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IONOSPHERIC DATA IN JAPAN

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《 Real time Ionograms on the Web ..... *http://wdc-c2.crl.go.jp/index_eng.html* 》

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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 iono-spheric 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 auto-matic 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

fxI	Top frequency of spred ***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 replaced 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 atmospherics.

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} Wm^{-2} 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
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 foF2 AT Wakkanai

NOV. 2002

LAT. 45°23.5'N LON. 141°41.2'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	36	43	44	44	42	41	54		91	91	111	109		99	114	92	92	81	67	64	62	52	52	44
2	48	45	47	41	39	44	57	92	117		105		136	94			90	77	65	67	61	59	53	53
3	54	49	50	48	46	41	42	81	115	144		138				93	90	80	66	53	44	38	44	42
4		40	40		34	32		74				112		94	92	94		82	65	34	36	45	46	43
5	42	40	44	41	41	32	48	89	102		137	141		90	97		94	83	71	52	A	38	43	42
6	43	42	42	41	41	40	48	84	85	92		106	92		94		94	77	73	70	52	54	54	54
7	42	38	51	48	42		47	82	92		135	136	128	109	92	93	93	64	57	60		53	42	40
8	42	38	44	41	34	40	46	81	89		125	126	106	92	91	91	82	76	54	50	45	42	42	44
9	42	42	44	40	41	42	50	85	115	91	111	94	92	94	93	104	77	64	58	52	45	39	42	40
10	43	42	46	44	45	42	48	78	115	109	94	94	113			93	83	71	70	78	71	46	44	44
11	45	43	48	45	45	45	50	84	90	95		91	102	103	106	102	92	82	65	52		44	43	38
12	41	42	38	46	53	46	48	84	93	100	103	127			102	95		76	62	70	62	53	47	42
13	44	52	47	44	43	37	45	82	117		125	140	103	127		122	102	83	73	61	53		40	37
14	42	45	46	44	44	38		80	102		103		94	94	102	92	92	77	55	50		38		34
15	34	38	38	37	36	35	43	77	92		93	127	94	104	92	94	84	64	50	38	41	34	41	
16	42	34	38	41	38	38	45	100	115			117			93	92	93	76	62	60	60		44	44
17	43	44	46	43	46	44	45	82							81	90	80	64	54	46	47	45	42	43
18	42	44	44	41	45	44	42	78	114	103	125		103					80	64	66	61			
19																			74	66	52	43		
20	48	69	53	58	44	42	47							103	95	124	84	78	68	60	51	45	43	34
21	47	44	45	41	33	37	42	82	88	90		141	174	147	128		92	85	80	40	38	46	37	40
22	40	34	34	40	44	34	34	72	98	93	126		141		92	92	90	72	51	46	48	34		38
23	37	37	38	38	40	38	37	72	90	113	104	104			104	92	83	64	48	40	44	34	37	34
24	41	35	40	37	41	47	41	64	89	114	120	93	103	89	83	112	88	61	45	45	34	31	36	38
25	40	40	38	36	37	38	37	72	88	109	94	110	96	90	98	91	69	67	46			40	38	42
26	44	43	46	45	44	47	38	61	81	92	91	92	104	92	90	94	77	53	52	42	38		38	37
27	38	40	41	41	42	40	36	65	78	77	111	106		105	104	92	82	80	62	53	44	42	42	34
28	40	34	38	37	38	41	43	73	90	92	95	92	94	102	104	82	81	66	25	38	37	36	28	41
29	40	40	40	40	40	40	38	81	83	91	92	99	93	94	93	102	77	51	44	42	34	36	40	34
30	40	40	40	41	40	40	45		90	93	91	89	94	103	92	85	76	66	50	48	52	38	47	41
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	28	29	29	28	29	28	27	26	26	18	21	23	19	20	24	24	26	29	30	29	25	26	26	27
MED	42	42	44	41	41	40	45	81	92	93	105	109	103	96	94	93	86	76	62	52	47	42	42	41
U Q	43	44	46	44	44	43	48	84	114	109	125	127	113	103	103	98	92	80	67	62	56	46	44	43
L Q	40	38	39	40	38	38	41	73	89	91	94	94	94	93	92	92	81	64	51	43	39	38	40	37

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

NOV. 2002

LAT. 45°23.5'N LON. 141°41.2'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	44		G	G	G	G	G	G	G	G	40	29	G	G	24	39	34	31
2	G	G	28	G	23	G	G		G	G	G	G	G	G		G	G	28	29	40	24	G	G	G
3	G	G	G	G	G	G	G	G	41	44	46	48	G	40	G	G	32	40	66	40	32	30	G	27
4	45	G	40	34	28	G	27		80	79		48	39	G	G	40	72	32	57	72	37	40	44	G
5	G	28	G	G	G	G	26	34	38	G	G	54	G	G		G	35	28	40	36	86	33	G	G
6	G	25	27	G	G	G	29	G	G	G	64		G	G	G	G	42	G	35	G	G	G	27	G
7	40	29	33	G	G	33	29		G	G		G	40	G	G	G	G	46	40	60	46	G	G	G
8	G	G	G	G	G	G	G	G	48	130	G		G		G	G	G	26	G	38	29	G	G	G
9	G	G	G	G	G	G	G	G	33	G	G	G	G	G	G	G	G	G	G	31	35	G	G	G
10	29	G	G	G	G	G	G	G	G	G	N			G	G	G	G	29	28	G	G	G	G	G
11	26	30	26	G	G	G	G	G	G	G	G	G	G	38	35	G	26	G	26	33	40	40	32	33
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	27	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G		G	G		G	G	G	G	G	G	G	31	31	34	G
14	G	G	G	G	G	G	40	40	60	G	G	G	G	G	G	38	34	G	29	G	30	G	41	G
15	G	G	G	G	G	G	G	G	G	50	G	G		G	G	G	20	38	54	33	26	29	29	29
16	26	G	G	29	29	29	G	38	48	39	G	G	G	G	G	G	G	G	39	30	30	34	26	G
17	G	G	G	G	G	G	G	32	G	G	G	G	G	G	G	G	G	G	G	G	33	32	31	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	37	26			99
19													G			G	G	G	G	G	36	40	36	28
20	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	G	G	G
21	G	G	G	G	G	G	G	G	G		40	G	G	G	G	G	G	G	G	28	G	11	26	G
22	37	27	G	G	G	G	G	G	40	60	42	G	G	G	G	G	27	24	G	G	G	29	36	32
23	27	33	28	26	G	G	24	31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
24	G	G	G	27	G	G	G	G	G	40	38	G	G	G	G	G	G	G	G	G	G	G	G	G
25	29	28	G	G	G	G	G	G	G	G	G	39	G	G	G	G	30	G	G	47	45	30	G	G
26	G	G	G	G	28	G	G	G	33	G	G	G	G	G	G	G	G	33	G	G	G	40	24	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	33	29	G	G	G	G
28	G	G	G	G	G	G	G	30	52	39	G	G	G	G	G	G	G	11	32	35	30	G	29	33
29	G	G	G	G	G	G	G	G	31	40	G	G	G	G	G	G	G	G	G	G	G	G	28	G
30	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	27	G	31	26	30
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	29	29	29	29	29	29	25	29	26	26	26	27	28	27	30	30	30	30	30	30	29	29	30
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	28	11	26	G
U Q	26	13	G	G	G	G	12	15	39	40	G	G	G	G	G	G	30	28	33	36	35	32	31	28
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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

NOV. 2002

LAT. 45°23.5'N LON. 141°41.2'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	20	14	14	15	14	16	14	14	17	15	15	17	17	21	18	17	14	18	14	14	14	14	14	14
2	15	16	15	15	14	15	15	21	14	14	14	14	14	20	14	14	14	14	14	14	16	15	15	18
3	14	14	14	14	16	20	15	16	14	15	17	17	20	16	18	15	14	14	14	14	14	18	14	14
4	15	14	14	14	14	15	15	14	18	14	14	20	22	18	18	14	14	14	14	14	14	14	14	15
5	14	15	14	14	14	16	15	14	14	16	16	15	17	18	14	14	14	14	14	15	14	15	16	18
6	18	14	15	15	14	15	14	14	14	14	15	20	20	20	15	15	14	14	14	14	14	15	15	14
7	15	14	14	15	16	15	15	14	14	15	15	16	17	14	14	16	18	14	14	14	14	14	17	17
8	20	18	18	16	14	16	17	20	17	14	17	18	20	15	14	14	18	14	16	14	15	14	18	14
9	16	18	15	14	14	14	15	16	14	15	14	20	18	20	20	16	20	14	16	14	14	14	16	18
10	16	14	15	14	14	14	14	14	15	18	18	20	20	21	17	14	14	14	15	17	14	15	15	17
11	14	14	14	14	14	14	15	17	14	17	20	20	18	20	14	15	15	14	14	14	14	14	14	14
12	18	17	14	22	14	15	14	22	15	18	18	21	18	20	17	14	14	17	14	15	15	15	14	14
13	14	14	14	14	14	15	14	14	17	14	20	21	20	22	18	14	17	14	15	15	14	15	14	14
14	14	14	14	14	15	14	14	14	14	49	18	17	18	20	15	15	15	15	14	15	15	16	14	20
15	14	16	14	14	16	15	15	15	15	14	18	22	18	20	15	15	17	14	14	14	15	20	17	16
16	15	18	15	14	15	15	15	15	15	18	14	14	17	14	20	26	18	14	14	14	15	15	16	16
17	15	14	14	15	14	15	15	16	16	21		22	23	22	28	24	20	14	15	15	14	14	16	14
18	14	17	15	14	14	14	14	14	16	20	23	23		21	18	24	15	14	14	14	15			14
19	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	18	14	14	14	14	14	14	15
20	14	14	15	14	14	15	14	18	14	17	15	18	17	20	16	14	17	15	15	14	14	14	14	15
21	14	15	14	14	14	14	14	15	17	17	18	18	17	18	15	14	16	14	14	14	17	15	14	15
22	14	15	14	14	14	14	14	14	17	17	18	15	16	15	15	14	16	14	14	16	14	14	14	14
23	17	14	14	20	18	16	14	14	14	14	15	18	14	15	16	14	15	14	14	14	14	14	14	15
24	16	14	14	14	14	15	14	18	16	16	17	17	18	18	15	14	18	17	14	15	14	15	18	15
25	14	16	14	15	16	18	15	17	14	16	18	14	14	15	14	14	14	15	14	14	14	14	15	15
26	14	15	16	14	15	14	14	17	14	18	18	16	16	15	21	21	17	14	14	15	15	14	14	15
27	14	14	14	15	14	14	15	17	15	16	20	17	23	16	18	23	17	17	15	14	14	15	14	14
28	14	15	14	14	14	14	14	14	15	17	18	21	15	15	14	14	16	14	14	15	14	15	18	15
29	14	14	15	14	15	14	15	18	14	15	15	18	18	17	15	23	16	14	14	18	15	14	14	16
30	15	15	15	15	18	14	14	15	24	17	15	17	14	15	15	15	17	15	14	15	14	15	14	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	30	30	30	30	30	30	30	30	30	29	30	29	30	30	30	30	30	30	30	30	29	29	30
MED	14	14	14	14	14	15	14	15	15	16	17	18	18	18	15	14	16	14	14	14	14	15	14	15
U Q	16	16	15	15	15	15	15	17	16	17	18	20	20	20	18	16	17	15	14	15	15	15	16	16
L Q	14	14	14	14	14	14	14	14	14	14	15	16	16	15	14	14	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

NOV. 2002

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	48	46	48	47	42	42	62	85	112	131	130		125	125	126	125	114	90	71	64	66	54	47	48
2	47	51	48	43	40	44	63	90	114	131	140	136	136	141	136	131	111	102	76	74	76	53	52	53
3	54		53	48	44		53	85	136	143	163	137	131	136	131	120	107	102	77	64	53	49	39	38
4	42	44	48	48	34		54	106	118	126	148	140	128	136	114	110	116	100	62	58	52		52	
5	45	49	49	47		43	53	90	125	126	134	142	137	132	117	115	122	117	87				46	47
6	47	43	48	47	43	37	55	84	101	120	118	118	127	120	128	122	105	100	71	66	51	47	45	43
7	42		46	48	43	42	54	94	120	127	138	135	126	128	137	126	117	91	71	57	66	54		
8	42	43	42	46	39	42	53	98	110	116	121	134	132	141	135	124	106	78	77	69	54	39	38	
9	41	35	37	39	38	37	54	92	101	104	112	120	115	117	112	104	96	82	53	64	64	48	42	39
10		34	46	42	42	39	54	95	113	115	112	120	111	117	112	106	100	87	86	78	77	52	43	43
11	43	47	44	43	41	41	54	100	120	115	115	110	112	120	121	114	101	88	85	65	57	52	53	52
12	49	42	47	54	59		51	93	116	122	131	130	130	137	131	124	111	94	78	62	73	64	53	49
13	53	59	67	55	30	35	51	90	115	130	130	126	131	131	130	124	116	100	80	64	64	59	52	48
14	38	44	45	46	48	32	47	93	110	116	130	132	130	136	135	120	110	84	82	57	49	47	47	42
15	42	38	39	41	30	37	52	90	88	106	130	126	125	131	149	113	97	84	63	54	50	48	42	44
16	41	39	38	41	34	37	54	87	105	116	126	110	105	112	107	105	92	82	70	67	66	53	42	38
17	41	42	43	43	41	43	54	95	114	120	128	117	121	125		97	91		63	57		51	41	C
18	C	C	C	32		39	C	C	110	C	C	115	C	117	115	104	101	83	72	69	51	49	49	48
19	47	44	43	41	43	43	54	80	93	112	127	110	120	128	116	103	108	95	82	59	49	48	52	45
20	42	47	47	46	45	42	48	89	128	104	110	134	C	128	127	117	114	98	81	82	62	48	38	39
21	44	47	48	46	43	37	60	76	116	112	140		143	134	131	126	116	106	73	63	51	44	54	51
22	49		30	34	34	37	42	81	125	143	137	140	140	148	131	115	104	88	80	52	46	46	34	35
23	42	39	37	32	37	38	43	74	104	116	125	126	105	107	103	113	92	80	62	46	44	45		28
24	34	32	31	32	34	35	42	78	85	114	122	115	108	102	101	86	84	85	52	43	38	32	30	34
25	38	37	34	30	27	31	43	82	100	111	128	128	124	115	111	98	84	61	57	47	42	42		38
26	42	42	41	42	47		38	78	100	103	115	114	115	105	104	100	92	59	52	52	51	31	30	
27		35	37	36	34	32	37	82	92	88	105	134	116	104	107	112	92	82	80	50	51	45	41	33
28	41	30	34	38	39	37	46	82	114	100	106	98	100	110	116	114	84	64	54	39	39	A		38
29		39	34	36	36	37	41	83	87	99	125	114	111	113	111	90	86	75	49	44	51	44	34	31
30	32	36	31	41	37	32	38	84	100	91	120	116	105	101	105	99	87	58	59	39	46	44	34	34
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	26	26	29	30	28	26	29	29	30	29	29	28	28	30	29	30	30	29	30	29	28	27	26	25
MED	42	42	43	42	40	37	53	87	111	116	127	126	124	125	117	114	102	87	72	59	51	48	42	42
U Q	47	46	48	47	43	42	54	93	116	126	132	134	130	134	131	122	111	99	80	65	64	52	52	48
L Q	41	37	37	38	34	37	43	82	100	105	116	115	111	113	111	104	92	81	62	51	49	44	38	36

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Kokubunji

NOV. 2002

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	G	G	G	G	G	G	G	G	G	G	G	G	47	G	G	G	35	37	33	28	G	31	43	G
2	31	39	30	G	G	G	G	G	G	G	G	G	G	G	G	41	G	39	29	59	29	34	G	27
3	29	45	79	34	34	58	28	35	51	59	50	48	G	44	47	42	80	G	48	35	29	29	G	G
4	G	G	G	G	30	51	33	G	G	G	G	53	61	G	G	G	G	G	40	59	60	67	31	37
5	G	G	27	24		26	G	G	G	G	G	G		G	G	G	34	G	33	51	59	58	29	26
6	28	25	G	G	G	G	26	G	G	G	G	46	47	46	G	G	G	G	30	28	26	G	39	29
7	29	32	29	G	G	G	G	G		G	G	G	G	G	G	40	31	G	G	G	55	60	68	49
8	33	31	G	G	G	G	G		G		G	G	G	G	G	G	33	35	G	G	G	28	G	40
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	46	G	G	27	39	G	27	G	G	G
10	48	34	32	G	G	G	G	G	G	49	G	G	G	G	G	G	48	40	30	24	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	53	77	57	77	55	34	29	G	G
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	G	G	G	25	G	28	34	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	46	50	44	35	23	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	G	42	G	G	G	G	33	G	G	G	26	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	36	G	G	G	G	G	G	G	G	38	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	C
18	C	C	C	G		G	C	C		C	C	G	C	G	G	G	G	G	G	G	G	G	G	G
19	G	G	G	G	G	G	G	33	G	48	G	G	48	50	G		34	G	G	G	G	G	G	52
20	28	33	23	G	G	G	G	G	G	G	G	G	C	G	G	G	G	G	G	G	G	G	G	25
21	27	G	G	G	G	G	11	G	35	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
22	G		G	G	G	G	G	G	G	G		G	89	48	G	G	G	11	G	G	27	G	G	G
23	G	G	G	G	G	G	G	31	G	62	53	88	G	G	G	G	G	G	G	G	G	G		G
24	G	G	G	G	G	G	G	G	G	G	G	G	85	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	G	G	G	G	38	47	49	G	G	G	G	G	30	G	G	G	G	G	59	44
26	39	29	28	G	G	G	G	G		G	G		G	G	G	35	32	G	G	G	G	G	G	33
27	43	25	27	33	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	27	G
28	G	G	G	G	23	G	G		G	60	G	48	G	G	G	G	33	29	G	G	24	59	34	32
29	39	G	G	G	G	G	G	G	G	39	49	50	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	29	36	39	G	G	G	G	G	34	29	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	29	28	29	30	28	30	29	27	27	28	28	29	27	30	30	29	30	30	30	30	30	30	29	29
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	29	27	25	G	G	G	G	G	G	39	G	21	G	G	G	17	33	29	30	24	27	29	28	30
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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

NOV. 2002

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	13	15	13	15	14	13	15	13	15	21	22		31	20	20	13	13	13	14	13	17	13	14	15
2	13	15	13	15	26	13	20	15	14	21	25	38	38	35	22	20	14	13	17	13	15	13	26	15
3	14	13	15	13	13	13	17	14	20	18	21	21	20	31	34	29	18	17	13	13	15	13	20	13
4	13	17	14	13	20	13	13	26		20			36	28	35	24	17	13	13	13	13	14	13	14
5	23	15	21	20	13	15	21	25	20	21	22	38	34	37	21	13	15	13	13	14	13	13	13	15
6	13	14	17	17	13	14	13	25	33			33	33	30	34		26	14	13	14	17	14	13	14
7	13	13	13	13	13	13	15	18	17	17	20		38		15	17	14	17	14	17	17	13	13	20
8	13	14	17	15	13	15	14	13	14	20	18	18	40		23	14	18	13	22	18	14	15	18	13
9	18	17	14	13	14	18	15	13	18	34	28		42	39	23	30	18	14	15	14	14	17	14	14
10	13	13	13	14	14	17	15	26	21	20		43		37	34	15	13	13	13	13	20	15	18	17
11	13	14	14	13	13	13	15	15	18	34	39	40	39	38	23	20	17	13	14	13	14	13	14	15
12	18	15	14	14	15	23	15	21	20	17	21	22	18	38	31	13	20	14	18	13	13	13	14	18
13	13	13	13	13	13	13	13	22	30	18	22	34	20	36	28	14	13	13	15	13	14	14	13	13
14	13	14	15	13	13	14	13	24	18	36		25		36	23	18	17	14	14	14	13	17	17	21
15	14	14	15	15	13	13	13	13	14	17	21	42	40	24	21	21	25	14	13	13	14	14	17	14
16	13	14	14	15	17	14	13	14	14	14	23			35	18	20	17	13	17	17	14	13	13	14
17	13	14	14	13	13	14	15	13	15	20	22		39	37		17	14		13	13		13	14	C
18	C	C	C	18		13	C	C	14	C	C	38	C	24	20	18	23	14	13	15	14	13	17	13
19	13	14	13	17	15	13	14	17	18	17	20	22	24	22	18	13	13	17	17	14	13	13	13	13
20	13	13	14	13	13	13	14	22	15	18	18	22	C	21	22	17	23	15	18	14	13	13	18	13
21	15	14	17	14	13	13	13	13	15	21	22	22	22	21	18	17	22	13	15	14	14	14	14	13
22	14		15	18	14	13	13	22	15	18	20	20	21	18	17	18	21	13	13	13	14	13	15	13
23	13	13	15	13	14	13	14	13	21	20	20	18	17	18	14	13	20	14	13	14	13	15		17
24	13	13	13	14	13	13	15	22	13	13	20	18	17	34	15	29	15	14	14	14	18	20	13	17
25	18	14	17	14	13	18	13	22	13	13	18	18	20	18	18	31	14	17	13	13	17	15	13	17
26	14	14	17	15	14	17	14	22	17	33	21	24	21	22	20	18	13	14	13	14	13	13	13	13
27	14	14	13	13	13	13	14	20	13	20	22	38	40	23	23	26	20	13	13	13	14	13	15	18
28	14	17	13	14	13	17	26	15	14	18	22	22	23	21	17	15	14	18	18	14	15	14	13	13
29	13	15	14	14	17	13	13	22	15	15	23	21	18	20	21	15	22	13	13	14	15	14	14	17
30	13	14	13	14	13	13	14	17	13	18		20	22	20	23	15	14	14	14	14	14	13	15	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	29	28	29	30	29	30	29	29	29	28	24	24	25	28	29	29	30	29	30	30	29	30	29	29
MED	13	14	14	14	13	13	14	18	15	19	22	22	24	26	21	17	17	14	14	14	14	13	14	14
U Q	14	15	15	15	14	15	15	22	19	21	22	38	38	36	23	20	20	14	15	14	15	14	17	17
L Q	13	13	13	13	13	13	13	13	14	17	20	20	20	21	18	14	14	13	13	13	13	13	13	13

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Yamagawa

NOV. 2002

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	52	54	50	46	38	39	51	74	99	128	130	130	116	126	128	128	121	110	85	76	74	65	52	
2	52	50	44	43		41	44	80	87	127	136	138	140	146	152	150	142	129	131			144		
3	84		78	73	50	48	45	74	111	138	173	142	127	136	138		85	88		80				
4	43	42	51	46		36	37	80	115	137	154	146	134	145		115	111	112		66	78	66	A	
5		54	54	50	37		36	C	114	114	129	140	138	128	114	125	132	124	108	77	77	78	63	61
6	60	51	51	57	47		38	78	86	112	128	126	115	132	150	130	126	133	110	78	77	70	52	54
7		43			36	36	43	74	105	116	137	130	115	136	140	144	130	127		78	78	76	52	47
8	43	43	43	43	49	43	43	81	103	115	113	130	148	154	156	154	142	114	117	111		77	64	52
9	53	47	37	32		34	37	81	100	100	119	114	114	115	127	132	114	84	78	78	82	80	54	50
10	42	43	37	37	37	34	33	77	114	86	110	86	113	121	116	115	114	93	92	80	80	78	52	51
11	52	64	60	50	43	41	42	94	106	91	112	112	112	115	133	115	114	112	86	77	64	78	66	52
12	50	46	44	52	53	30		74	97	111	112	137	114	138	151	130	151	110		80	86	80	66	54
13	66	77	64	42	34		36	75	97	117	114	116	129	140	142	141	130	112	85	86	80	79	78	52
14	46	42	44	37	43		36	66	90	116	115	130	127	128	138	137	114	114	86	78	66	77	77	66
15	53	49	46	36	30	34	41	70	90	95	117	143	142	147	145	117	116	108	83	76	74	74	51	47
16	43	36	37	49	37	29	34	77	92	106	151	112	107		111	113	101	86	76	77	78	67	50	43
17	36	40	37	37	37	36	41	65	111	111	120	110	118	131	128		112	96	78	72	74	66	51	47
18	37	32	38	36	37	49	34	66	96	120	149	115						85	79	76	76	66	51	44
19	51	52	43	41	44	34	37	66											76	62	52	51	53	43
20	42	45	48	41	36	34	34	66					141	150	132	128	115	114	86	78	85	53	43	37
21	36	43	36	37	46	37	60	51	81	86	136	148	140	126	116	129	114	115	80	71	82	52	53	54
22	54	44	38	44	41	37	49	58	111	116	113	127	130	150	150	124	115	110	90	78	66	52	52	48
23		36	46	41	41		34	63	87		112	110	109	104	106	114	114	102	86	62	52	51	36	30
24	32	36	34	34	36	34	40	66		116	131	128	112	117	111	111	91	114	77	64	62	52	47	41
25	37	41	37	36	32			66	94	98	115	150	130	132	117	99	100	72	64	57	49	52	42	40
26		42	36	34	42	28		54	86	103	114	90	111	113	111		99	86	76	77	77	52		38
27	34	34	34	36	37	34	26	60	86	81	87	150	106	90	114	149	104	93	86	85	76	53	52	46
28	35	37		37	47	32	34	67	92	110	86	82	85	115	114	149	106	81	63	60	46	47	43	40
29	34	36	34	41	34	32	37	60	82	114	105	111	130	117	128	111	112		78	62	74	74	48	36
30	34	36	34	41	36		28	50	86	91	111	110	111	111	110	112	111	79	68	52	52	51	43	30
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	26	29	28	29	27	23	27	29	27	27	28	28	28	27	27	25	28	28	26	29	27	29	26	26
MED	43	43	43	41	37	34	37	67	96	112	116	128	117	128	128	128	114	110	84	77	76	66	52	47
U Q	52	49	49	46	44	39	43	77	106	116	133	139	132	140	142	139	123	114	86	78	78	77	54	52
L Q	36	36	37	36	36	34	34	64	87	98	112	111	112	115	114	114	108	87	77	65	64	52	48	40

HOURLY VALUES OF fEs AT Yamagawa

NOV. 2002

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	G	G	G	G	G		39		G	G	G	G	G	G	G	G	41	58	59	50	33	33
2	28	29	G	G		G	G	G	G		G	G	G	G	G	G	43	43	25	G	G	G	G	29
3	33	57	51	29	58	64	26	63	G	G	G	G	49		G	G	G	70	65	28	86	59	40	48
4	29	28	G	G	G	G	G	G	G	G		G	G	G		G	48	51	45	59	54	53	75	59
5	44	34	28	29	28		G	C	G		50	G	G	55	51	65	54	29	103	33	104	60	29	G
6	G	G	G	G	26	G	G	G	G	43	G	G	G	G	G	53	48	43	41	26	G	G	G	42
7	40	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		44	40	28	26	G	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	49	39	G	G	G	G
9	G	G	G	G	27	G	G	G	G	G	G	G	G	G	G	G	60	41	33	G	G	G	24	G
10	G	G	G	G	G	G	G	G		G	G	G	54	G	G	G		28	28	26	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	42	G	G	G	G		G	23	28	40	34	27	G
12	G	G	G	G	G	G	G	29	G	40	G	46	G	G	50	52	59	34	G	G	28	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	23	G	G	G	G	33	G	G	G	G	G	G			G	26	28	25	G	G	G
15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G		G	G	G	G		G	27	40	50	34	26	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G		44	G	G		28	27	G	G	G	G
19	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	29	25	G	G	G	G
20	G	G	G	G	G	G	G	28		G	G	G		G	G	G		G	G	25	G	G	G	G
21	G	G	G	G	G	G	11	G	G	G	49	G	45	49	56	G	G	G	31	26	23	G	G	G
22	G	G	26	G	G	G	G		G	44	G	G	G	46	G	G	G	28	30	25	G	G	G	G
23		G	G	G	G	G	G	G	36	G	45	42	G	G	G			26	G	G	G	G	G	G
24	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	29	G	G		G	G	G
25	G	G	G	G	G	G		G	G	G		G	48	42		G	33	35	35	G	27	G	G	G
26		G	G	G	G	24	24	G	G	G		G	G	G	49	38	G	G	G	G	G	32	32	G
27	23	G	G	G	26	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G		G	G	G	47	53		44	G	G	G	G	G	G	G
29	G	G	G	G	G	G	G	G	G	G	44	G	G	G	G	G	G		G	G	27	23	G	G
30	G	G	G	G	G	30	G	G	G	38	43	G	G	G	43	38	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	28	30	30	30	29	29	29	26	27	26	25	30	29	28	28	26	24	28	30	30	29	30	30	30
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26	28	25	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	22	G	43	36	40	28	27	23	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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

NOV. 2002

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	16	16	15	14	15	15	16	15	15	18		42				26	20	15	15	15	15	14	14	14
2	15	14	15	16	14	16	17	22	15	16		30	40		21	21	17	15	15	17	15	14	15	14
3	15	14	15	14	14	14	17	14	16	17	21			23	22			17	14	14	15	14	14	14
4	14	14	17	16	14	15	14	22	18	15	17				14	20	18	16	21	16	15	14	14	14
5	14	15	15	14	14	18	15	C	15	18	21		33	27	28	22	18	15	15	14	14	14	14	15
6	16	18	17	14	14	17	14	16	16	29			28		21	33	17	15	16	14	14	14	14	14
7	14	16	32		14	16	15	16	15	17	21				23	20	15	15	15	14	15	17	15	17
8	16	18	15	15	14	16	15	22	16				46		40	18	18	20	15	15	16	14	16	16
9	15	15	15	15	14	14	14	15	16	20			43	44		18	20	16	14	16	16	15	17	14
10	15	16	14	14	15	14	16	21	16	20	39	45	46	43	16		18	15	14	14	16	17	16	16
11	15	16	15	15	14	14	15	21	15		20		43			36	20	24	15	15	14	15	14	17
12	15	16	15	17	17	14	18	16	18	18		24	42		24	17	15	14	16	15	14	14	14	14
13	14	14	14	14	14	15	15	21	15	17			40	39	43	23	20	24	16	15	15	17	14	14
14	15	14	15	17	15	17	15	20	15	35		43	43		38	22	17	22	14	14	15	14	14	15
15	15	15	14	14	16	15	14	14	15			44		44	20	37	21	22	16	14	15	15	14	16
16	15	16		16	15	18	14	20	16	22	23	40	43			22	15	21	14	16	17	15	15	15
17	15	15	16	15	15	14	15	18	15	17	22	27	29				16	15	14	15	14	15	18	15
18	15	17	15	14	15	14	15	20	15	16	18	21		27	21	18	18	14	14	15	16	16	14	14
19	14	15	15	16	14	17	15	20	16	16	23		27			18	17	14	14	14	17	14	17	15
20	16	16	17	20	17	15	15	14	16	16	21		28			16	20	21	15	17	15	14	15	15
21	15	15	15	15	15	15	14	17	15	18	29	28	29	22	20	17	17	21	14	15	15	15	14	16
22	14	14	15	14	16	14	16	14	16	21	23	22	23	22	17	17		14	14	18	16	15	17	16
23		14	16	15	14	15	15	17	16	18	17	21	18	17	17	14	14	15	15	15	14	15	15	15
24	14	14	17	14	14	15	15	14	15	15	30	20		17	18	21	18	14	15	15	15	15		14
25	15	16	15	14	16	17		18	15	16	21	21	27	26	20	18	15	15	15	16	15	15	15	15
26		14	15	15	15	15	15	16		16	20				32		15	20	14	14	15	14	15	14
27	15	15	15	15	16	14	16	20	18	17	21		33	27	22	18	17	21	15	15	15	14	14	15
28	14	14	15	15	15	14	14	18	16	15	27		21	27	21	17	15	22	15	15	16	14	15	15
29	15	15	15	15	15	14	15	17	16	16	17	22	27	20	22	20	17		15	15	14	14	15	15
30	15	17	16	15	14	14	15	16	15	16	22	33		38	21	20	28	20	15	15	15	15	15	15
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	28	30	29	29	30	30	29	29	29	27	21	16	21	16	23	26	28	29	30	30	30	30	29	30
MED	15	15	15	15	15	15	15	17	16	17	21	28	33	27	21	20	17	16	15	15	15	14	15	15
U Q	15	16	16	15	15	16	15	20	16	18	23	41	43	38	24	22	19	21	15	15	16	15	15	15
L Q	14	14	15	14	14	14	14	15	15	16	20	21	27	22	20	18	15	15	14	14	15	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Okinawa

NOV. 2002

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	86	78	50	43	32	37	52	77	115	126	141	137	138	145	144	142	135	132	128	107	89	110	87	76
2	82	81	55	41		37	38	75	101	126	151	150	152		174	175	172	170		167			146	152
3	142	133	108	97	66	50	61	72	122	148	148	146	141	141	148	136	127	118	131	108	88	86	86	62
4	55	54	65	43			34	71	121	145	151	146	141	145	158	141	136	142	131	108	109	108	88	66
5	66	77	90	66	44			76	111	126	131	142	146	138	137	144	145	134	127	108	106	130	103	87
6	84	86	67	76	46		35	80	116	118	134	137	147	150	148	168	150	148	145	145	142	142	128	89
7	73	72	72	54	35	38	40	75	100	118	144	138	131	144	152	150	151	151	148	131	128	108	88	76
8	66	73	72	55	40	42	45	81	102	110	125	143	152	175		176	171	171	170		145	145	128	108
9	98	86	72	53	46	42	45	82	104	111	115	120	128	133	142	140	143	129	128	106	140			88
10	77	74	66	66	52	36	34	76	114	111	112	118	128	130	136	146	137	133	140	110	118	108	87	86
11	84	88	82	60	41	42	43	80		113		128	126	132	147	130	134	130	121	102	100	108	88	73
12	62	54	61	66	54	37	29	72	106	118	138	140	137	143	145	146	145	140	133	131	139	143		130
13	132	131	104	60	41	37	38	72	101	118	115	127	144	148	154	171	152	147	142	149	129	134	120	86
14	61	54	51	31	30		28	68	102	117	127	131	140	147	149	160	151	148	145	145	134	142	143	128
15	89	84	74	62	44	42	60	88	101	110	135	151	144	168	157	148	151	150	141	142	131	109	88	73
16	66	58	54	61	46	31		73	92	101	136	134	118	126	130	124	115	100	88	88	100	98	84	67
17	55	53	52	40	38	35	34	73	116	118	130	136	141	148	146	146	141	123	101	100	103	104	90	77
18	61	48	43	42	41		29	64	104	131	149	125	131	140	147	143	130	124	104	102	107	104	87	51
19	64	66	64	54	45		35	75	92	115	138		125	135	136	134	143	137	90	72	72	66	61	47
20	44	45	43	46	35		28	66	113	92	101	128	147	148	136	142	141	141	143	109	120	108	53	43
21	48	54	54	34	31		37	52	73	122	151	146	136	124	129	146	142	138	112	87	124	87	74	76
22	66	57	50	56	48	45	38	63	107	110	114	118	131	124	126	130	130	117	110	85	78	78	77	65
23	62	54	54	45	43	37	40	64	95		125	122	127	125	138		146	144	144	124	88	75	63	40
24	34		32	37	38		37	67	98	112	150	130	128	137	134	130	126	118	108	87	84	81	75	58
25	66	64	58	52	46	37	42	73	98	116	136	141		140	131	116	121	101	81	64	83	66	66	54
26	54	53	50	42	47	46		62	104	110		121	118	130	125	118	118	130	108	88	107	88	66	49
27	43	47	44	45	51	38	29	57	102		86	151	108	105	140	138		131	141	128	108	108	84	77
28	54	58	41	47	62	41	26	60	114	118	114	101	121	136	148	147	152	126	113	86	84	81	77	66
29	53	40	41	46	38		30	58	113	130	108	124	142	140	145	145	145	143	143	135	131	130	88	53
30	58	61	54	54	36		29	52	91	110	130	126	131	127	141	141	142	120	90	86	86	88	72	52
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	29	30	30	28	19	27	30	29	28	28	29	29	29	29	29	29	30	29	29	29	28	28	30
MED	65	61	54	52	44	38	37	72	104	118	132	134	136	140	144	143	142	134	128	108	107	108	87	73
U Q	82	79	72	60	46	42	42	76	113	124	142	142	143	146	148	147	150	144	142	131	130	120	89	86
L Q	55	54	50	43	38	37	29	64	99	110	115	124	127	130	136	135	132	124	108	87	88	86	74	54

