	14	16	16	16	16	14	14	15	17
22	14	13	16	16	16	14	16	14	19	17	19	18	19	24	18	13	15	15	15	14	16	15	15	15
23	15	15	16	15	16	14	15	14	19	43	27	27	21	20	16	14	12	16	16	17	13	15	16	16
24	14	15	14	16	14	15	16	15	16	20	20	16	14	13	22	17	16	16	16	13	15	15	15	14
25	15	16	16	14	13	15	16	13	14	15	18	17	20	19	14	14	16	16	16	16	16	16	12	16
26	13	16	14	14	14	12	13	16	14	17	16	17	14	17	13	12	15	14	14	15	16	15	16	15
27	13	13	15	16	14	16	13	14	17	21	18	17	19	18	17	16	15	16	13	16	16	12	12	15
28	16	13	12	14	15	15	13	14	18	20	21	14	20	18	18	19	C	16	16	12	13	12	16	14
29	13	16	14	16	15	15	14	17	17	16	16	23	17	16	C	C	C	C	15	15	16	12	12	16
30	13	15	13	14	12	12	13	12	13	18	19	20	20	16	C	C	15	16	12	16	16	15	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	29	30	30	30	30	30	30
MED	15	15	14	15	14	15	16	15	15	18	19	20	20	18	18	16	15	16	15	15	16	15	15	15
U Q	15	16	15	16	15	16	16	16	17	20	21	24	23	21	20	18	16	16	16	16	16	16	16	16
L Q	14	14	13	14	13	14	14	14	14	16	17	17	18	16	17	14	14	14	13	14	14	14	14	15

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		290	278	256	248	251	274	300	329	318	304	299	282	273	276	278	278	277	289	289	280	286	290	288	298
2		276	264	272	261	239	244	285	307	313	311	292	299	290	287	288	293	303	303	304	309	303	301	297	290
3		249	255	281	318	300	268	309	324	326	316	314	294	287	285	290	295	304	298	308	295	299	302	291	309
4		289	287	295	328	339	274	309	333	332	320	314	297	290	285	282	290	296	302	281	281	291	308	299	274
5		268	252	269	315	301	266	307	327	320	318	310	293	285	281	287	284	294	301	291	304	303	289	284	288
6		287	284	245	253	273	283	299	310	314	316	299	284	259	245	247	254	258	261	257	281	270	255	273	276
7		268	246	246	251	240	238	280	302	305	299	291	276	278	271	284	291	292	295	298	300	312	288	280	273
8		289	309	314	280	275	288	310	331	322	306	317	298	282	285	294	286	301	306	307	318	304	304	327	297
9		295	286	294	289	310	285	307	337	334	323	317	294	291	291	294	292	301	304	292	299	307	297	283	285
10		285	289	296	290	276	266	319	332	334	328	317	298	292	283	297	291	284	297	300	287	297	290	290	285
11		297	281	286	302	305	270	301	334	329	315	315	300	295	281	278	288	301	294	291	294	297	281	280	288
12		299	307	301	285	281	280	317	333	332	316	297	298	297	292	290	295	303	292	295	291	293	294	286	273
13		271	279	276	295	328	297	310	331	331	321	313	291	291	289	289	297	303	296	295	293	301	304	300	277
14		275	276	281	292	300	275	305	335	328	320	316	292	296	284	287	291	294	304	292	307	289	305	297	292
15		274	284	297	300	327	277	302	333	329	322	314	301	294	289	290	300	304	305	297	292	300	284	282	277
16		284	291	298	312	302	257	298	341	325	306	292	300	288	290	285	290	289	289	286	288	295	280	281	273
17		270	290	287	291	294	289	289	324	313	316	304	301	290	278	298	294	301	297	299	278	286	298	281	263
18		271	259	278	288	251	260	286	329	337	320	306	303	295	296	293	299	307	303	292	292	308	307	290	269
19		284	290	284	256	250	261	305	325	321	323	318	310	285	290	306	297	300	299	298	312	294	298	295	288
20		274	246	275	259	271	307	283	306	314	308	302	285	289	289	293	291	299	292	301	315	326	299	303	304
21		297	276	298	308	301	285	315	346	340	324	329	304	297	304	309	308	329	318	297	324	388	319	316	282
22		265	266	297	289	260	289	322	340	345	331	327	314	314	303	302	301	309	322	320	282	283	296	274	280
23		285	288	287	287	264	277	301	335	337	319	317	311	300	292	299	317	307	307	312	304	306	288	282	278
24		259	281	290	279	270	286	316	335	332	315	320	310	294	292	297	300	310	310	265	304	302	269	239	223
25		242	210	248	346	230	246	247	291	F	R	R	R	304	309	308	306	313	306	302	305	309	304	316	300
26		299	320	308	296	284	281	302	345	336	325	324	317	311	295	315	321	327	313	297	325	332	312	303	291
27		294	291	309	306	284	305	322	333	348	335	323	323	319	309	311	313	325	317	324	314	298	312	296	290
28		293	300	315	292	305	290	295	338	350	337	330	313	307	297	298	316	C	C	C	C	314	313	329	298
29		272	283	281	296	298	281	318	345	344	329	326	306	300	306	C	C	C	C	C	303	305	331	313	270
30		280	270	284	295	306	288	291	339	335	332	328	312	315	288	C	C	C	C	C	320	311	313	313	292
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		30	30	30	30	30	30	30	30	29	30	30	30	30	30	28	28	28	29	30	30	30	30	30	30
MED		282	282	286	292	284	278	304	333	331	320	314	300	293	289	293	294	302	303	298	302	300	298	287	282
U Q		290	290	297	302	302	288	310	337	336	324	320	310	300	295	298	300	307	310	304	313	306	306	297	290
L Q		271	266	276	280	264	266	295	325	320	315	304	294	288	284	287	290	295	296	292	291	293	288	280	274

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1														L	L										
2														L	L	L									
3														L	L										
4														L	L										
5													L	L	L										
6														L	L	L	L								
7									L			L	L	L	L										
8													L		L										
9											L			L		L									
10												L		L	L										
11														L		L									
12												L		L	L										
13													L												
14														L	L										
15																									
16													L		L										
17														L		L									
18													L			L									
19													L	L		L									
20														L											
21															L										
22													L												
23																									
24																L									
25																									
26																L									
27														L		L									
28															L	L		C							
29													L		L	C	C	C							
30														L		C	C								
31																									
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																									
MED																									
U Q																									
L Q																									

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1														316	318											
2														312	302	312										
3														310	306											
4														298	314											
5													304	322	330											
6														360	396	374	360									
7									278			302	338	312	312											
8													294		300											
9										272				302		298										
10												278		302	338											
11														296		334										
12												312		308	322											
13													322													
14														294	308											
15																										
16													292		300											
17														308		284										
18														294		318										
19														290	328	278										
20														310												
21															298											
22														284												
23																										
24																298										
25																										
26																274										
27														264		282										
28															266	306										
29														284	290											
30															280											
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT										1	1	3	9	17	15	11	1									
MED										278	272	302	294	308	308	298	360									
U Q												312	313	314	322	318										
L Q												278	287	297	300	282										

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHZ TO 25.0MHZ IN 24.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
1	262	276	E BE B	E BE B	E BE B	250	236	228	220	216	224	228	232	244	236	238	266	236	270	258	254	244	224					
2	260	260	272	248	E AE B	E AE B	294	238	236	240	234	246	228	222	234	228	228	224	226	230	228	250	264	E A				
3	E BE B	E AE A	E AE A	230	E B	E B	270	230	228	226	222	216	220	240	242	230	230	226	226	254	242	234	244	248				
4	246	E AE A	E AE A	250	E B	E B	254	228	222	232	224	224	232	242	244	238	230	220	212	262	242	244	238	260				
5	292	304	296	242	E B	E B	258	232	226	236	230	220	232	238	242	238	238	226	222	246	246	238	248	262				
6	258	266	E BE B	E BE B	280	242	260	234	232	224	226	236	234	250	252	248	238	226	260	274	260	282	284	254				
7	250	278	E A	292	E BE B	E BE B	344	372	286	254	228	238	228	226	226	236	248	236	230	206	226	258	222	234	270	276		
8	264	246	246	264	E B	E B	250	228	220	226	228	212	226	230	242	230	238	218	220	220	240	228	220	242				
9	272	274	260	280	258	288	256	230	232	224	228	218	226	236	238	238	236	214	210	240	230	220	250	280				
10	278	282	262	284	E A	E A	238	224	222	232	218	226	228	230	238	226	228	214	214	228	240	226	250	266				
11	262	266	266	254	E B	E B	256	228	232	228	232	222	E A	240	236	230	238	238	216	226	250	238	250	272	266			
12	246	244	252	258	280	280	260	222	230	222	224	232	230	240	230	242	238	210	240	220	236	244	238	274				
13	276	276	282	256	238	228	232	228	230	230	226	218	226	240	252	238	226	212	216	230	230	232	228	258				
14	E BE B	E BE B	E A	276	260	282	268	220	224	228	224	226	230	228	242	228	E A	282	220	224	244	240	248	242	250			
15	E B	292	276	254	236	E B	308	262	232	232	230	230	220	232	E A	244	236	234	230	220	230	244	E AE B	E BE B	290			
16	E B	284	278	258	250	E B	356	254	224	218	230	234	236	230	242	238	240	234	214	234	250	240	236	258	254			
17	E A	292	282	272	250	258	288	242	238	234	234	232	228	238	240	244	228	216	224	246	264	264	254	E B	294			
18	E B	302	286	E A	E AE A	E A	320	378	290	236	232	230	236	216	230	H	E A	220	232	252	244	248	240	E A	292			
19	286	264	282	302	E BE A	E BE A	380	334	252	222	228	230	236	218	220	244	234	234	E A	E A	250	238	256	232	244	242	246	262
20	E AE B	E BE B	E BE B	E BE B	E BE B	E B	296	236	280	250	228	218	222	230	216	246	234	218	E A	234	252	244	234	216	234	252	292	
21	254	276	272	254	236	246	230	222	228	218	228	218	222	228	230	228	218	214	236	234	216	216	236	310				
22	E BE B	314	300	270	E B	E B	336	278	220	220	230	230	232	226	236	218	238	240	220	218	208	218	266	254	E AE A	308		
23	E B	298	268	282	272	308	286	250	232	228	230	238	232	240	238	230	236	238	224	244	224	232	254	274	280			
24	288	284	268	280	274	266	238	228	228	226	236	238	224	220	232	236	226	198	310	228	204	E BE B	E AE B	E B	504			
25	482	E BE B	490	366	226	E B	374	362	356	258	246	236	232	224	226	226	224	216	216	210	258	248	230	250	286	294		
26	272	234	230	236	E A	E A	298	278	242	212	234	220	220	232	224	226	226	220	202	222	236	214	234	E BE B	E B	304		
27	278	284	264	270	E B	E B	250	276	260	226	226	228	220	214	222	234	228	224	230	206	232	242	216	240	252	286		
28	278	264	256	260	270	E B	284	258	234	226	228	224	228	228	218	236	236	C	204	228	232	228	234	250	276			
29	E BE B	286	310	302	278	E B	294	246	230	224	230	234	228	234	232	C	C	C	C	226	244	222	214	E AE B	E B	312		
30	E BE B	292	314	276	268	E A	304	238	222	228	236	228	234	230	C	C	218	210	246	222	236	232	238	E B	314			
31																												
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	29	30	30	30	30	30	30	30			
MED	270	272	270	262	U	E	257	291	257	230	228	230	228	225	228	234	237	236	230	216	226	241	236	238	248	U	264	
UQ	E BE B	E BE B	E BE B	280	E BE B	E BE B	308	318	278	236	232	232	234	230	232	240	242	238	238	225	244	248	244	250	E BE B	E B		
LQ	262	266	264	250	250	276	250	226	224	226	224	218	226	228	230	228	226	210	222	230	228	234	244	260				

