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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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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

JUN. 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	80	77	78	#60	59	#80	80	82	81	78		79	85	A	82	82	A	100	*109	90	93	91	92	82
2	82	81	#95	#70	#81	91	96				A	81		90	91		82		83	81	80	80	#94	92
3	#77	70	77	70	74		94	81	*#115	81		80	#93	91		80	#94			92	82	A		78
4	70	#81	81	75	66	65	A	76	81	75	74		A	66	#83	A	83	92	#76	82	82		94	#76
5	69	79	#68	71	73	70	#95	#83	80	78	84	81	84	80	80	A	96	90	82		93	92	91	#80
6		73	81	77	67	#82	#93	83	87	80	80	72		83	86	81	82	82	86	#66	76	#95	#68	#92
7	95	89	#70	73	71	74	#98	88	82	80	71	69	#82		80	77	#92	92	82	81	80	#92	#68	#93
8	#80		70	75	67	76	#94	#81	#68		68			A	73	76	72	80			68			
9	95	#70	73	66	67	73	77	82	81	72	68	74				A	78		81	72	77	#94	#67	#79
10	#94	#74	69	72	71	81	84	82		A			73		68	62			74		71	67		73
11	68	73	#59	#70	64	68	73	#88					A	A	78	76	72	#94	94		70	80	80	82
12	79	70	71	69	67	70	78	80	#68	70	69		77		81	80	74	82		84	82	#70	70	A
13	A	A	71	67		81	*#115	89	#68		75			76	80		75	84	80					73
14	71	68	68	69	68	76	#94	#69	#80	81	83	80	83	84	82	80	78			88		83	81	82
15	#70	77	71	70	64	#77	78		A	84	83	81	82	82	74	73		A			82	82		73
16	76	69	60	65	67	#82	83	#95	#82	#67	67		71	A		80	80	80	83	79	77		81	
17	81	80	70	67	72	80	81		A	A		59		60		65			66	74	#62	71	76	72
18		68	62	66	68	68	73	68	60		A		A	A				61	66			95		72
19	74	70	68		58	68	#83	75	*#49	A							A	A	64		70		70	79
20	74	69	63	58	60							A					61		62				78	77
21	68	72	#61	68	60	68		81	84	80	78	80	82	76	80	84	78		A	83	#94		95	#82
22	79	#68	67	67		70	72	67	62	66				81		64	66	76		77	#91	#62	70	78
23	#57	#69	68	62	64	70		73		63							64		73	A	77			
24	66	70	68	66	64	70	A	66		64							59		61	#91	#68	#94	94	#62
25	68	72	#57	61		71	68	#81	72		63	73						64	63	A	73			
26	71	#59	#72	68	60	68	70	72		65	65			A	64		68	64	74	82	#71	76	A	74
27	68	68	71	67	67	74	#94		70			A	73	77	78	71	71	72	71	79	70	#91	94	94
28	92	#68	70	61	63	68	#80	*#115	92	82	80	77	80		74	83	80	78	82	82	#95	#70	76	83
29	#70	73	69	73	64		95	86	80	76	81	81				74		73	A		A	68		82
30	77	74	71	67	73	68	74	83	80	85		76		72	72	A	80	74		83	A		76	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	30	29	27	27	25	25	21	19	16	15	12	13	18	17	22	18	21	18	24	19	20	24
MED	74	71	70	68	67	71	83	81	80	78	74	79	82	80	80	77	78	80	76	82	77	82	79	79
U Q	80	75	71	70	71	80	94	84	82	81	80	81	83	83	82	80	82	90	82	84	82	92	93	82
L Q	69	69	68	66	64	68	75	74	68	67	68	73	75	74	74	72	71	73	66	79	70	70	70	73

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

JUN. 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	50	#24	#38	#50	G#	#40	49	#62	67	57	#78	#59	*G#	*96	45	#65	*# 103	*120		*138	50	#28	#48	*G#
2	*G	G	G	G	G	*G	48	#77	73		*111	46		*G	44		43	#75	#48	51	#28	34	*G#	*G
3	*G	G	#26	G#	G		46	50	*G#	46	#91	*81	60	*G#		50	58		45	*42	29	#71	73	71
4	*G#	G	#29	39	G#	#61	*# 100	72	64	70	76	78	*# 110	*88	66	*# 103	*G	*G	51	#85	#64		*G	*G
5	*G	G	G	G	G	#42	50	60	67	*G#	64	*G#	*G	53	63	*# 116	90	82	#57		33	*G#	44	38
6	34	#46	G#	#32	G#	#31	#53	55	58	#46	*G#	50	#81	82	#69	*G#	*G	51	50	#73	71	*G#	45	45
7	50	#30	28	G#	G	#38	#49	#86	#43	*G#	*G	*G	*G	*G	*G	66	*G#	50	57	58	#47	47		50
8	44	#30	30	G#	*# 32	*G	41	49	*G#		*G	*G		82	#64	61	57	61	71		41	#76	#58	62
9	#29	G#	G	#30	G#	*G	74	*G#	43	*G#	44	#60	#88	*98	75	*# 105	76	83	#64	73	81	#41	50	#62
10	#50		32	25	*# 40	*G	42	#69	70	*# 151	*99	*G	75	61	#78	*# 97	74	72	70		34	#67	*# 86	32
11	*G#	G	G	G	G	*G	74	#60	#82	78	*# 112	*82	*92	*115	68	*G#	*G	37	#61	#92	#72	65	#*G	#*G
12	63	G#	G	#32	30	#52	#63	#50	#61	#48		*G	74	#60	*G#	70	65	72	*# 154	93	#63	60	61	*# 119
13	*119	*98	*75	60	*# 87	61	*# 86	83	#63	65	66	*G#	86	#47	#68	#81	76	78	78	#89	#68	60		73
14	#48	50	51	44	G#	#50	#72	#61	#75	82	#70	64	#45	47	#63		43	#73		50	#88	#52		72
15	#49	51	#36	G#	G	#32	#46	49	#86	#62	63	70	#48	51	*G#	*G	72	*# 112	81	78	#47	#27		*G
16	*G	G	G	G	G	#38	#59	62	52	*G#	*G	*G	*G	*100	75	#50	#65	#40	#*134	73		*112	54	*# 89
17	50	#32	41	46	*45	45	#61	#82	81	76	#46	46	46	*G#	*108	74	#62	59	52	*# 33	58	50	*G#	*G
18		56	#30	G#	G	#36	45	45	#68	65	#90		75	75	*# 94	42	#68	58	62		78	#49		67
19	60	50	#33		*32	39	#51	60	*G#	*112	70	*G#	48	#63	#85	#70	#90		76	*# 107	40	#71	#42	41
20	*G#	26	G#	G	G		78	#65	65	72	#51	#71	65	#46	*G#	72	*G#	62	*# 108	#*108	74	#60	#44	#*G#
21	48	40	34	29	G#	#40	#51	48	#74	#61	*G#	*G	*G	*G	46	#62	58	*# 96	*122	82	#65	#48	49	#32
22	30	40		39	*# 56	34	41	*G#	48	45	#66	68	#45	*G#	*G	*G	61	#45		66	#39	39	#58	63
23	#40	46	40	37	G#	*G		60	#49	57	#44	#64		*G	44	#60	#76	73	68	*# 109	*109	68	#50	#39
24	34	42	33	30	30	#60	#*95	61	64	#49	45	*G#	*G	*G	*G	*G	42	42	40	*31	32	33	*G#	42
25	*G#	G	G		G	*G	36	#86	78	70	*G#	*G	*G	*G	*G	64	68	#38	#65	#84	#54	54		
26	50		40	#26	*# 38	*G	48	48	#64	58	61	61	#45	46	*G#	76	#65	#41	43		*99	50	*# 108	58
27	63	56	#38	31	*32	42	44	#78	#58	#45	#73	#48	#73	72	*G#	*G	43	*G#	41	#58	#41	40	38	32
28	*G#	G	G	G	G	*G	*G	*G	*G	52	61	58	60	64	72	62	#48	*G#	*G	*28	32	*G#	*G	47
29	#28	28	30	30	30	*G#	51	61	#42	#65	68	74	*# 94	64	74	*# 118	69	#48	#84		*89		*80	70
30	63	#41	34	43	*46	51	49	#65	72	74	78	#62	#74	*G#	60	*# 97	57	49	#74	#55	*# 114	73	#61	64
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	29	28	30	28	29	30	30	28	29	29	27	30	29	28	30	28	27	24	29	28	24	29
MED	40	30	30	30	G	37	50	60	64	60	64	50	60	52	63	64	62	58	64	73	58	50	49	45
U Q	50	46	37	38	32	43	67	69	72	71	77	66	75	75	73	78	72	74	78	90	76	66	59	65
L Q	G	G	G	G	G	G	45	49	48	46	44	G	G	G	G	46	43	41	50	53	39	36	40	16

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

JUN. 2002

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	20	20	16	16	21	20	20	21	21	24	27	23	32		21	18	18	16	17	15	20	17	15	16
2	21	20	17	17	21	27	18	20	20	22				35	#23		20	16	15	15	18	20	16	18
3	17	18	20	21	22		20	22	24		27	23	23	22		21	21		20	15	18	16	18	15
4	18	16	17	18	21	21	18	20	23	21	21	26			23	21	20	18	18	15	18		18	17
5	20	15	18	18	22	18	17	16	20	21	24			32	#20	22	21	18	21		17	20	18	17
6	15	17	20	20	21	22	16	17	20	22	21	24	22		20	22	20	20	18	14	17	20	17	16
7	18	16	17	20	20	18	17	17	21	24	32	#21	20	24	23	20	22	23	16	15	17	17	16	16
8	16	15	18	20	17	24	16	18	20					27	22	23	22	20	17		15	17	16	16
9	21	20	14	20	27	#16	15	15	20	21	21	20	23	21	22	23	18	17	16	15	16	18	15	15
10	15	15	18	17	17	26	17	18	18	21	23	32	34		30	23	18	18	15		16	15	16	15
11	18	16	22	20	27	28	#17	18	17	21	23	22	29	24	22	23	20	18	15	15	16	15	15	20
12	18	21	17	16	17	16	18	18	22	21	21	22		29	22	21	20	16	15	15	15	15	16	15
13	18	18	16	16	20	20	18	20	22	23	29	26	22		22	21	20	16	15	14	20	18		15
14	16	16	16	16	20	20	16	17	20	22	24	27		23	24	22	20	17		14	20	20	18	15
15	17	15	16	15	21	17	15	17	20	21		26		28	20	21	18	18	15	15	18	17	21	17
16	18	16	18	18	20	17	15	17	18	23		22	23	23	23	23	21	21	15	15	15	16	17	16
17	15	15	15	16	20	21	16	18	18	21	21	21		24	23	24	21	18	16	15	16	16	15	15
18		15	16	22	20	18	17	20	21	21	21	21	23	22	24	23	20	20	17	15	18	15	18	15
19	15	15	17		20	17	16	17	20	20	29	33	28	23	21	20	20	18	15	15	15	15	15	15
20	20	18	20	26	27		18	20	20	23	22	22	23		24	22	20	17	17	16	20	17	17	18
21	17	15	16	18	21	18	17	18	20	20	21	22	32	23	24	20	22	18	16	15	20	15	17	17
22	17	17	17	17	15	18	18	18	20	24	21	23	24		22	20	17	18		15	16	15	16	17
23	15	15	16	17	27	20		18	20	22	24	32		29	26	21	20	17	15	15	17	18	15	16
24	15	15	16	15		16	18	18	20	20	22	23	22	21	21	20	21	18	20	15	16	17	20	18
25	16	18	15	21	20	26	#15	18	20	21	24	24	22	24	21	20	18	17	15	15	16	18		
26	17	15	15	17	17	20	17	18	20	20	22	26	34	27	21	20	20	17	16	15	17	20	15	16
27	14	15	16	17	20	17	16	18	20	21	23		22	22	21	21	20	17	15	15	17	14	15	17
28	20	16	16	18	26	26	17	18	18	20	21	24	24	23	23	20	20	16	16	17	17	16	18	17
29	17	17	16	18	20	18	17	17	21	20	21			24	22	22	21	16	17		18	17	16	16
30	18	16	15	17	18	16	18	16	18	23	24	23	24	31	32	26	20	17	15	15	17	15	15	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	29	29	28	29	30	30	28	26	25	20	23	29	29	30	29	28	26	30	29	28	29
MED	17	16	16	18	20	19	17	18	20	21	22	23	23	24	22	21	20	18	16	15	17	17	16	16
U Q	18	18	18	20	21	21	18	18	21	22	24	26	28	28	23	23	21	18	17	15	18	18	18	17
L Q	15	15	16	16	20	17	16	17	20	21	21	22	22	23	21	20	20	17	15	15	16	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

JUN. 2002

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

HD	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	72	70	59		96		99		119	87			104										94
2	119	82	71	71	71	109	119	129			A										119	119	109	
3	94	72	75	59	71	109		129				159										119	109	119
4	99	74			115	99							159	159	126					119		A	109	99
5	99	69	94	72	114	95	115	119			91											119	119	70
6	119	71		59	62	109															119	119	119	109
7	99	71	59	71	61	109	119	129													119	119	119	109
8	119	75	68	71	75	109		129	A	159											119	119	109	99
9	109	78	59	61	71	119	119			A				92	A						129	119	99	119
10	82	80	69	59	82	109		149			114	90										119	119	109
11	99	72	71	76	71	99	109														129	119	109	94
12	70	63	76	72	74	81	119				A	159										119	119	96
13		75	77	69	62	119	119		A		73										A	A	119	89
14	99	71			59	89		119							A									
15		A	58	58	68	109	109	129			82	109										119	109	119
16	73	71	59		68	109	119				114	99	87								119	119		119
17				72	68	99	119	119		A	A	A	A				A					119		A
18		59	69		61	119	119	A	169	119		A										119	109	
19		69	69	62	57		119	119	A		A	A		A							119	119	99	119
20	74	69	67		59	99		99			58			A	88								109	109
21	89	71	62	59			119														119	119	119	119
22	76	71	60	71	99	99	119															119	119	109
23	119	79		59	61		119				82										159	109	119	119
24	70				61	71	119	119					58		82							109		99
25	89		58		99	109	99							A								109	99	
26						71		A			109											109	119	109
27	89	68	59	57	109	109	119				75		90								A	109	109	
28	94	71	57	59	99	109	119	129					A			A						94		70
29	115	68		61	60		119				81		A								119			119
30	70	71	61	62	61		109				119												99	109
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	23	25	22	22	27	25	21	14	1	3	12	5	4	3	3					1	11	23	23	24
MED	94	71	68	62	68	109	119	124	169	119	84	109	88	104	88					119	119	119	109	109
U Q	109	74	71	71	82	109	119	129	84	159	111	159	124	159	126					59	129	119	119	119
L Q	76	69	59	59	61	97	117	119	84	119	78	94	72	92	82					59	119	109	109	97

HOURLY VALUES OF fEs AT Kokubunji

JUN. 2002

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

HD	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	121	75	G	G			34	53	62	G	G	G		G						115	100		100	99
2		55	63	G	42						136	121	86	98	53									75
3	76	42	27	42							94				G	88				101	98			
4		45	93	G				98	94	94	131	51	119	88		72	99				75	104		
5	75	65	35		65	74						G	96			85			92	102	104			75
6	75	76	62		68	43			156	96	86			94	63						96	75		
7		45		G	42				99		47	G	52		G	155	96	100	95				75	
8		75	74	81	67	138			130		97	157	94	62		66	62	116						
9		38	31	42	32					125	62	59		G	122			80						
10		74	G	G		G						52	63	94	73		63							
11	99	65	35	G	65	43					62		50	87	62					76				
12		65	74	50	75	62					120		G	62	131	G								
13	75	G	G	35	73				119		49	G			94	87	106							75
14		64	62	64	65	75							94		120	96	98							
15		82	45	38							65	70			86		63			101	104			
16			63							63	63	G	58		87	94		94					75	115
17		81	65	28										94	94								75	76
18	97	64	39	53	64			130		66		59	56	62								75	75	
19		45		42					115		120	79	94		77									
20		G		G		G			156		49			71	56									
21	75	24	31	G							G		G		72	73	73	98						
22				26	43									63	63					107				
23	75	75	33	34								49		59	G	G	72			63			75	75
24	75	75	75	26		75					60	52	49	G	G		63						75	
25	75	60	60	G							61		63	88	88	G	65							
26	75			75	86	75					54	94		58	52	71								
27		G		24	44						55	50	52	50	G	G					102			
28	75			G		63					53		154	119			115	104		97				
29		G	75	27	65						46		94	120	86	87	106	100	100	81		108	120	
30											62	87	72	60	G	87	63				100	100		76
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	13	25	22	26	15	11	1	3	8	6	23	18	19	21	24	16	14	7	3	9	8	5	8	8
MED	75	64	52	26	65	63	34	98	117	80	62	52	63	63	68	79	72	100	95	101	100	100	75	76
U Q	86	75	65	42	68	75	17	130	143	96	94	79	94	94	87	87	99	104	100	104	103	106	87	87
L Q	75	40	31	G	43	43	17	53	96	63	49	G	52	58	26	33	63	94	92	78	97	75	75	75

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

JUN. 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	17	18	20	20	17	24	18	18	37	42			41	62	13	13	13	13	13	13	13	14	13	14
2	13	17	20	22	14	30	38	33	37	38	40	40	42	39	37	13	13	17	13	13	13	13	14	17
3	15	21	18	18	21		20	26	13	40	39	44	13	13	13	13	38	13		13	13	14	17	33
4	21	18	20		18	21	18	22	13	13	13	39	37	38	36	13	13		13	17	13	13	13	13
5	13	14	15	14	13	18	17	23	13	31	44	33		40	13	38	13	13	13	13	13	15	13	13
6	13	13	14	14	13	17	18	33	13	34	13	36	37	34	13		13	13	13	13	13	13	18	13
7	13	14	21		21	25	13	14	13	29	13	13	36	13	13	13	13	13	13	13	13	13	13	13
8	13	13	17	14	13	15		18	13	33	30	33	31	40	13	35	13	13	13	13	13	13	18	17
9	13	14	13	17	13	17	13	17	13	13	38	40	39		13	13	13	13	13	13	13	21	13	14
10	13	18	22	20	23	23	13	24	21	34	34	35	13	20	13	13	13	13	13	13	13	13	13	13
11	13	14	17	20	13		13	17	13	33	13			39	38	38	29	13	13	13	13	17	13	13
12	13	13	21	20	13	14	13	17	18	13	35	34	37	40	13	13	13	13	13	13	13	20	20	18
13	18		20	17	21	17	15	20	21	30	30	36	35	39	37	13	14	13	13	13	13	13	14	13
14	13	18	18		13	28		17	13	13	35	33	34	34	13	13	18	13	13	13	13	14	13	14
15	13	20	17	15	13	22	17	15	13	36	35	35	33	35	13	13	13	13	13	13	13	13	13	13
16	15	20	18		14	13	13	17	18	13	31	13	38	35	34	13	13	13	13	17	13	13	13	15
17		17	13	17	20	17	13	21	13	35	39	35	34	30	30	13	13		13	13		13	13	13
18	13	17	15	17	13	17	13	21	13	26	13	39	42	39		39	13	13	13	13	13	17	13	13
19	13	21	18		13	24	13	14	13	13	31	30	33	30	13	13	20	13	13	13	13	18	13	13
20	13		38	39	17		17	17	33		13		35	35		13	13	13	13	13	13	13	13	13
21	13		14		38	31	13	17	13	13	13	31	33	40	31	13	18	13	13	13	13	13	13	13
22	13	17	20	13	14	14	20	20	25	31	33	18		33	13	13	14	13	13	13		13	13	21
23	13	13	17	18	17	18	15	22	18	30	30	31		39	40	29	13	13	13	13	13	13	13	13
24	13	17	14	18	13	20	13	17	17	13	34	33	33	30	13	13	18	13	13	13	13	13	13	20
25	20	18		37	34		17	20	13	21	31	35	34	13	13	13	13	13	13	13	13	13	13	13
26	13			20	17	23	13	20	13	18	28	13	34	37	38	13	13		13	13	13	13	13	13
27	13			20	21		13	17	13	13	31	31	34	13	13	13	13	13	13		13	13	13	13
28	13	20		18	13	18	13	34	18	26	39	31	39	39		13	13	13	13	13	13	15		15
29		17	17	20	14	20	13	13	13	13	13	37	36	38	36	13	13	13	13	13	13	13	13	17
30	20		22		21	21	18	34	13		31	31	13		40	13	13	13	13	13	13	18	13	15
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	24	26	23	30	25	28	30	30	28	29	27	26	28	27	29	30	27	29	29	28	30	29	30
MED	13	17	18	18	14	20	13	19	13	28	31	33	34	36	13	13	13	13	13	13	13	13	13	13
U Q	14	18	20	20	21	23	17	22	18	33	35	36	37	39	36	13	14	13	13	13	13	15	13	15
L Q	13	14	15	17	13	17	13	17	13	13	13	31	33	30	13	13	13	13	13	13	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

JUN. 2002

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	69				60		95					A	A	A	A	92	71		121	93	A	A	119	A
2		70	94		95	60	89					94					A	A		90		A	A	A
3	70		99	58	76	94	109	116		93		92			88	92	91	100						
4		89			60		109	93			A	79				79	113			169	112	77		
5	A	A	A		A	61	99	99		119	A	A	92					A	A	A			91	79
6					94	70	95			80		A	89	96	123	92	A	A	A	88		77		99
7		95	61	57	80	95	95	94	89	93		94	92			115	95	113						
8					61	60		83	80	60			95		83		115	96		119	109		94	
9		95	95		67	89	109	109	72						94					81				
10		94				94	109	109	91								114	A	93	A			99	
11					68	92	95	95		80	93		89	92	92	A	87						109	75
12		99	67		61	73	98	94		73			89		119	94	94	115	119	114		109	99	95
13		94			95	109	60	92					87	74	92	95		109						71
14	99						99	75	99	109	116				61				94	83		C		
15					68	95	99	109	82	A	A	A	A			86	119	82			99		72	69
16		89	71	72	92	95	99	99		94	92	92			84		83	119		94				
17	69		58	59	57	58	99	109		84		A				79	116	124		115	99		73	99
18	76	71		70	68	94	95	93							94				159	119	109			72
19								89	59		82					95	112	119	83	89	60	69		
20					60		69	94												68	59	99		99
21			69				58	109						109		101	83	106	100	109		89		
22	70			68						113					94	82	86	87			A			70
23				60	61	57			95	94						119	79	97		109	59			
24				60			59	59					A					58	89					99
25	A		60	58	58	57			69	101	C	C	C				92	99			59		99	
26	89			62					95	119	93	A		A	A	95	A			89				
27					61	67	96	94		62		109						119			99	59	99	99
28	79		60		61	57	99	109	94	114					83		89	95		112	59			95
29				60	68		80	59									A	A			A		99	
30			70	58			109	99	91			81			70	87				82		57	75	
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	8	9	11	12	21	19	24	23	12	16	5	7	7	4	13	15	17	16	8	18	11	8	12	13
MED	73	94	69	60	67	73	97	94	90	94	93	92	89	94	92	92	92	103	97	94	99	77	99	95
U Q	84	95	94	65	78	94	99	109	94	111	104	94	92	102	94	95	113	117	120	114	109	94	99	99
L Q	69	80	60	58	60	60	92	92	76	80	87	81	89	83	83	86	84	95	91	88	59	64	83	71

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Yamagawa

JUN. 2002

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

HD	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			165	68		70	62	49	62	62		63	65		97
2	64	41	26	G	G	G	G	G				G				62	93	85	94	53			73	
3	51	42	35	28		37		G	76	G		G	72	84	G		56	56	85	160	35	62	66	G
4	G	G			44				62	76	86	95	156	153			64	44	44	32	44	50	62	80
5	86	78	60			30	G			66	156	121		66	78		106	157	154		97	97	96	29
6	64		38	41	42	G	32		G	G	119	83	64	92	105	70	105	178	156	89	64	44	98	62
7	41	G	G	G	G	G	G	42	G	52	G	69	82	58		G	G	78	65		36	70	53	33
8	34	52	53	26	42	38			G	G	85	94	62		86	70	58	G			100	64	44	59
9		74	36	36	G	G	G	G	G	G		75			G		G			51		74	59	
10	63	G			G	G			G		G		71	114	122	88		99	44	82	70	46	44	29
11	54	75	49	64	63	58	75	56	54	83	64	G	67	68		89	52	98	38	47			48	58
12	50	28	38	31	42	28	47	74	63	56		74	G		G	59	62	38	36	43		G	G	G
13		G		G	44	61	74						58	52	G	G			97	93	43	74	76	78
14	74	76	97	72	55		G	G	G	61	71	94	79	98	69	122	120	131	99	45	59	C		98
15	59		64	63	42		G	63	75	84	121	131	156	76	60	56	65	G		51	G	50	75	75
16	74	42	G	G	45	28		64		G	G	G	116	86	82	131	75	90	62	72	60	G	G	
17	34	44	16	26	G	G	G			79			118	G	58	63		G	49	47		30	64	61
18	G	G	G	G	62	31	G	G	G	G					57	79		117		65	44	44	74	41
19		G		G			G	G	G	G	86	98	95		86	63	69	94	74	83	29		64	G
20			41	36	G	28	G	36	72	G		65	G	62	60	G		65	74	86	31	74	52	27
21		G	G		G	G	G	G	75	75	73	60	74	54		G	48	G			84	G	G	52
22	74	61		G	G	G	G	G	G		G		66	82	67			42	62	110	123	77	65	
23	G	61		30	62	G	G	67	69	60	G				60	G	51	G	44	G	G	30	G	G
24			G	G		G	G			60	52		84	52	56	50	75	51	60	74	44	44	73	61
25	76	74	G	G	G	48		42	60	G	C	C	C			G	G	39	G	28	G	42	G	G
26	G		42	60			34	38	64	65	71	90	83	93	156	77	118	88	57			98	64	44
27	38	62	42	29	G	G	44	64	65	G		G					G	G	64	72	38		G	
28	76		52	61	50	31	G	G		68				72	55		G	53	129			49		G
29			G	44	41	72	64	63	84	98	57	66			62	98	99	157			120	101	78	74
30	81	74	50	28	42		G	G			95	G	58	55	79	75		84	99	80	62	37	G	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	23	23	26	25	24	24	22	22	24	18	21	21	19	23	23	23	28	24	22	23	25	27	24
MED	54	42	38	28	42	14	G	18	57	58	71	74	72	72	62	63	62	64	63	68	44	50	62	48
U Q	74	74	50	41	44	34	33	63	69	71	86	94	89	92	82	79	93	96	95	83	70	74	73	68
L Q	34	G	G	G	G	G	G	G	G	G	G	G	63	55	56	G	48	38	46	47	35	39	G	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Okinawa

