ISSN 0021−0382

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IONOSPHERIC DATA IN JAPAN

FOR OCTOBER 2002

VOL. 54 NO. 10

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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 automatic data processing system, but existence of film record.

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

OCT. 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	53	66	65	43		41	58	65	76	82	84	85	93	85	93	91	84	80	83	76	54	51	47	35
2							34	53	62	68	59	62		55	58	72	73	72	70	63	66	55	48	49
3	59	48	47	34	28	34	51	76	92	92	85	82	84	94	91	81	81	80	82	73	62	62	53	44
4	41	43	34	32		29			43	36			49	56	62	60	66	66	65	62	46	38	44	31
5	36	35	34	32	36	45	64	81	86	102	93	92	90	91	92	84	94	83	67	62	61	54	47	47
6	41	38	33		32	38	58	78	83	92		101		92	92	93	91	82	81	66	60	51	44	44
7	38	48	43	45	46	47	62		92				95	94	92	94	92	93	84	71	61	62	52	54
8	48	42	44	38	36	36	34	58	41	57	57	A			54	58	61	61	52	57	54	52	52	52
9	48	46	41	32			42	66	84	102	93	104	83	93	85	82	86	80	73	64	54	50	44	44
10		38	43	37	33	34	46	61	82	82	93	91	94	92	92	93	93	83	A	58	53	53		45
11	42	51	47	42	33	35	46	68	66		A	70	84	82	84	92	85	76	65	64	50	48	45	43
12	38	45	46	51	47	51	65	81	91	93	100	83	115	92	93	94	91	78	72	73	54	63	55	55
13	58	57	52	52	48	54	76	93				92	106	107	91	93	93	77	77	74	64	54	53	50
14	45	45	45	45	45	46	76	92	116			109	94	95	93	94	102	83	78	80	81	59	53	48
15	44	42	45	48	36	34	55	94	89			124	125	94		92		92		73	63	66	52	54
16	55	54	53	47	47		73	85	102	103	102	94	134	107	104		94	90	81	77	64		54	64
17	52	65	59	65	56	52	71		114				138	122	104	126		90	81	74	67	66	61	54
18	55	55	45	56	54	53	61	91	101	126	123	127		90	125	102	108		80	78	78	71	66	65
19	59	61	61	65	63	60	71	87	91	125	137		118					90	81	76	72	66	66	53
20	55	54	54	52	54	52	75		119			127								73	66	65	62	69
21	57	61	60	66	61	55	71													66	67	63	52	51
22	50	52	55	57	79		67												78	72	62	79	79	57
23	79	52	63	79	57		58							92	95	94	94	82	73	67	64		60	51
24	58	66	60	63	58	53	63	90	120	92	108	138	130				90	83	81	77	72	68	52	72
25	63	52		48	43		44	58	63	77	82	93	92	92	92	93	83	66	54	45	48	44	44	40
26	40	40	42	41	37	35	54	81	93	105	123			92	95	94	93	84	65	64	A			46
27	37	40	32	40	34	32	60	90		125		134	127			94	91	77	76	60		A		60
28	52	44	40	42	34	34	38	65	84	107	138	141	142		101		93	76	64	61	61	48	53	53
29	40	52	51	52	41	47	51	81	106		109			103	91	104	91	78	70	66	61	54	50	60
30	58	54		53	54	49	63	81	104	127	125		94	94	106	95	92	82	68	61	53			44
31	44	44	42	34	41	17	51	78	91				107	120	102			82	73	62	60	44	45	42
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	28	29	27	25	30	24	26	19	17	19	21	23	24	23	24	27	27	31	29	26	27	31
MED	50	50	46	47	45	45	59	81	91	93	100	94	95	92	92	93	91	82	73	66	61	54	52	51
U Q	57	54	54	54	54	52	67	88	102	107	123	127	126	95	98	94	93	83	81	74	66	65	55	55
L Q	41	43	42	39	36	34	51	65	82	82	84	85	91	91	91	84	84	77	67	62	54	51	47	44

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

OCT. 2002

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

HD \ 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	56	44	33	34	39		G	48	48			G	62	42	44	44	36	43	50	39	31	G	G	G
2			33	34	31	42	33	43	G	98	G	G	G	G	G	G	G	G	27	29	G	G	G	G
3	G	G	G	26	G	G	30	36	G	G	G	G	G	G		G	G	26	26	G	G	28	32	G
4	G	G	G	25	28	29		37	G	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G
5	G	G	G	G	G	G	33	38	G	40	G	G	76	52	G	G	G	G	G	G	G	G	42	34
6	30	29	G		G	G	G	G	41	48		G	47	45	G	61	48	42	51	G	G	G	39	N
7	40	G	G	G	G	G	G	39	G	73	60	G	G	G	50	G		G	G	G	38	G	G	G
8	G	G	11	G	G	G	35	39	G	49	47	80	78	G	G	42	59	42	30	39	34	29	G	G
9	G	G	G	G			G	G	41	42	G	G	G	G	G	G	G	G	G	26	31	40	30	23
10	46	31	G	G	G	G	G	G	G	G	62	44	G	G	G	G	37	48	90	30	32	27	33	30
11	35	G	G	24	26	G	G	G	45	61	86	G	G	41	41	G	G	G	G	32	G	G	G	G
12	G	G	G	G	27	33	G		38	G	G	G	48	66	G	G	49	46	34	G	G	G	36	43
13	G	G	30	G	30	G	G	G	54	48	G	G	G	G	G	G	G	G	38	38	G	G	G	G
14	G	G	G	G	G	G	G	38	G	G	G	G	G	G	G	G	G	26	41	44	G	G	41	29
15	30	G	G	G	27	G	29	G	G	39	40	G	G	G	46	G	G	G	G	37	53	36	40	40
16	34	31	32	60	43	40	30	G	46	48	50	G	G	G	G	72	G	G	G	G	G	108	60	33
17	30	36	31	28	G	G	G	G	G	54	G	G	G	G	G	G	G	G		35	35	38	48	29
18	32	33	G	26	30	G	G	G	G	G	46	G	G	G	G	G	30	G	30	G	59	G	G	48
19	28	G	28	G	G	G			37	G	G	41	41	48	G	G	33	G	G	G	G	G	G	27
20	33	34	G	25	25	29		53	G	G	G	48	G	G	42	41	53	39	34	G	G	71	G	G
21	28	29	G	G	G	35	26		36	G	G	G	G	G	57	62	51	36	G	G	G	29	46	G
22	33	25	30	31	30	32	34	G	G	G	46	G	G	51	41	40	38	30	G	G	G	27	28	48
23	40	44	30	26	24	G	G	G	G	51	49	54	G	G	G	G	39	49	37	38	26	32	31	G
24	28	28	G	24	G	G	G	G	G	53	45	45	G	G	G	G	G	G	G	G	G	G	G	24
25	G	G	40	25	26	32	28	33	41	44	G	G	G	G	G	G	G	G	29	31	G	G	G	G
26	G	G	G	G	G	G	25	G	G	G	40	G	G	G	G	46	G	37	42	68	71	71	38	27
27	24	29	26	29	G	24	27	30	49	44	40	52	89	66	79	85	G	G	68	50		80	73	44
28	32	30	30	G	G	G	26	38	G	G	G	G	G	G	G		30	44		34	43	32	G	29
29	G	G	24	G	G	G	G	35	39	55	G	G		G	40	37	34	11	G	G	G	G	G	28
30	G	28	57	30	39	33	32	G		40		G	G	40	G	G	32	G	G	30	33	68	32	G
31	G	G	G	G	G	G	30	G	G	G	G	G	G	G	G	G	29	28	30	G	G	G	G	29
	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	31	30	30	29	28	28	30	30	28	31	30	31	30	30	30	31	29	31	30	31	31	30
MED	28	G	G	12	G	G	13	G	G	40	G	G	G	G	G	G	15	11	27	26	G	G	28	26
U Q	33	30	30	26	28	30	30	38	41	49	46	G	G	41	41	41	37	39	37	37	33	36	39	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 Wakkanai

OCT. 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	14	14	14	14	14	14	14	15	14	15	18	18	14	15	15	14	14	14	14	14	14	14	14	16
2	14	14	14	14	14	14	14	18	16	15	18	21	20	18	17	14	16	17	14	14	14	14	14	14
3	14	14	14	15	15	17	14	15	17	17	20	22	20	20	17	15	14	18	14	14	17	16	14	15
4	15	14	18	17	14	14	14	14	17	18	22	22	18	22	18	20	18	15	14	14	16	18	17	15
5	14	17	16	15	14	16	14	14	20	18	18	22	18	18	15	15	14	18	14	14	14	15	14	14
6	14	14	15	14	14	14	21	16	17	16	14	23	14	20	21	20	14	14	14	14	14	14	14	14
7	14	16	15	14	14	15	20	14	14	20	21	22	20	16	17	14	15	18	14	14	14	14	14	17
8	14	14	14	14	14	15	14	18	14	20	20	20	21	21	20	17	16	14	14	14	14	14	14	18
9	15	14	14	14	14	14	15	20	14	17	18	18	17	18	14	15	15	16	14	17	14	14	14	14
10	14	14	17	15	15	16	20	26	14	14	18	20	18	20	21	15	14	14	14	14	14	15	14	15
11	14	15	15	17	18	15	20	15	16	18	20	18	20	18	16	14	14	17	15	14	14	14	14	16
12	14	14	15	14	14	14	20	15	17	18	20	21	20	14	15	14	14	14	14	14	14	16	14	14
13	15	18	14	14	14	14	20	14	15	14	20	21	21	23	21	17	17	16	15	14	14	14	15	14
14	16	14	15	14	14	14	20	15	16	21	23	24	21	21	17	18	14	14	14	14	15	14	14	15
15	15	15	14	14	15	14	14	15	17	18	21	20	22	20	18	18	14	14	14	14	14	14	15	14
16	14	14	14	14	14	14	14	17	17	18	21	21	18	17	17	18	23	15	14	14	14	15	14	14
17	14	14	14	14	14	14	18	14	15	17	17	18	18	15	15	14	14	15	14	14	14	14	14	14
18	14	14	14	14	14	14	18	14	14	16	17	17	20	17	17	14	14	15	14	14	14	14	14	14
19	14	15	14	14	14	14	20	14	15	15	20	20	14	14	14	14	14	15	14	14	14	14	14	15
20	14	14	14	15	15	14	14	14	18	20	32	24	21	22	15	14	14	14	14	14	14	14	14	14
21	14	14	14	14	14	14	18	14	14	14	21	17	18	20	17	14	14	14	14	14	15	15	14	16
22	14	15	14	14	14	14	14	14	15	18	20	20	18	17	17	14	14	14	14	14	15	14	15	14
23	14	14	14	15	14	14	16	17	14	17	17	18	18	18	18	15	15	14	14	15	15	14	15	16
24	14	15	14	14	15	14	15	14	14	14	17	20	14	15	14	14	15	14	14	16	16	15	14	14
25	14	14	14	14	15	14	16	14	14	15	17	18	18	17	14	14	14	15	14	14	15	15	14	16
26	14	14	14	14	14	18	16	14	14	18	20	18	20	15	14	14	16	14	14	14	14	14	14	17
27	14	14	15	14	14	15	17	14	14	18	18	20	18	18	16	15	14	14	14	14	14	14	15	14
28	14	14	14	14	15	16	16	15	16	16	22	20	18	18	16	15	14	14	15	14	14	14	16	16
29	17	14	14	14	14	14	16	14	14	16	14	17	14	18	17	14	14	14	15	14	15	15	17	15
30	14	15	14	14	14	14	14	14	17	14	17	17	18	18	14	14	15	14	17	14	14	14	14	15
31	14	14	15	14	14	15	16	14	14	14	14	15	20	18	15	14	14	15	14	14	14	14	17	14
	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	14	14	14	14	14	16	14	15	17	20	20	18	18	17	14	14	14	14	14	14	14	14	15
U Q	14	15	15	14	15	15	20	15	17	18	21	21	20	20	17	15	15	15	14	14	15	15	15	16
L Q	14	14	14	14	14	14	14	14	14	15	17	18	18	17	15	14	14	14	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Kokubunji

OCT. 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			71	66			70	110		135	131	137	122	111	110	106	106	100	78	65	64			51
2	47	32	37	A	23		46	69	62	68	61			45	57	63	67	A	75	64	61	57	49	52
3	51	54	57	53	46	42	67	113	106	110	107	102	101	96	100	102	98	90	74	72	66	51	45	40
4	41	43	38	37	34	37	54	55	73	77	77	84	85	92	85	80	77	86	74	54	54	54	61	54
5	53	51	54	54	46	51	72	93	96	106	102	115	124	117	107	112	105	104	83	64	62	54	51	54
6	48	52	47	42	41	45	74	106	120	130	127	131	135	128	122	117	112	108	84	76	62	48		
7	42	A		44	44	42	73	91	117	121	134	142	134	128	124	125	130	121	96	76	66	52	62	54
8	55		51	48	48	45	53	81	87	76		81	74	73	74	74	81	72	61	52	57	52	52	54
9	61	52	49	46	42	43	66	101	119	123	120	127	124	125	118	100	96	102	84	67	57	61	52	51
10	41		46	47	39	43	63	114	133	131	124	121	115	121	124	113	112	96	78	66	67	66	54	52
11	51	53	51	53		49	66	88	112	118	126	120	116	105	98	100	101	95	73	66	66	53		46
12	44	44	44	44	42	43	73	91	116	114	117	125	115	123	121	112	114	103	82	66	63	62	61	51
13	54	53	55	52	47	51	82	101	117	121	131	134	130	130	133	123	123	110	81	83	73	64	51	53
14	48	47	48	51	45	47	72	107	118	118	126	128	127	116	115	113	116	106	97	87	84	78	54	66
15	52	55		52	48	34	66	107	128	136	138	134	130	134	123	121	120	112	91	80	74	76	82	54
16	58	54	54	53	51	55	80	94	114	114	130	141	131	128	134	126	125	114	90	81	78	73	66	54
17	50	55	57	52	54	46	78	115	114	112	135	143	142	136	136	136	134	123	103	82	71	66	66	66
18	55	55	55	61	51	57	81	104	126	116	131	143	142	137	124	132	124	117	102	82	80	62	66	66
19	61	54	62	55	51	51	76	94	108	118	137	142	128	124	132	130	127	121	84	77	77	74	73	54
20	54	59	51	52	52	52	73	95	102	117	125	135	130	131	134	126	123	121	96	77	65	66	66	54
21	55	54	68	66	55	45	69	112	114	112	121	134	131	136	131	117	118	114	90	73	64	64	64	59
22	54	51	51	52	48	51	80	100	97	112	115	118	115	128	126	121	113	104	80	72	66	51	53	53
23	54	54	55	52	47	49	82	121	151	127	112	117	127	122	125	125	116	101	69	65	64	54	52	54
24	52	51	47	51	47	47	66	108	130	122	136	137	134	128	124	127	116	94	85	90	71	66	66	61
25	64	65	64	55	56	55	54	97	113	121	131	136	143	148	145	121	100	94	78	63	51	43	43	43
26	38	45	42	41		32	51	117	120	118	116	138	141	143	127	126	121				62	47	45	48
27	45	43		42	37	27	55	84	106	131	135	134	141	140	130	121	115	101	73	75	76	51	48	51
28	51	43	45	39	41		46	93	125	144	147	145	151	147	131	117	117	97	77	62	58	63	62	49
29	51	52	49	45	44	45	64	101	124	131	141	134	136	126	116	122	114	94	67	72	76	53	51	54
30	53	55	51	54	48	46	68	105	108	124	132	131	130	136	130	121	115	100	86	76	64	53	47	45
31	47		48	52		34	61	87	115	135	126	130	124	127	130	123	112	97	97	80	53	50	50	48
	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	26	28	30	27	28	31	31	30	31	30	30	30	31	31	31	31	29	30	30	31	30	28	30
MED	52	52	51	52	47	46	68	101	114	118	126	134	130	128	124	121	115	102	82	72	65	56	54	54
U Q	54	54	55	53	51	51	74	108	120	130	134	137	135	136	131	125	121	113	90	80	73	66	65	54
L Q	47	47	47	45	42	42	61	91	106	112	117	121	122	117	115	112	105	95	75	65	62	52	50	51

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Kokubunji

OCT. 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	28	G	G	G	G	50	42	42		G	G	G	G	G	G	G	G	28	38	35	29	31	27	G
2	29	G	45	56	34	49	35	37	G	G	G	44		G	G	47	40		35	G	28	28	25	G
3	G	G	G	G	G	G	G	40	40	45	52	G	G	G	G	G	G	30	27	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	57	52	G	G	G	G	G	40	36	26	G	G	44	50	G
5	G	24	G	G	G	G	32	40	G	G	G	G	76	G	G	G	G	G	26	28	G	26	29	28
6	29	35	30	33	24	G	33		G	G	49	G	G	G	53	G	G	44	36	61	40	29	71	53
7	40	60	66	28	G	G	G	G	G	G	G	G	49	49	50	48	43	34	30	31	27	34	24	26
8	26	G	G	G	G	G	G	G	G	45		G	G	49	G	G	43	45	48	40	26	G	32	39
9	39	G	29	G	G	G	G	G	G	50	G	47	G	G		48	G	27	G	G	G	G	G	39
10	39	59	35	30	G	G	G	36	43	45	G	G	G	G	G			31	G	G	26	27	G	G
11	G	G	G	30	39	G	G	G	43	52	48	55	71	52	G	49	47	70	53	42	30	37	60	G
12	G	27	29	31	23	29	G	G	G	G	G	G	G	G	G	G	40	G	25	25	G	42	23	27
13	G	28	G	G	G	G	G	G		G	G	G	G	G		86	38	40	52	34	47	43	31	33
14	28	G	G	G	G	G	28	G	40	G	G	G	G	G	G	G	55	G	24	27	26	G	26	30
15	G	G	G	G	G	G	G	G	G	46	56	G	G	G	48	G	51	54	48	58	G	G	G	30
16	26	G	26	26	23	G	G	G		48	G	G	G	G	G	G	47		26	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	89	G	G	G	G	G	G	38	52	50	33	35	G	32	31
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	G	G	G	G	G	28
19	26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	33	58	33	G	29	G	G	G	G	G	G	G	50	44	G	G	G	G	G	G	34	G
21	G	32	G	G	G	G	G	36	G	G	G	47	G	G	45	51		G	G	22	G	G	G	G
22	G	G	G	G	G	G	G	G	G	48	52	48	G	G	G	G	33	58	34	36		G	26	22
23	G	G	G	G	G	G	G	G	G	G	50	G	G	G	G	G	36	G	43	51	G	G	G	G
24	G	G	G	26	27	G	G	G	G	G	G	49	67	57	G	G	67	46	26	46	57	G	G	G
25	G	27	40	48	33	G	30	53	55	68	57	60	43	G	G	G	40	47	30	G	G	31	G	G
26	G	G	70	G		G	G	G	G	G	G	G	54	60	68	57	45			61	29	G	G	34
27	33	31	46	29	G	G	28	G	39	52	80	78	53	56	49	47		71	61	31	81	47	30	G
28	G	G	G	G	G		G	39	45	G	G	G		G	G	G	36	34	34	G	48	G	29	24
29	G	28	G	G	G	G	G	34	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	29	29	30	26	G	G
31	G	70	33	G	37	G	33	G	G	G	G	G	G	G	G	G		31	49	28	26	G	G	G
	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	31	31	31	31	30	30	31	30	28	31	30	31	29	31	29	30	27	28	30	31	30	31	31	31
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	32	30	28	26	G	23	G
U Q	28	28	33	29	23	G	28	36	20	48	49	44	22	G	23	47	43	45	43	36	30	31	30	30
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

OCT. 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	13	13	13	18	13	13	13	15	21	38	39	39	22	18	15	17	17	13	13	14	14	13	14
2	13	14	13	13	13	13	13	14	17	20	21	28		25	25	17	13	13	13	14	13	13	13	
3	15	14	15	13	13	13	22	14	17	30	30			28	22	20	13	15	13	13	14	13	13	14
4	14	14	14	14	15	18	21	13	17	21	30	29		17	40	34	17	14	13	14	13	13	13	13
5	14	13	13	14	13	13	13	13	34	23	37	29	29	40	20	15	13	15	14	13	13	13	13	13
6	13	13	13	13	14	14	15	13	21	20	33		30	20	34	18	14	13	13	13	13	13	13	13
7	13	14	13	13	13	13	13	13	15	17	20	25	25	17	20	15	14	13	13	13	13	13	13	13
8	14	15	13	18	13	13	20	14	17	20	13		40		22	20	13	13	13	13	14	17	13	13
9	13	13	13	14	17	14	20	14	18	21		26	23		20	14	13	14	17	13	14	13	13	13
10	13	13	13	13	14	13	20	14	18	30		41			35	18	14	14	14	13	15	13	14	13
11	13	13	13	13	13	15	14	13	18	20	33	34	30	23	18	17	13	13	14	18	13	13	13	14
12	15	13	13	13	13	13	20	18	18	21	21	43		38		17	15	13	14	14	13	13	15	14
13	15	14	14	13	14	17	13	14	17	17	24		22		30	20	18	13	13	13	13	13	13	13
14	13	13	14	15	17	14	20	14	18	42	43	43	44	21	18	20	17	14	14	13	14	13	13	13
15	13	17	13	13	13	13	20	14	14	21	21	25	41		30	22	15	13	13	14	28	14	17	13
16	20	13	13	13	13	14	20	17	18	20				40	34	20	14	13	14	13	14	13	13	14
17	14	18	13	13	13	15	18	14	17	18	23		40	39	23	21	13	13	13	14	13	15	13	13
18	14	13	13	14	13	13	20	18	15	20			40	28	34	21	14	13	14	15	14	15	14	14
19	15	14	14	14	17	15	20	18	17	21	39	40	40	39	14	13	13	18	14	13	18	13	14	13
20	14	17	13	13	13	14	14	24	33	24	40	40	42	42	22	21	18	18	13	13	14	14	13	17
21	15	13	13	13	13	14	20	13	17	22	30	29	29	39	24	22	14	17	14	13	14	13	15	14
22	13	14	15	14	13	14	20	13	18	34	23	34	40	31	21	18	15	13	13	13	13	13	13	14
23	13	13	13	13	13	13	18	14	17	17	30	40	21	38	24	20	13	17	13	13	13	13	25	13
24	13	14	20	13	13	20	17	14	17	18	18		20	34	23	31	20	13	13	14	14	17	13	17
25	26	13	13	13	14	17	14	17	17	20	29	21	25	22	17	14	13	13	13	15	15	13	14	14
26	14	14	13	13	18	18	18	25	17	21	20	30	21	33	21	15	13			13	13	14	14	14
27	14	14	13	13	18	18	17	13	18	23	33	26	34	33	31	23	15	14	13	13	13	13	13	18
28	17	21	15	13	17	13	18	14	15	18	23			24	22	30	13	14	13	13	13	13	13	14
29	18	15	14	14	13	14	17	13	18	20	21	18	18	39	34	20	25	17	13	13	13	13	14	13
30	20	13	26	13	14	13	18	13	17	18	18			36	34	17	25	13	13	14	13	14	17	14
31	15	15	13	13	13	13	17	13	15	17		42	40	24	22	21	14	13	13	13	13	13	13	14
	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	31	31	31	31	31	31	31	31	31	31	26	21	23	26	30	31	31	30	30	31	31	31	31	30
MED	14	14	13	13	13	14	18	14	17	20	26	30	30	32	22	20	14	13	13	13	13	13	13	14
U Q	15	14	14	14	15	15	20	14	18	22	33	40	40	39	31	21	17	15	14	14	14	14	14	14
L Q	13	13	13	13	13	13	14	13	17	18	21	26	23	23	20	17	13	13	13	13	13	13	13	13

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Yamagawa

OCT. 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	66	63	71	66	47	42	53	94	108	136		138	140	135	132	133	111	108	91	77	110	118		
2	86	51	69	67	51	48	54	72	93	78		80	74		74	70	70	72	73	72	55	54	60	61
3		61	66	72	51	40	45	82	98	126	114	130	111	111	113	82	113	116	84	78	66	49	44	36
4	38	47	43	42		37	44	77		111	110	104	111			87	86	92	84	72	64	62	64	52
5	50	48	50	47	37	40	54		104	110	112	128	130	137	126	121	114	115		79	66	64	60	54
6	51	52	50	46	47	51	61	81	114	127	130	135	142	142	143	130	127	113	113	81	74	62	A	
7			52	45	42	34	51	79	113	114	116	140	148	142	147	148	147	136	110	86	78	76	66	73
8	52	55	54	57	54	54	54	84	111	130	129	130	137	131	116	111	112	111	87	64	76	76	72	66
9	66	67	51	51	47	46	57	86	125	130	129	134	143	148	151	152	114	133	123	86	71	76	61	58
10	52	48	52	52	44	49	50	81	117	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	112	117	127	133	150	115	127	124	127		111	83	80	84	63	51
12	52	54		51	43	42	51	80	113	114	113	111	126	142	128	122	111	118	110	79	77	77	77	65
13	67	52	55	48	43	44	55	82	114	114	114	128	129	148	145	142	128	124	110	82	80	76	72	67
14	52	52	50	51	51	48	54	87	116	111	116	130		128	127	116	115	114		84	86		78	80
15	77	73	72	74	54	51	61	91	121	134	149	142	148	142	136	134	114	115		86	78	81	85	63
16	65	66	64	67	54	58		81	112	127	150	146	130	149	145	144	141	133	114	81	86	80	81	74
17		61	52	61	51	37	48	114	87	87	128	147	148	136	142	142	138	130	128	85	76	77	74	76
18	76	72	66	68	66	55	50	82	114	114	115	142	153	174	142	144	137	130	128	87	80	79	77	74
19	73	61	54	54	66	43	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C				129						86	80	78	78	76
22	66	67	58	62	51	47	51	84	90											78	80	66	55	61
23	54	C	54	52	47	44	54						133	147	156	152	138	C	117	83	90	81	66	55
24	61	50	47	45	43	36	47	90	107	C	128	140	149	C	152		130	113		C	78	77	78	C
25	80	61	60	55	54	52	62	93	153	C	C	147	163	174	164	153	137	138	110	80	72	C	44	C
26	44	51		50	C	31	42	84		114	138	152	152	155	150	154	148	151		75	78	74	61	51
27	47	45	C	C	37	34	C	82	86	121	150	148	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	163	154	152	164	174	153	140	136	116		73	76	66	63
29	54	52	54	51	43	42	47	82	116	121	149	128	131	148	130	128	111	88	84	78	85	80	52	51
30	52	52	51	56	46	34	43	78	107	114	133	137	128	144	134	130	114	112		81	79	77	50	48
31	50	52	51	52	45	25	37	96	107	121	126	126	124	127	131	120	110	114	110		73	66	66	51
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	25	24	26	25	27	24	24	24	22	22	25	24	23	24	24	25	23	19	24	27	25	25	23
MED	54	52	54	52	47	43	51	82	112	116	128	135	138	142	139	132	115	115	110	81	78	76	66	61
U Q	66	62	62	62	52	49	54	88	115	127	138	144	148	148	148	146	137	133	116	84	80	79	77	73
L Q	51	51	51	50	43	37	47	81	105	114	115	128	128	131	127	120	111	112	87	78	73	66	60	51

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Yamagawa

OCT. 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	G	52	42	G	G	G	G	G	G	40	43	50	50	G	24	G	34
2	24	G	G		37	42	39	68	47	72	G	G	G	46	G	48	59	34	56	49	26	46	28	28
3	G	G	G	G	G	G	G	G		G	53	47	G	46	G	G	43	51	50	34	G	G	G	G
4	G	G	G	G		G	G	G	G	G	G	G	48			G	G	39	34	29	42	G	G	G
5	G	26	22	25	G	G	G	G	G	42	50	G	G		49	58	45	G	32	36	G	G	27	24
6		29	27	G	24	G	G	G	G	G	48	95	61	68	77	G	39	42	38	58	35	58	59	42
7	54	60	52	38	28	G	26	G	G	46	G	53	59	54	56	56	56	42	48	44	78	27	24	G
8	G	G	G	G	G	G	G			G	42	G	G	G	G	G	G	52	72	58	33	30	39	32
9	27	35	33	29	G	G	G	G	42	46	G	G	G	56	44	52	48	40	66	77	35	41	36	41
10	27	G	G	30	G	G	27	G	41	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	54	G	49	61	61		77	79	70	51	29	40	40	33	58	41
12	33	38	54	39	29	24	27	52	G	G	G	G	51	50	G	G	43	35	G	G	G	G	G	G
13	G	G	G	G	G	G	G		G	G	G	G	G	G	53	48	45		26	38	40	52	36	33
14	43	34	G	25	23	G	26	G		G	G	G		G	G	G	G		G	23	G	G	G	G
15	25	25	G	G	G	30	36	34	48	G	G	G	53	54	54	55	50	40	33	38	34	25	G	G
16	G	G	G	G	G	G	G	G	G	G	51	G	G	G	G	G	G	34	28	38	42	56	36	44
17	40	35	32	32	30	G	G		38	41	55		50	47	G	G	41	43	29	24	59	32	G	60
18	24	G	G	G	G	G	G	G	39	42	G	G	G	G	G	G	G	G	G	26	30	G	G	G
19	G	G	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G		35	42	92	29	G	27	33
22	25	G	G	G	G	G	G	G	G	G	G	55	G	52	48	62	51		32	G	40	36	28	G
23	32	C	G	G	G	G	G		G	49	G	G	G	G	G	51		C		36	54	28	29	G
24	26	28	G	G	G	G	G	G	G	C	G	G	45	C			39	G	24	C	G	24	32	C
25	37	G	G	G	G	G	G	G		C	C	G	49	50	73	70	52	37	40	32	28	C	G	C
26	40	30	51	38	C	28	26	G	G	44	57	51	50	G	G	G	G	30	G	11	28	34	32	33
27	42	G	C	C	28	G	C		G	50	58	73	C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	42	G	G	84	G	G	40	35	76	71	67	32	G	G
29	G	G	G	G	G	G	G	G		G	G	G	G	G	G	42	40	42	37	24	G	G	G	G
30	G	G	G	G	G	G	G	G		G	G	G	G	G	G	46	48	38	25	G	G	G	G	G
31	G	G	G	G	G	33	24	G	G	G	48	61	75	58	G	G	G	49	71	42	G	G	23	23
	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	26	25	25	27	25	21	21	24	27	27	26	23	25	26	25	23	26	26	27	26	27	25
MED	24	G	G	G	G	G	G	G	G	G	G	G	G	46	G	G	41	39	34	37	30	26	24	23
U Q	33	29	22	27	23	G	26	G	41	43	49	51	50	54	51	52	49	43	50	49	40	34	32	33
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	26	24	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

OCT. 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	15	14	15	15	14	15	15	16	18	16	22	28	48	46		24	17	16	14	14		14	20	14
2	15	14	14	14	14	14	14	14	15	16	22	54				22	17	15	14	14	15	14	14	14
3	14	15	16	15	14	15	14	14	15	21	28	30	44	35	38		17	14	14	14	14	14	15	15
4	15	14	14	15	15	14	15	14	14	17	29		24			38	18	16	15	14	14	14	15	14
5	15	15	15	15	15	15	14	14	24	20	26	28	44	28	22	18	14	18	14	14	14	14	14	14
6	14	14	14	14	17	15	15	15	16	18	20	34	33	33	33	27	20	15	14	14	14	14	14	14
7	14	14	14	14	14	15	16	15	15	17	42			18	18	15	14	15	15	14	14	14	14	14
8	15	14	15	14	14	15	15	16	15	18			46	42	39		20	16	15	15	15	15	15	14
9	14	14	15	14	14	15	15	16	16	18			23	39	24	17	16	14	14	14	14	14	14	14
10	15	16	15	14	17	16	14	16	15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
11	C	C	C	C	C	C	C	C	18		34	38	35	35	30	23	15	14	14	14	15	14	14	14
12	14	14	14	14	14	17	15	18	15	16	18					20	17	16	17	15	14	14	14	14
13	15	14	14	14	15	14	14	15	17	20	40		32	28	24	20	20	15	16	14	15	14	14	14
14	15	14	15	14	16	15	14	14	14	45	48	45		46			18	26	20	15	15	15	15	14
15	15	15	14	14	15	14	14	15	15	18			38	38	38	30	17	15	14	14	14	14	14	14
16	15	14	15	15	14	14	14	15	16	17	18		44	43			17	15	14	14	14	14	14	14
17	16	14	14	14	14	16	14	16	15	17	26	24	21	21		22	16	15	14	14	14	14	15	14
18	14	15	14	15	14	14	14	18	15	28	30		44	20	15	26	17	16	15	15	14	15	15	14
19	15	15	15	16	14	15	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
20	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
21	C	C	C	C	C	C	C	C	C	C		44			40	22	21	15	14	14	14	14	15	14
22	16	15	15	15	15	15	14	14	16	26	27	38	35	28	27	20	15	15	14	14	14	14	14	15
23	14	C	15	14	14	14	14	22	15	17			45	44		34	16	C	14	14	14	14	14	15
24	15	14	14	15	14	15	14	23	14	C	34	38	43	C	43		16	15	15	C	15	14	14	C
25	14	15	15	17	15	15	15	14	15	C	C	24	26	26	16	15	15	14	15	14	14	C	17	C
26	14	15	14	14	C	14	14	15	14	18	18	33	33		18	21	17	15	15	14	14	14	14	14
27	14	15	C	C	15	16	C	22	14	17	34		C	C	C	C	C	C	C	C	C	C	C	C
28	C	C	C	C	C	C	C	C	C	C	20	21	28	29	28	34	16	16	15	15	16	15	16	16
29	14	15	15	20	20	15	15	17	16	20	20		20	46			15	15	15	14	15	14	15	14
30	15	15	15	14	14	15	15	22	16	17		43	46	43	44		16	16	16	15	14	14	14	15
31	16	15	14	14	14	16	14	17	15	18	20	36		38	42	21	17	14	15	14	15	14	15	16
	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	26	26	26	26	27	25	26	27	23	21	16	21	21	18	20	27	26	27	26	26	26	27	25
MED	15	14	15	14	14	15	14	16	15	18	26	35	35	35	29	22	17	15	15	14	14	14	14	14
U Q	15	15	15	15	15	15	15	17	16	20	34	40	44	43	39	26	17	16	15	14	15	14	15	14
L Q	14	14	14	14	14	14	14	14	15	17	20	28	27	28	22	20	16	15	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Okinawa

OCT. 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	87	80	82	65	54	46	50	87	112	135	136	136	151	148	152		131	125	120	110			138	126
2		79	77	76	82	78	84	72	121	104	105	91	91	90	91	76	81	76	82	90	A	54	61	55
3	55	66	76	86	47	36	41		108	121	132	144	148	131	148	132	134	134	132	99	88	72	52	60
4	54	51	54	37		41	41	74	103	140	130	110	137	128	120	117	111	121	108	84	71		76	53
5	50	48	53	37	42	41	52	88	105	117	128	143	148	152	151	150	150		140	131	88	88	86	76
6	66	54	64	50	47	47	54	84	113	123	138	137	144	152	150	147	142	140	123	110	104	73	53	
7	51	53	62	55	38		41	80	105	120		140	156	170	170	173	171	152	144	142	108	104	88	88
8	87	76	73	63	63	64	64	87	128	146	131	142	154	148	143	141	140	142	128	110	107	102	88	88
9	86	83	74	70	51	42	53	89	126	C	C	C	C	C	C	C	C	150	144	144	108	109	88	77
10	66	66	66	66	52	47	47	83	116	C	C	C	C	C	C	C	C	C	142	142	131	140	109	89
11	85	70	77	77	76	51	51	88	110	132	148	146	150	144	145	140	147	146	144	135	130	130	128	108
12	100	96	76	72	53	47	53	90	110	118	124	126	135	146	146		141	142	135	131	108	108	107	102
13	87	84	74	60	51	45	53	91	116	126	140	143	143	160	170		146	144	144	131	131	124	110	88
14	78	66	58	60	54	52	54	87	117	121	127	131	132	136	139	134	137	128	124	124	130	144	108	88
15	106	88	87	86	54	52	64	90	124	140	147	146	148	145	150	145	140	131	126	109	104	110	108	88
16	74	78	72	73	61	58	54	97	122	126	140	147	139	151	157	172	148	147	143	136	124	128	108	107
17	101	87	87	86	57		38	101	102	102	131	147	145	144	148	171	146	151	137	107	102	108	102	104
18	106	101	87	89	88	75	53	87	117	125	136		146	170	150	171	148	151	148	141		145	129	120
19	107		76	85	81	44	45	85	102	111	137	147	144	147	165	148	174	150	143	144	146	144	109	102
20	87	80	75	71	58	37	43	88	115	112	142	147	141	147	160	150	148	147	144	145			142	
21	131	124		108	84	53	41	76	112		128	148	141	146	146	148	144	150	145	131	128	144	143	143
22	138		89	86	73	51	54	84	100	107	126	135	130	150	147	172	151	140	138	108	109	88	83	76
23	73	58	61	63	47	38	47	92		130	128	131	145	172	174	171	150	172	170	148		146	118	104
24	89	88	78	55	50		44	86	98	114	131		135	136	151	147	149	138	131	130	107	107		86
25		78	82	84	52	54	58	102	133	132	138	150	171	170	170		148	150	146	126	87	88	73	55
26	61	55	65	42	29		40	85	116	126	142	146	172	156	171	170	171	169	145	131	108	109	89	75
27	66	61	61	54	40	36	40	89	101	108	148	150	145	146	151	145	145	148	139	110	133	120	87	72
28	66	61	51	47	32		34	81	120	147	164	157	158		175	172	171	170	172	147	143	130	109	104
29	87	87	78	72	54	46	44	81	106	116	135	150	141	146	158	144	131	127	109	108	109	126	90	86
30	65	72	73	66	46		35	80	111	121	146	151	147	157	170	159	146	144		143	130	130	88	73
31	68	66	72	72	44		31	78	114	132	134	132	134	145	144	141	135	140	147	138		127		88
	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	30	31	30	24	31	30	30	28	28	27	29	28	29	25	29	29	30	31	25	28	29	29
MED	85	76	74	70	52	47	47	87	112	122	136	144	145	147	151	148	146	144	141	131	108	115	102	88
U Q	94	85	78	84	61	52	54	89	117	132	141	147	149	154	167	171	149	150	144	142	130	130	109	104
L Q	66	61	64	55	47	41	41	81	105	115	129	135	138	144	146	141	138	136	128	110	104	103	86	75