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 h'E (KM)

135'E MEAN TIME (G.M.T. + 9 H)

LAT. 35'42.4'N LON. 139'29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1							B	120	126	122		A	A	118	120	116	116	A	B						
2							B	120	122	130		B	126	120	122	120	120	A	B						
3							B	122	134		A	A	120	118		A	120	124	B						
4							B	120	116	120	120	122	126	126	120	120	126	A	B						
5							B	120	124	128	124	126	120	120	118	118		A	B						
6							B	124		A	122	120		A	B	118	118	118	126	B					
7							B	122	126	124	122	122		A	124	124	116	A	B						
8							B	132	124	120	122	118		A	118	120	120	124	B						
9							B	118		A	122	122		B	122	122	120	118	120						
10							B	126	126	122	120	122	130	124	124	134	124								
11							B	118		A	124	124	124		A	120	122	118	122						
12							B	124	118		A	122	120	118	124	126	E	A	134	128					
13							B	118	124	124	124	122	126	124	118	122	126	A							
14							B	122	118	126	120	120	120	114	126	130		A							
15							B	118	120	120	122	118	118		A	122	124	120							
16							B	130	120	118	122	122	118	118		A	124	A							
17							B	120	118	122	120	128	120	120	124	118	122								
18							B	120	124	128	126	126	120	124	128	120	124								
19							B	118	122	118	122	118	116		A	A	A	A							
20							B	126		A	118	122	116		A	A	124	116	122						
21							B	122	118	122	116	120	120	118	120	122	112								
22							B	E	A	134	120	124	124	120	120	118	126	118	122						
23							B	122	128		B	116	118	118	120	118	120	118							
24							B	118	118	126	122		A	126		A	122	120	118						
25							B	A		126	118		A	A	A	124	124	126	A						
26							B	E	B	130	122	128	120	122	118	118		A	118						
27							B	E	B	142	122	120	132	122	122	120	122	120	122						
28							B	124	120	122	122	126	122	122	118	122		C	C	C					
29							B	138	124	128	130	122	116	126		C	C	C							
30							B	124	118	116	128	120		A	A	C	C	A							
31																									
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT								29	26	27	26	25	23	24	24	27	18								
MED								121	122	122	122	122	120	120	122	120	122								
U Q								126	124	126	124	123	122	124	124	122	124								
L Q								120	118	120	120	120	118	118	119	118	120								

NOV. 2001 h'E (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1		106	104	104	102	B	B	B	136	108	106	106	102	102	100	G	G	102	100	98	94	94	100	B	B	
2		92	94	94	B	98	B	132	146	G	160	B	102	108	106	114	104	104	106	B	104	102	100	102	104	
3		108	98	96	98	B	B	138	170	102	106	106	102	102	102	96	G	108	120	B	110	108	B	B	B	
4		114	96	98	98	100	B	100	116	G	G	G	G	110	108	G	102	134	100	98	98	B	B	B	B	
5		B	B	B	B	B	B	B	G	136	110	108	108	G	G	G	118	96	104	96	B	104	104	104	110	
6		B	108	B	102	B	B	122	130	132	122	116	106	B	116	G	G	G	B	B	B	B	B	B	102	
7		102	112	102	B	110	B	170	152	108	128	116	120	104	108	G	G	104	102	100	98	B	B	B	120	
8		B	B	B	B	B	B	162	142	104	102	126	122	114	122	G	100	G	B	B	114	B	B	B	128	
9		B	B	104	104	104	B	120	122	108	110	110	B	G	102	130	122	114	110	114	B	B	B	114	B	
10		106	B	B	B	B	106	B	136	140	124	120	120	136	110	114	116	G	B	120	B	B	B	B	B	
11		B	B	B	B	B	B	B	148	110	110	110	108	108	104	110	134	124	114	B	B	B	B	B	B	
12		B	B	98	102	B	B	110	146	124	110	110	118	120	112	108	108	138	106	106	B	B	B	B	B	
13		B	B	B	B	B	B	B	140	128	128	106	108	112	104	154	120	144	100	100	98	B	B	B	B	
14		B	B	106	100	96	B	B	G	G	110	132	124	126	122	140	122	108	108	108	104	B	B	B	B	
15		B	B	B	B	B	B	122	116	108	150	132	122	122	110	G	G	134	98	96	96	96	B	B	B	
16		B	B	B	B	B	B	116	156	144	G	146	126	116	116	110	124	104	104	110	B	B	B	B	B	
17		B	122	106	108	104	B	B	142	146	108	118	112	106	122	120	122	140	96	100	94	B	B	B	B	
18		104	102	108	102	102	114	100	124	110	128	122	112	106	106	136	124	116	104	102	100	102	102	B	108	
19		112	106	104	106	112	106	100	110	140	116	116	116	112	104	104	106	108	108	106	112	102	B	B	B	
20		104	102	B	B	B	B	B	152	104	104	102	114	110	106	110	132	124	112	B	B	B	B	B	104	
21		B	B	B	B	108	102	100	130	120	134	G	128	122	134	G	136	138	B	B	B	B	102	B	B	
22		B	B	104	B	B	B	148	154	118	108	124	120	118	116	112	134	142	B	B	B	B	100	98	100	
23		B	B	B	B	B	B	B	136	G	B	G	120	104	100	98	98	136	112	94	B	B	B	B	B	
24		B	B	B	B	B	B	102	160	142	134	120	110	108	110	108	104	100	B	B	B	B	B	126	122	
25		B	B	B	B	B	B	114	110	122	122	110	108	104	108	100	130	102	B	106	B	B	B	B	B	
26		92	B	102	B	B	B	130	142	124	152	122	128	124	122	100	132	98	94	B	B	B	114	B	B	
27		B	134	B	B	B	B	122	130	152	G	110	104	108	104	108	134	128	102	106	108	B	106	100	98	
28		120	114	B	B	108	B	144	134	134	112	110	122	104	124	128	C	C	C	C	100	104	98	B	B	
29		B	B	B	B	B	B	96	140	138	144	108	124	G	114	C	C	C	C	104	102	B	100	96	B	
30		B	B	B	B	B	B	102	126	124	G	110	106	110	124	C	C	116	120	104	B	B	B	B	B	
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT		11	12	13	11	10	5	19	28	26	25	26	28	26	29	20	23	25	22	19	16	9	12	9	10	
MED		106	105	104	102	104	106	116	140	124	122	114	113	110	108	110	122	116	104	104	101	102	101	102	106	
U Q		112	113	105	106	108	122	132	147	138	134	122	121	120	116	122	132	135	110	106	108	106	103	110	120	
L Q		102	100	98	100	100	104	100	128	108	109	110	108	106	104	106	106	104	100	98	98	99	100	98	102	

NOV. 2001 h'Es (KM)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2001 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	F2	F2	F2	F1				C2	L1	L1	L2	L1	L1	L1			L2	L2	F2	F3	F2	F1				
2	F2	F1	F2		F2		CL11	HL11		H1		L1	L1	L1	CL11	L2	LL31	L1		F2	F1	F2	F3	F2		
3	F2	F3	F3	F2			C2	H1	L2	L2	L1	L2	L1	L2	L2		L1	CL11		F3	F1					
4	F1	F3	F2	F2	F1		L1	CL11					L1	L1		L1	HL11	L1	F2	F1						
5									CL11	L2	L2	L1				C2	L2	L1	F1			F3	F2	F2	F1	
6		F1		F1			C2	C2	CL11	CL11	CL11	L1		C1											F1	
7	F1	F2	F1		F2		H1	H1	L2	CL11	CL21	C1	L1	L1			L2	L2	F2	F2					F1	
8							HL11	HL11	L2	L2	CL11	CL11	L1	CL11		L1				F2					F1	
9			F2	F2	F1		C1	C1	L2	L1	L1			L2	C1	C1	C3	F2	F2					F2		
10	F2					F1		H1	HL11	CL11	CL11	CL11	CL12	L2	L1	L1			F2							
11								H2	L2	L2	L2	L2	L2	L2	L1	L1	C3	F2					F1			
12		F1	F2				C1	H1	C1	L2	L1	CL11	CL11	L1	L1	L2	CL21	F2	F2				F1			
13								H2	C1	C2	L1	L1	L2	L1	L1	CL11	H2	F2	F2	F1						
14		F2	F1	F2						L2	HL11	CL11	CL21	CL11	HL11	CL21	L3	F2	F2	F1						
15							C2	CL21	L2	HL11	CL11	CL21	CL11	L2			C1	F2	F2	F2	F2					
16			F1				C2	H1	H1		H1	C2	C1	C2	L2	CL11	L2	F2	F2					F2		
17		F2	F2	F2	F2			H1	H1	L2	CL11	L1	L1	CL11	CL21	CL11	H2	F2	F1	F1						
18	F2	F2	F2	F1	F1	F1	L2	CL11	L1	CL11	CL11	L2	L2	L2	CL11	CL32	CL2	F2	F2	F2	F2	F1			F3	
19	F2	F2	F2	F1	F2	F2	L2	LH11	HL11	CL11	CL11	CL21	CL21	L2	L2	L3	L3	F4	F3	F1	F2	F2	F2	F2	F5	
20	F2	F2						HL11	L2	L2	L2	CL11	L2	L2	L1	CL11	C1	F3		F3	F1	F2	F2	F2	F5	
21				F1	F1	L2	HL11	CL11	CL11		CL11	CL11	C1		C2	H2						F1				
22		F2				H1	L1	CL11	L2	CL11	CL11	CL11	CL11	L1	CL11	H1						F2	F2	F2	F2	
23							C1					CL11	L2	L1	L1	L2	HL12	F1	F1							
24						L1	H2	C2	CL12	CL22	L2	L2	L1	L2	L2	L2	L1						F1	F1		
25						L6	L3	CL22	C3	L2	L1	L2	L2	L1	L1	CL11	L1		F2							
26	F2		F2			F2		H1	CH11	HL11	C2	CL12	CL11	L2	HL11	L2	F1					F2				
27		F2					C1	C1	HC11		L2	L2	L1	L1	L2	CL11	CL11	F1	F2	F1		F2	F1	F2		
28	F2	F2		F1				HL11	CL11	CL11	L1	L2	CL11	L1	CL11	CL11		F1		F5	F2	F2				
29						L1	HL11	HL11	HL11	L2	C1		L1		L1				F3	F4		F2	F1			
30						L2	CL11	C1		L2	L1	L2	CL12				CL12	FF21	FF22							
31																										
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT																										
MED																										
U Q																										
L Q																										