JUN. 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		119		95			99	99	78	94			113		127	119		121			95		109	
2		96		77	71	74	76	98		94		115	104	116	115		118	119		116	109	93		95
3	95			94	93	93		95	99	112	82		104		125		116	102	103					
4		69		95	96	109		109	82	84	119	124		126		150	170	150	159	133		94	82	
5				109				94		109			115	117	113	134	116			119	94	93		
6	109			72	95	94	95	96	109	94		101	134	118	127	A		121	119				72	89
7	99	96	95	62	74		82	88	95	82	92	114		116		150	151	134	95	90	119			
8		94	71	94	74	94	96	109	119	104	93	93	102		106	121		107					109	
9	109	94					74	82		92							119	101	119	94	114	94		94
10			95	94	94	99	94	93	94		119	93	118	134	102	124				96	93	119		
11		119	95		82	70	59	61		90	92		114	122	116	103	115					116	78	89
12					109	94	99	89			115	124		115	104	102	106	110		135	119		109	
13		95		99	97	80		99	95		77		122			118		104			82		109	
14			95		62		72	109	99	93			118	116	125		116	A		C	C	C	85	
15	82	71			94	94	95	114	82		A				A	99	114		130	119			94	
16	94		95	60	94	94	80	94	97		93		116				122	125		109	119			
17							99	119	94	119	119					115	151	125	121	119	91	70		
18			97				93	109	73					100	93	119	99	95	95		109	94		94
19	109	75	94	99		62		109	89							91	101			109	95	99		
20	58			89				89	82				A			92	82	96	96	119	115			73
21					68			94						87	98	92	90	100	119	109	99	98		
22		99		71		94	99		99	109	93			85	118		114	114	119	99			119	
23	70	69	95	61		60	99		101			83		91	94		119	104	122		99		99	
24			70		56			115	94							69		89	97			95		
25	71		61		58	56		95	89					94		99	84		125	119	109	115		
26		94	89		A	A		109	94	112				83	115	114	98	A		117	78			
27		96	96		96		95	72	72	92		94	81		122	119	119		109	94	92			
28		77			58	59		82	93		A	94		93	115		A	A	159		96			
29		79	69		80		94	109	96	83	91							128	121		119	82		
30	99	94		71	72	59		109	71		93			113	118			109	93			99		69
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	17	14	16	20	17	18	28	24	16	13	10	12	17	18	19	21	20	18	17	20	14	11	7
MED	95	94	95	92	81	93	94	97	94	94	93	98	114	115	115	115	116	110	119	116	99	94	99	89
U Q	109	96	95	95	94	94	99	109	98	109	117	115	118	117	122	121	119	123	122	119	114	99	109	94
L Q	71	76	71	71	69	61	80	91	82	91	91	93	104	92	104	99	100	101	97	97	93	93	82	73

HOURLY VALUES OF fEs AT Okinawa

JUN. 2002

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G		G	G	50		78		49	G		49	63	87		G	G	42
2		G	G	G	G		G	42		59		66	96	64		65	49	G	G			G	G	76
3	64				35	34		G	G	58	G		86		G		G	56	63					
4	G	G		G	G	G		64	52	82		G		G		G	51	63	46	74	36			
5	75			G	G		G	G					G	70	G	67	49		41	48	38	96	121	70
6	76	G		G	G	G	G			99		G	G	62	G	173	126	113	105	90	120		74	96
7	76	G	G	G	G		G	G	60	87	51	52		88		G	G	G		G		61		63
8	40	G	G	61	G	78	41		G	G		G	G	118	65	81	68	G	95	93			31	
9	G	G		G			G		G	G	95	100					G	G	39	G	G	G		G
10	G	G		G	G	45	G	G	52	50	50	52	71	78	G	64	122	114	68	101	74	48	G	G
11			G	G	G	24	G	46			G	64	70	G	50	G	G	108	100	95		85	62	28
12	32	G	G	61	64	30	64	64	52	52	G	G		G	68	G	86	80	101	33			35	G
13	G	G	G	G	G	G	33	74	50	70	G		64			G		63	94		G	G	G	
14	67		G		G	G	G	G	G	68	99		79	95	G		79	126	155	C	C	C	61	
15	96	51	G		G	G	72		75	90	78	87		G	120	98			84		87	42	G	
16	24	G	G	G	G	G	G	G	48		55	G	82	80	96	91	90	62	122	68			40	G
17		G	G	G		G			G	57						50	G	G	G	44	G	G	G	G
18			G	G		61	36	61	G	98	96			G	G	52	88	75	100	27		G		
19	G	G	G	G		G	G		G					88	G	58	68	100	94	G	63			
20			64	62	74	97			G	G		69	107	120			50	G	100	63		34		G
21	G		G		G	G		64			66		85	49	G	63	51	G	G	G	G	G		
22	G	G	G	G		G	G	64	G		G		98		G		52		107	62	66	G	52	60
23	G	75	G	G	G	54	G	64	68	98	68	78	92	67	51	64		43	G	30	86	42		G
24	G	G	G	G	G			G	40				54		50	G	47	G	39	56	53	42	62	G
25	76		G		G	G		34	48					G		G	G					G	G	G
26	G	G			36	34			G	63	52	94	94	48	G	60	96	126	141		75		G	
27	64	G	G	48	G		G	49	48	56	53	48	G		G	G	G		40	39		62	64	
28		G	G	100	G	G	65		G	125	122	86		G	G	106	135	156			91	63	G	
29		G	G	G	G		G		66	54	G	64			83	66	85	59	62			G		75
30		G		G	36	G	G		47		59	80			77	70		90	86	47	64		52	76
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	22	22	24	25	23	22	18	25	21	20	18	18	20	22	25	25	25	27	21	16	20	20	18
MED	12	G	G	G	G	G	G	44	40	59	52	64	78	63	G	60	51	62	84	48	64	18	33	14
U Q	67	G	G	G	G	34	33	64	52	88	73	80	92	84	65	68	87	104	100	80	80	54	61	70
L Q	G	G	G	G	G	G	G	G	G	51	G	G	54	G	G	G	G	G	40	28	18	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

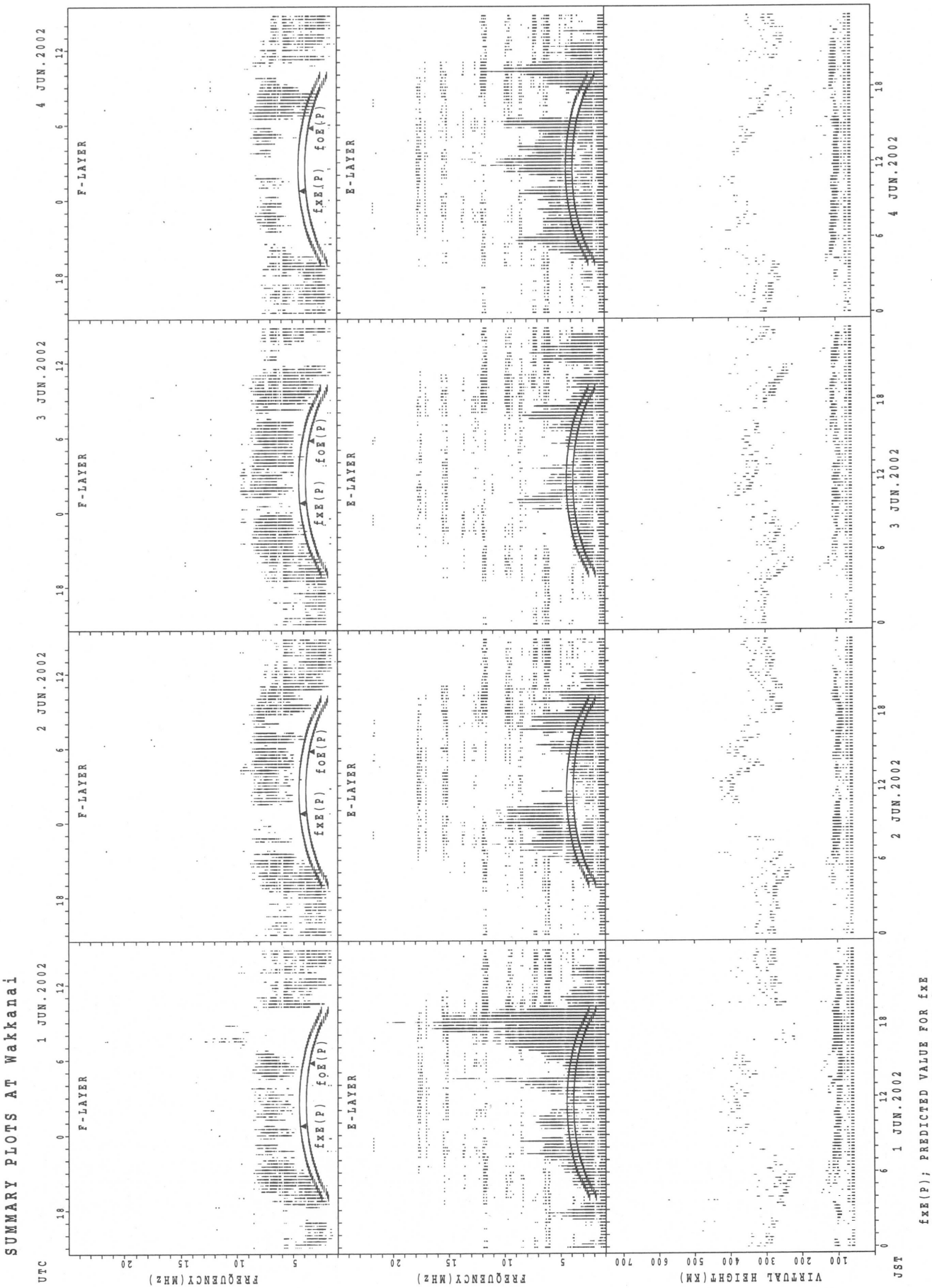
HOURLY VALUES OF fmin AT Okinawa

JUN. 2002

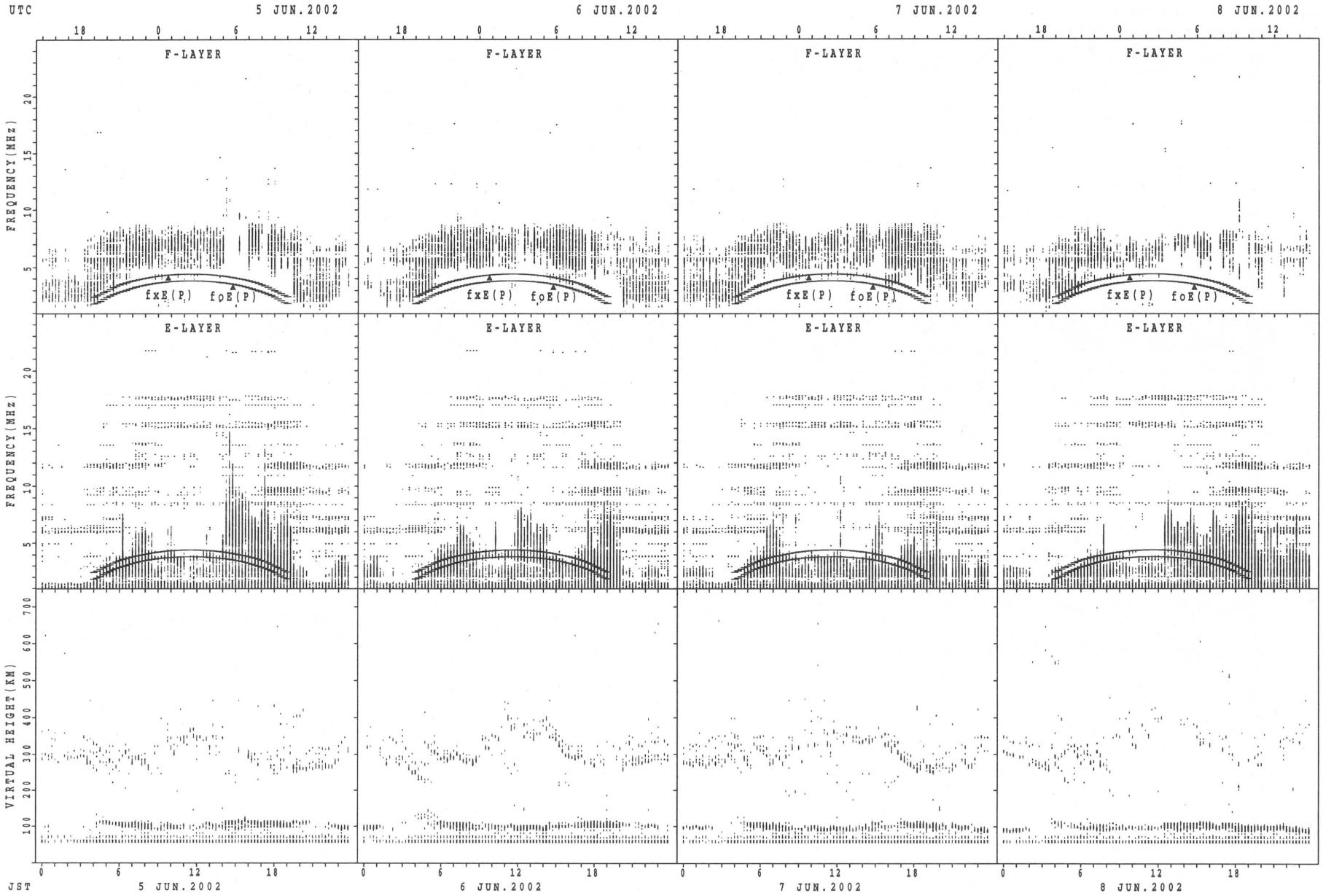
LAT. 26°16.9'N LON. 127°48.4'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

HD	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						24		36			40		43		43			22	26	18	21		43	21
2		49		59		33	36	40	39	41		43	43	42		45		54	30	14	15	27		28
3	21			28	17	21		43		42		40	45					34	33		14	18		
4						56		34	40	33		64		56		59	34	21	17	15	16		39	38
5	44			38			34	44					58	48		42	43		22	24	22	17	28	20
6	20		23		32	39	32		32	32		62	63	54	59	33	35	28	17	18	15	28	22	18
7		33	36	30	35		32		33	35	40	40		42		57	59		33	23	23	14		29
8	15			33	38	16	22	23		56	59	56			49	40	39	38	22	17			20	17
9	33	42					33	40			42	43					53	28	17	27	27			22
10	29		39		58	24	29	39	32	41		40	43	40		41	34	32	20	20	14	14	38	
11	44	40	36		28			28	39		60	48	48	63	60	55	58	33	26	17		14	18	
12	15			20	21	21	24	29	30	34				58				33	15	32	14	16		
13		54		39	29	29	32	24	27	33			44		58	56		22	18		28			
14	32		57		40	33	38	33		39	43		43	47			43	39	22	C	C	C	28	32
15	30	39			54	28	21		34	39	45	40			43	40	34		20	20	15	14	34	
16	60		43	39	57	27	30		41		33		44	54	46	42	42	33	23	20	14		20	
17			44			42	33			39						32			20	17	21	18		
18						26	22	21		32	44			67	60	56	38	26	22	16	15	29		34
19	42	29	29	30		28	27	30						46		42	38	35	20	36	14	37		
20	17		18	27	21	18		29		58		50	42	42	39		40		18	18	14			34
21					39	18		39		29	42		38	29		34	28			28	15	30		
22	44	42	39			30	39						44				27	20	14	15	14	28	14	15
23	34	29		39	38	26		28	32	30	38	38	59	43	43	35	33	21	20	16	37	18		40
24	40	31	28		28			43		29	35		38		41		33		23	26	14	14	17	
25	23	20		38	30	27		22	26										16	22	30	30		27
26			18		22	22		29		40	45	49	46			43	41	26	18	17	24		27	
27	20		26	21			39	21	26	33	33		59			57			24	20	16	14		
28	37	34	40	20	20	27	28	24			45	48			58	38	27	30	14		14	22		
29		46	39		55		34	40	36	33		46			46	38	40	28	26		22	28		22
30	30			22	20	20		39			43	45		60	43	42		35	22		14	17	24	32
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	13	15	15	20	23	19	24	14	20	16	16	17	16	14	21	21	21	29	24	27	21	14	16
MED	31	39	36	30	31	27	32	32	32	34	42	46	44	48	46	42	38	30	20	19	15	18	26	28
U Q	41	44	40	39	39	30	34	39	39	40	45	49	53	57	58	55	42	34	23	23	22	28	34	33
L Q	20	30	26	22	21	21	27	26	30	32	39	40	43	42	43	38	33	24	17	17	14	14	20	20

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

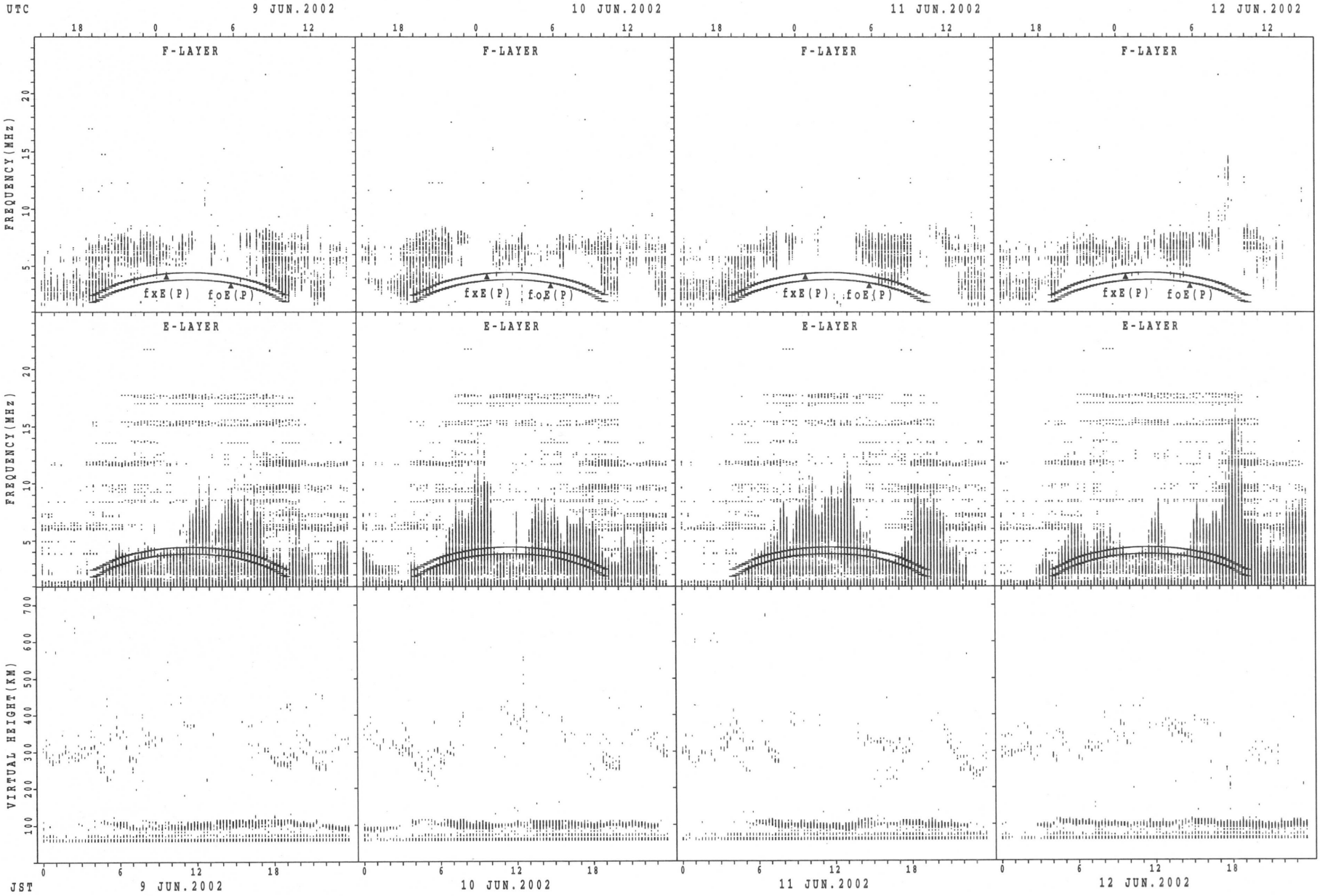

SUMMARY PLOTS AT Wakkanai
UTC
JST
1 JUN.2002
2 JUN.2002
3 JUN.2002
4 JUN.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



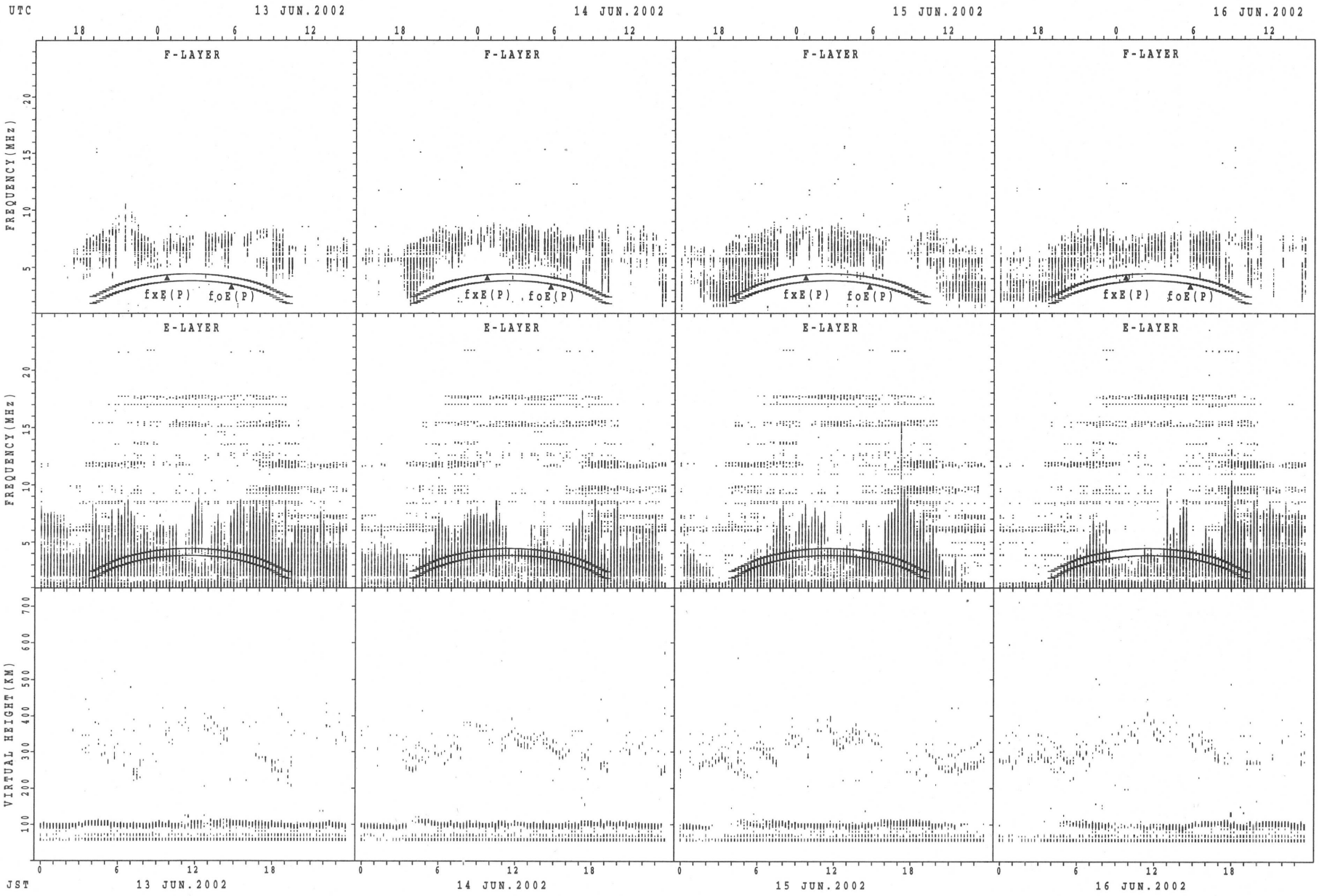
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