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

NOV. 2002

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	30	39	G	G	G	G	G	G	G	42	39	41	33	36	40	34	G
2	G	G	G	G	28	24	G	G	G	G	G	G	G	G	G	G	44	37	26	G	33	G	G	25
3	G	G	29	G	27	G	52	72	52	G	50	54	72	G	G	G	79	84	84	71	G	G	G	G
4	G	G	G	38	30	G	26	G	G	G	G	G	50	G	G	G	G	G	28	58	G	G	G	G
5	G	G	G	G	G		29	G	G	G	49	G	64	G	52	41	46	36	29	G	36	28	70	34
6	G	G	G	27	G		G	30	G	45	48	50	G	52	66	80	53	36	30	29	26	G	G	28
7	G	G	26	G	28	G	G	G	G	G	G	G	61	46	48	G	G	G	G	G	G	G	G	G
8	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	51	48	42	G	G	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	49	50	41	G	G	G	G	G	G	G
10	G	G	G	G	G	G	G	G	G	43	G	G	G	G	G	G	37	43	39	G	G	G	G	G
11	G	G	G	G	G	G	G	G		G	G	44	54	52	G	G	G	G	G	G	G	G	G	G
12	G	G	G	G	G	G	G	G	G	G		48	G	G	G	60	38	38	25	G	G	G	G	G
13	G	G	11	G	G	G	G	G	G	G	47	50	50	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G	G	G	36	42	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	48	48	46	51	G	50	48	32	25	G	G	G
17	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G	G	28	34	29	G	G	G
18	G	G	G	G	G		G	G		G	G	G	G	G	G	G	G	40	G	G	G	G	G	G
19	G	G	G	G	G		G	G	G	G	44	G	50	50	G	G	G	38	11	G	G	G	G	G
20	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	11	G
21	G	G	G	G	G		G		G	G	48	46	G	G	G	G		G	36	31	30	G	G	27
22	G	G	G	G	G	G	G	G	G	41	G	G	G	154	G	79	G	38	29	G	G	G	G	G
23	G	G	G	G	G	G	G	G	G		G	G		G	G	44	G	29	30	11	G	G	G	G
24	G	43	G	G	G	G	G	G	33	G	G	G	48	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	27	G	G	G	G	G	G	G	G	43	G	G	G	33	41	28	G	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	52	G	40	G	31	32	G	G	G	59	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	36	G	G	G	G	G	G	G
29	G	G	G	G	G		G	G	G	G	47	G	G	G	64	G	G	G	G	11	36	G	G	G
30	G	G	G	G	G		G	G	G	G	G	47	47	46	G	G	G	G	31	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	30	30	30	30	22	30	29	28	29	27	30	29	30	30	30	29	30	30	30	30	30	30	30
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	15	27	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	44	G	49	46	G	40	39	38	32	28	25	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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

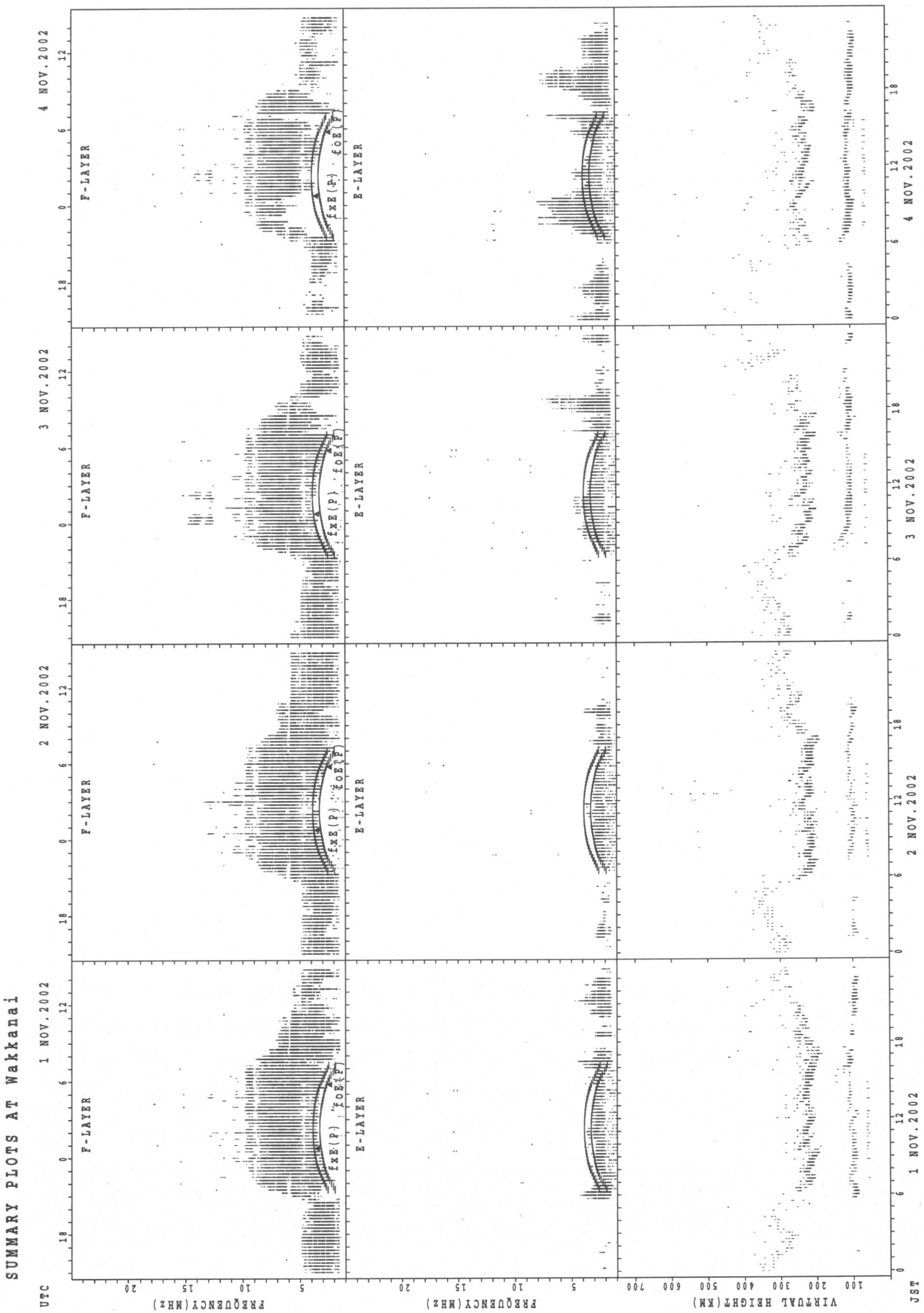
HOURLY VALUES OF fmin AT Okinawa

NOV. 2002

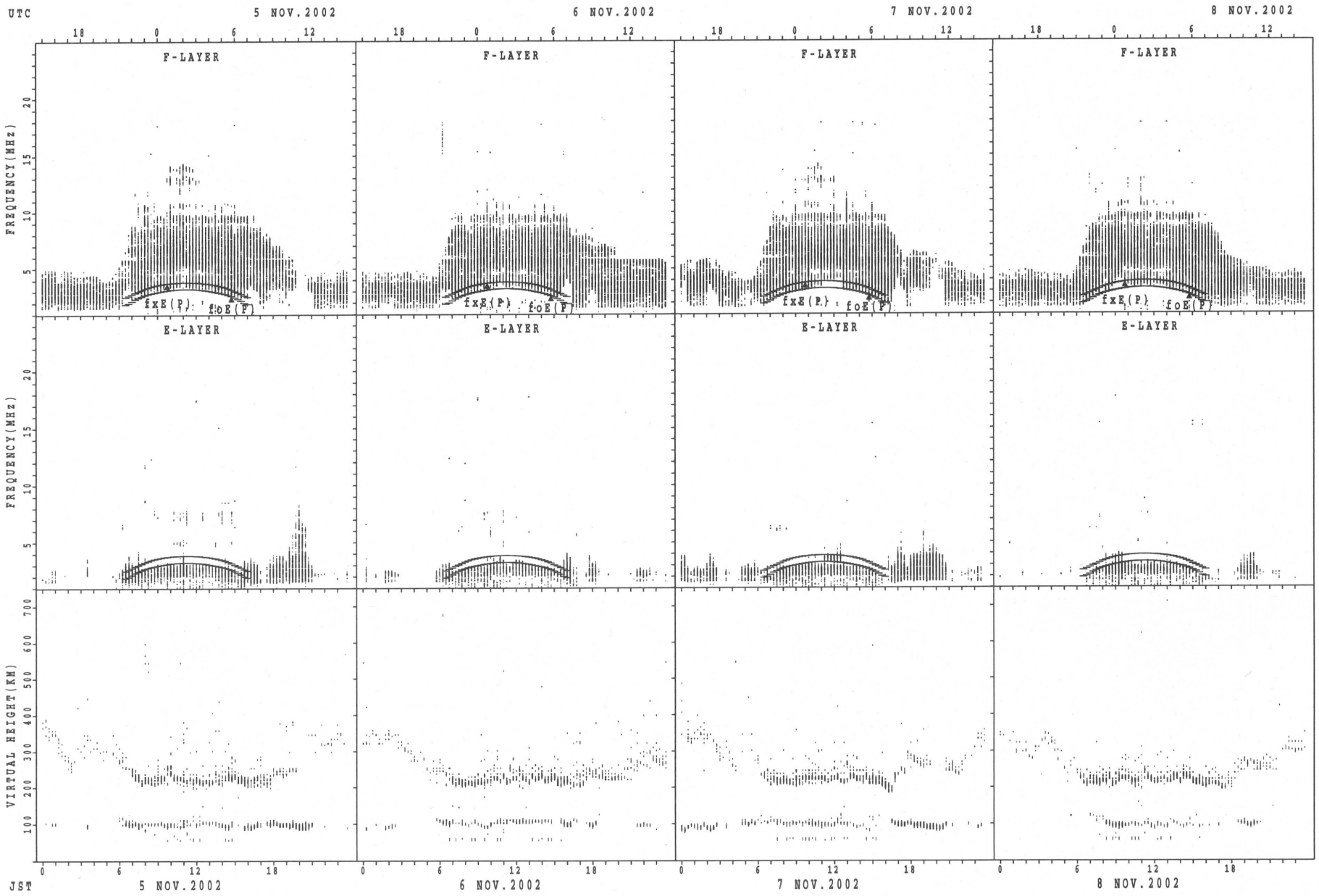
LAT. 26°16.9'N LON. 127°48.4'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

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	17	15	14	15	20	15	15	15	18	35	30	42	43		29	39	33	21	15	14	14	14	14	15
2	15	14	15	17	14	17	15	22	16	20	27		42	26	23	22	20	15	14	16	14	15	14	15
3	14	15	14	15	14	15	14	15	18	18		36	40	42		27	20	17	14	14	22	14	15	15
4	17	16	16	14	14		14	21	16	17	22	23	36	40	23	24	21	24	14	14	20	18	15	14
5	16	15	15	15	17		14	22	16	20	21	26	22		43	28	18	16	14	17	14	15	15	14
6	20	16	15	14	16		15	17	18	18	33	32			28	30	20	14	15	14	17	15	15	15
7	15	18	14	17	14	16	16	21	20	18	22	26	27	24	21	26	21	28	16	16	15	16	17	16
8	15	15	18	16	15	16	18	22	18	21	27	38	43			17	14	14	14	14	15	16	14	17
9	15	15	15	15	14	14	16	21	15	20	20		32	32	29	24	20	22	17	15	14	20	14	17
10	16	15	15	14	15	15	15	21	16	18	21	47	43	49	28	28	21	14	14	16	22	18	18	17
11	15	15	15	15	15	15	16	21	15			42	39	38	39	38	20	29	14	17	16	15	15	15
12	15	15	15	14	14	15	17	15	29	18	30	27	42	42	39	22	18	14	16	14	16	14	16	17
13	16	16	16	15	16	15	15	21	15	21	22	35	36	38	39	22	33	23	15	16	21	15	15	15
14	15	16	15	14	14		17	20	16	36	42	44	50	42	43	38	22	24	15	15	18	16	15	15
15	14	15	14	15	15	17	15	20	16	23	43	44		42		36	20	18	18	17	16	17	15	16
16	17	15	15	14	18	18	17	21	16	22	23	28	29	29	27	21	17	14	14	14	14	16	14	14
17	15	15	14	15	14	15	15	21	16	20	24	38	42	28	24	22	15	15	14	14	16	17	15	16
18	14	15	15	15	15		20	21	18	20	26	38				18	16	16	17	17	16	16	15	15
19	16	17	15	15	17		14	20	16	20	22		33	30	40	22	16	17	18	15	20	17	15	15
20	14	15	14	15	15		20	16	18	20	18		39	38	38	23	20	24	15	18	22	16	15	18
21	15	14	15	15	14		14	14	16	33	26	28	42	27	26	20	18	17	15	14	15	16	16	14
22	15	14	15	16	15	14	14	17	16	21		27	41	26		20	17	16	14	14	14	14	15	16
23	15	15	18	14	15	14	16	18	15	17	20		23	22	20	17	14	14	14	15	16	14	15	14
24	15	14	14	17	14	15	15	18	14	17	20	24	28			17	17	23	17	17	15	15	14	15
25	16	16	15	15	14	20	16	18	17	18	21			35	27	20	15	14	14	14	14	16	14	18
26	17	16	14	17	14	14	14	20	27	16	20	21	39	35	28	22	16	15	14	14	17	17	16	16
27	15	16	17	16	14	15	20	18	15	18	21	42	42	41	42	23	15	26	14	16	14	16	17	17
28	21	16	15	14	15	15	15	18	17	20	21	23	37		32		21	22	15	14	15	14	16	15
29	14	16	14	14	14		15	17	16	18	20	21	28	27	23	22	18	22	15	14	14	15	15	15
30	15	15	15	15	15		16	18	15	17	20	26	22	24	21	20	17	22	15	16	15	14	15	15
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	20	30	30	30	29	27	24	26	23	24	29	30	30	30	30	30	30	30	30
MED	15	15	15	15	15	15	15	20	16	20	22	30	39	35	28	22	18	17	15	15	16	16	15	15
U Q	16	16	15	15	15	16	16	21	18	21	27	40	42	41	39	27	20	23	15	16	17	16	15	16
L Q	15	15	14	14	14	15	15	17	16	18	20	26	29	27	23	20	16	15	14	14	14	15	15	15

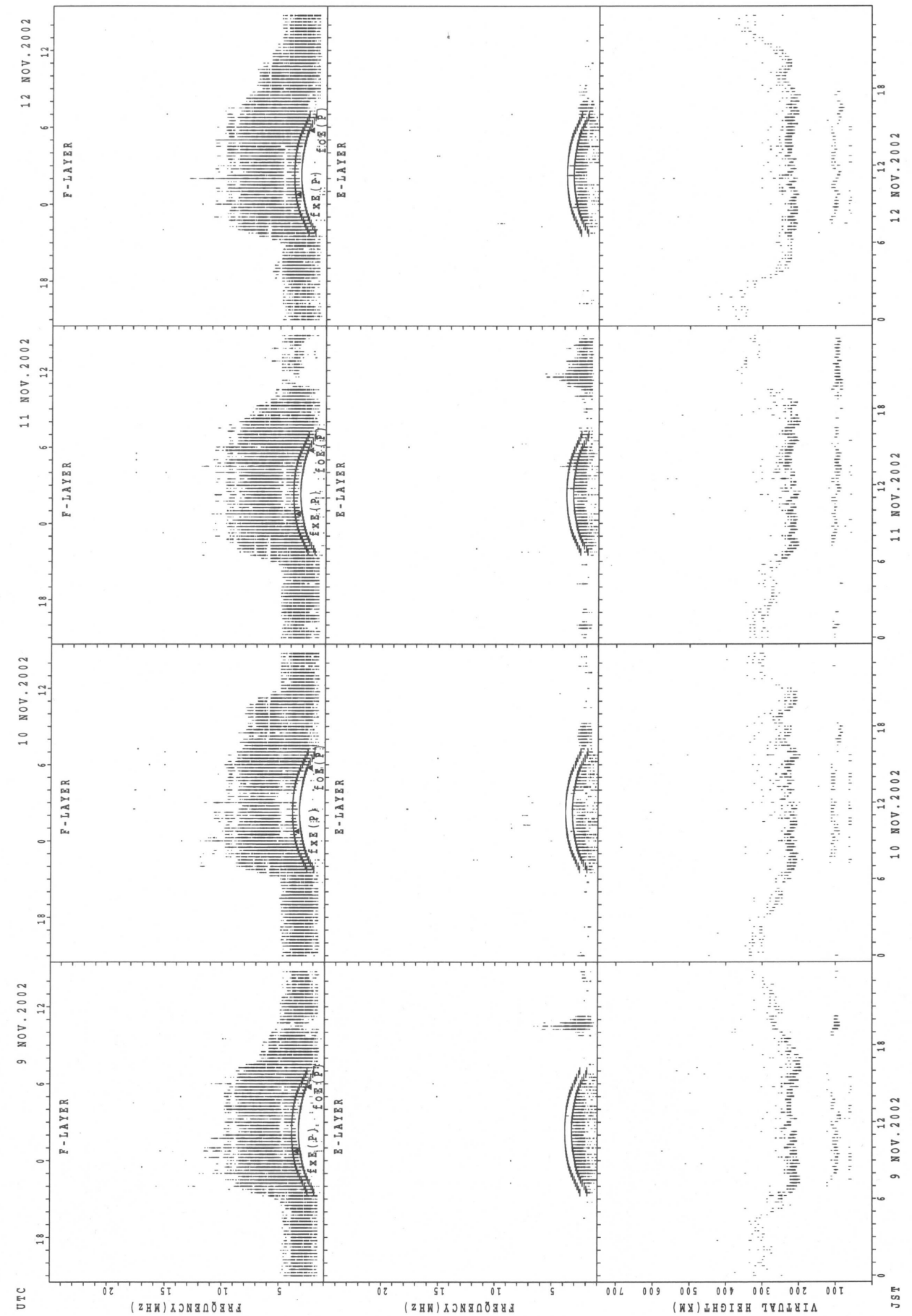
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


SUMMARY PLOTS AT Wakkanai
UTC
JST
1 NOV.2002
2 NOV.2002
3 NOV.2002
4 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

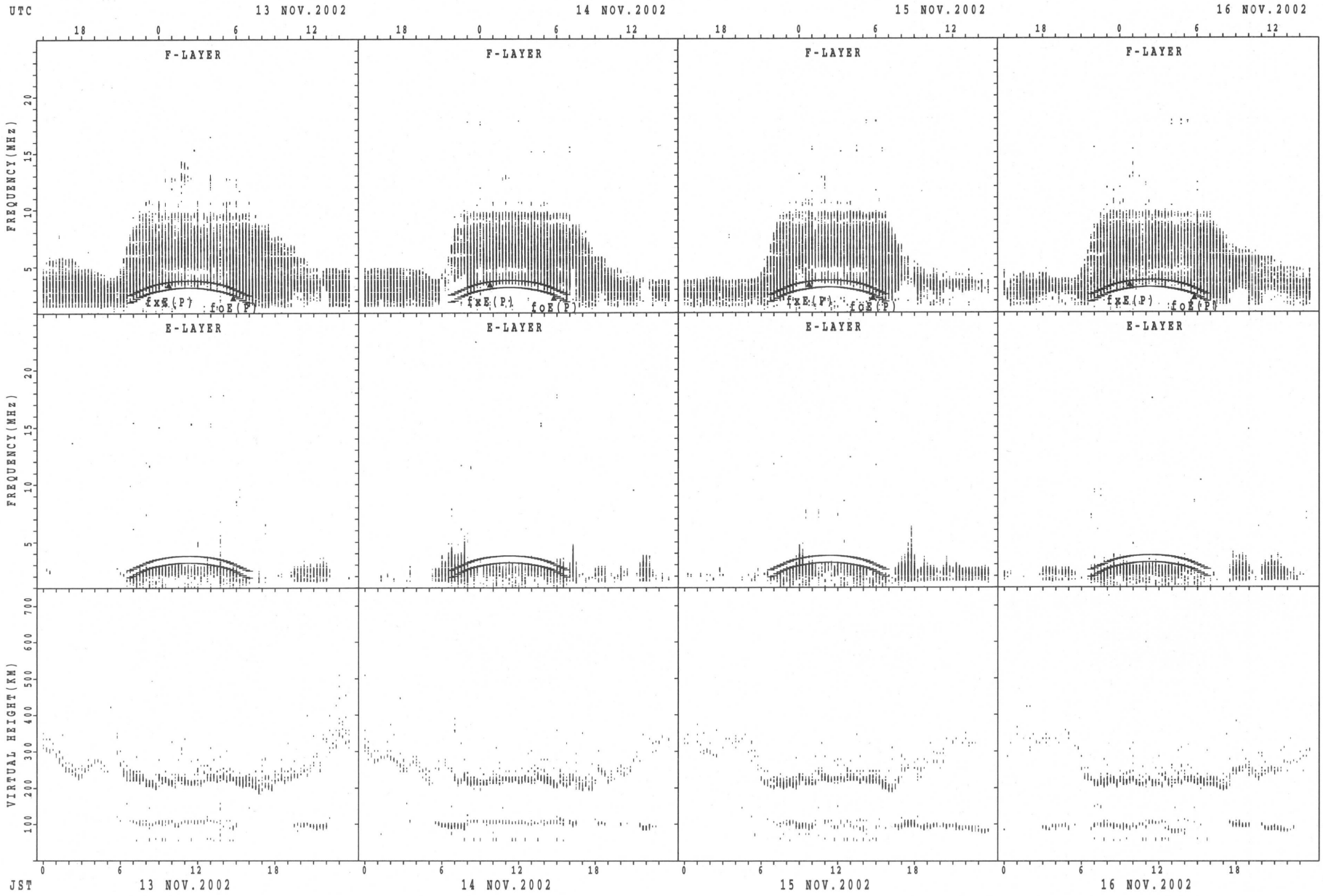
SUMMARY PLOTS AT Wakkanai



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

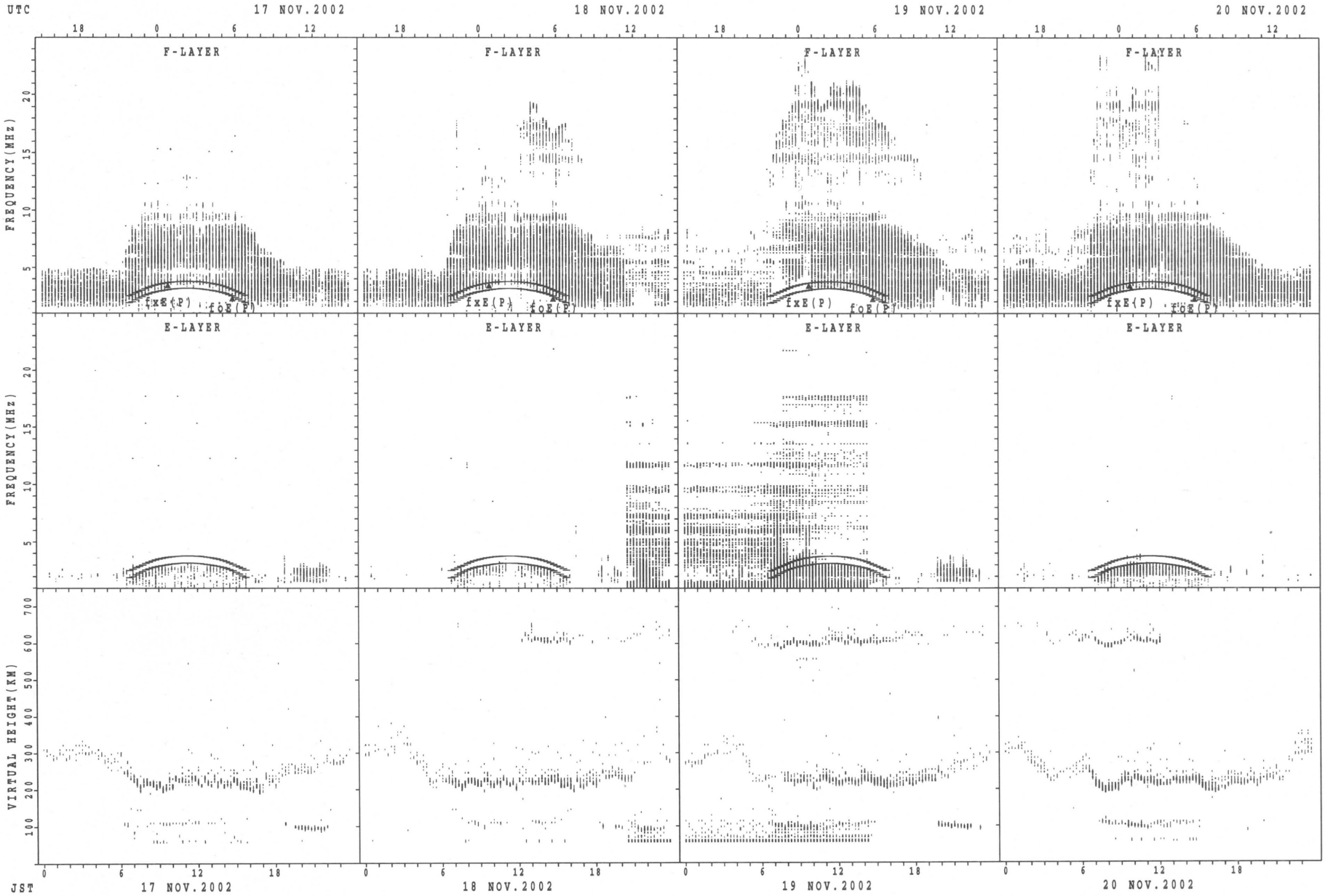

SUMMARY PLOTS AT Wakkanai
UTC
JST
9 NOV.2002
10 NOV.2002
11 NOV.2002
12 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



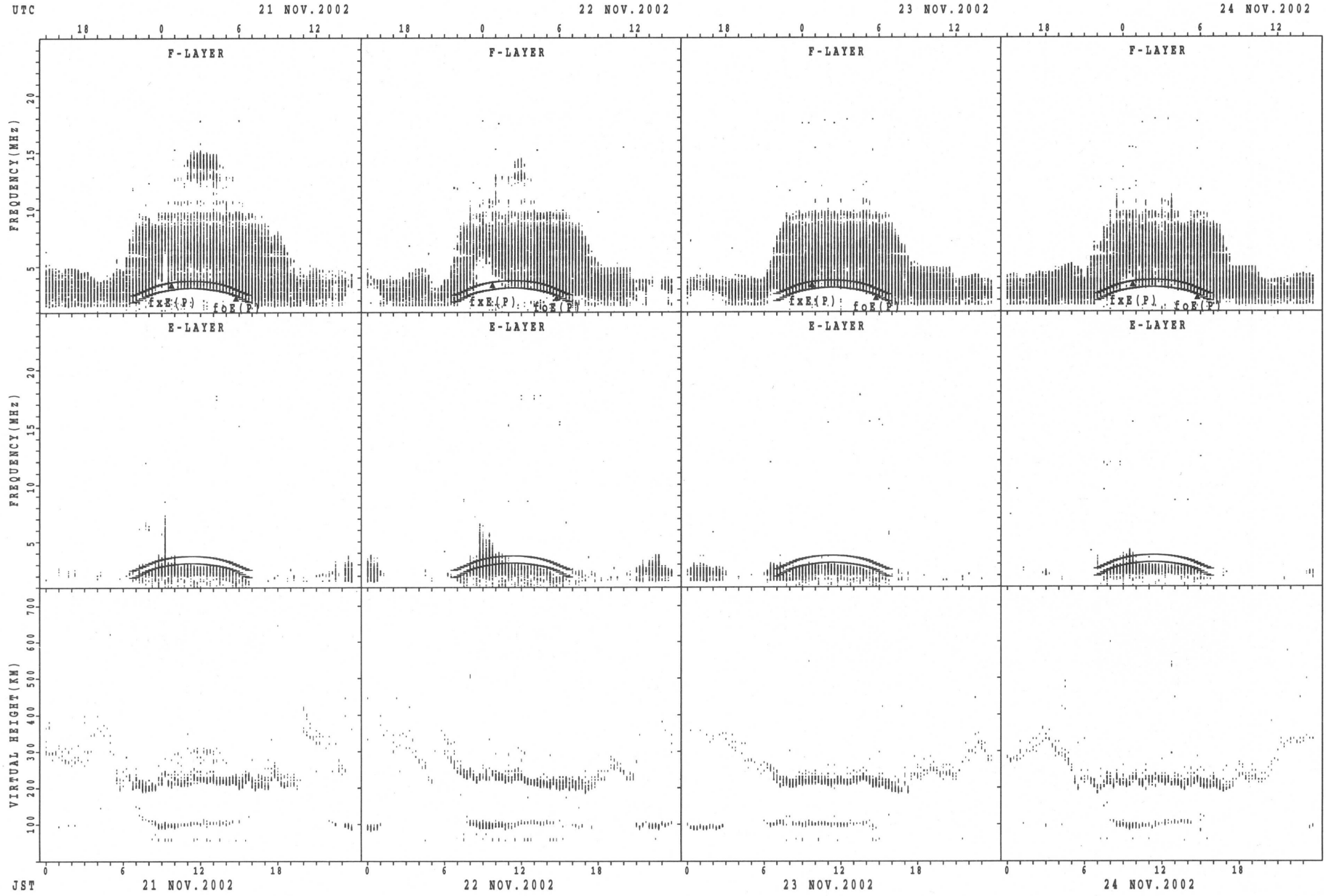
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



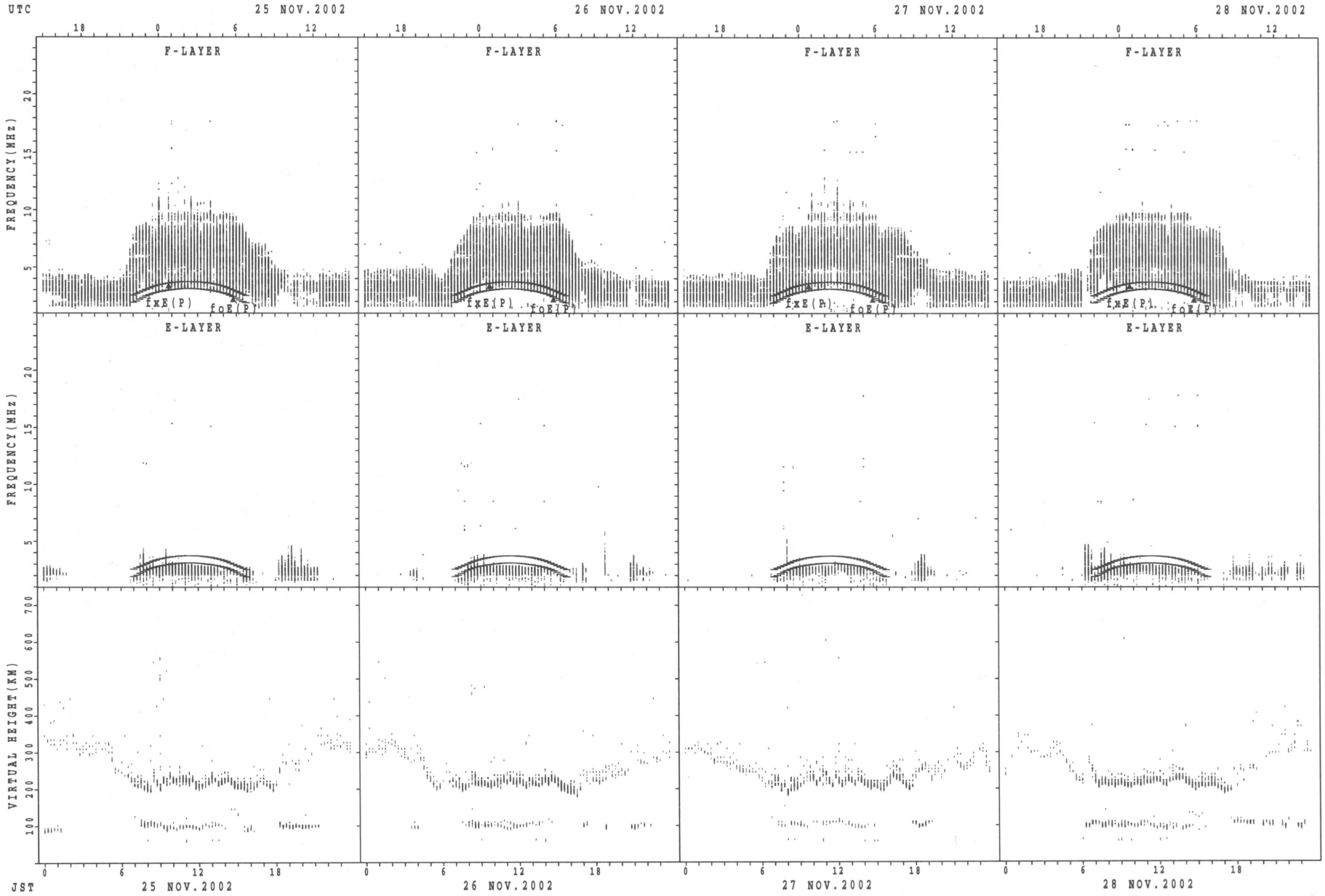
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