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
◊	f _o F ₂ , f _o F ₁ , f _o E
×	f _x F ₂
✱	DOUBTFUL f _o F ₂ , f _o F ₁ , f _o E
⊗	f _b E _s
└	ESTIMATED f _o F ₁
†, ‡	f _{min}
^	GREATER THAN
v	LESS THAN

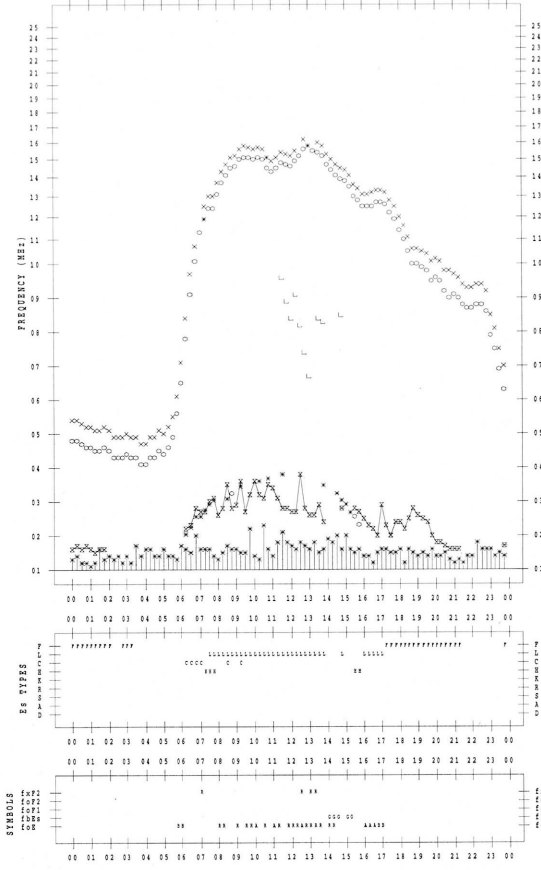
f-PLOT DATA

SCALER : I.NISHIMOTA

STATION : Kokubunji

DATE : 2001/11/ 1

135 °E MEAN TIME



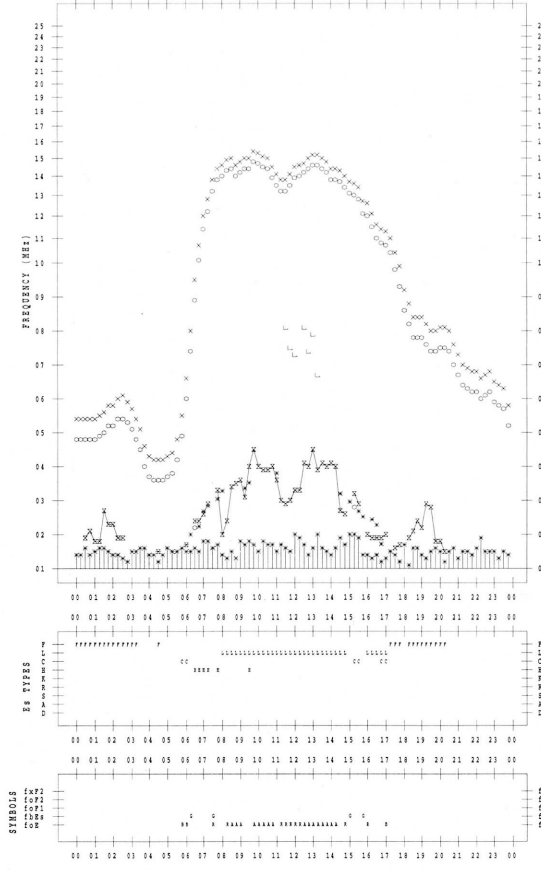
f-PLOT DATA

SCALER : I.NISHIMOTA

STATION : Kokubunji

DATE : 2001/11/ 3

135 °E MEAN TIME



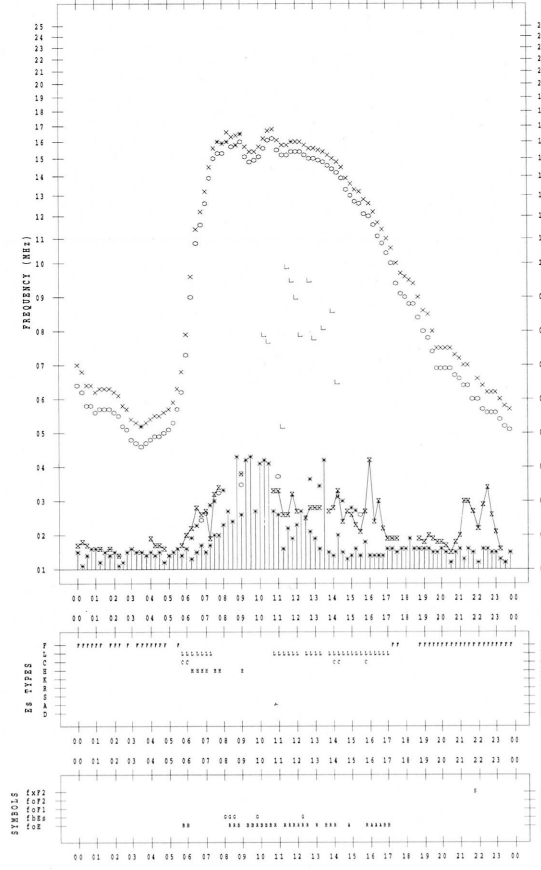
f-PLOT DATA

SCALER : I.NISHIMOTA

STATION : Kokubunji

DATE : 2001/11/ 2

135 °E MEAN TIME