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

OCT. 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	25	G	G	G	G	G	G	G	G		G	51	G	44	G	G	68	52	56	36	56	30	26
2	G	28	29	G	G	47	53	40	45	57	G	G	G	G	G	G	G	G	44	46	51	29	50	33
3	G	G	26	G	G	G	G	31	37	G	G	50	G	G	46	45	G	39	28	67	G	25	G	G
4	G	G	G	G		G	G	G	G	G	G	G	G	58	G	G	48	51	67	40	32	67	30	33
5	36	25	G	G	G	G	G	33	G	154	G	G	59	G	G	G	51		92	53	28	G	G	G
6	G	G	G	26	31	26	G	32	G	G	47	50	53	52	53	G	46	50	40	47	34	48	26	58
7	32	36	26	29	26	34	25	G	G	45	G	53	75	73	53	G	52	42	36	45	37	G	33	72
8	50	30	29	26	24	G	G	G	41	50	53	G	75	54	G	56	G	53	66	113	59	50	G	G
9	G	G	G	G	G	G	G	G	38	C	C	C	C	C	C	C	C	47	36	G	G	G	G	70
10	39	60	40	25	28	G	27	G	G	C	C	C	C	C	C	C	C	C	39	52	59	34	G	G
11	G	28	29	33	G	G	G	G	37	41	46	G	52	60	78	84	64	59	51	58	41	G	G	26
12	32	60	G	40	30	27	36		G	G	50	55	50	56	52	49	43	38	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	40	45	48	G	G		52	52	G	38	34	39	31	G	G	G
14	G	34	38	31	28	G	32	G	G	G	G	G	G	56	53	G	48	44	34	32	G	G	G	G
15	G	G	G	24	G	G	G	G	41	47	49	60	G	56	67	53	68	59	46	38	68	43	33	G
16	G	G	G	26	G	G	G	G	G	G	G	52	G	57	G	G	G	48	48	50	40	34	37	G
17	G	G	G	G		G	G		G	44	G	G	G	G	G	G	68	39	29	25	G	34	32	G
18	G	G	G	G	G	G	G	G		44	49	46	G	G	G	56	47	64	34	48	49	44	40	30
19	38		28	33	25	G	G	G	39	G	G	G	G	G	52	58	51	51	32	G	G	G	G	24
20	G	G	G	G	G	G	G	G	G	G	G	45	G	G	G	G		41	G	G	G	34	28	G
21	G	G	G	G	G	G	G	G	G	G	G	51	78	G	53	46	G	70	38	28	26	G	28	G
22	G	G	G	G	G	G	G	G	43	53	54	57	G	G	45	46	64	64	67	36	56	43	G	G
23	G	G	G	G	G	G	G	G	36	G	G	G	G	54	54	52	67	46	57	57	37	33	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	27	G	G	G
25	G	G	37	28	24	24	G	G	35	42		G	51	G	50	47	37	42	G	29	G	G	G	G
26	G	28	26	G	G	28	29	G	38		49	G	48	G	G	G	G	G	G	G	G	43	G	G
27	G	G	40	24	G	G	G	G	G	G		52	53	G	51		72	50	49	33	G	27	28	G
28	G	40	39	34	G		G		45	42		56	52	G	51	50	G		61	71	81	56	28	G
29	G	70	G	G	G	G	G	G		G	51	G	G	G	53	52	61	57	38	68	34	G	G	G
30	G	34	29	27	26		G	G	G	G	G	G	G	G	G	G	42	35	G	G	G	G	G	G
31	24	G	28	26	11		G	48	G	G	49	52	59	G	G	56	68	60	59	50	G	70	38	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	31	30	31	31	29	28	31	28	29	28	25	29	29	28	29	28	28	28	30	31	31	31	31	31
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	46	46	46	48	38	40	31	29	G	G
U Q	G	30	29	27	24	G	G	G	38	44	49	52	52	55	53	52	62	58	52	53	41	43	30	26
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	32	25	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

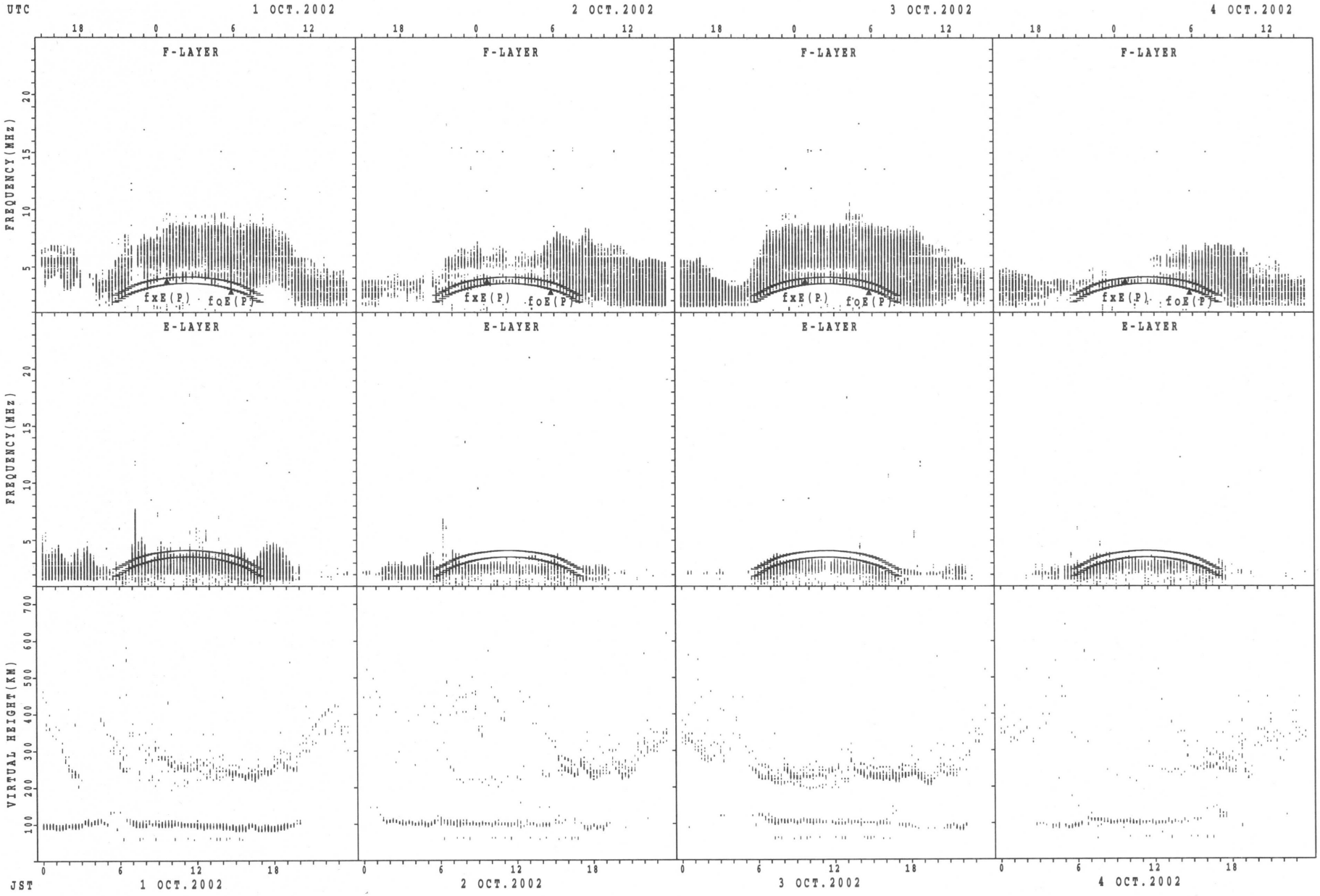
OCT. 2002

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

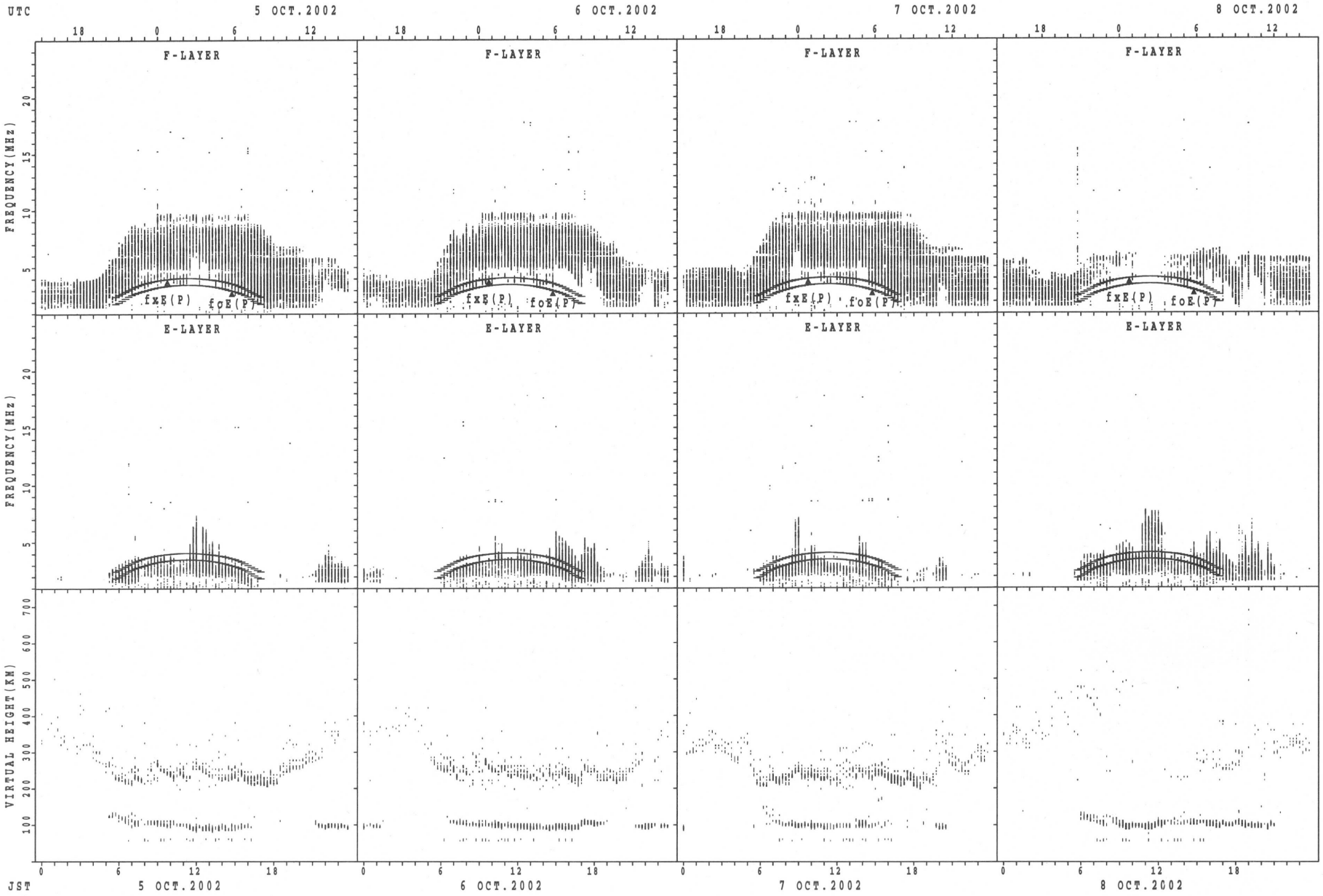
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15	14	15	14	15	17	18	28	23			44	27	21	18	15	14	14	18	14	14
2	14	15	14	14	14	14	14	14	15	21		28			43	35	21	16	14	14	14	14	14	14
3	17	16	14	14	14	14	14	14	17	20	29	32	52		33	27	18	14	14	14	14	17	15	15
4	16	17	15	14		15	15	15	15	18	39	45	27	21	48		16	14	14	14	14	14	14	14
5	14	15	18	14	14	15	14	15	28	20		29	28	29	26	40	18	14	14	14	14	15	15	15
6	23	15	18	14	14	14	15	16	18	20	21	30	38	32	39	28	32	17	14	14	14	14	14	15
7	14	14	15	14	16	15	14	18	17	18			39	39	38	27	14	14	14	15	14	16	14	14
8	14	14	14	14	15	17	14	17	17	33	29		39	40		20	16	14	17	16	15	16	20	17
9	16	15	15	14	15	18	15	17	18	C	C	C	C	C	C	C	C	16	17	15	15	14	15	14
10	14	14	14	14	14	15	14	18	18	C	C	C	C	C	C	C	C	C	16	14	15	15	17	15
11	14	14	14	14	17	15	15	15	17	22	27		39	39	34	21	17	16	14	14	14	16	15	15
12	14	16	15	15	14	15	14	14	15	20	21	40	42	39	38	23	18	18	17	14	15	14	15	15
13	14	15	15	14	14	15	15	15	17	30	33	32			35	21	18	16	14	14	14	17	15	14
14	17	16	14	14	14	14	14	23	18	42	48	53	54	40	40	22	18	16	14	14	16	15	15	15
15	15	15	15	14	14	15	15	26	17	21	35	40		40	38	36	30	16	14	14	14	14	15	26
16	29		15	16	23	15	14	23	14	18		38	42	41	43	26	23	24	14	15	15	14	14	15
17	15	15	15	15	15		15	23	16	20	23				21	18	20	17	14	14	14	14	14	20
18	17	15	18	21	14	14	15	23	26	30	36						28	14	14	14	14	14	14	14
19	14		14	14	14	18	14	15	17	20					29	20	21	17	15	16	14	15	14	14
20	15	15	14	15	15	17	15	18	32	20	44	43	44	54	43	40	22	17	14	17	15	14	14	17
21	17	21	20	15	15	16	14	15	15		42	37	40	53	39	29	18	16	14	14	15	15	15	16
22	15	15	16	14	15	14	14	15	17	34	35	38	44	44	38	22	18	15	14	14	14	14	21	20
23	17	17	15	14	14	15	21	21	15	18	30	41	39	41	27	27	18	14	14	14	14	17	14	15
24	17	16	14	14	18	21	15	14	14	24	23		42		43	24	20	15	17	14	15	14	14	15
25	14	14	14	14	14	14	14	18	16	20	21	27	27	24	20	18	21	14	16	14	18	16	15	15
26	17	15	14	15	17	14	14	14	16	20	22	26	30	29		35	20	15	15	15	16	14	15	17
27	17	16	14	15	18	16	16	23	29	18	35				29	24	21	16	15	15	14	14	15	14
28	15	14	14	14	20		15	14	15	22	28	27	29		24	27	22	17	14	15	14	14	15	18
29	15	15	14	15	14	15	15	22	16	20	23		24	29	22	18	16	14	14	15	14	15	16	16
30	23	14	14	14	14		18	22	17	20			43	43	45	23	18	17	26	15	15	14	14	15
31	16	16	14	14	16		17	14	16	18					17	33	15	17	16	14	16	14	15	14
	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	31	29	31	31	30	27	31	31	31	28	22	18	20	18	26	27	29	30	31	31	31	31	31	31
MED	15	15	14	14	14	15	15	16	17	20	29	34	39	40	38	26	18	16	14	14	14	14	15	15
U Q	17	16	15	15	16	16	15	22	18	22	35	40	42	41	43	29	21	17	16	15	15	16	15	16
L Q	14	14	14	14	14	14	14	15	15	19	23	28	29	29	27	21	18	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

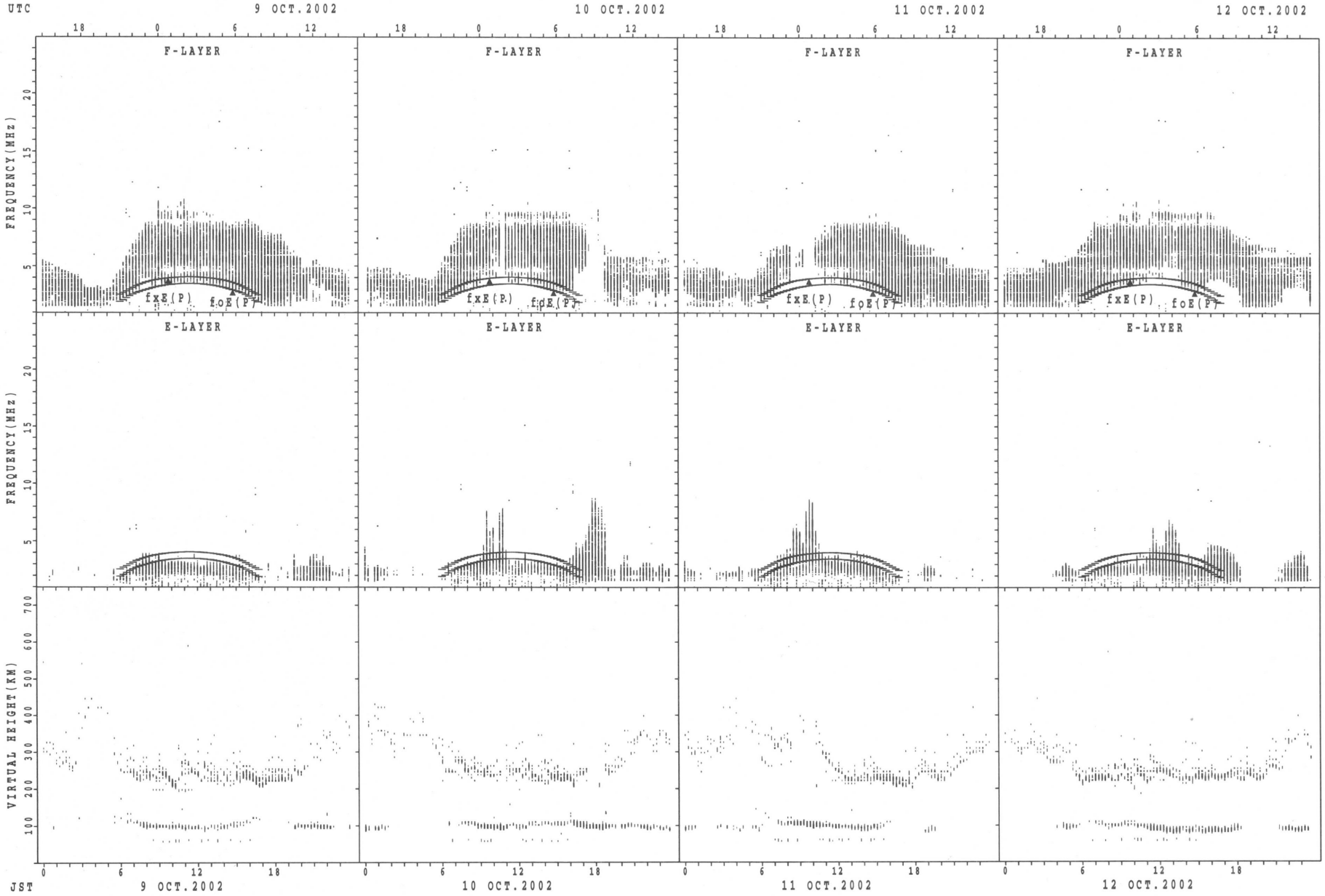
SUMMARY PLOTS AT Wakkanai



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

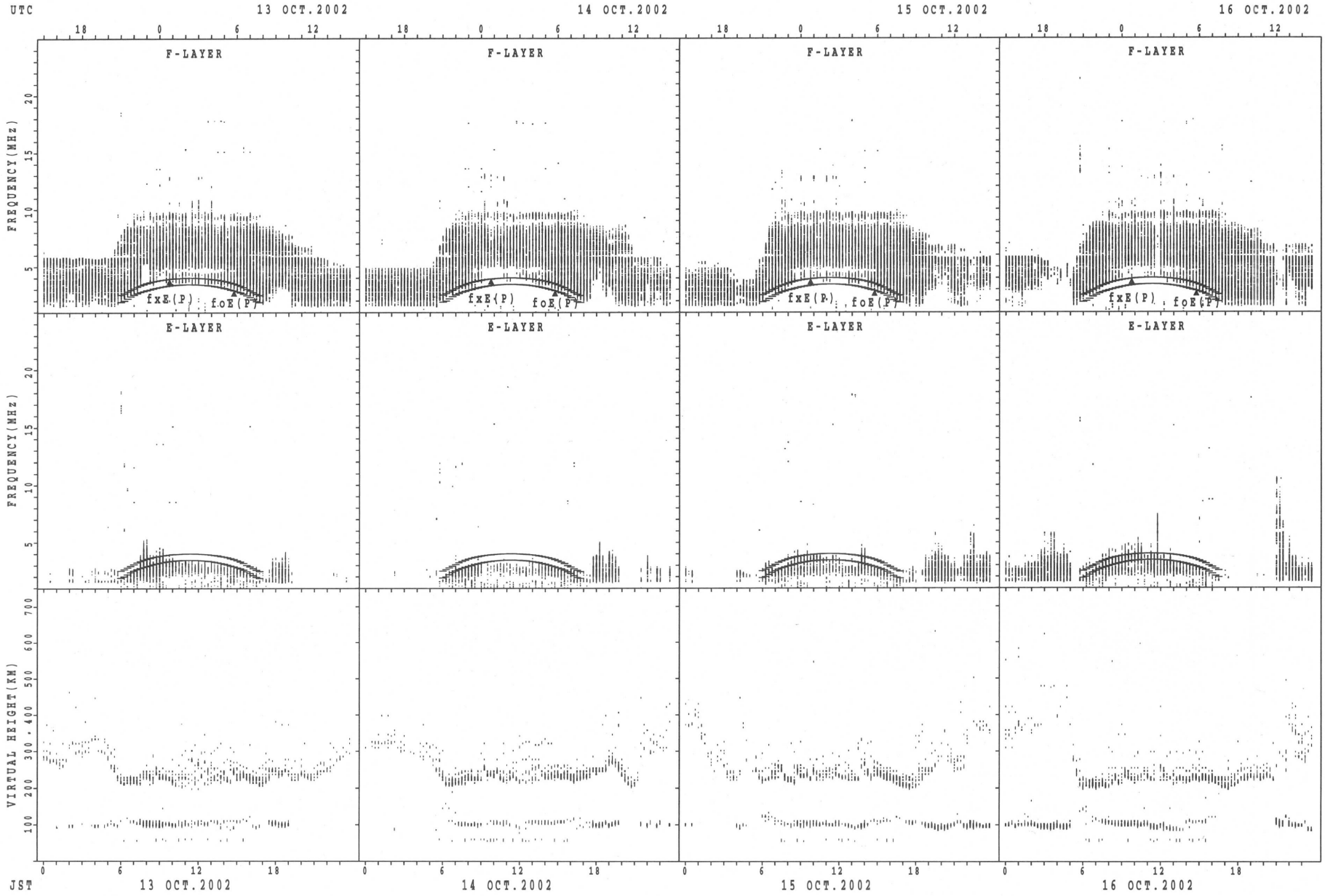

SUMMARY PLOTS AT Wakkanai
UTC
5 OCT.2002
6 OCT.2002
7 OCT.2002
8 OCT.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



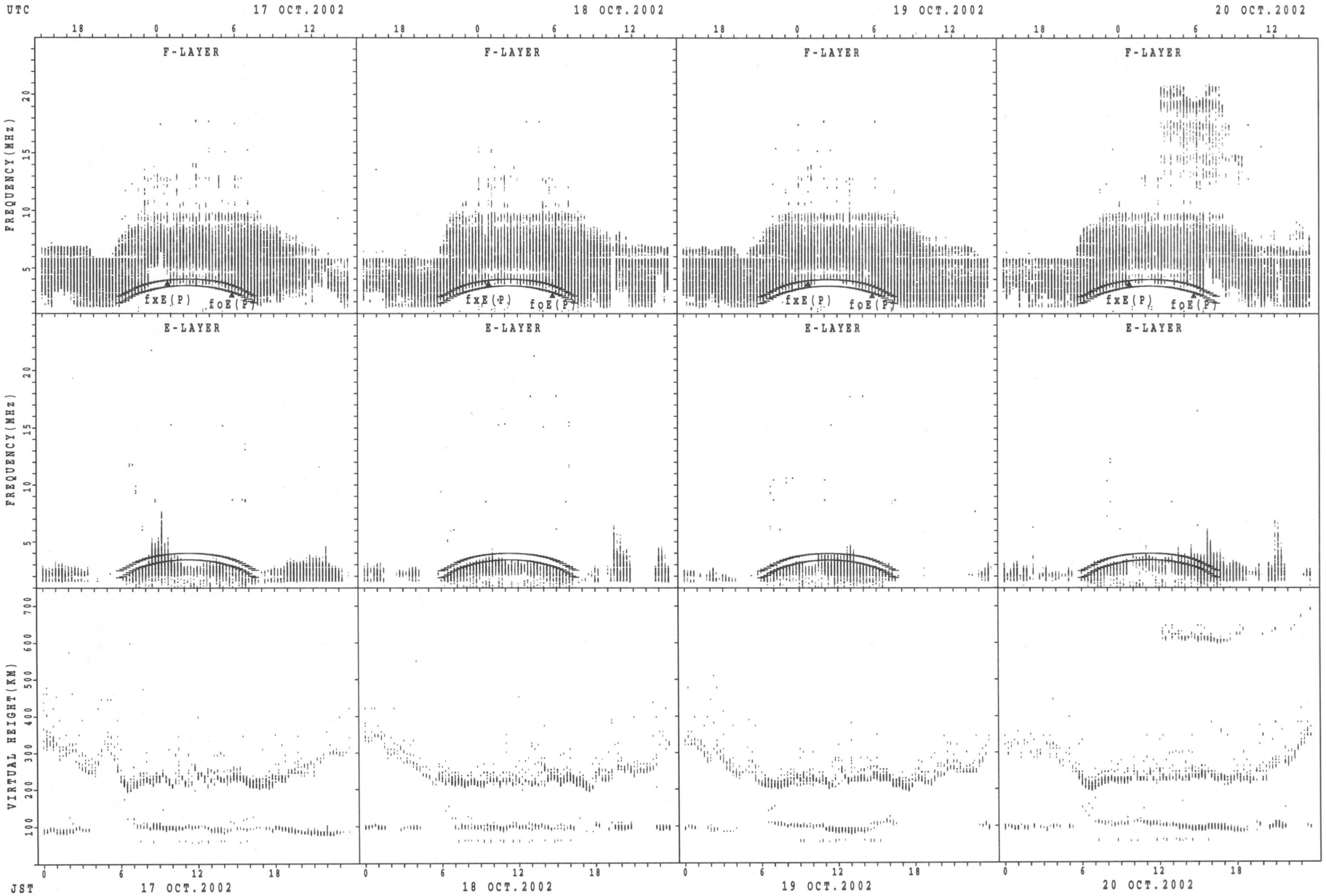
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



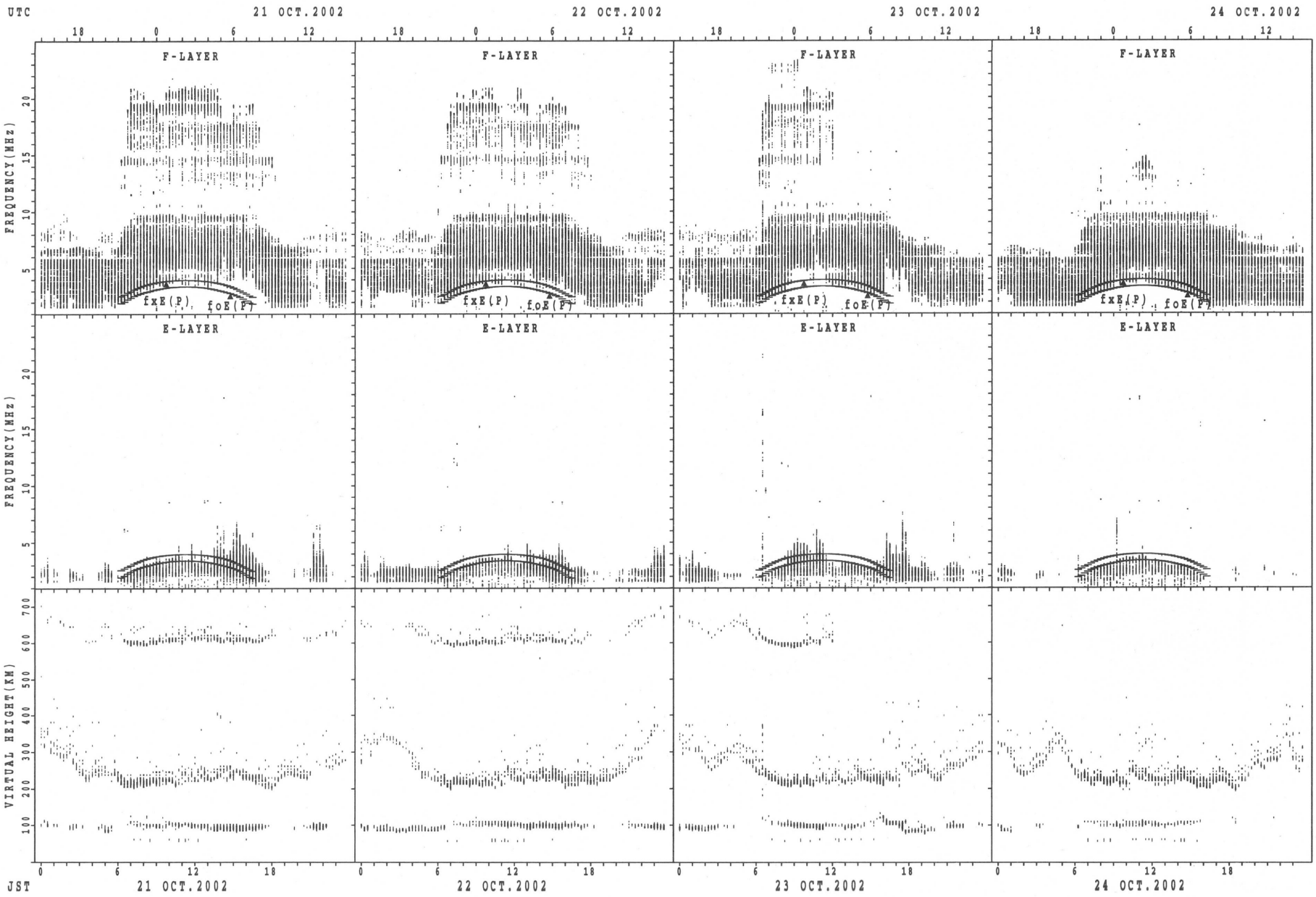
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

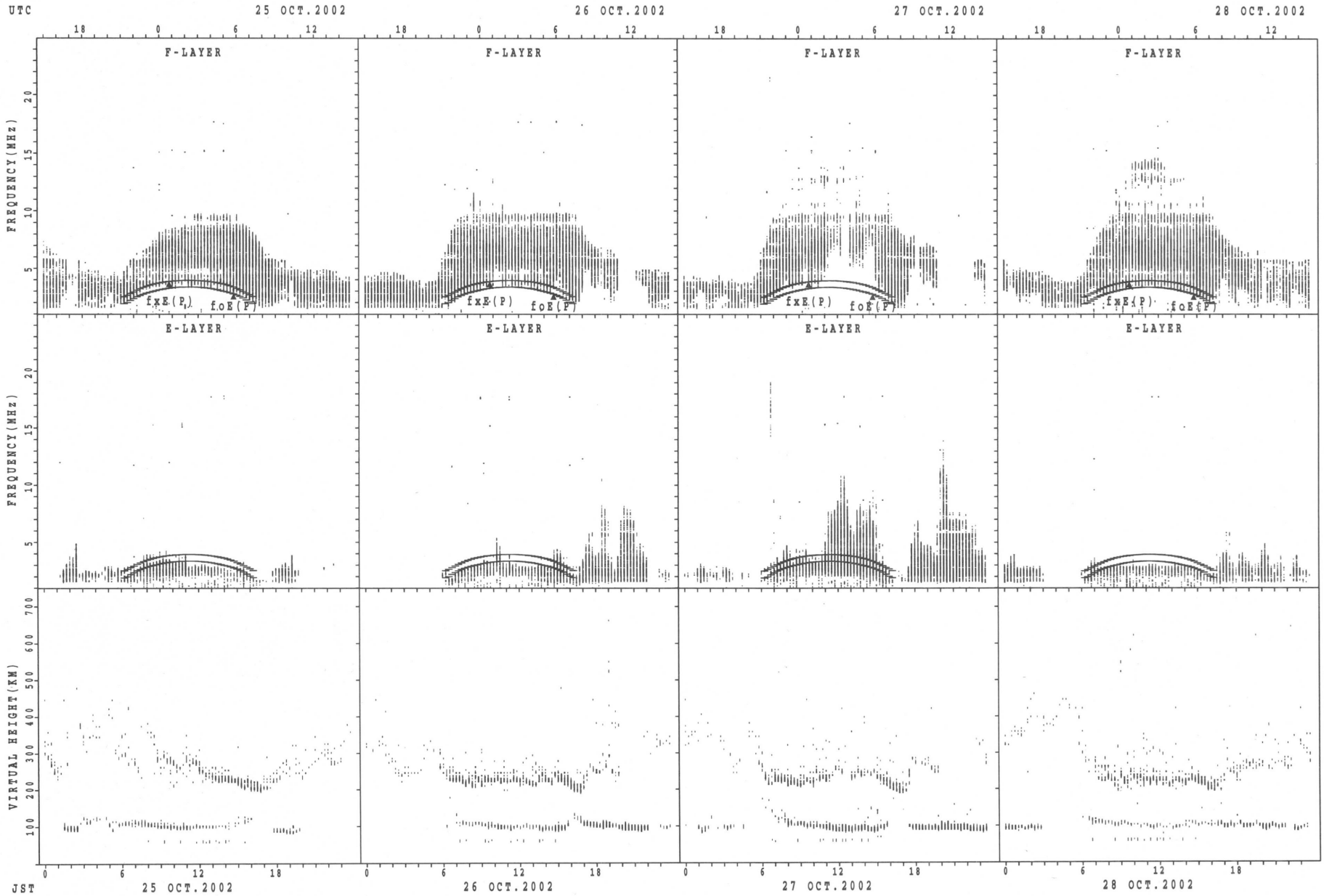


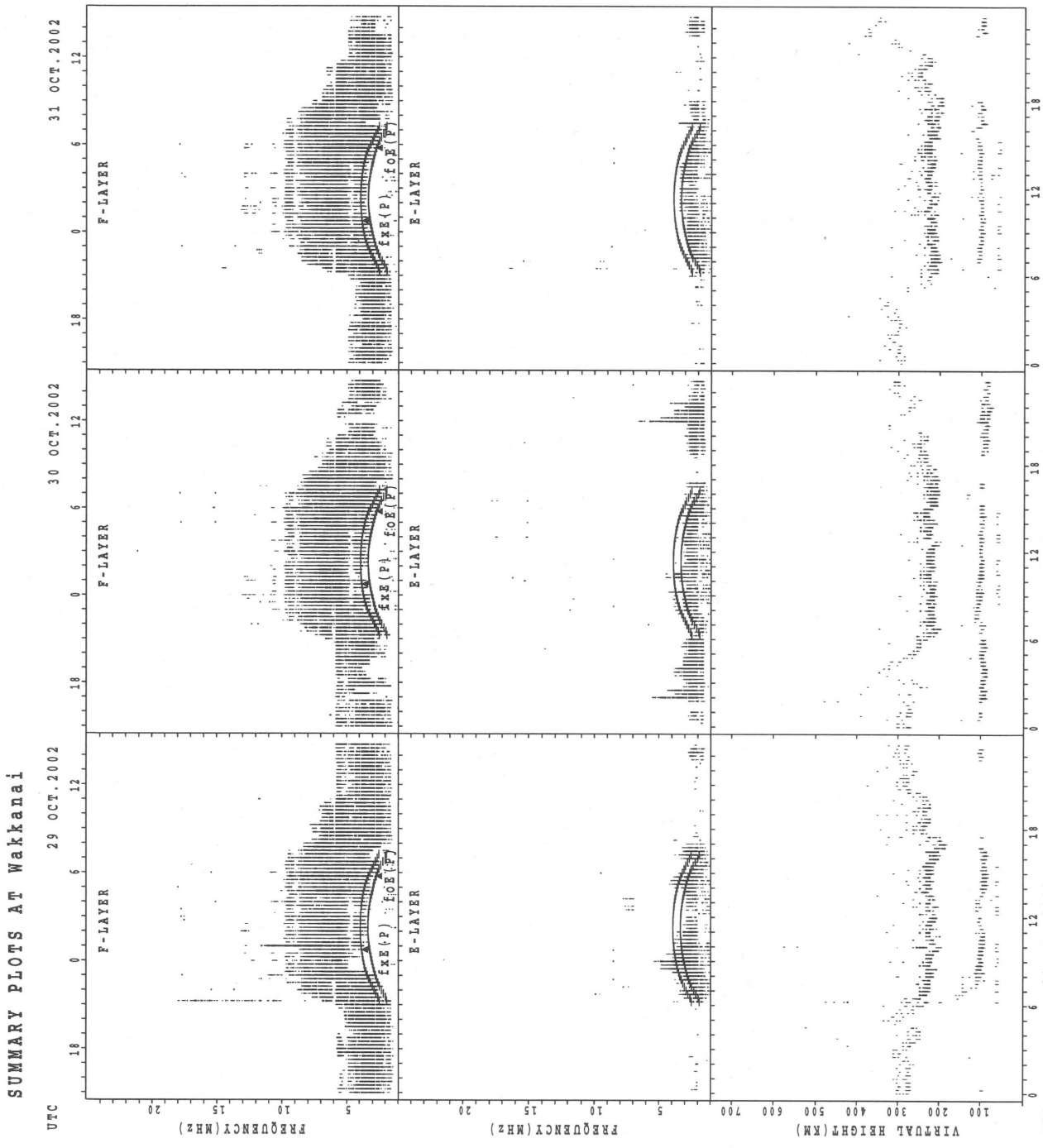
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