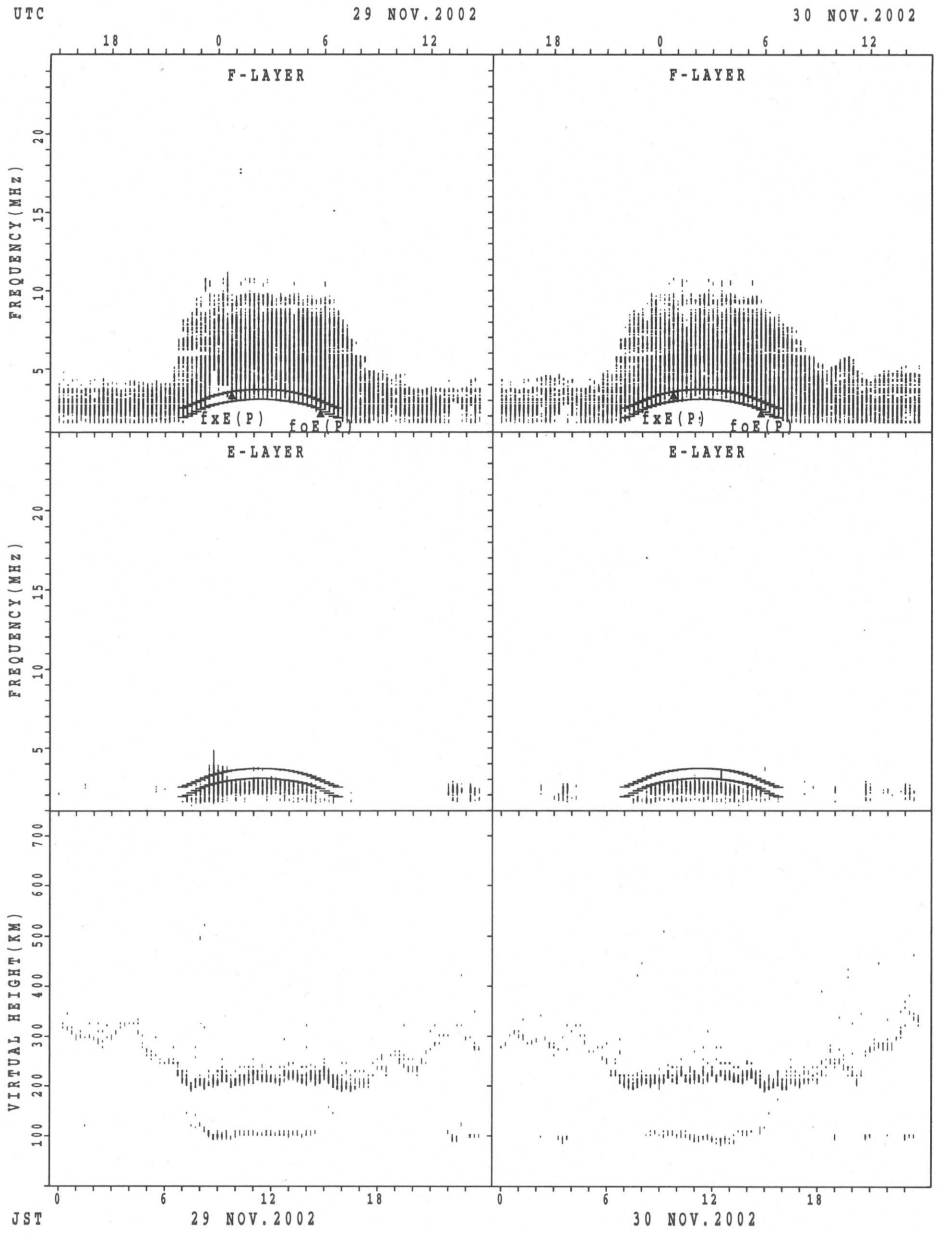
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



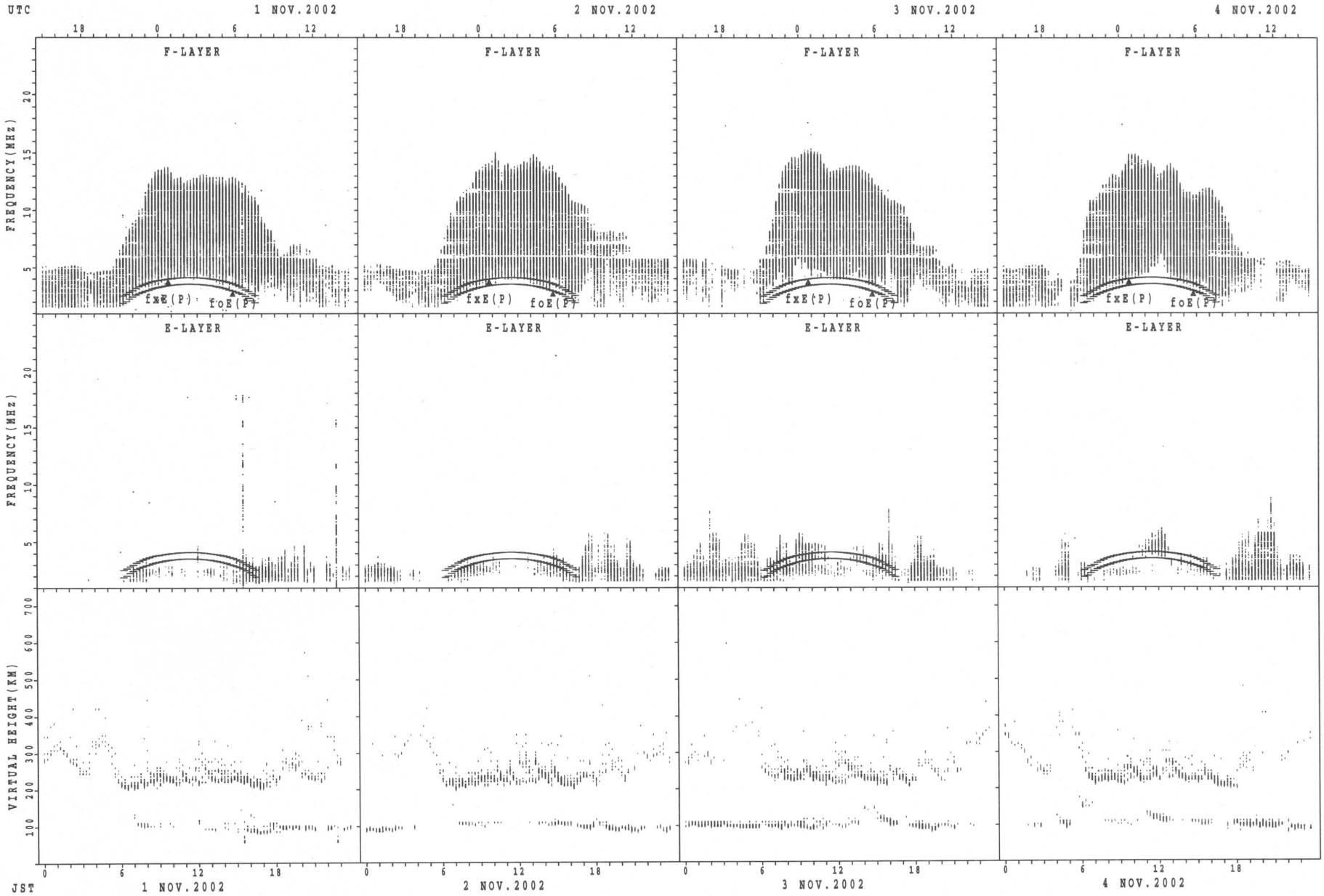
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



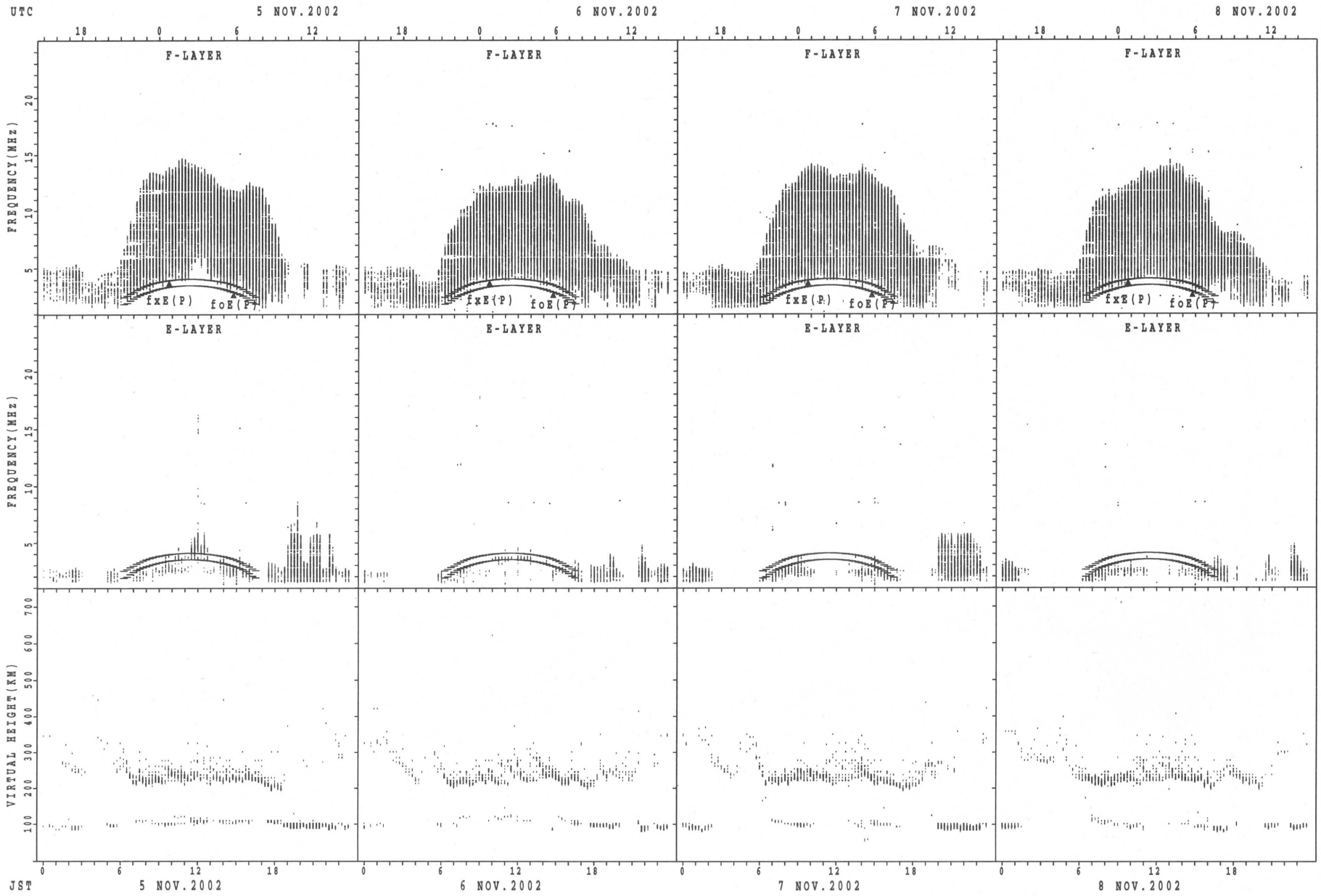
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



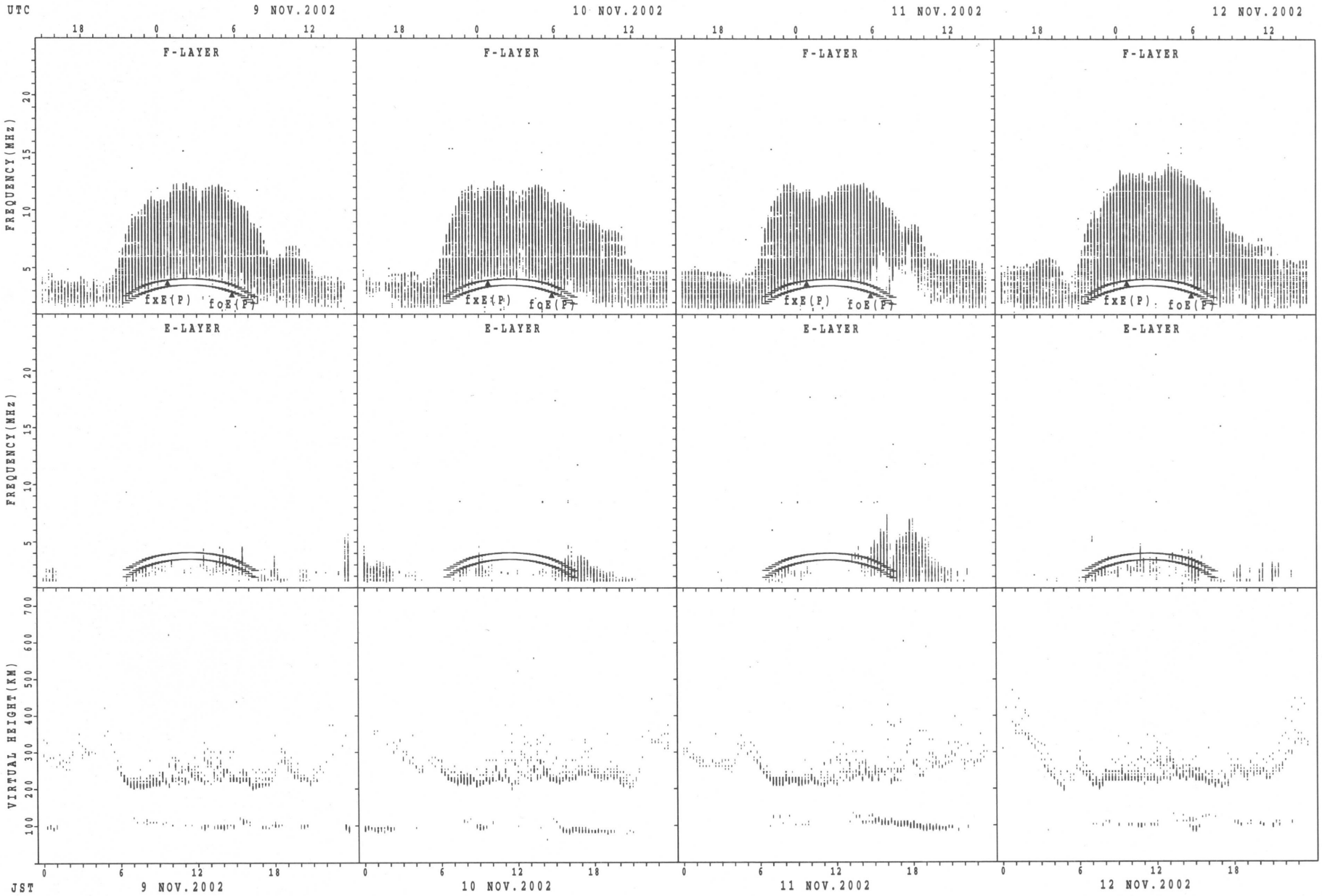
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



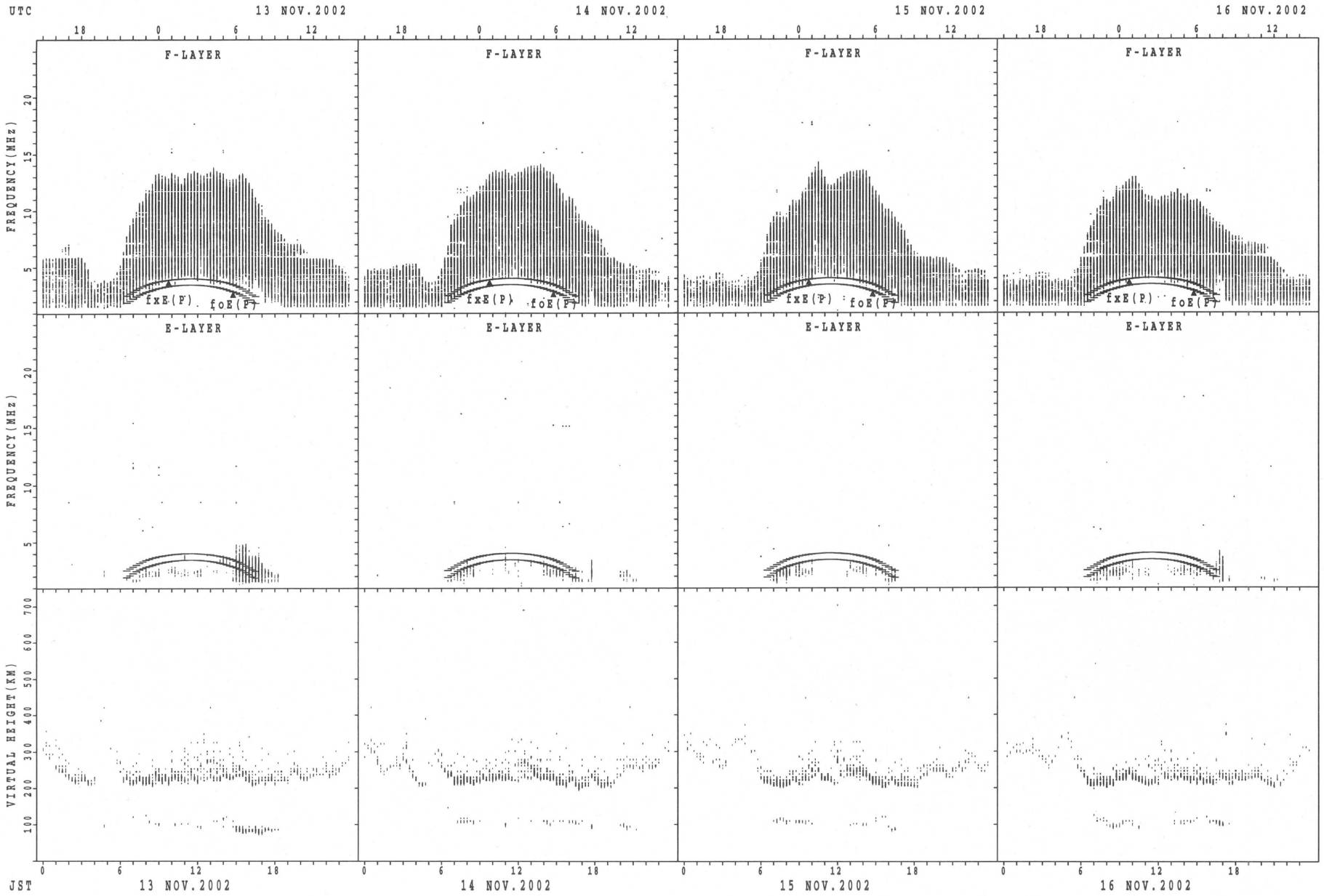
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

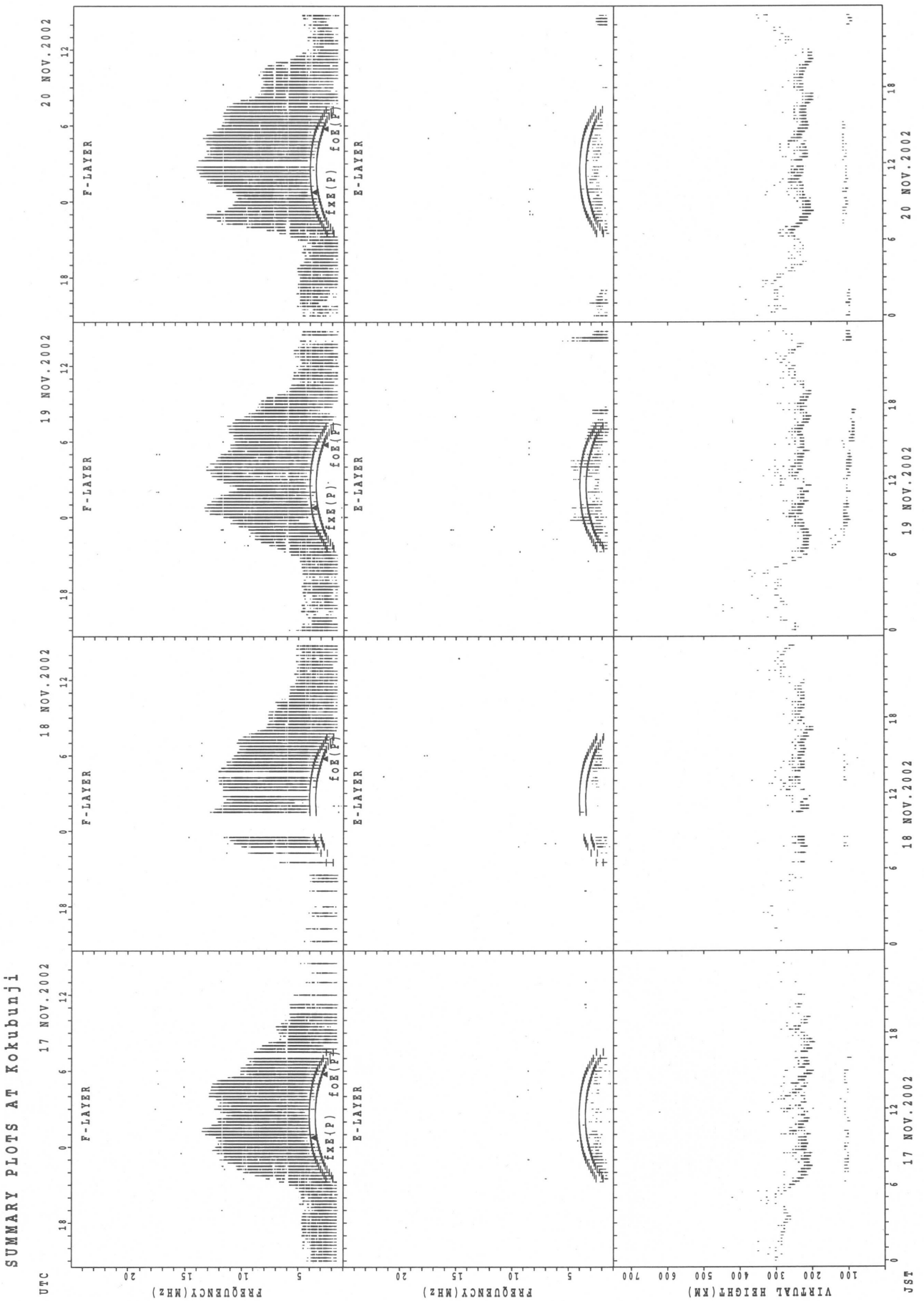


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

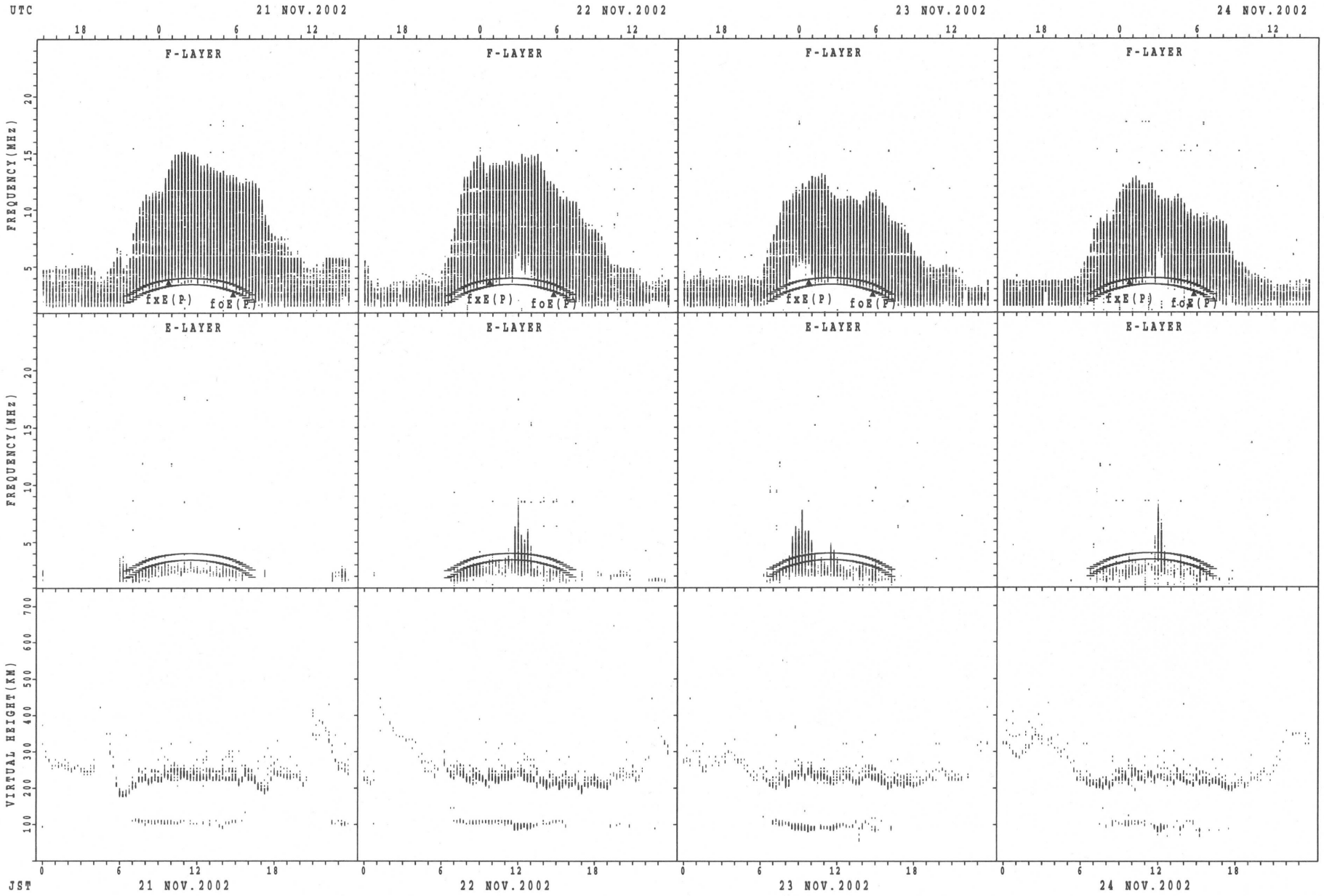
SUMMARY PLOTS AT Kokubunji



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

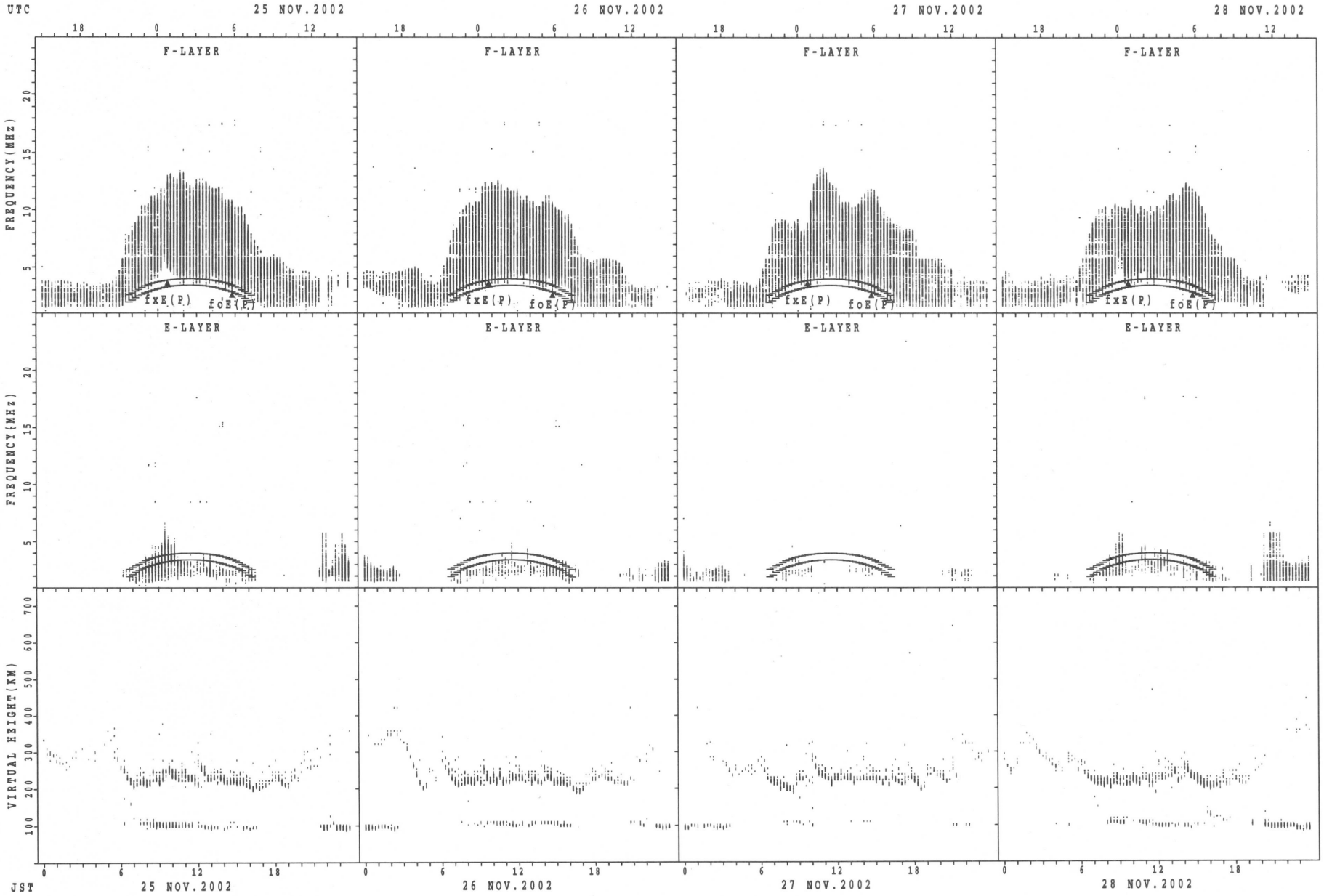

SUMMARY PLOTS AT Kokubunji
UTC
JST
17 NOV.2002
18 NOV.2002
19 NOV.2002
20 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



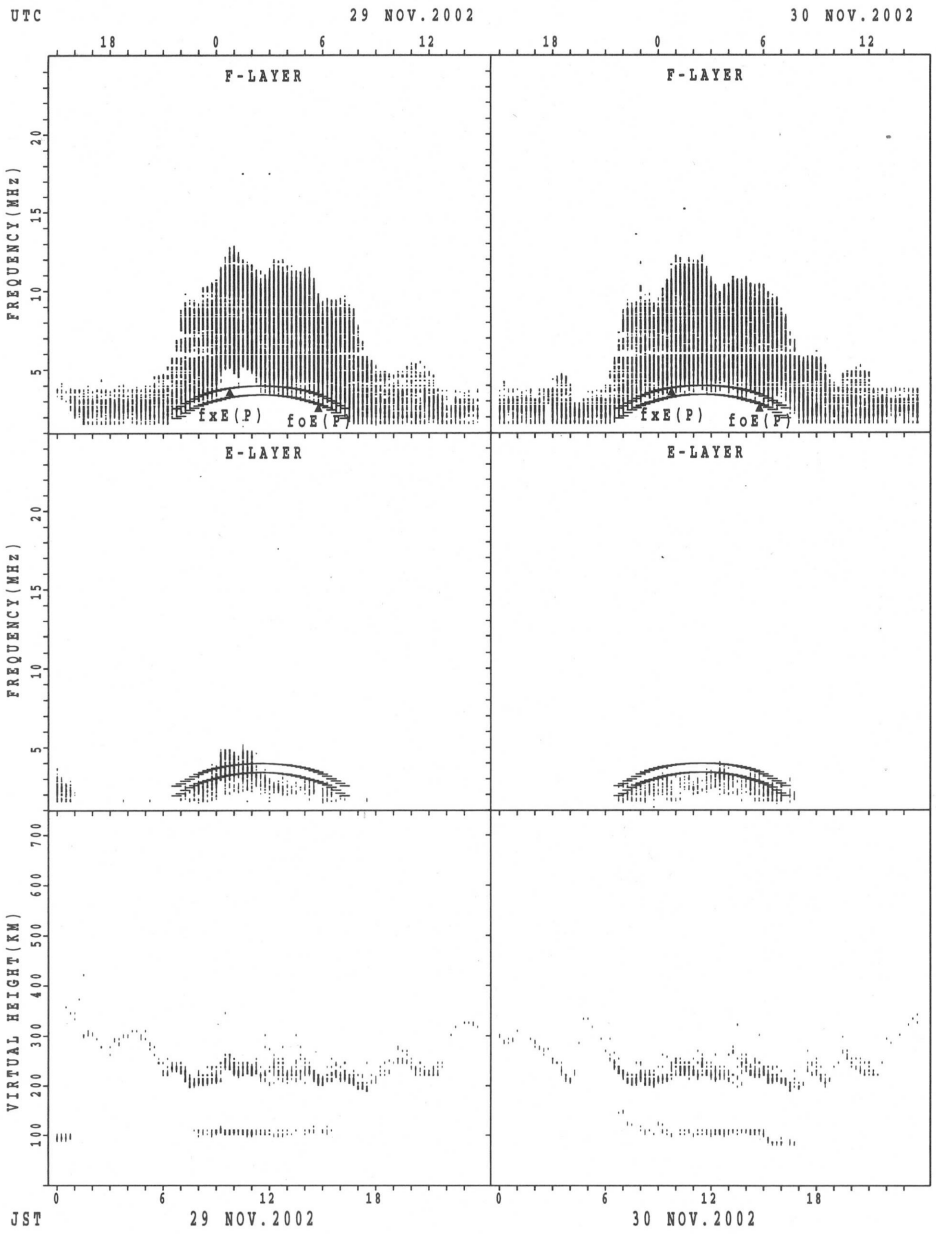
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