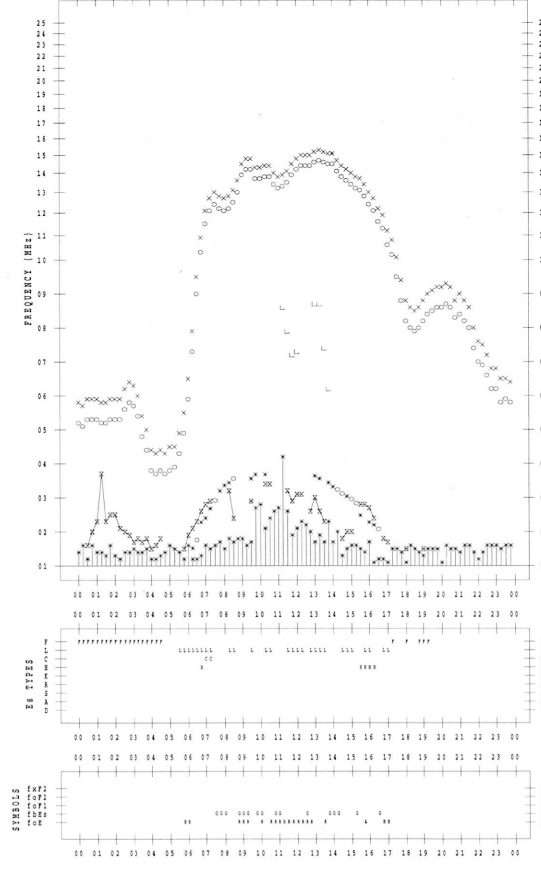
f-PLOT DATA

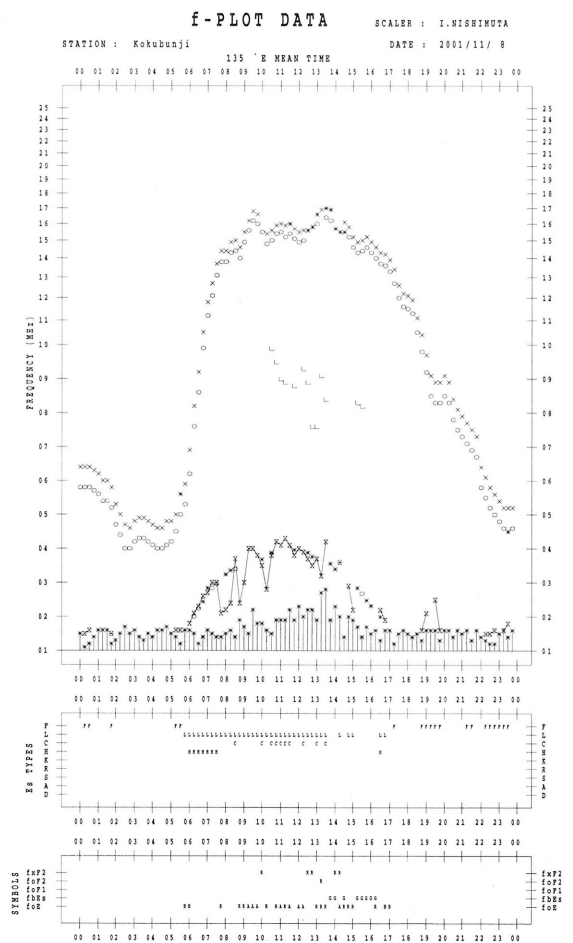
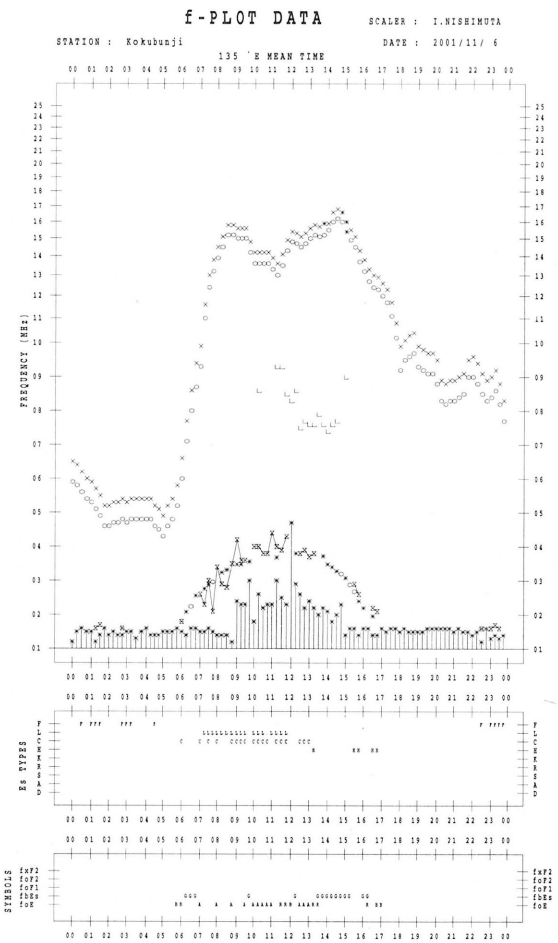
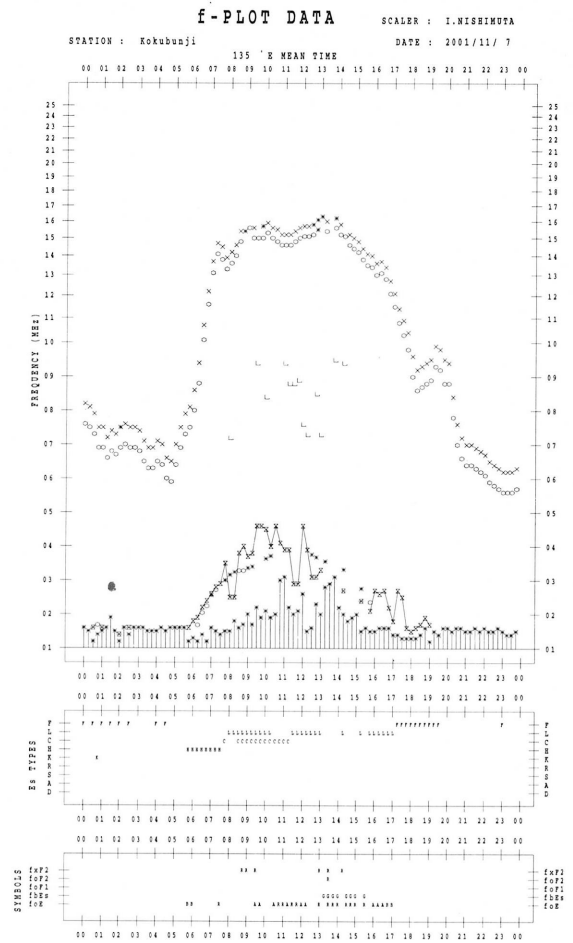
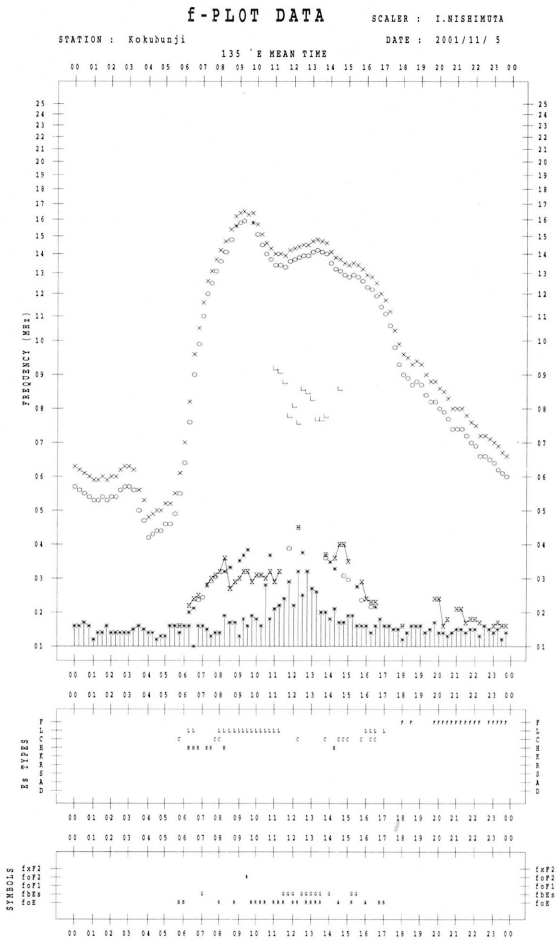
SCALER : I.NISHIMOTA

STATION : Kokubunji

DATE : 2001/11/ 4

135 °E MEAN TIME





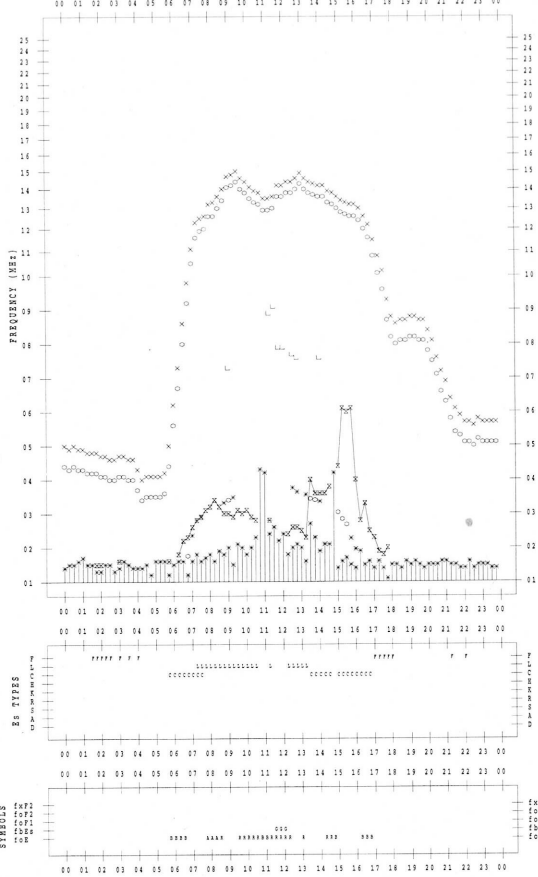
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/9

135 °E MEAN TIME



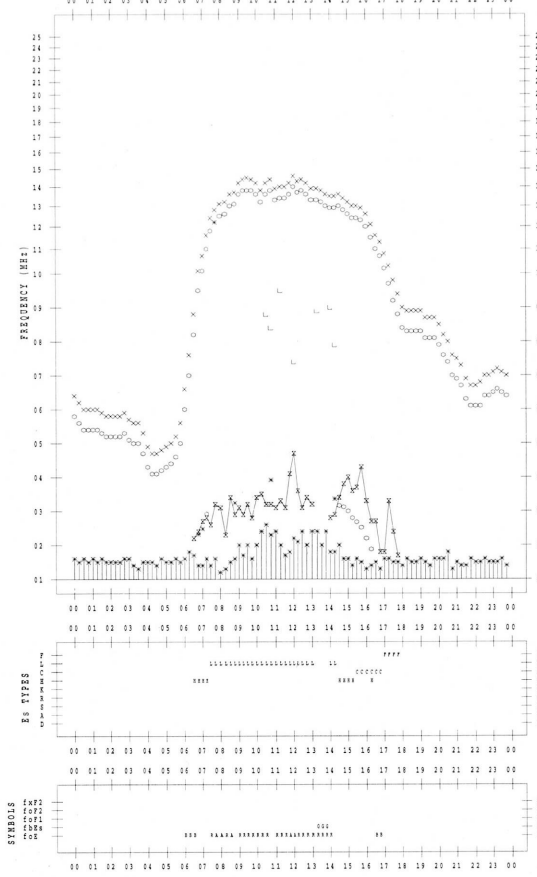
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/11

135 °E MEAN TIME



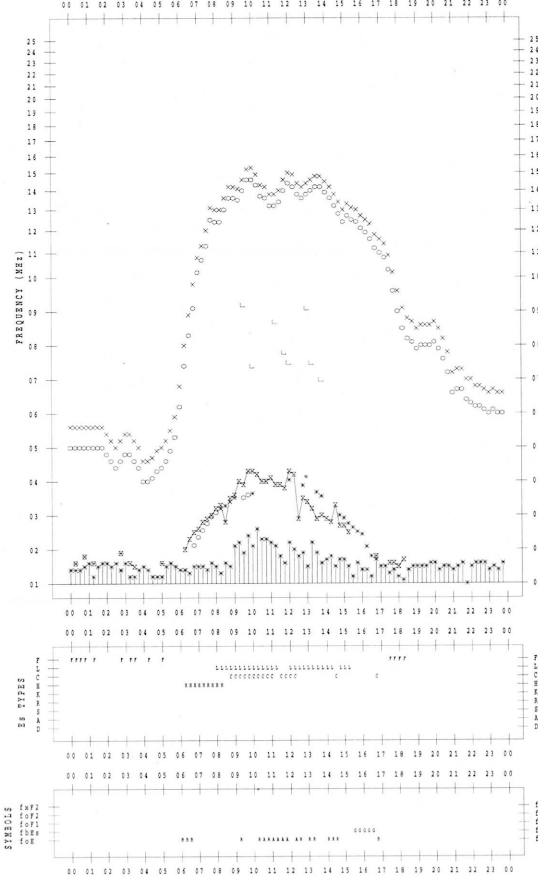
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/10