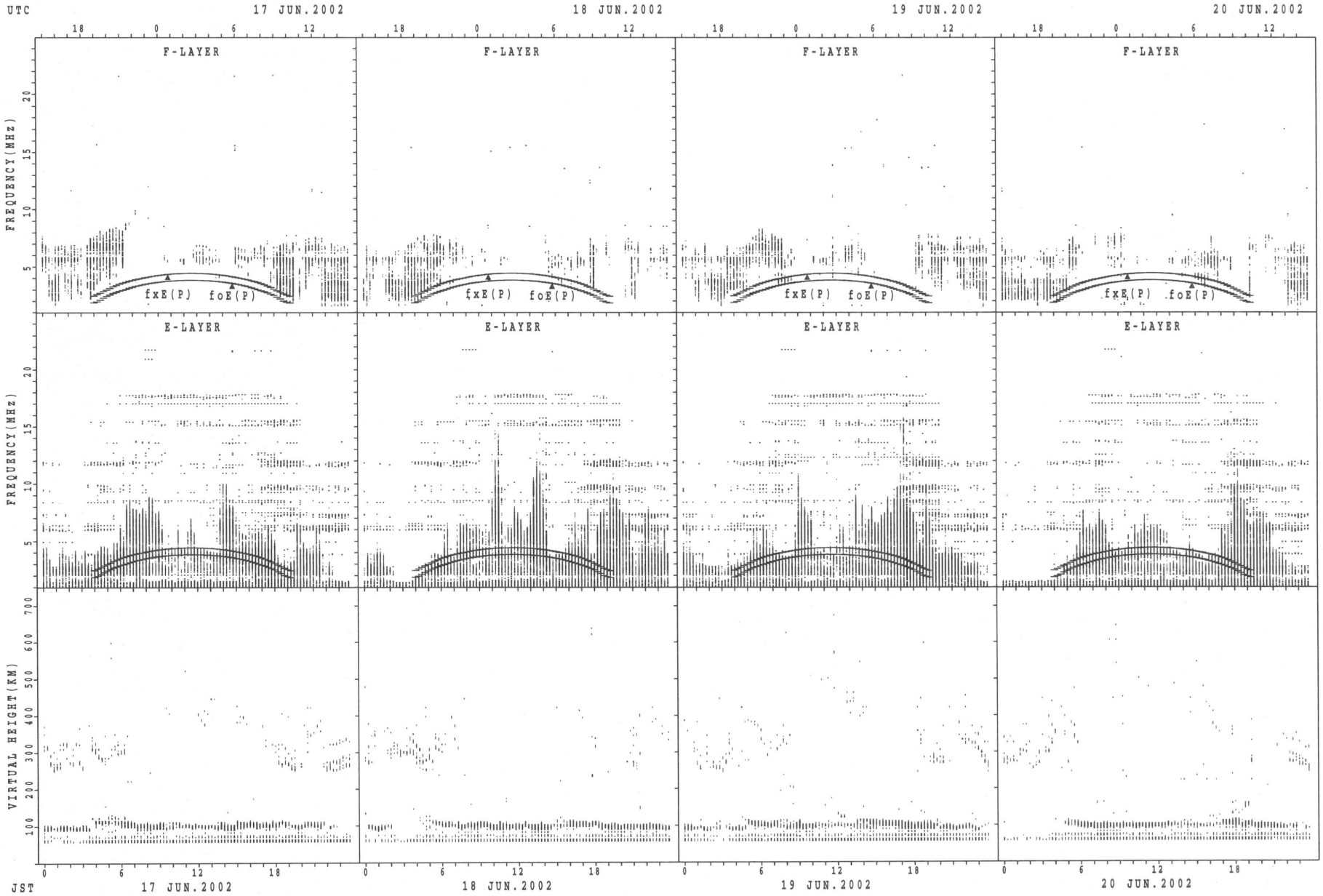
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



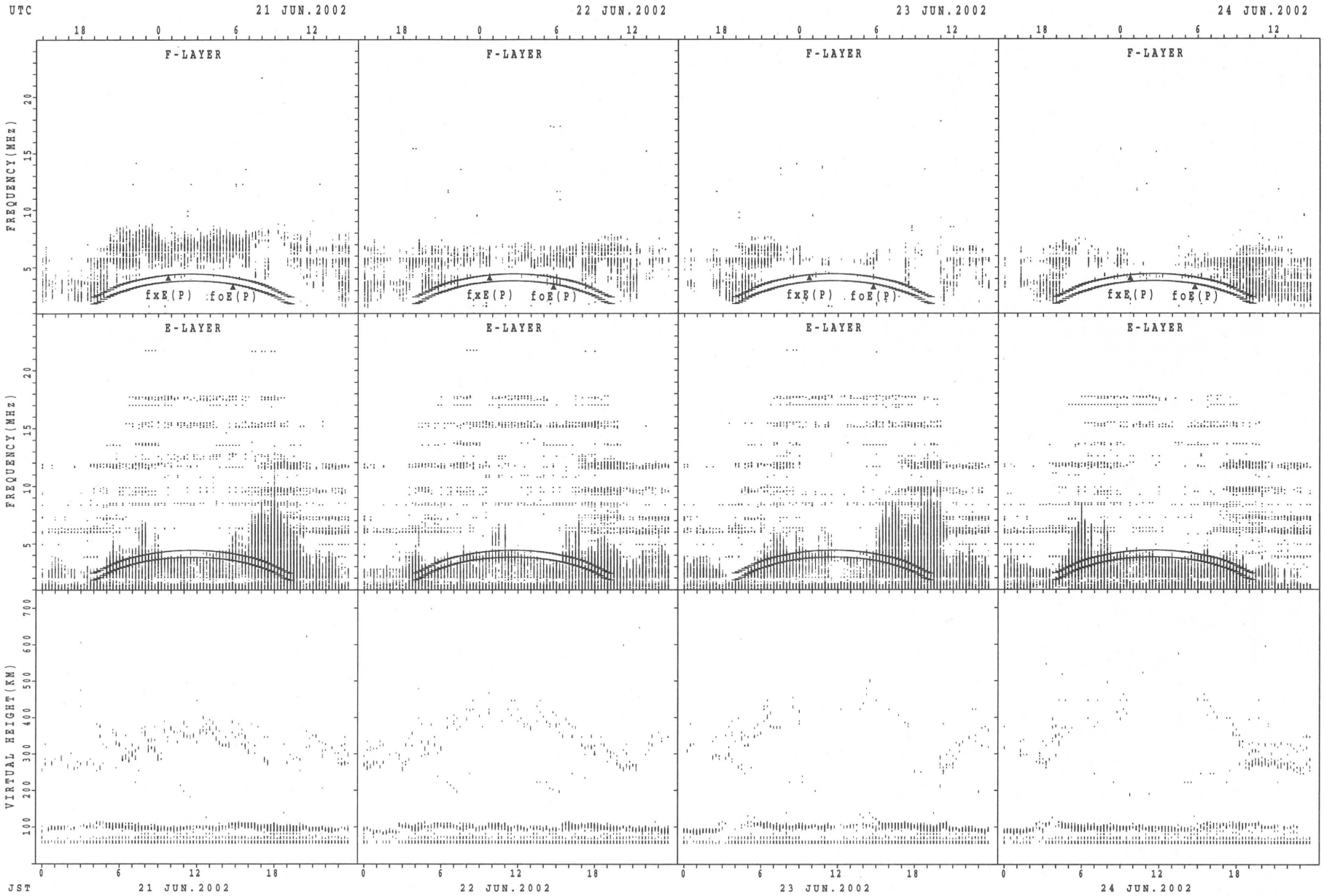
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



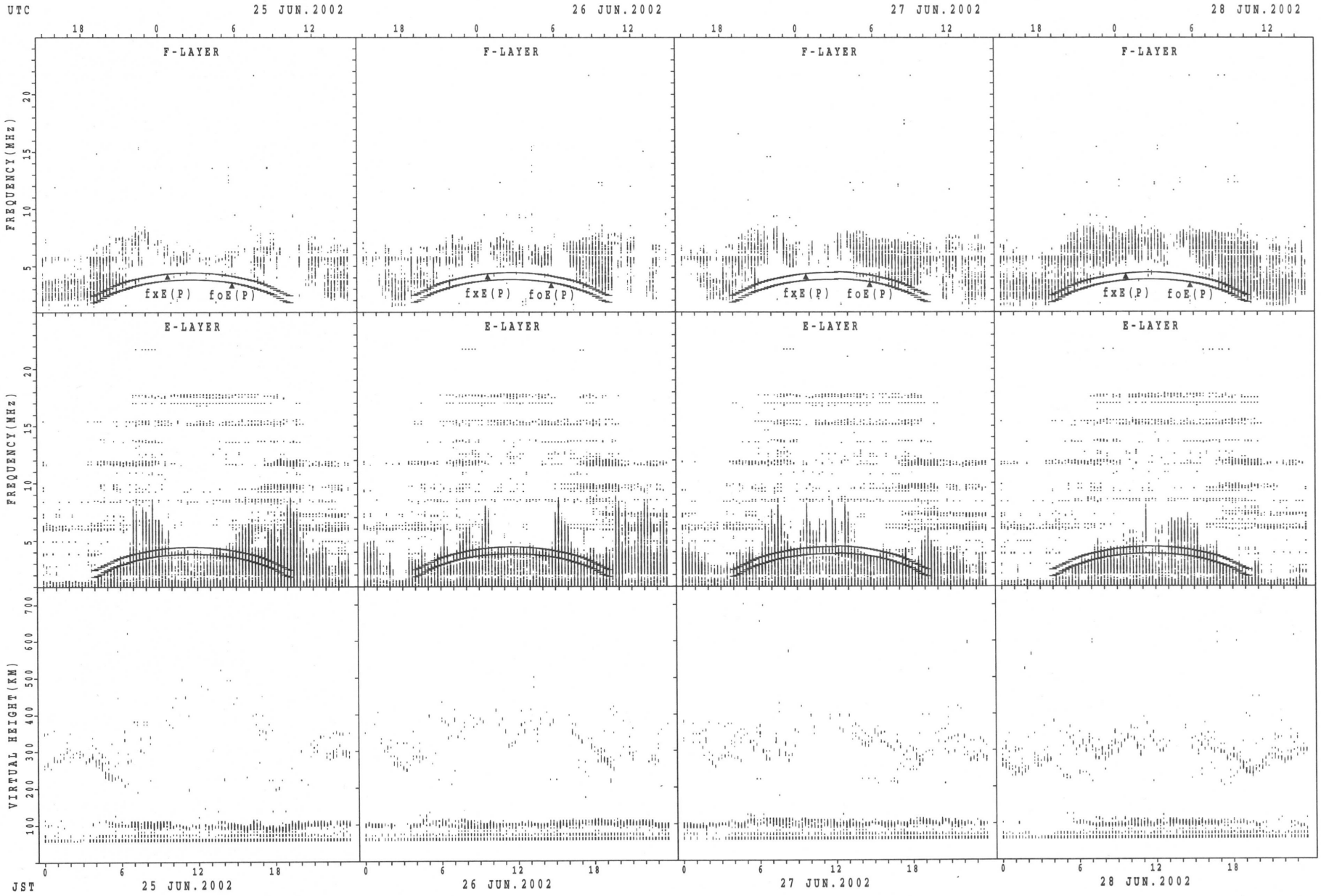
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



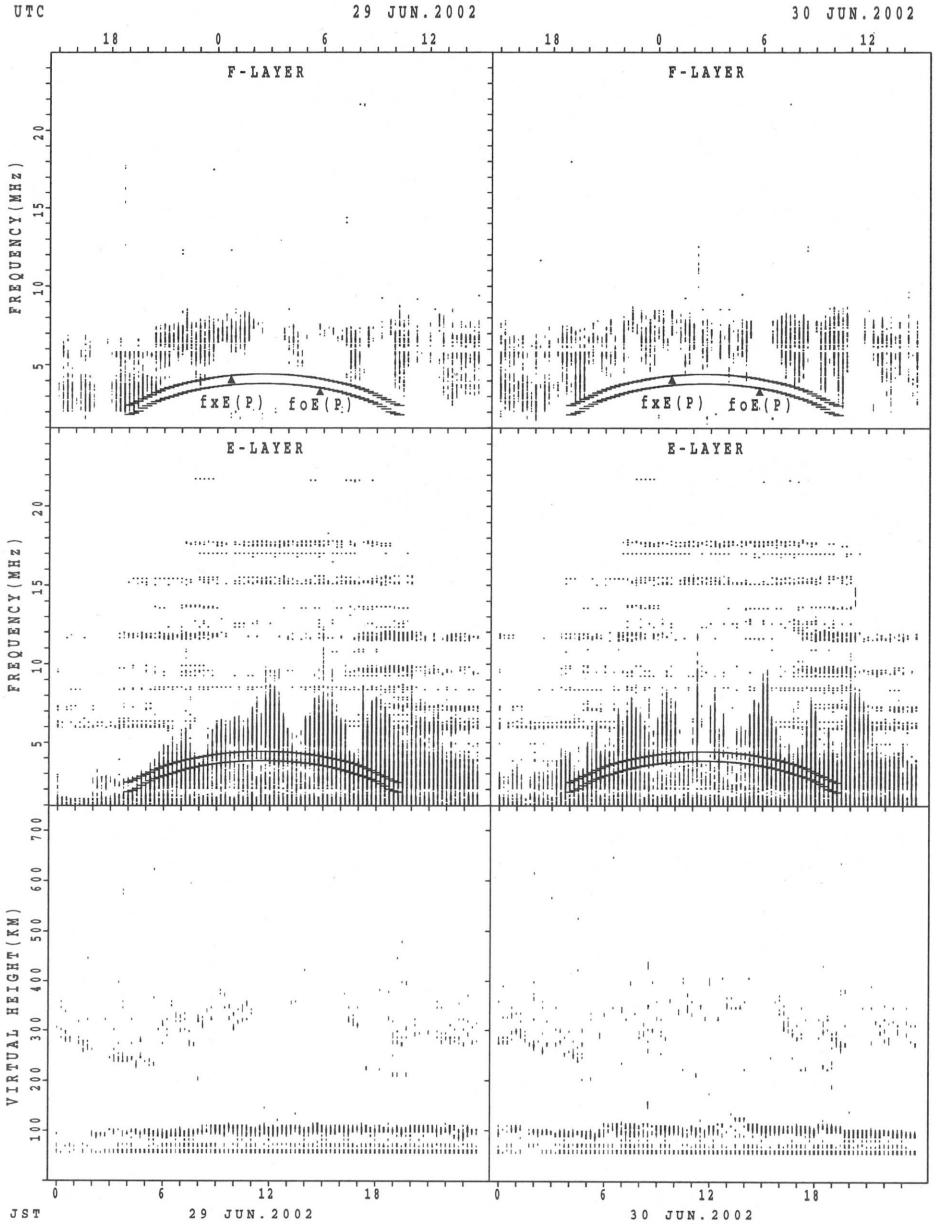
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

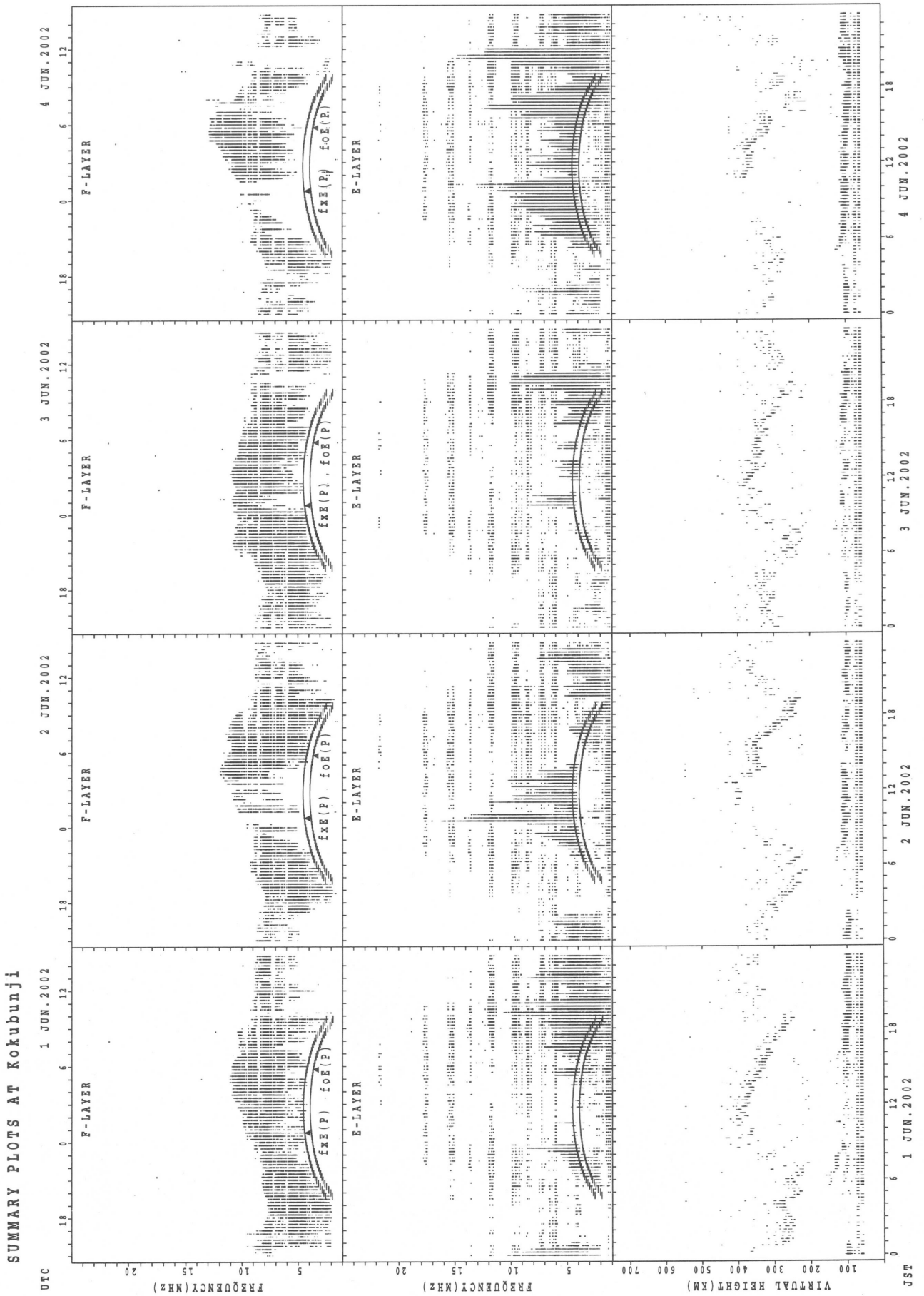


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

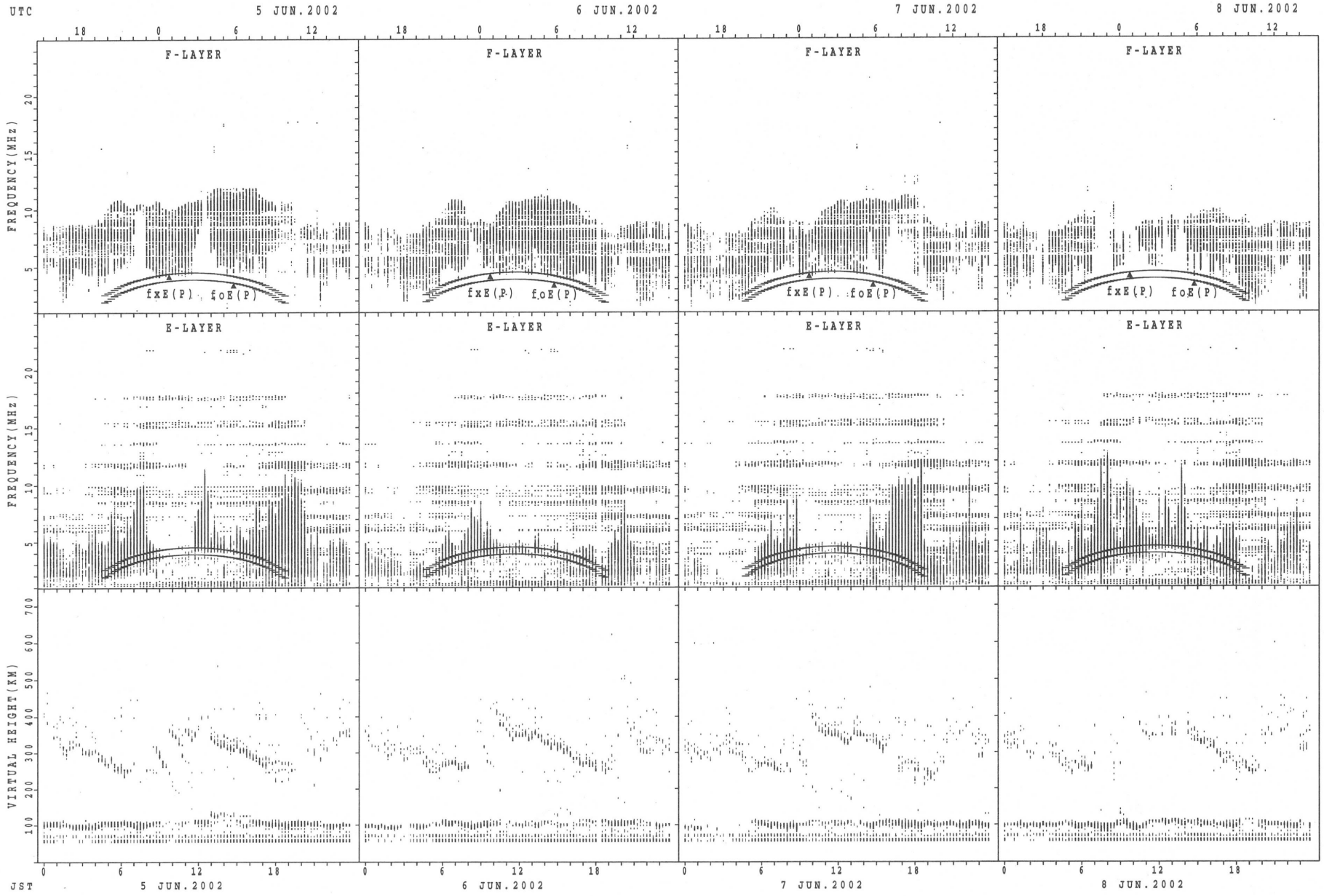
SUMMARY PLOTS AT Wakkanai



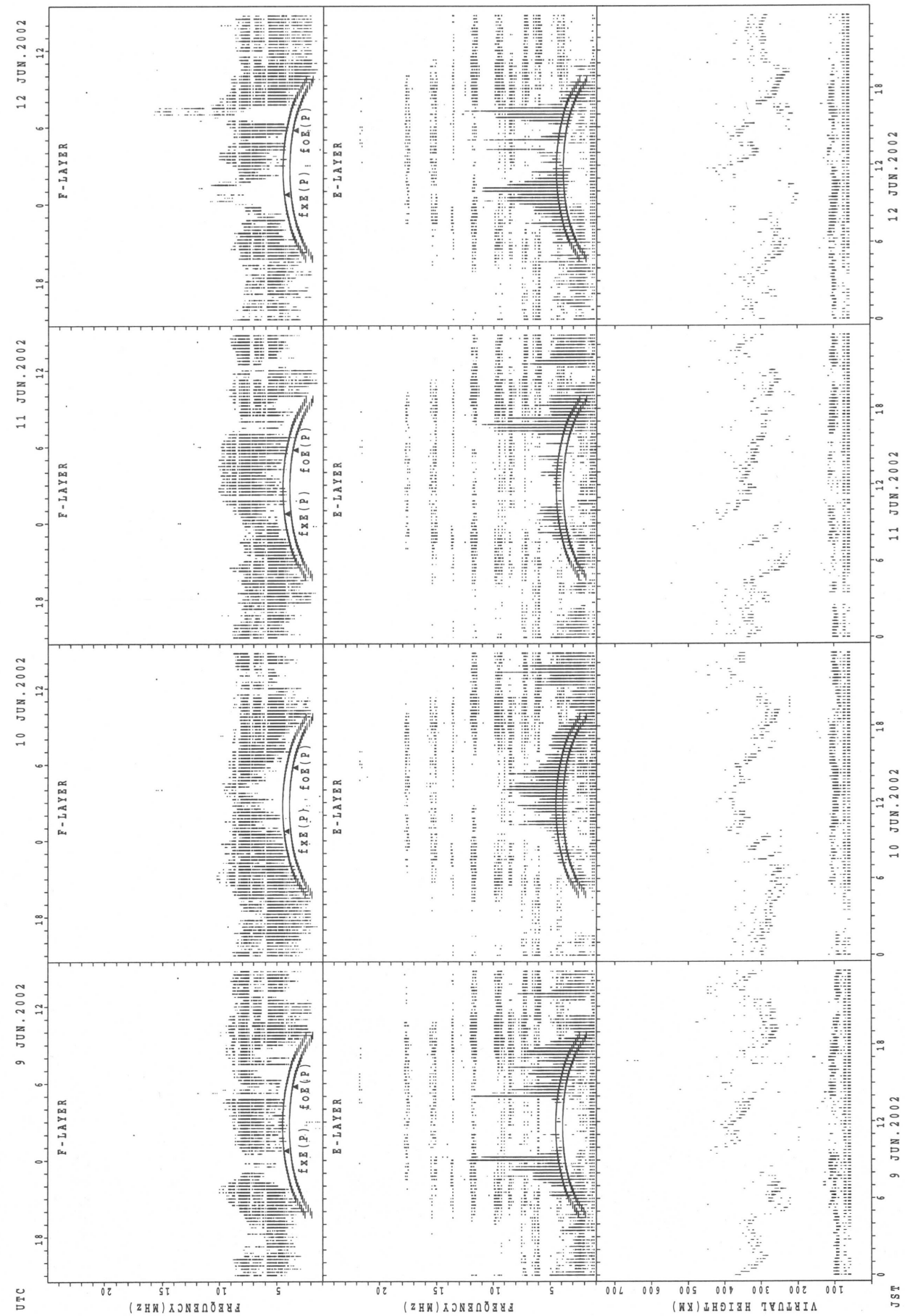
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