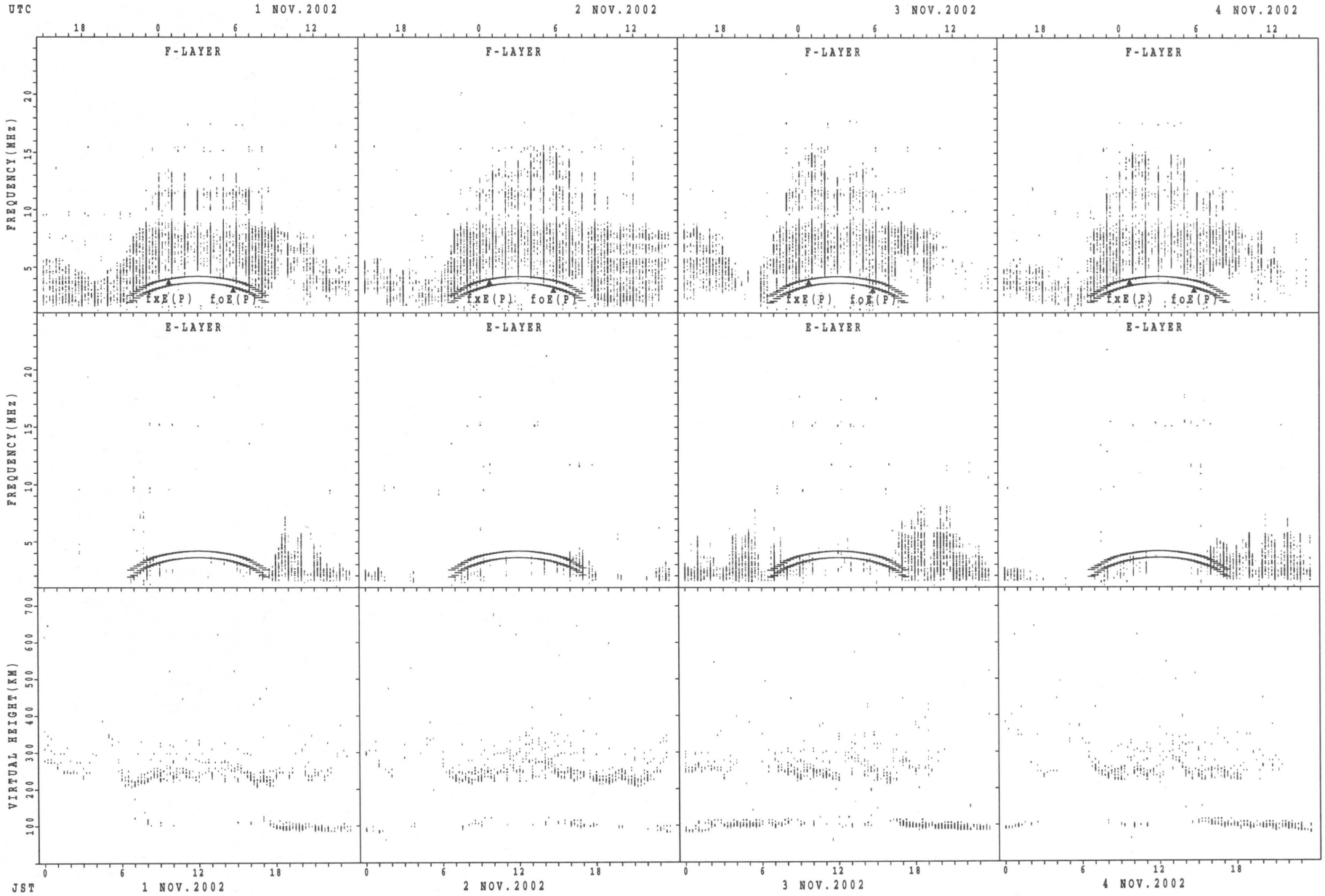


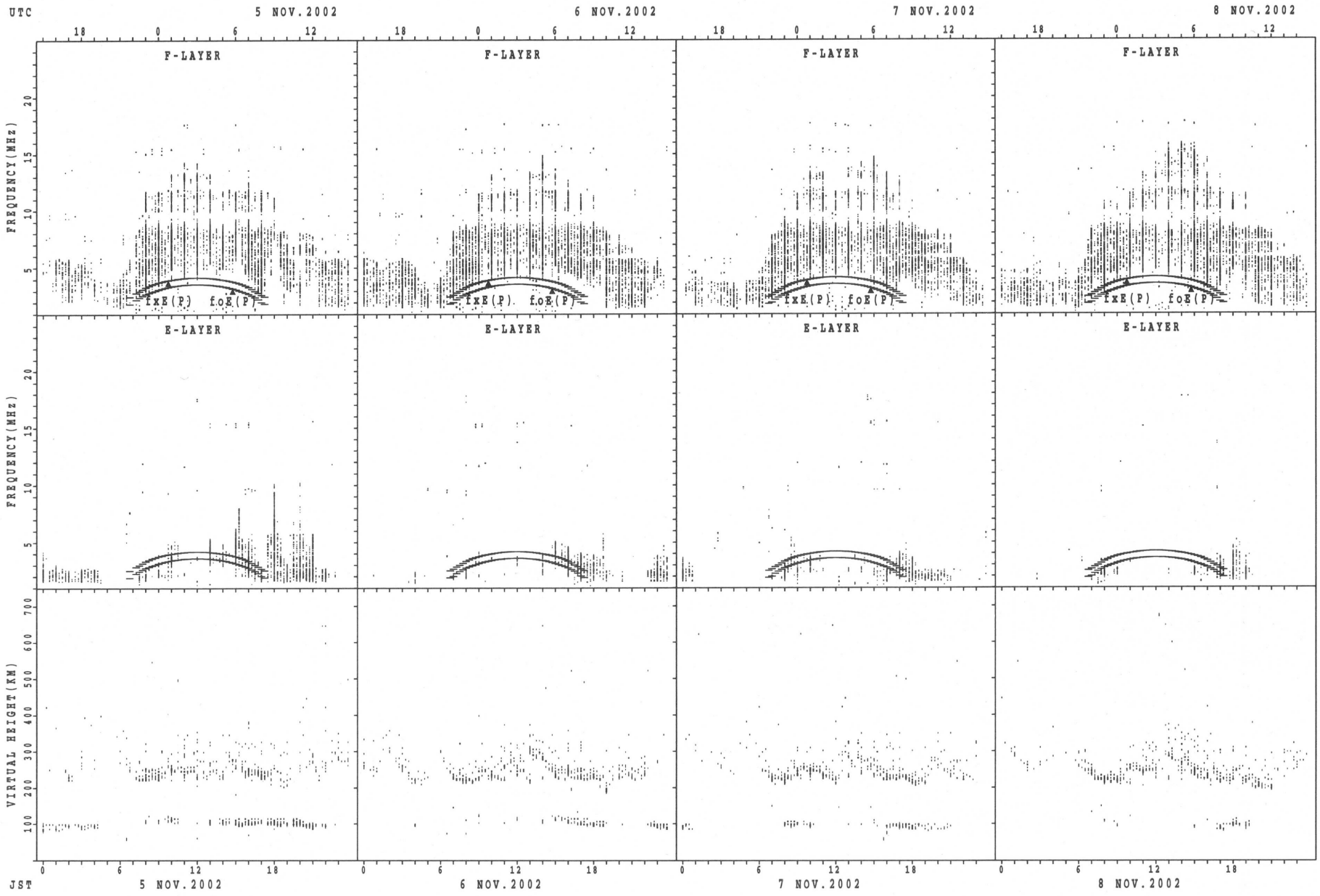
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

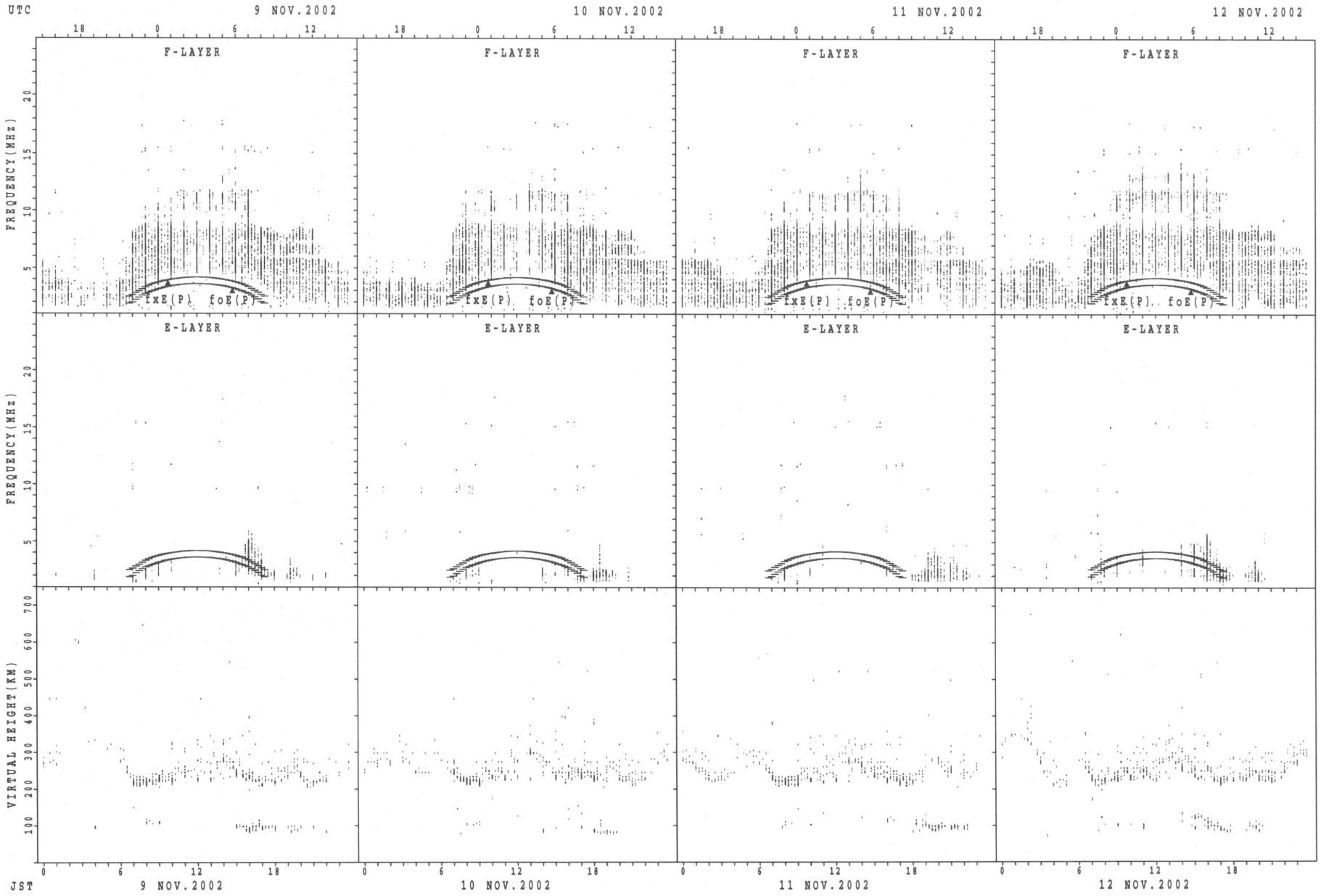
SUMMARY PLOTS AT Kokubunji



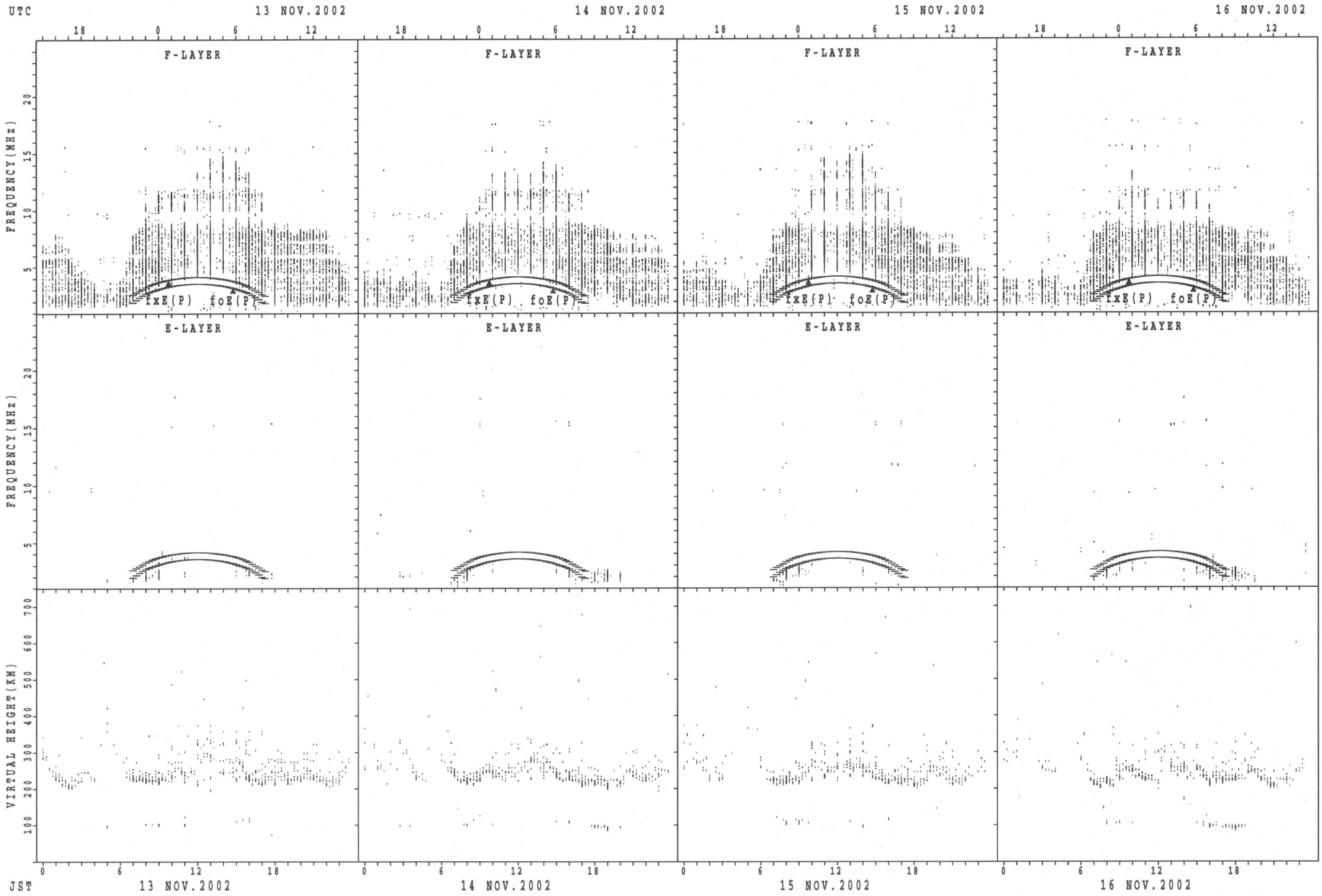
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
UTC
1 NOV.2002
2 NOV.2002
3 NOV.2002
4 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Yamagawa
UTC
5 NOV.2002
6 NOV.2002
7 NOV.2002
8 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

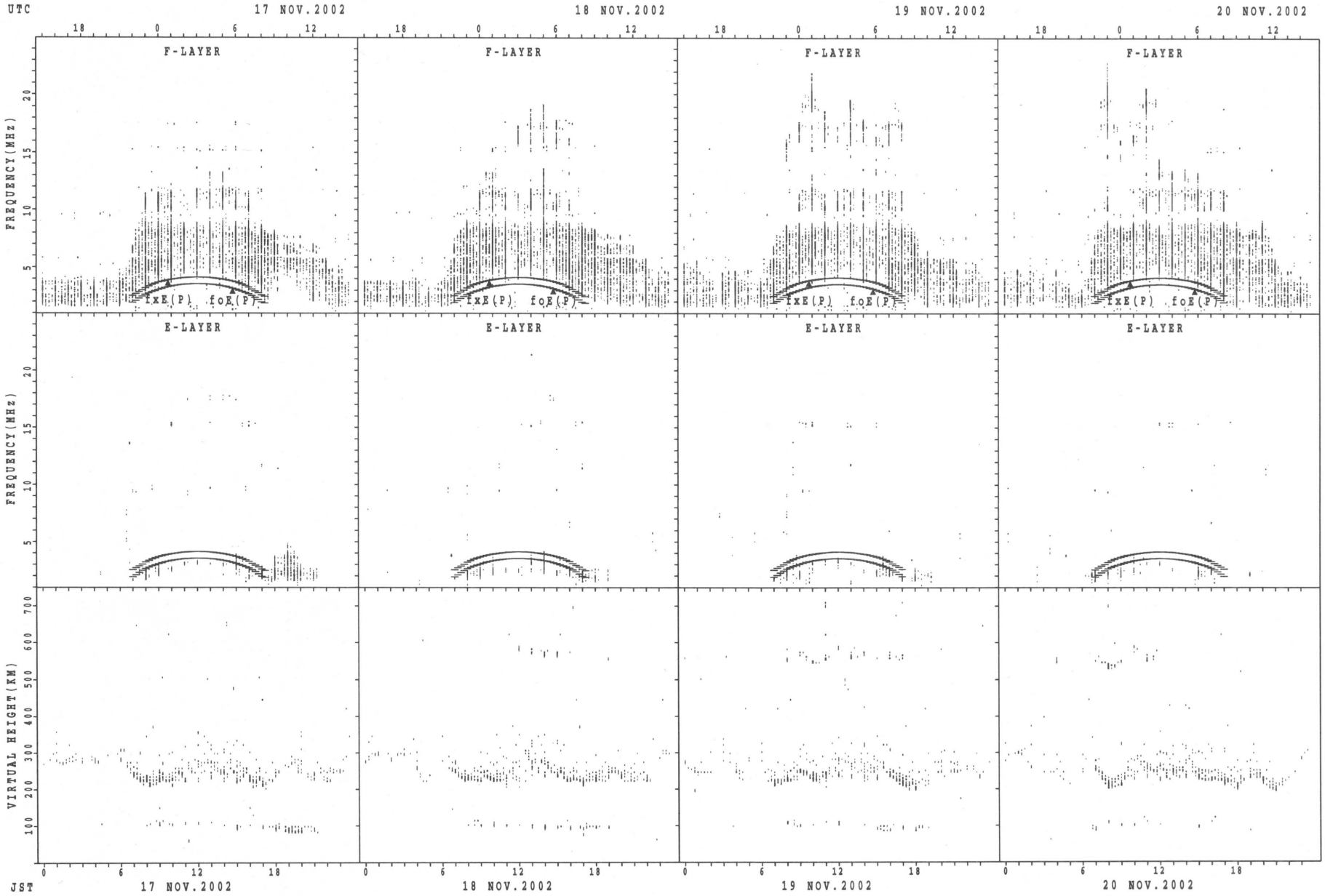

SUMMARY PLOTS AT Yamagawa
UTC
9 NOV.2002
10 NOV.2002
11 NOV.2002
12 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



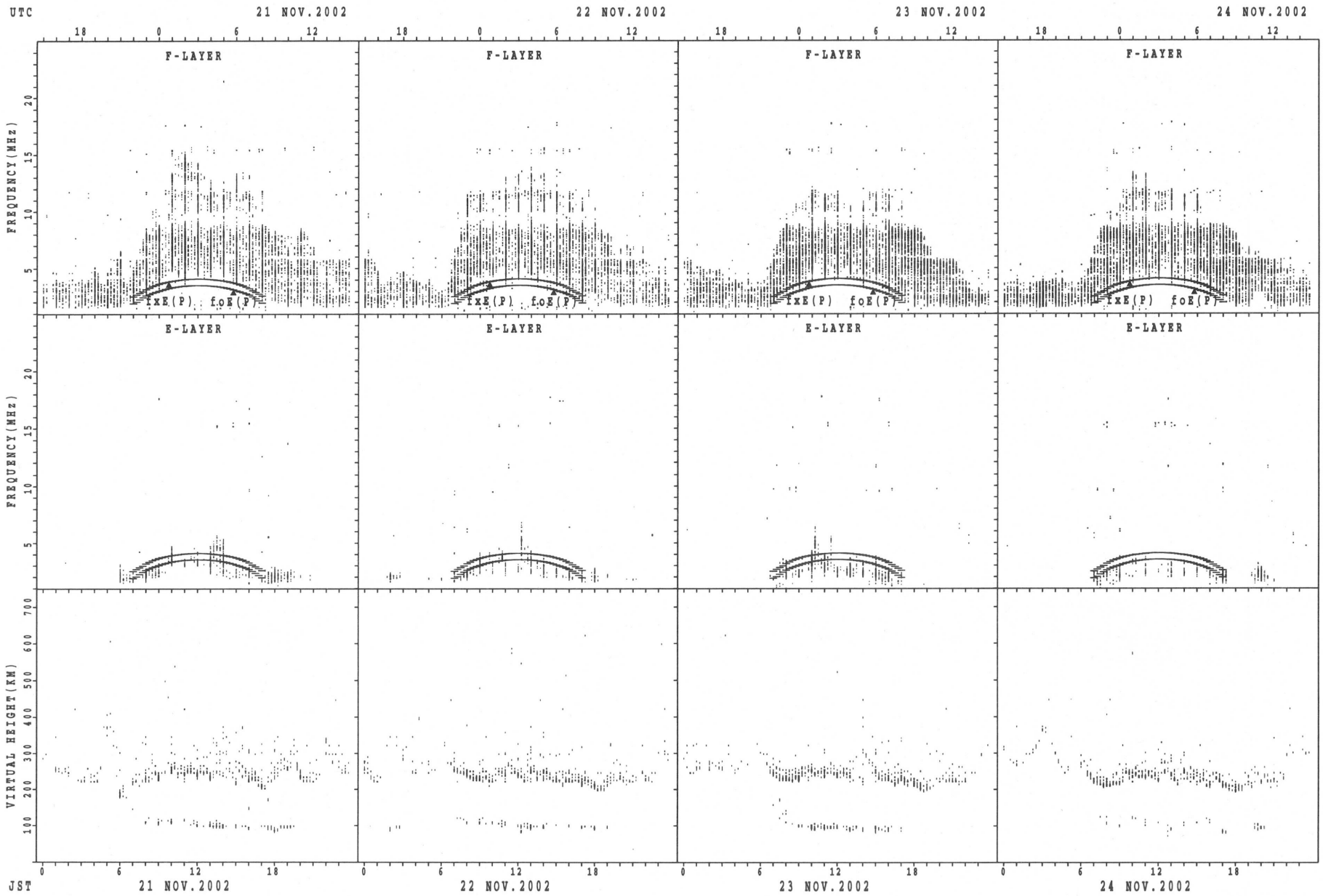
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

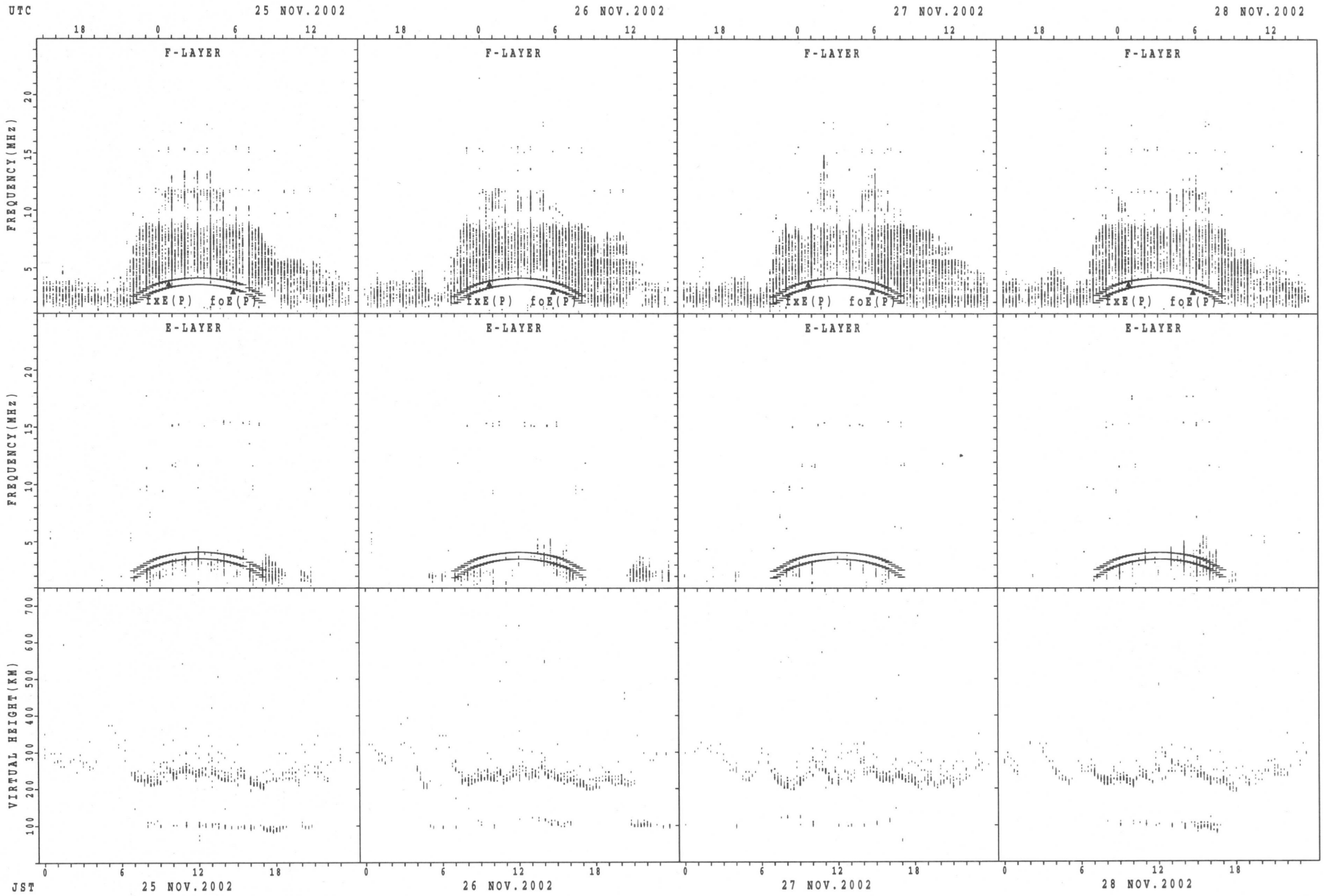


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

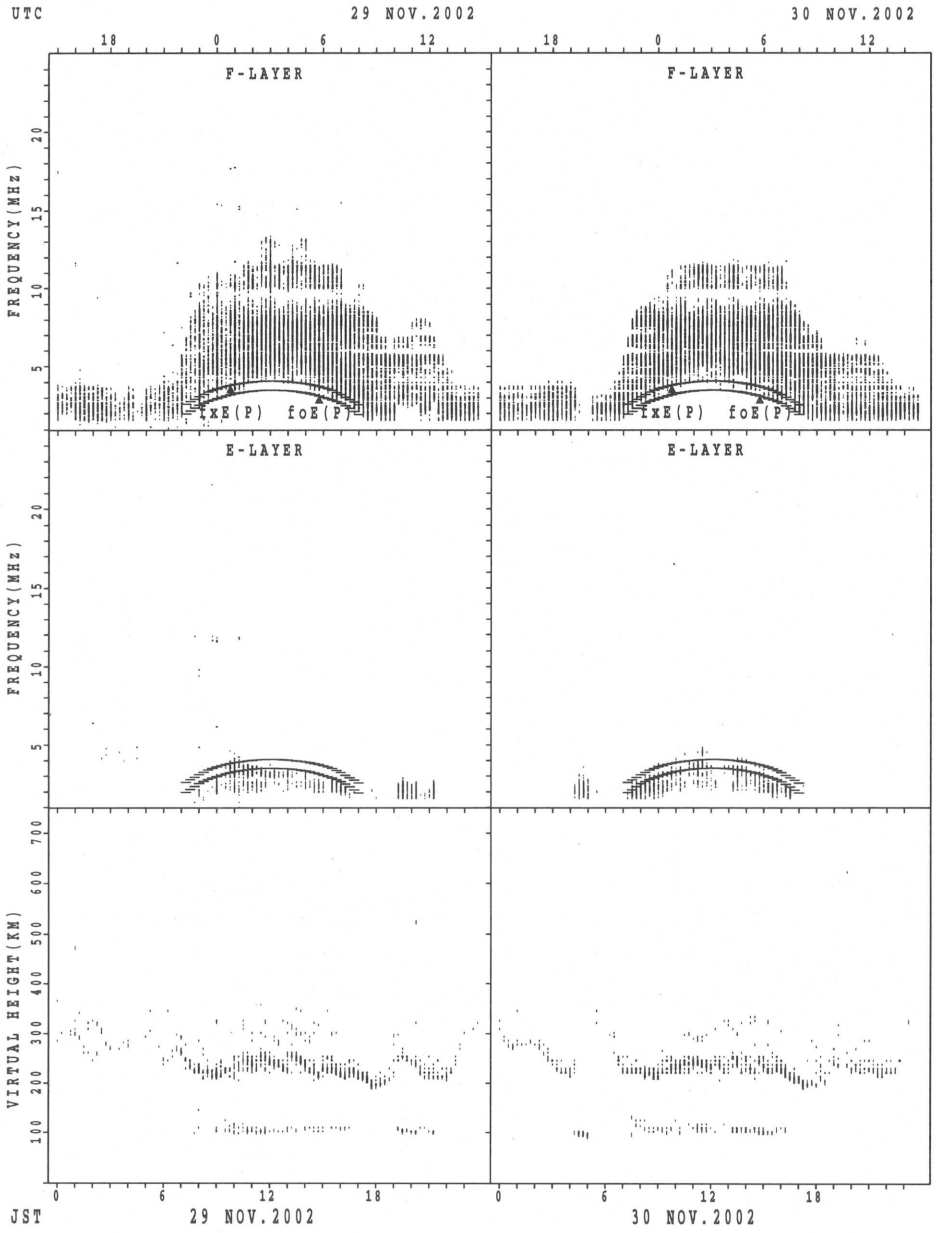


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

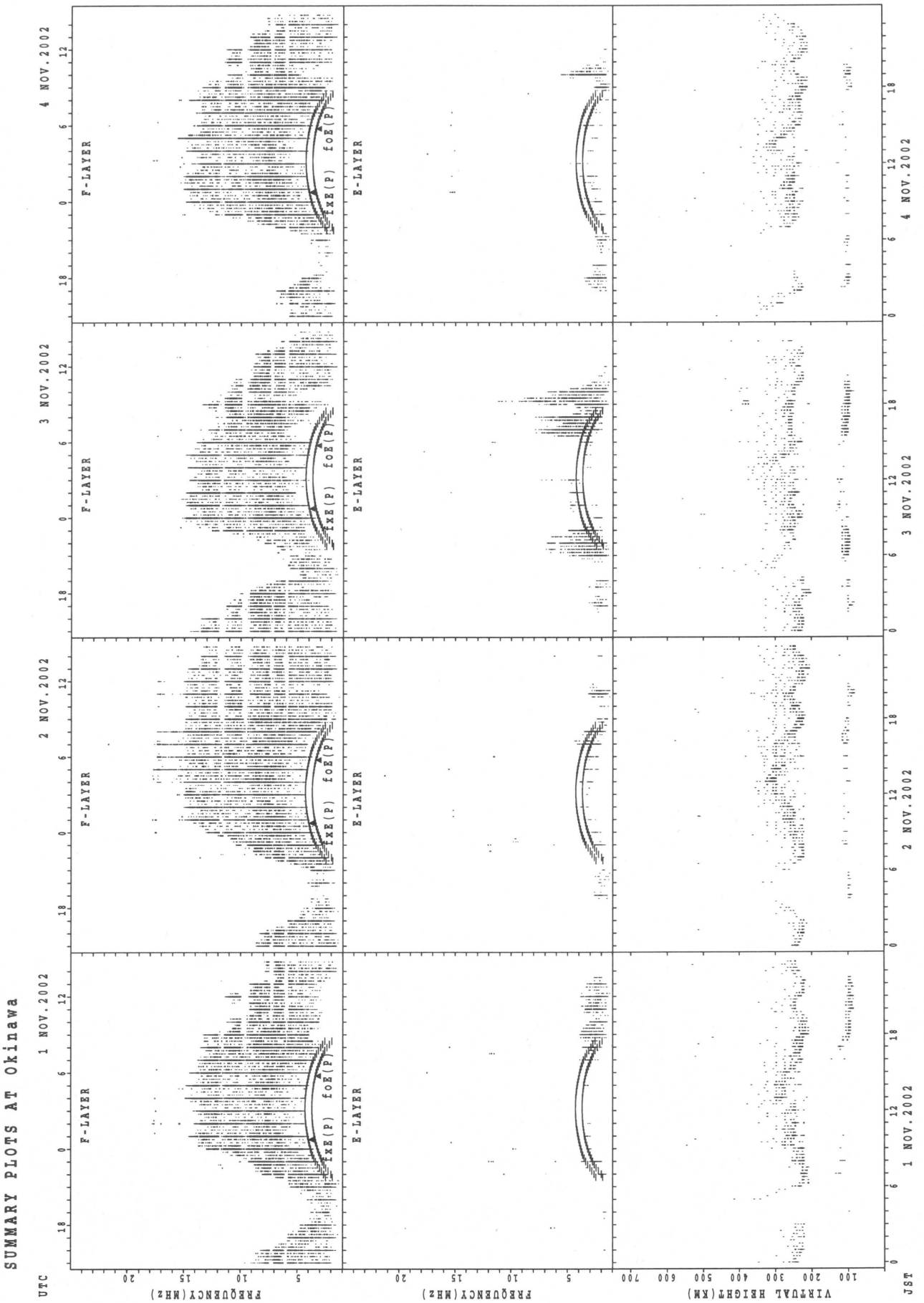


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

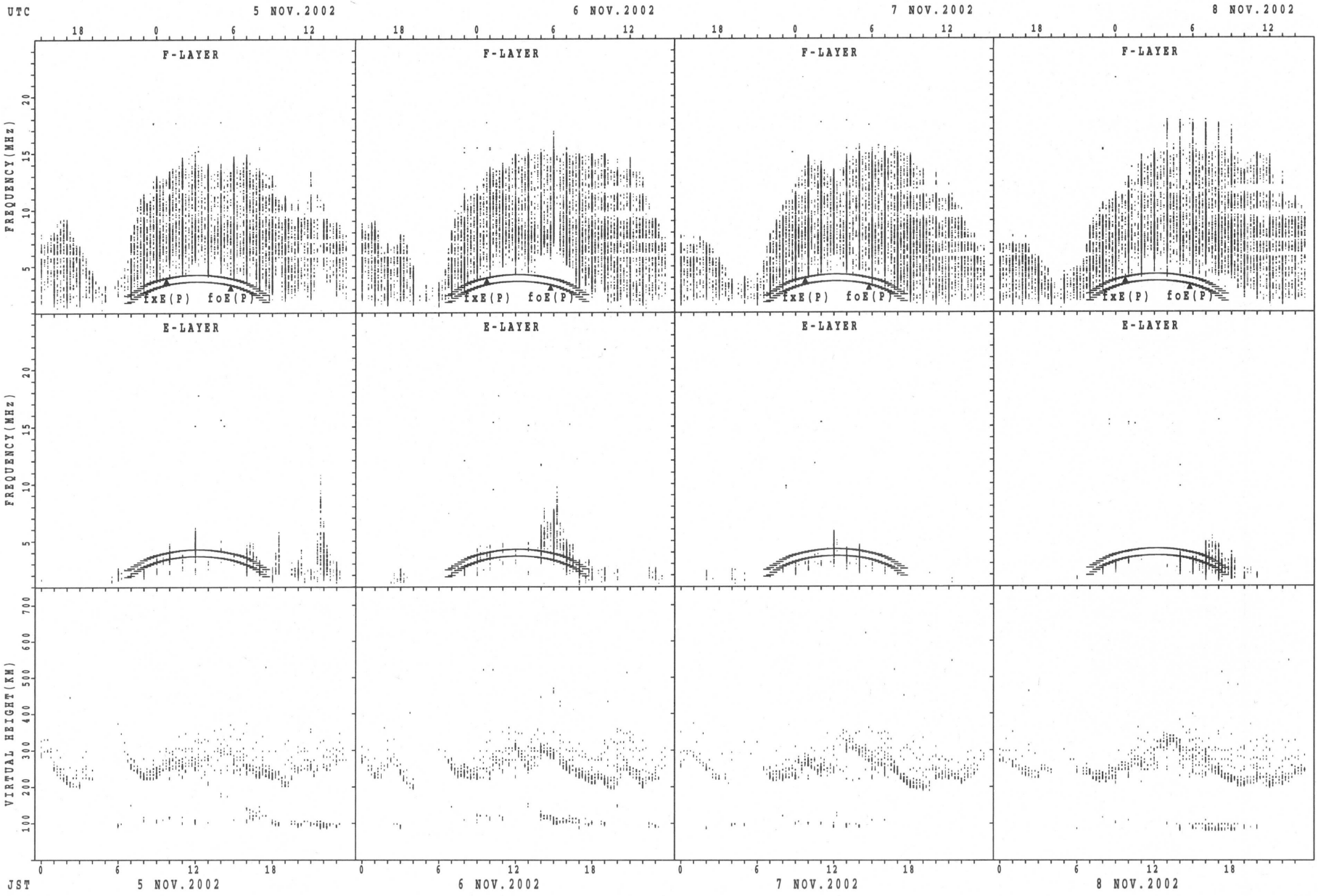
SUMMARY PLOTS AT Yamagawa



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

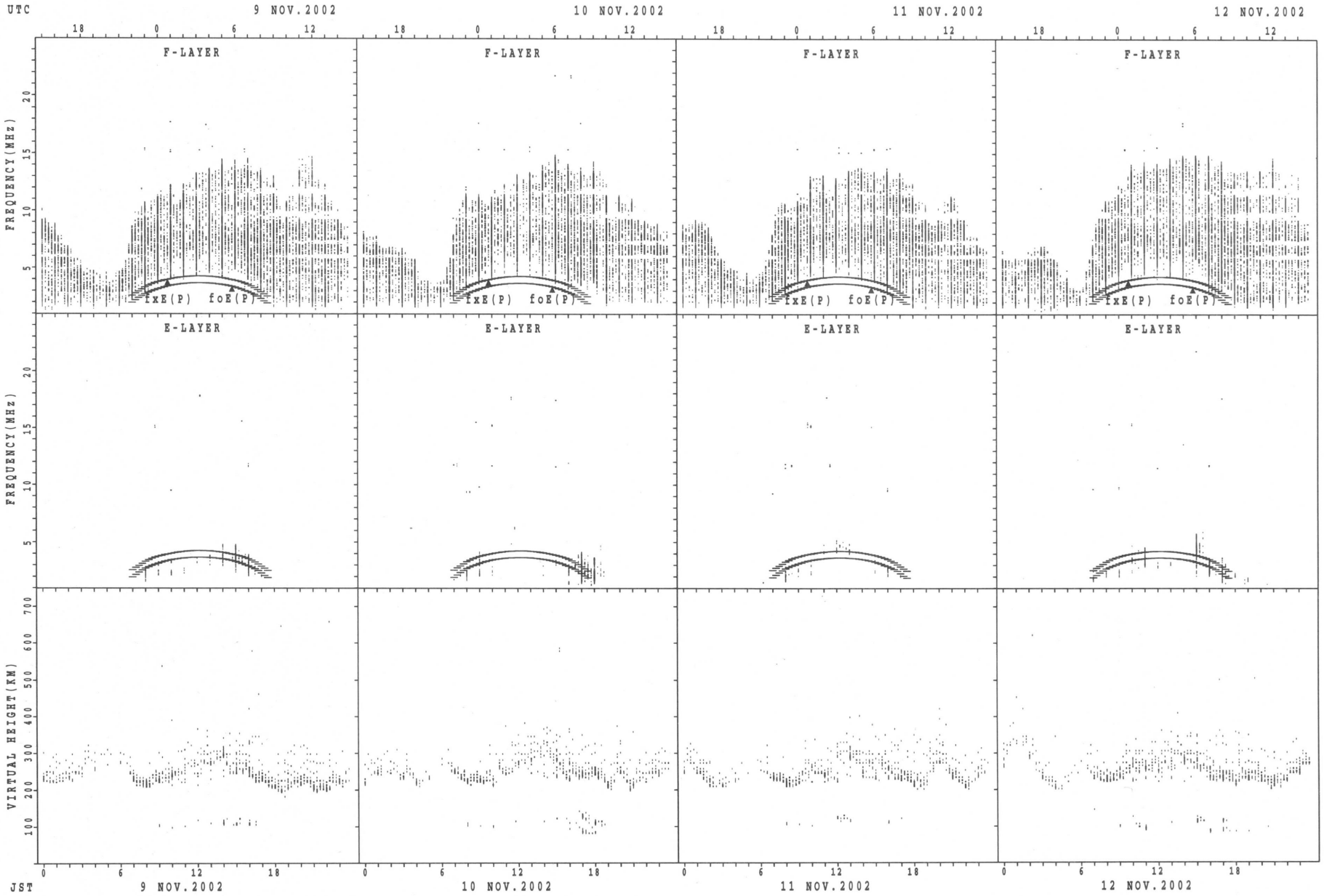

SUMMARY PLOTS AT Okinawa
UTC
JST
1 NOV.2002
2 NOV.2002
3 NOV.2002
4 NOV.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