135 °E MEAN TIME



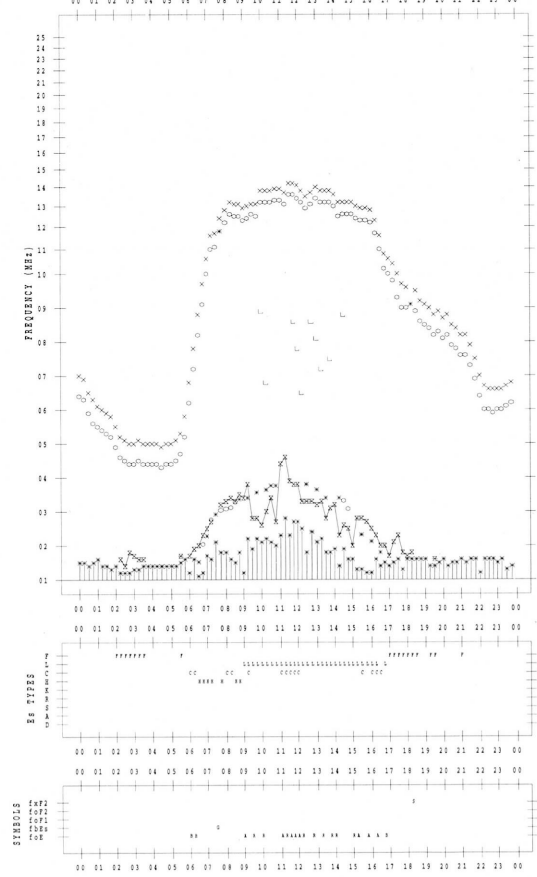
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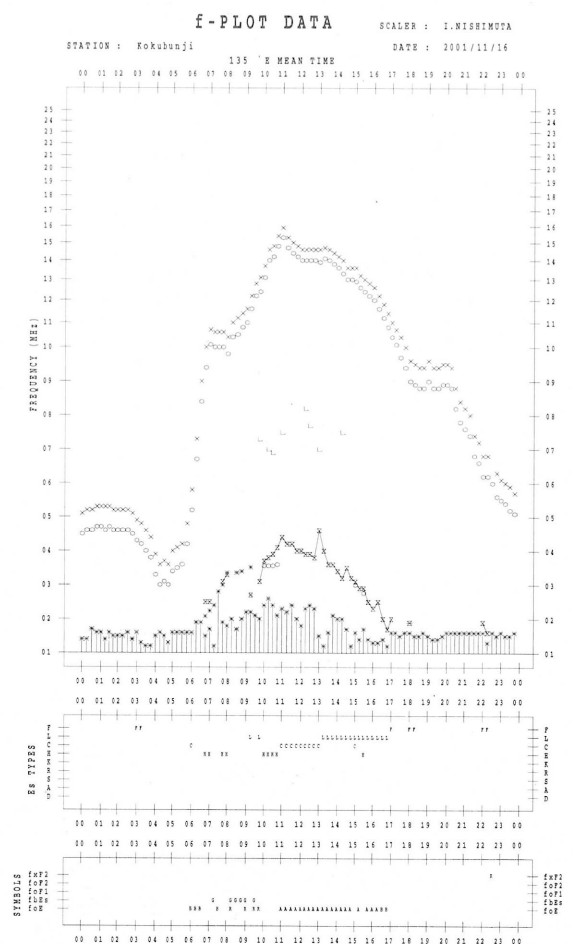
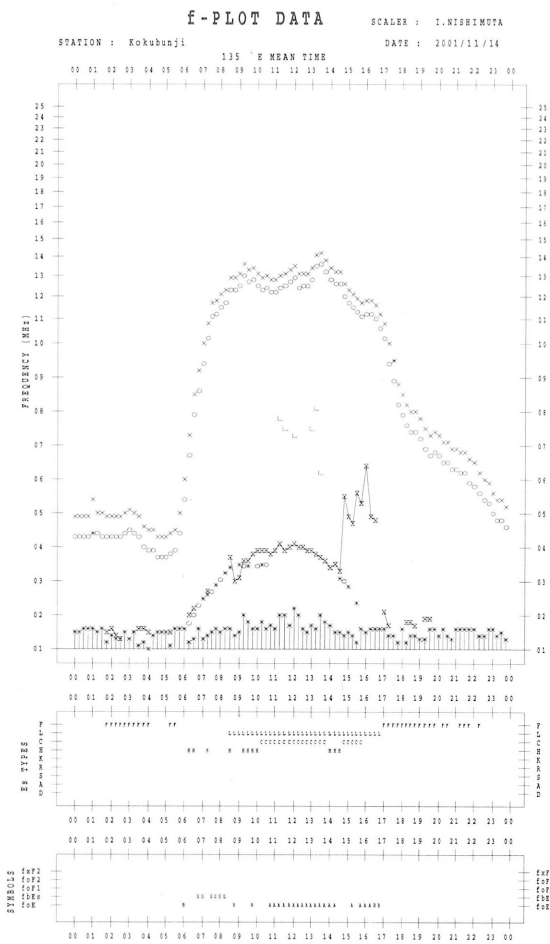
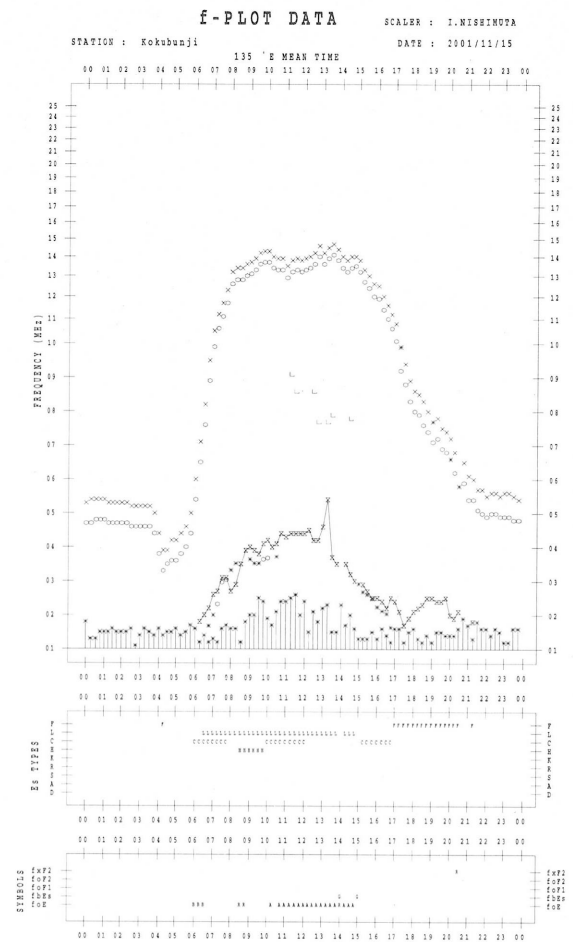
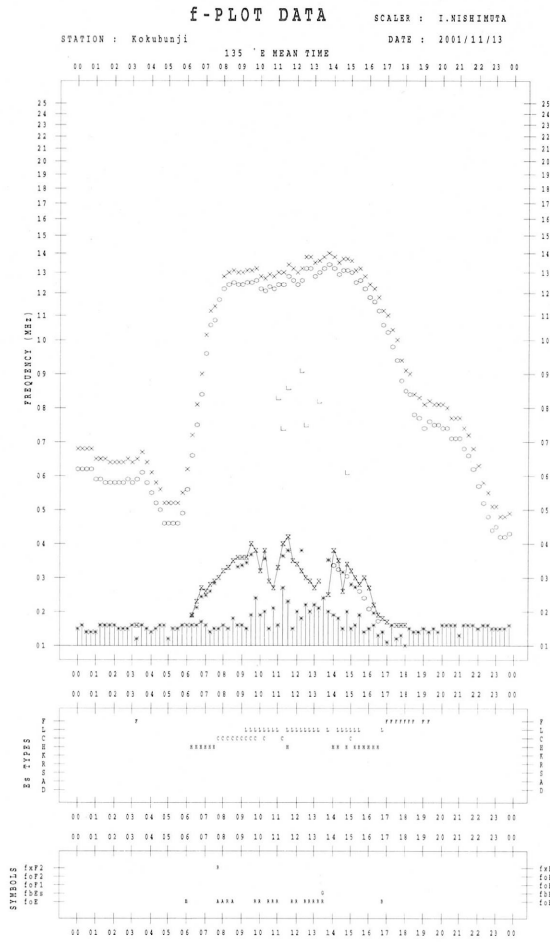
SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/12

135 °E MEAN TIME





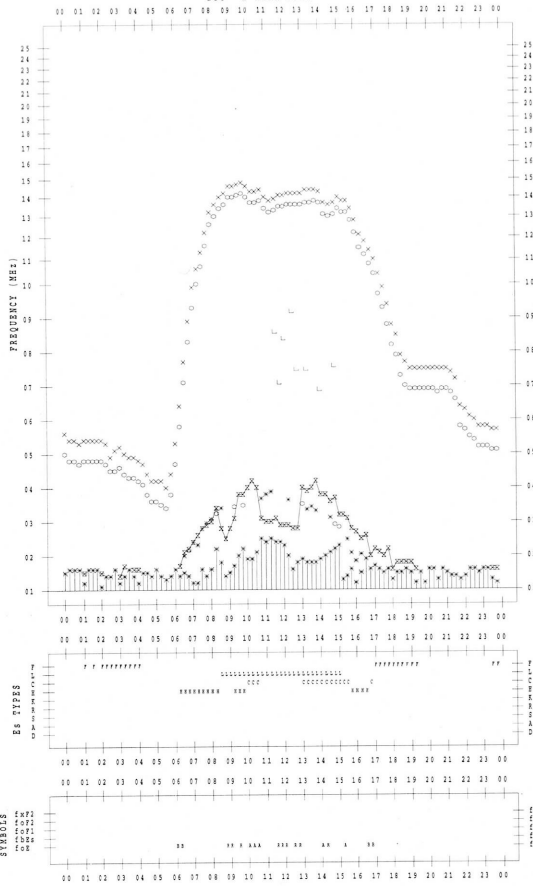
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001/11/17



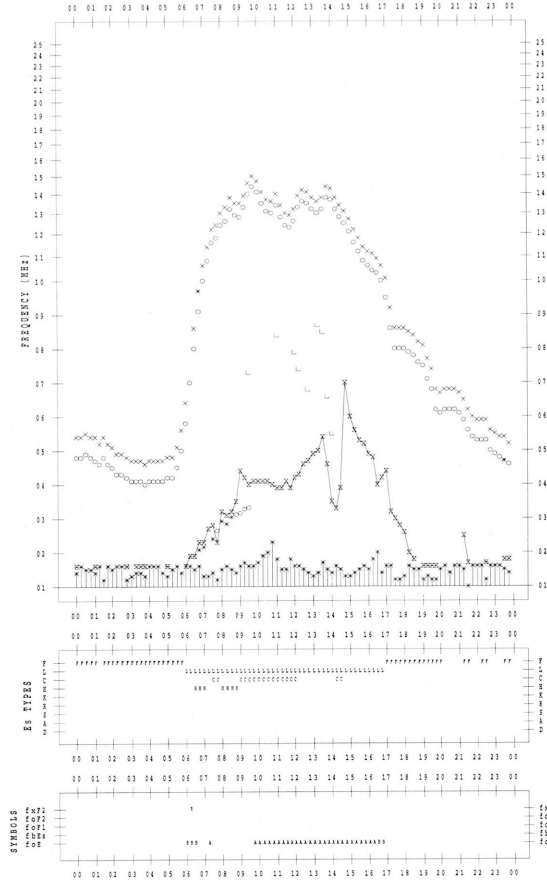
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001/11/19