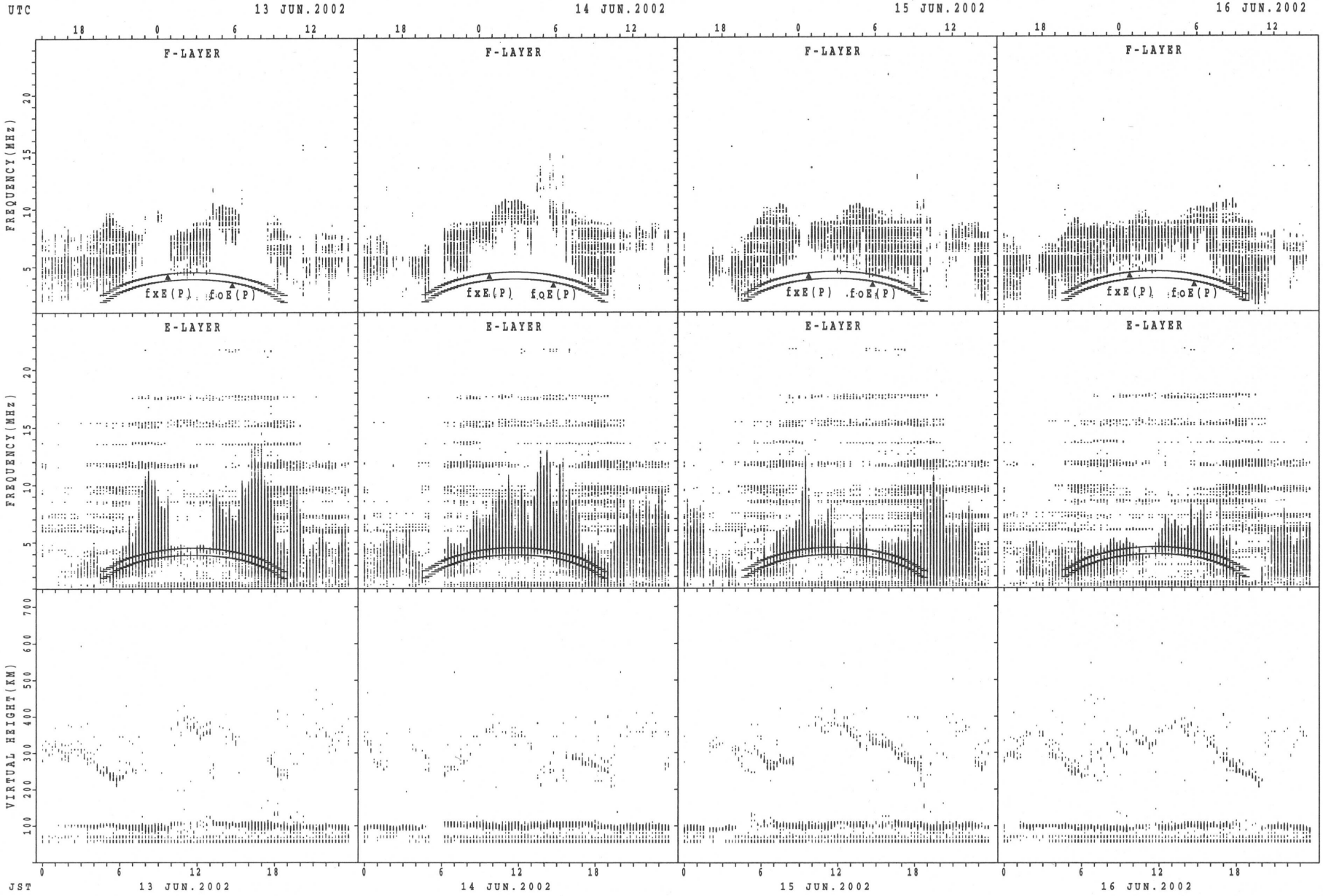
SUMMARY PLOTS AT Kokubunji



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

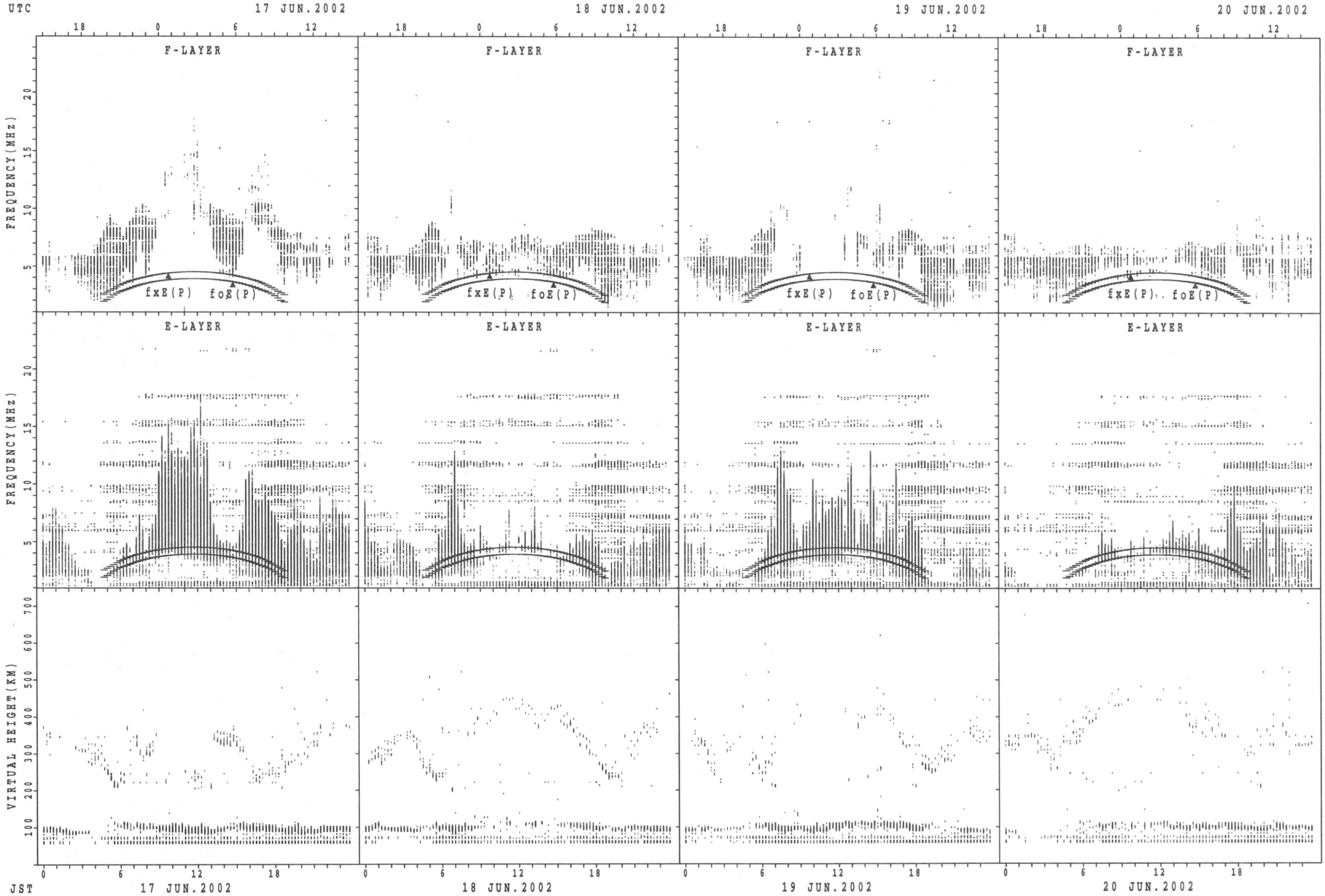

SUMMARY PLOTS AT Kokubunji
UTC
JST
9 JUN.2002
10 JUN.2002
11 JUN.2002
12 JUN.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



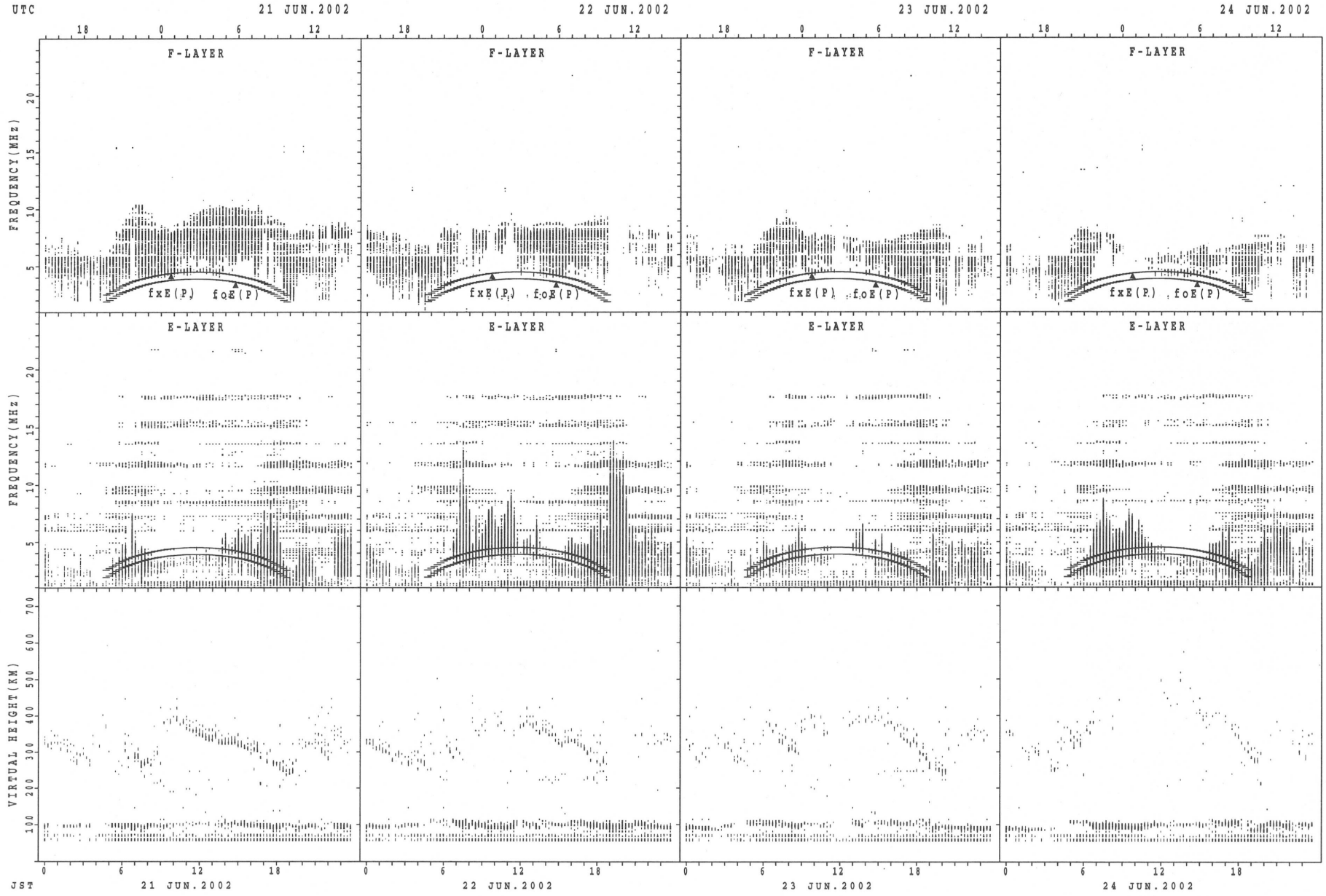
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



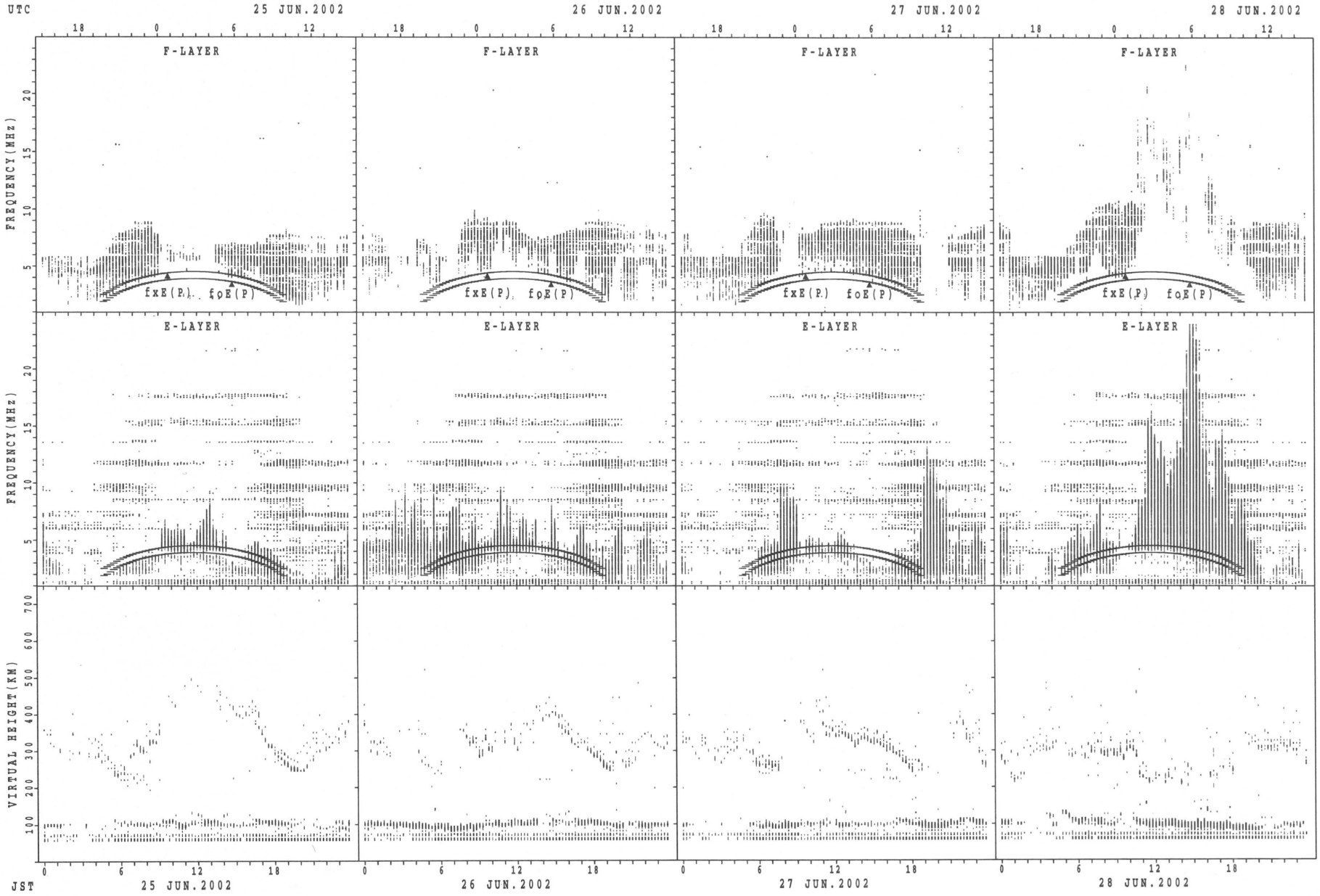
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



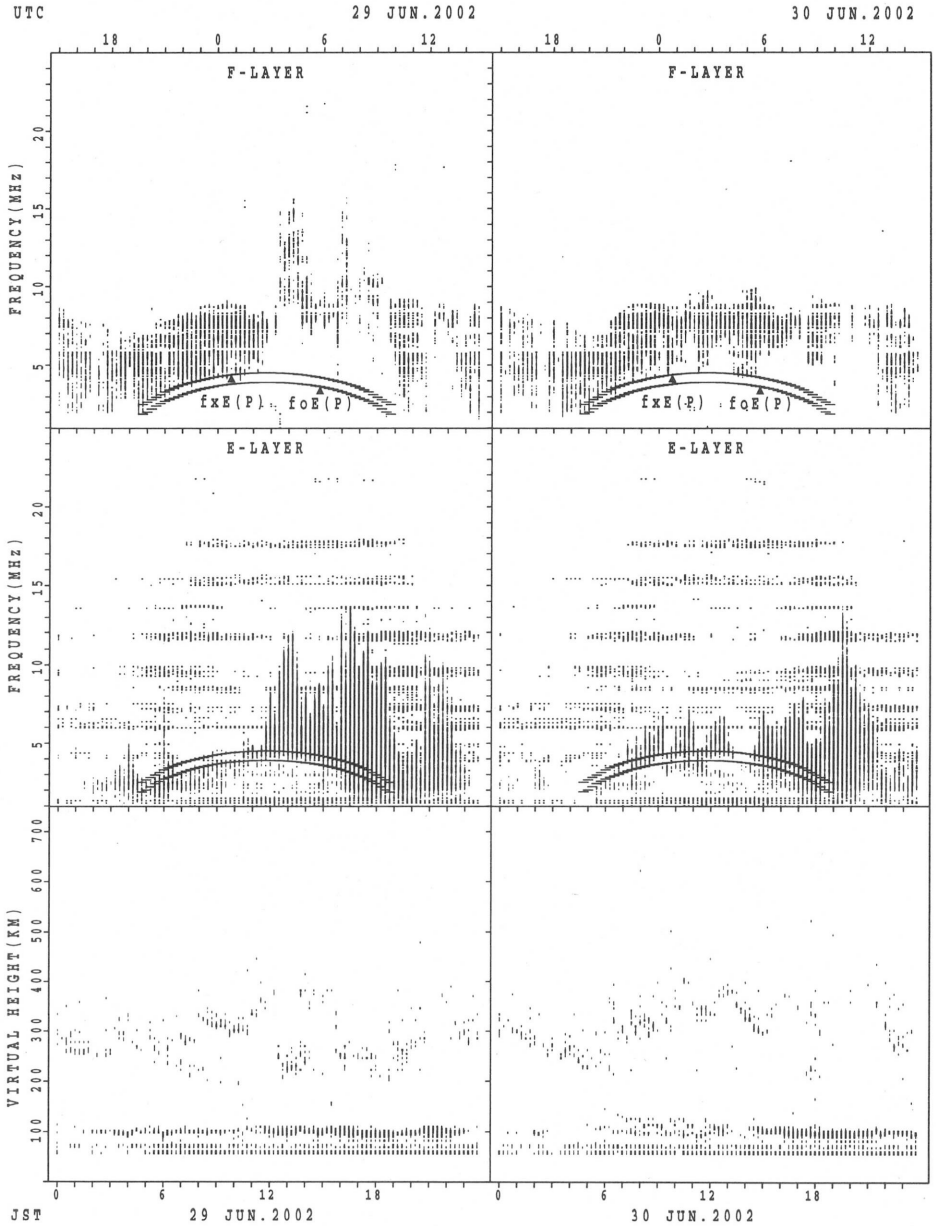
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



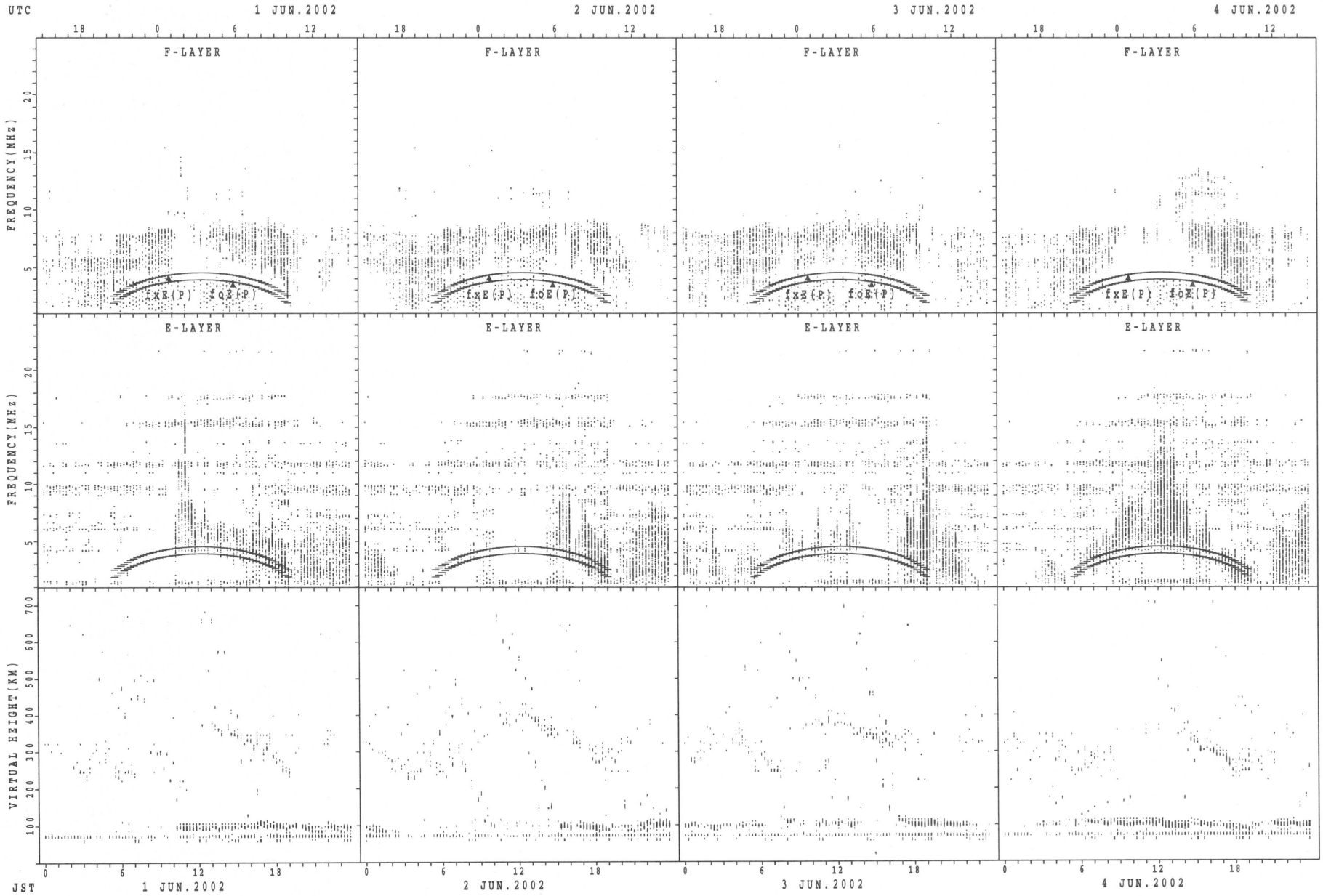
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



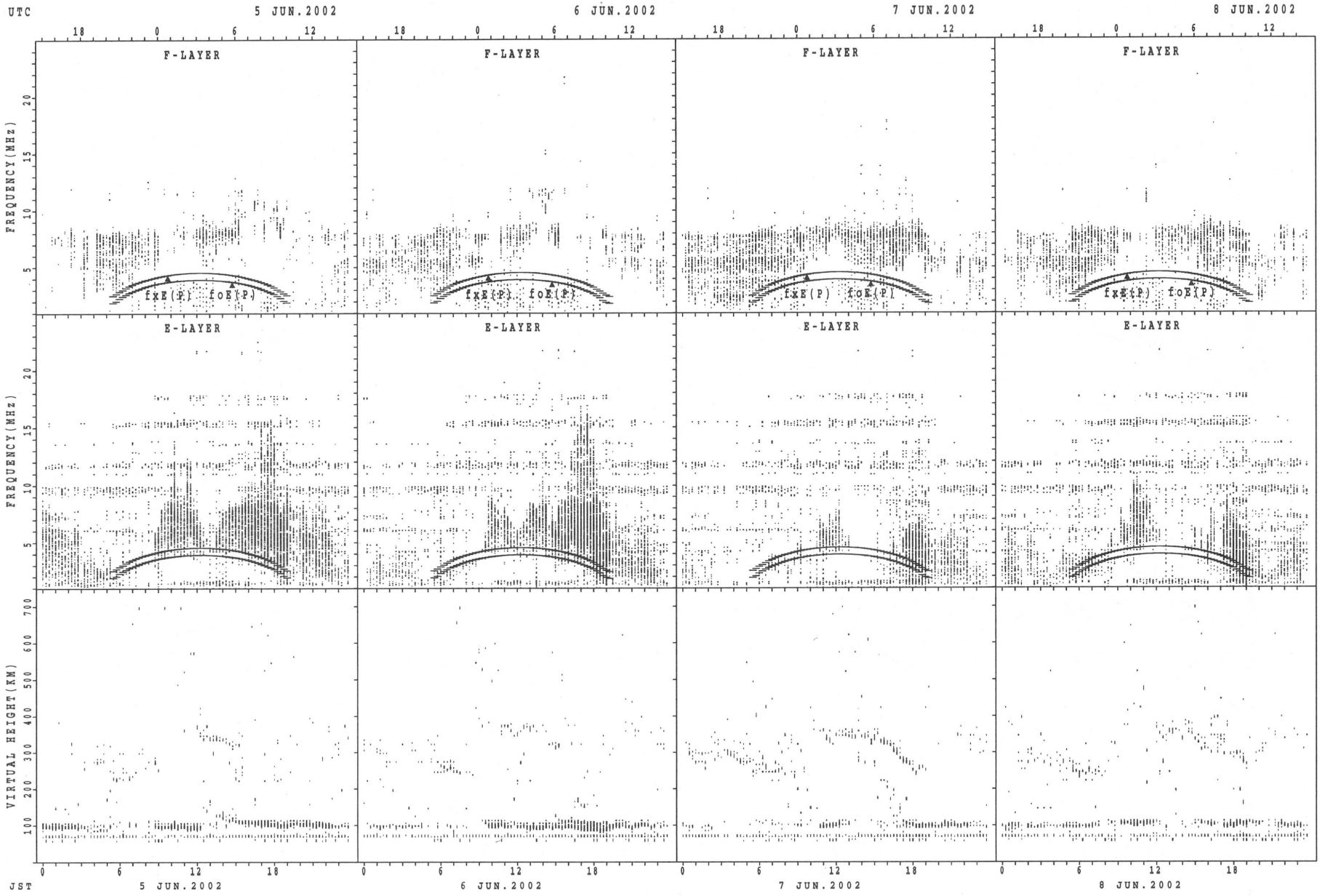
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