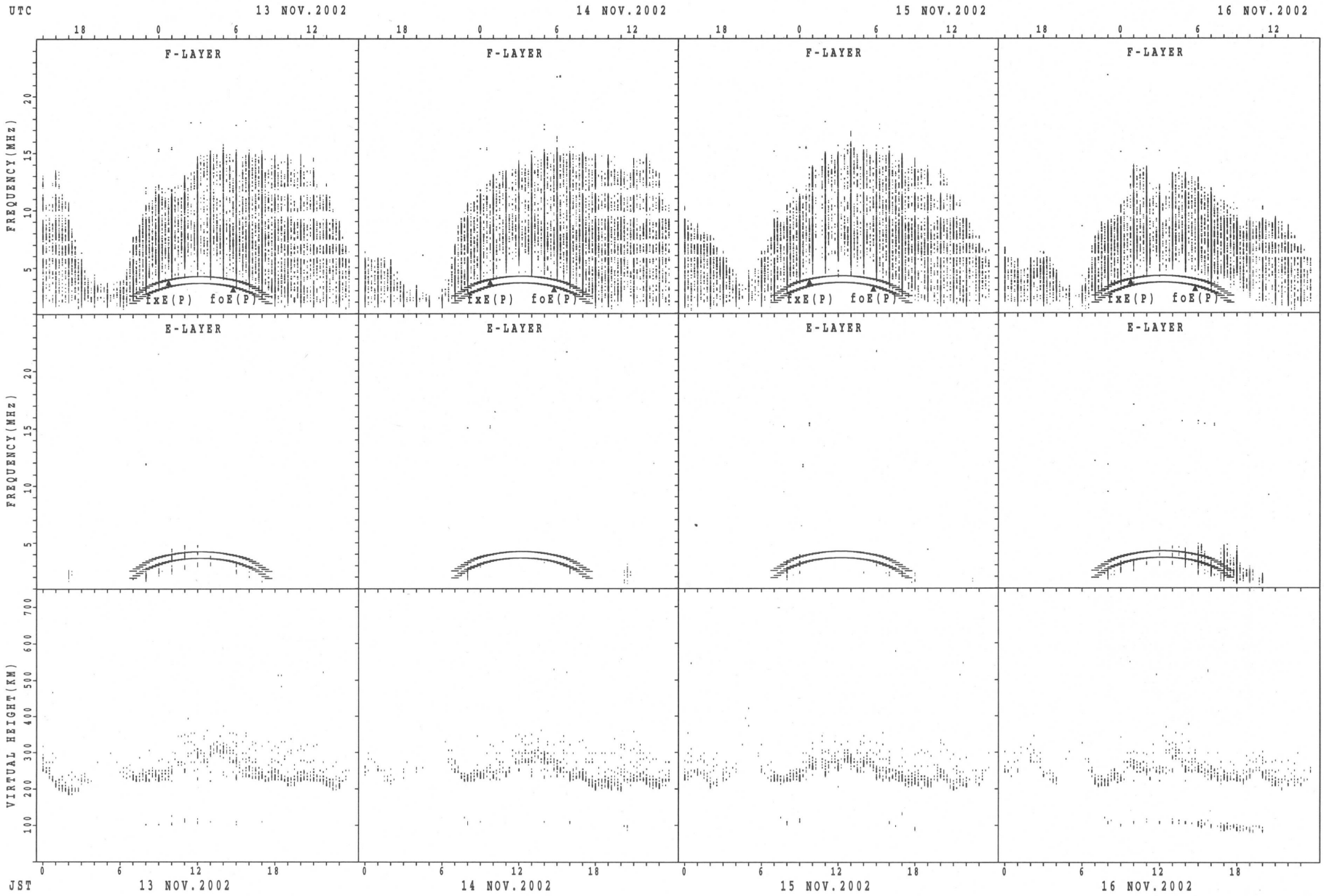
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



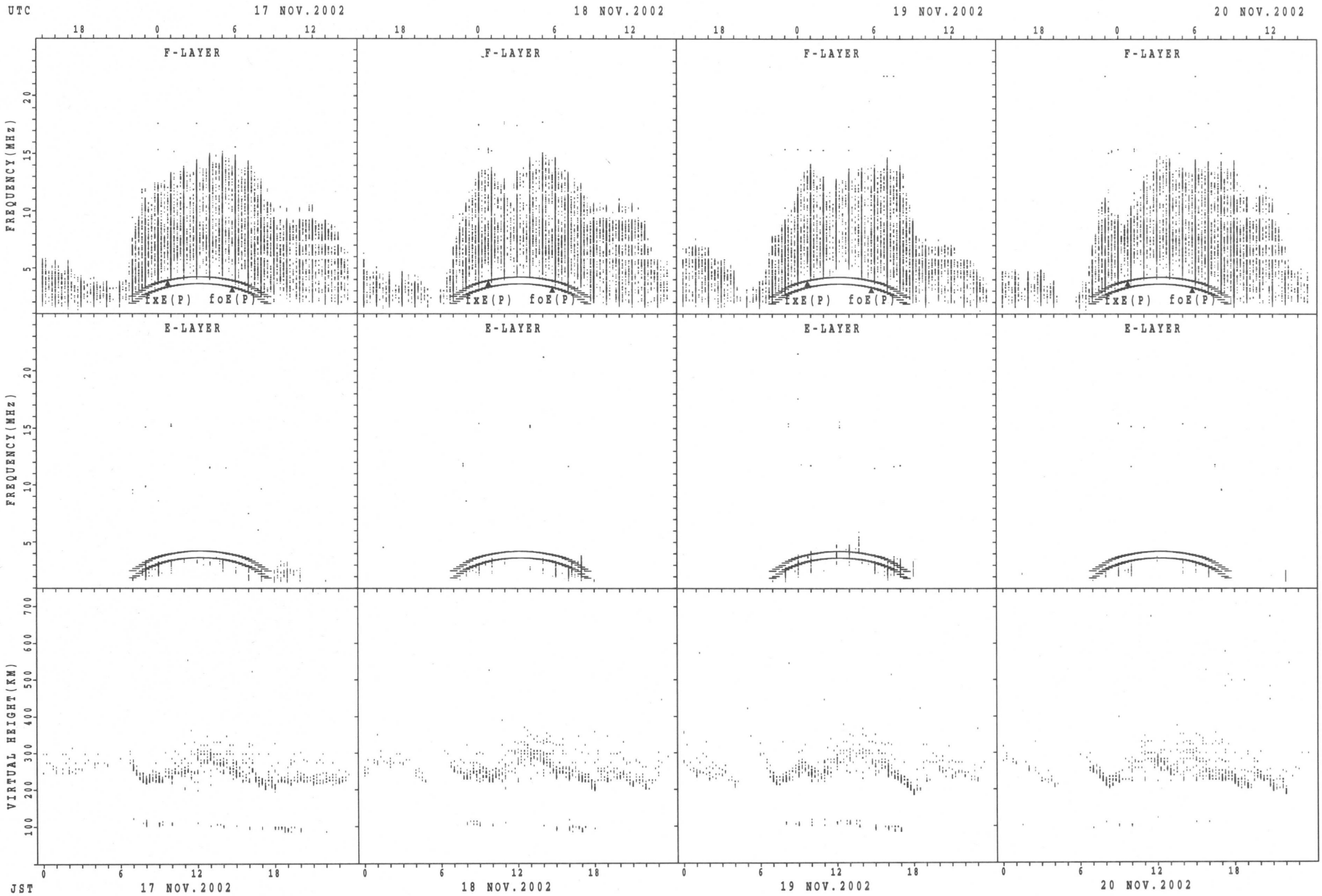
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



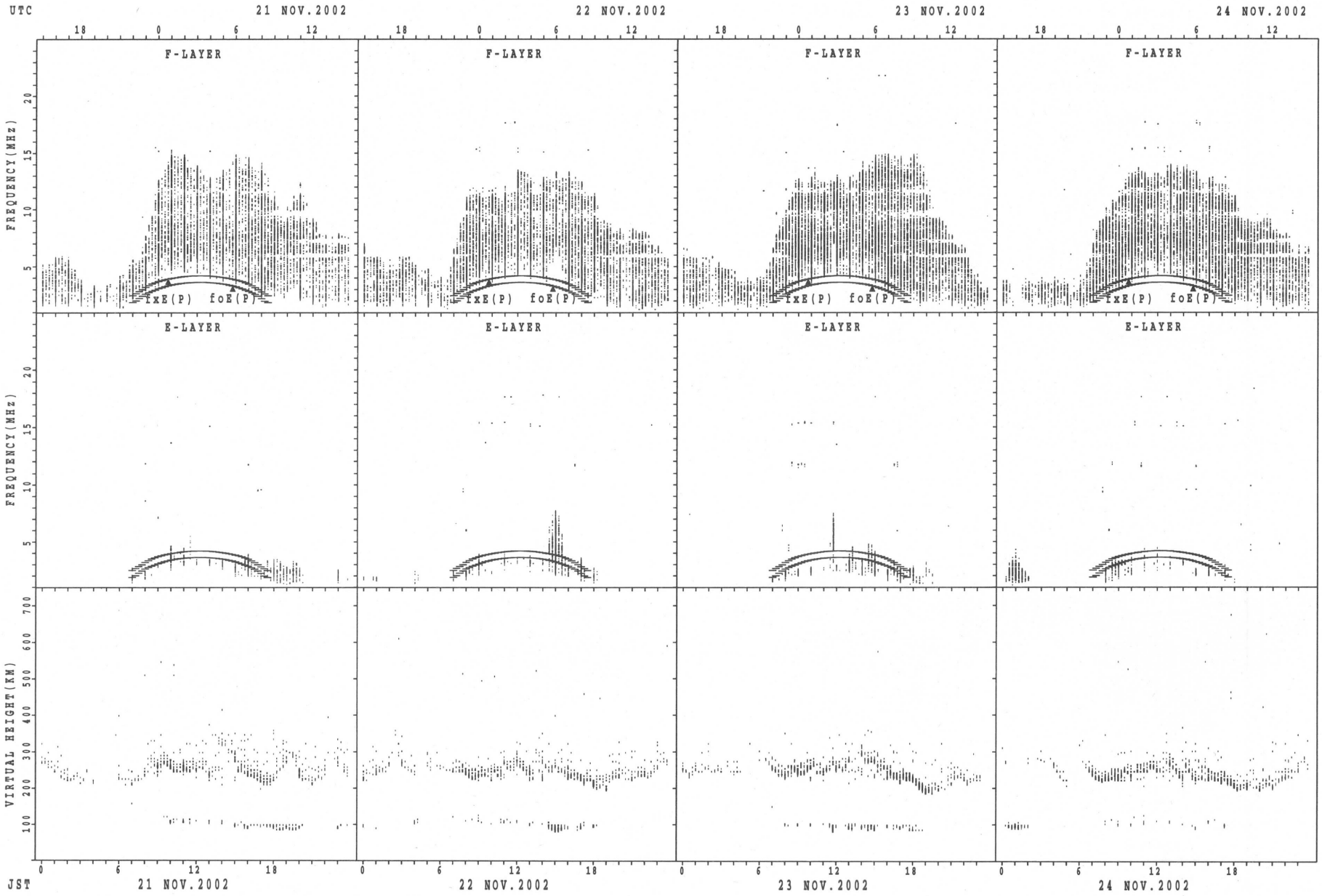
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



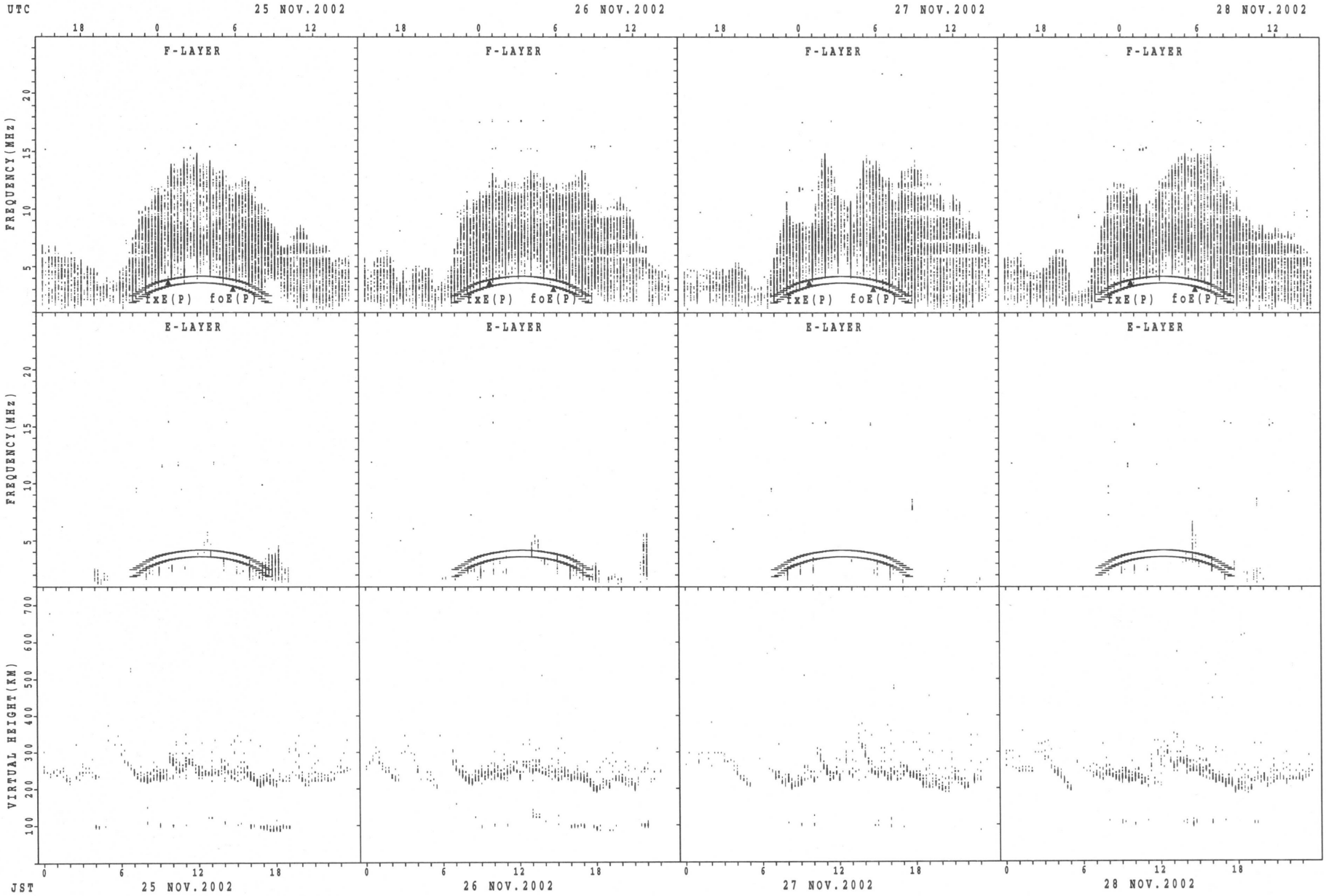
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



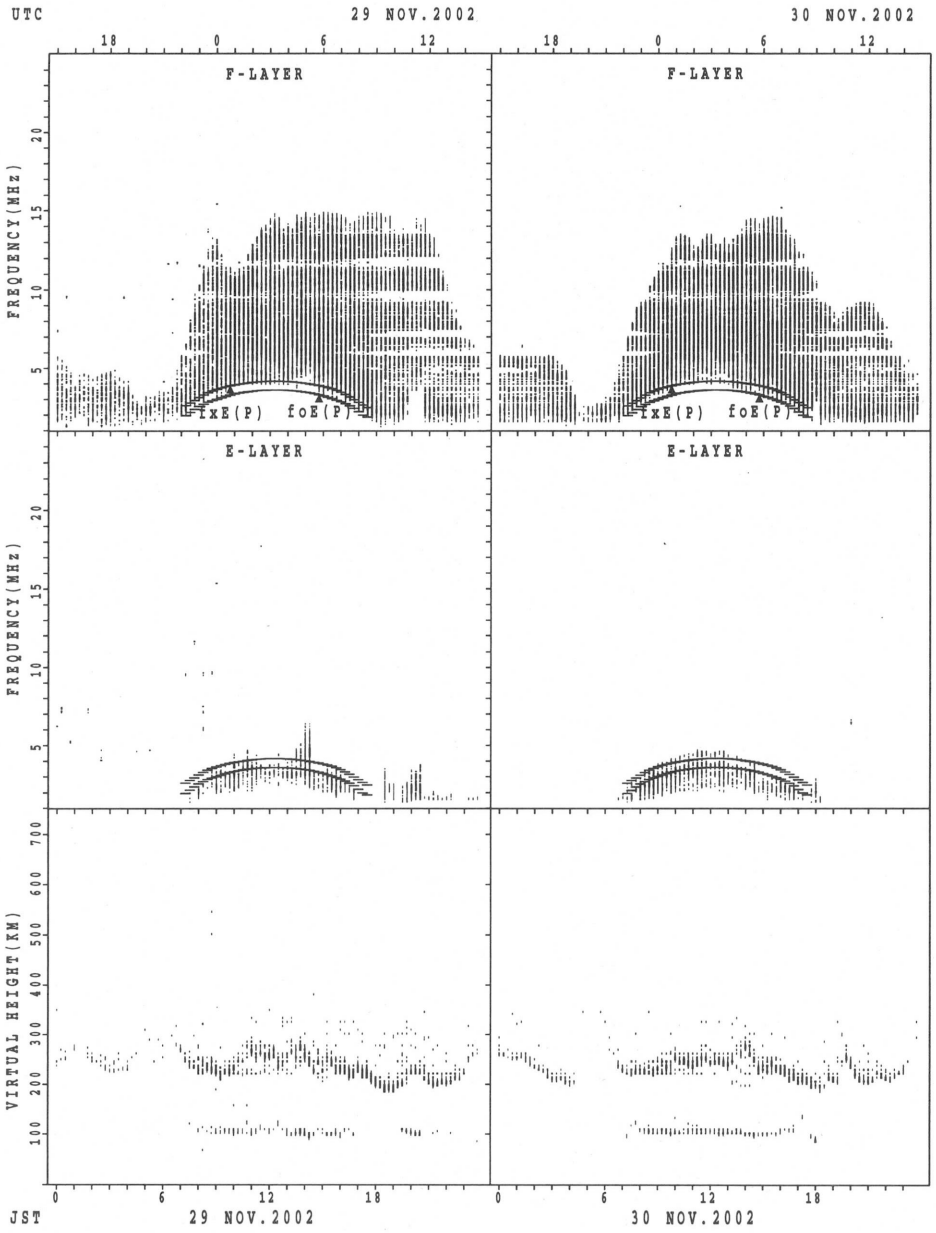
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

NOV.2002 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						1		29	29	30	30	30	30	30	30	30	29	21	7	2				
MED						314		238	220	220	224	224	222	230	230	230	230	246	274	296				
U Q						157		248	225	226	230	230	230	234	234	232	235	260	284	310				
L Q						157		224	214	214	220	222	220	222	226	222	222	238	256	282				

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	8	7	6	4	4	2	7	6	11	9	5	4	2	2	1	2	11	12	13	16	18	14	16	9
MED	94	97	95	97	97	97	115	99	111	99	97	106	111	99	97	103	99	100	103	101	99	97	96	95
U Q	101	101	97	98	98	105	115	105	125	102	106	110	113	103	48	105	105	106	108	104	103	103	103	109
L Q	90	95	95	96	95	89	97	97	103	95	96	104	109	95	48	101	95	99	97	97	95	95	95	93

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			1					28	30	29	29	24	23	30	30	30	30	23	12	3	4			
MED			274					230	222	226	232	232	248	253	241	230	230	240	263	330	272			
U Q			137					238	230	235	243	239	264	264	248	238	242	250	275	340	280			
L Q			137					222	214	222	230	226	232	238	232	222	222	230	248	258	248			

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	11	9	8	3	3	3	3	4	5	8	4	6	6	4	4	7	14	9	11	8	12	11	8	11
MED	95	97	96	97	105	101	111	119	107	107	105	107	113	106	121	105	102	95	105	97	102	95	97	95
U Q	99	100	102	109	113	103	153	141	113	111	109	121	115	114	133	115	113	104	111	101	105	101	98	97
L Q	95	92	91	97	103	97	97	105	102	102	97	105	101	98	109	103	89	88	95	95	97	95	96	91

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	1	2	1					13	30	30	30	24	16	23	30	30	30	28	24	17	14	5	1	1
MED	272	280	322					248	228	237	238	242	248	256	258	246	240	240	248	280	273	264	256	304
U Q	136	298	161					276	240	248	254	246	264	278	272	256	250	250	272	300	288	265	128	152
L Q	136	262	161					240	218	230	230	235	240	246	246	238	232	232	240	253	268	249	128	152

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	4	3	3	5	3	2	3	3	4	5	3	4	5	7	5	8	15	19	16	12	8	7	5
MED	91	93	95	101	97	101	103	99	125	116	113	97	114	103	105	111	104	97	95	97	97	95	93	95
U Q	95	105	111	103	103	105	109	167	139	123	116	135	128	103	119	118	106	103	99	100	101	101	95	96
L Q	89	88	91	91	96	97	97	91	113	107	104	97	103	98	97	104	94	93	91	92	90	92	91	92

MONTHLY MEDIANS OF h'F AND h'Es

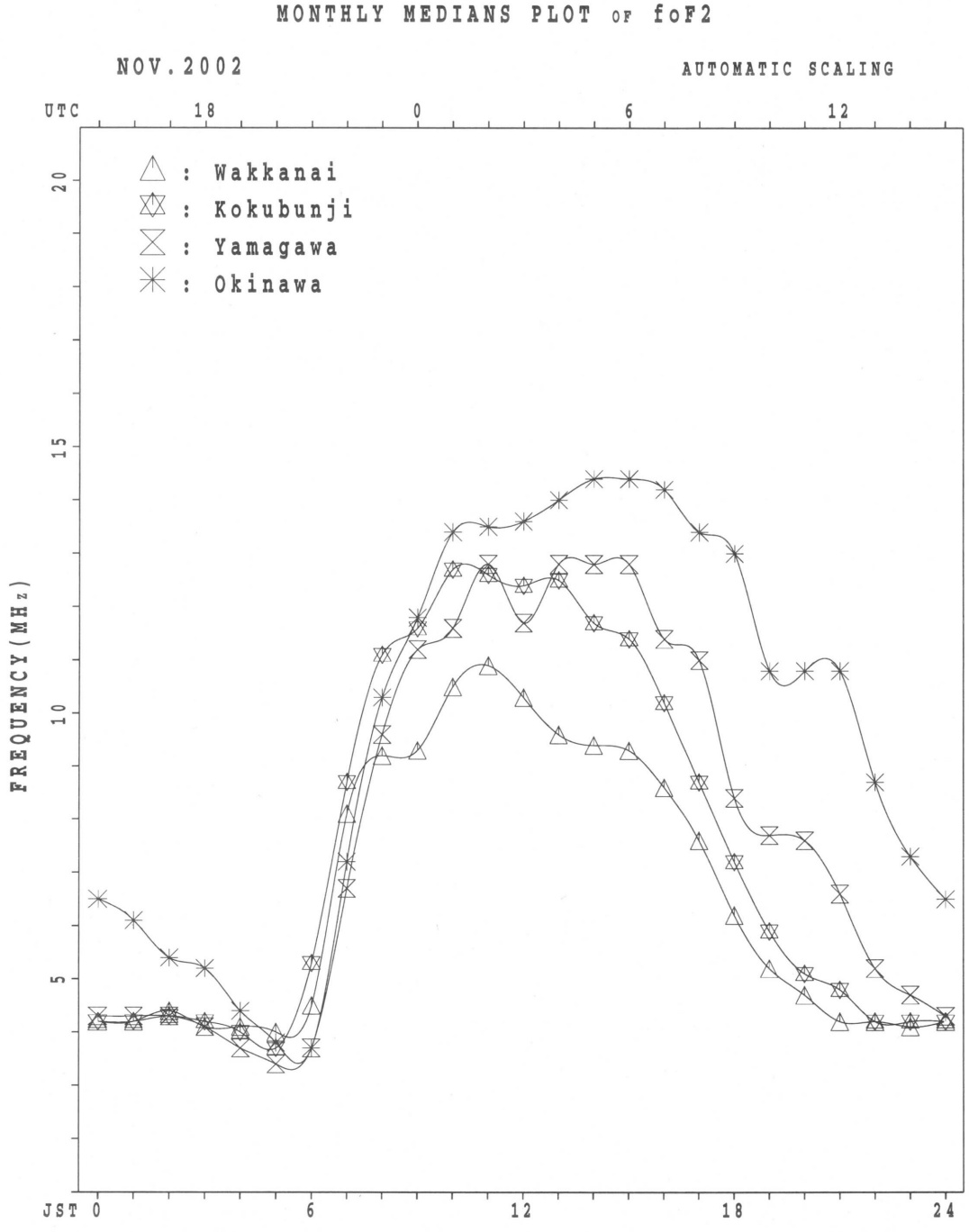
NOV.2002 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	10	10	6	2	1			17	29	30	30	20	7	12	30	30	30	30	30	27	29	29	20	11
MED	274	262	249	250	280			254	232	235	247	246	246	247	273	252	246	238	230	234	254	244	239	254
U Q	294	280	270	268	140			270	240	240	254	254	254	263	294	262	254	238	240	250	267	259	255	280
L Q	254	252	230	232	140			243	222	230	238	239	234	241	256	244	238	232	220	226	242	233	230	242

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		1	2	2	5	1	3	4	8	4	9	7	11	9	6	8	11	15	17	8	8	2	3	4
MED		97	92	96	97	99	97	138	114	118	113	113	113	113	113	106	109	97	95	97	94	95	97	95
U Q		48	93	97	98	49	105	157	137	138	126	115	119	125	123	115	113	117	104	99	99	99	105	110
L Q		48	91	95	97	49	97	116	110	112	108	111	105	106	105	97	101	91	90	95	91	91	95	95


MONTHLY MEDIANS PLOT OF foF2
NOV.2002
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
✡ : Kokubunji
⧖ : Yamagawa
✳ : Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 fxI (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 55	X 52	X 54	X 54	X 48	X 48													X 78	X 70	X 74	X 63	X 53	X 55
2	X 55	X 56	X 53	X 50	X 49	X 51													X 88	X 85	X 83	X 69	X 68	X 66
3	X 67	X 61	X 59	X 54	X 51	X 53												X 108	X 83	X 75	X 60	X 56	X 48	X 52
4	X 53	X 52	X 54	X 53	X 44	X 44												X 106	X 76	X 67	X 62	X 55	X 58	X 54
5	X 52	X 56	X 56	X 51	X 45	X 48												X 123	X 93	X 57	X 56	X 52	X 50	X 54
6	X 52	X 52	X 53	X 54	X 48	X 45												X 107	X 78	X 72	X 63	X 52	X 52	X 48
7	X 49	X 49	X 53	X 56	X 50	X 49													X 79	X 71	X 70	X 59	X 50	X 49
8	X 50	X 49	X 50	X 52	X 45	X 48												X 84	X 83	X 75	X 60	X 46	X 44	X 45
9	X 47	X 47	X 44	X 45	X 44	X 45													X 60	X 70	X 70	X 54	X 46	X 46
10	X 47	X 46	X 46	X 48	X 49	X 44													X 97	X 86	X 83	X 61	X 49	X 50
11	X 52	X 52	X 50	X 49	X 46	X 46													X 89	X 74	X 64	X 61	X 60	X 59
12	X 54	X 53	X 56	XO 59	X 63	X 46													X 84	X 76	X 78	X 71	X 60	X 58
13	XO 60	X 66	X 72	X 60	X 41	X 43													X 86	X 75	X 75	X 66	X 64	X 54
14	X 53	X 51	X 50	X 52	X 56	X 39													X 87	X 67	X 55	X 53	X 52	X 50
15	X 48	X 46	X 46	X 45	X 42	X 43												X 90	X 68	X 61	X 61	X 53	X 47	X 50
16	X 46	X 46	X 46	X 47	X 44	X 44												X 88	X 78	X 72	X 74	X 58	X 46	X 45
17	X 46	X 47	X 49	X 49	X 46	X 49													X 70	X 65	X 58	X 56	X 47	C
18	C	C	C	X 44	C	X 46	C	C		C	C		C					X 87	X 78	X 74	X 64	X 54	X 56	X 54
19	X 53	X 47	X 48	X 47	X 48	X 50												X 101	X 88	X 65	X 57	X 54	X 58	X 50
20	X 49	X 52	X 52	X 51	X 51	X 46	X 54						C					X 104	X 86	X 84	X 74	X 44	X 45	X 46
21	X 50	X 52	X 53	X 53	X 49	X 48	X 63											X 112	X 80	X 69	X 64	X 52	X 60	X 63
22	X 56	X 38	X 39	X 40	X 41	X 44												X 95	X 85	X 63	X 52	X 52	X 41	X 43
23	X 47	X 47	X 43	X 43	X 44	X 44	X 46											X 86	X 66	X 52	X 50	X 51	X 44	X 35
24	X 39	X 41	X 38	X 38	X 40	X 40	X 46											X 91	X 57	X 47	X 43	X 38	X 38	X 41
25	X 40	X 42	X 40	X 39	X 38	X 40	X 49											X 67	X 64	X 53	X 46	X 46	X 44	X 46
26	X 48	X 46	X 47	X 50	X 53	X 40	X 45											X 67	X 57	X 63	X 56	X 38	X 37	X 38
27	X 39	X 40	X 42	X 44	X 42	X 40	X 43											X 88	X 86	X 62	X 60	X 51	X 46	X 46
28	X 46	X 39	X 41	X 44	X 45	X 43	X 52											X 70	X 59	X 45	X 44	A	X 42	X 44
29	X 46	X 46	X 46	X 44	X 44	X 46	X 50											X 80	X 55	X 52	X 56	X 51	X 40	X 41
30	X 44	X 42	X 44	X 46	X 42	X 39	X 44											X 65	X 65	X 47	X 51	X 50	X 42	X 44
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	29	29	30	29	30	10											20	30	30	30	29	30	29
MED	X 49	X 47	X 49	X 49	X 45	X 45	X 48											X 89	X 78	X 68	X 60	X 53	X 48	X 49
U Q	X 53	X 52	X 53	X 53	X 49	X 48	X 52											X 105	X 86	X 74	X 70	X 58	X 56	X 54
L Q	X 46	X 46	X 44	X 44	X 43	X 43	X 45											X 82	X 66	X 61	X 56	X 51	X 44	X 44

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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