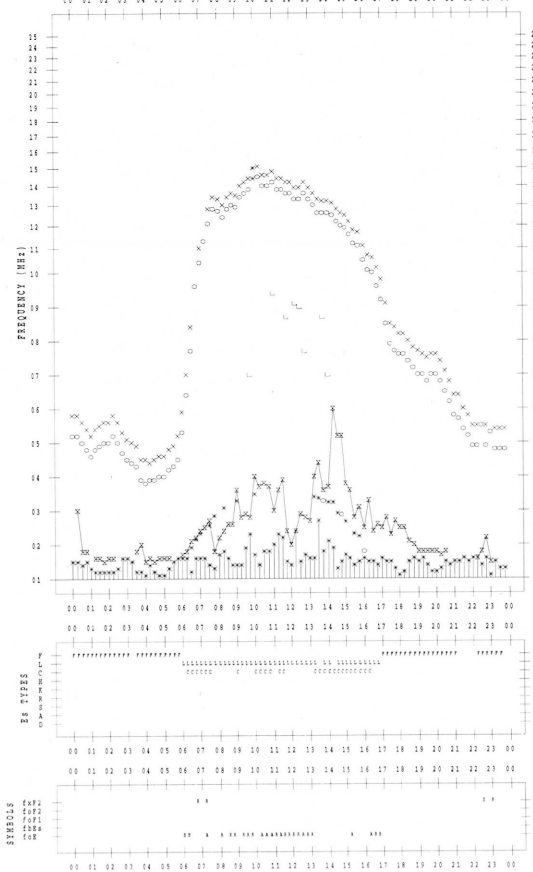
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001/11/18



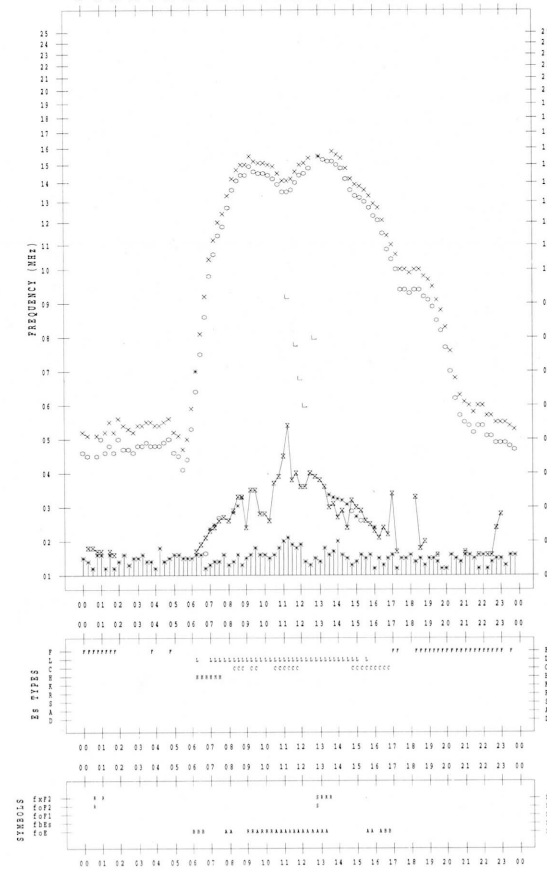
f-PLOT DATA

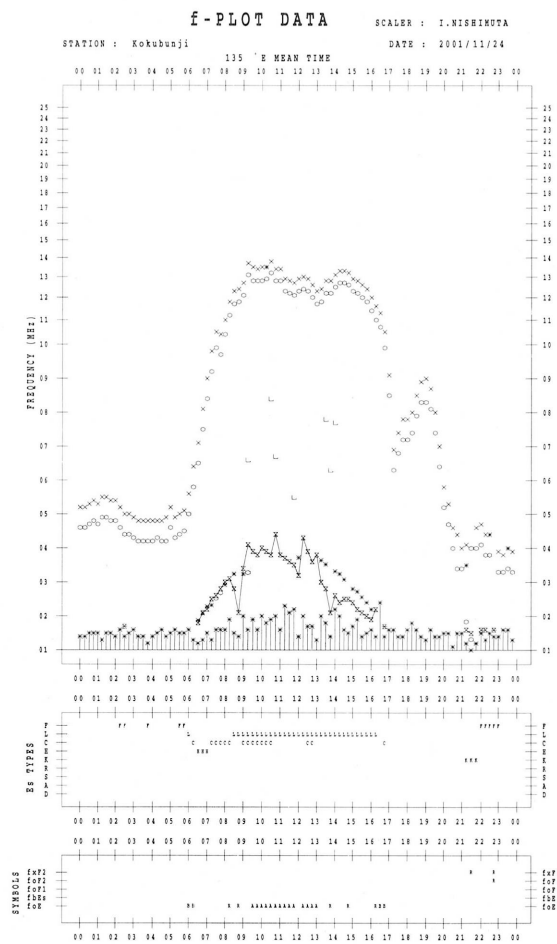
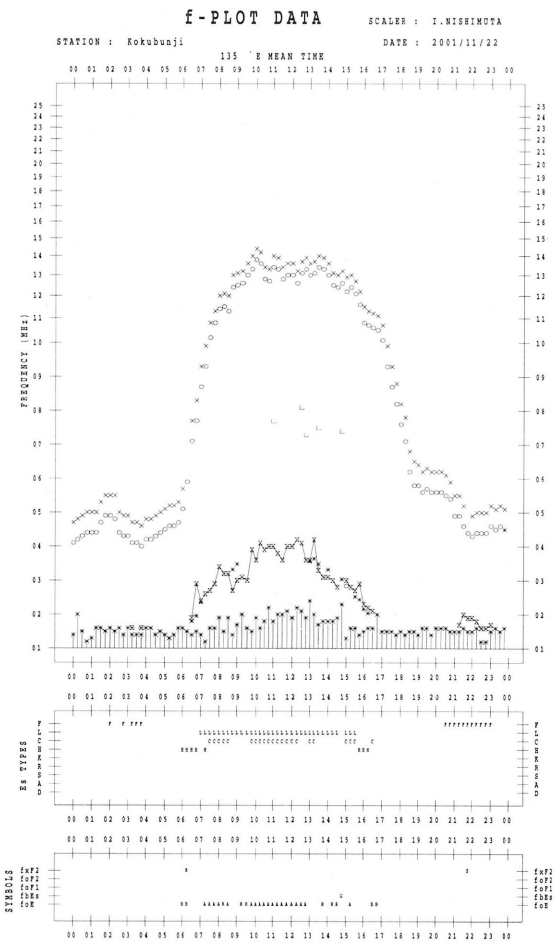
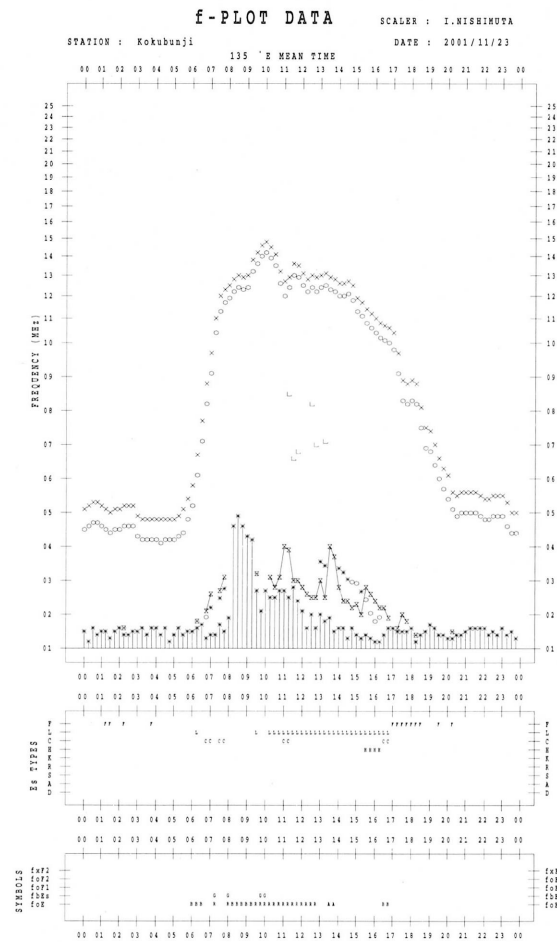
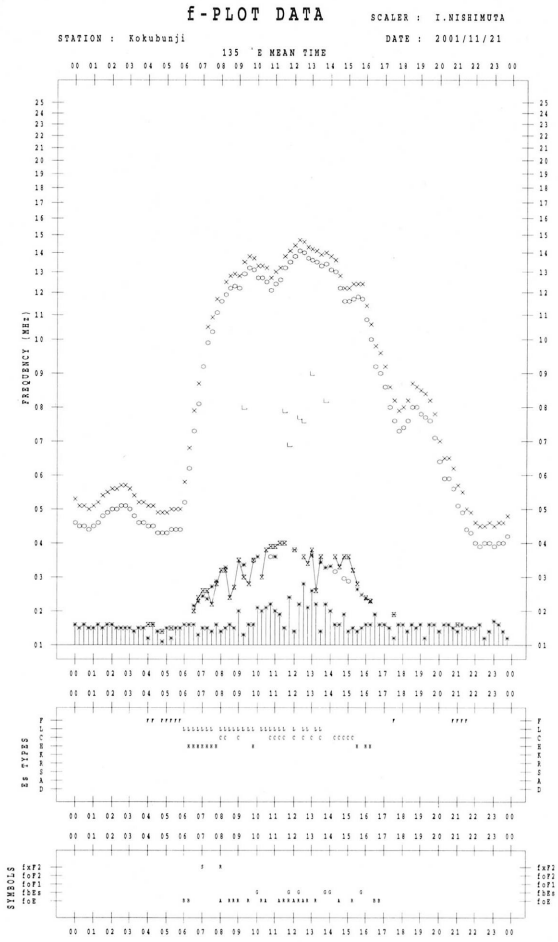
SCALER : I.NISHIMUTA

STATION : Kokubunji

135 °E MEAN TIME

DATE : 2001/11/20





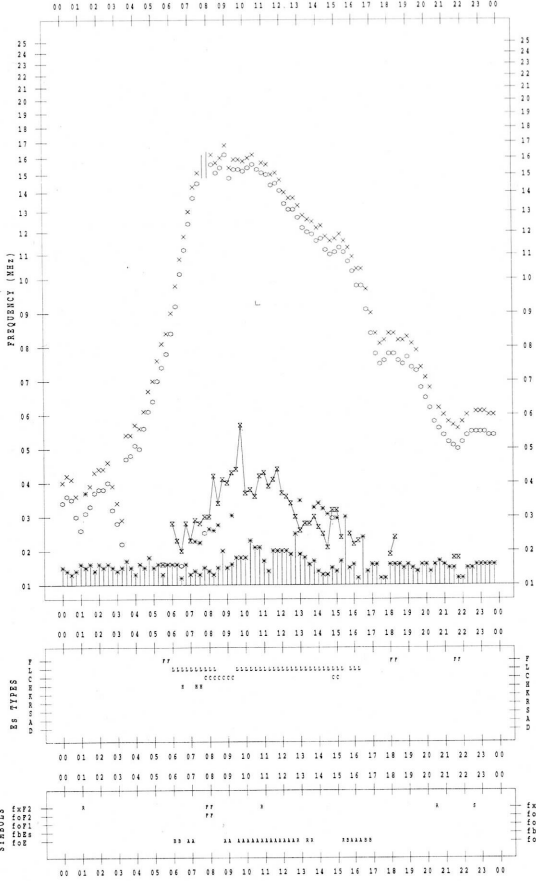
f- PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/25