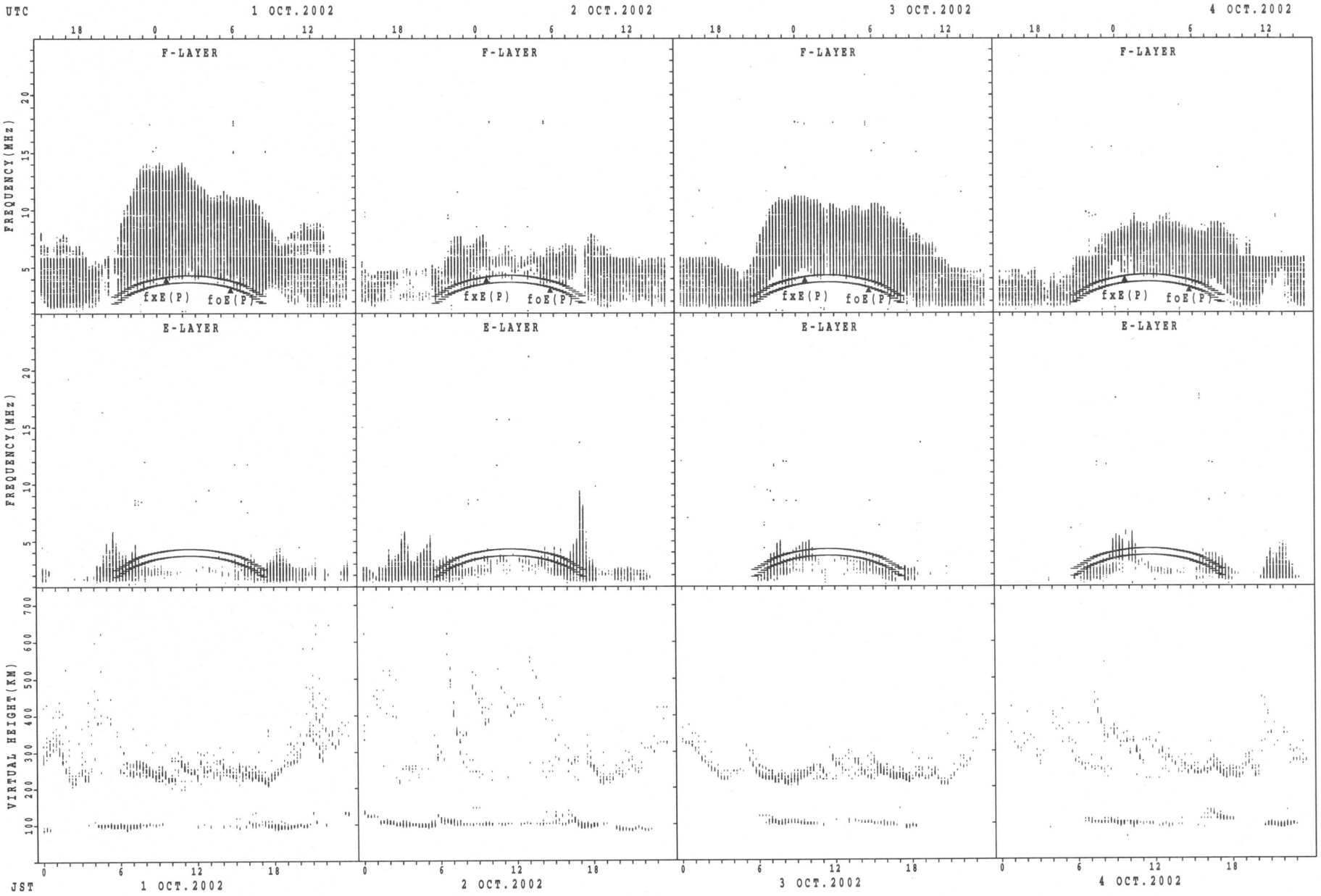


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
25 OCT.2002
26 OCT.2002
27 OCT.2002
28 OCT.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

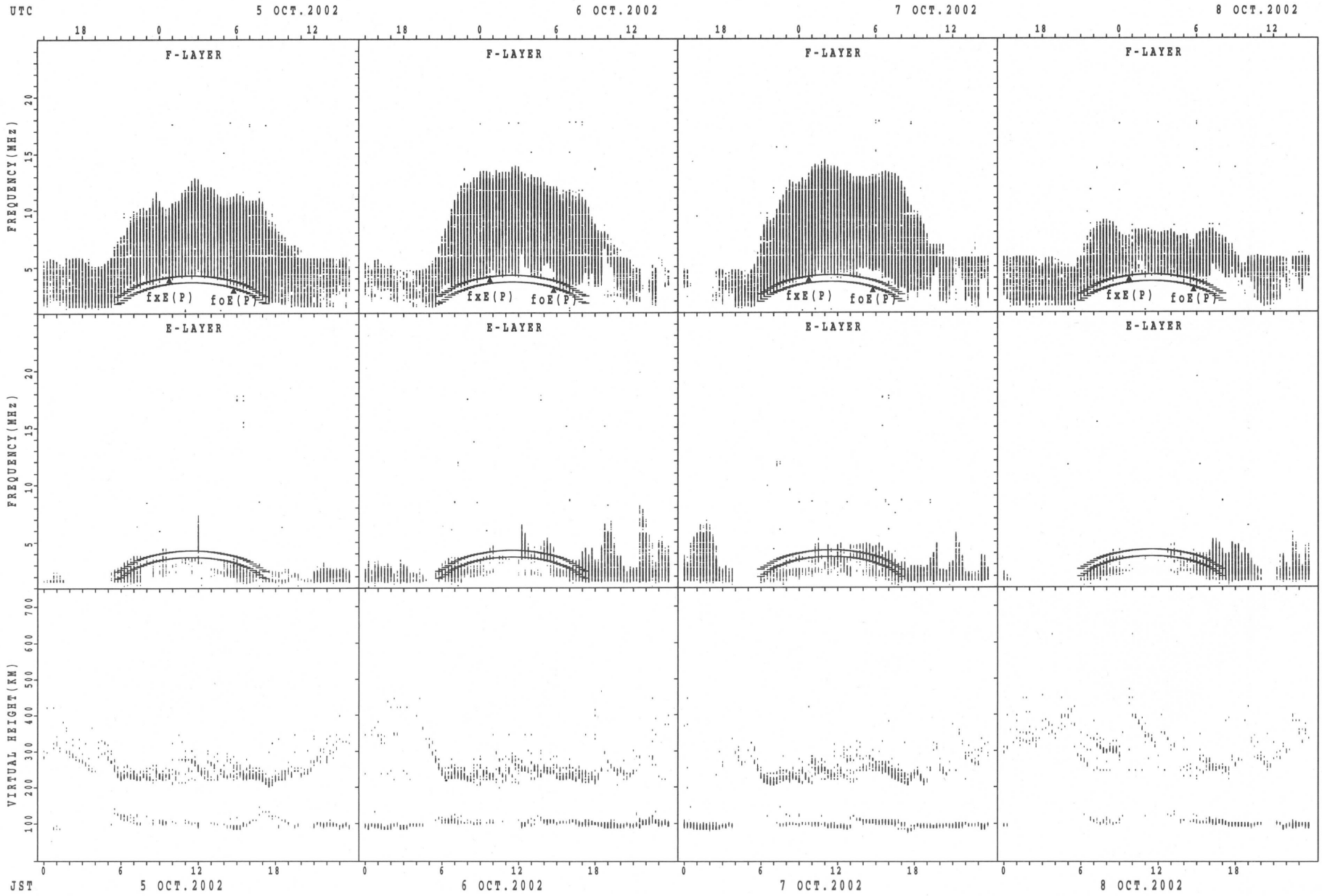

SUMMARY PLOTS AT Wakkanai
UTC
29 OCT.2002
30 OCT.2002
31 OCT.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) : PREDICTED VALUE FOR fxE
foE(P) : PREDICTED VALUE FOR foE
JST

SUMMARY PLOTS AT Kokubunji



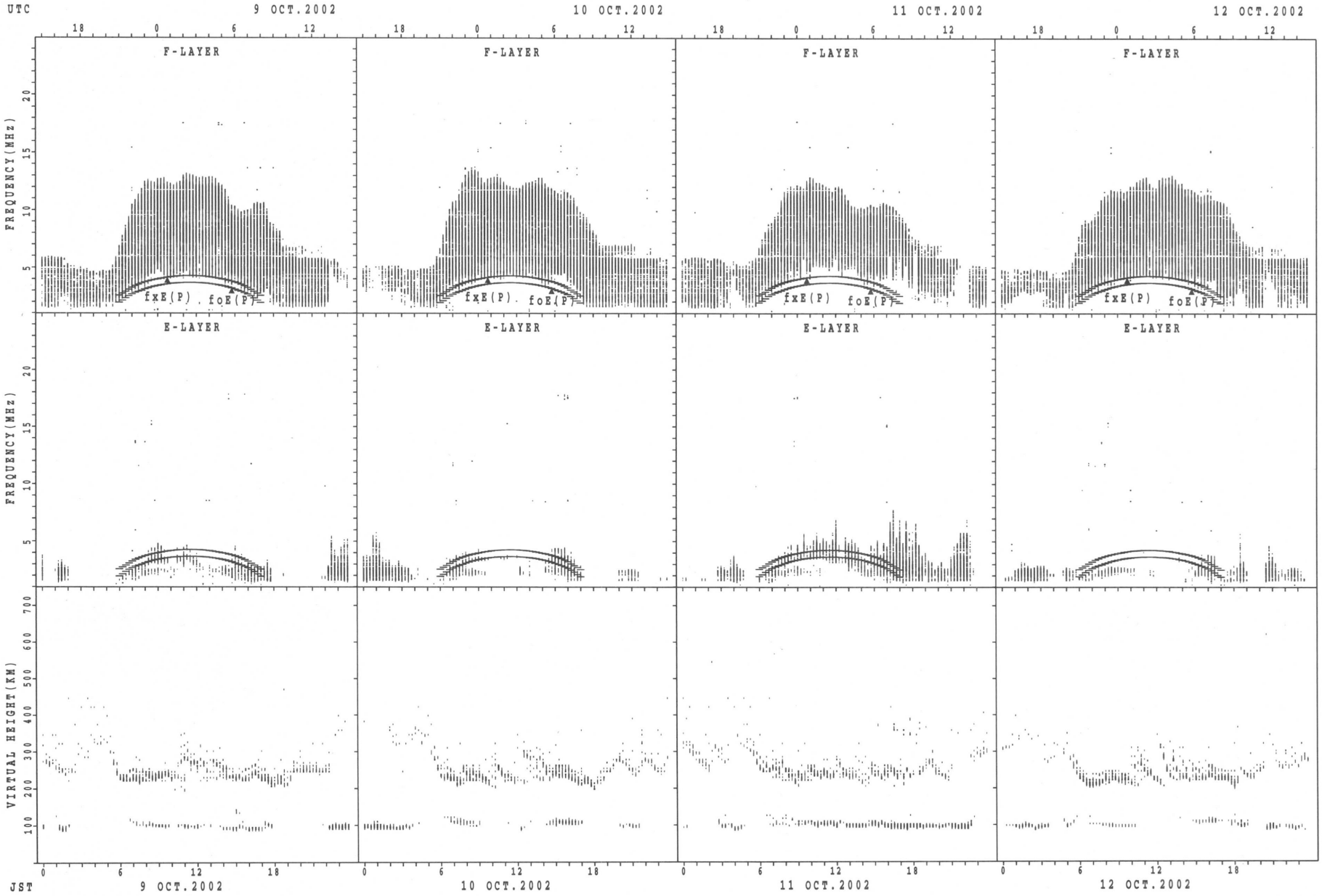
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



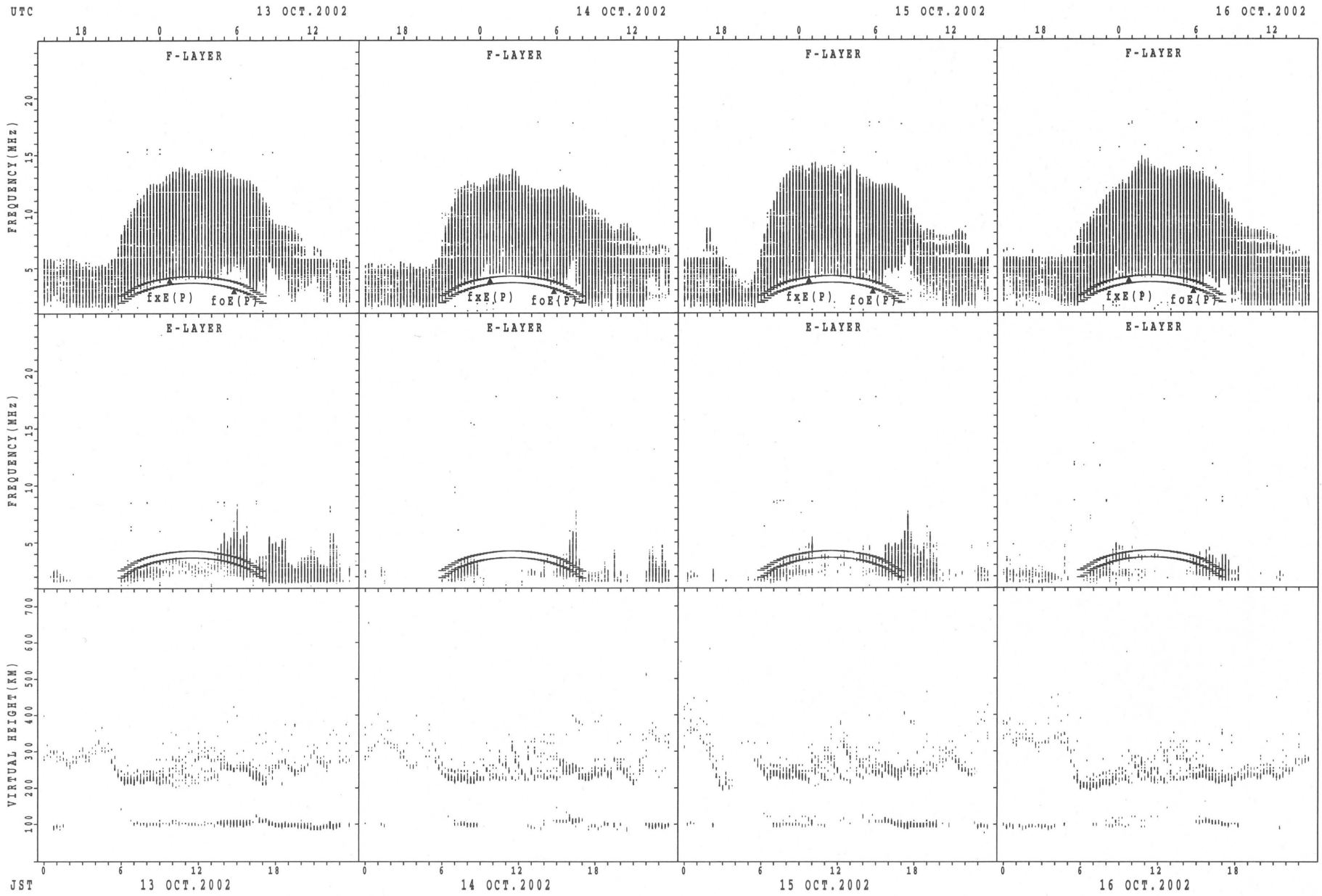
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



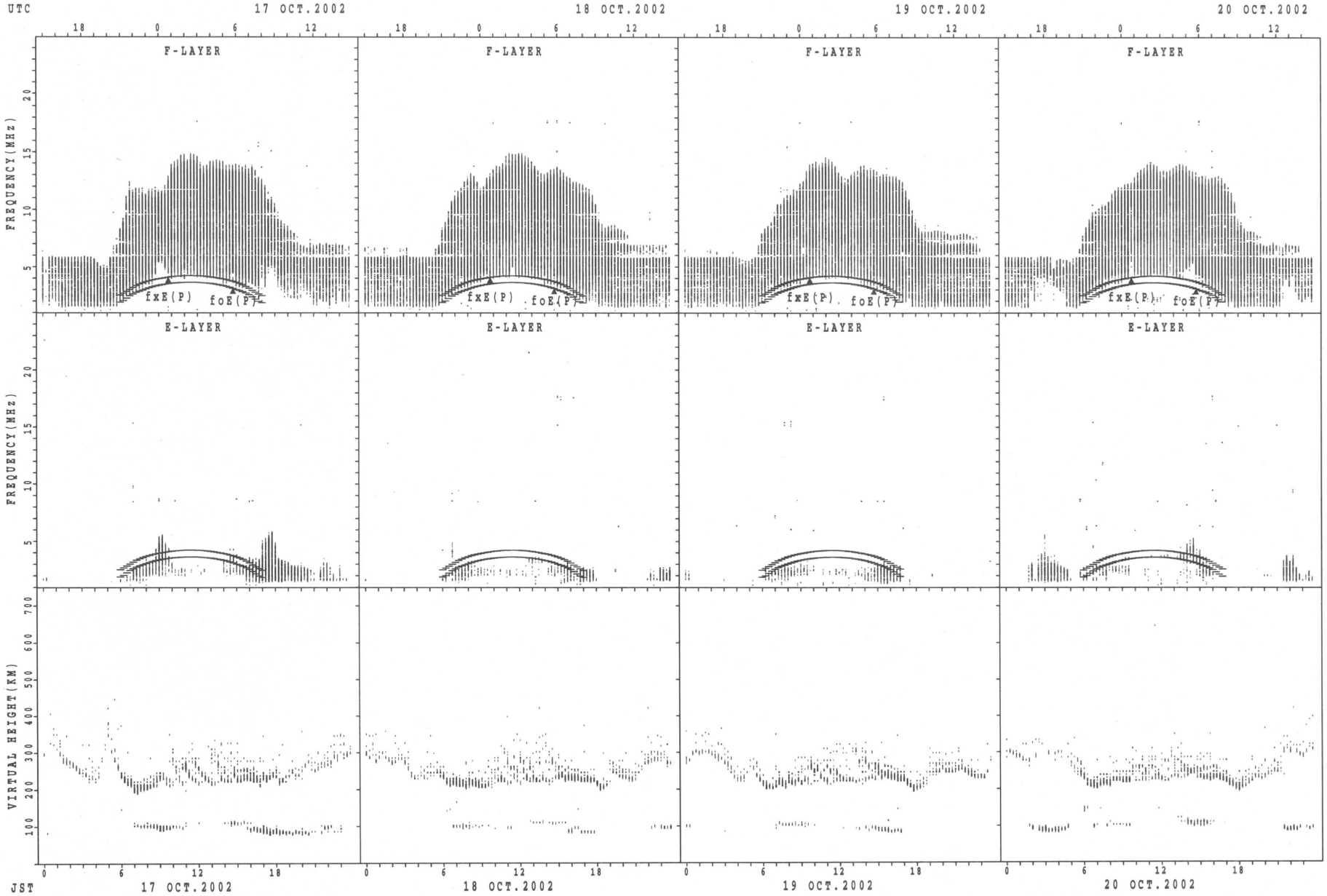
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



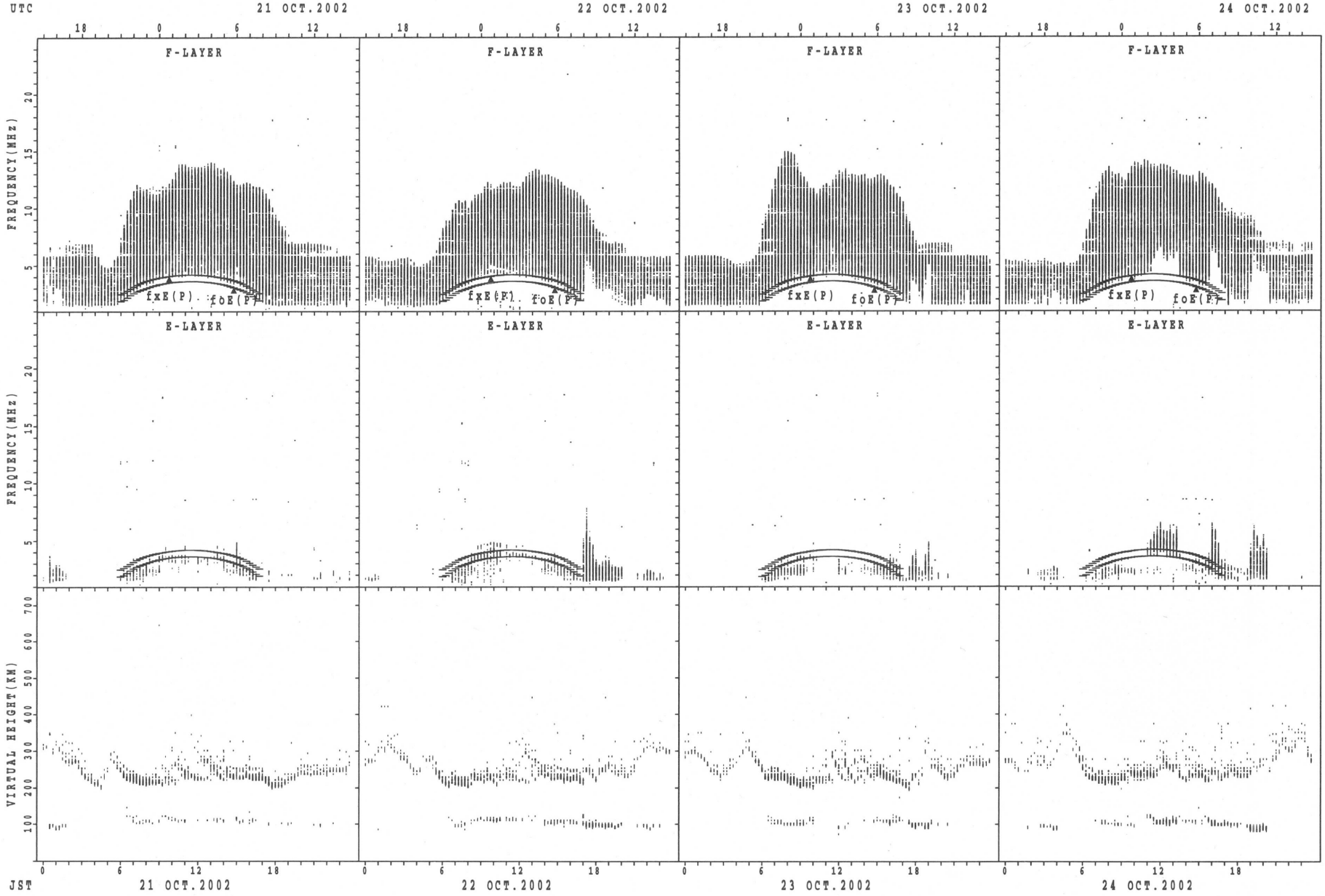
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



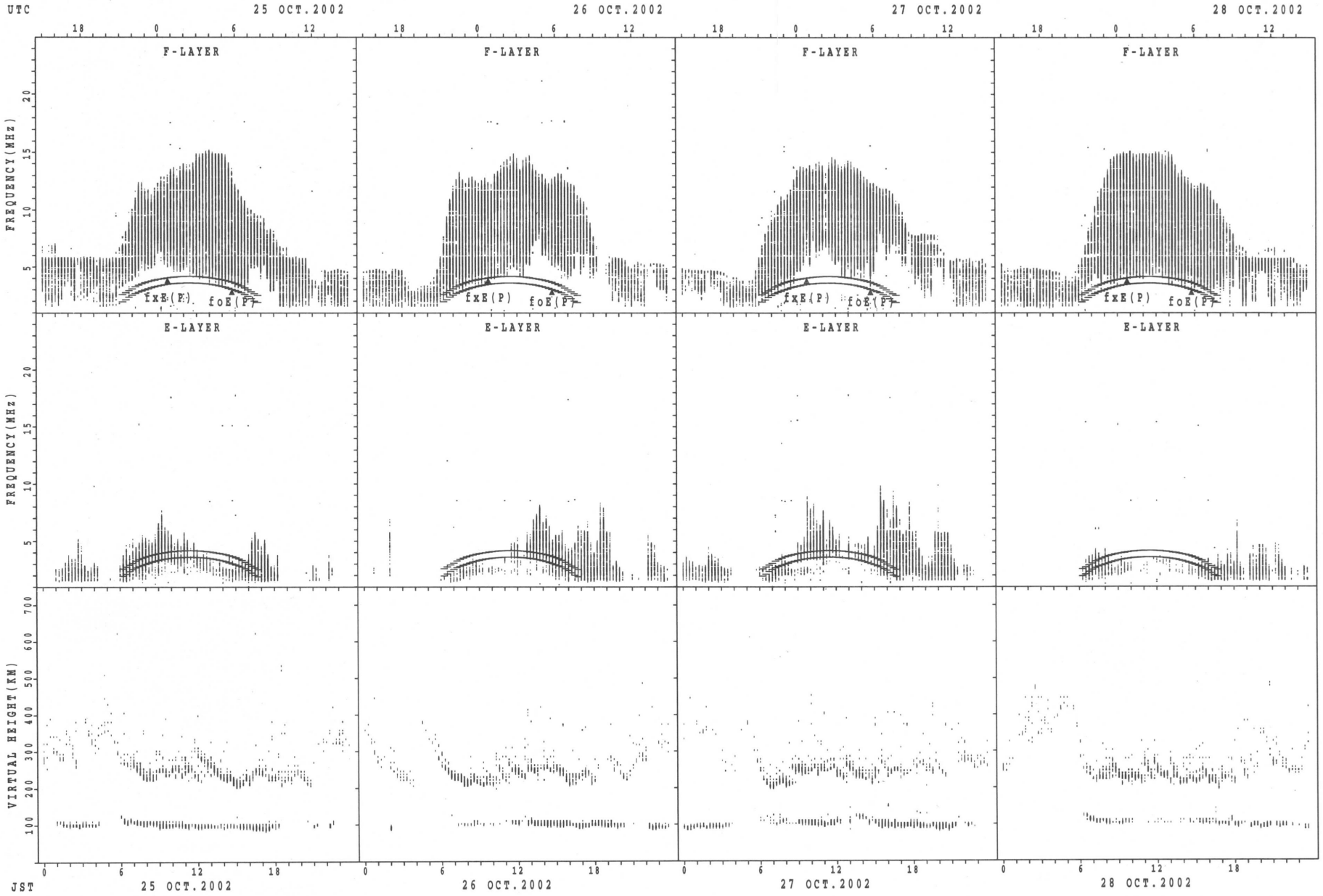
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



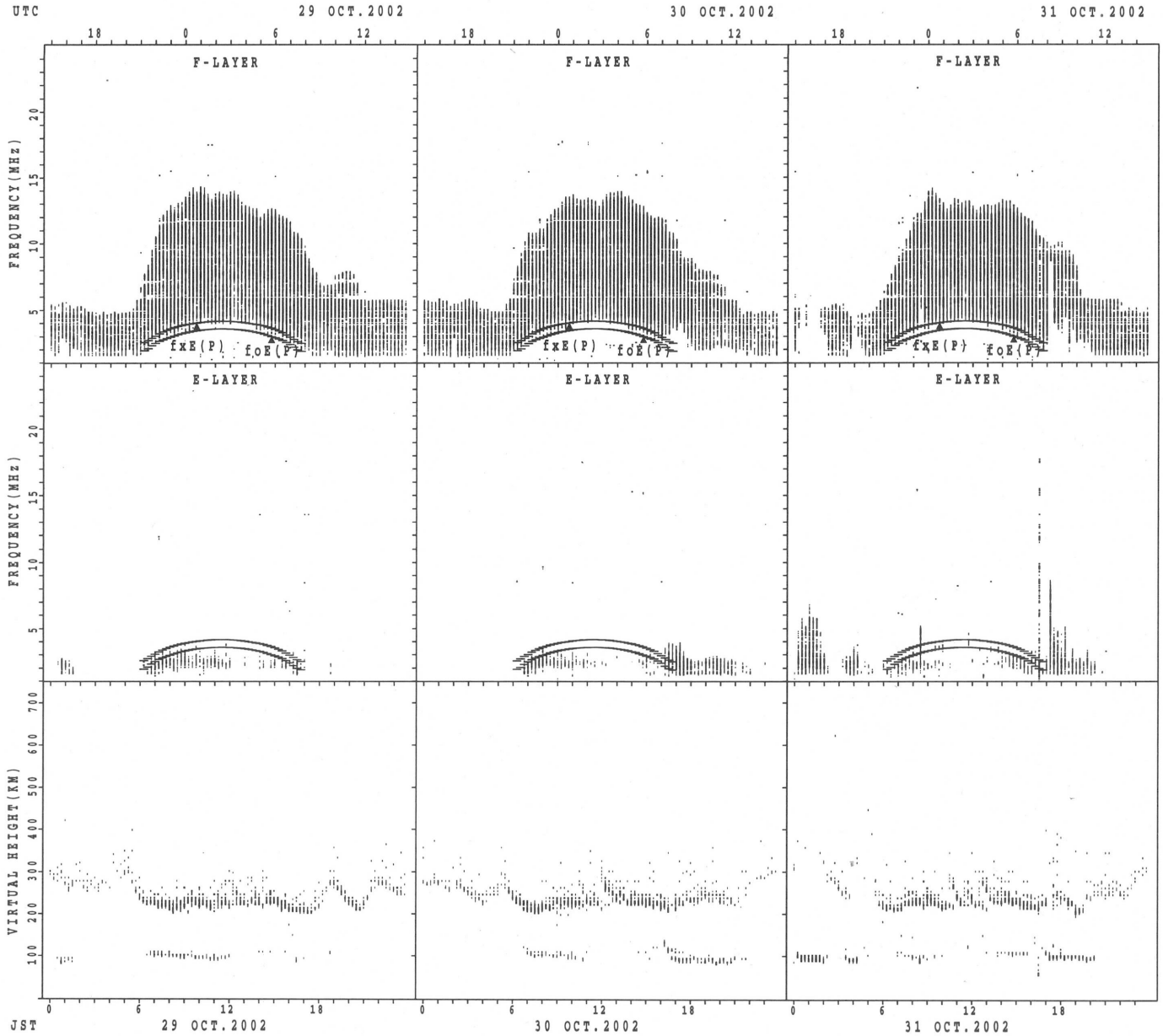
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