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	49	46	48	47	42	42	62	85	112	132	S 131	122	124	126	125	123	111	94	72	64	67	56	47	48
2	49	50	47	44	43	45	S 63	96	S 114	132	139	136	137	142	136	130	111	102	81	79	76	63	S 62	S 60
3	S 60	55	53	48	45	47	54	91	136	143	S 162	S 139	132	136	132	120	108	102	77	69	54	50	S 42	46
4	47	46	48	47	38	38	64	104	120	125	151	140	128	S 137	115	110	115	100	70	S 61	56	S 48	52	47
5	45	50	50	45	39	42	54	95	124	129	135	142	138	130	116	113	121	117	87	51	50	46	44	48
6	46	46	47	48	42	39	54	82	100	S 120	118	119	126	120	127	121	104	100	72	66	56	46	45	42
7	43	42	47	50	44	43	60	92	119	126	139	135	126	128	137	125	117	92	73	S 65	64	53	S 44	43
8	44	43	44	46	39	42	53	98	109	114	122	133	132	S 140	135	123	105	78	77	68	54	40	38	39
9	41	41	38	39	38	39	55	88	102	103	113	120	114	117	116	104	96	76	54	64	64	48	40	40
10	41	40	40	42	43	38	53	S 94	111	112	117	118	109	115	117	106	99	90	91	80	77	55	43	44
11	46	46	44	42	40	40	56	S 100	120	112	114	109	112	120	120	113	98	87	83	67	58	55	54	53
12	48	47	49	53	57	40	49	92	108	125	129	129	129	138	130	122	109	94	78	70	72	65	54	52
13	54	60	66	54	H 35	37	50	90	112	130	130	126	130	131	128	124	122	99	80	68	69	60	58	48
14	S 46	45	44	46	50	33	46	89	108	116	130	133	129	135	134	120	108	89	80	61	48	47	46	S 44
15	42	40	39	39	36	37	51	90	93	107	129	S 125	123	130	132	112	96	84	62	55	54	47	41	44
16	40	40	40	41	38	38	53	88	104	115	125	109	104	111	108	104	92	82	72	66	68	52	40	39
17	40	41	43	42	40	43	54	95	114	120	130	117	120	124	121	96	91	78	64	59	52	49	41	C
18	C	C	C	38	C	40	C	C	102	C	C	S 114	C	117	113	102	100	81	72	68	57	48	50	48
19	47	41	42	41	42	44	53	79	90	114	127	108	120	S 127	114	103	108	95	82	59	51	48	52	44
20	43	46	46	45	45	40	48	94	127	103	111	133	C	128	132	116	112	98	80	78	68	38	39	40
21	44	46	47	47	43	42	56	76	110	110	140	S	144	134	130	124	121	106	74	63	58	46	S 54	57
22	50	32	33	34	35	38	42	79	124	144	137	140	140	144	130	114	103	89	79	57	46	46	35	37
23	41	41	37	37	38	38	40	73	103	112	124	124	104	107	102	110	91	80	60	46	44	45	38	28
24	33	34	32	32	34	34	40	78	91	111	122	117	107	103	100	91	88	85	51	41	37	32	32	35
25	36	36	33	33	32	34	43	79	99	H 110	128	128	122	118	110	98	83	60	58	46	40	40	S 37	40
26	42	40	41	44	46	34	38	76	100	103	120	114	114	104	104	98	92	61	51	57	49	32	31	32
27	33	34	36	38	35	34	37	82	86	87	106	133	116	102	108	112	91	82	80	56	54	45	40	40
28	40	33	35	38	39	37	46	85	99	98	105	98	99	108	114	112	81	64	53	39	38	A	36	38
29	40	40	40	38	38	40	44	84	94	103	124	113	110	112	110	90	93	74	49	46	50	45	34	35
30	37	36	38	40	36	33	38	83	99	90	119	115	104	101	104	100	88	58	59	41	45	44	36	37
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	29	29	30	29	30	29	29	30	29	29	29	28	30	30	30	30	30	30	30	30	29	30	29
MED	43	41	43	42	39	39	53	88	108	114	127	124	122	125	118	112	102	88	72	62	54	47	42	43
U Q	47	46	47	47	43	42	54	94	114	126	133	133	130	134	130	121	111	98	80	68	64	52	50	48
L Q	40	40	38	38	37	37	44	80	99	105	118	114	111	112	110	103	92	78	60	55	49	45	38	38

NOV. 2002 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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														
2													L											
3													L											
4														L										
5											L		L	L	L									
6										L		L	L											
7											L				L									
8										L	L	L	L	L										
9														L	L									
10												L		L										
11												L	L	L	L									
12												L	L	L										
13											L	L												
14													L	L										
15											L		L											
16													L	L										
17											L		L	L	L	L								
18								C		C	C		C	L										
19										L			L	L										
20													C											
21												L												
22											L													
23											L													
24											L													
25												L	L											
26																								
27											L													
28													L		L									
29																								
30											L				L									
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																								

NOV. 2002 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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

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							B	U R 248	R	R	U R 336	R	A	R	U R 320	U A 300	U A 236	B						
2							B	U R 236	304	U R 344	R	U A 356	R	R	336	A	A	B						
3							B	A	A	U A 336	A	A	U R 364	A	U A 336	292	U A 212							
4							B	R	U R 284	R	348	U A 372	376	U R 356	A	A	A							
5							B	U R 248	R	R	A	A	A	B	A	R	A							
6							B	U R 248	U R 300	U R 328	348	A	A	A	332	U R 292	B							
7							B	232	R	R	R	R	U R 360	U R 340	R	A	R	B						
8							B	U R 240	U R 304	U R 336	U R 352	R	R	R	U R 324	R	A							
9							B	U R 240	R	R	R	R	B	R	A	A	U A 200	B						
10							B	224	U R 300	A	R	B	U R 360	B	R	U R 292	A	B						
11							B	240	U R 288	U R 340	R	R	B	R	A	288	A	B						
12							B	212	U R 292	U R 336	R	U R 352	R	360	320	276	B	B						
13							B	U R 212	R	R	R	U R 352	R	R	A	A	A	B						
14							B	216	292	U R 348	U R 380	A	U R 376	R	R	U A 284	A	B						
15							B	220	U R 300	R	U R 364	B	R	U R 352	R	R	U R 208							
16							B	228	U R 300	U R 332	R	R	R	R	328	U R 284	U A 200							
17							B	U R 236	U R 280	U R 336	R	R	R	B	324	U R 268	228	B						
18								C	U R 268	C	C	U R 356	C	U R 328	U R 300	U R 268	R							
19							B	216	A	A	R	A	A	A	A	U R 276	A							
20								200	U R 272	U R 308	R	R	C	U R 336	R	U R 264	U R 200							
21								172	U R 272	U R 324	R	U R 348	U R 356	U R 332	U R 300	U R 260	U R 188							
22							B	192	U R 280	R	U R 348	A	A	A	U R 296	U R 264	R							
23								A	280	A	A	U R 348	U R 352	U R 272	R	U R 264	U R 188							
24								U R 200	260	R	U R 340	R	A	R	R	R	A							
25								220	A	A	A	R	R	320	R	R	A							
26								R	U R 288	R	R	U R 356	R	A	R	A	A							
27								U R 192	U R 256	U A 304	R	R	R	R	R	B	U R 204							
28								U R 172	R	A	R	A	A	U R 344	U R 296	256	208							
29								188	U R 280	A	A	A	U R 356	R	U R 304	U R 256	U R 184							
30								176	A	A	A	U R 344	A	U R 328	R	A	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								25	20	12	8	9	8	11	13	17	12							
MED								220	U R 286	U R 336	U R 348	U R 352	U R 360	U R 336	U R 320	U R 276	U 202							
U Q								U R 238	U R 300	U R 338	U R 358	U R 356	U R 370	U R 352	330	U 290	U 210							
L Q								196	U R 276	U R 326	U R 344	U R 348	U R 356	U R 328	U R 300	U R 264	U R 194							

NOV. 2002 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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

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	E B 14	E B 16	E B 14	E B 16	E B 14	E B 15	E B 15	G 20	G 27	G 28	G 26	G	J A 42	G 28	G 22	34	30	J A 32	J A 30	J A 23	E B 15	J A 25	J A 38	E B 15
2	J A 26	J A 32	J A 28	J A 21	E B 28	E B 15	E B 15	G	G	G	G 23	38	G	G	G	J A 36	25	J A 34	J A 26	J A 53	J A 28	J A 30	E B 28	J A 24
3	J A 24	J A 40	J A 44	J A 36	J A 31	J A 52	J A 25	33	J A 45	J A 53	J A 45	42	G 25	38	42	38	J A 73	J A 24	J A 43	J A 39	J A 26	J A 24	J A 20	E B 15
4	E B 16	E B 15	J A 23	J A 20	J A 28	J A 47	27	G	G	G 26	38	46	J A 55	G	38	32	28	J A 16	J A 40	J A 54	J A 54	J A 66	J A 26	J A 32
5	J A 25	J A 24	J A 23	J A 23	E B 15	J A 21	22	G	G 25	G 27	39	40	J A 56	E B 34	38	G 29	J A 28	E B 14	J A 28	J A 55	J A 56	J A 53	J A 26	J A 23
6	J A 24	J A 18	J A 21	E B 14	E B 16	E B 16	J A 20	G 19	G	G	38	39	41	39	37	G 26	E B 28	J A 21	J A 24	J A 27	J A 21	J A 17	J A 42	J A 25
7	J A 25	J A 27	J A 23	E B 15	E B 15	21	E B 16	G	G 28	G 31	G 26	G 30	G	G	G 27	40	G 23	J A 21	E B 16	E B 14	J A 50	J A 53	J A 65	J A 44
8	J A 28	J A 28	J A 23	E B 15	E B 14	E B 16	E B 15	G	G 21	G 28	G 32	G 29	G	G	G	G 22	J A 28	J A 31	E B 20	E B 16	19	J A 23	E B 16	J A 40
9	J A 20	J A 21	E B 14	E B 15	E B 14	E B 15	E B 15	G	G	G 29	G 34	G 27	E B 43	G 30	J A 40	36	26	J A 24	J A 34	20	J A E B 26	14	E B 16	E B 15
10	J A 41	J A 30	J A 26	J A 21	J A 23	E B 14	E B 15	G	G	J A 42	G	E B 41	G 26	E B 38	G 23	G 20	J A 42	J A 42	J A 28	J A 22	J A 22	20	E B 15	E B 15
11	E B 15	E B 15	E B 16	18	E B 15	E B 16	E B 15	G	G 23	G 25	G	G 28	E B 41	39	38	J A 47	J A 70	J A 55	J A 74	J A 50	J A 29	J A 23	J A 21	E B 16
12	E B 15	E B 16	E B 16	E B 15	E B 15	E B 18	E B 17	G 19	G	G 30	G 30	G 30	G 30	39	39	31	28	19	J A 25	19	J A 23	J A 30	21	E B 15
13	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	G	G 24	G 29	G 31	G 27	G 26	G	40	J A 43	J A 39	J A 31	J A 20	18	E B 15	E B 16	E B 16	E B 15
14	E B 15	J A 17	E B 16	E B 14	E B 15	E B 14	E B 15	24	G 26	G 28	G 26	J A 42	G 31	G	G	31	J A 27	18	J A 21	E B 16	J A 20	J A 21	E B 15	E B 15
15	E B 16	E B 16	E B 14	E B 15	E B 15	E B 15	E B 16	G	G 25	G 30	G 29	E B 42	G	G 31	G 27	G	G 19	E B 14	E B 14	E B 15	J A 20	E B 15	E B 15	E B 16
16	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 22	G 23	G 26	G 26	G	G 26	G 28	G	26	J A 35	E B 14	20	22	18	E B 14	E B 15
17	E B 14	E B 16	E B 16	E B 15	E B 16	E B 16	E B 15	G 19	G 26	G 29	G 29	G 27	G	E B 42	G	G	G 21	E B 28	E B 15	E B 16	E B 15	E B 15	E B 16	C
18	C	C	C	E B 15	C	E B 15	C	C	G 24	C	C	G	C	G	G	G	G	E B 15	E B 15	E B 16	E B 16	E B 16	E B 15	E B E B 16 14
19	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15	E B 16	26	30	J A 42	G 33	36	J A 45	J A 43	38	G 24	J A 29	J A 23	E B 22	E B 16	E B 15	E B 14	E B 15	J A 52
20	J A 27	J A 31	J A 24	E B 15	E B 15	E B 14	E B 15	G	G 26	G 28	G 32	G 31	C	G 31	G	G	G	E B 16	E B 19	E B 15	E B 16	E B 15	E B 18	J A 23
21	J A 22	E B 14	E B 16	E B 14	E B 15	E B 15	E B 15	22	G 22	G 30	G	G	G 29	G 28	G 26	G	G	E B 16	E B 16	E B 15	E B 15	E B 15	20	J A 19
22	E B 14	E B 20	E B 16	E B 16	E B 15	E B 15	E B 20	23	G 23	G 31	G	38	J A 86	J A 42	G 27	G 25	G 18	E B 16	E B 14	E B 15	J A 23	J A 16	A E B 13	21
23	E B 15	E B 14	E B 16	E B 15	E B 15	E B 16	E B 15	24	G J A 26	J A 56	A 46	G 26	G J 28	G 23	G 24	G 25	G	E 20	B E 15	B E 16	B E 15	B E 15	C E 28	B 15
24	E B 14	E B 15	E B 15	E B 15	E B 16	E B 14	E B 15	G	30	G 23	G 28	G 29	J A 81	G	G 24	G	26	E B 15	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15
25	E B 17	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	G	J A 32	J A 41	J A 42	G	G 28	J A 35	G 26	G 22	26	E B 16	E B 15	E B 14	E B 14	E B 15	J A 53	J A 37
26	J A 34	J A 23	J A 24	E B 14	E B 16	E B 15	E B 16	G	G 21	G 26	G 31	G 32	G 30	38	G 29	35	J A 26	E B 16	E B 15	E B 16	23	J A 20	J A 22	J A 27
27	J A 37	J A 19	J A 23	J A 27	E B 15	E B 14	E B 15	G	G 21	35	G 30	G	G	G	G	E B 28	G	E B 16	E B 15	E B 16	E B 16	B J 23	A E 24	B 15
28	J A 19	E B 14	E B 16	E B 16	J A 19	J A 17	E C 28	23	G 20	J A 54	G 27	J A 42	J A 39	G 28	G 26	31	26	22	19	E B 16	J A 18	J A 69	J A 36	J A 28
29	J A 32	J A 22	18	E B 16	20	E B 16	E B 15	G	G 22	38	J A 45	J A 45	G 27	G 29	G 27	G	G	E B 15	E B 14	E B 15	E B 15	E B 16	E B 16	E B 16
30	E B 15	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	22	29	32	34	G 26	37	G 28	G 25	28	29	E B 15	E B 15	E B 16	E B 15	E B 16	E B 15	E B 15
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	29	29	30	29	30	29	29	30	29	29	30	28	30	30	30	30	30	30	30	30	30	30	29
MED	E B 17	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	G	G 26	G 30	G 32	G	G	G	G	G	26	19	19	E B 16	20	18	E B 19	E B 16
U Q	J A 26	J A 24	J A 23	J A 16	16	16	16	22	G J 36	A 36	40	J A 42	38	38	34	J A 28	J A 28	J A 26	J A 22	J A 23	J A 24	J A 26	J A 26
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 23	G 28	G 28	G 29	G 30	G 30	G 26	G 28	G	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15

NOV. 2002 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV.2002 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	E B 14	E B 16	E B 14	E B 16	E B 14	E B 15	E B 15	G 20	G 26	G 28	G 26	G	40	U Y 28	G 22	33	30	24	22	20	E B 15	20	17	E B 15
2	20	28	19	E B 15	E B 28	E B 15	E B 15	G	G	G	G 23	38	G	G	G	32	24	26	21	30	18	21	E B 28	16
3	20	21	E B 16	E B 14	25	24	18	27	33	41	41	41	G 24	37	41	34	35	16	17	20	19	19	E B 16	E B 15
4	E B 16	E B 15	E B 16	E B 15	E B 15	22	25	G	G	G 26	36	44	52	G	35	31	26	14	26	25	29	43	19	26
5	23	20	19	19	E B 15	16	19	G	G 25	G 27	36	39	53	E B 34	35	U Y 29	26	E B 14	26	42	22	36	16	E B 15
6	19	16	E B 14	E B 14	E B 16	E B 16	18	G 18	G	G	38	39	41	38	36	G 24	E B 28	18	22	17	E B 16	E B 15	30	20
7	17	21	16	E B 15	E B 15	E B 15	E B 16	G	G 28	G 30	G 24	G 30	G	G	G 22	32	G 21	18	E B 16	E B 14	35	29	34	34
8	22	21	16	E B 15	E B 14	E B 16	E B 15	G	G 19	G 28	G 30	G 29	G	G	G	G 20	25	23	18	E B 16	16	16	E B 16	25
9	17	17	E B 14	E B 15	E B 14	E B 15	E B 15	G	G	G 29	G 31	U Y 27	E B 43	U Y 30	36	33	24	19	20	E B 15	E B 16	E B 14	E B 16	E B 15
10	25	24	21	16	E B 15	E B 14	E B 15	G	G	36	G	E B 41	U Y 26	E B 38	G 23	G 18	33	30	20	17	20	E B 15	E B 15	E B 15
11	E B 15	E B 15	E B 16	E B 16	E B 15	E B 16	E B 15	G	G U Y 23	25	G U Y	28	E B 41	38	37	46	38	43	44	36	21	18	16	E B 16
12	E B 15	E B 16	E B 16	E B 15	E B 15	E B 18	E B 17	G 19	G	G 29	G 29	G 30	G 30	38	38	30	27	E B 15	E B 20	E B 16	E B 15	22	E B 16	E B 15
13	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	G	G 24	G 29	G 31	G 27	G 26	G	40	32	28	27	16	E B 15	E B 15	E B 16	E B 16	E B 15
14	E B 15	16	E B 16	E B 14	E B 15	E B 14	E B 15	24	G 25	G 28	G 26	38	G 30	G	G	30	25	17	E B 16	E B 16	E B 16	17	E B 15	E B 15
15	E B 16	E B 16	E B 14	E B 15	E B 15	E B 15	E B 16	G	G 24	G 30	G E B 29	42	G	G 30	G 27	G	G 19	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15	E B 16
16	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 20	G 20	G 25	G 24	G	U Y 26	G 27	G	23	E B 21	E B 14	E B 16	E B 16	E B 16	E B 14	E B 15
17	E B 14	E B 16	E B 16	E B 15	E B 16	E B 16	E B 15	G 19	G 26	G 27	G U Y 26	27	G	E B 42	G	G	G E 18	B 28	E B 15	E B 16	E B 15	E B 15	E B 16	C
18	C	C	C	E B 15	C	E B 15	C	C	G 18	C	C	G	C	G	G	G	G	E B 15	E B 15	E B 16	E B 16	E B 15	E B 16	E B 16
19	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15	E B 16	24	29	38	G 30	35	40	38	36	G 23	24	19	18	E B 16	E B 15	E B 14	E B 15	17
20	15	19	E B 16	E B 15	E B 15	E B 14	E B 15	G	G 25	G 27	G 32	G 30	C	G 30	G	G	G	E B 16	E B 19	E B 15	E B 16	E B 15	E B 18	E B 15
21	16	E B 14	E B 16	E B 14	E B 15	E B 15	E B 15	20	G 22	G 28	G	G	G 27	G 27	G 25	G	G	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	E B 14
22	E B 14	E B 20	E B 16	E B 16	E B 15	E B 15	E B 15	22	G 20	G 28	G	36	57	33	G 27	G 23	G 18	E B 16	E B 14	E B 15	17	E B 15	E B 13	16
23	E B 15	E B 14	E B 16	E B 15	E B 15	E B 16	E B 15	22	G 24	43	40	G 25	G 25	G 22	G 23	G 22	G	E B 15	E B 15	E B 16	E B 15	E B 15	E C 28	E B 15
24	E B 14	E B 15	E B 15	E B 15	E B 16	E B 14	E B 15	G	29	G 22	G 28	G 28	63	G	G 24	G	23	E B 15	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15
25	E B 17	E B 14	E B 15	E B 14	E B 14	E B 14	E B 14	G	29	33	38	G	G 28	G 29	G 25	G 22	G 18	E B 16	E B 15	E B 14	E B 14	E B 15	20	24
26	24	17	18	E B 14	E B 16	E B 15	E B 16	G	G 20	G 26	G 31	G 29	G 30	34	U Y 29	32	22	E B 16	E B 15	E B 16	E B 16	E B 16	E B 15	21
27	21	17	E B 15	19	E B 15	E B 14	E B 15	G	G 20	35	G 29	G	G	G	G	E B 28	G	E B 16	E B 15	E B 16	E B 16	E B 16	E B 14	E B 15
28	E B 16	E B 14	E B 16	E B 16	E B 15	E B 15	E B 28	21	G 20	34	G 27	36	34	G 27	G 24	30	25	21	16	E B 16	E B 15	A 69	20	19
29	20	E B 15	16	E B 16	16	E B 16	E B 15	G	G 20	33	42	38	G 27	G 29	G 27	G	G	E B 15	E B 14	E B 15	E B 15	E B 16	E B 16	E B 16
30	E B 15	E B 16	E B 15	E B 16	E B 15	E B 16	E B 16	21	28	32	33	G 26	34	G 28	G 25	26	26	E B 15	E B 15	E B 16	E B 15	E B 16	E B 15	E B 15
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	29	29	30	29	30	29	29	30	29	29	30	28	30	30	30	30	30	30	30	30	30	30	29
MED	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	G	G 25	G 29	G 31	G	G	G	G	G	24	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15
U Q	20	20	16	E B 16	E B 16	E B 16	16	20	G 33	34	38	40	34	35	32	26	21	20	17	17	19	18	18	
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G 20	G 27	G 28	G 28	G 29	G 29	G 25	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15

NOV.2002 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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	14	16	14	16	14	15	15	16	16	19	21	29	28	20	15	15	13	15	16	14	15	15	16	15
2	14	15	15	15	28	15	15	14	14	22	17	21	23	26	20	20	15	13	15	15	15	14	28	14
3	15	15	16	14	15	15	14	16	16	17	20	20	20	18	20	16	15	14	14	16	15	16	16	15
4	16	15	16	15	15	15	15	14	15	20	21	21	26	27	23	19	17	11	15	15	15	14	15	15
5	15	14	14	13	15	14	12	15	19	20	21	23	24	34	21	17	14	14	15	15	15	16	14	15
6	14	14	14	14	16	16	15	15	20	23	17	24	24	24	28	17	28	16	15	16	16	15	14	15
7	14	14	15	15	15	15	16	13	18	16	19	19	25	20	16	23	14	15	16	14	16	15	15	20
8	14	16	15	15	14	16	15	15	15	20	18	18	26	22	22	18	16	15	14	16	14	14	16	15
9	15	15	14	15	14	15	15	15	19	24	24	20	43	26	21	22	16	15	15	15	16	14	16	15
10	15	14	15	14	15	14	15	14	19	18	23	41	20	38	19	15	15	15	14	15	14	15	15	15
11	15	15	16	16	15	16	15	14	16	21	26	24	41	24	23	20	16	14	14	15	14	15	15	16
12	15	16	16	15	15	18	17	15	21	19	21	23	20	26	23	14	21	15	15	16	15	14	16	15
13	15	15	15	15	14	15	15	15	19	18	23	21	22	24	16	15	14	14	13	15	15	16	16	15
14	15	15	16	14	15	14	15	16	20	23	21	22	22	30	24	19	14	14	16	16	16	15	15	15
15	16	16	14	15	15	15	16	15	16	19	18	42	28	24	21	20	13	14	14	15	15	15	15	16
16	14	16	15	15	15	15	15	15	16	14	16	16	20	22	20	20	14	14	14	16	16	16	14	15
17	14	16	16	15	16	16	15	14	16	20	19	21	24	42	22	20	15	28	15	16	15	15	16	C
18	C	C	C	15	C	15	C	C	14	C	C	22	C	24	20	20	14	15	15	16	16	15	16	14
19	16	15	16	15	15	15	16	12	16	16	20	19	23	22	20	15	14	15	14	16	15	14	15	15
20	15	15	16	15	15	14	15	12	16	17	16	20	C	19	24	19	16	16	19	15	16	15	18	15
21	12	14	16	14	15	15	15	14	15	20	23	22	20	20	18	15	14	16	16	15	15	15	15	14
22	14	20	16	16	15	15	15	14	16	19	21	20	20	19	16	20	15	16	14	15	15	15	13	15
23	15	14	16	15	15	16	15	14	18	18	17	20	18	19	16	16	14	15	15	16	15	15	E C 28	15
24	14	15	15	15	16	14	15	16	14	19	21	20	20	22	19	16	12	15	16	16	16	15	15	15
25	17	14	15	14	14	14	14	14	14	15	19	19	18	19	19	20	14	16	15	14	14	15	14	15
26	17	14	15	14	16	15	16	16	15	21	19	22	20	22	19	18	14	16	15	16	16	15	15	14
27	16	15	15	15	15	14	15	15	15	20	23	25	28	23	23	28	14	16	15	16	16	16	14	15
28	15	14	16	16	14	15	E C 28	14	14	20	20	21	19	20	18	16	16	15	15	16	15	15	14	15
29	16	15	14	16	16	16	15	14	13	16	18	20	20	17	18	15	13	15	14	15	15	16	16	16
30	15	16	15	16	15	16	16	15	14	16	16	17	20	20	17	14	14	15	15	16	15	16	15	15
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	29	29	30	29	30	29	29	30	29	29	30	28	30	30	30	30	30	30	30	30	30	30	29
MED	15	15	15	15	15	15	15	15	16	19	20	21	22	22	20	18	14	15	15	16	15	15	15	15
U Q	16	16	16	15	15	16	16	15	18	20	21	23	26	26	22	20	16	16	15	16	16	15	16	15
L Q	14	14	15	14	15	15	15	14	15	17	18	20	20	20	18	15	14	14	14	15	15	15	15	15

NOV. 2002 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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	276	264	286	312	267	277	333	343	316	328	S 322	314	307	307	312	318	329	327	331	296	320	325	289	294
2	276	304	282	265	263	268	S 322	342	S 329	326	317	309	303	293	302	310	319	313	308	292	311	267	S 272	S 270
3	S 284	285	296	281	260	273	281	296	327	309	S 315	S 315	297	303	308	310	311	313	314	312	320	296	S 264	256
4	254	261	294	316	255	244	292	337	315	305	320	305	301	S 313	310	307	325	321	293	S 315	296	S 286	295	281
5	264	281	298	311	261	288	292	328	323	319	313	313	305	310	305	308	321	327	336	307	299	291	278	286
6	276	268	286	300	327	281	315	354	338	S 329	316	304	312	292	310	320	308	326	314	315	312	305	296	302
7	275	274	276	299	268	263	308	331	336	316	328	315	301	296	307	305	313	318	294	S 292	307	328	S 296	267
8	270	280	283	297	269	293	317	350	339	327	315	316	302	S 302	304	306	332	306	313	329	327	317	281	271
9	293	297	301	287	278	275	322	364	340	337	312	308	323	308	316	317	341	330	286	307	332	325	293	281
10	275	283	293	286	309	295	322	S 346	339	333	311	328	305	303	303	307	313	297	311	301	319	310	268	278
11	286	295	286	300	282	279	311	S 348	339	341	339	312	295	302	301	314	317	315	316	291	293	272	281	282
12	272	258	267	285	331	312	307	346	332	315	317	309	300	303	305	313	308	310	301	305	308	308	275	260
13	267	303	333	342	297	269	310	337	336	332	315	297	298	290	304	293	322	309	309	292	316	302	315	302
14	S 294	304	306	284	345	299	310	349	352	327	320	312	301	305	313	314	326	321	331	344	305	303	298	S 301
15	275	288	296	310	273	277	325	362	339	324	320	S 322	304	310	314	318	319	324	319	300	309	308	287	304
16	294	287	281	295	289	263	314	345	346	335	322	317	305	314	318	320	333	314	320	314	324	322	302	278
17	284	290	282	296	295	279	313	348	346	341	316	317	319	311	327	312	323	321	307	335	313	312	311	C
18	C	C	C	289	C	312	C	C	344	C	C	S 327	C	306	310	320	322	324	309	312	311	293	294	295
19	312	285	285	275	278	272	328	350	334	320	334	318	300	S 319	313	312	324	330	327	310	304	300	316	294
20	276	288	289	284	322	321	298	328	363	340	316	312	C	304	313	311	323	321	318	328	362	309	307	284
21	287	295	304	314	301	268	404	319	335	321	318	S	320	312	309	314	310	321	293	322	325	255	S 247	298
22	338	244	261	275	280	314	287	310	325	334	331	322	314	317	331	346	338	326	344	357	322	330	293	264
23	303	295	291	292	299	322	307	337	347	330	336	339	325	323	304	328	324	326	337	316	307	323	327	301
24	284	298	272	265	286	305	320	352	366	338	345	324	331	320	332	339	330	339	344	331	319	302	272	271
25	274	300	302	292	284	265	315	346	347	H 314	334	338	315	320	345	338	361	325	325	318	289	304	S 277	272
26	276	289	276	271	335	313	307	347	348	327	345	323	344	336	326	341	345	318	314	337	343	304	302	296
27	279	285	293	313	316	327	312	367	358	363	303	332	315	324	304	324	316	313	326	312	313	312	287	298
28	305	297	287	296	315	304	321	361	373	365	358	337	325	322	319	341	357	329	344	316	310	A	271	279
29	295	273	280	298	283	287	335	346	346	333	340	332	314	326	328	326	324	350	322	304	331	337	286	288
30	296	285	308	319	365	282	303	356	355	333	333	334	326	316	335	340	351	323	326	311	320	328	309	279
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	29	29	30	29	30	29	29	30	29	29	29	28	30	30	30	30	30	30	30	30	29	30	29
MED	279	287	287	296	286	282	313	346	339	329	320	317	306	310	311	316	324	321	317	312	313	308	291	282
U Q	294	296	297	310	316	305	322	351	347	336	334	328	320	319	319	326	332	326	327	322	322	322	302	297
L Q	275	277	282	284	271	272	307	337	334	320	316	312	301	303	305	310	317	314	309	304	307	298	277	272

NOV. 2002 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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														
2													L											
3													L											
4														L										
5											L		L	L	L									
6										L		L	L											
7											L				L									
8										L	L	L	L	L										
9														L	L									
10												L		L										
11												L	L	L	L									
12												L	L	L										
13											L	L												
14													L	L										
15											L		L											
16													L	L										
17											L		L	L	L	L								
18								C		C	C		C	L										
19										L			L	L										
20													C											
21												L												
22											L													
23											L													
24											L													
25												L	L											
26																								
27											L													
28													L		L									
29																								
30											L				L									
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																								

NOV. 2002 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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										260														
2													292											
3													292											
4														284										
5											278		280	286	286									
6										266		282	292											
7											256				268									
8										256	246	276	292	284										
9														282	272									
10												274		298										
11												288	298	292	296									
12												276	290	302										
13											280	298												
14													298	292										
15											272		282											
16													280	280										
17											272		274	294	248	274								
18								C		C	C		C	278										
19										270			302	282										
20													C											
21												260												
22											254													
23											266													
24											256													
25												248	300											
26																								
27											298													
28													278		274									
29																								
30											268				258									
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										4	11	8	14	12	7	1								
MED										263	268	276	292	285	272	274								
U Q										268	278	285	298	293	286									
L Q										258	256	267	280	282	258									

NOV. 2002 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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

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	274	E B 300	E B 276	236	E B 290	E B 294	214	210	216	204	216	218	216	232	224	226	216	202	218	256	236	224	262	268
2	E A 292	E A 294	272	E B 304	E B 368	E B 316	224	206	H 188	218	216	220	218	224	H 190	224	214	228	222	E A 274	234	240	E B 284	E A 286
3	E A 268	E A 270	262	254	E A 336	E A 324	256	226	230	232	218	218	218	218	226	216	214	226	210	240	218	E A 268	E B 298	E B 318
4	E B 332	E B 312	264	244	E B 292	E A 390	E A 282	216	224	222	226	220	230	226	224	222	226	210	206	E A 254	E A 278	E A 364	E A 282	E A 308
5	E A 342	E A 302	E A 270	238	E B 294	E A 298	250	220	214	220	214	210	222	214	222	226	232	220	202	E A 314	E A 266	E A 324	E A 278	E B 286
6	E A 300	E A 294	E B 294	260	220	246	256	206	220	220	228	216	238	218	228	234	218	214	202	224	228	222	E A 292	E A 270
7	E A 300	E A 328	E A 294	252	228	E B 304	258	H 202	226	222	218	228	212	212	230	216	220	204	208	238	E A 268	248	E A 324	E A 390
8	E A 328	E A 316	E A 272	270	266	272	230	218	214	204	200	220	214	H 190	230	224	220	218	234	216	202	236	272	E A 342
9	E A 282	E A 260	250	E B 286	272	E B 318	244	208	208	212	220	216	232	212	216	222	216	202	216	252	220	214	E B 272	266
10	E A 340	E A 328	E A 294	E A 274	254	248	246	224	220	212	216	H 200	H 190	220	236	222	224	236	232	230	218	204	E B 282	E B 304
11	E B 292	266	250	252	248	E B 292	260	216	220	216	220	212	212	224	230	228	226	240	E A 264	E A 248	E A 262	E A 272	E A 258	E B 262
12	E B 294	E B 348	E B 328	E B 278	228	210	242	212	224	224	226	212	216	224	232	228	214	206	238	224	236	234	268	E B 320
13	E B 298	252	232	222	210	E B 312	246	216	218	222	220	H 182	216	H 204	234	234	224	216	214	216	230	228	236	240
14	266	262	238	270	226	252	262	218	218	222	218	220	220	224	230	212	216	202	224	210	228	252	248	246
15	E B 298	274	250	250	E B 302	E B 298	232	214	212	214	216	218	204	232	236	218	208	210	206	234	238	226	242	248
16	256	E B 288	E B 274	264	256	E B 320	250	212	210	216	230	216	212	226	230	220	218	220	224	224	226	202	216	258
17	E B 280	280	268	268	258	E B 296	258	226	214	216	214	218	H 194	220	222	202	222	220	224	216	234	226	228	C
18	C	C	C	E B 290	C	248	C	C	224	C	C	H 186	C	208	224	230	226	206	224	222	222	220	266	272
19	244	E B 270	272	276	E B 276	E B 290	222	218	212	228	224	214	220	228	226	224	232	206	216	202	238	234	250	244
20	266	E A 294	272	278	228	224	232	240	206	206	220	230	C	218	234	212	218	204	224	220	208	200	252	272
21	E A 296	256	250	246	244	E B 324	186	H 198	226	222	222	206	218	204	216	226	230	194	236	230	220	E B 340	E B 356	250
22	218	E B 256	E B 352	E B 318	E B 300	236	260	234	226	224	198	218	234	220	212	212	208	192	214	204	232	230	248	E A 340
23	270	E B 280	246	262	268	E B 230	222	208	212	228	234	218	206	220	222	228	204	210	210	216	232	224	E C 258	E B 284
24	E B 310	E B 280	E B 306	328	E B 300	270	222	H 194	214	222	208	222	230	212	220	220	212	206	206	204	218	228	E B 320	E B 326
25	E B 314	260	248	274	268	E B 318	256	210	212	216	232	210	212	220	222	218	208	202	220	208	236	246	E A 312	E A 338
26	E A 328	E A 286	E A 334	E B 308	234	222	E B 272	216	218	220	220	214	224	216	H 200	216	212	196	222	226	214	214	264	E A 314
27	E A 342	E A 316	E B 286	E A 270	236	234	250	216	202	220	222	232	224	226	226	222	208	216	224	234	232	248	286	266
28	268	244	E B 318	E B 278	252	262	E C 262	214	212	214	218	206	H 190	230	H 186	218	206	210	220	220	248	A	E A 324	E A 320
29	E A 310	E B 314	E A 284	250	E A 286	E B 282	228	230	210	210	228	218	206	208	208	206	218	200	206	224	234	216	244	E B 300
30	E B 294	E B 286	E B 280	240	210	E B 300	260	220	212	204	212	224	214	210	200	H 186	214	196	222	218	234	226	246	272
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	29	29	30	29	30	29	29	30	29	29	30	28	30	30	30	30	30	30	30	30	29	30	29
MED	E 294	E 286	E 272	U 258	U 243	E 291	247	216	214	220	220	218	216	220	224	222	217	208	220	222	230	226	U 253	E 284
U Q	E A 312	E A 307	E B 294	E B 278	E B 291	E B 312	259	220	220	222	225	220	223	224	230	226	224	218	224	238	236	E 248	E 286	E A 319
L Q	269	264	250	250	231	248	229	209	212	213	216	212	212	212	216	216	212	202	210	216	220	221	248	264