135 °E MEAN TIME



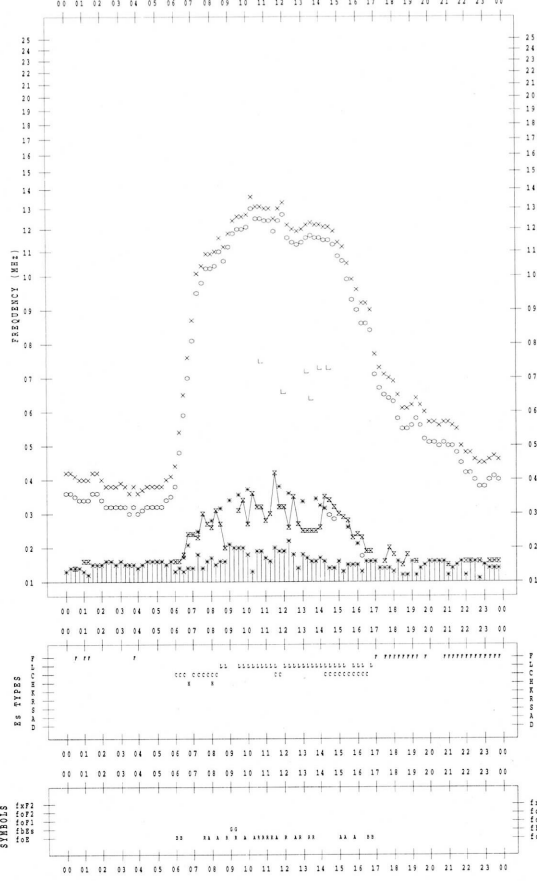
f- PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/27

135 °E MEAN TIME



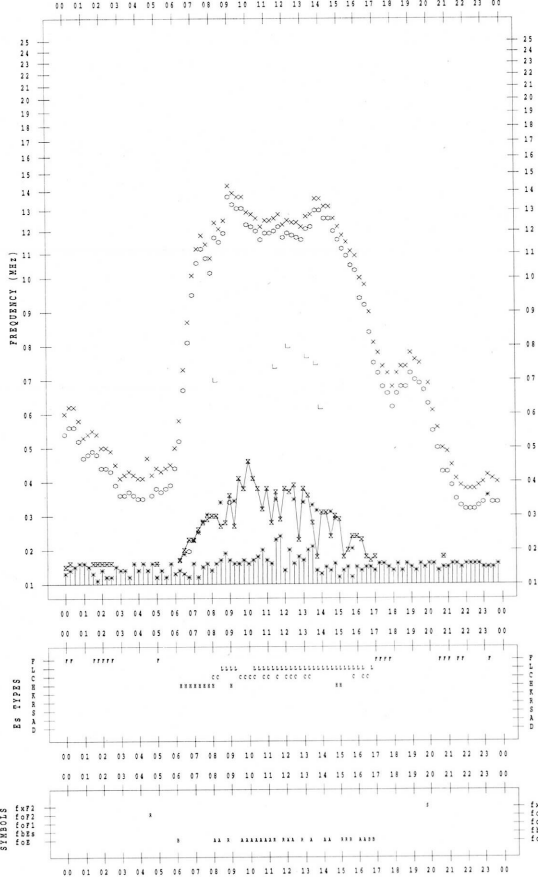
f- PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/26

135 °E MEAN TIME



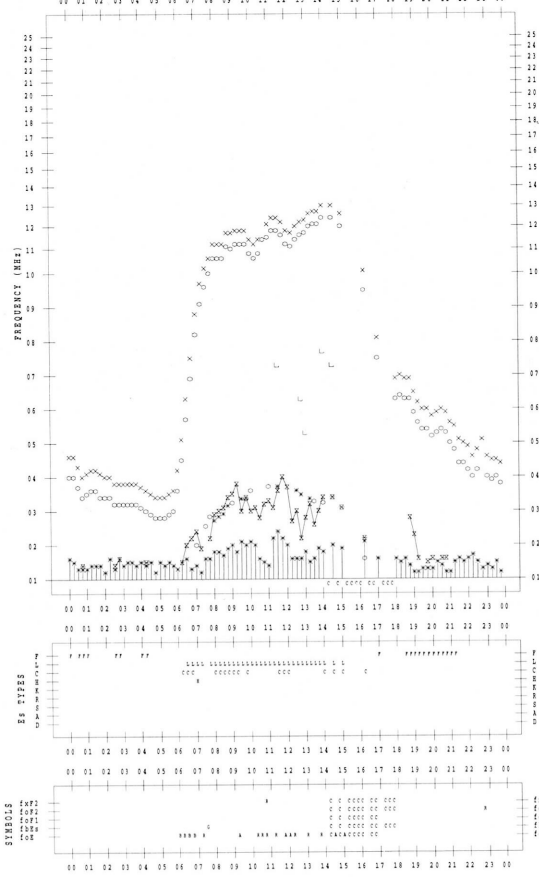
f- PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/28

135 °E MEAN TIME



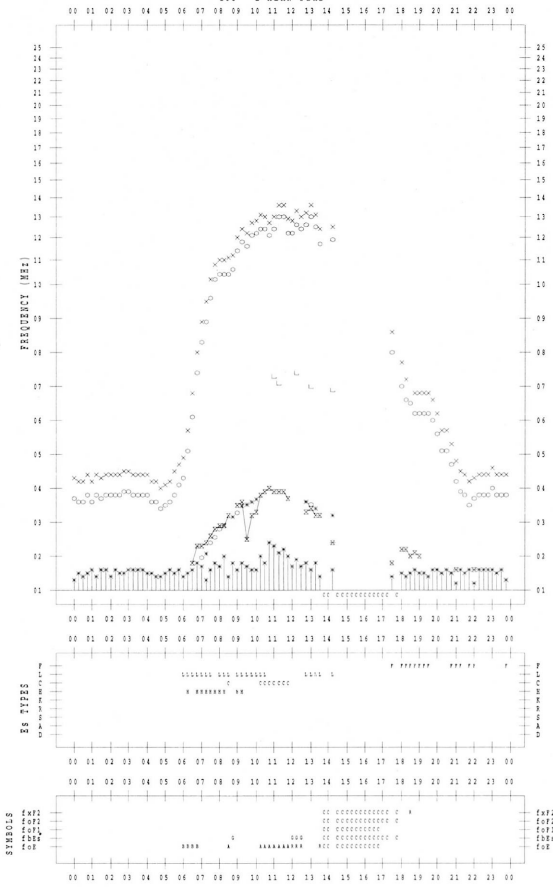
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/29

135 °E MEAN TIME



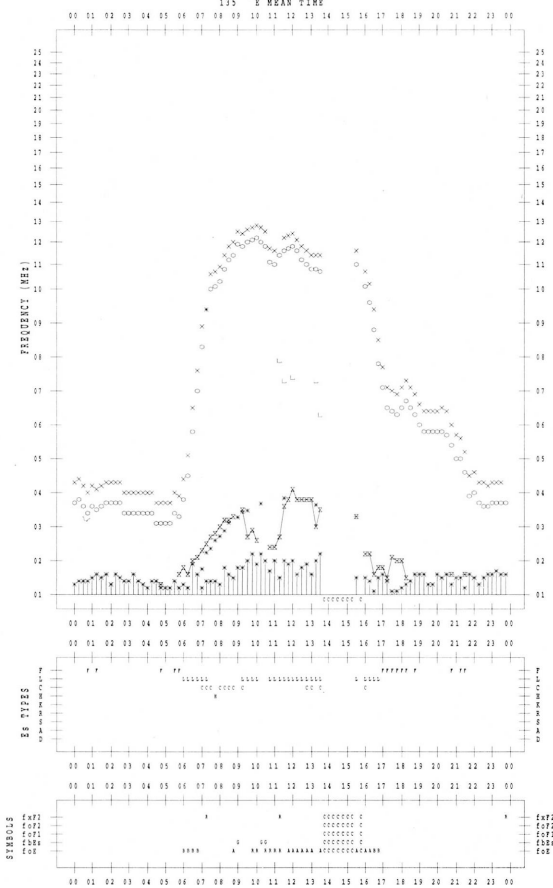
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2001/11/29

135 °E MEAN TIME



B. Solar Radio Emission
 B1. Daily Data at Hiraiso
 500 MHz

Hiraiso

November 2001

Single-frequency total flux observations at 500 MHz					
Flux density: $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$					
Date \ UT	00-03	03-06	06-09	21-24	Day
1	55	52	51	62	55
2	56	54	52	51	54
3	48	47	46	57	49
4	49	47	49	57	50
5	52	48	48	48	50
6	47	47	45	-	47
7	-	-	48	60	56
8	55	49	49	54	52
9	54	51	50	48	51
10	50	52	52	57	53
11	51	47	47	51	49
12	52	48	48	56	51
13	52	50	48	58	52
14	53	50	50	64	54
15	57	55	51	62	57
16	55	50	48	57	53
17	58	60	51	55	57
18	52	48	46	59	51
19	53	49	49	58	53
20	51	48	47	59	51
21	51	47	46	60	51
22	53	48	47	68	52
23	57	49	47	58	54
24	51	47	47	56	50
25	51	46	47	49	49
26	49	49	48	55	50
27	51	48	46	56	51
28	51	47	-	57	51
29	52	48	48	54	51
30	54	47	48	59	52
31					

Note: No data is available during the following periods.
 6th 2100 - 7th 0600 28th 0600 - 28th 0730