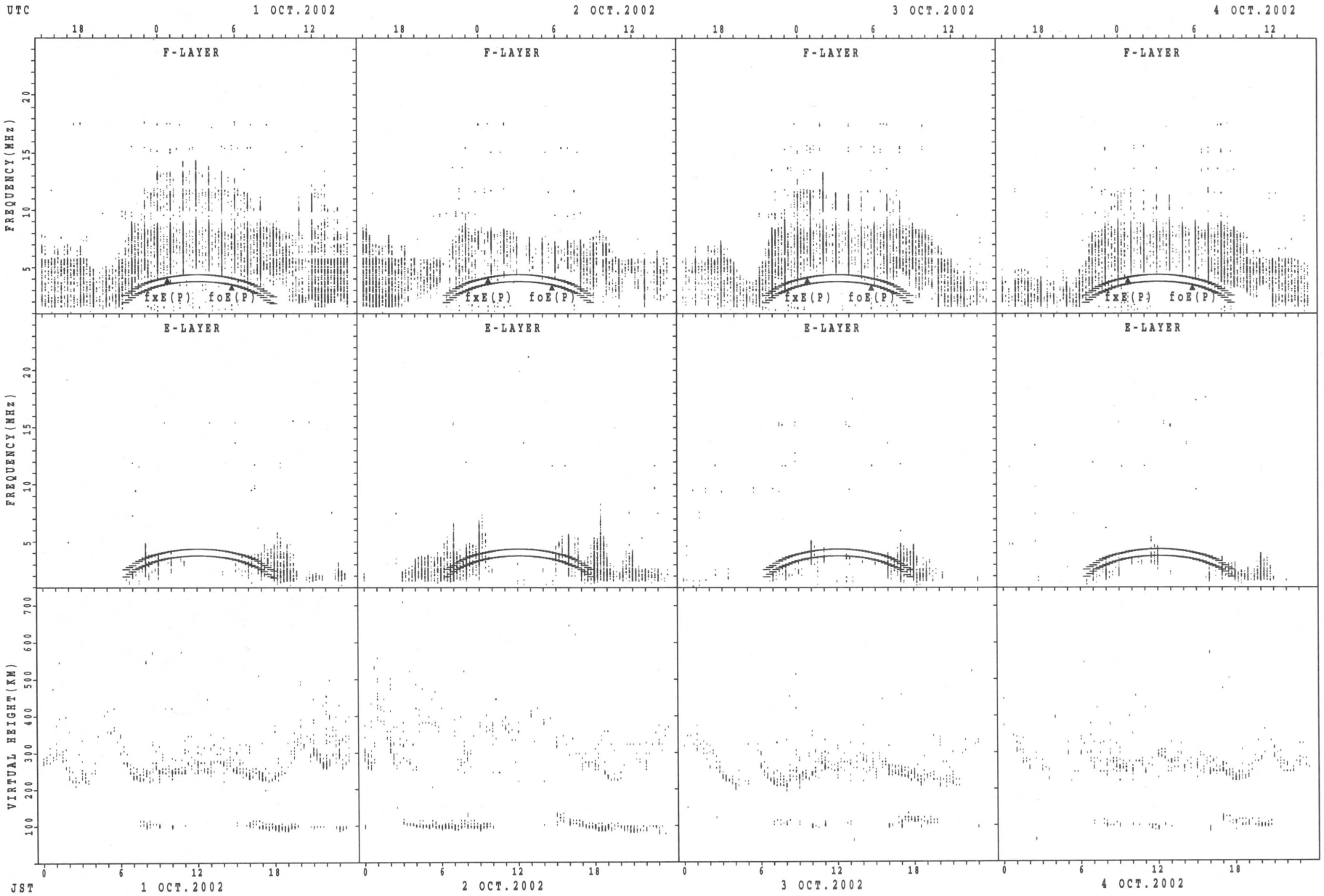


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

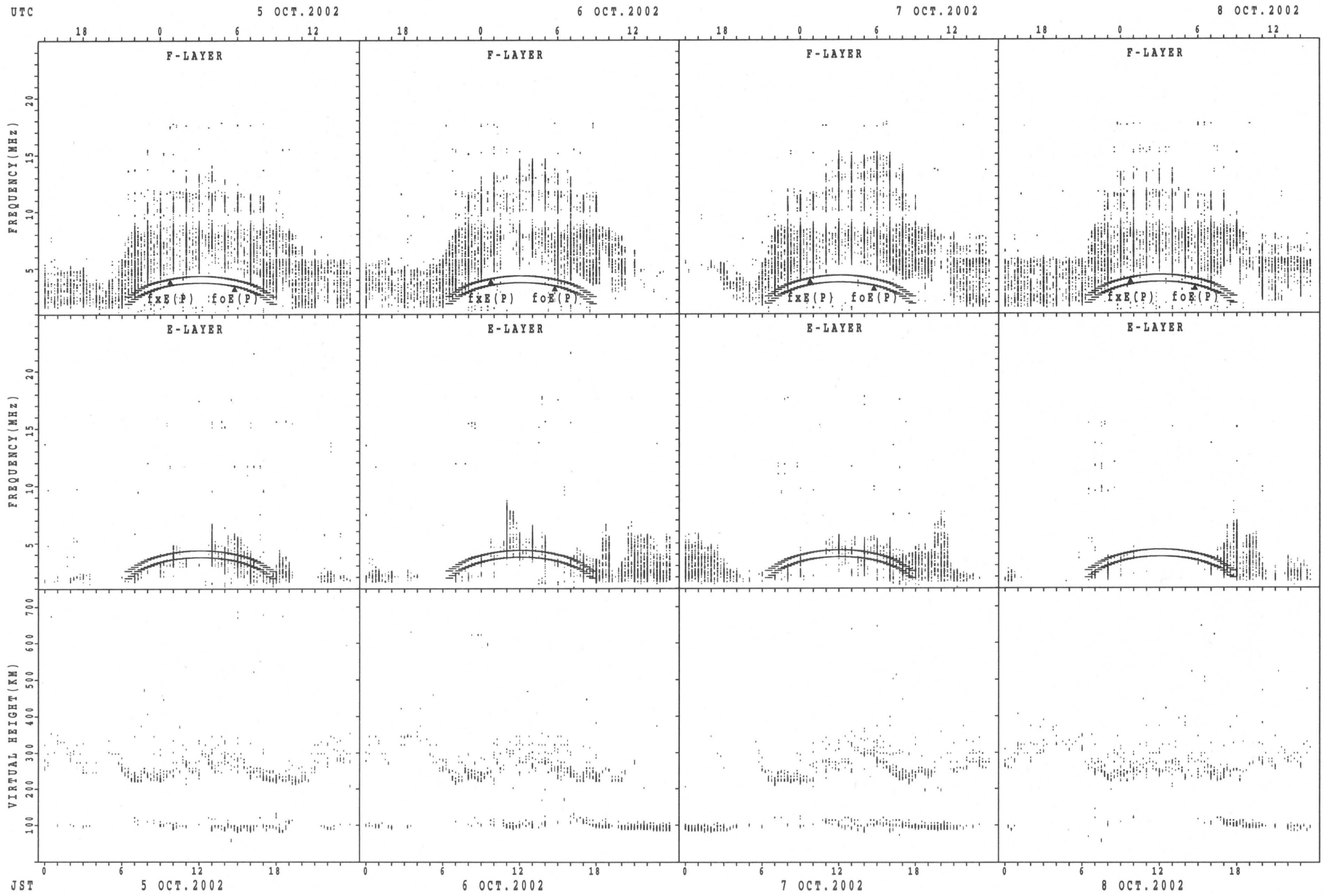
SUMMARY PLOTS AT Kokubunji



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

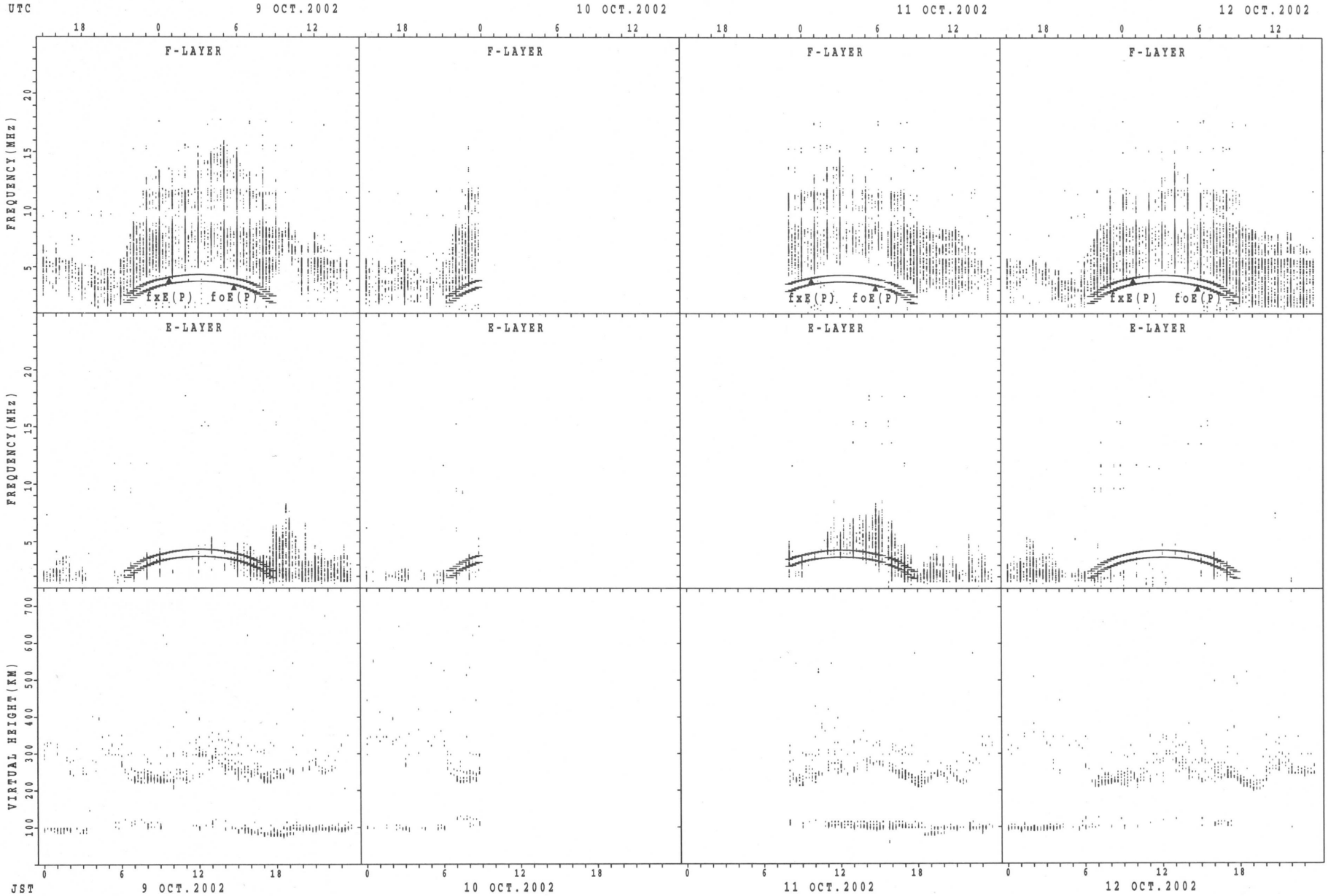

SUMMARY PLOTS AT Yamagawa
UTC
1 OCT.2002
2 OCT.2002
3 OCT.2002
4 OCT.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



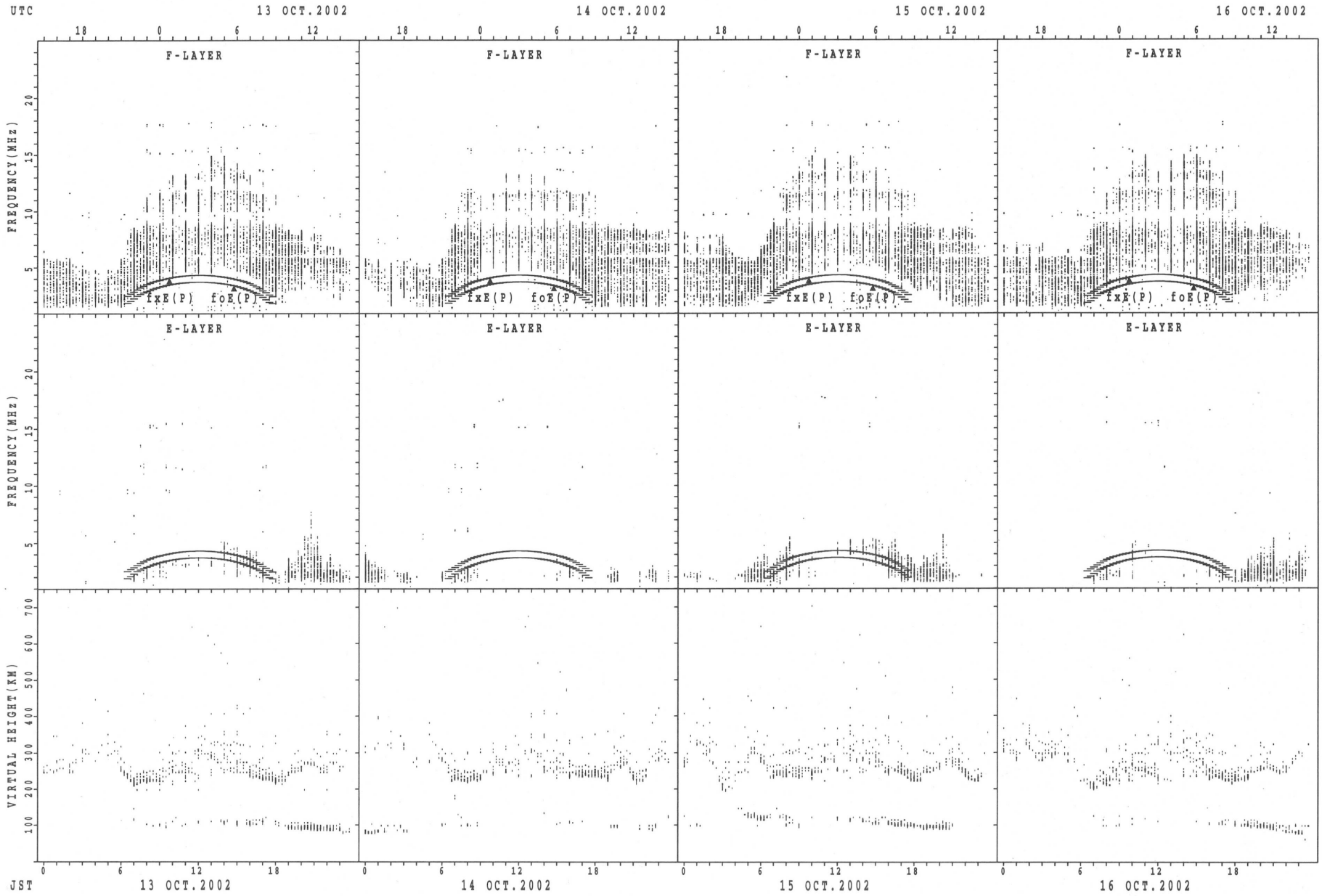
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



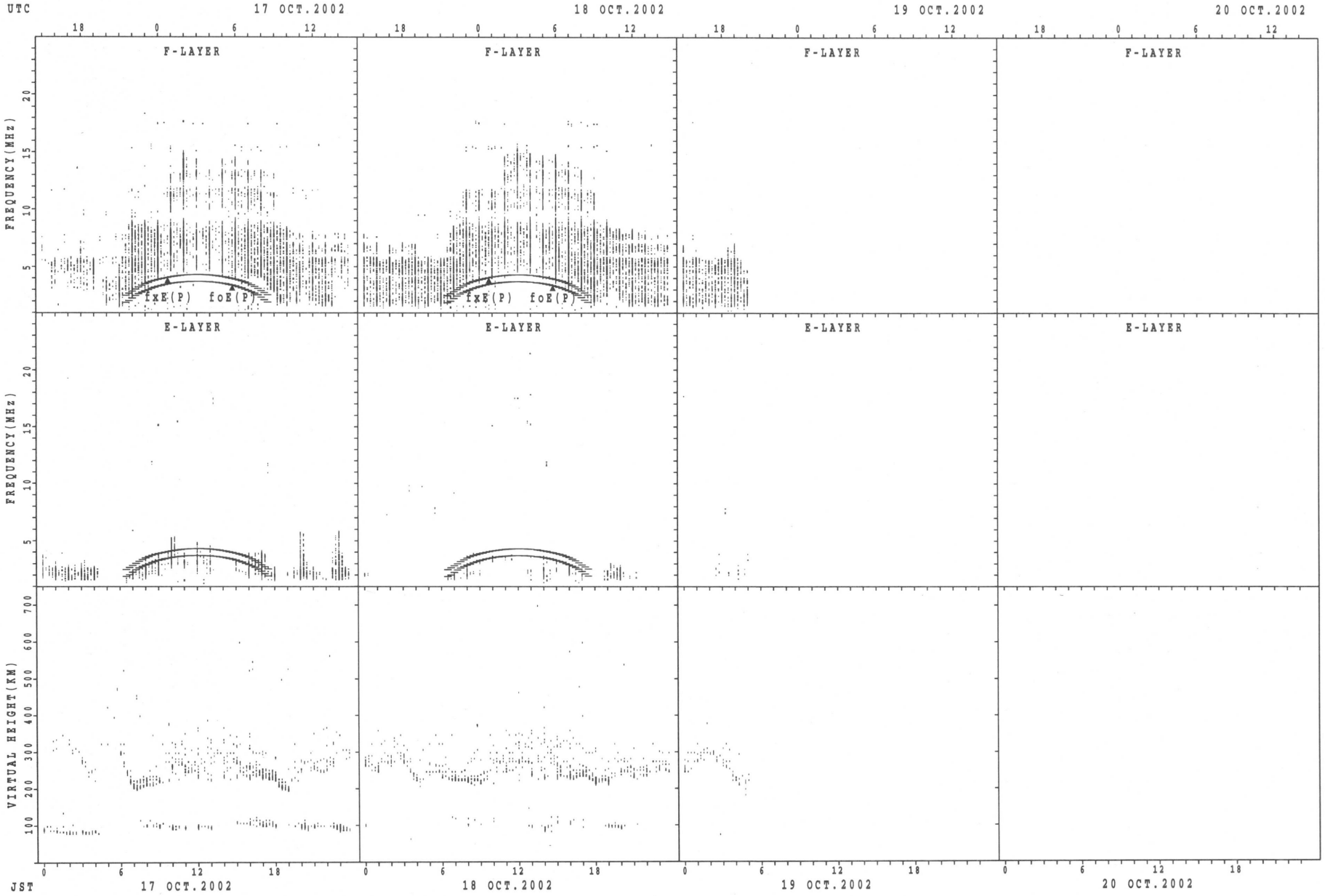
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



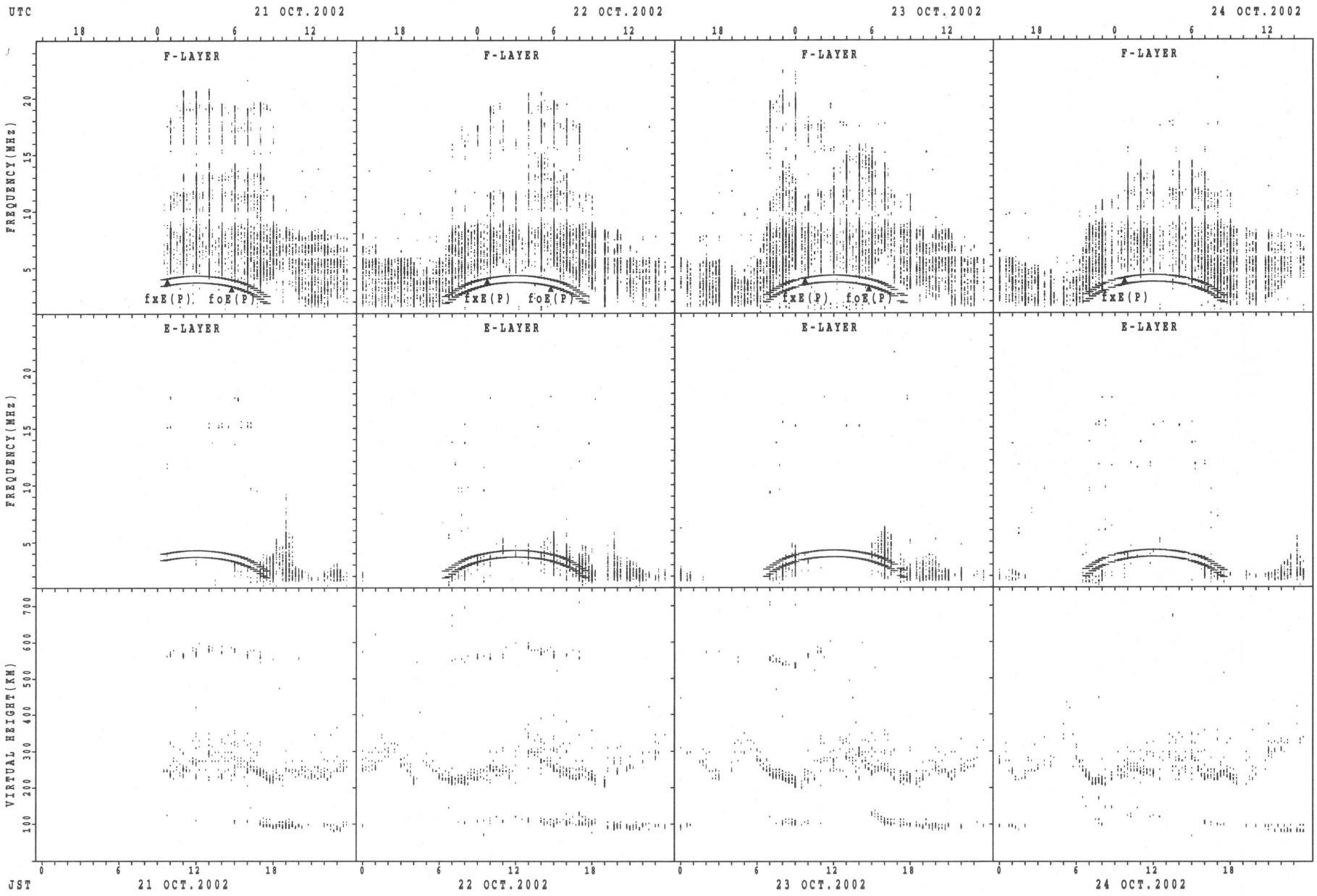
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



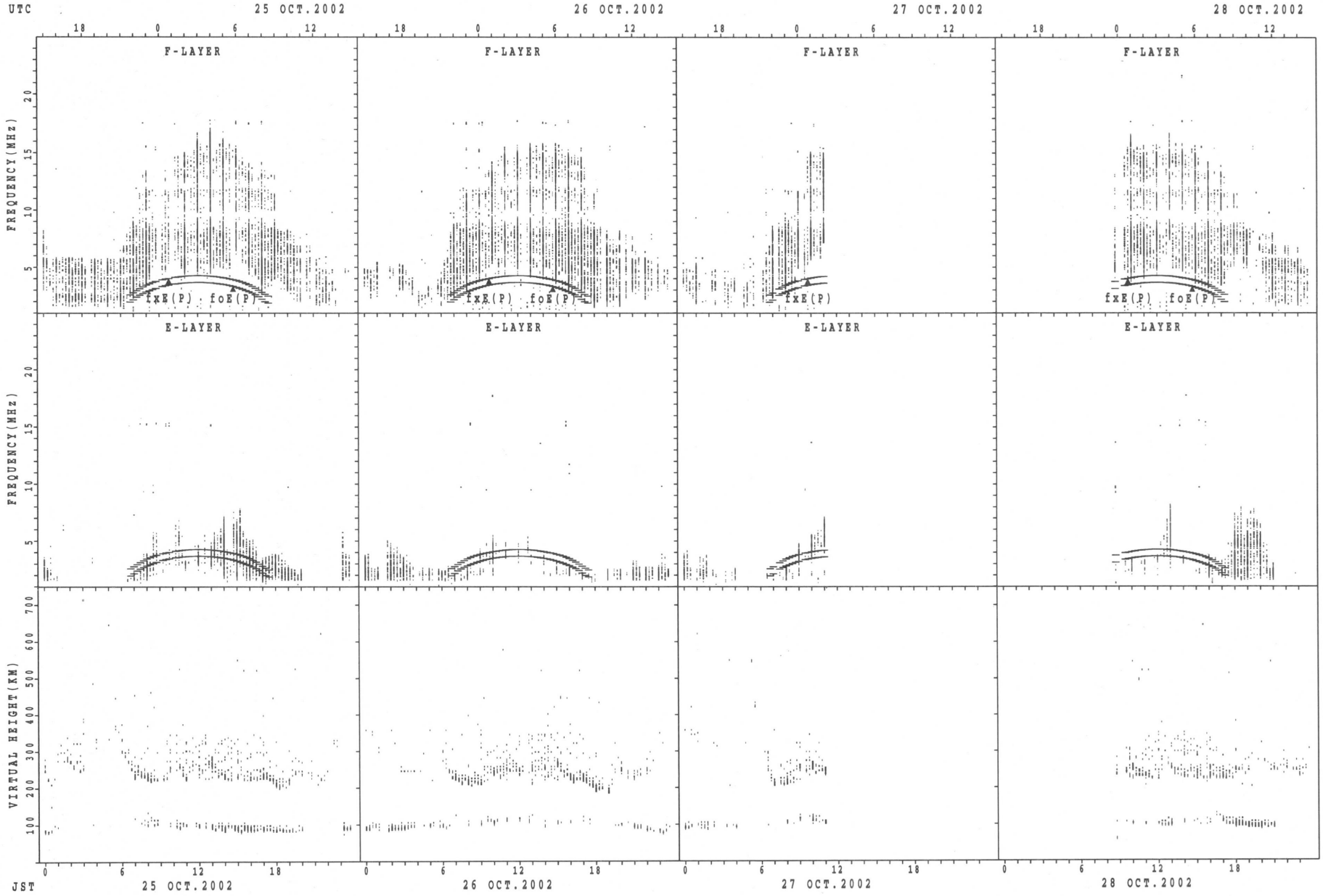
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



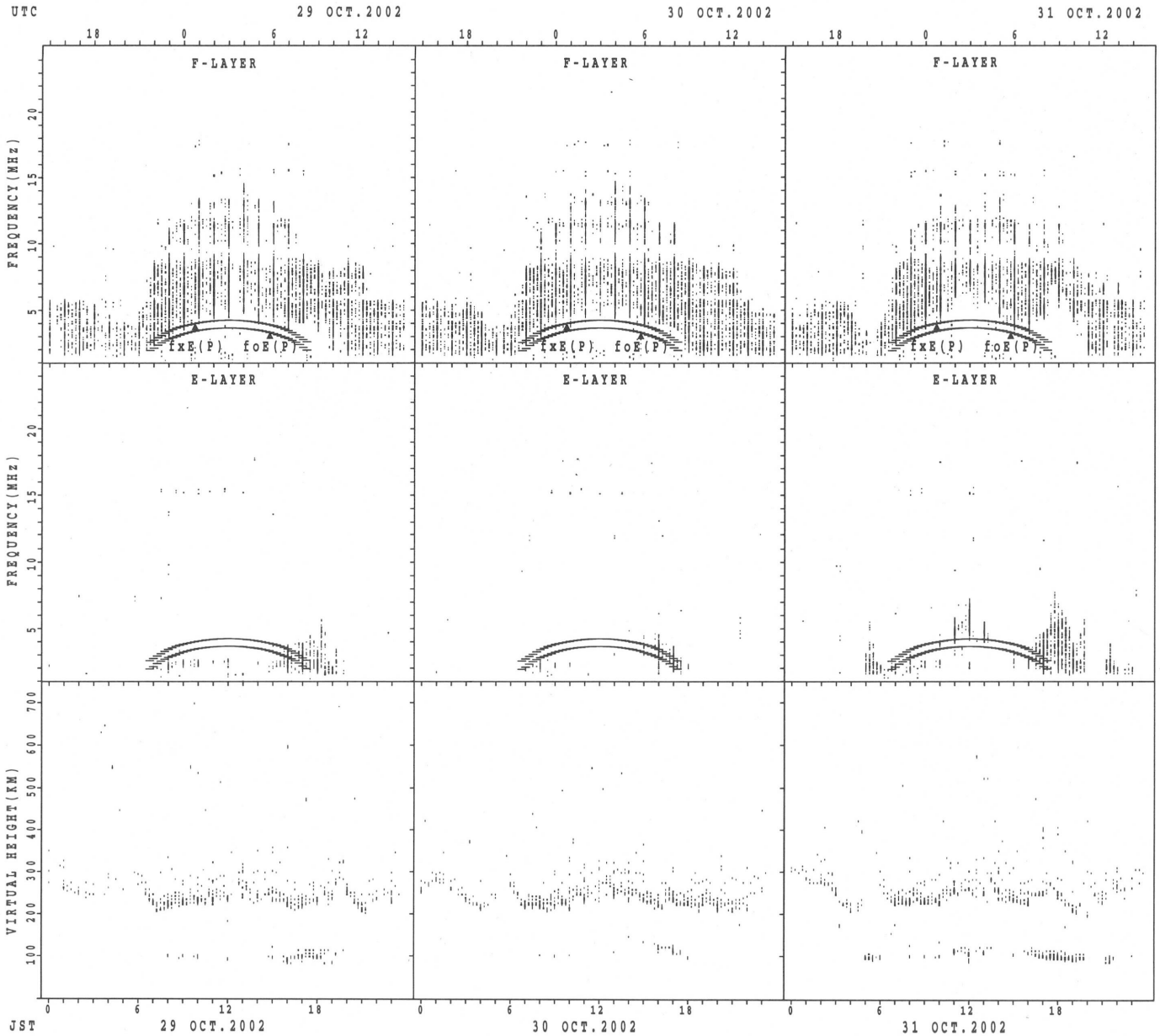
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



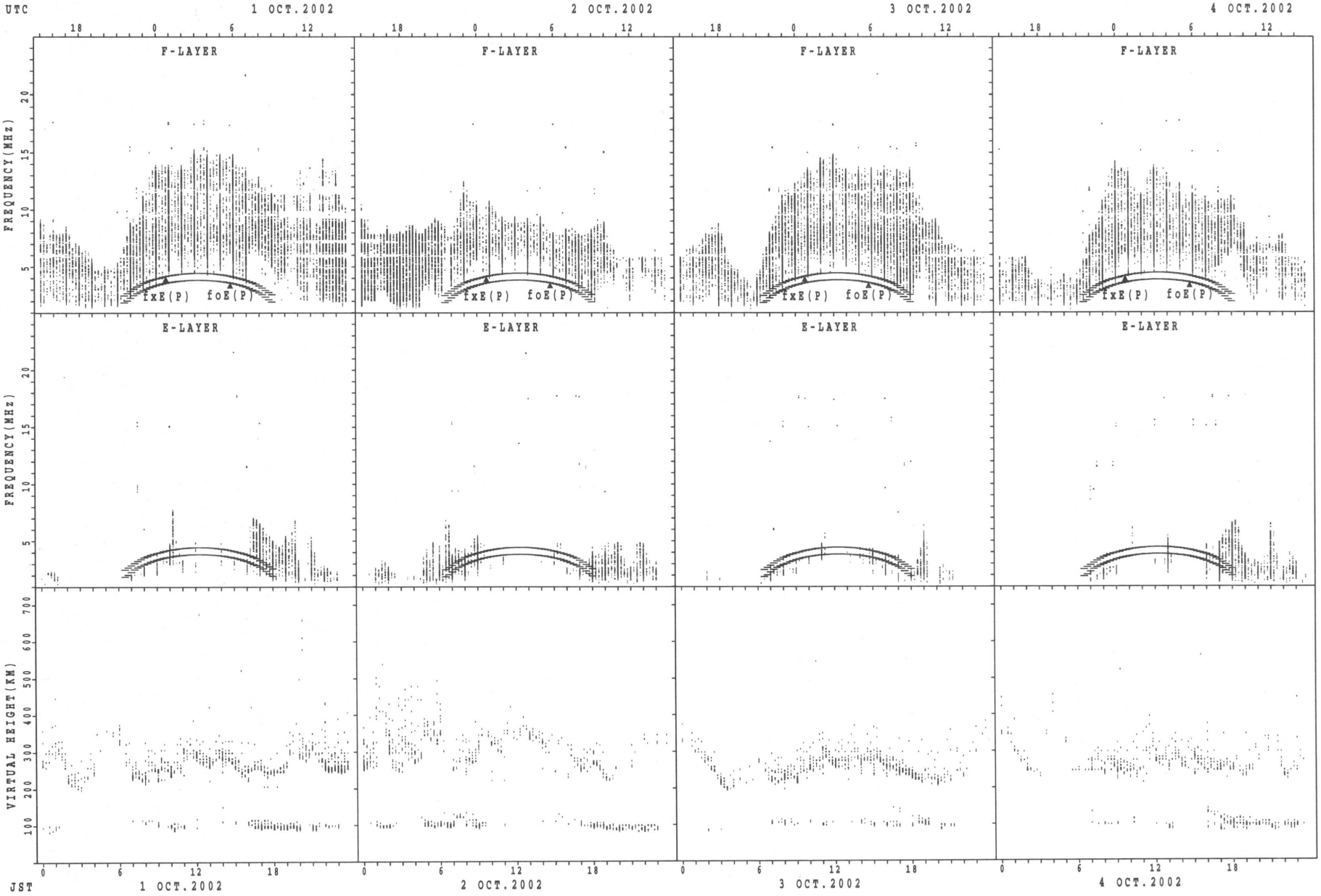
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



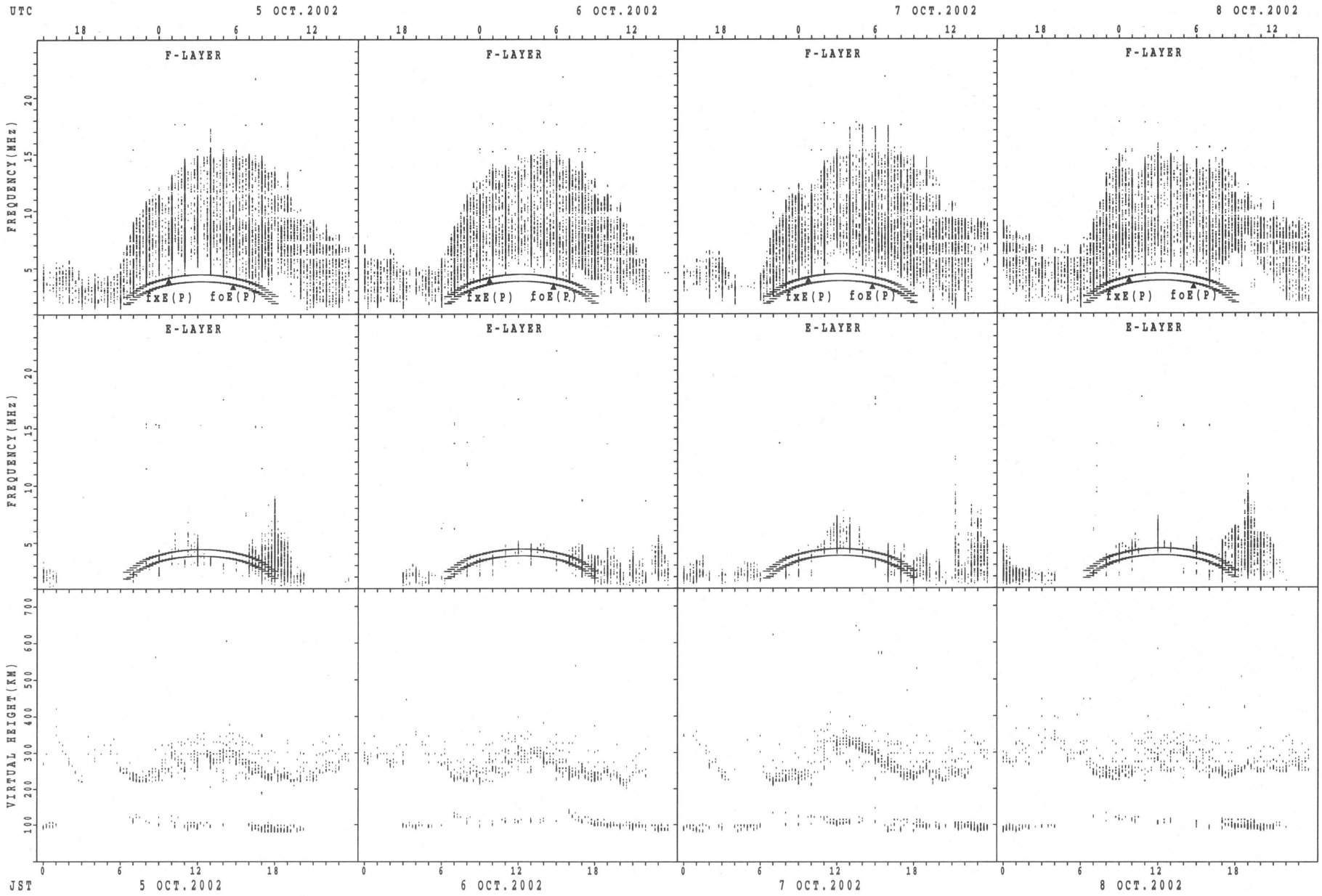
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



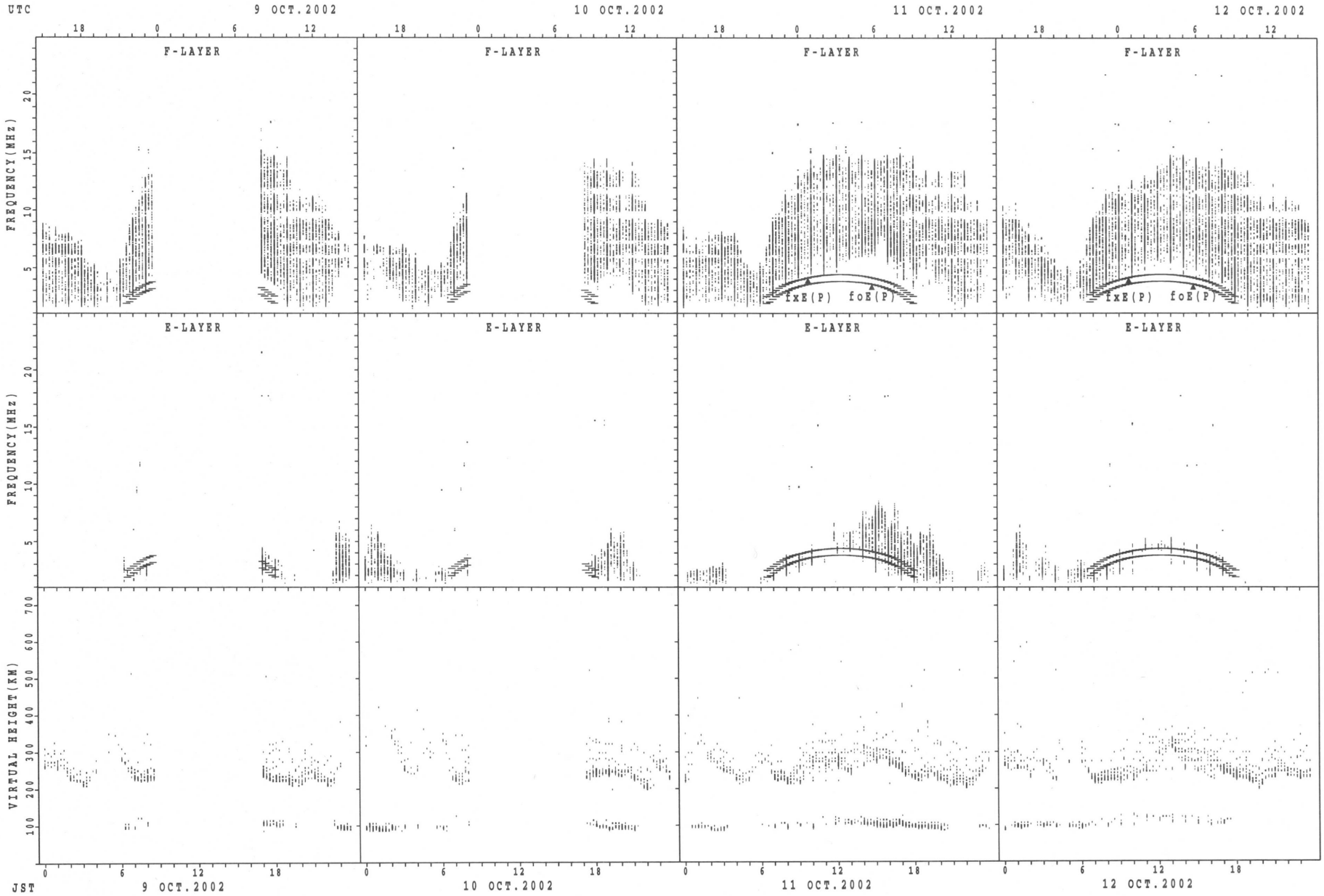
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