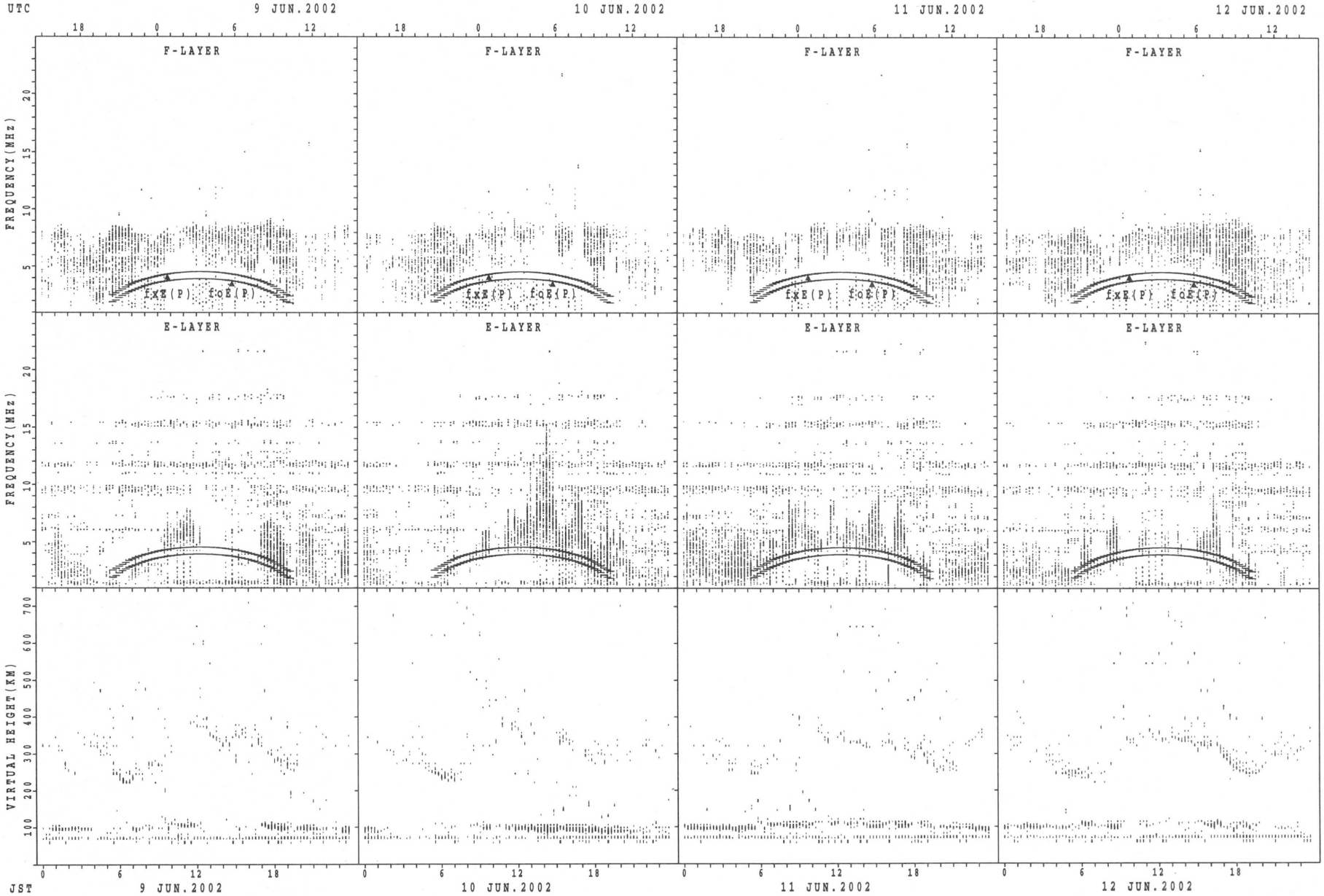
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



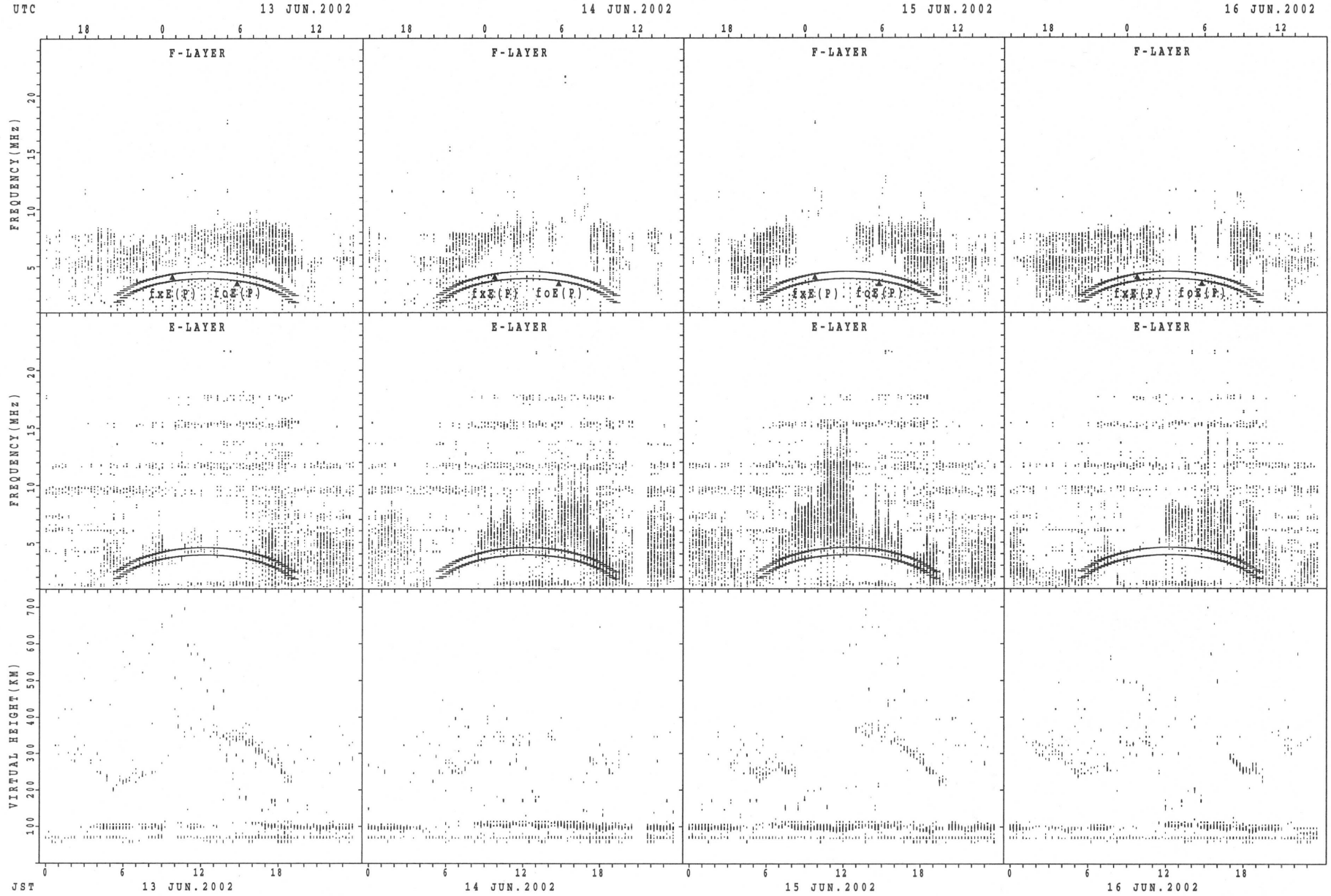
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



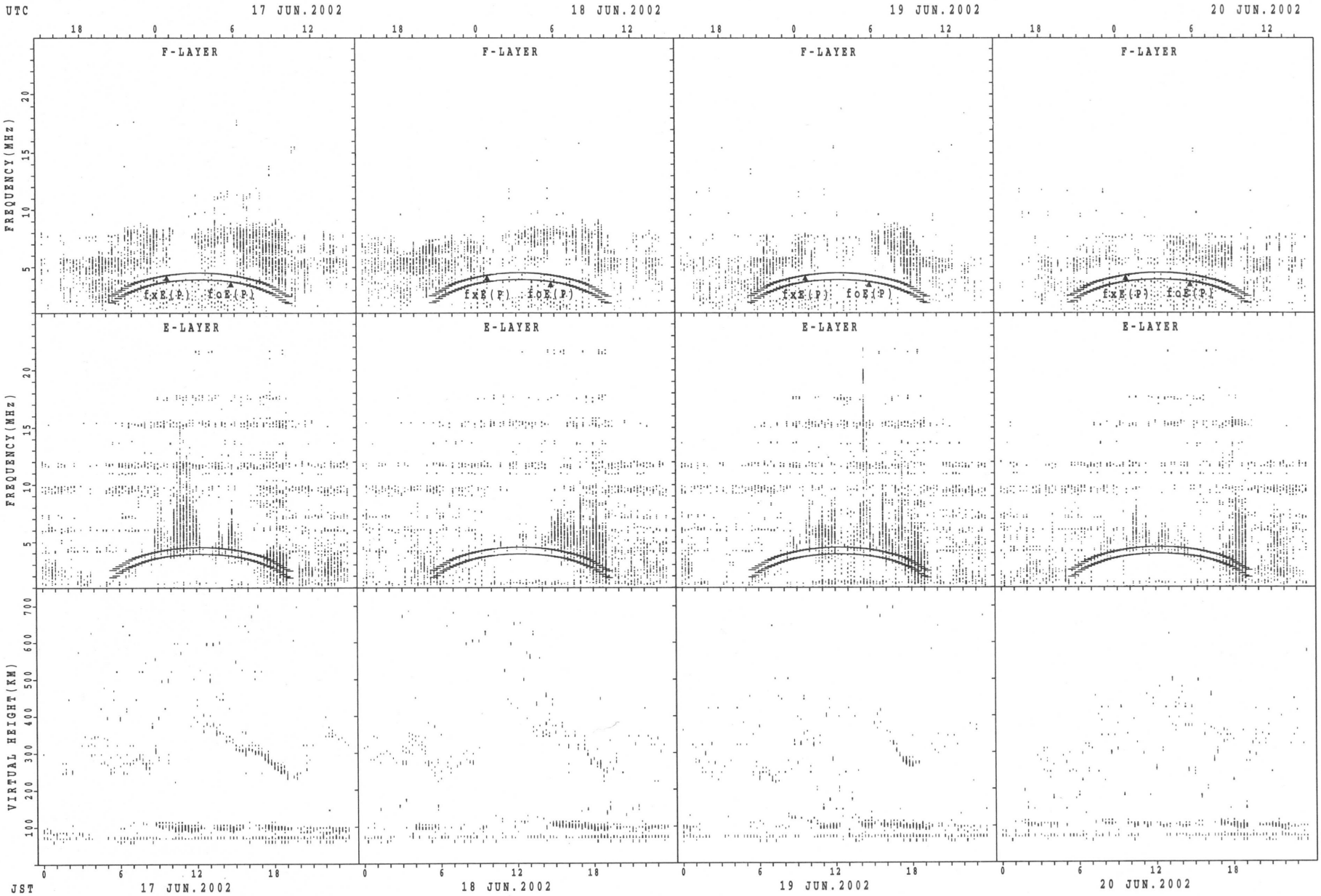
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



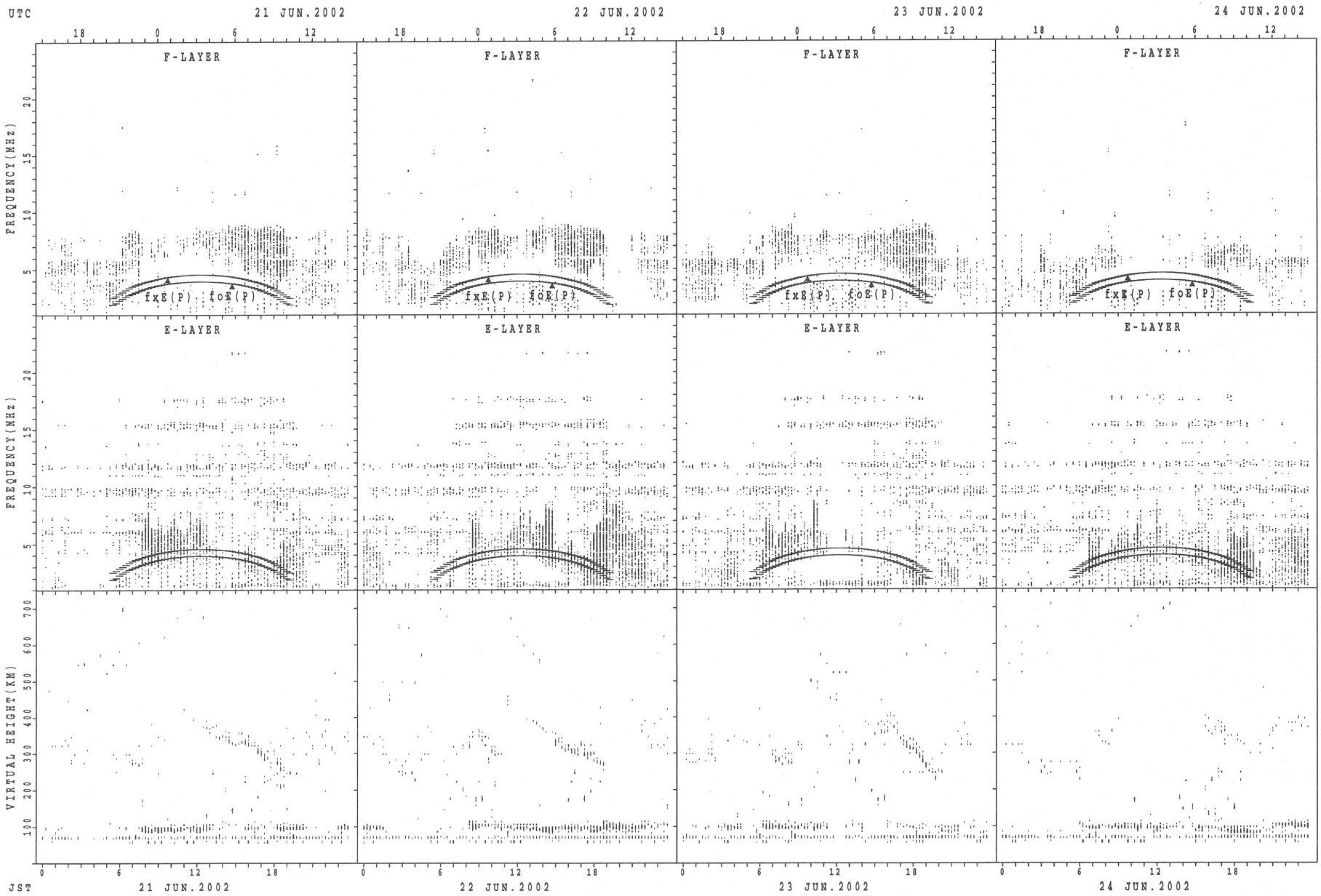
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



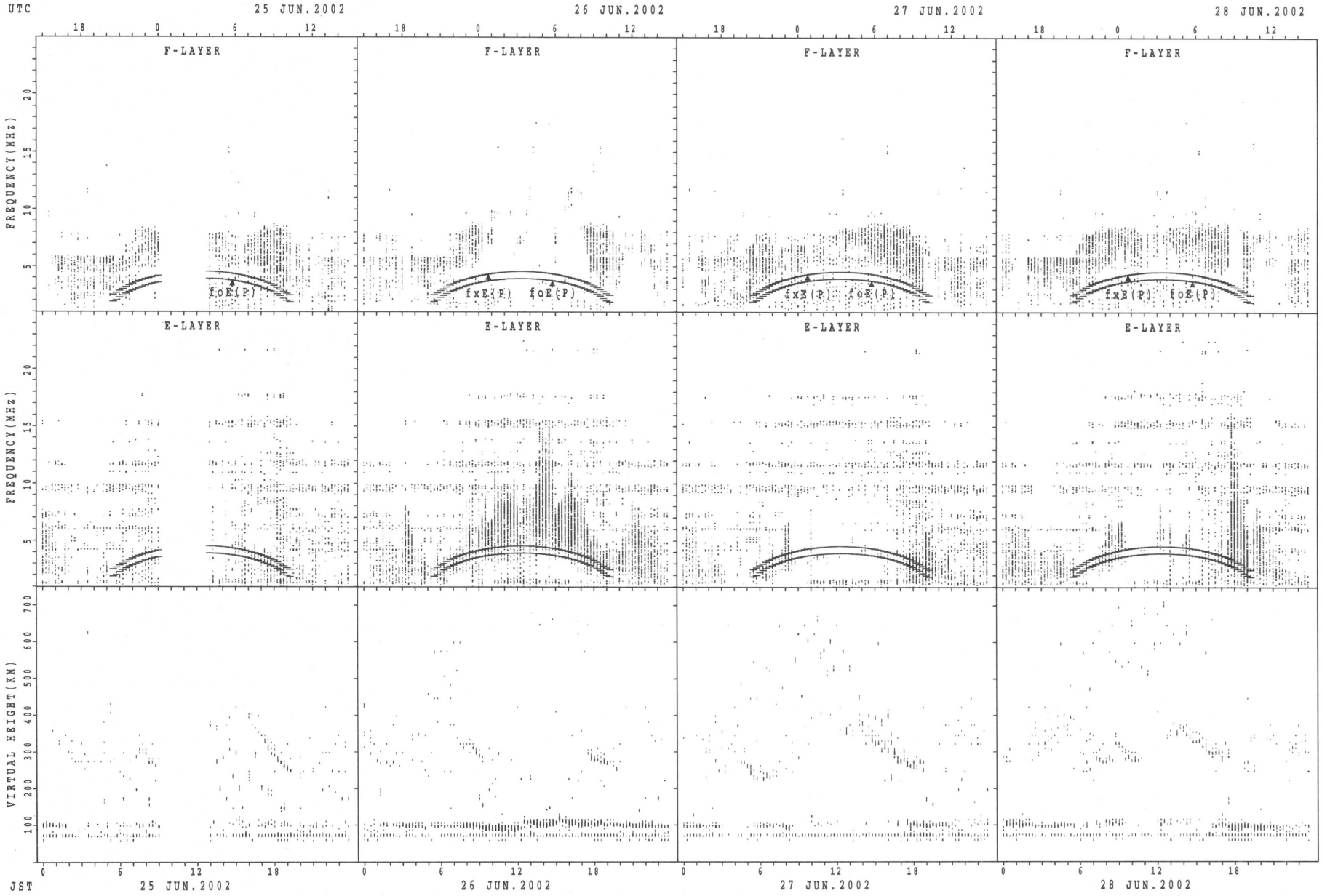
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



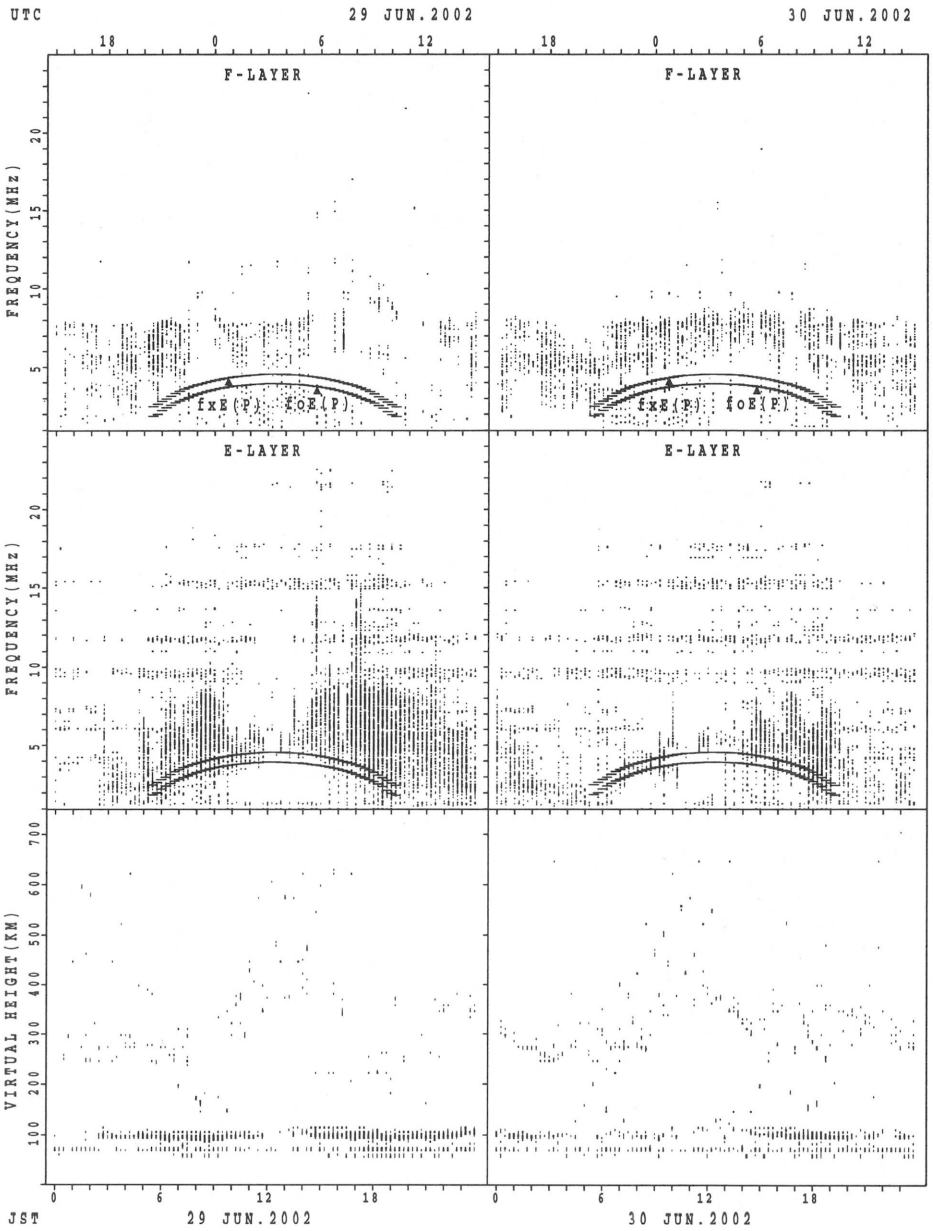
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



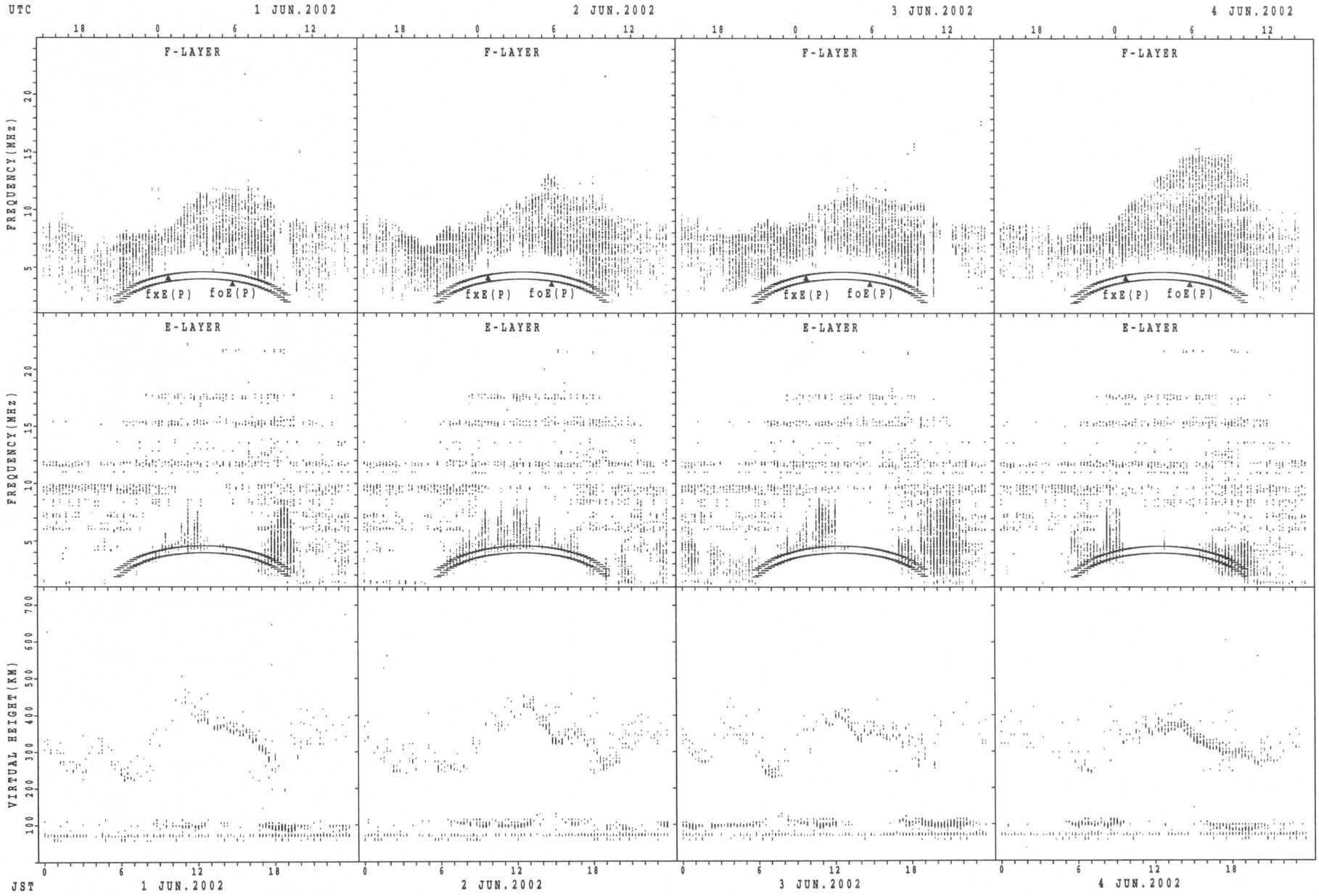
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