B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso

November 2001

Single-frequency observations								
Normal observing period: 2115 - 0730 U.T. (sunrise to sunset)								
NOV. 2001	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
1	500	8 S	0037.0	0037.0	1.0	20	-	0
1	500	7 C	2208.0	2213.0	13.0	400	-	ML
2	2800	3 S	2234.0	2234.0	5.0	50	-	0
4	2800	3 S	0641.0	0642.0	3.0	60	-	0
4	500	1 S	2250.0	2254.0	9.0	5	-	0
5	500	8 S	0149.0	0149.0	1.0	5	-	0
5	2800	3 S	0249.0	0249.0	3.0	45	-	0
5	2800	3 S	2153.0	2153.0	2.0	35	-	0
5	500	8 S	2153.0	2154.0	1.0	40	-	0
6	2800	3 S	0258.0	0259.0	6.0	160	-	0
6	500	4 S/F	0258.0	0300.0	12.0	275	-	0
6	500	8 S	0707.0	0707.0	1.0	280	-	0
7	500	7 C	0640.0	0640.0	1.0	50	-	0
7	500	7 C	0648.0	0651.0	5.0	360	-	WR
7	500	8 S	2208.0	2208.0	1.0	110	-	0
7	500	8 S	2242.0	2242.0	2.0	55	-	0
8	500	8 S	0001.0	0002.0	1.0	25	-	0
8	500	8 S	0037.0	0037.0	1.0	300	-	0
8	500	8 S	0418.0	0418.0	2.0	25	-	0
8	2800	3 S	0702.0	0703.0	10.0	360	-	0
8	500	4 S/F	0702.0	0703.0	14.0	300	-	0
8	200	47 GB	0702.0	0705.0	17.0	4340	-	0
8	200	47 GB	2159.0	2159.0	1.0	1380	-	0
8	500	7 C	2331.0	2331.0	2.0	90	-	0
8	200	7 C	2331.0	2332.0	5.0	220	-	0
8	2800	1 S	2350.0	2353.0	6.0	25	-	0
8	500	8 S	2352.0	2352.0	2.0	130	-	0
9	500	47 GB	0024.0	0024.0	2.0	690	-	0
9	200	8 S	0110.0	0110.0	1.0	70	-	0
9	200	42 SER	0119.0	0127.0	8.0	65	-	0
9	500	4 S/F	0123.0	0126.0	6.0	95	-	0
9	500	8 S	0212.0	0212.0	1.0	235	-	0
9	200	42 SER	0237.0	0241.0	5.0	40	-	WR
9	500	42 SER	0238.0	0247.0	9.0	430	-	0
9	500	8 S	0326.0	0326.0	1.0	10	-	0
9	200	8 S	0327.0	0327.0	1.0	40	-	0
9	500	8 S	0436.0	0436.0	1.0	65	-	0
9	200	8 S	0539.0	0539.0	1.0	80	-	WR
9	500	42 SER	0705.0	0706.0	3.0	80	-	0
9	200	8 S	2144.0	2144.0	1.0	25	-	WR
11	200	8 S	0604.0	0604.0	1.0	65	-	0
11	200	8 S	2301.0	2301.0	1.0	35	-	0
11	200	8 S	2335.0	2335.0	1.0	50	-	0
11	200	8 S	2349.0	2350.0	1.0	25	-	0
12	200	7 C	0110.0	0113.0	7.0	30	-	0
12	500	8 S	0113.0	0114.0	1.0	25	-	0
12	200	8 S	0144.0	0144.0	1.0	55	-	0

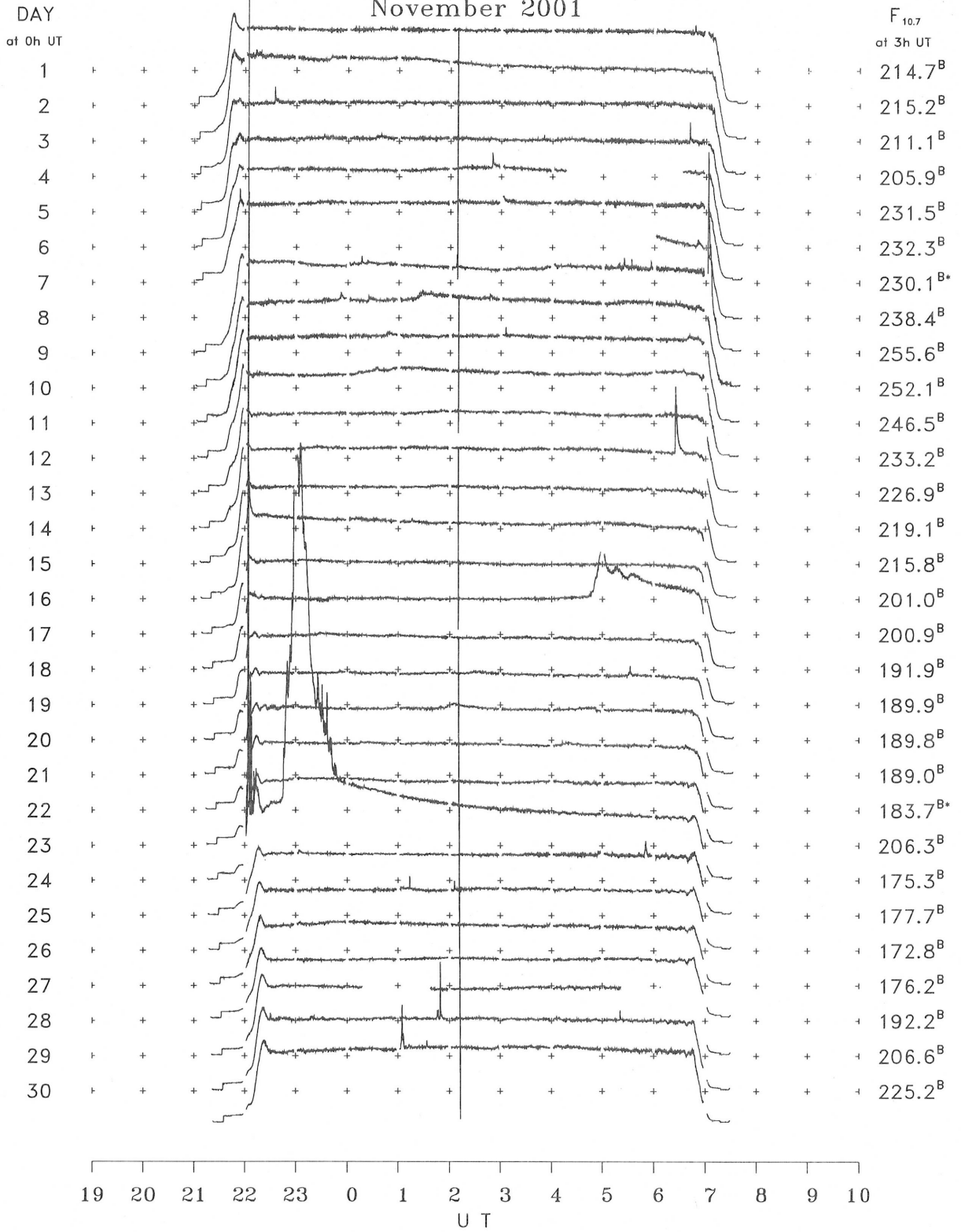
B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso

November 2001

Single-frequency observations								
Normal observing period: 2115 - 0730 U.T. (sunrise to sunset)								
NOV. 2001	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$)		POLARIZATION REMARKS
						PEAK	MEAN	
12	200	8 S	0440.0	0440.0	3.0	270	-	0
13	2800	4 S/F	0624.0	0625.0	8.0	195	-	WR
14	2800	3 S	2157.0	2206.0	14.0	185	-	0
15	200	7 C	0202.0	0203.0	4.0	60	-	0
15	200	7 C	0656.0	0658.0	3.0	40	-	0
15	500	7 C	2301.0	2303.0	4.0	45	-	0
17	200	7 C	0422.0	0553.0	97.0	10	-	0
17	2800	3 S	0442.0	0459.0	36.0	145	-	0
17	2800	29 PBI		0518.0	86.0	85	-	0
17	500	7 C	0443.0	0452.0	11.0	60	-	0
17	500	7 C	0513.0	0528.0	46.0	170	-	0
20	500	7 C	0147.0	0149.0	4.0	55	-	0
20	500	8 S	2156.0	2156.0	1.0	25	-	0
22	2800	47 GB	2200.0	2204.0	9.0	4415	-	0
22	500	8 S	2201.0	2202.0	2.0	165	-	0
22	200	8 S	2202.0	2202.0	1.0	300	-	0
22	500	47 GB	2227.0	2325.0	95.0	1410	-	0
22	200	47 GB	2232.0	2317.0	68.0	870	-	0
22	2800	47 GB	2245.0	2259.0	67.0	1115	-	0
23	200	8 S	0529.0	0529.0	1.0	50	-	0
24	2800	3 S	0549.0	0551.0	5.0	45	-	0
24	500	8 S	0549.0	0551.0	4.0	85	-	0
24	200	7 C	0550.0	0553.0	4.0	30	-	0
25	500	8 S	0112.0	0113.0	2.0	105	-	0
25	200	47 GB	0112.0	0113.0	2.0	3095	-	0
25	2800	8 S	0113.0	0113.0	1.0	40	-	0
25	2800	3 S	0205.0	0206.0	2.0	30	-	0
26	500	7 C	0104.0	0106.0	2.0	185	-	0
28	500	8 S	0429.0	0429.0	1.0	45	-	0
28	200	8 S	0429.0	0429.0	1.0	70	-	0
29	500	8 S	0120.0	0121.0	2.0	60	-	0
29	200	47 GB	0144.0	0150.0	8.0	1030	-	0
29	2800	7 C	0145.0	0149.0	7.0	160	-	0
29	500	47 GB	0145.0	0145.0	4.0	690	-	0
29	200	8 S	0340.0	0341.0	2.0	40	-	WR
29	500	8 S	0442.0	0442.0	1.0	240	-	0
29	500	47 GB	0515.0	0521.0	8.0	775	-	0
29	200	47 GB	0515.0	0521.0	8.0	1430	-	0
29	2800	1 S	0521.0	0521.0	2.0	30	-	0
30	2800	4 S/F	0103.0	0105.0	4.0	130	-	0
30	500	4 S/F	0104.0	0105.0	5.0	135	-	0
30	200	8 S	0104.0	0108.0	5.0	30	-	0
30	500	8 S	0222.0	0222.0	1.0	40	-	0
30	200	8 S	0222.0	0222.0	1.0	55	-	0
30	200	7 C	0539.0	0541.0	5.0	60	-	0

B. Solar Radio Emission
 B3 Summary Plots of $F_{10.7}$ at Hiraiso
 November 2001



Note: A vertical grid space corresponds to a 100 sfu.
 Elevation angle range $\geq 6^\circ$.

IONOSPHERIC DATA IN JAPAN FOR NOVEMBER 2001
F-635 Vol.53 No.11 (Not for Sale)

電離層月報 (2001年11月)

第53卷 第11号 (非売品)

2002年3月5日 印刷

2002年3月11日 発行

編集兼 独立行政法人通信総合研究所

発行所 〒184-8795 東京都小金井市貫井北町4丁目2-1

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