NOV. 2002 h'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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

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							B	122	122	120	120	120	114	114	114	114	126	B						
2							B	116	112	112	112	120	116	116	116	A	A	B						
3							B	A	A	118	A	114	112	118	120	118	116							
4							B	116	112	118	118	134	122	116	120	A	A							
5							B	120	122	122	A	118	A	B	116	A	A							
6							B	120	118	118	110	116	118	A	118	112	B							
7							B	116	118	118	114	116	116	116	116	A	120	B						
8							B	118	118	116	114	114	114	110	110	112	112							
9							B	116	114	120	120	118	B	R	A	114	114	B						
10							B	114	114	A	114	B	112	B	114	114	A	B						
11							B	116	122	122	130	R	B	114	116	116	A	B						
12							B	116	118	118	116	114	114	116	116	112	B	B						
13							B	120	122	120	122	118	116	120	114	A	A	B						
14							B	112	124	122	114	A	116	116	114	118	A	B						
15							B	116	122	124	118	B	114	114	116	120	118							
16							B	118	120	114	114	116	118	118	116	116	116							
17							B	126	122	124	118	114	116	B	114	112	E A 142	B						
18								C	124	C	C	114	C	120	114	112	118							
19							B	130	118	A	118	A	A	A	A	116	A							
20								116	120	116	A	122	C	122	116	114	122							
21								118	124	120	120	114	116	120	114	112	120							
22							B	116	126	124	116	A	A	A	118	126	116							
23								A	116	A	A	116	116	110	112	112	126							
24								126	120	126	122	116	A	118	112	114	A							
25								120	114	A	A	110	116	116	112	128	110							
26								E B 146	110	118	120	124	122	A	A	A	A							
27								116	118	114	120	116	120	114	116	B	118							
28								122	122	A	118	A	A	114	114	114	118							
29								E B 134	126	118	A	A	120	118	118	114	116							
30								E B 122	120	122	116	118	A	118	120	A	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								27	29	24	23	22	20	22	27	22	17							
MED								117	120	119	118	116	116	116	116	114	118							
U Q								122	122	122	120	118	118	118	116	116	121							
L Q								116	117	118	114	114	114	114	114	112	116							

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 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	B	B	B	B	B	B	B	106	108	104	102	G	114	94	96	148	132	90	106	100	B	94	100	B
2	94	94	92	98	B	B	B	G	G	G	100	164	G	G	G	108	106	98	116	94	96	92	B	98
3	96	104	100	110	102	100	106	104	100	112	118	110	96	112	144	138	106	104	98	98	102	92	100	B
4	B	B	110	102	104	104	152	G	G	106	136	134	118	G	124	106	106	94	106	100	100	100	88	92
5	92	96	94	98	B	102	96	G	106	102	102	120	106	B	116	108	106	B	110	100	98	98	98	102
6	96	98	100	B	B	B	98	96	G	G	124	116	116	108	146	94	B	108	102	102	96	98	92	96
7	100	94	94	B	B	112	B	G	106	102	98	104	G	G	98	102	102	96	B	B	98	94	96	94
8	100	100	98	B	B	B	B	G	104	104	100	96	G	G	G	98	112	92	92	B	90	100	B	98
9	100	96	B	B	B	B	B	G	G	104	106	100	B	96	98	126	116	96	102	102	98	B	B	B
10	94	94	94	104	98	B	B	G	G	96	G	B	98	B	92	100	88	92	86	84	86	86	B	B
11	B	B	B	88	B	B	B	G	106	104	G	104	B	146	126	120	108	106	106	98	96	96	94	B
12	B	B	B	B	B	B	B	102	G	102	100	98	102	154	124	124	126	110	106	102	104	100	102	B
13	B	B	B	B	B	B	B	G	104	102	104	100	98	G	118	92	88	84	90	88	B	B	B	B
14	B	102	B	B	B	B	B	144	110	104	104	102	102	G	G	126	116	106	102	B	96	92	B	B
15	B	B	B	B	B	B	B	G	106	106	104	B	G	100	98	G	88	B	B	B	110	B	B	B
16	B	B	B	B	B	B	B	G	104	100	104	96	G	104	106	G	116	106	B	94	94	92	B	B
17	B	B	B	B	B	B	B	104	106	108	100	102	G	B	G	G	98	B	B	B	B	B	B	C
18	C	C	C	B	C	B	C	C	100	C	C	G	C	G	G	G	G	B	B	B	B	B	B	B
19	B	B	B	B	B	B	B	130	118	104	100	100	104	100	98	90	90	92	94	B	B	B	B	94
20	100	98	94	B	B	B	B	G	104	104	102	106	C	106	G	G	G	B	B	B	B	B	B	98
21	92	B	B	B	B	B	B	120	106	104	G	G	100	102	96	G	G	B	B	B	B	B	104	108
22	B	B	B	B	B	B	138	136	104	110	G	104	94	100	100	106	94	B	B	B	104	98	B	94
23	B	B	B	B	B	B	B	108	106	96	96	102	100	96	98	92	G	92	B	B	B	B	C	B
24	B	B	B	B	B	B	B	G	152	110	106	106	90	G	94	G	92	B	B	B	B	B	B	B
25	B	B	B	B	B	B	B	G	120	108	106	G	104	102	94	110	94	B	B	B	B	B	100	96
26	96	98	98	B	B	B	B	G	104	106	106	106	100	106	110	106	102	B	B	B	112	110	110	100
27	100	100	102	98	B	B	B	G	102	168	104	G	G	G	G	B	G	B	B	B	B	108	102	B
28	100	B	B	B	102	100	C	154	108	108	108	104	104	102	98	150	124	112	98	B	108	100	100	94
29	94	100	100	B	100	B	B	G	104	116	106	108	104	108	106	G	G	B	B	B	B	B	B	B
30	B	B	B	B	B	B	B	142	118	118	114	104	104	104	108	104	92	B	B	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	14	13	12	7	5	5	5	12	24	27	25	23	19	18	23	21	23	17	15	12	17	17	13	13
MED	96	98	98	98	102	102	106	114	106	104	104	104	102	103	100	106	106	96	102	99	98	98	100	96
U Q	100	100	100	104	103	108	145	139	108	108	106	108	104	108	118	125	116	106	106	101	104	100	102	99
L Q	94	95	94	98	99	100	97	104	104	102	100	100	98	100	98	99	92	92	94	94	96	92	95	94

IONOSPHERIC DATA STATION Kokubunji

NOV. 2002 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

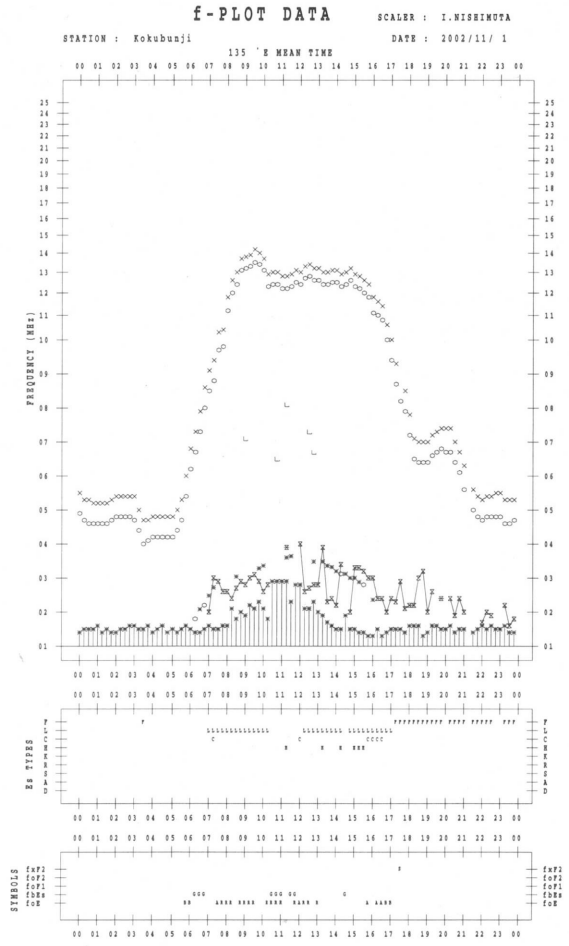
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

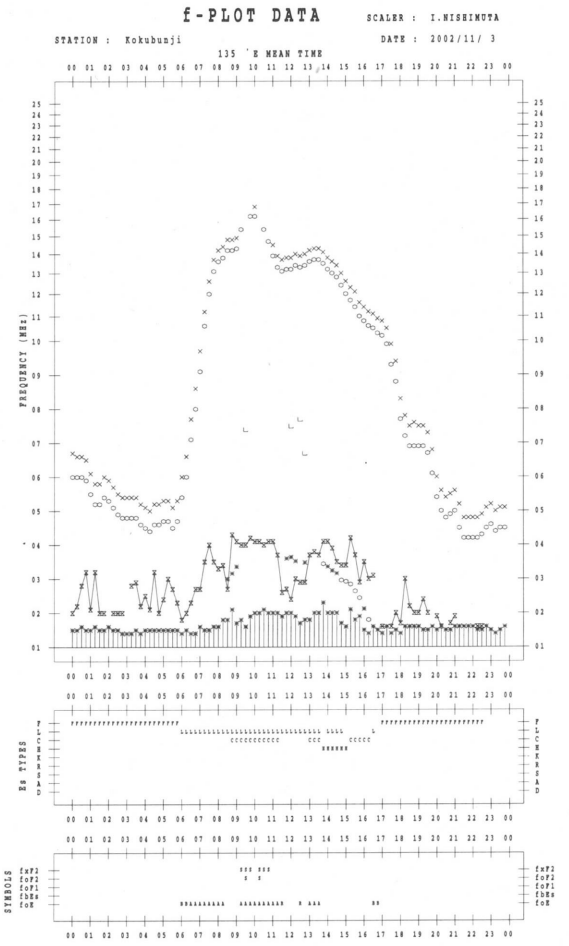
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L 1	L 1	L 1	L 1		C 1	L 1	L 1	HL 11	CL 11	L 2	FF 11	F 2		F 3	F 3	
2	F 2	F 3	F 2	F 1							L 1	HL 11				L 1	L 1	L 3	F 2	F 3	F 2	F 2		F 1
3	F 2	F 3	F 3	F 2	F 2	F 3	L 2	L 2	L 1	CL 11	CL 11	CL 11	L 1	CL 11	HL 11	H 1	C 2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

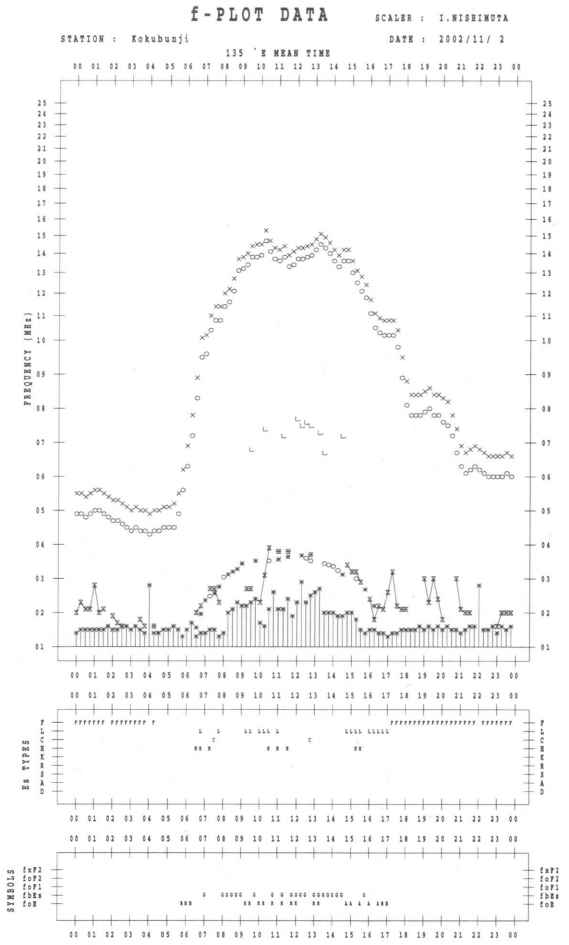
NOV. 2002 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

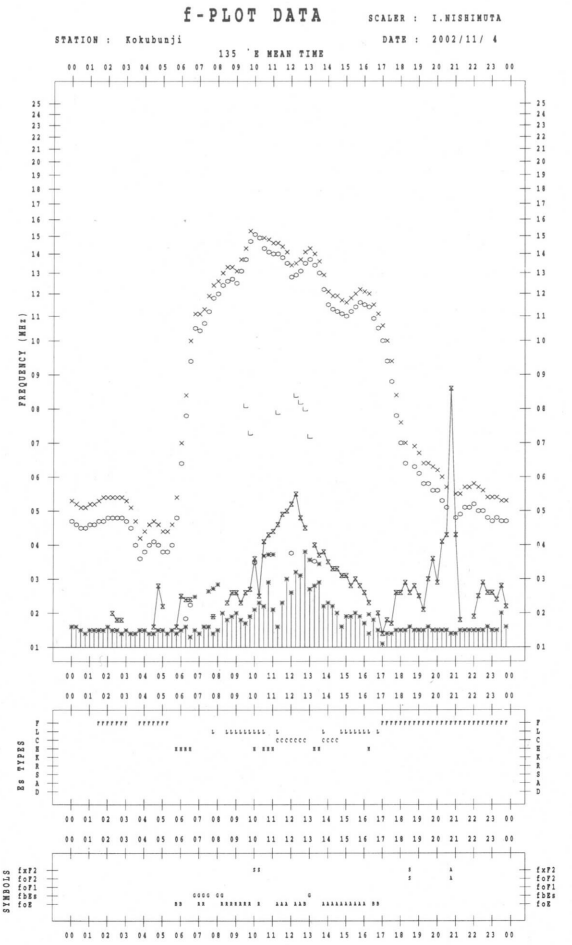
f-PLOTS OF IONOSPHERIC DATA

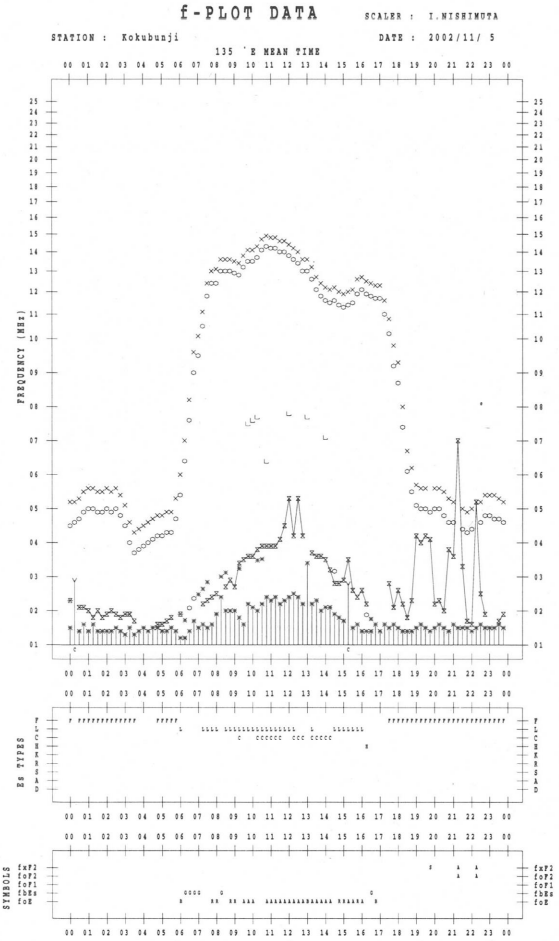
KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

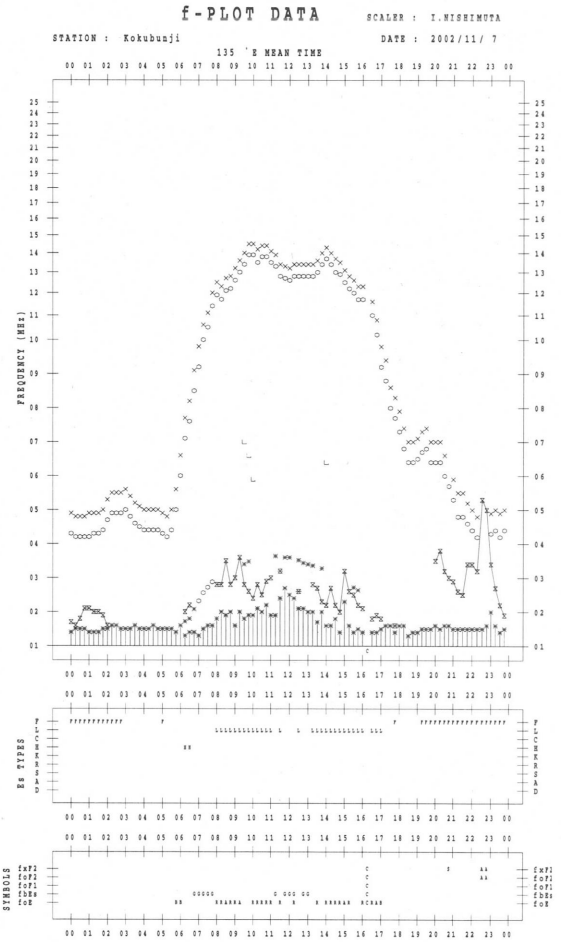

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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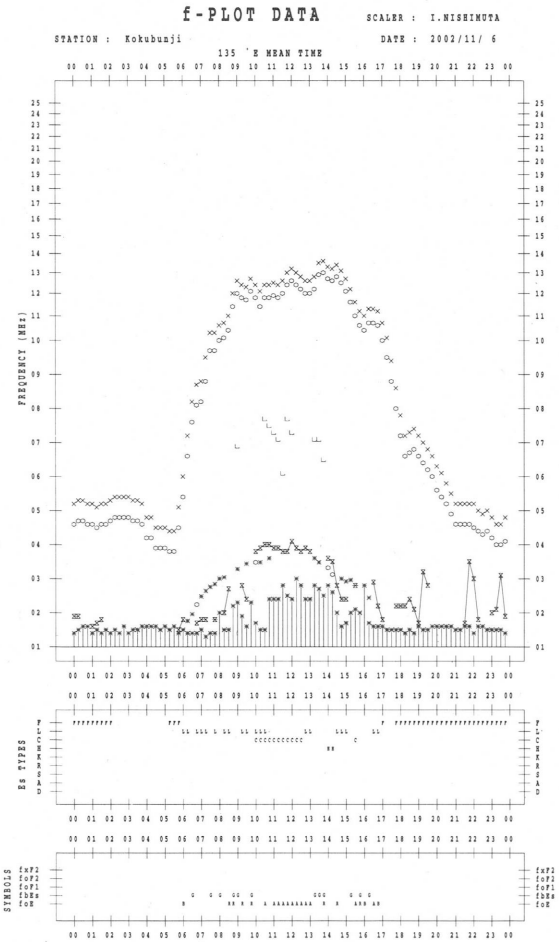
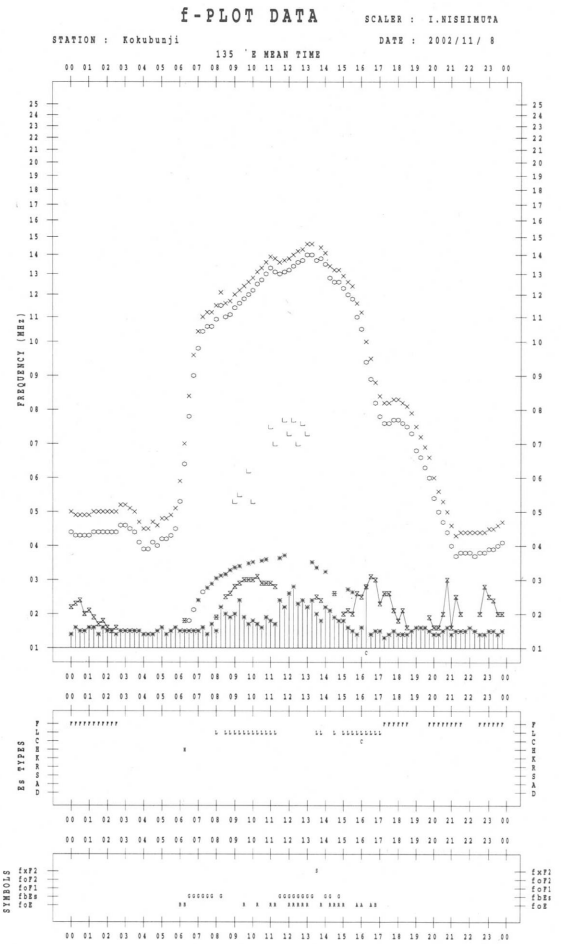
STATION : Kokubunji
DATE : 2002/11/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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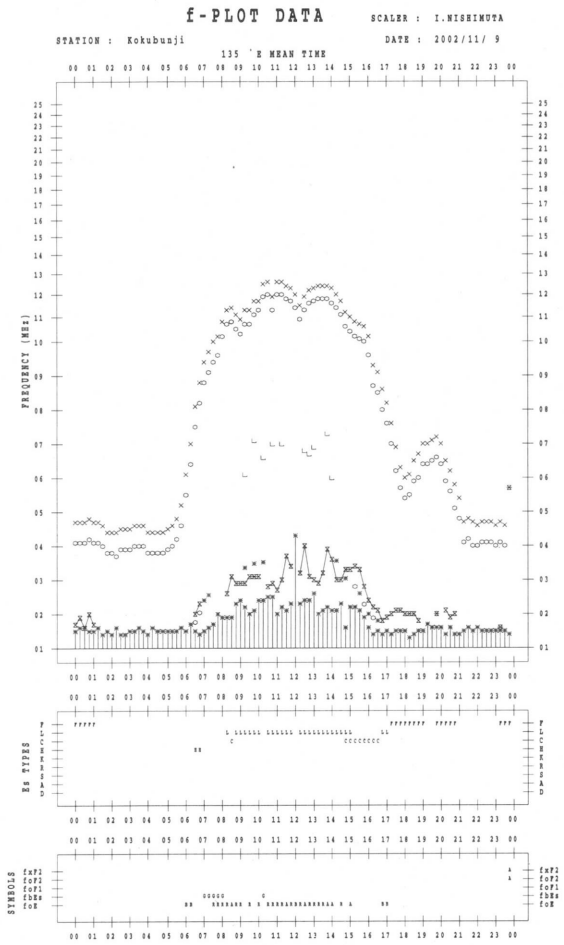
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
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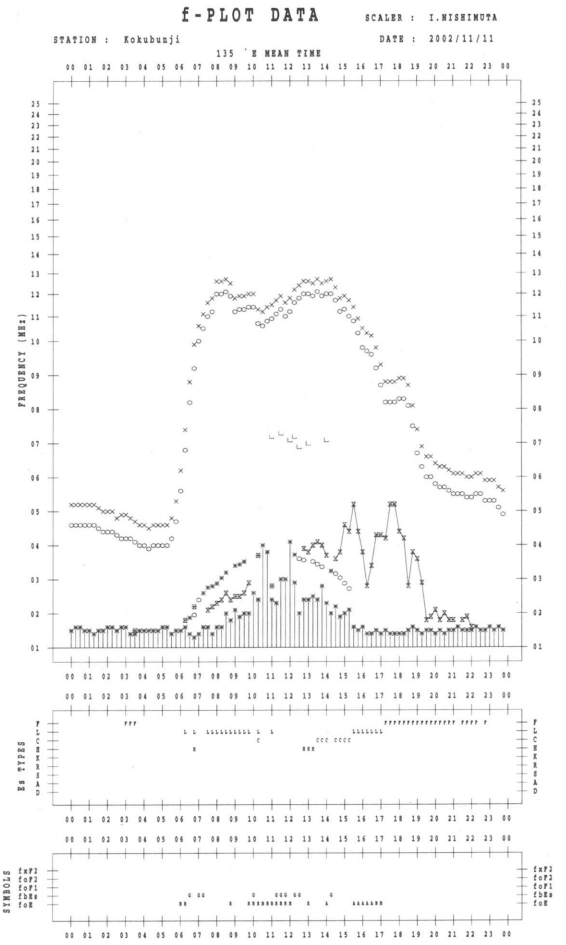
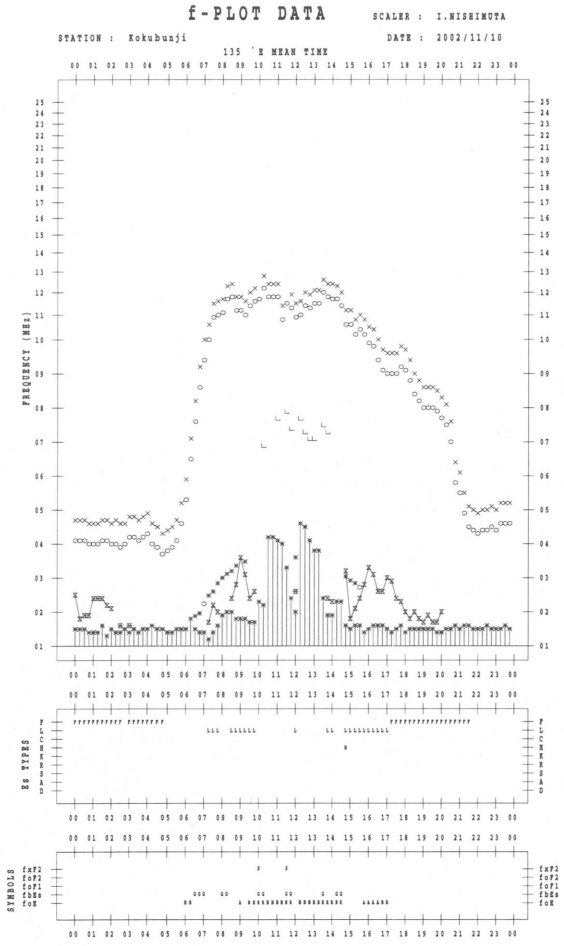
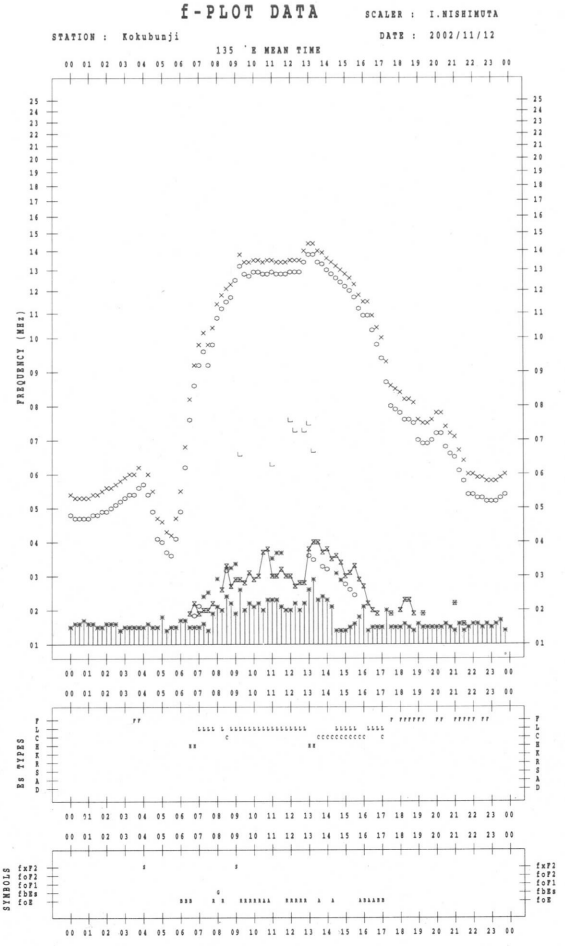
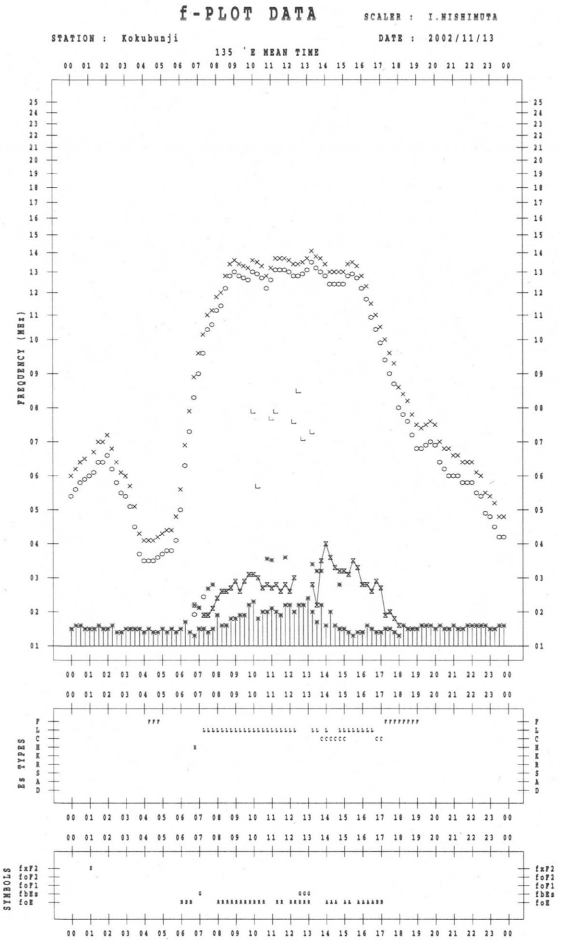
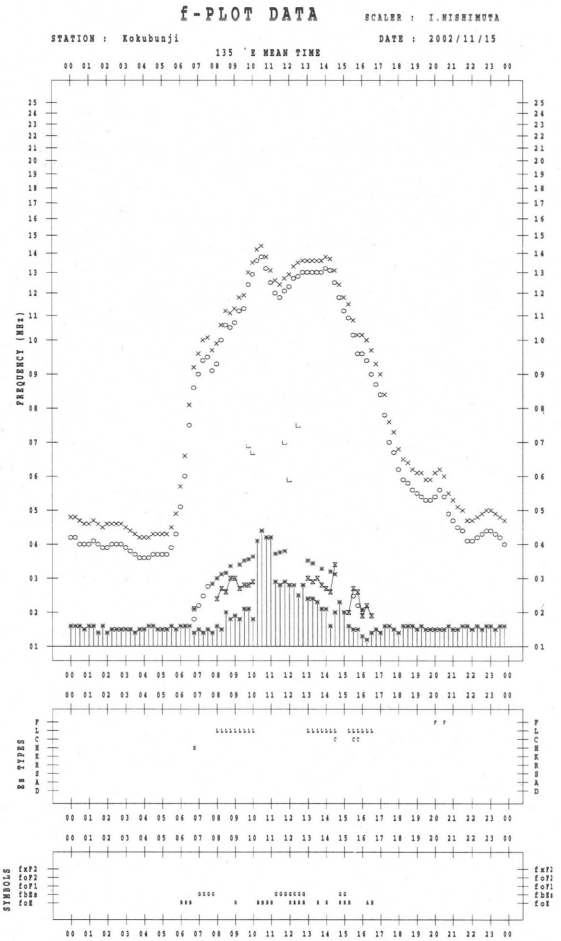
STATION : Kokubunji
DATE : 2002/11/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