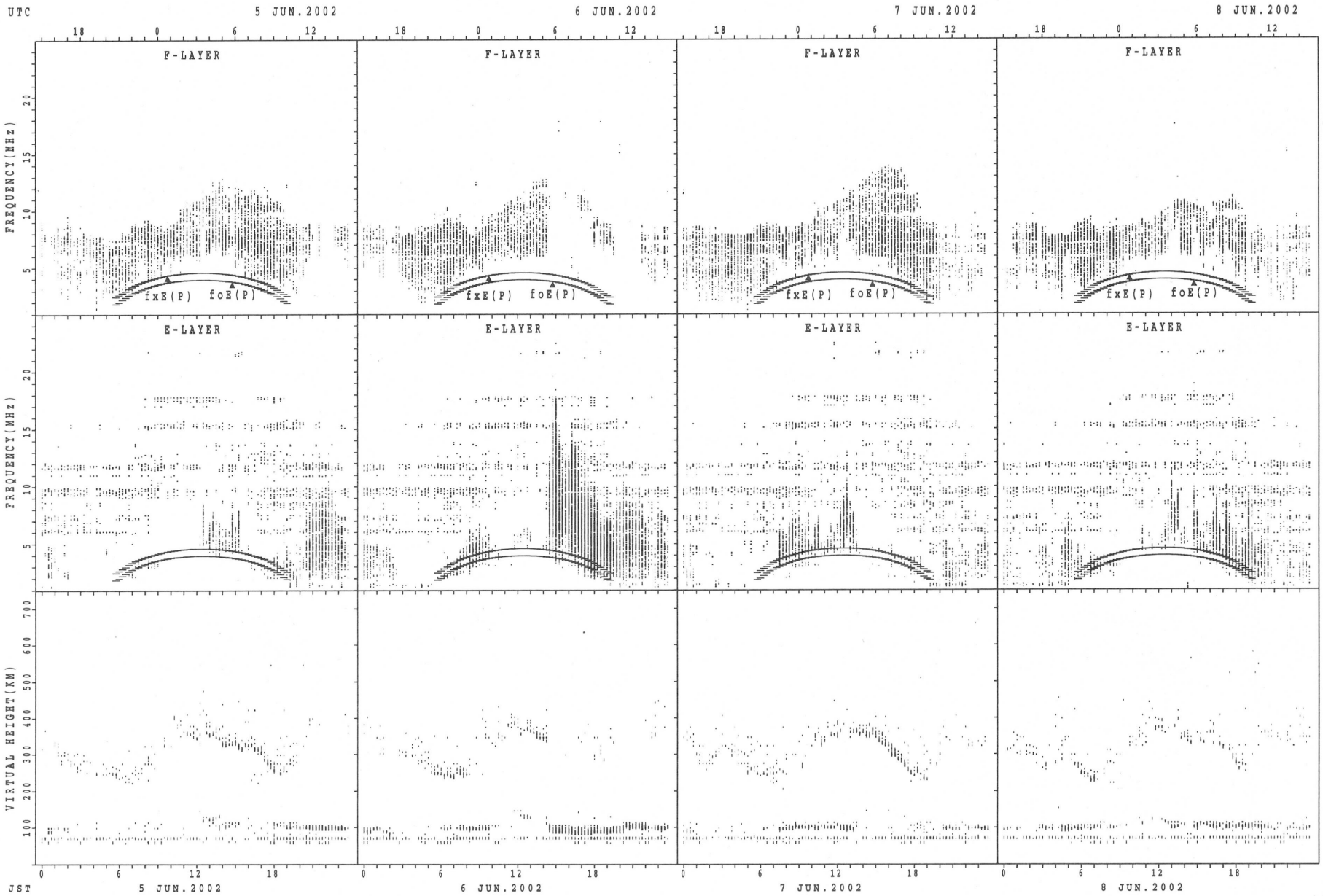
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



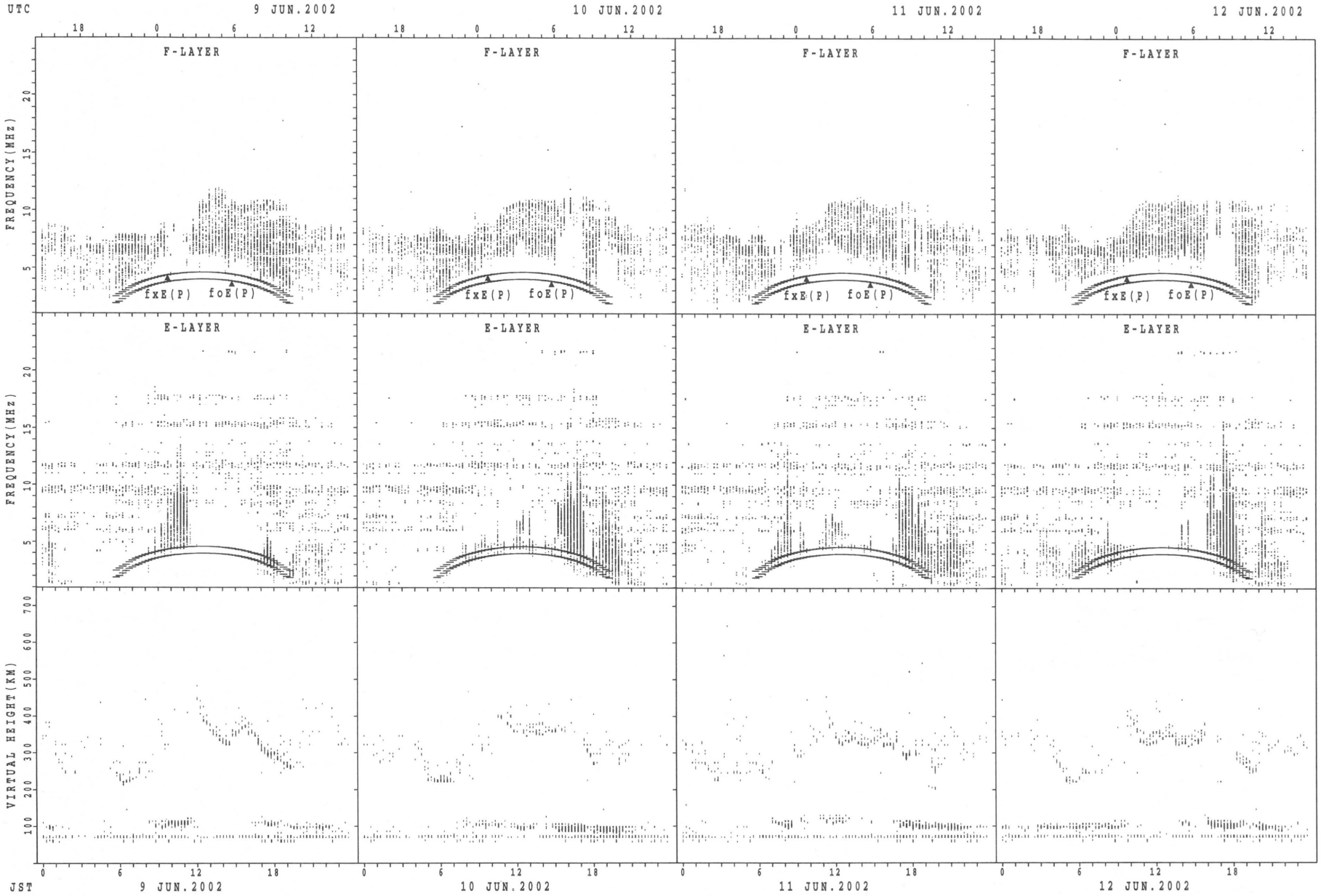
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



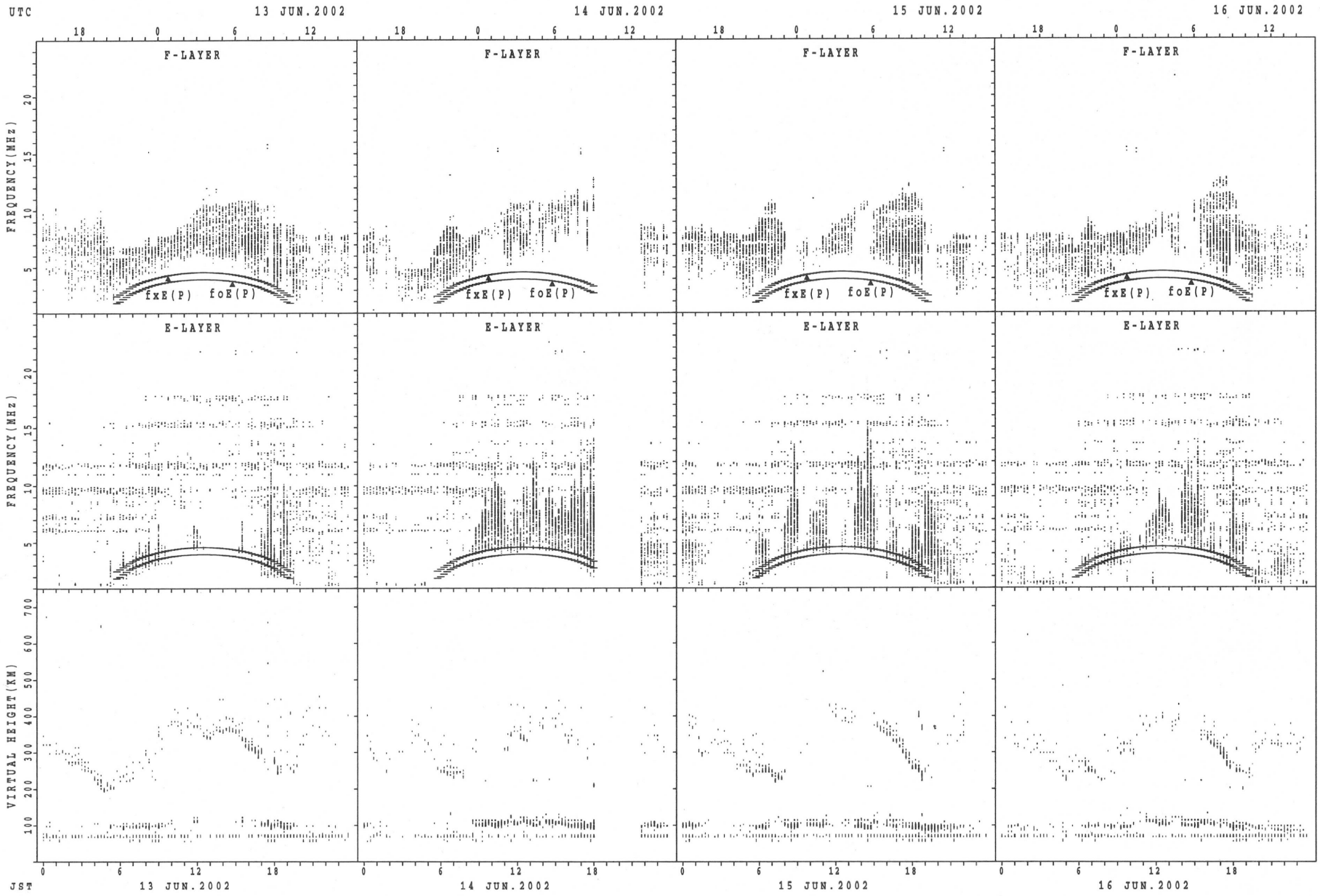
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



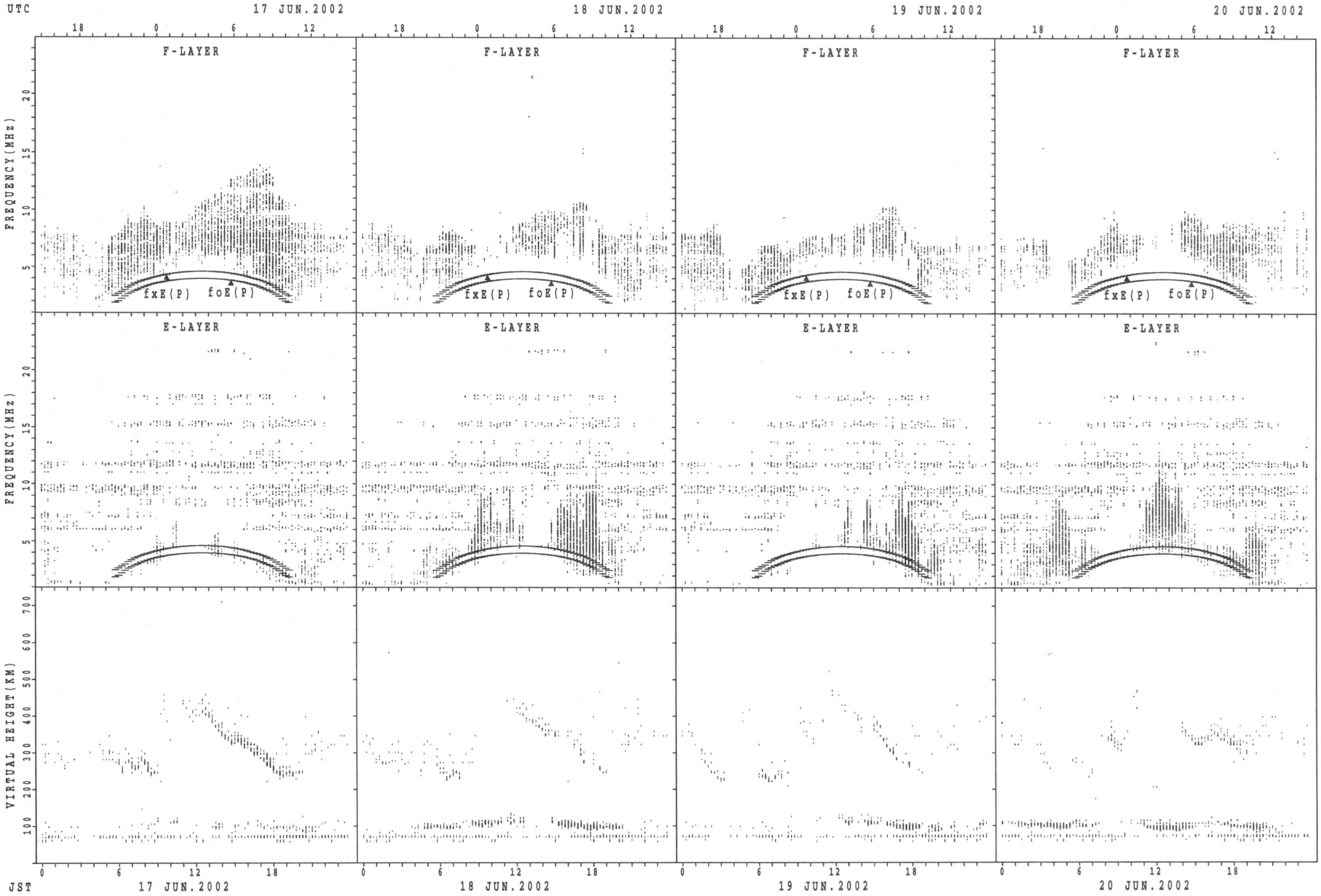
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



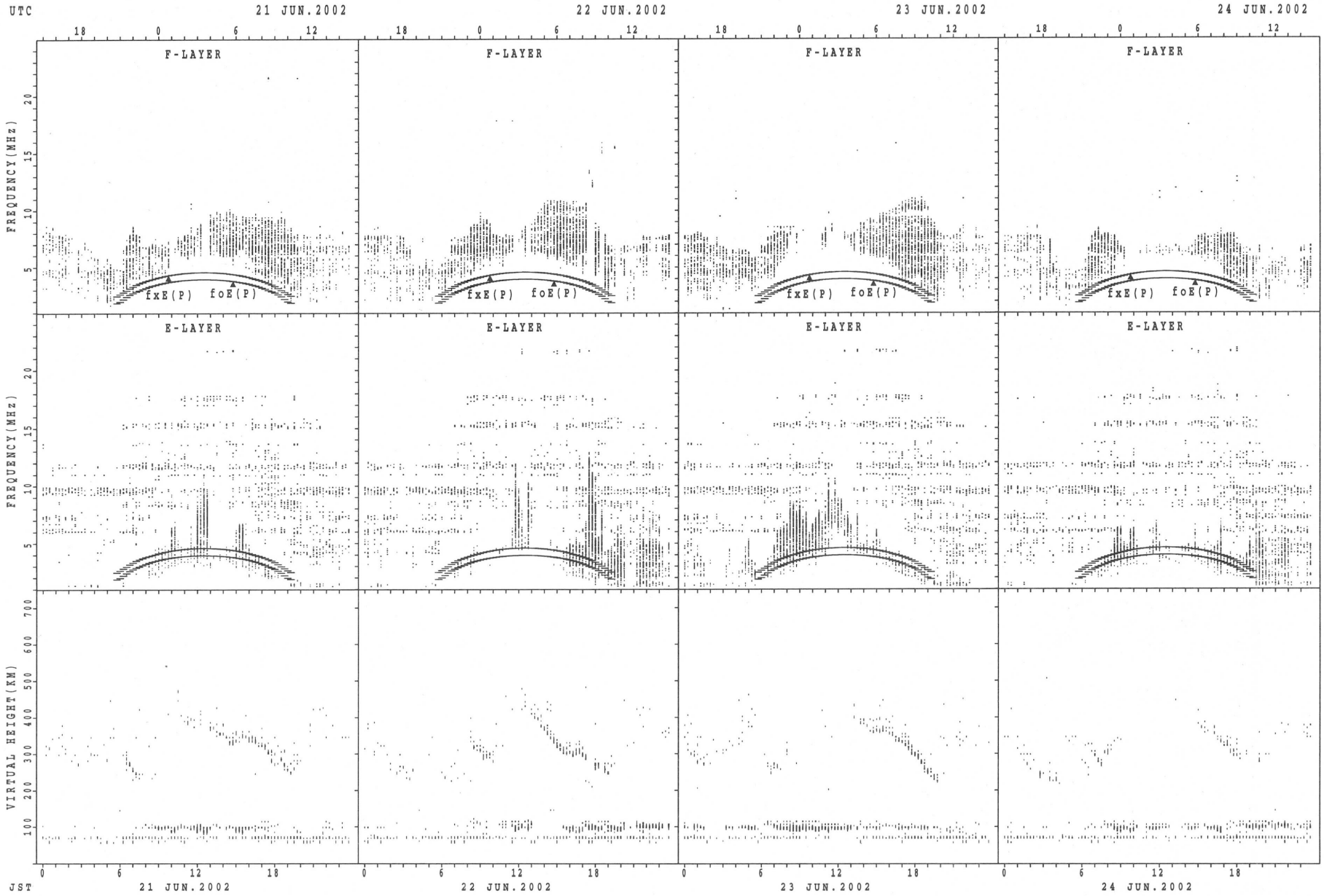
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



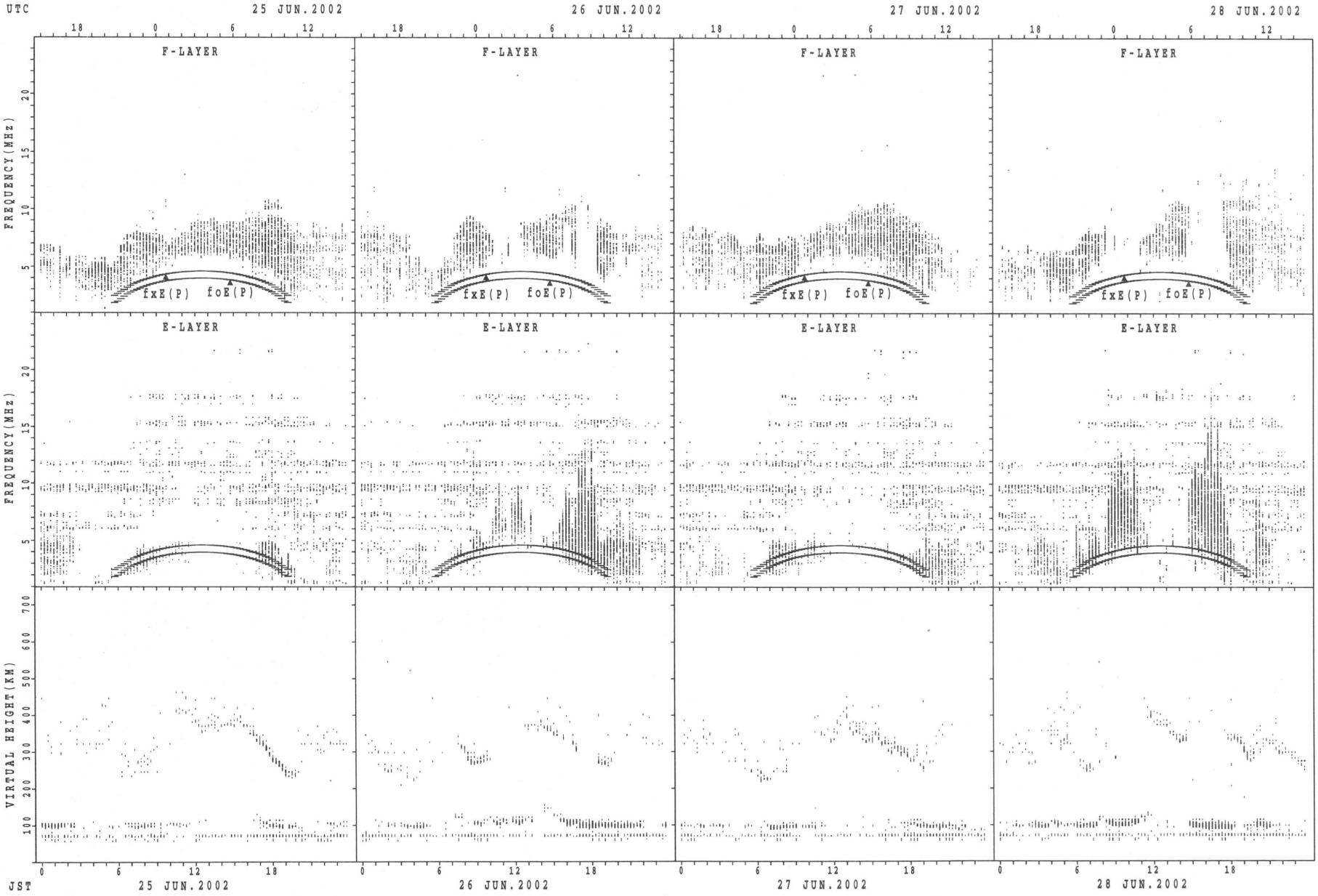
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



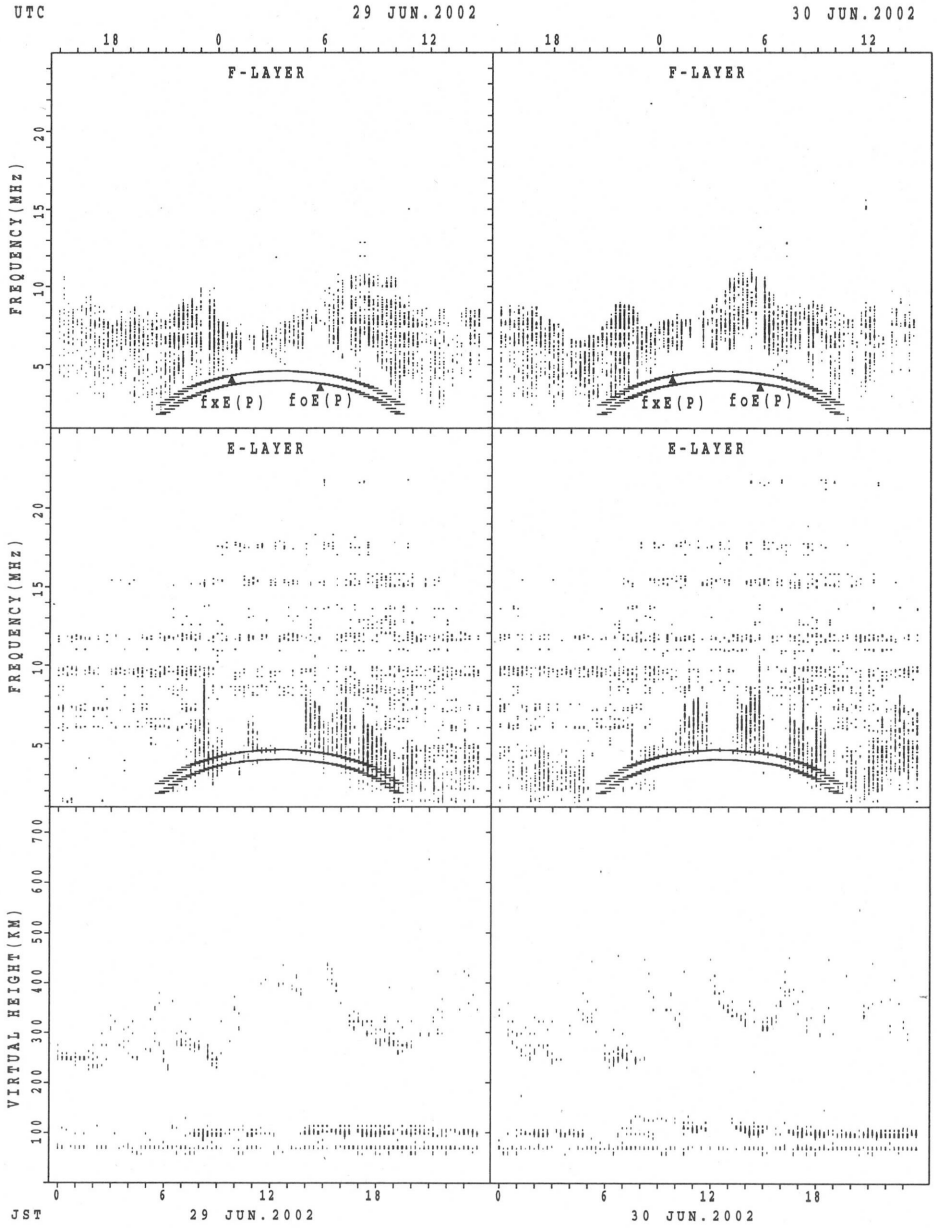
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