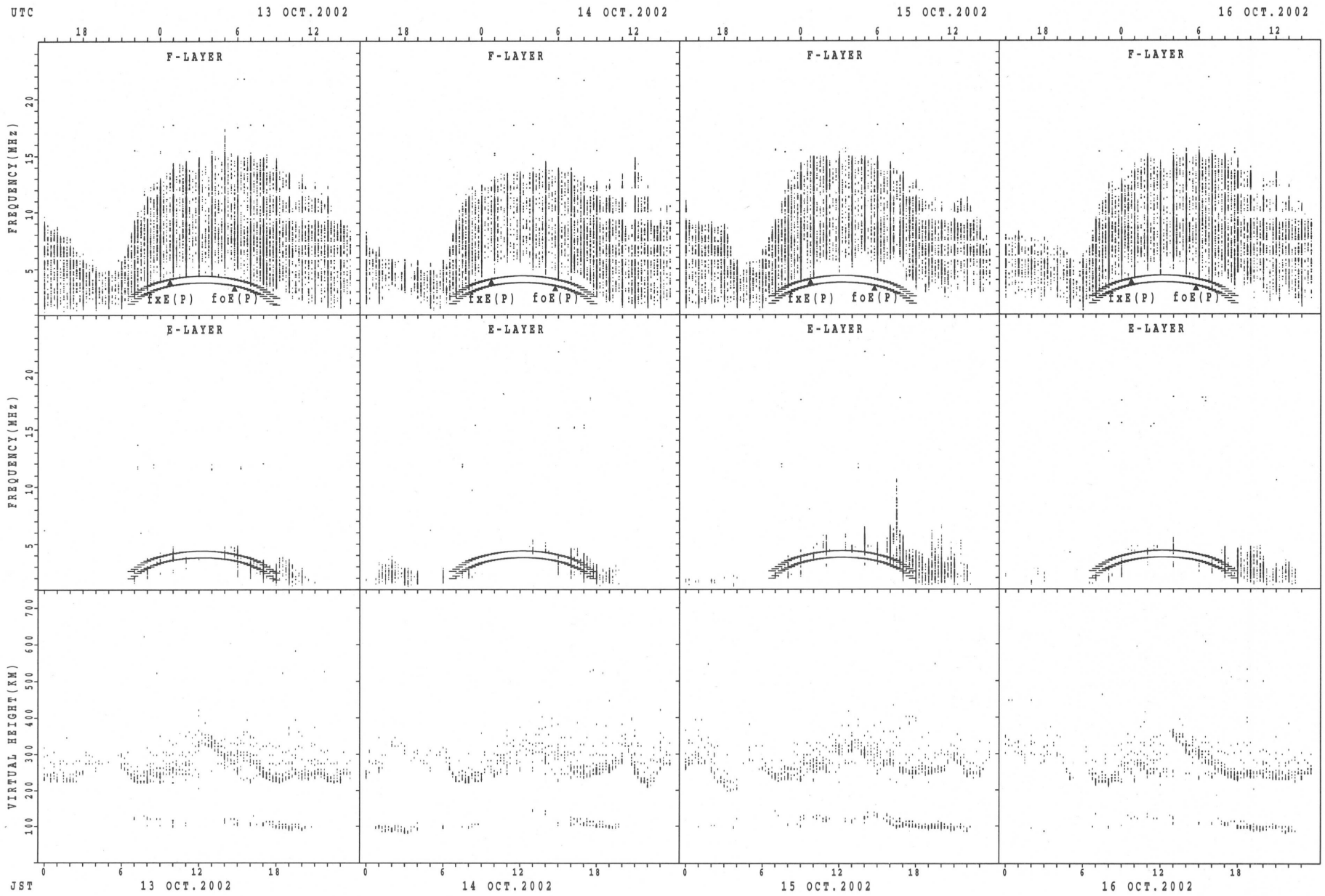
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



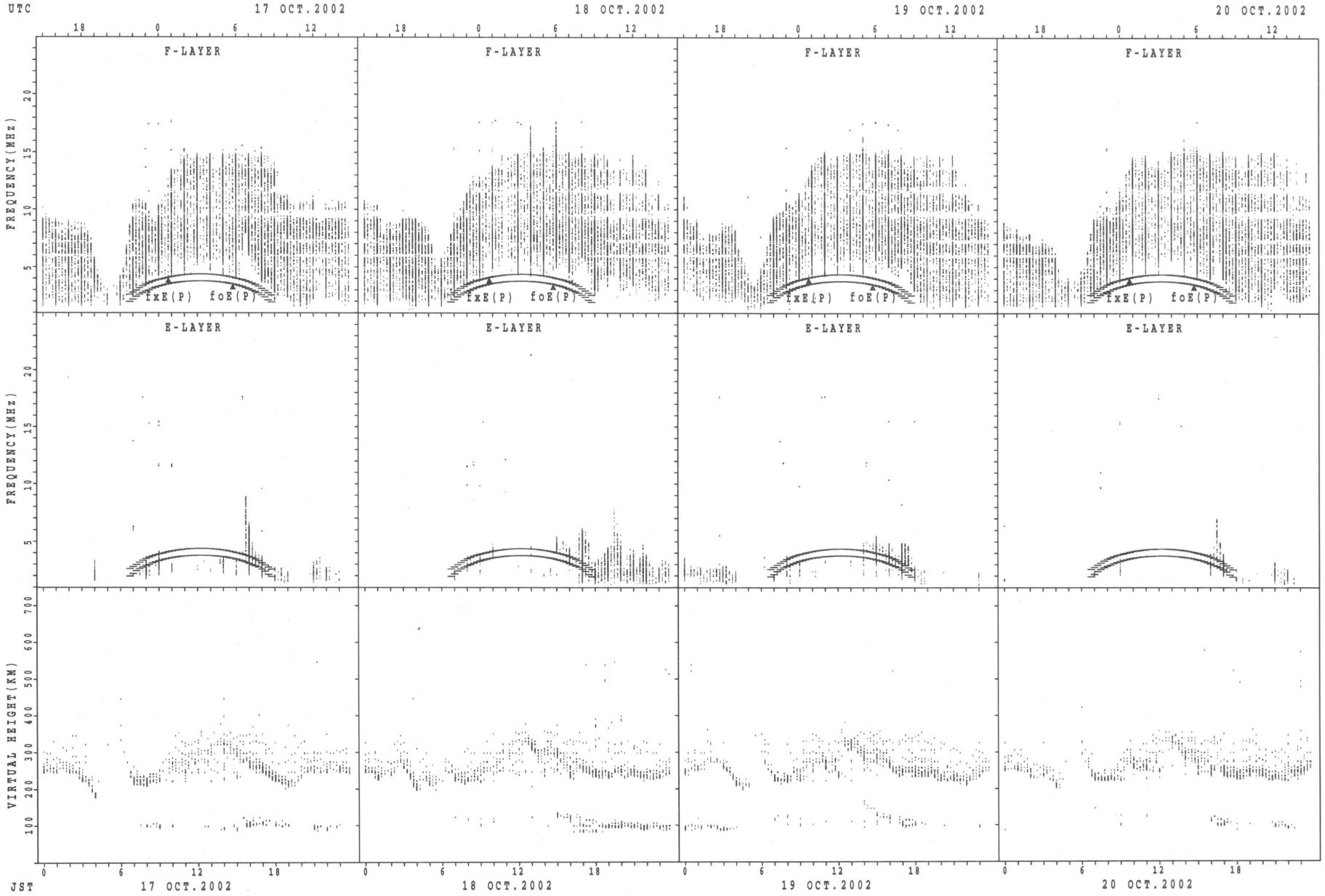
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



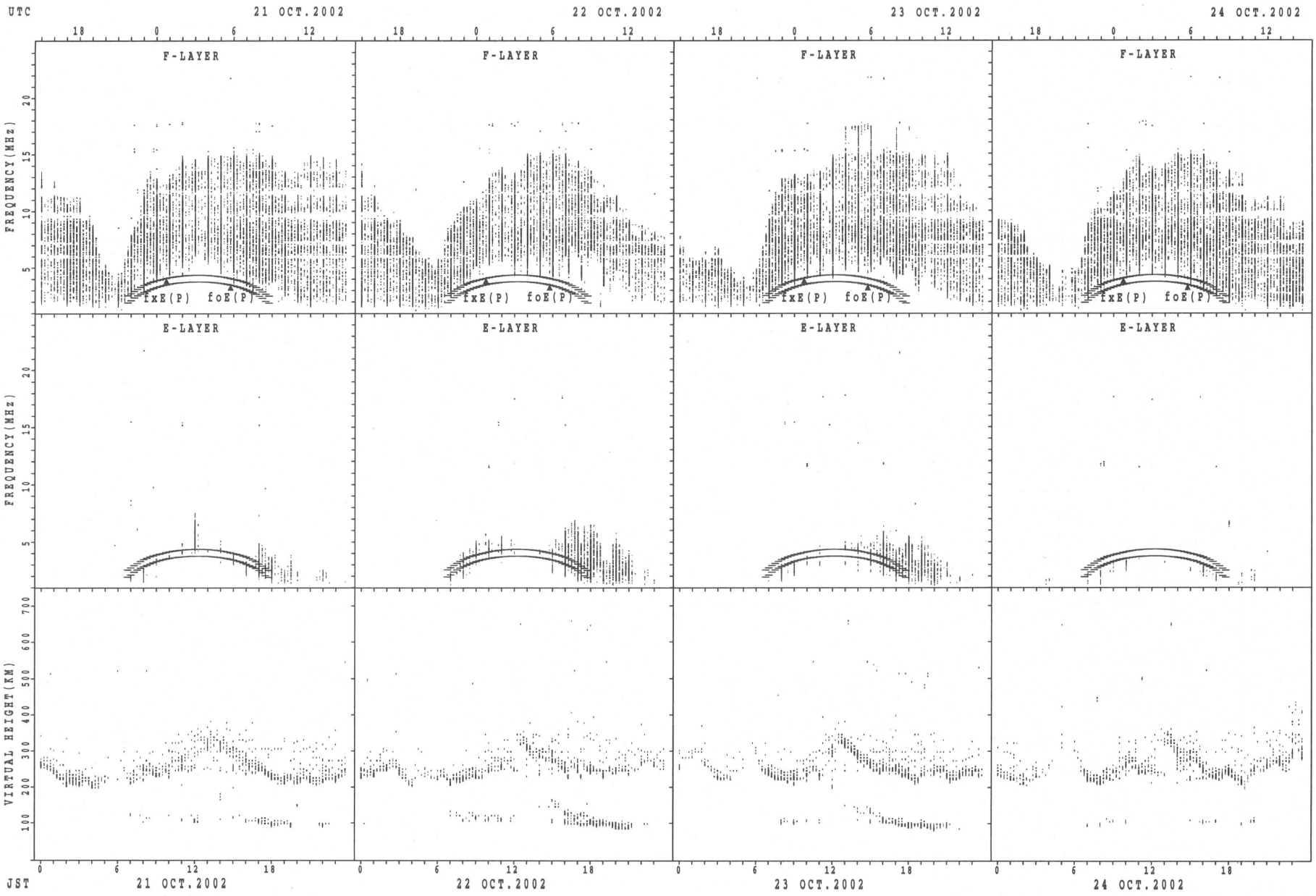
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa

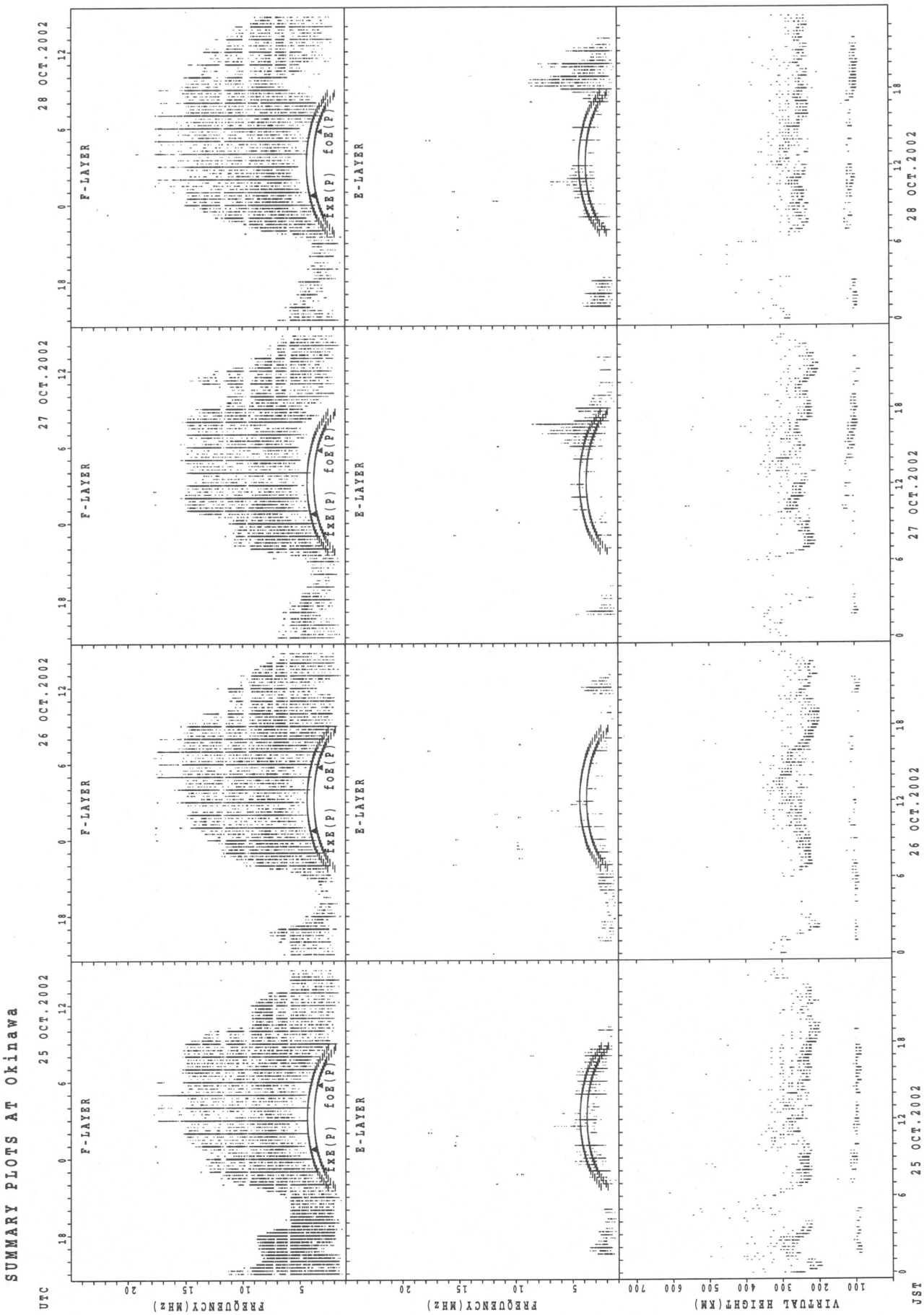


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

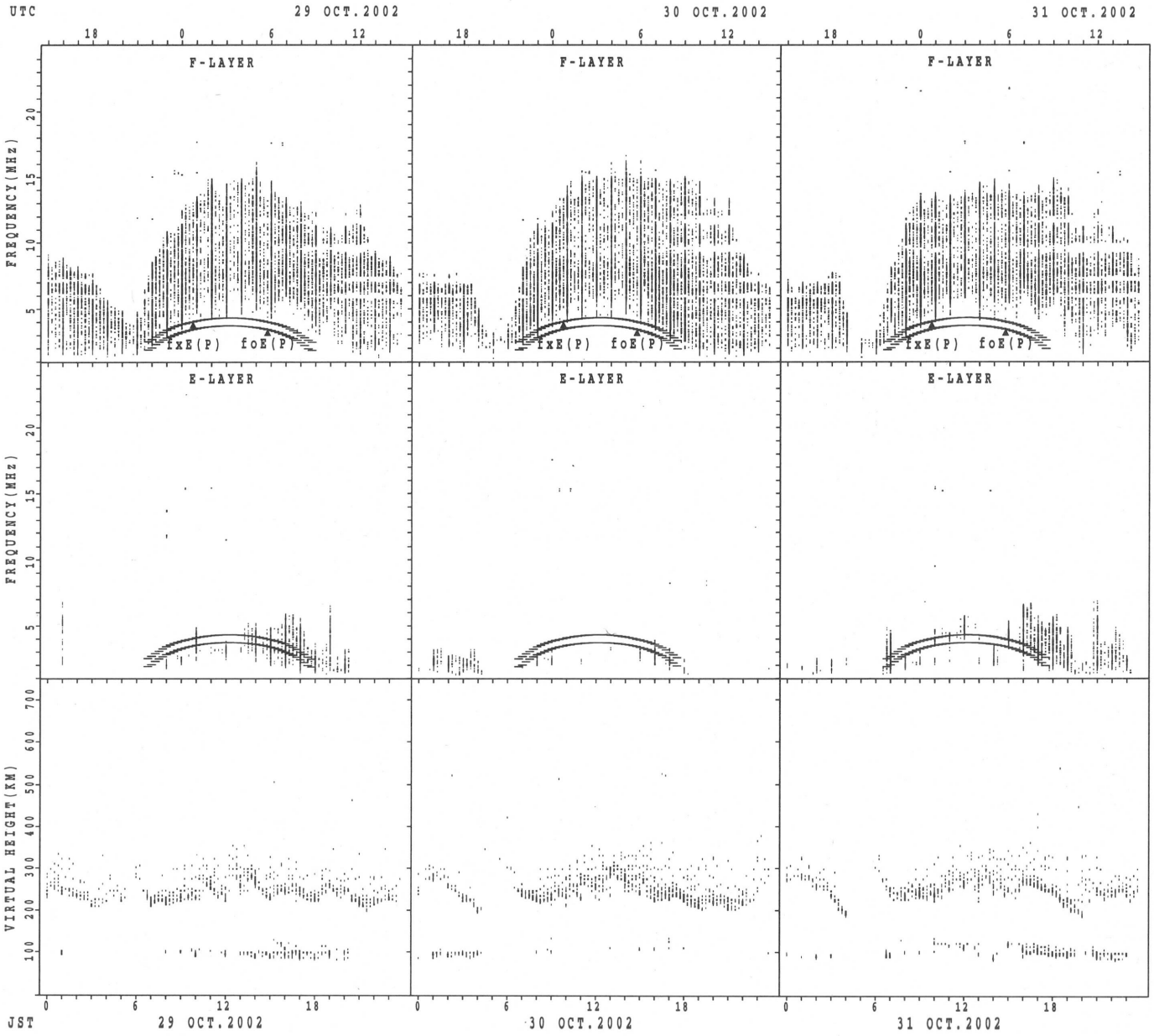
SUMMARY PLOTS AT Okinawa



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


SUMMARY PLOTS AT Okinawa
UTC
25 OCT.2002
26 OCT.2002
27 OCT.2002
28 OCT.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 Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

OCT.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			2				8	24	27	27	16	8	10	20	28	28	29	25	18	12	6	2		
MED			301				250	235	230	230	224	226	226	233	245	238	230	240	267	278	292	312		
U Q			316				261	251	242	248	235	230	230	245	251	246	238	252	274	302	326	322		
L Q			286				247	229	222	222	220	223	218	229	236	230	222	230	254	270	278	302		

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	17	14	13	15	14	10	14	13	12	15	12	7	7	9	9	10	15	15	16	16	12	15	16	17
MED	97	95	95	97	97	97	118	115	107	103	103	97	93	95	97	96	103	103	102	96	97	103	96	99
U Q	101	97	105	105	103	105	127	137	113	105	105	105	113	96	102	99	115	107	103	102	102	105	99	104
L Q	94	93	92	95	95	93	105	110	105	101	100	95	91	90	92	93	95	97	92	90	93	97	93	95

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				12	29	30	30	6			9	29	29	30	29	21	9	3	1		
MED			296				255	228	224	230	223			254	254	248	238	238	250	274	272	328		
U Q			148				260	243	238	238	230			256	272	264	244	244	263	288	296	164		
L Q			148				247	222	218	222	218			238	243	238	230	230	242	267	266	164		

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	11	12	11	9	3	9	9	7	12	9	8	7	6	7	9	17	20	23	19	16	13	16	14
MED	97	97	96	97	95	99	115	111	105	106	105	104	101	111	111	105	109	105	99	97	97	97	97	97
U Q	103	97	102	97	103	103	132	115	111	113	111	115	107	119	119	119	117	111	103	103	103	97	103	99
L Q	95	91	93	95	90	97	102	104	101	102	101	102	97	107	107	104	102	98	95	95	94	95	93	95

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	4			2				24	27	24	14				11	25	26	25	27	23	13	14	6	2
MED	322			290				245	230	233	251				254	254	246	240	240	264	312	304	288	334
U Q	337			298				261	240	252	262				270	270	254	255	256	274	332	322	324	336
L Q	300			282				230	224	227	238				240	247	242	238	238	256	295	278	284	332

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	16	10	7	8	7	5	8	8	13	10	11	9	11	13	10	12	18	22	23	22	18	16	15	13
MED	96	94	95	93	97	99	99	147	113	105	113	107	103	109	105	108	107	105	101	98	96	97	95	93
U Q	98	99	97	96	101	115	101	152	119	107	119	112	115	114	113	126	113	113	105	105	101	97	101	97
L Q	91	91	89	88	95	98	98	120	104	101	99	99	99	97	95	94	101	103	95	95	95	95	93	90

MONTHLY MEDIANS OF h'F AND h'Es

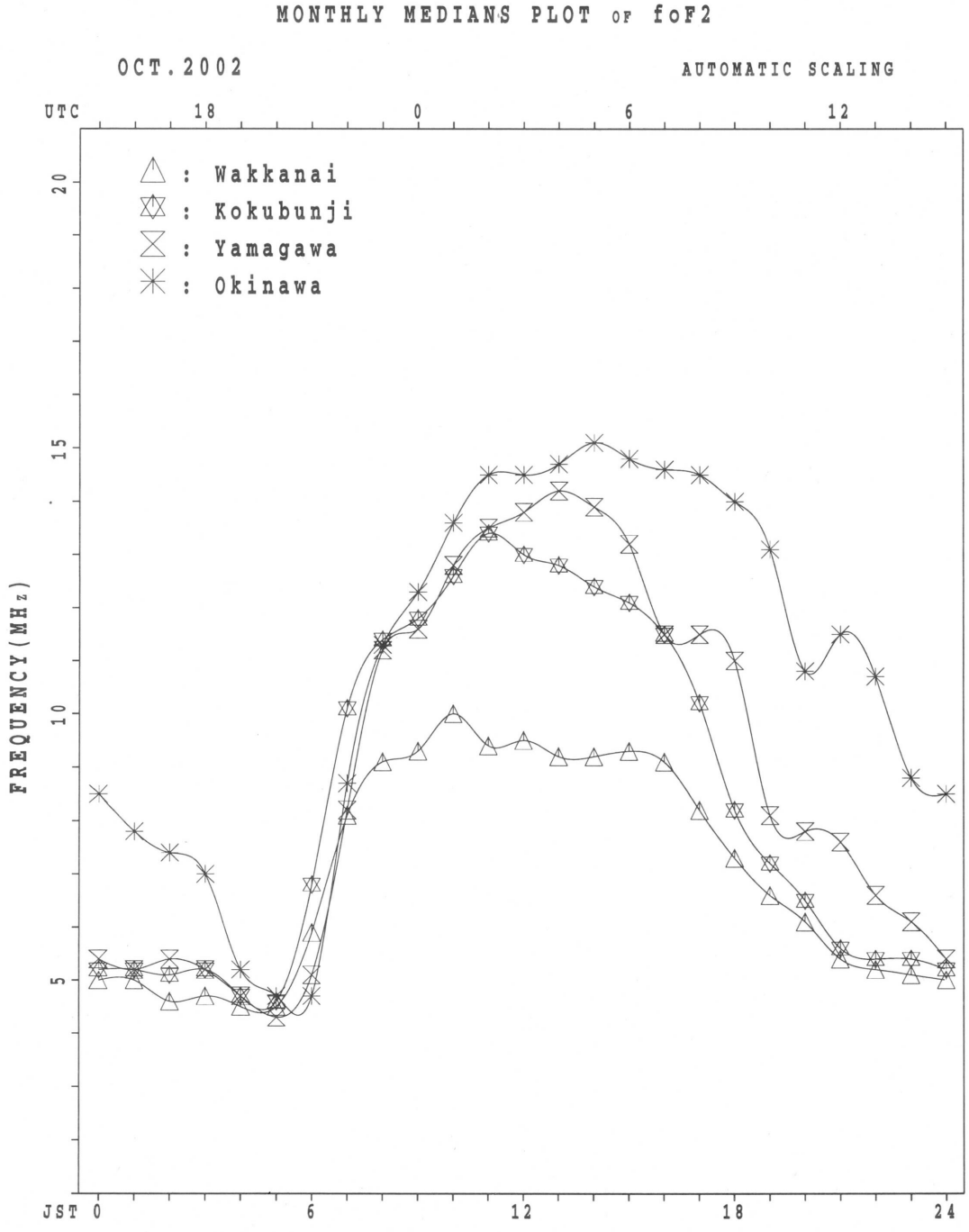
OCT. 2002 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	18	16	17	11	5	1	1	30	31	29	21				6	29	29	30	31	31	29	27	27	23
MED	280	286	280	264	254	248	352	246	232	238	246				263	262	256	247	238	238	254	256	250	262
U Q	288	317	295	288	292	124	176	254	246	246	262				278	286	264	252	244	254	271	280	262	294
L Q	262	259	270	254	229	124	176	238	226	231	238				256	254	247	238	230	232	242	238	244	256

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	7	14	14	15	11	7	6	7	14	12	15	12	13	10	17	15	19	26	26	24	19	18	14	10
MED	91	97	95	97	97	97	96	119	110	109	115	118	107	114	115	113	113	106	99	98	95	95	94	96
U Q	97	101	95	99	99	99	99	123	113	118	123	120	114	119	144	125	121	111	103	102	97	97	95	99
L Q	91	95	93	91	95	91	95	105	105	104	109	112	103	109	110	103	105	103	95	97	91	93	91	91


MONTHLY MEDIANS PLOT OF foF2
OCT. 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

OCT. 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	83	78	84	X 72	X 56	X 59													X 88	X 76	X 83	92	92	X 70
2		48	X 46	A	X 40	A													X 81	X 71	X 67	O X 69	X 58	X 60
3	X 60	X 62	X 62	X 58	X 51	X 47													X 80	X 78	X 71	X 56	X 51	X 48
4	X 48	X 51	X 46	X 46	X 45	X 44													X 80	X 66	X 59	X 66	X 66	X 61
5	X 60	X 58	X 60	X 60	X 53	X 56													X 88	X 76	X 67	X O 63	X 62	X 60
6	X 57	X 58	X 53	X 49	X 49	X 53													X 89	X 82	X 68	X 55	X 52	X 50
7	X 50	A	X 52	X 49	X 50	X 47													X 102	X 82	X 75	X 66	X 70	X 68
8	X 62	X 62	X 61	X 58	X 58	X 54													X 67	X 60	X 64	X 65	X 66	X 64
9	X 66	X 63	X 56	X 51	X 49	X 50													X 88	X 72	X 70	X O 68	X 66	X 58
10	X 52	X 54	X 55	X 52	X 50	X 52													X 84	X 72	X 72	X 74	X 67	X 65
11	X 59	X 61	X 57	X 58	X 56	X 57												X 100	X 81	X 72	X 75	X 61	X 56	X 52
12	X 52	X 52	X 51	X 50	X 47	X 49													X 91	X 74	X 70	X 69	X 68	X 63
13	X 61	X 61	X 61	X 58	X 55	X 57													X 94	X 89	X 79	X 71	X 64	X 60
14	X 57	X 56	X 56	X 57	X 52	X 54													X 103	X 94	X 90	X 85	X 75	X 74
15	X 66	X 66	X 72	X 64	X 45	X 40													X 98	X 85	X 82	X 82	X 82	X 65
16	X 68	X 68	X 66	X 66	X 62	X 66													X 96	X 86	X 84	X 79	X 72	X 68
17	X 64	X 65	X 66	X 64	X 58	X 54													X 109	X O 88	X O 77	X 74	X 72	X 72
18	X 70	X 69	X 70	X 68	X 63	X 61													X 108	X 88	X 85	X 74	X 73	X 72
19	X 68	X 67	X 67	X 67	X 64	X 57													X 94	X 84	X 84	X 79	X 80	X 69
20	X 61	X 65	X 62	X 63	X 58	X 58													X 101	X 83	X 76	X 74	X 72	X 70
21	X 66	X 68	X 70	X 72	X 65	X 51												X 120	X 99	X 79	X O 75	X 74	X 69	X 66
22	X 61	X 58	X 57	X 58	X 54	X 56													X 84	X 77	X 73	X 62	X 62	X 59
23	X 60	X 61	X 61	X 58	X 54	X 56													X 74	X 72	X 75	X 67	X 64	X 61
24	X 58	X 57	X 56	X 57	X 54	X 54													X 98	X 96	X 77	X 74	X 75	X 70
25	X 71	X 76	X 69	X 64	X 66	X 64													X 84	X 70	X 64	X 46	X 48	X 50
26	X 47	X 51	X 48	X 49	X 36	X 38												C	C	X 66	X 67	X 54	X 56	X 54
27	X 52	X 49	X 49	X 47	X 42	X 40													X 81	X 81	X 82	X 57	X 60	X 58
28	X 56	X 50	X 52	X 50	X 49	X 45													X 82	X 69	X 65	X 69	X 66	X 57
29	X 56	X 57	X 55	X 51	X 50	X 52													X 74	X 77	X 81	X 60	X 62	X 62
30	X 60	X 60		X 60	X 54	X 52													X 92	X 82	X 75	X 60	X 52	X 53
31	X 53	X 54	X 54	X 56	X 47	X 50													X 103	X 86	X 62	X 61	X 58	X 54
	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	31	30												2	30	31	31	31	31	31
MED	X 60	X 60	X 57	X 58	X 53	X 54												X 110	X 88	X 78	X 75	X 68	X 66	X 61
U Q	X 66	X 65	X 66	X 64	X 58	X 57													X 98	X 85	X 81	X 74	X 72	X 68
L Q	X 56	X 54	X 53	X 51	X 49	X 49													X 81	X 72	X 67	X 61	X 58	X 57

OCT. 2002 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	F	F	F 72	66	50	53	74	108	137	136	132	S 138	124	110	109	106	S 105	100	81	70	77	F	F	S 64
2	50	F 38	40	A	34	A	45	69	68	72	62	65	61	57	62	64	67	A	75	65	61	S 63	52	54
3	54	56	56	52	45	40	66	96	106	108	106	101	100	95	98	101	97	90	74	72	65	50	45	42
4	42	45	40	40	38	38	54	58	72	77	83	83	84	89	83	79	76	85	74	60	53	60	59	55
5	54	51	54	53	47	50	70	93	96	105	102	114	122	116	107	111	105	103	82	70	61	56	56	54
6	51	52	46	43	43	46	73	105	120	130	128	130	134	127	121	116	111	107	83	76	62	49	46	44
7	44	A	46	43	44	41	72	88	117	120	136	142	133	127	124	126	129	122	95	76	69	60	S 64	S 62
8	56	56	55	52	52	48	59	80	90	75	75	80	76	77	72	74	78	72	60	54	58	58	60	57
9	60	57	50	45	43	44	66	101	121	123	120	126	124	125	118	99	95	101	82	65	64	61	60	52
10	46	48	49	46	44	46	65	103	126	130	124	121	115	120	123	112	111	95	78	66	66	68	S 61	59
11	53	55	51	52	50	51	64	87	S 112	117	125	118	116	104	98	98	100	94	75	66	S 69	55	50	46
12	46	46	45	44	41	43	73	88	108	113	116	125	117	125	120	112	109	103	85	68	64	63	62	57
13	55	55	55	52	49	51	77	100	117	121	131	134	130	132	133	125	124	109	87	83	S 73	65	58	54
14	51	50	50	51	46	48	72	107	122	118	126	128	128	115	114	116	116	106	97	88	84	78	69	68
15	60	60	66	57	39	34	63	107	128	137	138	135	133	136	125	120	119	112	92	79	76	76	76	59
16	S 62	62	60	60	56	60	78	94	108	118	130	141	132	130	133	128	124	111	90	80	78	73	66	62
17	57	58	60	57	52	50	78	114	113	114	135	144	142	139	138	136	133	123	103	82	71	68	66	66
18	64	63	64	62	56	55	80	108	125	114	130	142	148	137	127	133	123	117	101	81	79	68	66	66
19	62	61	61	61	58	51	76	94	108	118	137	142	129	126	134	130	126	120	88	77	78	73	74	S 64
20	57	59	56	57	52	52	73	93	102	116	124	135	130	132	133	125	123	120	95	77	70	68	66	64
21	60	S 61	64	66	59	45	70	111	110	108	122	134	132	135	132	117	118	114	93	72	69	68	63	60
22	55	52	51	52	48	50	78	100	97	108	114	118	114	128	125	121	111	103	78	71	66	56	55	53
23	54	55	55	52	48	50	78	122	149	127	112	116	S 127	124	124	124	115	100	68	66	69	S 61	58	55
24	52	51	50	51	48	48	66	108	132	123	137	137	133	128	123	126	116	95	92	90	71	68	68	S 64
25	65	70	63	58	60	58	66	96	S 114	120	132	S 136	145	D S 154	S 152	120	98	93	78	64	58	40	42	44
26	41	45	42	43	30	32	57	117	121	121	120	139	142	143	127	126	121	C	C	60	61	47	50	48
27	46	43	43	41	36	34	57	86	106	131	135	S 136	141	140	130	120	115	102	75	75	76	51	54	52
28	50	44	46	44	43	39	47	87	124	151	S 157	S 153	S 154	149	131	117	116	98	76	62	59	62	60	50
29	50	51	49	45	44	46	63	101	124	132	140	135	137	126	117	122	112	94	68	71	75	54	56	56
30	54	54	51	54	48	46	69	104	108	122	132	131	129	136	129	120	115	98	86	76	69	54	45	47
31	47	48	48	50	41	44	60	86	112	134	126	128	124	125	129	122	112	97	97	79	56	55	52	48
	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	31	30	31	30	31	31	31	31	31	31	31	31	31	31	31	29	30	31	31	30	30	31
MED	54	54	51	52	47	47	69	100	113	120	126	134	129	127	124	120	115	102	82	72	69	61	60	55
U Q	57	58	60	57	52	51	74	107	124	130	135	138	134	136	131	125	121	112	92	79	75	68	66	62
L Q	50	48	46	45	43	43	63	88	106	113	116	118	117	116	114	111	105	95	75	66	61	55	52	50

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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		L		L	L									
2							A	L 408	L 480	472	L 488	500	476	556	492	L 476	L	A						
3									L	L		L	L	L		L								
4								L 452	L 492	A	L	L	L	L										
5										L		L	A	L		L								
6										L		L	L	L	L									
7											L	L	L	L	L	L								
8								L	L	L	516	L 520	L	L	L	L								
9										L	L	L	L		L									
10									L	L	L		L	L	L									
11								L	L		L	L	L											
12									L		L	L		L	L									
13											L		L	L										
14											L	L	L	L	L	L								
15											L	L		L	L									
16											L	L	L	L	L									
17											L	L	L	L	L									
18												L	L		L									
19										L		L		L	L									
20														L										
21													L	L	L									
22													L	L										
23												L			L									
24										L	L		L		L									
25								L			L	L	L	L										
26														L				C	C					
27										L	L													
28												L	L	L										
29												L	L											
30										L			L											
31												L		L										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	2	1	2	2	1	1	1	1								
MED								L 430	L 486	472	502	510	476	556	492	L 476								
U Q																								
L Q																								