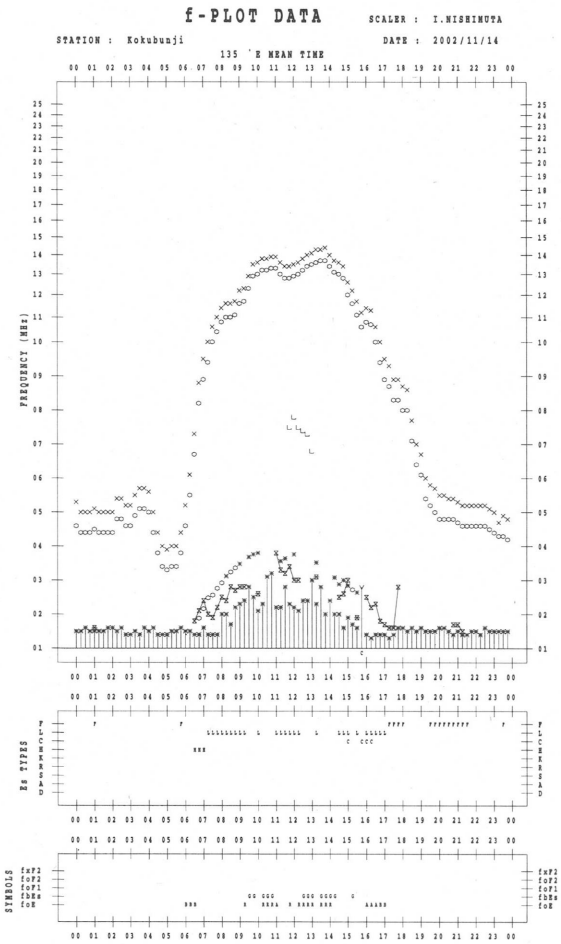

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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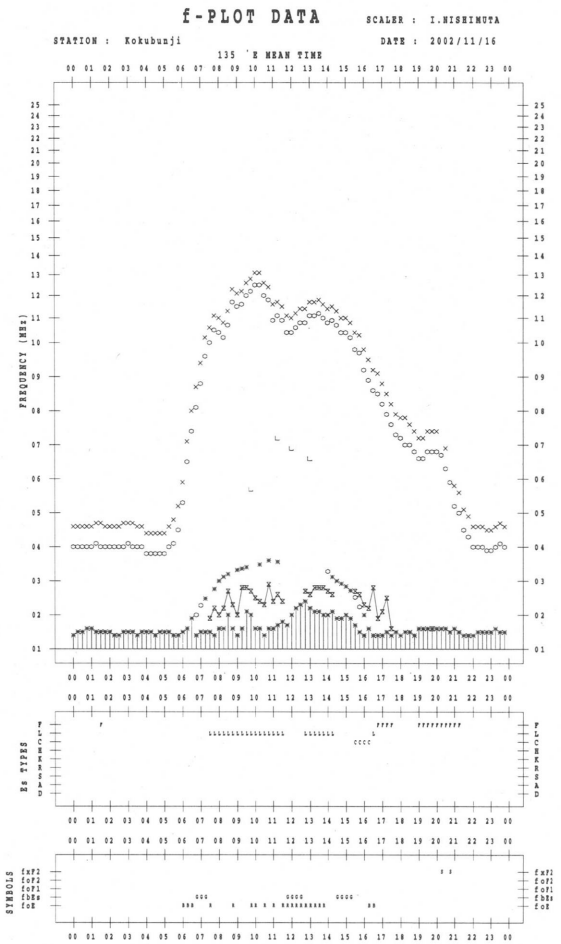
STATION : Kokubunji
DATE : 2002/11/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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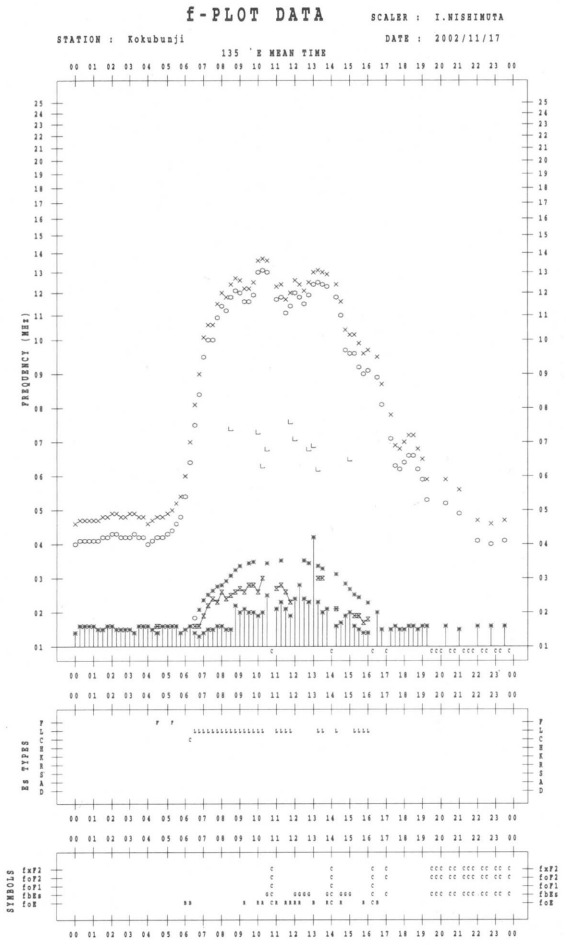
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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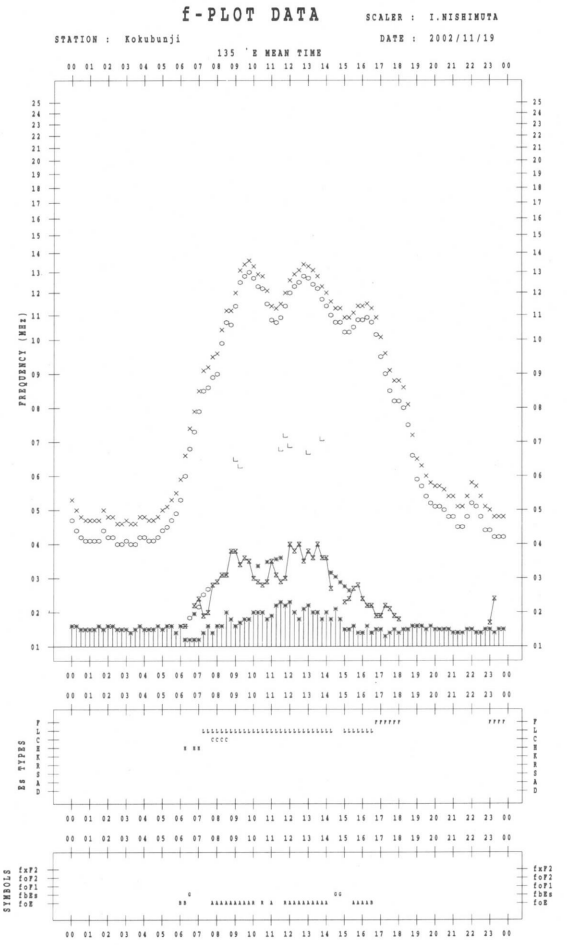
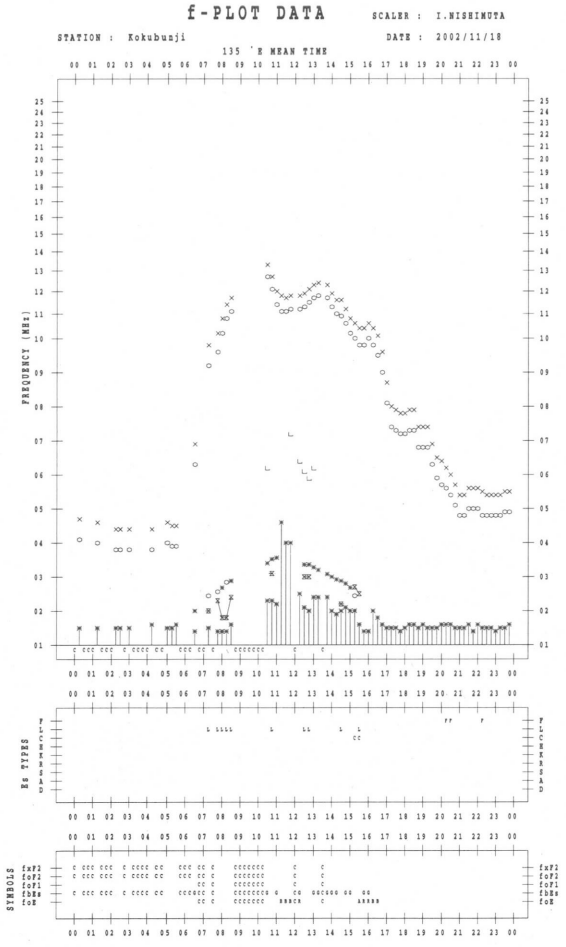
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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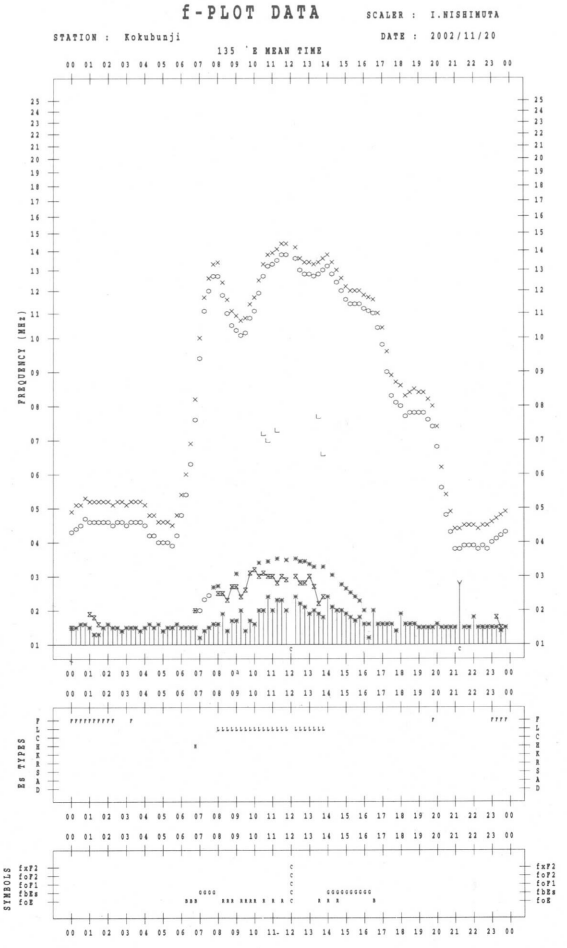
STATION : Kokubunji
DATE : 2002/11/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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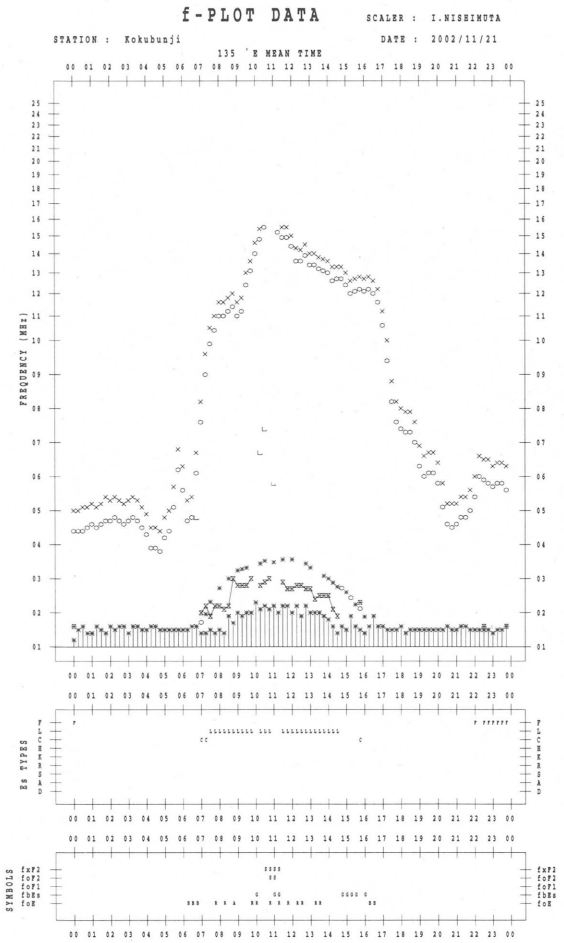
STATION : Kokubunji
DATE : 2002/11/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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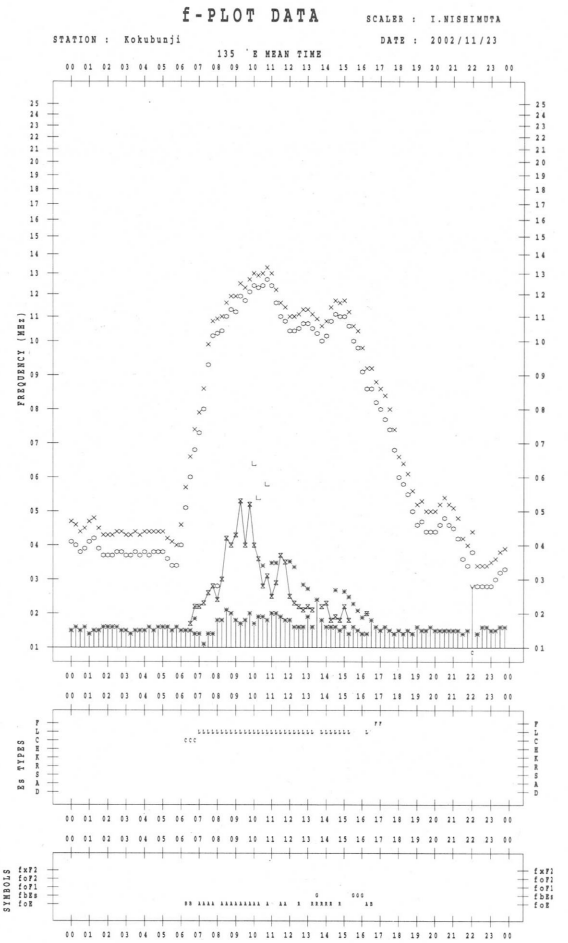
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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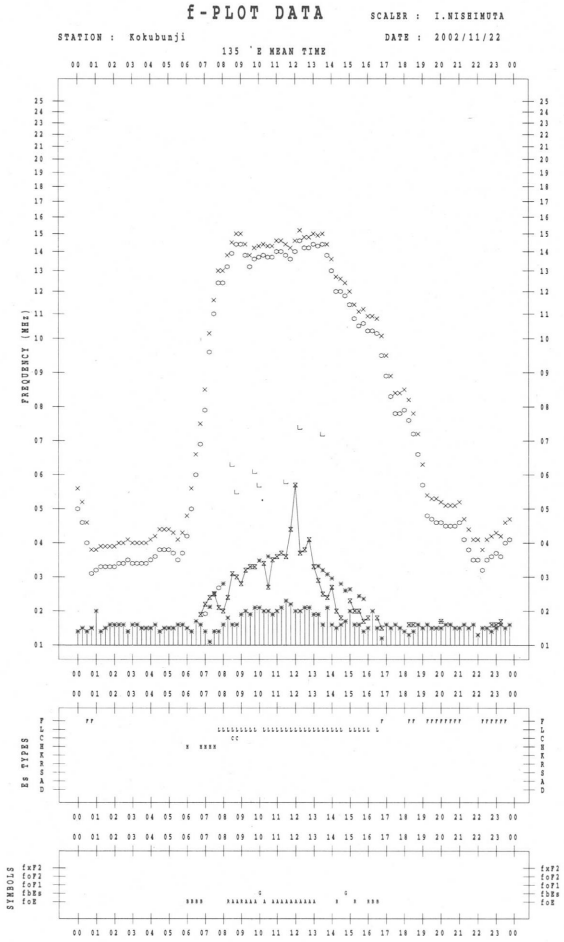
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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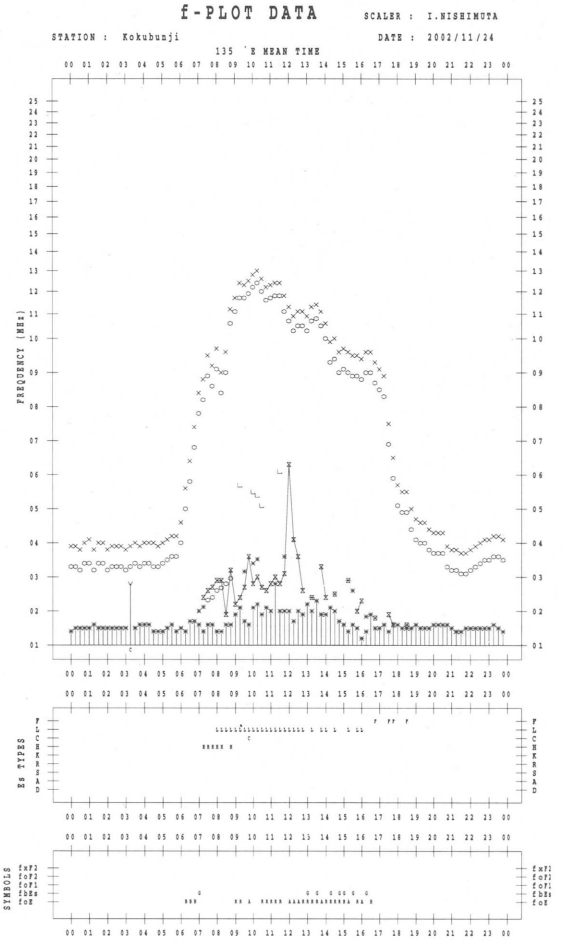
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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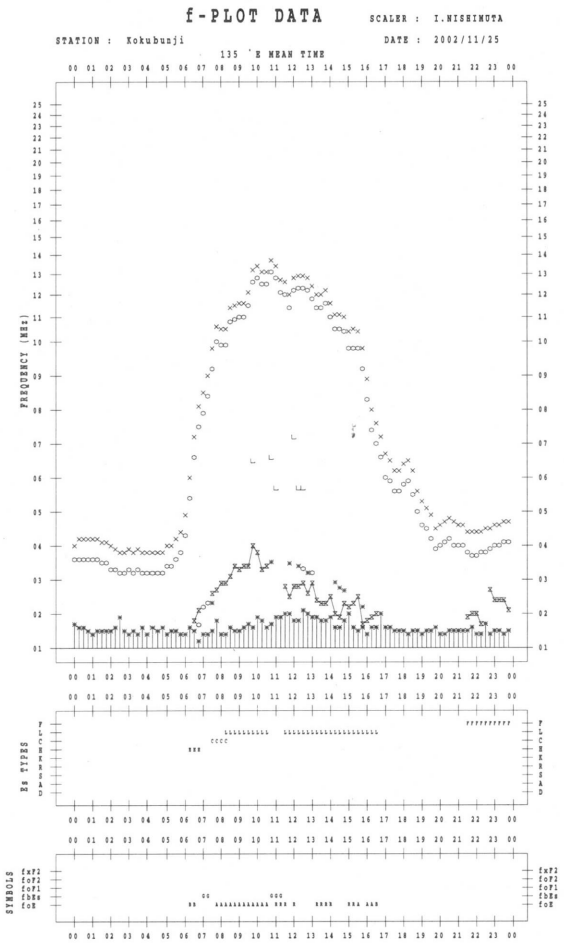
STATION : Kokubunji
DATE : 2002/11/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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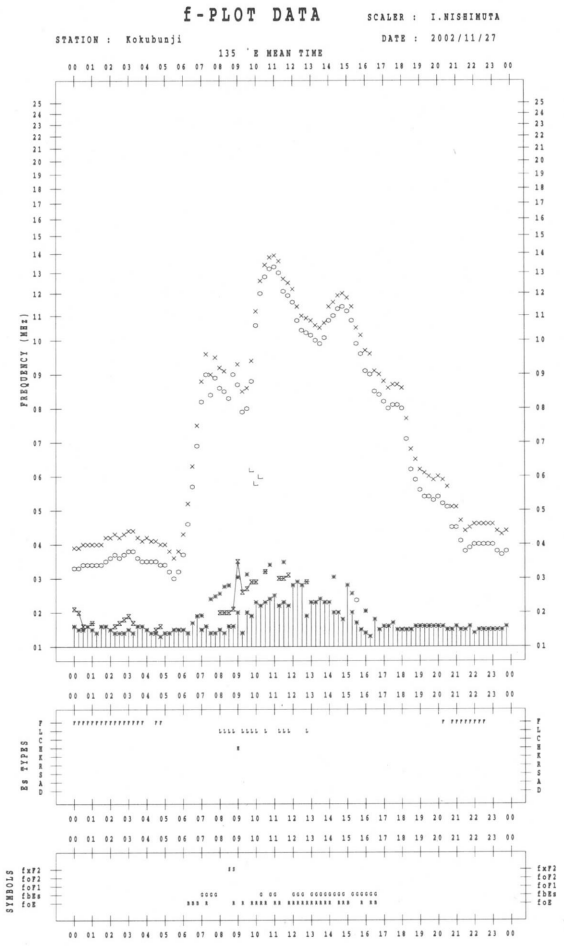
STATION : Kokubunji
DATE : 2002/11/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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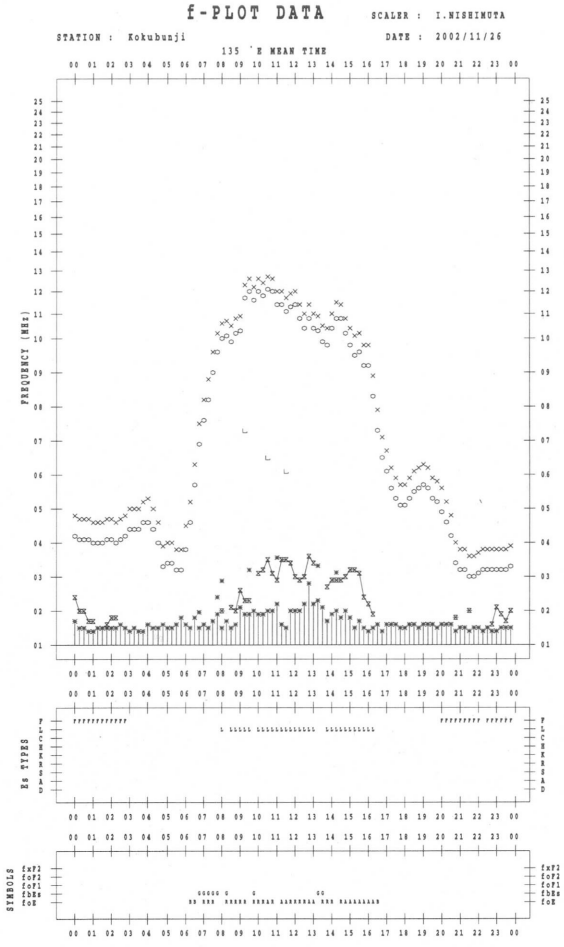
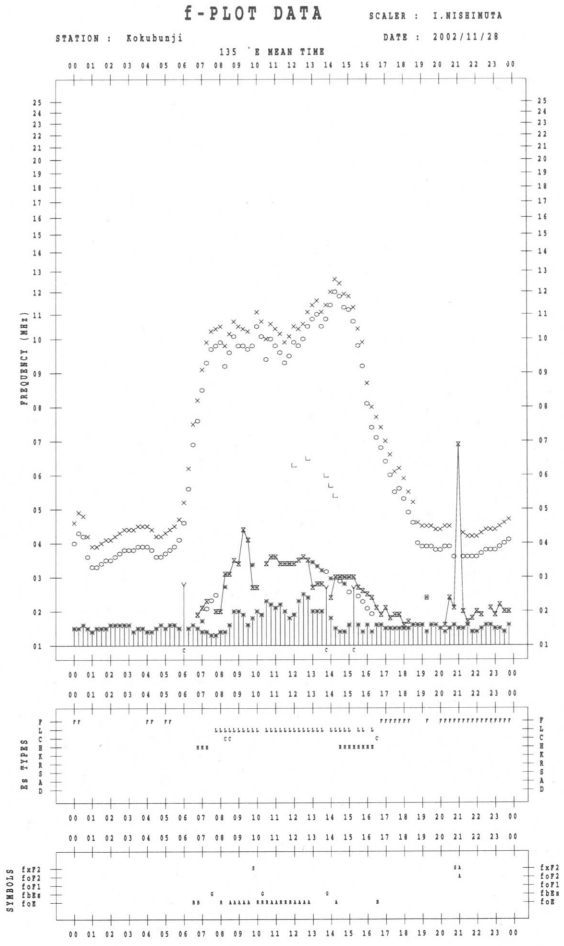
STATION : Kokubunji
DATE : 2002/11/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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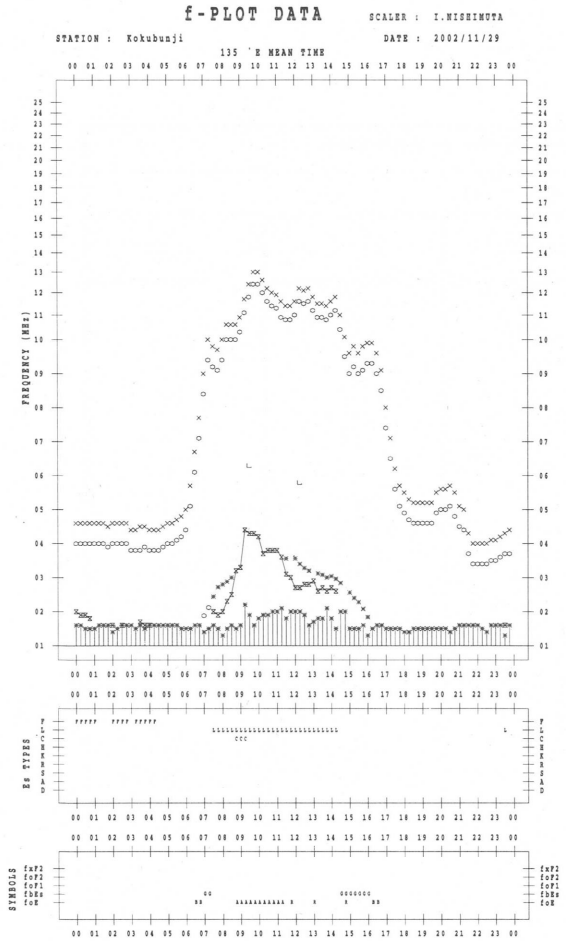
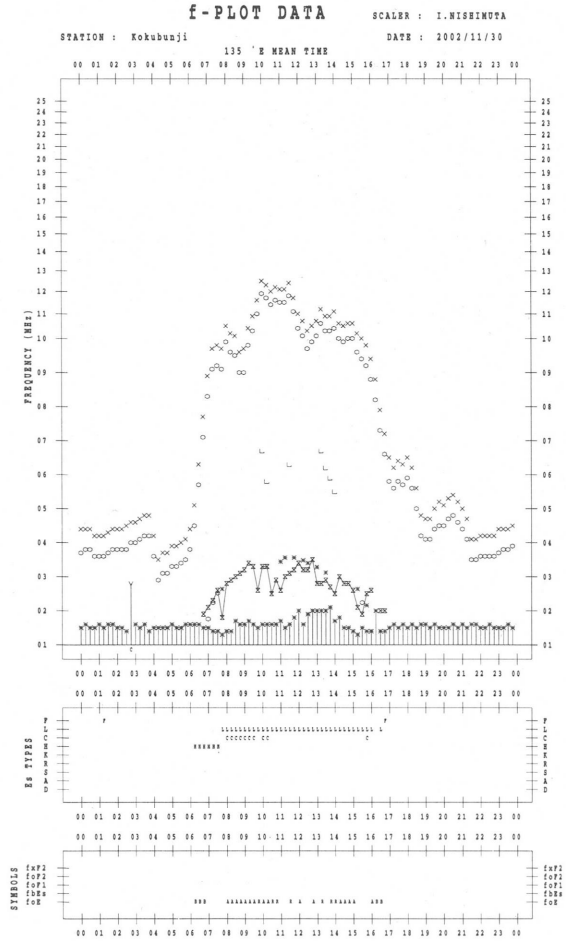
STATION : Kokubunji
DATE : 2002/11/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/11/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

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

Hiraiso November 2002

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} W m^{-2} Hz^{-1}					
UT / Date	00-03	03-06	06-09	21-24	Day
1	41	38	35	43	40
2	41	39	38	45	41
3	40	37	37	67	55
4	59	45	44	51	51
5	44	43	43	48	45
6	43	41	42	45	43
7	41	40	40	43	41
8	40	40	40	42	40
9	42	42	41	47	43
10	43	38	38	46	41
11	42	38	37	45	41
12	41	38	37	44	40
13	39	37	37	46	40
14	49	44	42	45	46
15	43	43	42	48	44
16	48	49	51	54	50
17	51	46	44	-	48
18	48	44	45	-	46
19	46	44	43	43	44
20	43	42	42	44	43
21	42	41	39	45	42
22	45	43	42	43	44
23	42	42	40	50	43
24	49	58	51	45	51
25	45	40	40	43	42
26	44	41	41	52	45
27	44	43	43	48	43
28	43	41	41	48	43
29	43	39	38	46	42
30	43	39	39	42	41
31					

Note: No data is available during the following periods.
17th 20700 - 18th 0040 18th 2200 - 19th 0030 26th 0200 - 26th 0530
A superscript * stands for being superposed on a burst.

B. Solar Radio Emission

B2.Outstanding Occurrences at Hiraiso

Hiraiso November 2002

Single-frequency observations

Normal observing period: 2115 - 0730 U.T. (sunrise to sunset)

NOV. 2002	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	MEAN	POLARIZATION REMARKS
1	500	8 S	01400	01400	1.0	25	-	0
1	200	8 S	02160	02160	1.0	30	-	WL
1	500	8 S	04120	04120	1.0	10	-	0
3	200	8 S	01300	01320	2.0	30	-	WR
3	500	8 S	02280	02280	1.0	10	-	0
4	200	47 GB	01270	01270	1.0	630	-	0
4	200	8 S	02340	02340	1.0	125	-	0
4	200	8 S	22140	22140	1.0	80	-	WL
4	200	8 S	22360	22360	1.0	110	-	WL
4	500	8 S	22380	22390	2.0	70	-	WR
5	500	47 GB	01170	01170	1.0	680	-	
5	200	8 S	01170	01170	2.0	415	-	
5	200	8 S	02480	02480	1.0	105	-	
5	200	47 GB	03330	03340	3.0	1000	-	
5	200	8 S	03450	03460	1.0	50	-	
5	200	7 C	04060	04080	2.0	60	-	
5	200	8 S	05050	05050	1.0	40	-	
5	200	8 S	05120	05130	1.0	55	-	
5	200	8 S	05510	05520	2.0	400	-	
5	500	8 S	05520	05520	2.0	215	-	
5	200	8 S	22240	22240	1.0	15	-	
5	200	8 S	22530	22530	1.0	20	-	
5	500	7 C	23390	23400	4.0	40	-	
6	200	47 GB	01070	01070	1.0	1015	-	
6	200	8 S	01330	01330	1.0	355	-	
6	500	8 S	02580	02580	1.0	45	-	
6	200	8 S	02580	02580	1.0	295	-	
6	2800	7 C	05170	05290	17.0	35	-	
6	500	47 GB	05170	05320	23.0	625	-	
6	200	8 S	05250	05250	1.0	110	-	
6	200	8 S	06310	06310	1.0	120	-	
6	200	7 C	21360	21380	4.0	55	-	0
6	500	8 S	21550	21570	3.0	95	-	WR
7	200	8 S	02340	02340	1.0	25	-	0
7	500	7 C	06270	06280	2.0	35	-	0
9	200	7 C	03490	03510	4.0	15	-	WR
9	200	7 C	04000	04150	12.0	15	-	WR
9	200	8 S	23090	23090	1.0	245	-	0
10	2800	3 S	03060	03110	13.0	410	-	0
10	500	7 C	03070	03110	14.0	45	-	
10	200	7 C	03070	03090	10.0	100	-	
11	200	8 S	00080	00080	1.0	30	-	0
12	500	7 C	03530	04000	13.0	30	-	0
12	200	3 S	03550	04000	14.0	490	-	0
11	500	8 S	04020	04020	1.0	50	-	
11	200	8 S	04020	04020	1.0	15	-	0
14	500	8 S	22230	22240	2.0	335	-	0

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso November 2002

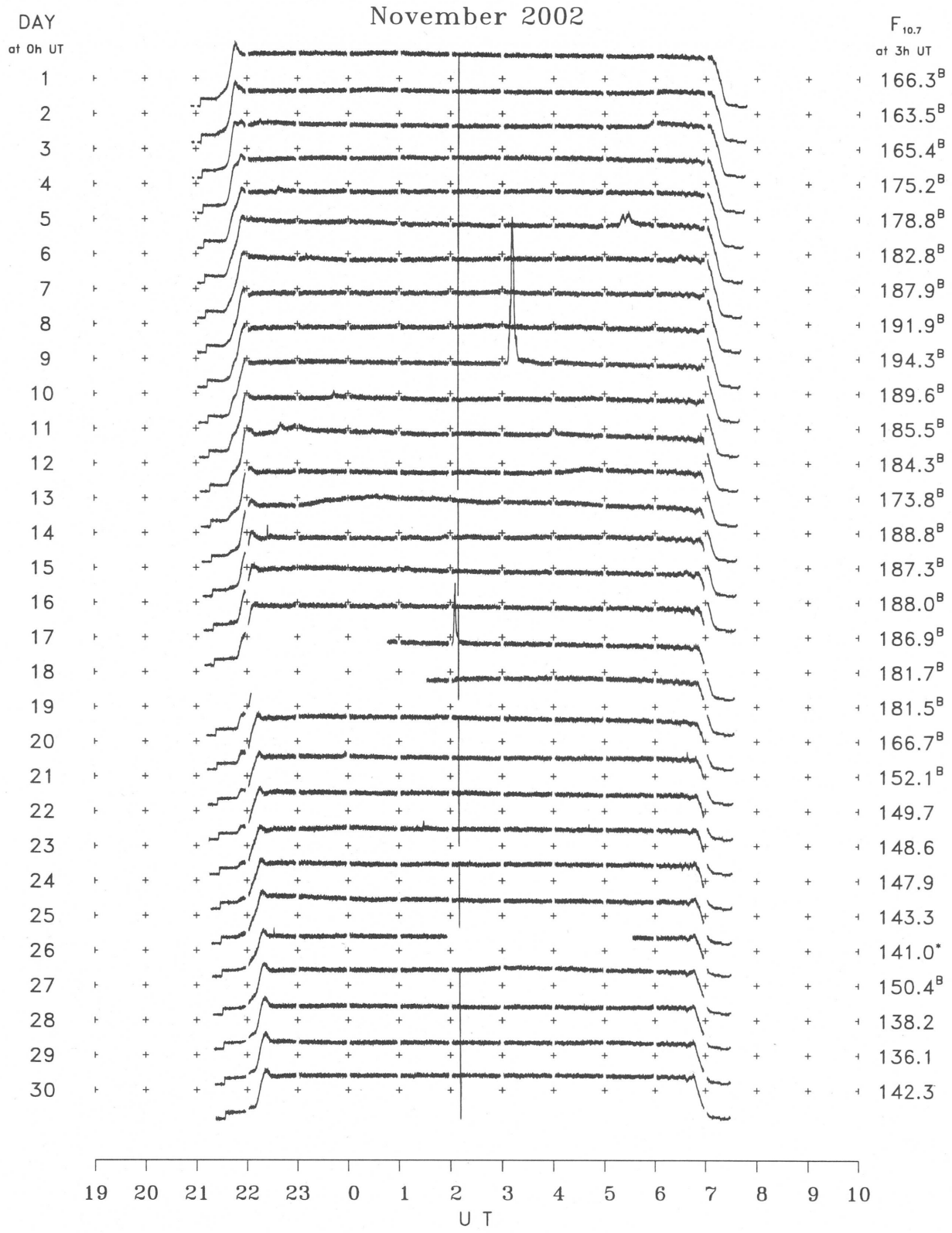
Single-frequency observations

Normal observing period: 2115 - 0730 U.T. (sunrise to sunset)

NOV. 2002	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
14	2800	8 S	22240	22240	1.0	40	-	0
15	500	7 C	01120	01280	45.0	80	-	0
16	200	8 S	23150	23150	1.0	110	-	0
17	200	8 S	05040	05040	1.0	10	-	0
17	200	8 S	05390	05400	1.0	50	-	ML
17	500	7 C	05400	05440	10.0	80	-	0
18	2800	3 S	02020	02060	8.0	170	-	0
18	500	47 GB	02030	02080	10.0	905	-	0
18	200	8 S	02040	02050	3.0	450	-	0
20	200	8 S	03080	03080	1.0	90	-	0
21	200	8 S	01390	01390	1.0	35	-	
22	200	8 S	00300	00300	1.0	20	-	0
23	500	8 S	01210	01210	1.0	10	-	0
23	2800	1 S	01230	01290	1.0	25	-	0
23	200	8 S	01310	01310	1.0	30	-	0
23	200	8 S	03090	03090	1.0	30	-	0
23	200	8 S	05290	05290	1.0	45	-	0
23	200	8 S	06230	06230	1.0	20	-	0
26	500	8 S	23050	23050	1.0	20	-	0
27	200	47 GB	02030	02030	1.0	845	-	0
28	500	8 S	02570	02580	1.0	65	-	0
29	200	8 S	04210	04210	1.0	20	-	0
29	200	8 S	23240	23240	1.0	175	-	0

B. Solar Radio Emission

B3. Summary Plots of $F_{10.7}$ at Hiraiso



Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range ≧ 6°.

IONOSPHERIC DATA IN JAPAN FOR NOVEMBER 2002
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