JUN. 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	15	9	6	2	13	20	21	18									15	19	16	17	22	16	13	17
MED	328	330	332	337	330	300	312	290									324	294	289	286	310	318	330	326
U Q	346	338	340	348	340	323	331	302									336	320	314	307	328	330	336	352
L Q	312	317	322	326	310	284	286	270									306	230	262	263	290	307	316	317

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	28	22	22	15	27	26	29	30	28	26	24	22	22	21	23	27	28	29	29	29	27	27	29	27
MED	99	85	89	93	107	113	95	100	104	103	103	105	101	101	99	103	96	101	89	101	95	95	95	101
U Q	143	97	101	101	123	137	107	107	122	107	108	107	107	111	113	117	122	128	107	131	119	107	122	131
L Q	86	83	83	89	83	89	77	91	92	89	98	97	91	94	83	95	92	81	77	89	83	89	83	77

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	19	18	15	11	10	20	26	25									20	22	28	26	16	16	17	16
MED	336	332	332	326	344	287	266	266									302	292	266	275	306	349	342	342
U Q	354	340	336	342	362	339	286	295									321	310	306	288	335	390	351	351
L Q	326	322	320	316	328	265	248	258									244	272	216	238	292	324	273	331

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	13	20	19	16	15	8	1	3	8	5	21	13	17	18	18	12	14	7	3	9	8	5	8	8
MED	83	90	97	99	77	92	155	95	98	95	105	105	101	105	105	101	101	101	95	95	95	101	98	83
U Q	101	99	101	103	93	110	77	127	134	109	116	113	110	113	113	108	107	113	107	101	101	125	146	89
L Q	77	84	83	94	71	89	77	83	89	89	98	97	89	95	97	95	95	89	95	89	92	77	86	80

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	5	8	5	7	8	14	23	21	10								16	18	24	22	6	4	6	7
MED	336	332	326	320	334	321	286	280	278								328	301	286	279	306	328	339	358
U Q	352	386	348	348	339	346	316	312	296								333	334	310	306	322	368	348	388
L Q	270	317	310	282	322	308	250	251	268								316	288	258	248	298	319	246	344

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	18	15	16	16	14	12	7	11	12	14	13	15	19	18	19	17	18	22	23	21	20	22	20	18
MED	99	93	99	100	96	100	101	101	101	103	101	101	101	106	107	105	105	102	95	95	97	91	95	94
U Q	103	97	102	103	101	104	113	109	106	107	108	107	115	107	117	108	115	109	105	101	103	101	103	101
L Q	91	87	93	97	91	97	83	83	95	99	93	97	99	99	97	96	101	99	89	90	91	83	89	89

MONTHLY MEDIANS OF h'F AND h'Es

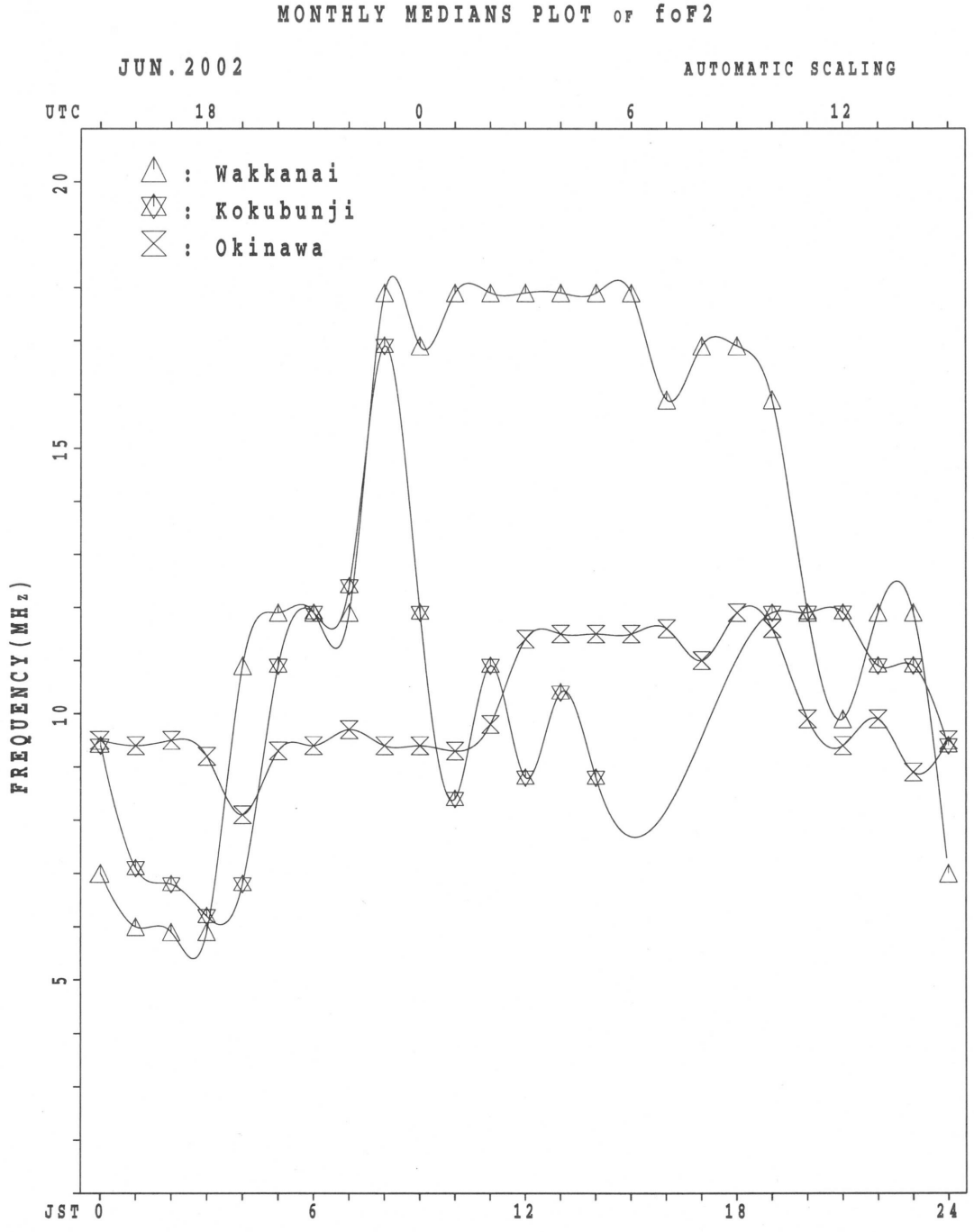
JUN.2002 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	6	14	11	12	13	9	19	26	24	19							19	20	25	20	19	7	8	4
MED	336	323	310	303	330	298	296	260	294	314							334	307	278	285	320	380	316	349
U Q	364	336	332	331	346	347	314	276	311	344							342	335	304	322	336	400	325	368
L Q	248	300	296	284	304	269	260	250	277	274							320	296	251	272	288	332	234	335

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	2	1	5	5	9	6	11	13	17	14	13	14	13	10	16	18	17	23	17	12	10	11	9
MED	101	91	95	101	101	99	101	97	101	101	105	107	99	109	106	106	105	95	105	95	93	91	99	91
U Q	143	105	47	104	104	102	101	105	107	108	111	114	109	125	109	116	109	100	113	102	105	101	103	95
L Q	97	77	47	86	92	87	89	71	101	100	99	101	97	100	103	100	97	93	95	93	89	83	89	83


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

IONOSPHERIC DATA STATION Kokubunji

JUN. 2002 foI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 98	S 95	X 94	X 81	X 79																X 92	X 95	X 96	O X 96
2	X 101	X 100	X 95	O X 86	X 85															X 98	X 93	X 93	X 94	O X 94
3	X 95	X 91	X 89	X 82	X 85															X 99	X 96	X 93	X 93	X 95
4	X 89	X 92	X 85	X 80	X 81															X 94	A	A	X 87	X 81
5	X 91	X 92	X 99	X 96	X 96															X 96	X 93	O X 95	O X 93	X 94
6	X 95	X 95	X 88	X 83	X 85															X 85	X 87	X 91	X 95	X 94
7	O X 95	X 94	X 85	X 82	X 81															X 99	X 87	X 89	X 92	X 99
8	X 88	X 90	X 89	X 82	X 81															X 89	X 86	X 89	X 90	X 92
9	X 91	X 92	X 83	X 80	X 78															X 100	X 98	X 94	X 94	X 96
10	X 95	O X 91	X 90	X 83	X 84															X 86	X 89	O X 86	X 87	X 91
11	X 92	X 90	X 86	X 89	X 80															X 96	X 97	X 97	X 89	X 94
12	X 92	X 88	X 86	X 80	X 81															X 91	X 89	X 89	X 91	X 91
13	X 89	X 88	X 88	X 87	X 86															X 83	X 73	X 72	X 80	X 80
14	X 77	X 79	X 67	X 69	X 68															X 89	X 88	X 89		
15		A	X 74	X 72	X 69															X 96	X 87	X 86	O X 93	X 90
16	X 80	X 77	X 75	X 75	X 73			87												X 92	X 78	X 82	X 79	X 76
17	O X 78	X 76	O X 76	X 74	X 70															X 84	X 82	X 77	X 78	A
18	X 84	X 79	X 74	X 72	X 73															X 86	X 74	X 75	X 76	X 76
19	X 72	X 79	O X 80	X 64	X 62															X 71	X 79	X 78	X 77	X 78
20	X 80	X 80	X 74	X 74	X 69															X 73	X 78	X 79	X 82	X 80
21	X 80	X 77	X 76	X 73																X 86	X 87	X 92	X 88	X 94
22	X 88	X 88	X 85	X 80	X 72															X 94	X 87	X 84	X 84	X 84
23	X 82	X 75	X 74	X 74	X 71															X 88	X 84	X 76	X 75	X 79
24	X 76	X 78	X 71	S 62	X 67															X 78	X 78	X 80	S 67	X 78
25	X 72	O X 69	X 65	X 64	X 64															X 82	X 80	X 79	X 81	X 78
26	X 80	X 82	X 74	X 72	X 74															X 92	X 89	X 85	X 84	S 60
27	X 83	X 81	X 78	X 73	X 68															X 72	A	X 80	X 79	88
28	X 93	X 78	O X 65	X 64	X 63															X 86	X 90	X 92	X 93	X 96
29	X 92	X 84	O X 82	X 74	X 72															X 98	X 98	X 96	O X 96	O X 92
30	X 90	O X 90	S 77	X 82	X 78															X 94	X 90	X 90	O X 93	X 89
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	29			1												29	28	29	29	28
MED	X 89	X 88	X 81	X 78	X 74			87												X 89	X 87	X 89	X 88	X 90
U Q	X 92	X 92	X 88	X 82	X 81															X 96	X 91	X 92	X 93	X 94
L Q	X 80	X 78	X 74	X 72	X 69															X 84	X 81	X 80	X 80	X 80

JUN. 2002 foI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	S 92	S	S 88	74	73	75	78	79	81	88	93	97	99	104	105	104	96	98	97	89	86	89	90	S 90
2	S 95	S 94	S 88	S 80	78	82	92	86	88	91	A	101	104	114	113	108	109	109	101	92	S 87	87	88	S 88
3	S 88	84	82	76	79	83	98	105	100	100	104	101	106	102	99	97	94	90	94	92	90	S 87	86	89
4	S 83	S 86	S 78	74	75	79	86	88	90	S 94	96	102	110	114	126	124	118	106	95	87	A	A	81	75
5	S 85	S 86	S 93	90	90	96	106	96	99	102	97	101	103	110	114	114	113	107	99	90	S 87	89	S 87	88
6	89	S 89	82	77	79	87	96	107	91	88	89	100	103	106	108	104	102	93	88	79	81	85	89	88
7	S 89	88	S 79	S 76	75	81	91	95	85	84	84	94	102	101	104	104	101	107	106	93	81	83	S 86	S 93
8	82	84	83	76	75	83	92	89	A	72	78	84	86	90	88	91	93	91	86	83	80	S 82	84	S 86
9	85	86	S 76	S 74	72	76	91	95	76	A	78	82	87	91	A	80	86	91	93	94	92	88	88	S 90
10	89	S 85	84	S 77	78	86	97	92	89	92	88	87	85	92	90	89	85	84	81	80	83	80	81	85
11	86	84	80	83	74	82	75	77	72	74	87	C	94	94	96	94	89	80	82	90	91	90	83	88
12	86	S 81	80	74	75	81	81	78	69	S 68	A	80	88	95	85	89	94	95	92	85	82	82	85	85
13	83	82	82	81	80	96	85	77	A	A	74	79	87	91	98	96	89	94	92	S 77	67	66	S 74	S 73
14	71	S 73	S 60	S 63	62	70	C	83	83	88	95	104	103	96	A	95	S 95	88	87	83	82	82		
15		A	68	66	63	72	91	95	95	81	84	89	90	98	97	94	92	92	87	90	S 81	80	S 87	84
16	74	S 70	S 69	S 68	67	78	78	F	82	84	86	92	85	S 86	90	96	96	101	99	86	S 72	76	S 73	70
17	S 72	S 70	U S 70	S 68	64	85	78	91	97	A	A	A	A	95	94	89	A	80	79	78	76	70	72	A
18	S 78	73	S 68	S 66	67	83	70	A	67	S 67	66	68	S 73	73	70	67	68	72	80	80	68	69	70	70
19	S 66	S 73	74	S 58	55	62	V 78	Z 83	A	65	A	A	68	A	73	68	70	80	77	65	S 73	72	71	S 72
20	74	74	68	S 67	63	S 65	S 66	64	S 62	63	62	S 61	S 64	A	66	65	63	65	68	67	72	S 72	76	74
21	74	71	70	67	S 60	64	S 86	100	92	82	82	89	95	96	97	97	94	92	90	80	81	86	S 82	88
22	V 82	82	79	74	66	64	79	81	73	78	80	86	81	82	84	85	81	85	86	88	81	78	78	S 78
23	76	69	68	68	65	65	76	V 89	90	77	74	72	U S 70	70	68	68	70	74	76	82	78	S 70	69	73
24	70	S 73	S 65	S	61	69	78	75	73	68	61	60	60	62	58	63	61	61	65	72	72	74	S	72
25	66	S 63	59	S 58	58	65	75	80	86	74	66	64	S 63	A	68	66	64	69	73	76	S 73	S 73	75	S 72
26	74	76	68	S 66	68	66	62	A	84	90	88	87	84	72	71	72	77	81	85	86	83	79	S 78	S
27	77	75	72	S 67	62	69	R 89	92	82	76	78	82	86	90	86	86	84	84	77	66	A	74	73	F
28	87	72	59	58	57	60	76	90	98	101	101	96	A	A	A	A	115	108	87	80	84	86	87	90
29	86	S 77	S 76	68	66	68	77	80	82	86	87	81	82	A	88	89	86	80	86	92	92	90	S 90	S 86
30	84	84	S	76	72	68	70	82	87	85	84	S 90	90	87	93	88	77	81	86	88	84	84	87	83
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	29	29	30	30	29	27	27	27	26	27	28	25	27	29	29	30	30	30	28	29	28	26
MED	83	79	76	74	68	76	79	88	85	84	84	87	87	94	90	89	89	89	86	84	81	82	82	85
U Q	86	S 84	82	76	75	83	91	95	91	90	89	97	100	102	99	97	96	95	93	90	85	86	87	S 88
L Q	74	73	68	S 66	63	66	76	80	76	74	78	80	82	86	73	76	77	80	80	79	74	74	74	73

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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 644	L 592	L 560		568	564	544	L 548	A	A	A					
2							L 640	L	A	L 640	A	A	A	A	L 588	L 580	L 560	L						
3							L	L		L	A	L 636	A	L 620	536	L 568	L	A	A					
4							A	A	A	A	A	588	A	L 584	L	A		A						
5								A	L	L 552	596	L	A	A	L	A	L	A						
6								L	A	L	L 656	L 548	556	L 604	552	L 516	L 508	L	L					
7							L	L	A	L 556	L 588	560	540	L 580	540	L 544	A	A	A					
8							A	A	A	L 620	U L 600	520	U L 576	U L 552	A	A	L 528	L						
9							L	L	A	A	568	564	568	556	A	L 556	A	L	L					
10								L		L 552	L 576	L 568	L 588	A	U L 552	A	L	L						
11						L		L	L	L 576	A	C	L 548	528	L	L		L						
12						A	A	L	A	A	A	A	556	L 540	L	512	A	L	L						
13							L	L	A	A	L 556	556	536	L 532	A	A	A	L	L					
14							C	A	L	A	L	A	A	A	A	A	A	L	A					
15							L	L	A	A	L 672	A	540	A	A	L 504	U L 508	A	L					
16							L		L 528	532	U L 564	L 548	U L 580	A	L 540	A	A	L	L					
17							L	L	L	A	A	A	A	A	516	520	A	A	A					
18							A	A	L 480	A	L 512	U L 532	S 544	U L 552	L 528	524	L 520	A	L					
19						L		A	A	508	A	A	A	A	A	508	A	448						
20						L	L 428	456	480	504	L 516	520	U L 520	A	A	A	464	L 456						
21								L	L	L 684	L 592	548	548	L 544	A	A	A	A						
22							L 528	L 488	A	A	A	A	552	540	532	504	A	L 464	A					
23							A	L 508	484	516	520	512	E	B U L 540	L 528	516	500	L 464	L					
24						L	L	A	A	A	A	516	516	524	508	484	L 496	A	L 416					
25								L	L	508	A	A	A	A	500	492	476	L 456	L					
26								A	516	L 516	L 532	A	532	L 544	536	A	492	A	L					
27							L	L	L	A	U L 532	536	536	516	L 532	504	L 496	L 452	L					
28							A	A	L	L 524	L 528	A	A	A	A	A	A	A						
29						L	L	L	L	492	532	U L 536	A	A	A	A	A	A	A					
30							L	L 500	L 548	A	A	A	A	A	540	A	A	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	4	6	16	18	17	18	17	16	16	11	6	1					
MED							L 478	L 494	500	L 542	L 566	548	548	L 544	536	516	L 500	L 456	L 416					
U Q								L 504	L 528	L 598	L 592	562	L 568	L 572	L 542	L 546	L 520	L 464						
L Q								472	480	512	L 532	526	536	536	528	504	492	452						

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 2002 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B	U R 316	A	A	R	R	R	A	B	A	U R 360	A	288	A	B				
2						B	296	R	B	B	B	A	B	A	A	U R 368	A	A	B					
3						R	296	U R 360	A	B	A	A	A	A	U R 392	U R 364	R	292	U A 216					
4						212	280	332	A	A	A	A	A	B	B	A	A	A	A					
5						A	A	A	A	A	U A 384	U R 400	A	A	R	U R 364	A	292	U A 212					
6						A	A	R	A	A	A	A	A	A	A	U A 376	340	A	220					
7						188	A	A	A	A	A	A	A	A	A	A	336	A	204					
8						A	A	A	A	A	A	A	A	U A 404	U A 396	U A 376	332	U A 272	A					
9						A	A	U R 320	A	R	B	B	B	R	U A 384	A	U A 336	A	A					
10						B	A	A	A	A	A	A	A	A	A	A	U A 340	288	U A 212					
11						196	268	R	U A 316	A	A	C	B	392	A	U R 360	A	A	A					
12						A	264	320	A	A	A	A	A	R	A	A	336	U A 288	A					
13						A	A	A	A	A	A	A	A	U R 384	A	U A 356	336	A	A					
14						U R 200	C	A	A	A	A	A	A	A	A	U A 364	A	A	A					
15						U A 204	U A 276	A	A	A	A	A	A	A	A	U R 356	A	292	U A 216					
16						A	A	A	A	A	A	U R 392	A	A	A	A	A	A	232					
17						U R 216	268	A	A	A	A	A	A	A	A	A	U A 344	288	A					
18						A	A	A	A	U A 380	A	A	B	B	B	A	A	288	A					
19						U R 204	A	A	A	A	A	A	A	U A 396	A	A	A	U A 284	A					
20						U R 196	A	U A 308	A	A	A	A	A	A	A	A	A	U A 288	212					
21					B	U R 196	A	A	A	R	U R 388	R	R	R	R	U R 364	U A 320	A	A					
22						B	U A 248	A	A	A	A	A	A	A	A	R	328	288	U A 208					
23						A	A	A	A	A	R	R	B	B	U R 388	U A 372	A	U A 288	236					
24						A	U A 256	A	A	A	A	A	A	R	U R 372	U A 360	A	288	A					
25						R	U R 280	R	352	U R 388	A	A	A	U A 404	A	R	336	292	224					
26						A	A	A	A	U A 372	R	A	A	A	388	A	A	A	A					
27						200	A	A	A	A	A	A	A	A	R	368	R	A	U A 212					
28						204	280	R	A	R	R	A	A	A	A	A	A	A	A					
29						U R 204	U A 276	A	R	A	R	U A 404	A	A	A	356	A	A	A					
30						U A 200	R	U R 324	356	U R 380	A	A	A	R	A	U A 372	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						13	13	6	3	4	2	3		5	6	16	11	15	12					
MED						U 200	276	U 322	352	U 380	U 386	U R 400		U A 396	U 388	U 364	336	288	214					
U Q						U R 204	288	332	356	U R 384		U A 404		U A 404	U 392	U A 370	U A 340	292	222					
L Q						196	266	320	U A 316	U A 376		U R 392		388	U 384	U 360	332	288	212					