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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							A	A	U R 300	R	R	R	R	R	R	320	276	B						
2	J K 140						U R 160	U A 248	R	U A 328	U A 352	A	A	R	336	A	264	A						
3							188	A	A	A	A	R	U R 376	A	R	R	264	B						
4							204	256	A	A	A	R	U R 356	R	R	R	264	176						
5							U A 196	256	B	A	R	R	A	U R 364	U R 344	A	256	188						
6							U A 172	U A 272	A	A	A	A	R	A	U A 344	U A 312	268	B						
7							200	268	312	340	U R 364	A	A	360	A	312	A	B						
8							172	260	A	A	A	U R 372	U R 384	360	U A 340	U A 312	256	B						
9							192	A	A	A	R	A	A	R	R	308	260	U A 200						
10							B	248	A	A	A	A	A	R	U R 344	312	A	B						
11							184	256	308	U A 332	A	A	A	A	A	A	A							
12							184	268	R	R	R	B	R	A	A	R	264	B						
13							B	268	A	A	A	U R 380	U R 388	U R 360	A	A	A	B						
14							B	252	A	B	B	B	B	U R 372	356	320	264	B						
15							B	264	U A 316	A	A	A	R	U R 372	348	312	252	B						
16							B	U R 256	320	A	A	A	A	U R 364	R	312	248	B						
17							168	264	R	A	R	R	U R 360	B	340	U A 304	A	B						
18							184	268	U R 320	A	R	R	R	A	A	A	U A 248	B						
19							U R 176	U R 264	R	U R 340	R	B	R	R	R	U R 308	U R 248	B						
20							B	256	U A 312	U A 344	B	B	R	B	A	A	A	B						
21							B	256	312	344	A	A	U R 384	R	A	U A 300	U R 260							
22							B	260	312	A	A	A	A	A	A	A	U R 256	B						
23							B	252	A	A	A	R	R	R	U R 340	U R 312	A	B						
24							B	248	R	A	A	R	A	A	U R 328	A	220	B						
25							B	A	A	A	A	A	A	R	R	U A 288	A	B						
26							B	U R 248	U R 296	R	R	A	A	A	A	A	A	C	C					
27							B	248	U A 300	A	A	A	A	A	A	A	A	B						
28							B	A	U A 316	U R 336	U R 344	R	U R 376	A	A	U A 264	220	B						
29							B	A	U R 288	A	U R 340	R	R	B	U R 328	U R 296	U A 232	B						
30			E C 284				B	U R 244	A	R	R	R	R	U R 312	B	292	236	B						
31							B	U R 256	U R 308	U A 332	A	B	A	R	U R 332	292	U R 220	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1		1				13	25	14	8	4	2	7	8	12	18	21	3						
MED	J K 140		E C 284				184	256	U 312	U 338	U R 348	U R 376	U R 376	U R 362	U 340	310	256	188						
U Q							194	264	U 316	U 342	U 358		U R 384	U R 368	344	U 312	264	U A 200						
L Q							172	250	U R 300	U A 332	U R 342		U R 360	360	U R 334	U 296	242	176						

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	J A 23	22	E B 14	E B 16	21	J A 47	J A 36	J A 37	G 28	G 28	G 25	G 26	G 26	G 28	G 24	37	33	J A 32	J A 46	J A 29	J A 23	J A 30	26	E B 15
2	J K 29	J A 16	J A 38	J A 52	J A 28	J A 43	J A 30	31	G 26	37	38	38	42	G 28	38	40	35	J A 89	J A 30	J A 19	J A 26	J A 24	J A 22	J A 24
3	E B 15	E B 15	E B 16	E B 16	E B 14	E B 14	G	33	35	38	J A 46	G 25	G 34	36	G 33	G 30	30	23	J A 22	E B 14	20	E B 14	E B 15	E B 14
4	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	G	28	35	J A 50	J A 45	G 35	G 26	G 26	G 23	G	34	29	J A 20	E B 15	19	J A 39	J A 45	20
5	20	J A 23	19	E B 15	E B 16	E B 16	25	33	36	37	G 33	G 33	J A 69	G 28	G 26	36	G 24	23	20	22	20	J A 21	J A 24	J A 22
6	J A 23	J A 29	J A 25	J A 27	J A 19	E B 16	27	J A 33	34	37	42	38	G 30	41	46	35	G 23	J A 38	J A 31	J A 55	J A 34	J A 23	J A 76	J A 49
7	J A 42	J A 54	J A 60	J A 24	E B 15	E B 14	G	30	35	39	G 33	42	J A 43	42	42	40	J A 37	J A 28	J A 24	J A 26	J A 21	34	J A 24	J A 19
8	J A 19	E B 16	E B 15	E B 16	E B 14	E B 16	20	30	36	38	38	G 27	G	42	38	38	J A 38	J A 38	J A 42	J A 34	J A 20	E B 15	J A 33	J A 34
9	J A 33	J A 27	J A 24	E B 15	E B 16	E B 16	G	28	33	J A 43	G 28	J A 42	41	G 30	G 28	40	30	23	J A 21	E B 16	23	E B 15	21	J A 32
10	J A 33	J A 54	J A 30	J A 24	20	J A 18	E B 18	30	36	38	37	38	41	G 26	G	39	32	24	E B 16	E B 15	J A 20	J A 22	E B 15	19
11	20	E B 16	J A 17	J A 28	J A 35	20	22	30	39	J A 46	J A 42	J A 50	J A 64	J A 46	J A 39	J A 43	J A 41	J A 67	J A 54	J A 38	J A 24	J A 33	J A 55	E B 16
12	E B 14	J A 20	J A 25	J A 28	J A 18	J A 24	22	30	G 26	G 28	G 28	E B 40	G 27	39	36	G	32	22	19	J A 19	E B 14	J A 38	24	J A 23
13	E B 14	J A 24	19	J A 21	E B 15	E B 14	21	G	35	37	42	G 35	G 31	G J 32	J A 53	J A 80	J A 33	J A 34	J A 46	J A 28	J A 40	J A 40	J A 27	J A 28
14	J A 23	J A 24	J A 21	J A 26	E B 14	E B 15	20	29	J A 35	E B 41	E B 44	E B 42	E B 45	G 27	38	37	J A 50	23	J A 20	J A 24	19	E B 15	J A 20	J A 25
15	19	22	E B 15	E B 14	E B 14	20	19	G 22	37	39	J A 50	41	G	G 30	40	36	44	J A 48	J A 52	J A 54	30	E B 16	E B 15	J A 26
16	24	J A 19	J A 21	26	J A 18	20	E B 15	G	36	41	41	40	40	G	G	36	39	39	20	E B 16	J A 21	E B 15	E B 16	E B 15
17	19	E B 15	E B 15	E B 16	E B 15	E B 15	G	G 22	G J 26	A 50	G 32	G 30	G	E B 41	G	34	30	J A 48	J A 43	J A 28	J A 24	J A 20	J A 26	J A 24
18	18	E B 16	E B 16	E B 15	E B 15	E B 16	G	G	G 26	36	G 26	G 27	G	38	36	34	G 22	J A 23	20	E B 16	E B 16	E B 16	20	J A 24
19	J A 20	J A 17	E B 15	19	E B 15	E B 14	G	G	G	G 28	G 28	E B 40	G	G	G 23	J G 26	28	E B 17	E B 16	E B 16	E B 16	E B 15	E B 14	E B 16
20	18	E B 15	J A 30	J A 50	J A 28	J A 16	22	30	34	37	E B 42	40	G	42	43	J A 38	26	E B 18	E B 15	E B 16	E B 16	E B 16	J A 29	18
21	E B 16	J A 26	E B 15	E B 14	E B 15	E B 16	19	29	G	38	40	J A 41	G	G	38	44	G	E B 18	17	22	E B 16	19	E B 16	20
22	20	J A 20	E B 16	E B 15	E B 15	E B 15	E B 18	G	36	42	J A 45	41	40	41	36	33	G 25	J A 57	J A 29	J A 32	J A 23	18	J A 20	J A 17
23	E B 15	E B 15	E B 15	E B 14	E B 15	E B 16	E B 16	G	32	38	J A 44	G 32	G 33	G 32	G	G	J A 33	19	J A 30	J A 46	18	E B 16	E B 28	E B 16
24	E B 16	E B 14	J A 21	J A 22	J A 21	E B 15	E B 14	G	G 23	36	37	44	J A 60	J A 50	G	35	J A 62	J A 38	20	J A 47	J A 54	E B 17	E B 13	21
25	E B 27	21	J A 34	J A 45	J A 27	E B 15	J A 25	J A 49	J A 48	A J 61	A J 51	A J 53	J A 39	J A 32	G 26	G 34	27	J A 42	J A 24	E B 15	E B 15	E B 25	E B 15	E B 14
26	E B 15	E B 16	E B 66	J A 15	E B 15	E B 16	E B 18	G	G 26	G 28	G 29	38	J A 48	J A 54	J A 62	J A 51	J A 40	C	C	J A 54	J A 23	J A 19	J A 42	J A 30
27	J A 27	J A 26	J A 43	J A 23	E B 14	E B 15	E B J 24	G	35	J A 47	J A 73	J A 72	J A 48	J A 50	43	J A 40	J A 54	J A 54	J A 59	J A 26	74	J A 42	J A 26	J A 22
28	J A 21	E B 15	E B 14	19	E B 14	E B 15	E B J 20	A 33	J A 39	G 29	G 31	G 30	G 35	35	36	G	29	J A 28	J A 28	J A 21	J A 42	J A 28	J A 23	18
29	J A 20	J A 24	J A 19	E B 16	E B 15	E B 15	E B 16	26	G J 26	A 36	G 28	G 30	G E 28	B 39	G 24	G	26	J A 24	E B 16	J A 18	E B 15	E B 14	E B 16	E B 15
30	E B 15	E B 14	E B 28	C E 14	E B 16	E B 15	E B 14	G	J A 32	G 31	G 32	G 27	G 26	G	E B 35	32	27	J A 33	J A 24	J A 24	J A 24	19	J A 20	J A 28
31	18	J A 64	J A 26	J A 16	J A 31	J A 24	E B 17	G 20	G 27	36	39	E B 41	47	G	G	G	G	J A 25	J A 44	J A 22	20	20	E B 15	E B 15
	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31
MED	20	J A 20	19	16	E B 15	E B 16	E G 18	28	34	38	38	36	G	G	36	36	32	J A 28	J A 24	J A 22	J A 21	19	J A 22	J A 20
U Q	J A 23	J A 24	A J 28	A J 26	J A 20	A J 18	A J 22	30	36	J A 41	J A 44	A J 41	J A 43	41	39	40	J A 38	J A 39	A J 42	A J 32	A J 24	A J 28	A J 27	A J 25
L Q	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	E B 18	G	G 27	36	G 31	G 30	G 33	30	G 33	G	G 26	23	20	E B 16	E B 18	E B 16	E B 16	E B 16

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

IONOSPHERIC DATA STATION Kokubunji

OCT.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	20	E B 15	E B 14	E B 16	14	23	24	33	G 28	G 28	U Y 25	G 26	U Y 26	U Y 28	U Y 24	34	31	21	20	25	18	E B 15	20	E B 15
2	21	E B 16	24	A A 52	27	A A 43	25	29	G 26	35	37	U Y 38	41	G 28	36	35	32	A A 89	19	E B 15	19	20	17	18
3	E B 15	E B 15	E B 16	E B 16	E B 14	E B 14	G	31	35	35	44	U Y 25	G 34	U Y 36	U Y 33	G 29	28	22	18	E B 14	E B 15	E B 14	E B 15	E B 14
4	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	G	27	32	47	42	U Y 35	U Y 26	U Y 26	U Y 23	G	32	29	17	E B 15	E B 15	28	34	E B 16
5	E B 16	20	E B 15	E B 15	E B 16	E B 16	23	30	35	36	G 33	G 33	46	U Y 28	U Y 26	33	G 23	22	18	19	15	17	E B 16	20
6	E B 14	25	20	22	E B 15	E B 16	25	28	33	U Y 37	41	U Y 38	G 30	39	45	34	G 22	36	28	54	30	19	20	33
7	19	A A 54	40	18	E B 15	E B 14	G	28	34	38	G 33	38	40	40	41	37	34	24	20	20	19	31	19	E B 16
8	16	E B 16	E B 15	E B 16	E B 14	E B 16	20	28	35	37	38	U Y 27	G	40	37	34	34	36	40	32	17	E B 15	24	16
9	E B 15	E B 15	16	E B 15	E B 16	E B 16	G	27	U Y 33	39	U Y 28	39	38	G 30	G 28	38	29	21	17	E B 16	E B 16	E B 15	E B 16	27
10	20	21	17	20	E B 15	E B 16	E B 18	28	35	38	U Y 37	U Y 38	40	G 26	G	37	31	23	E B 16	E B 15	E B 16	18	E B 15	E B 15
11	E B 15	E B 16	E B 15	16	25	E B 16	20	29	35	42	40	44	53	39	36	34	39	36	27	25	19	29	35	E B 16
12	E B 14	E B 16	E B 15	19	E B 15	16	20	28	G U Y 26	U Y 28	U Y 28	E B 40	U Y 27	38	36	G	31	21	18	16	E B 14	28	20	E B 15
13	E B 14	16	E B 16	E B 14	E B 15	E B 14	20	G	32	35	39	G 35	G 31	G 32	51	43	29	31	44	20	21	27	19	17
14	E B 15	E B 15	17	E B 15	E B 14	E B 15	20	27	32	E B 41	E B 44	E B 42	E B 45	U Y 27	38	35	42	20	16	19	17	E B 15	18	22
15	E B 15	E B 18	E B 15	E B 14	E B 14	15	19	G 19	35	38	46	41	G	G 30	40	34	43	43	33	27	28	E B 16	E B 15	E B 16
16	21	E B 15	18	22	E B 15	E B 15	E B 15	G	35	40	40	40	U Y 40	G	G	34	38	36	19	E B 16	E B 15	E B 15	E B 16	E B 15
17	E B 15	E B 15	E B 15	E B 16	E B 15	15	G	G 21	G 25	46	U Y 32	G 30	G	E B 41	G	33	29	20	32	24	22	18	20	20
18	E B 15	E B 16	E B 16	E B 15	E B 15	E B 16	G	G	G 26	35	U Y 26	U Y 27	G	37	35	32	G 21	18	19	E B 16	E B 16	E B 16	E B 15	E B 14
19	E B 15	E B 16	E B 15	E B 15	E B 15	E B 14	G	G	G	G 27	G E B 28 40		G	G	G 23	G 19	28	E B 17	E B 16	E B 16	E B 16	E B 15	E B 14	E B 16
20	E B 15	E B 15	E B 17	28	23	E B 15	20	28	33	36	E B 42	40	G	42	41	35	25	E B 18	E B 15	E B 16	E B 16	E B 16	27	E B 15
21	E B 16	20	E B 15	E B 14	E B 15	E B 16	19	28	G	37	38	40	G	G	36	42	G	E B 18	16	E B 15	E B 16	E B 15	E B 16	E B 16
22	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15	E B 18	G	33	41	42	40	40	40	36	U Y 32	G 23	40	19	22	E B 15	E B 16	17	E B 14
23	E B 15	E B 15	E B 15	E B 14	E B 15	E B 16	E B 16	G	31	36	37	U Y 32	G 33	G 32	G	G	31	17	21	29	E B 14	E B 16	E B 28	E B 16
24	E B 16	E B 14	18	16	19	E B 15	E B 14	G	G 23	35	36	43	54	48	G	34	59	23	18	34	33	E B 17	E B 13	E B 16
25	E B 27	19	19	16	17	E B 15	22	32	31	55	44	42	36	G 32	G 26	32	26	24	20	E B 15	E B 15	21	E B 15	E B 14
26	E B 15	E B 16	E B 15	E B 15	E B 15	E B 16	U Y 18	G	G 25	G 28	U Y 29	36	42	46	60	46	31	C	C	40	19	E B 16	E B 16	22
27	19	22	23	20	E B 14	E B 15	18	G	32	39	45	64	45	41	40	38	45	47	44	23	44	21	E B 15	E B 16
28	18	E B 15	E B 14	E B 14	E B 14	E B 15	E B 20	28	G 28	G 29	G 31	G 30	G 33	35	33	G	26	17	16	E B 16	30	E B 16	E B 16	E B 16
29	17	19	E B 15	E B 16	E B 15	E B 15	E B 16	24	G 26	32	G 27	G 30	G 28	E B 39	G 24	G	26	18	E B 16	E B 16	E B 15	E B 14	E B 16	E B 15
30	E B 15	E B 14	E C 28	E B 14	E B 16	E B 15	E B 14	G	30	G U Y 31	U Y 32	U Y 27	U Y 26	G	E B 35	32	26	30	21	20	20	16	E B 15	E B 15
31	E B 16	27	22	E B 15	26	E B 14	E B 17	G 19	G 26	35	E B 38	E B 41	42	G	G	G	G	20	18	19	18	E B 16	E B 15	E B 16
	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31
MED	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E G 18	27	32	36	37	36	G	G	35	34	29	22	19	19	17	E B 16	E B 16	E B 16
U Q	18	19	18	18	16	E B 16	20	28	34	39	42	40	41	40	38	35	34	36	21	25	20	20	20	17
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 18	G	G 26	G U Y 35	31	30	33	30	G	G	G 26	20	17	E B 16	E B 15	E B 15	E B 15	E B 15

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	15	14	16	14	15	15	14	15	16	19	22	24	21	20	14	15	18	15	14	14	15	15	15
2	16	16	15	15	16	15	13	14	16	19	19	22	22	23	19	16	16	14	14	15	14	14	15	13
3	15	15	16	16	14	14	14	16	20	20	28	20	22	22	20	19	16	17	13	14	15	14	15	14
4	16	16	16	15	15	16	14	13	14	20	31	25	20	20	19	24	17	14	15	15	15	16	15	16
5	16	15	15	15	16	16	14	15	32	21	26	23	22	20	20	17	15	14	14	14	15	14	16	15
6	14	16	15	15	15	16	14	14	21	20	22	24	21	21	30	20	16	16	14	15	15	15	15	14
7	14	16	15	14	15	14	15	14	14	14	19	18	27	17	20	18	15	14	15	15	16	15	15	16
8	15	16	15	16	14	16	13	15	20	20	21	23	30	21	19	20	15	15	16	15	15	15	14	13
9	15	15	16	15	16	16	15	16	19	18	22	27	20	23	21	15	15	15	15	16	16	15	16	15
10	16	15	16	15	15	16	18	16	20	20	22	34	23	20	22	19	17	16	16	15	16	14	15	15
11	15	16	15	16	15	16	15	15	19	19	20	34	28	22	20	16	14	15	16	18	14	14	14	16
12	14	16	15	16	15	14	14	16	19	22	22	40	19	28	22	19	16	16	15	14	14	15	16	15
13	14	14	16	14	15	14	15	16	16	20	22	22	23	21	22	20	19	15	16	14	14	16	15	14
14	15	15	15	15	14	15	16	14	16	41	44	42	45	20	19	18	18	12	12	14	15	15	15	15
15	15	18	15	14	14	15	15	15	14	22	21	18	24	22	20	20	15	14	16	15	15	16	15	16
16	16	15	14	13	15	15	15	15	20	20	19	18	22	30	27	20	16	14	15	16	15	15	16	15
17	15	15	15	16	15	15	14	15	15	17	23	19	28	41	22	21	13	13	16	15	15	15	15	15
18	15	16	16	15	15	16	14	15	18	20	20	21	30	20	22	22	14	14	16	16	16	16	15	14
19	15	16	15	15	15	14	15	17	15	22	24	40	28	27	16	14	15	17	16	16	16	15	14	16
20	15	15	14	14	14	15	16	17	19	22	42	35	35	36	24	21	20	18	15	16	16	16	15	15
21	16	16	15	14	15	16	16	16	18	22	25	30	30	31	23	21	15	18	11	15	16	15	16	16
22	16	15	16	15	15	15	18	15	14	25	22	26	27	29	21	18	14	14	16	16	15	16	14	14
23	15	15	15	14	15	16	16	16	17	18	21	26	24	23	24	21	16	14	15	15	14	16	28	16
24	16	14	14	14	14	15	14	16	15	18	18	19	18	29	22	20	17	15	14	15	16	17	13	15
25	27	16	14	14	16	15	13	15	16	20	28	23	23	23	17	14	13	14	16	15	15	15	15	14
26	15	16	15	15	15	16	13	14	19	21	20	22	20	20	20	16	14	C	C	15	15	16	16	16
27	16	16	15	14	14	15	14	16	19	22	23	24	30	22	25	21	17	15	15	15	15	16	15	16
28	15	15	14	14	14	15	20	16	20	18	23	22	24	23	20	17	15	15	16	16	15	16	16	16
29	15	16	15	16	15	15	16	14	17	18	20	20	20	39	19	20	18	14	16	16	15	14	16	15
30	15	14	E C 28	14	16	15	14	14	18	19	19	20	22	28	35	15	15	15	15	13	15	14	15	15
31	16	16	15	15	15	14	17	13	15	17	21	41	27	26	21	18	16	14	14	15	15	16	15	15
	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	30	30	31	31	31	31	31
MED	15	16	15	15	15	15	15	15	18	20	22	23	24	23	21	19	15	15	15	15	15	15	15	15
U Q	16	16	16	15	15	16	16	16	19	22	24	30	28	28	22	20	17	16	16	16	16	16	16	16
L Q	15	15	15	14	14	15	14	14	15	18	20	20	22	21	20	16	15	14	14	15	15	15	15	14

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	F	F	F									S					S					F	F	S
			270	310	226	248	267	303	322	312	308	313	300	309	313	314	326	333	321	280	260			246
2		F		A		A												A		S		S		
	247	234	243		241		283	263	279	251	259	253	270	246	270	292	308		301	304	304	286	272	262
3	262	273	293	319	312	292	332	348	349	340	330	323	319	306	316	315	333	336	305	312	317	299	298	265
4	259	267	268	296	257	265	277	267	289	287	286	285	292	314	320	323	305	329	309	270	273	275	282	272
5	274	271	270	273	273	280	344	346	340	344	311	306	308	307	295	311	317	337	322	315	303	279	279	279
6	258	277	263	248	243	273	330	334	325	320	302	306	311	306	308	315	328	336	324	324	317	308	299	283
7	269	A	290	294	277	278	334	334	317	313	310	310	301	298	292	293	309	316	302	304	295	273	S 279	S 294
8	276	247	257	243	249	246	268	275	280	310	266	280	270	287	296	289	318	319	322	261	277	272	283	265
9	284	289	273	269	258	274	334	333	328	316	303	299	296	296	305	304	312	321	314	309	294	291	290	279
10	254	255	268	275	255	265	299	336	318	330	307	306	292	294	309	308	322	323	299	292	282	288	S 281	287
11	256	269	271	287	265	264	303	305	S 311	327	330	317	308	312	311	311	326	322	305	289	S 301	297	289	277
12	265	262	267	281	270	275	337	345	339	327	312	295	286	294	305	303	310	313	320	297	291	277	289	284
13	267	281	288	274	264	277	326	328	322	312	304	297	288	288	294	287	304	311	300	298	S 300	296	294	280
14	273	263	267	285	271	269	311	327	329	311	307	298	306	278	290	293	308	311	301	305	288	282	257	265
15	249	249	277	314	294	287	306	323	316	309	305	287	282	288	288	294	303	315	313	290	278	281	312	255
16	S 261	265	268	259	255	258	336	338	330	308	297	305	290	285	291	299	309	313	305	298	295	310	290	278
17	272	273	292	299	308	244	315	354	330	311	299	310	300	288	298	294	303	314	313	300	287	287	279	274
18	271	267	281	286	295	298	326	338	334	319	307	299	298	294	284	297	302	310	324	288	298	287	281	286
19	276	269	282	287	316	279	330	335	337	310	314	300	297	283	298	307	303	318	305	284	292	290	309	S 309
20	270	281	279	294	285	280	331	343	326	316	307	305	297	293	301	304	304	321	314	295	287	286	281	279
21	265	S 281	290	314	335	286	322	347	346	321	302	303	294	299	301	298	308	316	314	306	295	301	300	301
22	293	272	274	287	288	297	351	361	340	333	322	311	294	294	302	307	311	321	298	306	309	289	274	275
23	274	280	293	302	286	275	319	335	349	343	330	312	S 301	298	303	307	322	328	313	292	308	S 309	295	295
24	282	290	288	303	272	262	305	327	340	327	323	319	298	302	296	308	312	303	298	310	300	274	271	S 261
25	281	282	280	239	269	246	289	309	S 323	303	302	S 309	291	S	S 307	316	327	319	322	313	315	312	278	268
26	266	298	311	332	256	281	307	353	338	320	305	306	317	316	308	311	313	C	C	303	319	285	289	280
27	271	270	266	281	270	259	308	341	324	323	320	S 321	313	306	308	314	316	329	299	302	334	283	292	291
28	300	268	270	252	243	235	261	311	307	333	S 324	S 305	S 313	307	310	308	313	321	327	293	275	304	311	296
29	282	305	301	293	281	276	313	335	337	328	326	313	313	317	307	321	324	332	309	299	330	306	287	297
30	289	292	286	306	303	291	314	356	340	331	325	320	303	308	315	315	325	326	311	305	322	297	295	282
31	267	293	285	312	284	269	326	341	329	330	323	319	315	311	307	319	324	312	317	336	283	293	300	274
	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	31	30	31	30	31	31	31	31	31	31	31	30	31	31	31	29	30	31	31	30	30	31
MED	270	272	277	287	271	274	315	335	329	320	307	306	298	298	303	307	312	321	312	300	295	288	289	279
U Q	276	282	288	303	288	280	331	345	339	330	323	313	308	307	308	314	324	328	320	306	309	299	295	287
L Q	262	266	268	274	256	262	303	323	318	311	302	299	292	288	295	297	308	314	302	292	287	282	279	268

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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		L		L	L									
2							A	L 319	L 324	355	L 364	355	378	298	341	L 334	L	A						
3									L	L		L	L	L		L								
4								L 333	L 326	A	L	L	L	L										
5										L		L	A	L		L								
6										L		L	L	L	L									
7											L	L	L	L	L	L								
8								L	L	L	354	L 349	L	L	L	L								
9										L	L	L	L		L									
10									L	L	L		L	L	L									
11								L	L		L	L	L											
12									L		L	L		L	L									
13											L		L	L										
14											L	L	L	L	L	L								
15											L	L		L	L									
16											L	L	L	L	L									
17											L	L	L	L	L									
18												L	L		L									
19										L		L		L	L									
20														L										
21													L	L	L									
22													L	L										
23												L			L									
24										L	L		L		L									
25								L			L	L	L	L										
26														L				C	C					
27										L	L													
28												L	L	L										
29												L	L											
30										L			L											
31												L		L										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	2	1	2	2	1	1	1	1								
MED								L 326	L 325	355	359	352	378	298	341	L 334								
U Q																								
L Q																								

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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										264		266		270	278									
2							296	402	358	440	432	464	426	538	424	336	312	A						
3									230	242		258	278	302		286								
4								368	344	338	292	276	318	292										
5										236		288	270	274		274								
6										278		272	276	274	266									
7											282	278	272	296	302	284								
8								338	304	290	396	340	292	322	320	334								
9										254	260	298	278		274									
10									262	256	282		310	310	288									
11								274	262		266	264	292											
12									248		296	256		326	292									
13											282		298	286										
14											288	294	284	318	310	304								
15											298	306		308	298									
16											302	264	276	298	310									
17											310	264	284	302	292									
18												302	294		316									
19										290		276		322	298									
20														306										
21													302	296	296									
22													302	298										
23												276			292									
24										246	270		308		316									
25								286			270	286	312	276										
26														274				C	C					
27										282	272													
28												280	262	282										
29												260	272											
30										256			304											
31												262		276										
	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	5	7	13	16	22	22	23	17	6	1							
MED							296	338	262	264	285	276	292	298	298	295	312							
U Q								385	344	290	300	294	304	310	313	334								
L Q								280	248	250	271	264	276	276	290	284								

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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	E A 264	E B 308	222	238	242	E A 378	E A 246	236	232	214	H 202	196	208	H 196	226	220	232	226	208	E A 260	E A 282	E B 330	E A 302	E B 312
2	E A 332	E B 420	E A 406	A	E A 480	A	A	246	258	228	216	226	222	264	240	238	E A 244	A	248	210	236	246	E A 258	E A 308
3	E B 320	E B 300	260	228	242	272	234	226	210	206	222	218	218	210	212	214	238	226	214	222	220	214	244	E B 320
4	E B 352	E B 310	E B 314	258	E B 366	E B 316	264	250	236	A	E A 240	216	208	U R 240	234	234	240	240	230	246	228	E A 316	E A 314	268
5	270	E A 304	E B 290	266	242	274	228	228	228	A	214	210	A	220	222	224	232	222	220	234	E B 234	E A 266	264	E A 304
6	E B 294	E A 326	E A 348	E A 382	E B 364	E B 310	238	226	224	208	222	202	210	220	228	228	228	220	216	E A 268	E A 240	236	E A 268	E A 356
7	E A 308	A	E A 380	E A 262	E B 280	264	228	212	220	218	208	214	206	218	226	228	238	220	222	210	E A 252	E A 298	E A 286	258
8	E A 278	E B 328	E B 312	E B 336	E B 332	E B 350	272	248	240	E A 268	232	226	U R 248	230	230	224	E A 252	E A 240	E A 258	E A 332	274	258	E A 284	E A 296
9	272	254	218	E B 264	E B 304	E B 308	230	228	220	210	200	194	190	220	226	226	224	230	208	210	244	240	240	E A 300
10	E A 344	E A 354	E A 326	E A 276	E B 322	E B 308	236	226	218	212	208	202	214	224	224	228	234	218	202	234	276	238	266	244
11	E B 284	E B 282	248	E A 276	E A 324	A E B 302	254	228	214	208	202	216	E A 238	218	214	238	232	222	220	E A 256	E A 236	E A 248	E A 328	E B 278
12	E B 288	E B 302	E B 306	E A 292	256	E A 292	232	210	208	216	212	H 186	220	230	216	226	236	226	208	224	240	E A 296	264	256
13	272	270	256	278	E B 286	E B 288	222	216	220	218	204	208	208	224	E A 252	230	236	216	E A 254	248	224	E A 270	250	E A 264
14	E B 272	E B 304	E B 314	E A 280	250	274	240	222	218	226	228	206	220	236	228	224	238	232	234	232	E A 250	218	E A 282	E A 304
15	E B 304	E B 354	E B 278	200	212	E B 276	252	238	230	226	216	220	240	218	226	238	238	228	228	E A 254	E A 268	E B 278	242	E B 268
16	E A 334	E B 304	E B 324	E A 318	E B 314	E B 306	202	H 188	212	216	212	224	214	214	222	230	224	222	212	232	230	234	232	256
17	E B 284	E B 304	262	234	224	E B 344	240	202	204	218	204	202	220	216	222	226	228	220	228	232	232	E A 254	E A 268	E A 286
18	E B 288	278	270	268	226	232	240	220	208	208	H 200	214	218	222	220	230	232	224	220	218	234	226	262	274
19	264	E B 290	E B 288	270	226	250	218	210	210	218	214	220	224	222	226	244	234	226	200	230	242	246	E B 248	232
20	E B 284	E B 282	E B 278	E A 288	E A 270	264	234	208	212	222	220	218	226	232	232	230	230	220	200	218	230	242	E A 290	E B 280
21	E B 306	E A 298	264	242	208	224	246	222	212	210	212	H 194	226	218	230	230	230	224	204	210	234	238	238	244
22	260	E B 280	E B 300	E B 278	240	266	218	218	208	226	216	218	220	232	234	228	224	224	210	236	228	242	E A 298	E B 286
23	E B 284	E B 288	246	238	252	E B 302	248	228	224	208	200	208	H 210	234	214	234	228	210	212	E A 280	242	228	E B 274	260
24	264	244	250	258	E A 276	E B 328	252	226	216	194	204	226	232	248	222	232	234	228	234	242	E A 256	272	E B 296	E B 320
25	266	E A 294	E A 294	E A 302	E A 288	E B 350	256	E A 250	222	232	226	220	216	234	230	206	216	220	212	220	230	E A 236	E B 290	E B 316
26	E B 318	266	250	218	E B 246	E B 302	258	230	212	218	206	202	232	240	E A 246	238	216	C	C	E A 274	238	232	262	E A 292
27	E A 296	E A 334	E A 330	E A 274	230	E B 344	240	202	210	230	228	246	232	238	234	226	230	222	E A 264	248	238	254	264	256
28	256	274	E B 312	E B 342	E B 354	E B 400	276	222	220	H 198	H 206	200	216	216	208	214	216	204	208	224	E A 308	260	242	234
29	E A 282	262	262	252	254	E B 290	236	H 210	216	204	216	210	220	220	222	230	212	208	214	266	226	214	258	250
30	246	266	E C 280	246	224	234	240	210	210	204	H 192	H 190	212	232	226	226	220	216	228	242	232	218	250	E B 280
31	E B 304	E A 310	E A 304	260	E A 282	E B 286	218	H 198	230	222	214	218	228	214	226	H 202	218	220	220	202	228	240	240	E B 278
	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	31	30	31	30	31	30	30	31	31	29	31	31	30	31	31	31	31	29	30	31	31	31	31	31
MED	E 284	E 299	E 288	U 249	E 256	E B 297	240	222	218	216	212	214	220	222	226	228	231	222	216	228	233	237	U 252	E 278
U Q	E 306	E 310	E A 314	E A 280	E B 314	E B 316	252	228	224	224	220	220	226	234	230	232	236	226	228	E A 254	E A 250	E A 266	E A 286	E 304
L Q	270	278	260	246	240	272	230	210	210	208	204	202	212	218	222	224	224	220	208	220	230	234	248	256

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

IONOSPHERIC DATA STATION Kokubunji

OCT. 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							A	A						R				B						
									120	114	118	108	114		114	114	116							
2	134									A	A	A						A						
							118	110	114				116	114	116	116	124							
3									A	A	A			A	A			B						
							118	116				112	112			124	118							
4										A	A	R												
							118	116	118				114	110	112	112	112	122						
5							E B		B					A		A								
							126	112		114	116	112		118	116		114	122						
6											A	A						B						
							118	112	108	116			112	114	114	118	118							
7							E B							A				A	B					
							132	112	118	120	116	116		114	114	114								
8																		B						
							124	118	116	116	116	118	114	118	118	120	110							
9										A		A	A											
							120	114	118		114		116	112	112	112	110							
10							B					A	A					B						
								116	108	110	112		114	112	110	110								
11											A	A	A	A	A	A	A							
							120	110	116	122														
12							E B					B						B						
							150	120	118	116	114		114	114	114	110	114							
13							B				A				A	A	A	B						
								112	112	112		122	116	118										
14							B		A	B	B	B	B					B						
								110						118	118	114	112							
15							B				A	A						B						
								116	116	110			110	120	120	118	114							
16							B											B						
								110	118	120	114	112	122	120	116	116	114							
17							E B																	
							136	118	114		A	R	R		B		A	B						
18							E B								114	118								
							134	112	118	118	116	116	118	A	A	A	112	B						
19							E B																	
							128	116	114	118	116	B	114	112	112	110	116	B						
20							B				B	B		B		A	A	B						
								120	120	120			116		114									
21							B					A												
								112	110	114	118		116	116	114	114	116							
22							B									A		B						
								114	116	120	116	116	118	116	114		120							
23							B				A						A	B						
								112	114	116		114	110	114	114	116								
24							B											B						
								114	118	108	112	114	116	118	112	114	122							
25							B		A	A	A	A	A				A	B						
								A						112	110	116								
26							B					A	A		A	A	A	C	C					
								116	118	116	120			116										
27							B			A	A	A	A			A	A	B						
								112	118						124									
28							B							A				B						
								114	134	116	116	114	116		118	112	114							
29							B		A		A			B				B						
								A	120		114	112	110		114	116	116							
30			C				B			A						B		B						
								120		118	120	112	114	110		112	120							
31							B		E A			B						B						
								132	128	114	116		126	116	114	112	114							
	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						13	28	26	22	18	14	22	22	25	23	22	3						
MED	134						121	114	118	116	116	114	115	116	114	114	114	122						
U Q							E B																	
							133	116	118	118	116	116	116	118	116	116	118	122						
L Q							118	112	114	114	114	112	114	114	113	112	112	110						

OCT. 2002 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

OCT. 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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	90	90	B	B	106	104	104	100	104	100	102	94	98	98	96	128	124	114	98	94	98	130	104	B
2	136	118	108	104	102	98	118	112	104	138	144	98	122	100	136	128	130	100	100	100	90	88	90	90
3	B	B	B	B	B	B	G	114	104	102	100	98	98	98	104	100	124	124	94	B	92	B	B	B
4	B	B	B	B	B	B	G	134	112	100	102	96	98	92	94	G	126	116	108	B	100	98	94	96
5	94	96	92	B	B	B	122	118	118	112	106	104	100	102	102	94	104	126	120	108	94	98	102	96
6	94	94	92	92	98	B	108	122	116	114	104	104	98	114	110	118	104	120	104	98	96	96	108	106
7	98	94	92	94	B	B	G	142	128	120	106	116	96	120	116	110	102	102	96	100	98	98	98	96
8	96	B	B	B	B	B	140	128	118	120	124	102	G	132	130	122	118	108	104	98	102	B	96	100
9	98	124	102	B	B	B	G	112	114	102	102	102	96	102	96	132	130	102	100	B	106	B	104	98
10	98	100	96	94	96	102	B	116	108	108	116	106	108	100	G	112	108	108	B	B	102	100	B	98
11	92	B	100	98	90	98	134	132	120	114	110	106	102	102	98	104	102	100	102	96	98	96	96	B
12	B	96	100	96	98	98	152	150	100	98	96	B	94	114	118	G	120	114	108	102	B	94	94	92
13	B	94	98	96	B	B	140	G	118	114	108	104	98	104	102	102	104	110	104	100	96	90	98	98
14	102	110	96	88	B	B	120	110	104	B	B	B	B	90	142	138	120	112	90	104	96	B	94	98
15	100	104	B	B	B	96	128	98	118	118	104	108	G	102	122	120	112	100	100	100	104	B	B	98
16	96	100	94	96	94	102	B	G	132	114	118	114	114	G	G	126	114	106	104	B	102	B	B	B
17	86	B	B	B	B	B	G	104	104	100	98	102	G	B	G	116	112	92	90	88	86	88	100	96
18	86	B	B	B	B	B	G	G	100	118	100	100	G	106	106	108	90	94	90	B	B	B	94	98
19	98	100	B	92	B	B	G	G	G	104	106	B	G	G	98	94	158	B	B	B	B	B	B	B
20	98	B	94	92	90	96	140	150	138	126	B	114	G	114	110	104	108	B	B	B	B	B	92	96
21	B	92	B	B	B	B	156	160	G	126	116	110	G	G	114	116	G	B	106	98	B	98	B	94
22	90	90	B	B	B	B	B	G	126	118	116	116	114	120	116	106	110	118	106	98	100	104	94	96
23	B	B	B	B	B	B	B	G	120	116	106	100	98	102	G	G	108	112	100	98	100	B	B	B
24	B	B	90	96	90	B	B	G	102	120	116	112	108	110	G	120	108	106	100	94	92	B	B	98
25	B	104	102	102	102	B	130	108	104	102	100	100	98	98	94	130	122	94	108	B	B	98	B	B
26	B	B	92	B	B	B	152	G	102	102	104	110	102	114	102	104	106	C	C	102	100	102	114	94
27	94	94	96	96	B	B	106	G	144	108	106	100	106	110	118	106	100	102	98	96	92	94	106	92
28	92	B	B	106	B	B	B	116	108	104	102	104	104	104	124	G	130	104	100	104	94	104	98	94
29	92	88	90	B	B	B	B	102	106	100	102	98	98	B	98	G	160	96	B	104	B	B	B	B
30	B	B	C	B	B	B	B	G	106	104	104	96	100	G	B	148	146	116	92	90	88	94	92	106
31	90	98	94	100	94	108	B	104	104	128	124	B	124	G	G	G	G	114	104	102	96	100	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	21	19	18	16	11	9	15	21	29	30	29	27	23	24	24	25	29	27	26	22	24	19	20	22
MED	94	96	95	96	96	98	130	116	108	113	106	104	100	103	108	116	112	108	100	99	97	98	97	96
U Q	98	104	100	99	102	103	140	133	119	118	116	110	108	114	118	127	125	114	104	102	100	100	103	98
L Q	91	94	92	93	90	97	118	106	104	102	102	100	98	100	98	104	105	100	98	96	93	94	94	94

IONOSPHERIC DATA STATION Kokubunji

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

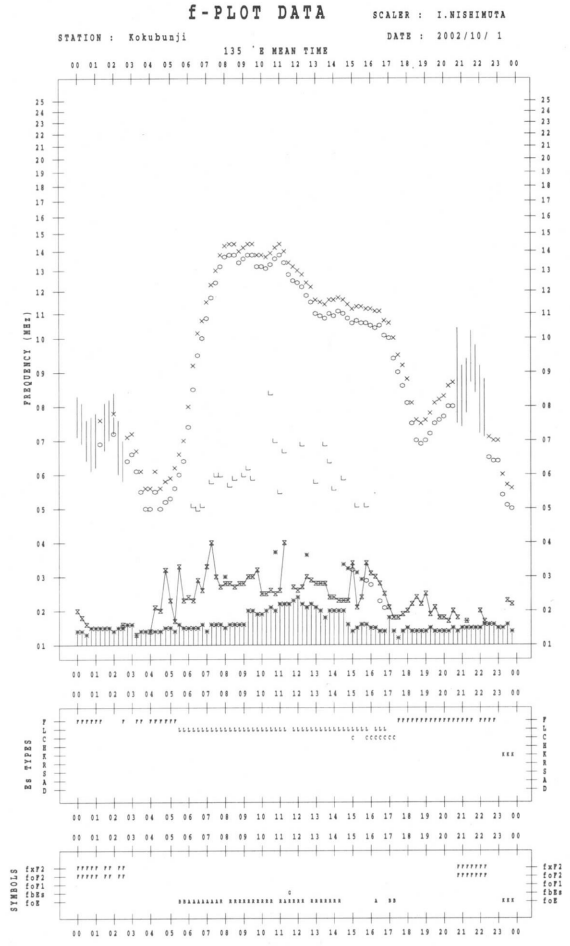
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

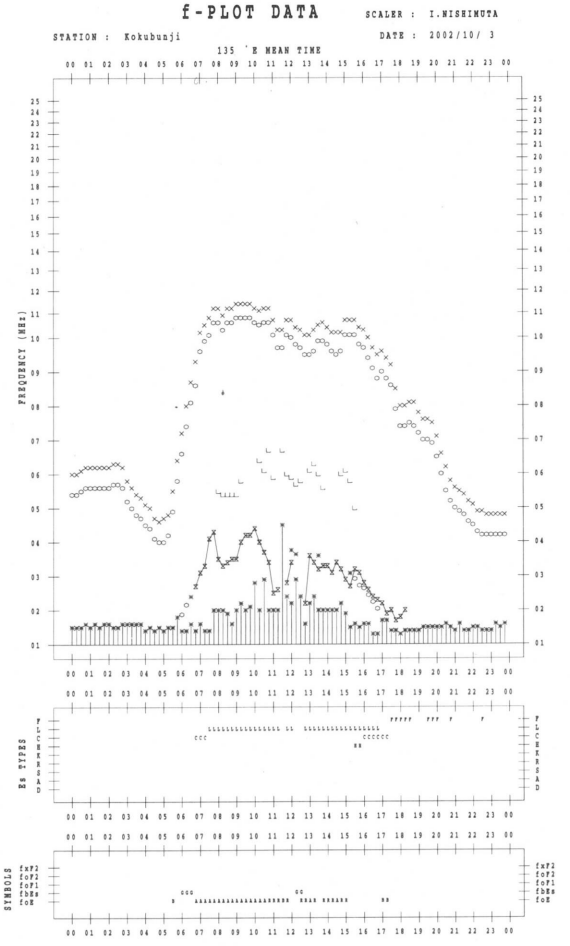
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F2	F1			F1	F3	L3	L2	L1	L1	L1	L1	L1	L1	L1	CL11	C1	C1	F3	F4	F4	F1	F3	
2	K2	F2	F5	F6	F4	F6	C2	C2	L1	CL11	HL11	L1	CL11	L1	H1	CL11	CL11	L3	F2	F1	F2	F2	F1	F1
3								C2	L2	L1	L2	L1	L1	L1	L1	L1	CL11	C1	F2		F1			
4								CL11	CL11	L2	L1	L1	L1	L1	L1		C1	C3	F2		F1	F3	F4	F1
5	F1	F1	F1				C2	CL11	C1	CL11	L1	L1	L2	L1	L1	L2	L1	C2	F2	F2	F1	F2	F2	F3
6	F4	F4	F4	F5	F2		C2	C1	C1	CL11	L1	L1	L1	CL11	C1	CL11	L1	CL22	F7	F4	F5	F3	F4	F4
7	F3	F4	F4	F2				HL11	CL11	CL11	L1	CL11	L2	CL11	CL11	CL21	L2	L3	F3	F5	F5	F8	F3	F2
8	F2						H1	C1	CL11	CL11	CL11	L1		HL11	CL11	CL11	C3	C2	F6	F4	F2		F3	F2
9	F3	F2	F2					CL11	CL11	L1	L1	L1	L1	L1	L1	CL12	CL11	LC11	F1		F1		F1	F4
10	F3	F4	F3	F3	F1	F1		C2	C1	CL11	CL11	L1	L1	L1		C1	C2	C1			F1	F2		F1
11	F1		F1	F2	F3	F1	C1	C1	CL11	CL11	L1	L1	L1	L1	L1	L1	L2	L3	L3	L3	F2	F4	F4	
12		F2	F2	F3	F1	F2	H1	HL11	L1	L1	L1		L1	C1	C1		C1	C2	F1	F1		F4	F2	F2
13		F1	F1	F1			H1		CL11	CL11	L1	L1	L1	L1	L2	L2	L2	L2	F7	F5	F3	F2	F3	F2
14	F1	F1	F1	F1			C1	CL11	L2					L1	HL11	H1	C2	C1	F1	F2	F3		F2	F4
15	F1	F2				F2	C1	L1	CL11	C1	L1	CL11		L1	C1	CL11	C2	L4	F7	F3	F2			F2
16	F2	F2	F2	F2	F1	F1			HL11	CL21	CL11	CL11	CL11			C1	C2	L2	F2		F2			
17	F1							L1	L1	L2	L1	L1				C1	CL22	L2	F2	F4	F2	F1	F1	F2
18	F1								L1	CL11	L1	L1		L1	L1	L1	L1	L2	F1				F1	F1
19	F1	F1		F1						L1	L1				L1	L1	HL12							
20	F1		F2	F4	F5	F1	H1	H1	HL11	CL11		C1		C1	C1	L1	L1						F6	F1
21		F2					H1	H1		C1	C1	L1			C1	C1			F1	F1		F1		F1
22	F1	F1							CL11	C1	C1	C1	C1	C1	C1	L1	L1	CL32	F2	F2	F1	F1	F2	F2
23									CL11	CL11	L1	L1	L1	L1			L1	C2	F5	F3	F1			
24			F1	F2	F2				L1	C1	CL11	CL11	CL21	C2		C1	C2	L2	F2	F3	F3			F2
25		F2	F4	F2	F3		C1	L2	L2	L2	L2	L1	L1	L2	L2	CL11	CL12	L2	FF12			F4		
26			F1				H1		L1	L1	L1	L1	L1	CL21	L2	L2	L2	C	C	F4	F3	F2	F1	F2
27	F2	F3	F3	F2			L1		H1	L1	L2	L2	L1	L1	C1	L2	L3	L4	F4	F5	F4	F3	F1	F1
28	F1			F1				C2	L2	L1	L1	L1	L1	L1	CL11		HL11	L1	F1	F1	F4	F2	F2	F1
29	F2	F2	F1					L2	L1	L1	L1	L1	L1		L1		H1	L1		F1				
30									L1	L1	L1	L1	L1			HL11	H1	CL32	F2	F2	F3	F1	F1	F1
31	F1	F3	F3	F1	F3	F1		L1	L2	CL11	CL11		C1					C2	F2	F2	F2	F1		
	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																								

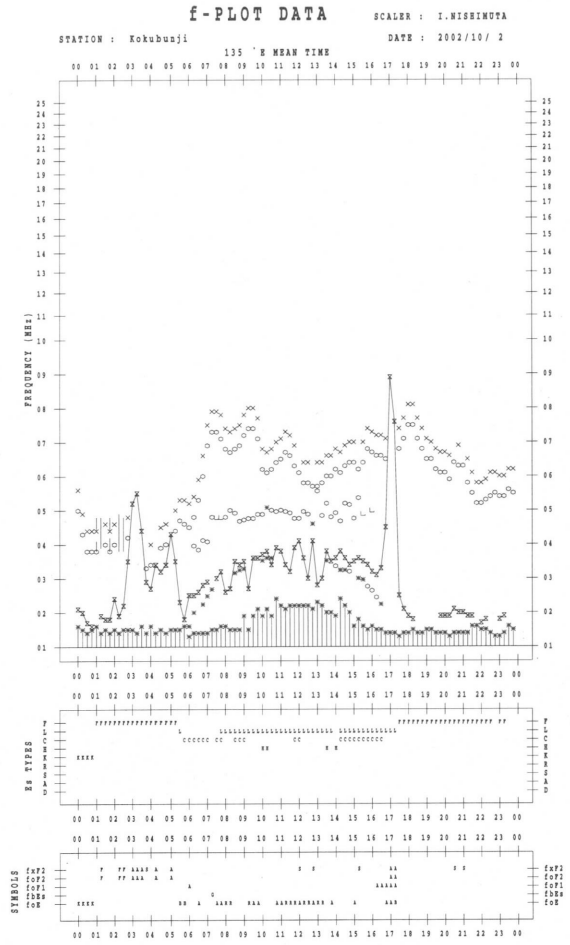
OCT. 2002 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

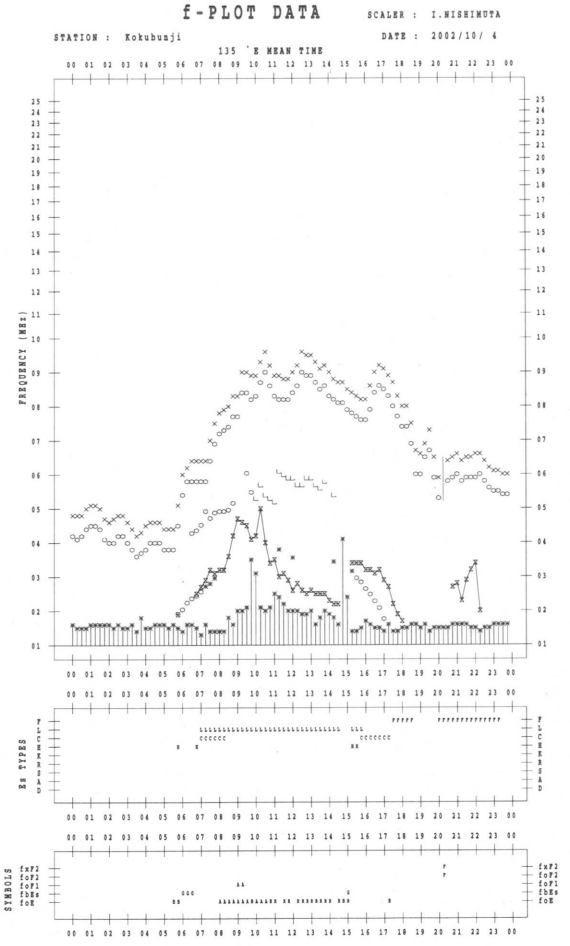
f-PLOTS OF IONOSPHERIC DATA

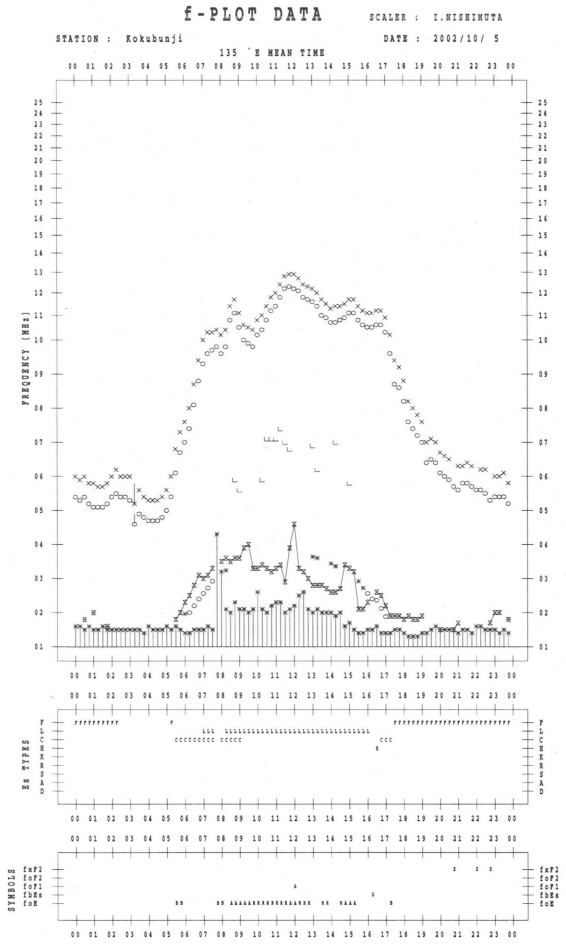
KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

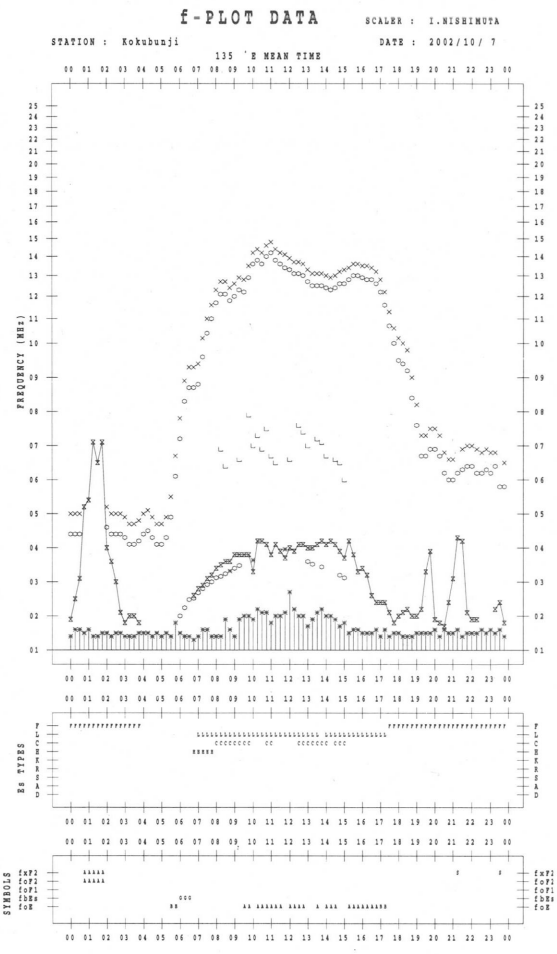

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

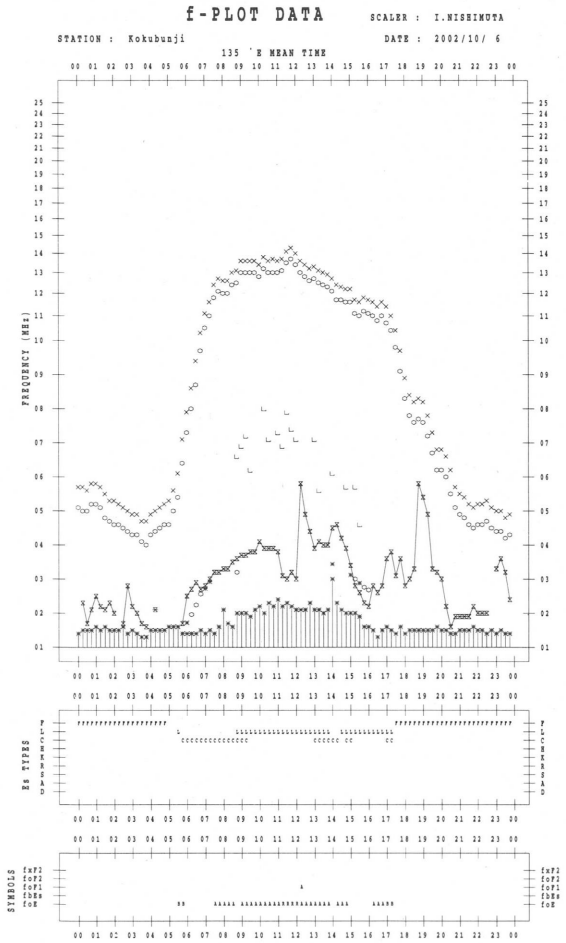

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

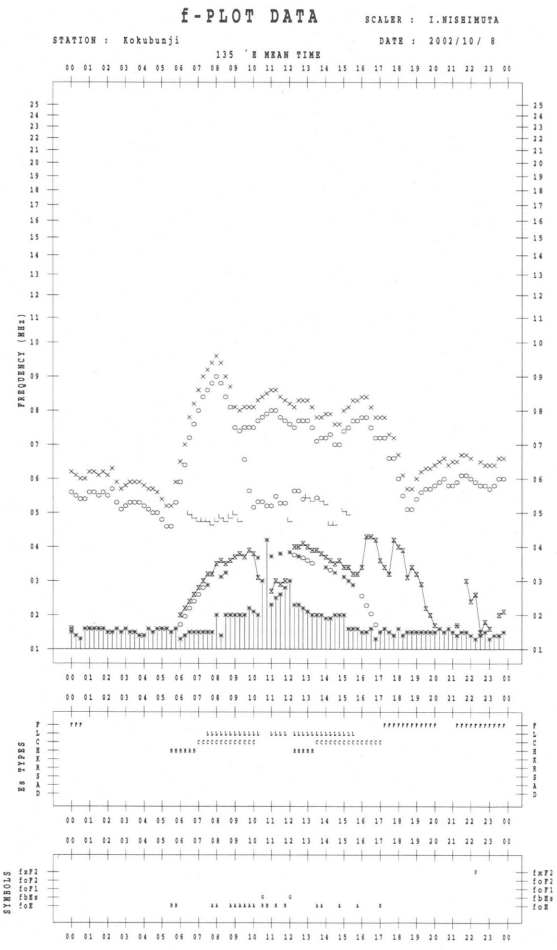

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

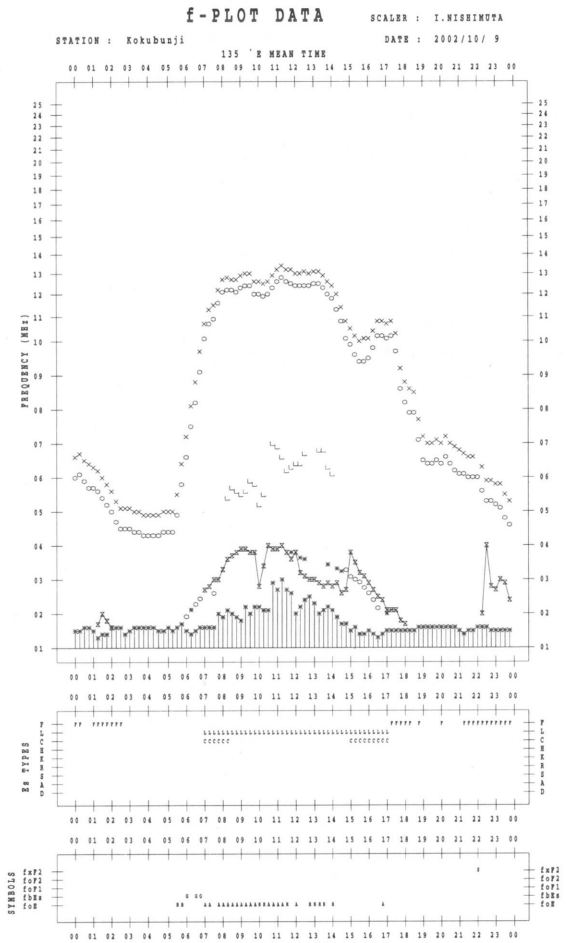

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

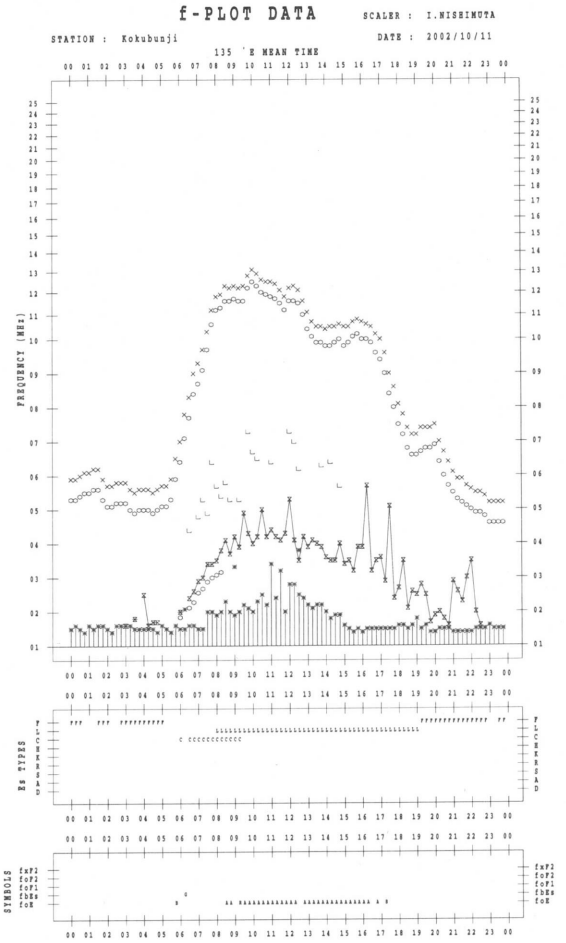

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

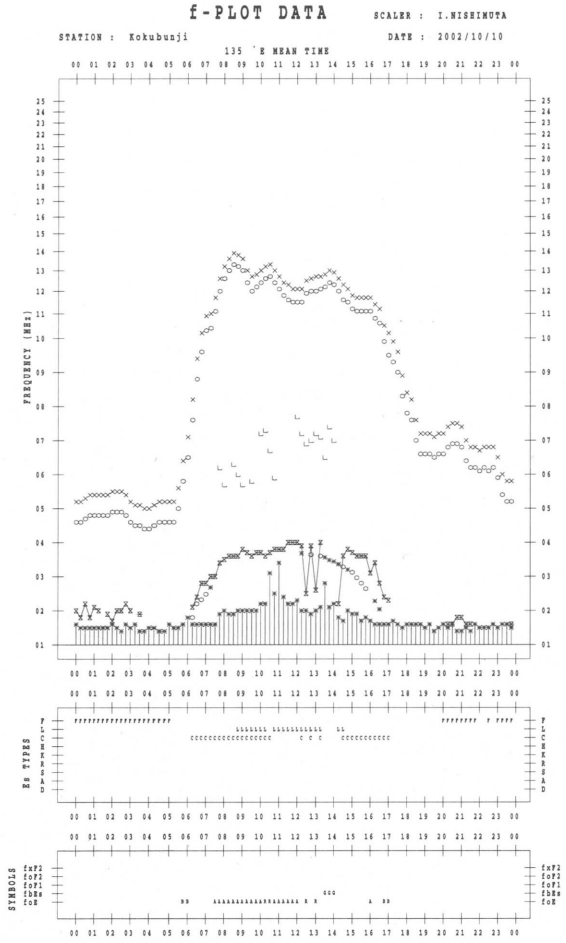

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


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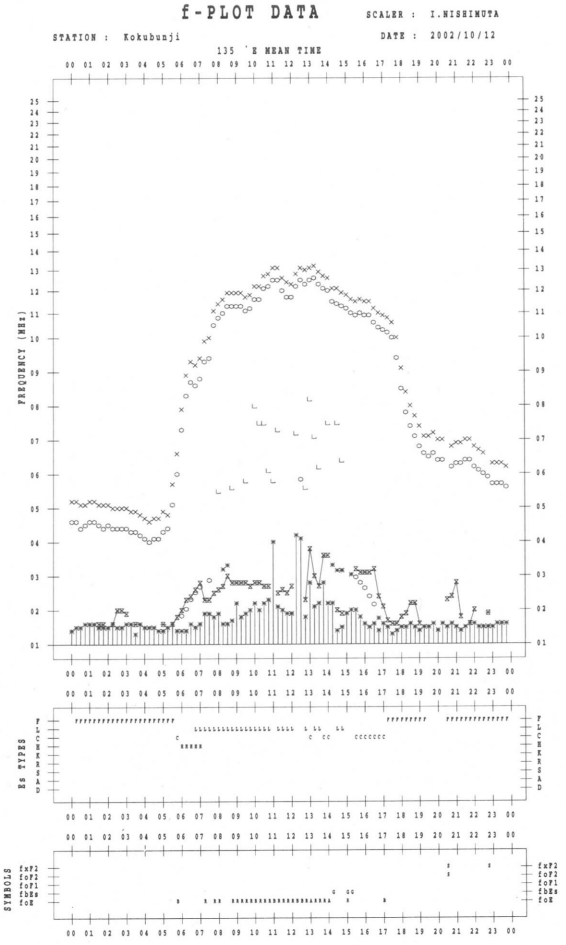
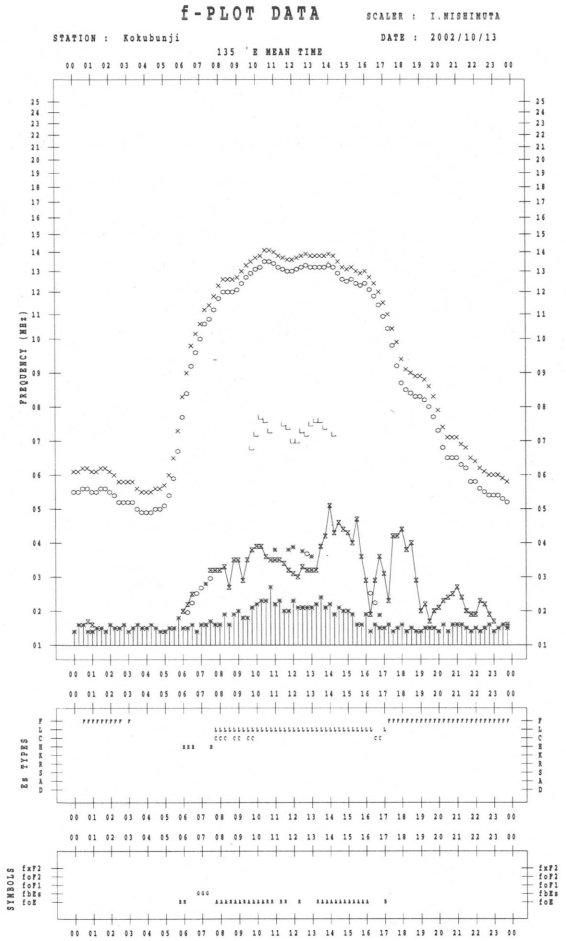
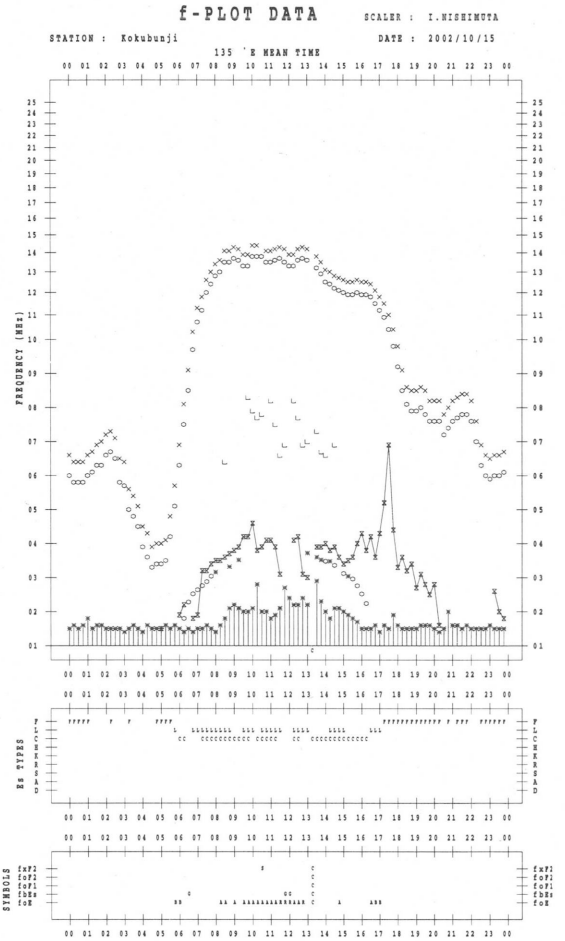
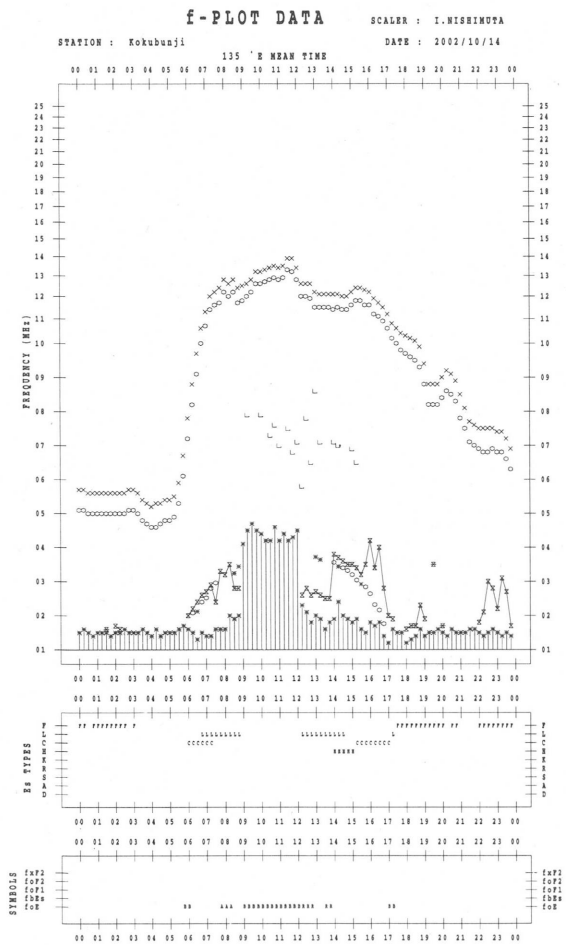
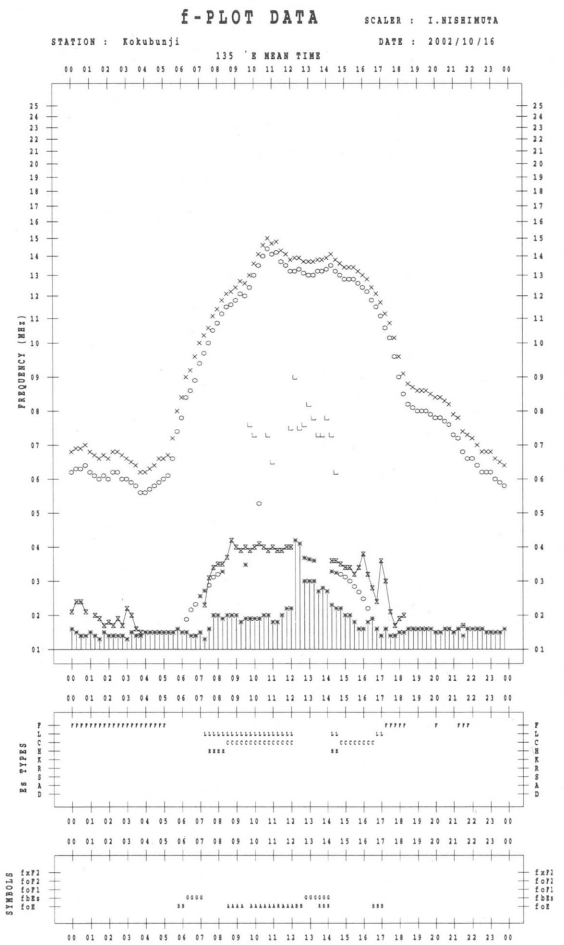
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

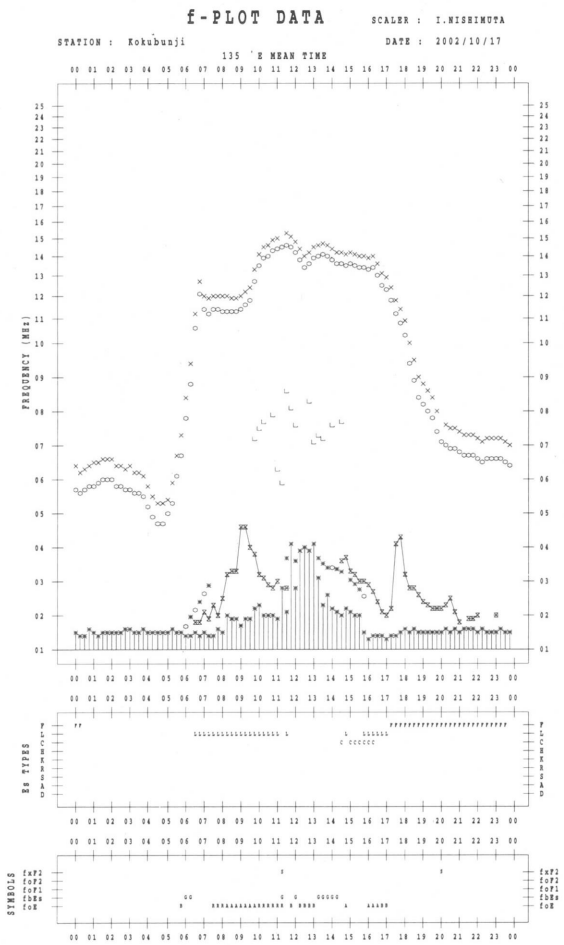

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

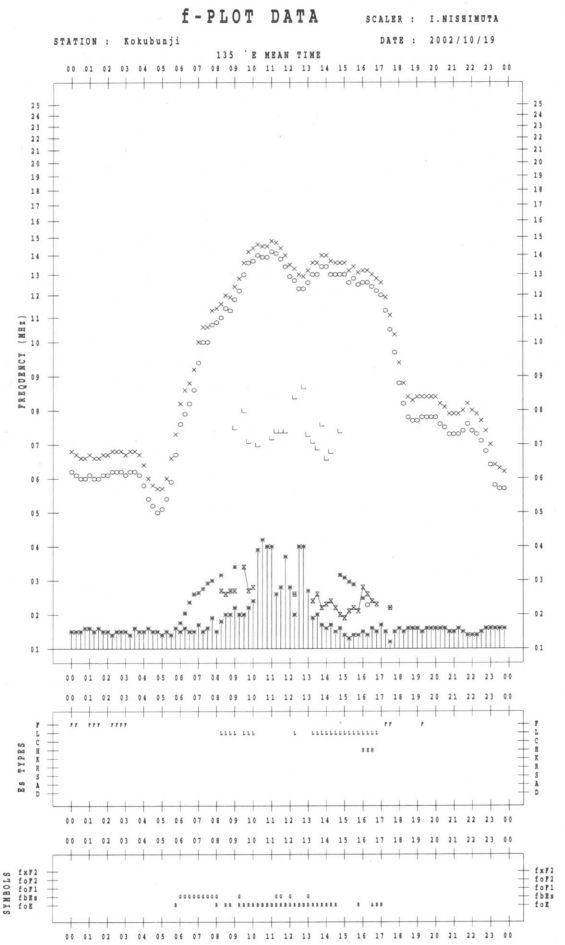

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

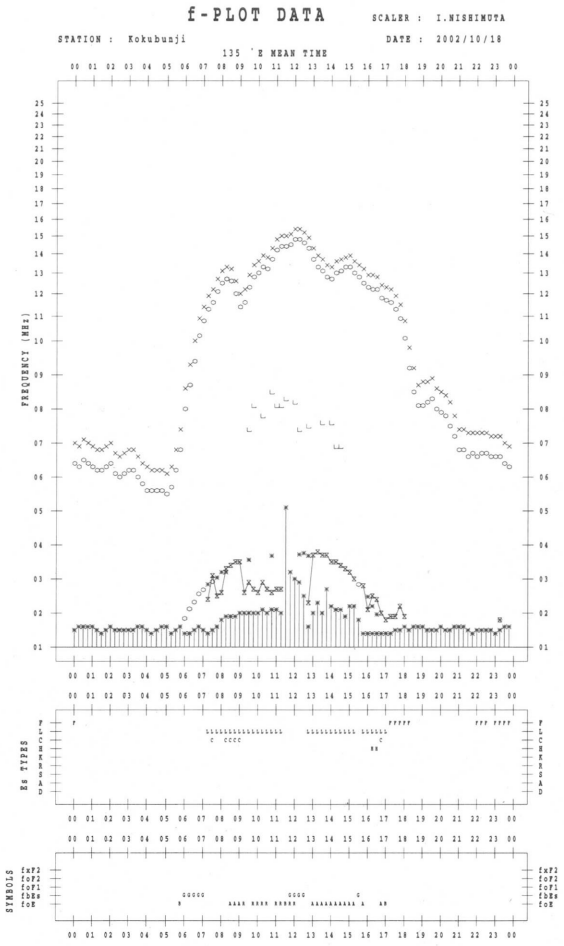

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

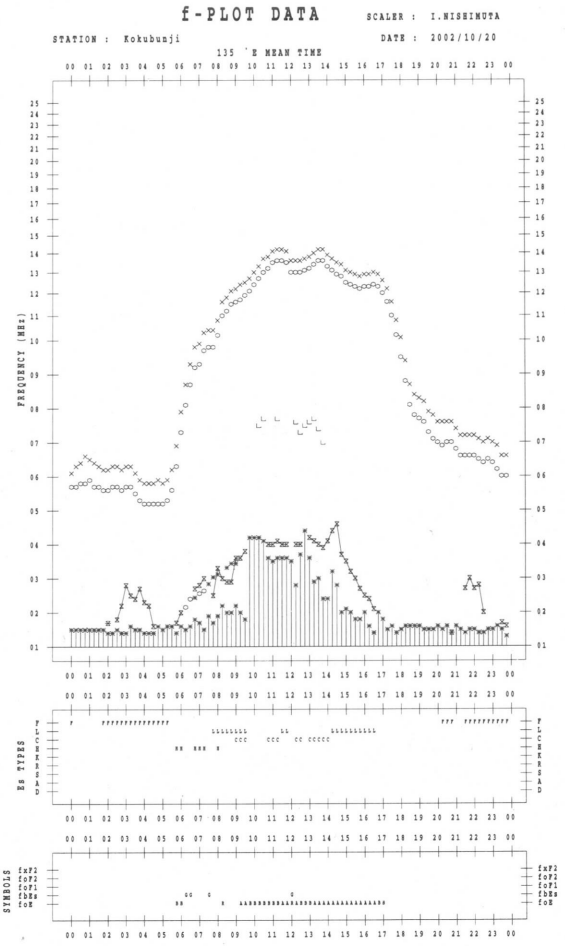

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

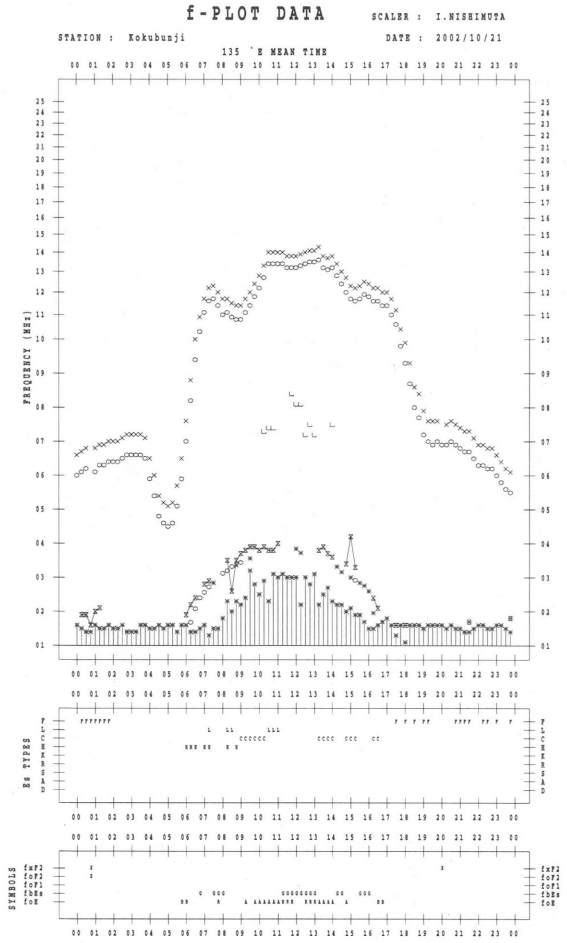

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

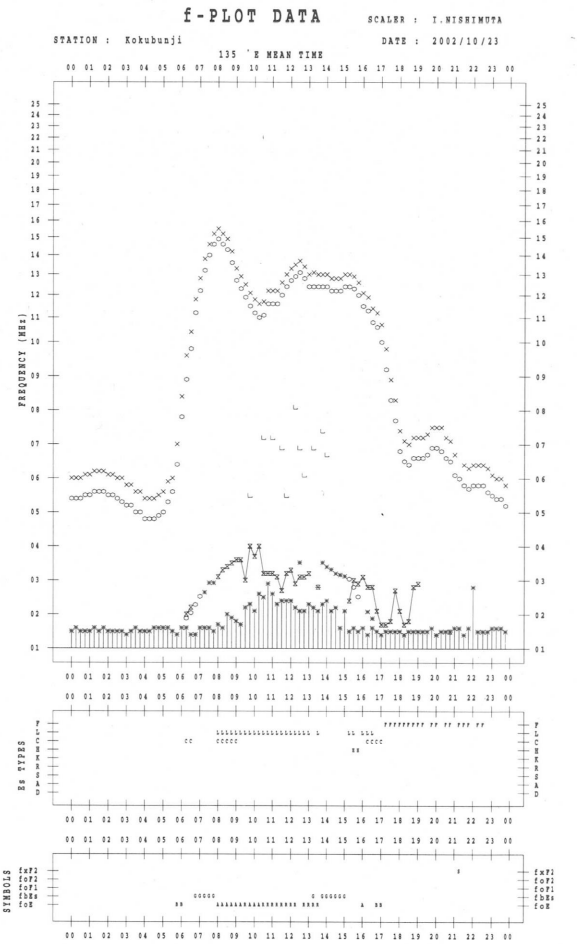

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

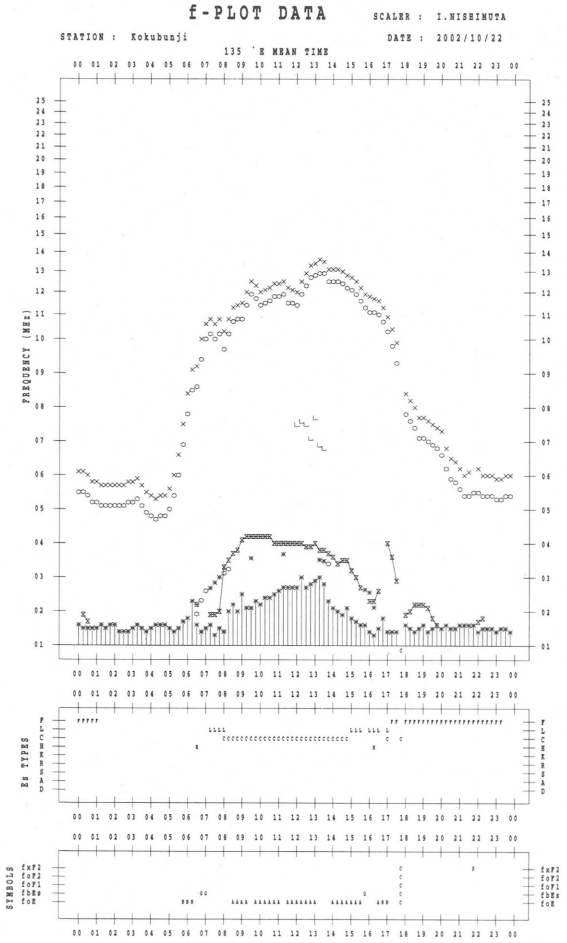

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

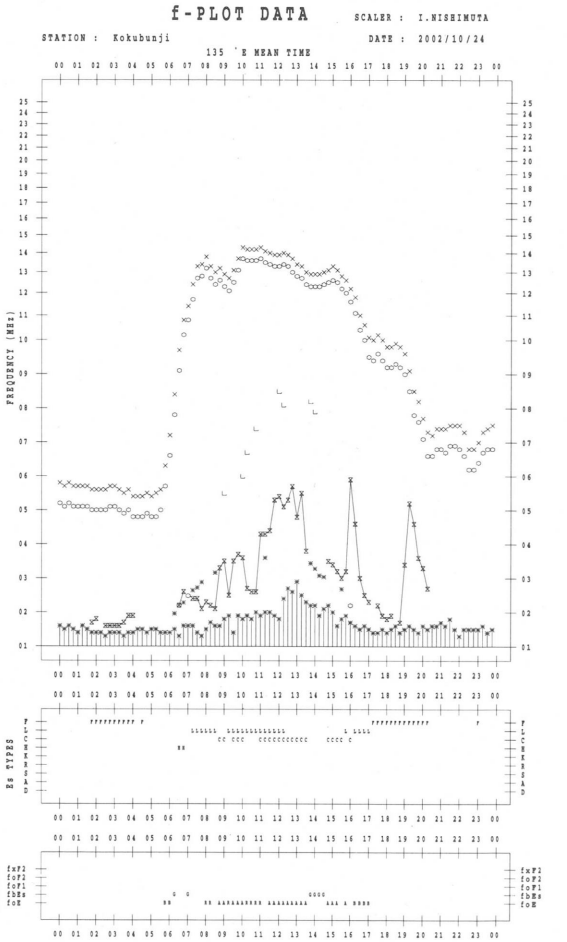

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

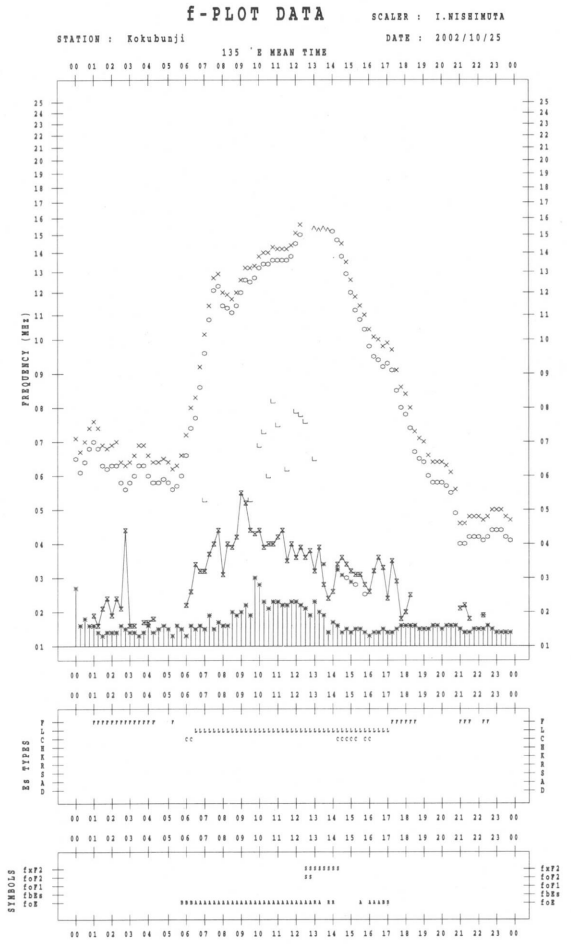

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

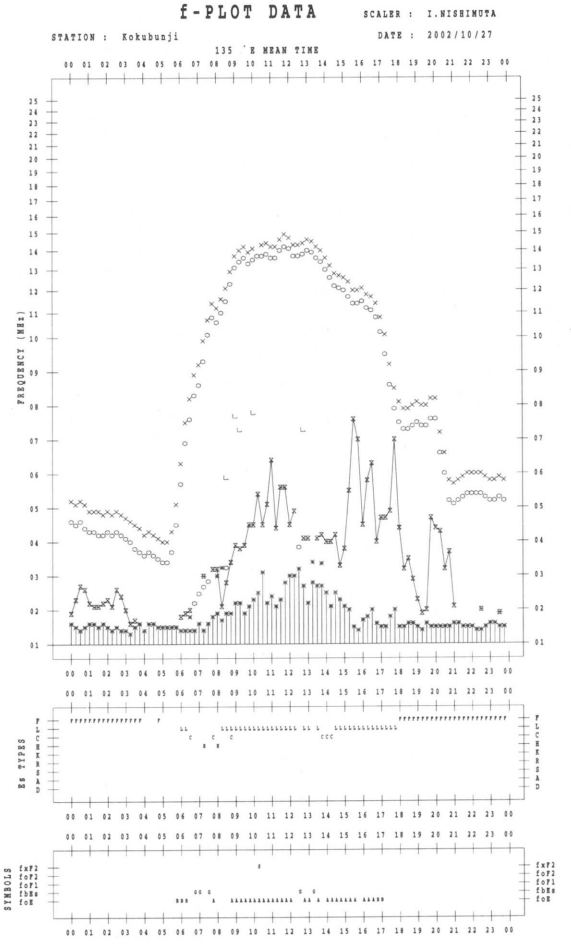

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

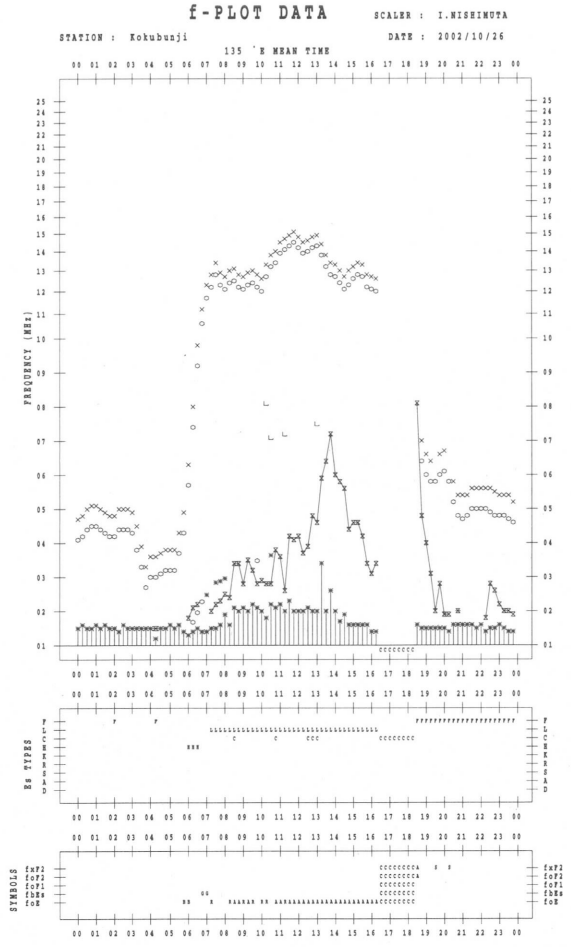

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

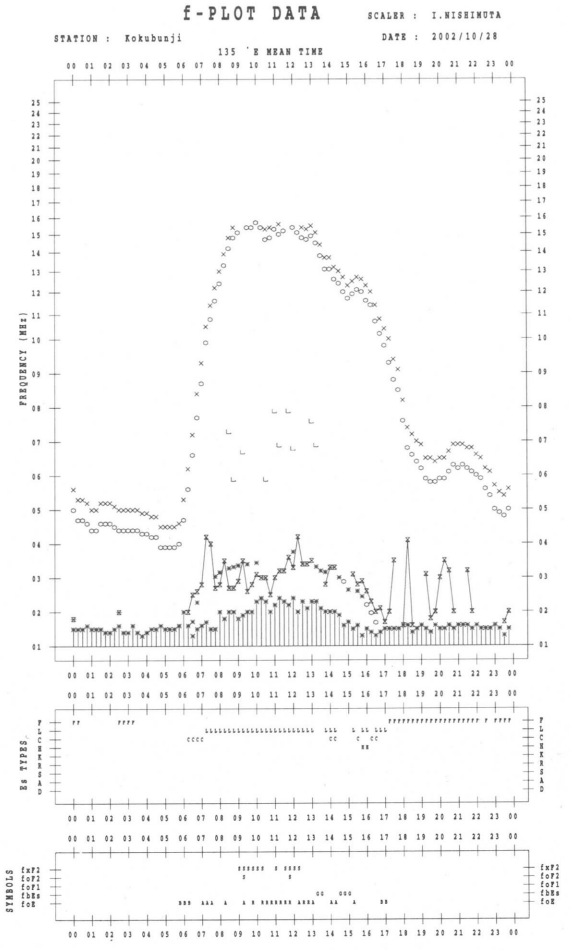

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

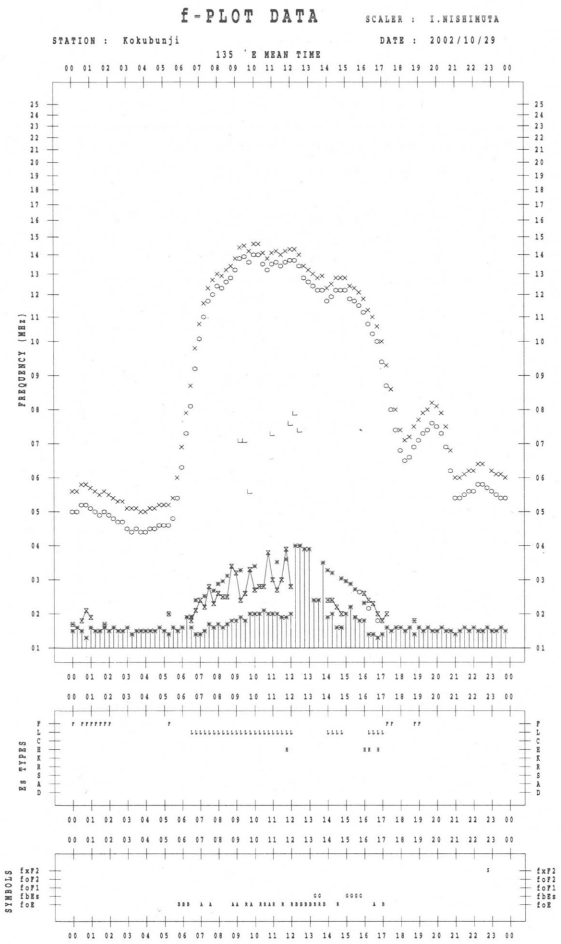

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

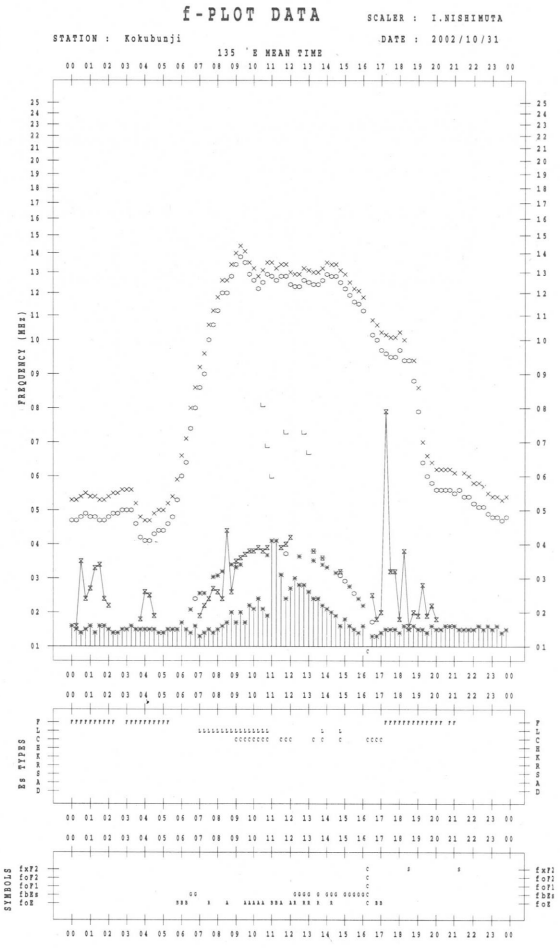

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

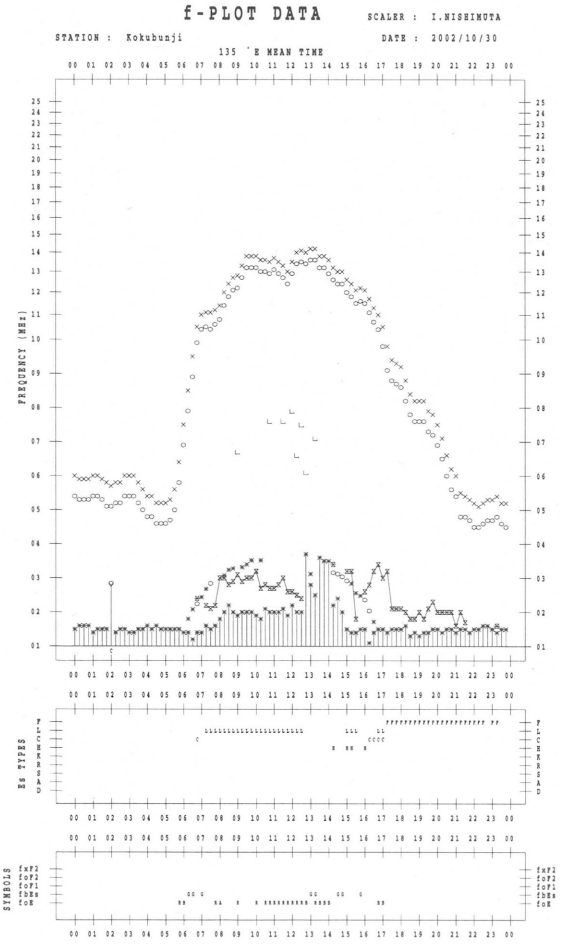

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/10/30
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 October 2002

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} W m^{-2} Hz^{-1}					
Date \ UT	00-03	03-06	06-09	21-24	Day
1	35	34	31	-	33
2	-	-	-	-	-
3	-	32	33	37	35
4	34	32	32	37	34
5	35	34	35	39	36
6	37	35	34	34	35
7	35	32	33	38	35
8	37	36	36	36	36
9	37	35	36	39	37
10	37	35	37	41	37
11	39	37	37	42	39
12	39	37	37	41	38
13	39	37	38	43	39
14	39	39	38	39	39
15	39	38	36	41	39
16	38	37	36	46	40
17	41	39	40	41	41
18	39	38	38	37	38
19	37	36	37	38	37
20	40	40	39	41	40
21	41	39	38	44	41
22	39	37	36	46	40
23	40	37	36	39	38
24	42	39	38	44	41
25	39	40	40	40	40
26	40	38	39	41	40
27	37	37	39	40	38
28	38	38	40	43	40
29	40	39	38	44	40
30	40	34	34	45	40
31	40	37	37	41	39

Note: No data is available during the following periods.
1st 2100 - 3rd 0400
A superscript * stands for being superposed on a burst.

B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso October 2002

Single-frequency observations
Normal observing period: 2045 - 0800 U.T. (sunrise to sunset)

OCT.	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1})		POLARIZATION
2002	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
1	200	8 S	03220	03220	1.0	85	-	0
1	200	8 S	05000	05000	1.0	35	-	0
1	200	8 S	05250	05250	1.0	40	-	0
1	200	8 S	05500	05500	1.0	20	-	ML
4	200	8 S	01330	01330	1.0	145	-	0
4	500	8 S	01430	01430	1.0	20	-	0
4	500	7 C	04220	04260	6.0	55	-	0
4	200	7 C	22350	22420	8.0	290	-	0
4	500	7 C	22360	22390	9.0	170	-	0
4	500	7 C	23080	23100	2.0	45	-	0
5	200	8 S	01340	01340	1.0	80	-	0
6	200	8 S	00040	00040	1.0	110	-	
6	500	8 S	01210	01210	1.0	10	-	0
6	500	8 S	02110	02120	1.0	40	-	0
8	200	7 C	03230	03270	5.0	110	-	
8	500	7 C	03240	03270	4.0	15	-	0
8	200	8 S	04230	04230	1.0	60	-	
8	200	7 C	04320	04330	3.0	130	-	
8	200	7 C	04410	04420	3.0	300	-	
8	200	8 S	05340	05340	1.0	50	-	
8	200	8 S	06300	06300	1.0	110	-	
8	200	8 S	22590	22590	1.0	35	-	
9	200	8 S	22220	22220	1.0	25	-	
10	200	8 S	02470	02470	1.0	30	-	
10	500	7 C	22050	22050	6.0	40	-	0
10	200	7 C	22080	22090	4.0	70	-	
11	200	8 S	04570	04580	1.0	95	-	
13	2800	7 C	23490	00040	26.0	75	-	0
13	200	7 C	23520	23540	5.0	35	-	
14	500	7 C	02360	03170	53.0	35	-	0
14	500	7 C	04240	04280	4.0	15	-	0
14	200	7 C	02370	02540	38.0	30	-	
14	200	8 S	04230	04230	1.0	15	-	
14	500	7 C	06460	06500	12.0	200	-	0
14	200	8 S	06450	06460	1.0	60	-	
16	2800	4 S/F	03130	03140	3.0	30	-	0
16	500	8 S	03140	03140	1.0	70	-	0
19	200	7 C	01080	01090	3.0	45	-	
19	200	8 S	05240	05250	1.0	20	-	
20	2800	7 C	00390	00420	7.0	40	-	
20	500	7 C	00390	00400	10.0	20	-	
20	2800	7 C	03320	03330	5.0	30	-	
20	2800	7 C	05010	05140	14.0	40	-	
20	500	7 C	05050	05140	10.0	135	-	
20	500	8 S	06150	06150	1.0	45	-	
20	200	8 S	06110	06120	2.0	195	-	
21	500	8 S	00590	00590	1.0	20	-	

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso October 2002

Single-frequency observations

Normal observing period: 2045 - 0800 U.T. (sunrise to sunset)

OCT. 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
21	200	8 S	00450	00450	1.0	20	-	
21	200	8 S	02390	02400	1.0	90	-	
21	200	8 S	06130	06130	1.0	55	-	
21	200	8 S	06440	06450	1.0	30	-	
21	500	8 S	06130	06130	1.0	20	-	
22	500	8 S	03350	03350	1.0	60	-	0
22	200	8 S	02300	02310	1.0	160	-	0
22	200	8 S	03350	03350	1.0	60	-	0
22	200	8 S	23350	23360	1.0	30	-	0
23	200	8 S	04090	04100	1.0	80	-	WL
23	500	7 C	02260	02480	50.0	40	-	0
24	2800	8 S	00090	00090	1.0	35	-	0
24	500	8 S	00090	00100	2.0	25	-	WR
24	500	8 S	00530	00530	1.0	10	-	0
24	500	8 S	02260	02280	2.0	160	-	0
24	500	42 SER	03370	03570	20.0	35	-	0
24	500	8 S	22020	22020	1.0	100	-	0
24	500	8 S	22120	22120	1.0	25	-	0
24	200	8 S	22260	22270	2.0	50	-	WL
24	200	8 S	23410	23410	1.0	200	-	0
25	200	8 S	06440	06450	1.0	40	-	0
25	500	8 S	07020	07030	1.0	145	-	WL
26	2800	1 S	03270	03270	2.0	25	-	0
26	500	8 S	03270	03280	3.0	45	-	WR
26	200	8 S	03270	03270	2.0	100	-	WR
27	500	3 S	22510	23000	14.0	10	-	0
27	200	7 C	22520	22560	14.0	50	-	0
28	200	8 S	00340	00340	1.0	25	-	0
28	200	8 S	01150	01160	4.0	50	-	WR
28	200	8 S	01390	01390	1.0	20	-	0
28	200	8 S	02280	02280	1.0	20	-	0
28	200	7 C	05160	05190	8.0	20	-	0
28	500	8 S	01420	01420	1.0	25	-	0
28	500	8 S	02280	02310	3.0	20	-	0
28	500	8 S	05250	05250	1.0	15	-	0
28	200	8 S	22250	22250	1.0	25	-	0
29	200	8 S	01320	01320	1.0	25	-	WR
29	200	42 SER	03050	03310	29.0	25	-	0
29	200	8 S	04220	04230	2.0	80	-	0
29	200	8 S	05190	05190	1.0	20	-	0
29	200	8 S	05510	05510	1.0	20	-	0
29	2800	3 S	03000	03110	21.0	60	-	0
29	500	4 S/F	03070	03150	8.0	10	-	0
29	500	8 S	23450	23450	1.0	10	-	0
29	200	8 S	23560	23560	1.0	15	-	0
30	200	8 S	06370	06380	3.0	25	-	WL
30	200	7 C	22340	22360	5.0	145	-	0

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso October 2002

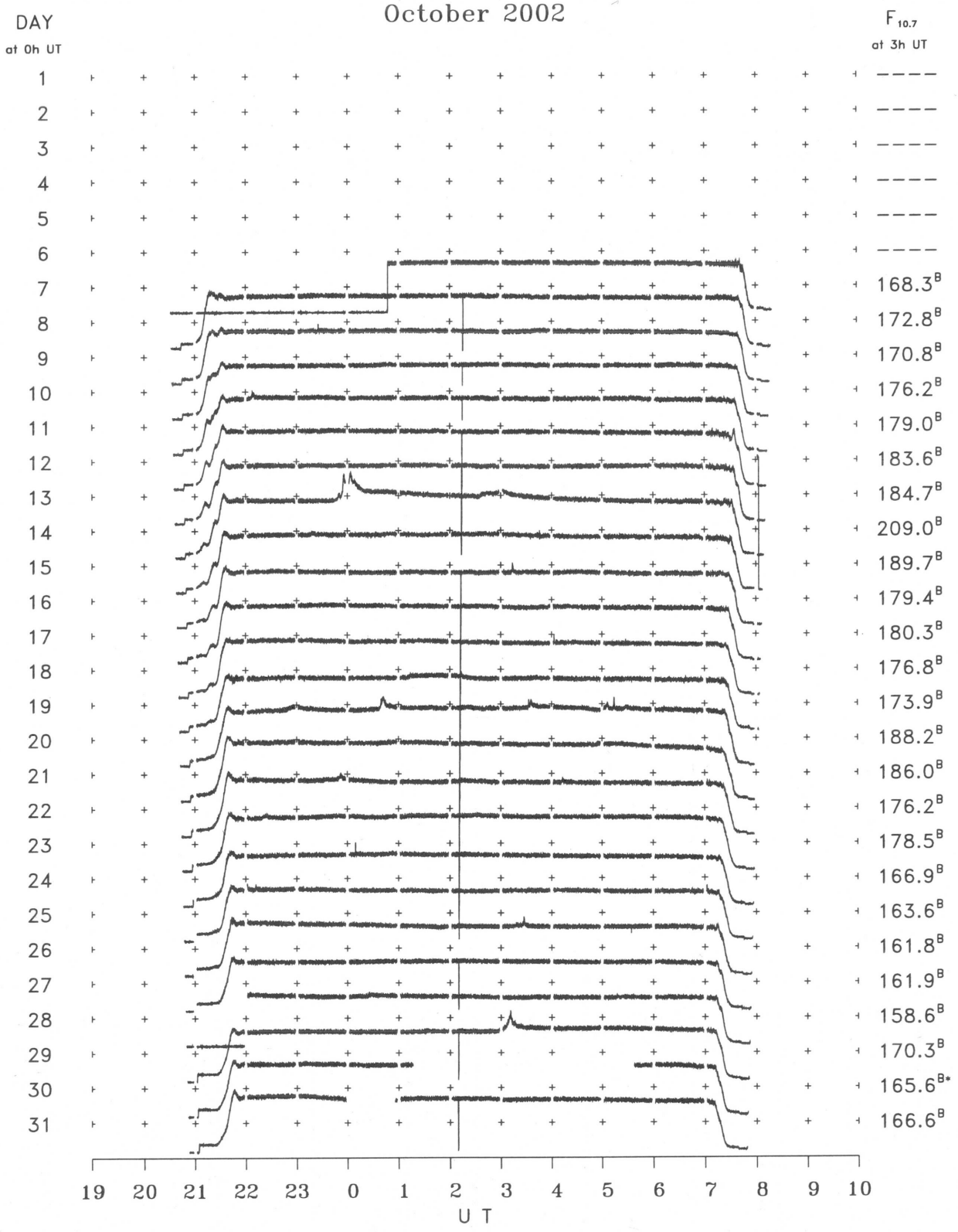
Single-frequency observations

Normal observing period: 2045 - 0800 U.T. (sunrise to sunset)

OCT. 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
31	200	8 S	05080	05080	1.0	10	-	0
31	500	42 SER	23020	23070	9.0	50	-	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 OCTOBER 2002
F-646 Vol.54 No.10 (Not for Sale)

電離層月報（2002年10月）
第54巻 第10号（非売品）
2003年１月24日 印刷
2003年１月30日 発行
編 集 兼 独立行政法人通信総合研究所
発 行 所 〒184-8795 東京都小金井市貫井北町４丁目２－１
☎ (042) (327) ７４７８(直通)

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