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	JA 100	JA 56	EB 17	EB 15	EB 13	EB 24	34	46	50	50	G	45	42	EB 46	45	G 31	JA 49	JA 51	JA 59	JA 98	JA 99	JA 46	JA 86	JA 55
2	JA 55	JA 54	JA 54	EB 16	EB 15	EB 23	34	42	JA 59	JA 54	JA 128	JA 115	79	JA 72	JA 53	G 31	37	JA 43	JA 30	20	JA 35	JA 38	JA 50	JA 63
3	JA 22	JA 27	JA 28	JA 30	20	G 18	33	G	45	EB 42	JA 74	44	57	JA 50	G	G 29	G	JA 45	64	JA 75	JA 88	JA 35	AE B 15	27
4	JA 46	JA 38	JA 88	29	JA 22	35	JA 48	JA 75	JA 78	JA 84	JA 126	JA 50	JA 73	JA 57	JA 52	JA 56	JA 76	JA 90	JA 56	JA 45	JA 100	JA 129	JA 57	JA 56
5	JA 54	JA 60	JA 32	JA 40	JA 57	JA 46	JA 46	JA 74	JA 61	42	44	44	JA 74	60	50	65	JA 52	JA 56	JA 66	JA 88	JA 84	JA 50	32	JA 50
6	JA 40	JA 41	JA 40	JA 20	JA 27	JA 28	JA 43	42	JA 58	80	JA 47	44	JA 47	42	42	45	41	39	29	JA 38	JA 80	JA 50	JA 42	JA 44
7	JA 29	JA 33	JA 20	19	EB 14	23	JA 43	JA 46	JA 79	40	42	45	47	44	40	JA 55	JA 71	JA 86	77	JA 37	JA 31	JA 44	JA 64	JA 43
8	JA 32	JA 29	JA 46	JA 77	JA 47	JA 44	JA 76	JA 69	JA 125	JA 48	JA 91	56	82	55	95	JA 60	38	JA 54	51	17	JA 38	JA 32	JA 56	JA 52
9	JA 52	JA 36	JA 32	JA 32	JA 28	JA 29	33	45	JA 62	JA 118	45	50	46	G	JA 116	JA 63	JA 61	JA 54	JA 49	JA 24	JA 28	AE B 15	JA 78	35
10	JA 29	JA 28	JA 22	AE B 14	EB 20	EB 23	33	34	JA 43	47	JA 55	JA 46	JA 56	86	66	JA 54	40	JA 44	35	JA 22	JA 27	JA 24	JA 48	JA 40
11	JA 45	JA 42	JA 34	JA 20	JA 29	26	33	37	JA 46	49	JA 56	C	49	JA 55	JA 55	G	JA 56	JA 56	JA 46	JA 45	JA 19	AE B 19	JA 47	JA 42
12	JA 26	34	31	JA 46	JA 42	JA 46	JA 44	JA 44	JA 54	JA 72	JA 106	62	44	JA 55	JA 131	39	JA 83	34	27	JA 24	22	EB 20	EB 16	EB 14
13	EB 14	EB 22	22	JA 28	JA 43	29	JA 34	JA 54	JA 104	JA 85	44	42	JA 47	47	80	JA 64	JA 98	JA 144	JA 62	39	JA 76	48	JA 47	49
14	JA 47	JA 43	JA 56	JA 54	JA 34	G 18	CJ	A 46	47	JA 72	JA 75	JA 82	JA 80	JA 62	JA 112	JA 73	JA 90	JA 46	JA 42	JA 28	JA 59	JA 82		
15		JA 79	JA 32	JA 36	JA 23	24	32	JA 46	JA 54	JA 65	JA 60	JA 63	JA 46	JA 56	JA 74	44	46	JA 48	50	JA 80	JA 85	JA 71	JA 53	JA 33
16	JA 20	JA 23	JA 46	JA 45	JA 34	JA 34	JA 44	JA 41	46	46	JA 42	45	58	JA 60	JA 51	JA 63	54	JA 50	G 20	EB 17	JA 22	JA 54	JA 54	JA 74
17	JA 52	JA 76	JA 49	JA 24	JA 21	G	36	38	39	JA 107	JA 142	JA 120	JA 132	JA 79	JA 45	43	JA 106	JA 80	JA 66	JA 54	JA 72	JA 36	JA 67	JA 74
18	JA 84	JA 46	JA 43	JA 47	JA 30	35	JA 53	JA 124	46	JA 60	45	50	EB 44	JA 55	AE B 40	41	43	JA 52	41	24	JA 28	JA 53	JA 44	JA 55
19	JA 55	JA 43	JA 25	28	28	G	34	67	JA 86	JA 43	JA 100	75	JA 88	JA 114	JA 70	50	55	JA 48	56	19	EB 14	JA 22	JA 42	JA 28
20	JA 29	26	EB 23	EB 20	EB 16	22	30	35	41	41	43	45	47	JA 64	JA 50	JA 58	40	JA 40	JA 56	JA 42	JA 64	JA 98	JA 28	34
21	JA 40	26	JA 25	JA 23	AE B 24	25	JA 44	JA 52	JA 40	G 33	G 35	G 35	G 36	G	52	JA 57	JA 53	JA 73	JA 62	24	JA 35	JA 22	21	JA 54
22	JA 44	JA 29	JA 20	JA 25	JA 24	25	30	JA 70	JA 74	JA 53	JA 65	81	43	42	42	G 33	48	JA 45	JA 53	JA 105	JA 144	JA 52	JA 54	41
23	JA 54	JA 40	38	JA 30	JA 20	JA 40	JA 46	39	JA 42	JA 46	G 37	G 38	EB 57	50	G	42	44	33	GJ 22	JA 28	JA 19	JA 27	JA 40	46
24	JA 42	32	JA 24	25	EB 14	BJ A 35	31	JA 69	JA 64	JA 55	JA 54	JA 49	41	G	G 31	40	43	JA 46	35	JA 29	JA 54	JA 77	JA 53	JA 48
25	JA 54	35	JA 20	AE B 21	23	G	G 26	G 31	40	G 32	JA 55	60	JA 56	JA 77	JA 56	G 29	40	36	31	22	JA 18	19	22	JA 32
26	JA 45	JA 54	JA 50	JA 89	JA 80	JA 55	JA 44	JA 76	JA 45	47	49	JA 56	JA 52	JA 51	47	JA 64	39	JA 57	29	JA 30	JA 56	JA 24	JA 50	JA 34
27	JA 31	JA 20	AE B 15	24	EB 20	G	JA 36	JA 44	JA 96	JA 76	JA 49	JA 43	JA 46	48	G 35	G 28	G 29	35	29	JA 101	JA 104	JA 49	JA 42	JA 60
28	JA 55	21	28	EB 18	BJ A 38	JA 40	JA 58	JA 53	JA 46	45	47	80	JA 138	JA 94	JA 126	JA 291	JA 122	JA 116	JA 58	JA 64	JA 27	JA 20	JA 30	JA 31
29	EB 17	JA 46	30	JA 22	JA 44	27	JA 62	38	G 33	45	G 38	51	JA 78	JA 112	JA 76	JA 69	JA 130	JA 90	JA 89	JA 51	JA 38	JA 143	JA 98	JA 32
30	JA 25	JA 22	JA 30	25	EB 13	23	G	40	46	JA 62	JA 55	JA 60	54	54	44	JA 64	JA 56	JA 62	JA 48	JA 85	JA 99	JA 73	JA 29	52
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	29
MED	JA 44	JA 36	JA 30	JA 25	JA 24	26	JA 36	JA 46	JA 48	JA 50	JA 52	50	52	JA 55	JA 52	52	50	JA 50	JA 50	JA 38	JA 46	JA 45	JA 47	JA 44
U Q	JA 54	JA 46	JA 43	JA 36	JA 34	JA 35	JA 45	JA 67	JA 64	JA 72	JA 74	JA 62	JA 74	JA 64	JA 74	JA 63	JA 71	JA 62	JA 59	JA 64	JA 84	JA 54	JA 55	JA 54
L Q	JA 29	27	23	EB 20	EB 20	G 23	33	39	45	45	44	44	46	47	42	G 39	40	44	31	24	JA 27	24	31	JA 34

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	45	E B 16	E B 17	E B 15	E B 13	E B 24	U Y 34	40	47	47	G	44	42	E B 46	43	G 31	47	45	45	42	32	29	45	42
2	29	44	43	E B 16	E B 15	E B 23	32	40	57	51	A A 128	71	75	56	44	U Y 31	36	40	28	19	29	29	42	45
3	18	16	22	24	19	G 18	33	G	43	E B 42	60	44	54	48	G	G 29	G	43	60	44	60	22	E B 15	21
4	40	23	43	U Y 29	18	34	46	74	76	72	82	48	57	51	49	52	70	86	36	35	A A 100	A A 129	31	39
5	44	39	23	36	48	42	42	62	42	41	43	43	70	59	49	58	42	43	62	82	42	48	26	29
6	32	31	34	E B 16	22	24	40	41	55	47	46	43	45	U Y 42	41	42	39	36	27	33	30	22	E B 17	29
7	18	28	E B 15	19	E B 14	23	35	41	53	40	41	44	45	43	U Y 40	43	54	78	75	25	23	22	28	20
8	22	20	23	24	23	27	48	54	A A 125	42	55	47	52	48	64	53	36	37	44	17	20	22	43	21
9	32	30	29	28	22	24	31	42	56	A A 118	44	47	44	G	A A 116	40	53	38	36	19	22	E B 15	52	30
10	22	23	E B 15	E B 14	E B 20	E B 23	30	34	39	43	45	44	48	61	49	51	38	42	33	21	23	22	39	30
11	35	35	30	16	20	25	32	36	39	46	52	C	47	49	45	G	44	37	38	25	E B 15	E B 19	32	30
12	22	34	26	21	34	31	42	39	52	53	A A 106	58	44	46	46	38	78	34	24	21	E B 15	E B 20	E B 16	E B 14
13	E B 14	E B 22	21	27	32	23	23	42	A A 104	A A 85	43	42	45	45	75	62	80	38	30	34	59	U Y 48	37	44
14	22	32	44	43	30	G 18	C	43	46	50	48	75	51	54	A A 112	50	72	38	34	25	42	68		
15		A A 79	24	31	18	23	30	38	51	58	52	50	43	52	54	42	45	45	33	60	40	40	40	22
16	16	18	42	21	19	30	31	34	42	46	38	44	54	59	49	47	54	40	G 20	E B 17	20	44	46	40
17	30	42	45	21	16	G	35	36	38	A A 107	A A 142	A A 120	A A 132	75	43	42	A A 106	74	53	38	25	29	53	A A 74
18	42	29	22	42	22	35	41	A A 124	43	54	44	45	E B 44	48	E B 40	40	41	48	35	23	24	21	28	42
19	40	20	21	24	22	G	30	64	A A 86	43	A A 100	A A 75	58	A A 114	60	43	48	40	52	17	E B 14	E B 15	31	19
20	20	22	E B 23	E B 20	E B 16	21	29	35	38	U Y 41	43	45	45	A A 64	49	56	39	38	47	38	64	20	20	29
21	35	23	22	21	E B 24	25	39	41	36	G 33	G 35	G 35	G 36	G	51	54	51	69	48	21	31	20	16	40
22	41	22	E B 15	19	17	23	28	39	52	52	63	68	41	42	41	G 33	46	39	39	55	38	42	22	36
23	43	28	38	22	15	34	41	39	38	41	G 37	G 38	E B 57	50	G	41	43	33	G 21	19	E B 15	20	18	44
24	33	U Y 32	21	20	E B 14	30	29	57	50	50	54	42	41	G	G 31	39	41	45	33	24	40	41	41	42
25	36	33	E B 16	E B 21	20	G	G 25	G 31	37	G 30	53	56	53	A A 77	44	G 29	39	36	31	21	E B 16	18	18	20
26	36	22	34	23	40	41	30	A A 76	40	44	46	55	45	48	46	54	37	46	28	24	44	20	32	29
27	22	E B 15	E B 15	20	E B 20	G	31	24	46	58	46	43	44	45	G 35	G 28	G 29	32	27	42	A A 104	21	19	42
28	39	19	24	E B 18	23	38	57	50	42	42	46	75	A A 138	A A 94	A A 126	A A 291	73	104	55	47	21	17	21	21
29	E B 17	E B 16	U Y 30	18	34	G 18	G 22	35	G 33	42	G 37	48	55	A A 112	68	56	56	74	70	50	33	34	39	24
30	18	21	20	20	E B 13	22	G	39	44	54	50	58	53	52	43	62	48	57	44	32	46	58	23	33
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	29
MED	32	23	23	21	20	24	32	40	45	46	46	47	47	50	46	42	46	41	36	25	30	22	31	30
U Q	40	32	34	24	23	30	40	50	53	54	55	58	55	A A 59	54	54	54	48	48	42	42	41	40	42
L Q	21	20	E B 21	E B 19	E B 16	G 21	30	36	39	42	43	44	44	45	41	G 38	39	38	30	21	E B 21	20	20	22

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

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JUN. 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	16	16	17	15	13	24	20	20	26	24	35	35	24	46	28	22	23	16	15	14	16	14	14	14
2	14	16	15	16	15	23	18	23	38	40	42	41	44	35	34	20	22	20	17	14	14	15	15	16
3	15	14	14	16	14	15	20	23	20	42	34	30	31	35	26	24	27	18	15	15	14	15	15	16
4	14	15	18	14	12	18	19	22	20	24	32	31	28	40	36	22	20	16	13	15	16	14	14	15
5	15	15	16	16	16	17	18	22	21	26	30	30	35	34	33	25	21	18	16	14	16	16	14	15
6	16	15	15	16	13	16	18	20	20	24	23	28	23	27	29	24	21	15	14	16	14	15	17	15
7	14	14	15	14	14	16	17	20	20	30	24	28	27	25	31	22	21	16	16	15	16	15	14	14
8	15	15	15	16	14	16	16	21	20	23	30	31	32	32	22	23	20	14	15	14	16	16	15	14
9	14	14	15	15	14	14	16	19	21	18	39	42	42	31	22	22	16	16	15	12	14	15	15	16
10	16	15	15	14	20	23	15	21	22	27	34	36	25	35	32	24	22	16	15	14	15	13	16	14
11	16	16	15	13	15	16	16	20	20	29	23	C	41	32	30	24	25	17	15	14	15	19	16	15
12	14	14	14	15	14	17	16	20	20	23	36	35	31	29	22	20	20	15	16	15	15	20	16	14
13	14	22	16	16	19	16	16	20	22	30	29	30	36	31	24	25	21	16	15	14	16	14	14	14
14	15	15	16	19	14	16	C	18	20	22	35	28	30	36	26	21	20	15	15	14	16	16		
15		15	14	14	14	14	16	16	22	28	29	32	29	32	21	20	21	16	16	15	16	14	15	13
16	15	14	16	15	16	15	16	17	21	24	26	25	32	37	32	24	21	19	16	17	15	15	15	17
17	15	15	13	14	14	14	16	21	20	23	32	35	33	30	30	21	19	15	14	14	15	15	15	14
18	16	16	15	15	15	16	16	20	21	22	24	34	44	41	40	25	21	20	15	14	14	15	15	16
19	15	16	14	15	11	16	15	18	18	20	29	32	33	28	24	21	21	16	13	14	14	15	16	16
20	15	16	23	20	16	15	15	18	24	22	21	30	29	34	32	21	21	20	15	15	15	15	14	15
21	15	16	14	14	24	14	15	20	20	22	28	30	32	31	30	23	21	16	13	14	15	15	14	15
22	15	16	15	12	14	15	20	20	22	22	23	31	34	30	22	20	20	15	14	13	14	15	14	18
23	15	14	17	13	14	18	18	20	20	22	32	31	57	42	30	28	21	18	15	15	15	15	15	16
24	14	15	12	14	14	20	16	18	20	21	35	31	32	31	21	20	21	20	16	14	14	14	16	17
25	17	15	16	21	18	16	17	20	20	22	25	31	30	24	23	21	18	18	16	13	16	15	14	12
26	15	15	15	18	15	24	15	20	20	20	24	22	25	36	24	20	21	20	17	15	20	14	15	16
27	14	15	15	14	20	15	16	17	20	23	24	28	32	27	20	21	20	16	15	15	15	14	13	15
28	14	17	16	18	14	14	15	20	20	24	32	28	40	34	29	24	23	18	19	15	14	14	14	16
29	17	16	15	14	15	14	15	18	18	20	24	30	30	31	28	21	18	15	14	16	14	15	16	15
30	14	14	14	15	13	16	16	23	19	22	30	31	30	23	26	20	19	19	15	16	15	15	14	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	30	30	30	30	29	30	30	30	30	30	30	30	30	30	30	29	29
MED	15	15	15	15	14	16	16	20	20	23	30	31	32	32	28	22	21	16	15	14	15	15	15	15
U Q	16	16	16	16	16	17	18	21	21	26	34	33	35	35	31	24	21	18	16	15	16	15	16	16
L Q	14	15	14	14	14	15	16	18	20	22	24	29	29	30	23	21	20	16	15	14	14	14	14	14

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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	S 260	S	S 297	287	268	292	317	296	292	252	259	254	262	264	273	275	279	277	296	280	263	258	257	S 270
2	S 280	S 282	S 282	S 294	294	313	305	287	278	255	A	250	253	259	271	269	274	285	285	290	S 266	253	258	S 273
3	S 275	279	271	265	259	258	288	288	269	261	262	258	261	271	271	277	281	286	279	284	264	S 272	263	269
4	S 271	S 277	S 299	281	274	262	296	264	267	S 272	270	262	260	259	278	283	287	284	280	273	A	A	269	241
5	S 242	S 273	S 266	283	292	293	310	276	273	303	275	269	271	278	285	284	293	294	308	296	S 268	271	S 272	266
6	260	S 282	287	277	276	287	296	308	329	274	244	265	274	270	279	284	297	293	302	277	252	255	268	268
7	S 270	284	S 287	S 279	271	278	295	317	316	312	273	276	274	274	278	282	283	291	310	314	265	263	S 253	S 283
8	275	276	292	291	285	303	311	313	A	264	275	287	281	284	279	286	286	296	291	293	259	S 269	257	S 264
9	265	285	S 275	S 279	272	275	296	318	314	A	274	275	274	286	A	271	273	278	283	287	281	273	253	S 261
10	274	S 268	277	S 284	282	299	304	297	262	291	279	281	270	282	278	283	290	294	298	280	276	256	259	255
11	268	272	267	279	264	301	297	279	288	254	265	C	284	282	292	288	292	291	279	280	284	298	267	261
12	275	S 276	278	272	287	314	317	327	311	S 318	A	273	273	297	287	286	299	303	305	313	265	271	272	273
13	278	278	283	279	294	331	329	321	A	A	287	269	280	276	281	288	287	289	310	S 307	S 258	R 237	S 274	S 281
14	274	S 315	S 305	S 274	294	301	C	285	286	284	270	289	289	288	A	286	S 289	304	304	286	274	267		
15		A	278	289	290	276	289	308	305	280	251	268	267	270	283	286	285	299	301	302	S 291	264	S 272	303
16	282	S 281	S 272	S 274	281	309	314	F	293	303	289	282	280	S 279	274	272	278	298	314	308	S 260	265	S 290	285
17	S 283	S 281	S 289	S 284	S 295	318	310	274	295	A	A	A	A	271	281	290	A	294	304	303	293	262	274	A
18	S 278	S 289	S 296	S 290	278	309	336	A	288	S 282	282	261	S 260	266	271	259	285	293	286	289	270	257	254	267
19	S 253	S 275	311	S 281	269	282	V 301	Z 308	A	276	A	A	253	A	284	272	282	292	307	292	S 261	266	254	S 252
20	271	273	261	S 286	S 287	S 269	S 271	271	S 264	266	253	S 266	S 266	A	278	285	286	289	294	287	264	S 270	266	272
21	277	275	289	290	S 273	268	S 269	284	292	255	256	271	276	277	284	287	288	302	310	287	268	262	S 275	278
22	V 272	272	288	287	285	270	266	279	S 262	276	271	287	280	279	280	295	292	300	298	293	258	264	264	S 267
23	280	296	287	273	280	255	256	V 258	299	281	287	275	S 278	288	280	281	278	289	289	293	293	S 263	256	265
24	259	S 285	S 289	S	270	282	257	267	273	279	266	243	255	269	244	277	275	283	280	288	282	268	S	277
25	287	S 286	276	S 283	286	300	298	296	272	290	265	260	S 257	A	284	277	272	286	291	301	S 287	S 272	274	S 265
26	258	286	296	S 268	288	309	291	A	288	311	300	297	310	285	278	282	288	298	296	299	289	273	S 272	S
27	275	284	277	S 289	277	286	R 309	311	291	262	290	278	282	285	290	293	293	310	312	289	A	258	255	F
28	291	322	276	279	276	278	286	288	294	289	295	298	A	A	A	A	296	318	299	279	263	266	273	280
29	290	S 295	S 296	285	291	277	302	303	294	296	300	281	274	A	283	280	288	289	286	292	289	286	S 282	S 275
30	278	279	S	304	299	286	281	298	280	268	279	S 281	283	268	287	306	279	290	280	269	278	261	269	293
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	29	29	30	30	29	27	27	27	26	27	28	25	27	29	29	30	30	30	28	29	28	26
MED	275	281	287	283	282	286	297	296	288	279	274	273	274	277	280	283	286	292	297	290	268	265	268	270
U Q	279	S 286	S 294	288	290	303	310	308	295	291	287	281	280	284	284	286	291	298	305	299	283	271	S 272	278
L Q	266	276	276	278	273	276	287	279	273	264	265	262	262	270	278	277	279	289	286	284	263	260	257	265

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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 310	L 342	L 363		365	350	363	L 334	A	A	A					
2							L	L	A 314	L	A	A	A	A	L 340	L 328	L 318	L						
3							L	L		L	A	L 318	A	L 325	376	L 332	L	A	A					
4							A	A	A	A	A	354	A	L 320	L	A		A						
5								A	L	L 363	361	L	A	A	L	A	L	A						
6								L	A	L	L 317	L 385	358	L 324	348	L 373	L 353	L	L					
7							L	L	A	L 358	L 363	382	385	L 377	366	L 346	A	A	A					
8							A	A	A	L 347	U L 342	409	U L 359	U L 366	A	A	L 338	L						
9							L	L	A	A	363	362	360	363		A L 334	A	L	L					
10								L		L 349	L 351	L 362	L 328	A	U L 325	A	L	L						
11						L		L	L	L 356	A	C	L 366	374		L	L		L					
12						A	A	L	A	A	A	A	363	L 346		L 358	A	L	L					
13							L	L	A	A	L 364	364	349	L 363	A	A	A	L	L					
14							C	A	L	A	L	A	A	A	A	A	A	L	A					
15							L	L	A	A	L 306	A	380	A	A	L 342	U L 338	A	L					
16							L		L 358	372	U L 366	L 354	R 353	A	L 338	A	A	L	L					
17							L	L	L	A	A	A	A	A	361	349		A	A	A				
18							A	A	L 355	A	L 375	U L 361	S 364	U L 324	L 348	340	L 323	A	L					
19						L		A	A 384		A	A	A	A	A	369	A	330						
20						L	L 342	343	370	375	376	373	U L 387	A	A	A	374	L 333						
21								L	L	L 320	L 357	387	347	L 377	A	A	A	A						
22							L 343	L 369	A	A	A	A	366	374	358	365		A L 337	A					
23							A	L 323	376	369	391	420	E	B U L 336	L 360	358	350	L 334	L					
24						L	L	A	A	A	A	382	394	376	379	378	L 339	A	L 313					
25								L	L 386		A	A	A	A	373	367	353	L 335	L					
26								A	357	L 367	L 372	A	384	L 354	L 360	A	353	A	L					
27							L	L	L	A	U L 369	389	391	375	L 355	365	L 347	L 354	L					
28							A	A	L	L 378	L 385	A	A	A	A	A	A	A						
29						L	L	L	L	408	374	U L 385	A	A	A	A	A	A	A					
30							L	L 354	L 341	A	A	A	A	A	382	A	A	A						
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	4	6	16	18	17	18	17	16	16	11	6	1					
MED							L 342	L 348	358	L 365	L 364	373	364	L 363	360	354	L 347	L 334	L 313					
U Q								L 362	370	376	L 374	386	384	374	370	366	353	L 337						
L Q								333	L 355	L 348	L 351	L 362	358	L 330	L 348	L 337	L 338	333						

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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									318	406	368	380	374	362	348	336	314	304	282					
2							266	266	312	356	A	394	402	368	348	352	346	306						
3							304	292		358	336	364	366	350	332	344	336	306	320					
4							288	E A 410	E A 394	E A 346	E A 384	380	354	372	332	318		E A 360						
5								E A 268	330	296	354	364	354	344	324	320	298	270						
6								280	262	354	442	372	346	344	332	316	298	300	266					
7							286	276	270	298	398	350	348	342	346	334	328	324	276					
8							270	284	A	440	408	352	374	358	E A 350	336	318	284						
9							290	268	264	A	396	374	374	342	A	388	344	298	296					
10								280		294	364	350	376	360	354	342	312	320						
11						286		322	308	458	374	C	328	338	326	316		294						
12						260	254	252	274	308	A	376	386	316	334	340	E A 330	288	270					
13							250	260	A	A	364	392	358	358	346	322	E A 384	304	252					
14							C	284	340	320	352	330	320	316	A	318	E A 320	274	270					
15							304	262	274	E A 330	430	348	380	352	310	330	322	296	274					
16							260		320	326	354	336	364	372	362	342	318	284	266					
17							258	352	302	A	A	A	A	E A 376	330	324	A	E A 382	E A 284					
18							244	A	354	396	384	452	416	400	392	430	382	322	322					
19						358		E A 298	A	412	A	A	E A 468	A	E A 368	408	370	330						
20						340	360	396	440	438	498	460	440	A	408	E A 392	366	348						
21								290	282	428	396	366	350	338	328	326	302	302						
22							386	314	E A 364	366	E A 372	E A 354	364	372	358	324	332	314	284					
23							332	372	312	362	368	354	402	376	388	392	384	340	324					
24						332	334	E A 386	380	390	458	528	494	458	546	408	396	382	344					
25								302	338	352	436	468	480	A	390	400	402	352	298					
26								A	344	292	302	326	304	362	386	374	344	316	290					
27							266	270	340	436	342	378	344	340	332	322	306	288	258					
28							E A 322	302	300	288	312	E A 306	A	A	A	A	304	266						
29						340	304	300	324	314	302	338	362	A	E A 350	340	322	E A 384	E A 360					
30							326	308	320	304	352	356	342	374	328	300	332	320						
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						6	20	26	25	27	26	27	28	25	27	29	27	30	19					
MED						336	288	286	316	354	368	364	364	358	341	336	329	304	283					
U Q						340	324	314	342	406	398	380	394	372	368	381	366	330	320					
L Q						286	263	270	291	308	352	350	349	342	332	322	314	294	270					

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 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 336	262	248	244	268	228	246	216	E A 258	H 204	212	200	208	240	218	234	A	A	A	E A 270	E A 294	E A 322	E A 358	E A 330
2	E A E 302	A E 314	E A 294	276	244	246	E A E 222	E A 222	A	E A 272	A	A	A	A	216	218	218	E A 258	234	240	E A E 284	A E 312	A E 348	E A 324
3	E A 286	284	E A 296	E A E 310	E A E 298	252	238	222	222	224	A	238	A E 248	E A 214	226	234	A	266	E A 350	278	272	E A 304		
4	E A E 326	A E 292	306	U R 316	274	266	A	A	A	A	A	224	A E 304	A E 326	A	298	A E 270	266	A	A E 292	A E 394			
5	E A E 394	A E 324	A E 302	A E 304	E A 302	262	246	A	230	204	214	202	A	A	258	A	E A 248	A E 268	E A 384	A E 312	A E 300	A E 300	320	
6	E A E 346	A E 308	A E 286	274	280	246	252	E A 242	A	244	208	190	214	230	224	212	228	228	E A 234	242	E A E 322	A E 334	B E 296	E A 306
7	E A 296	A E 286	272	E A 288	288	250	E A 236	A E 238	A	198	196	190	204	H 174	222	228	A	A	A	232	E A 264	A E 302	A E 320	B 278
8	E A E 300	A E 300	A E 280	272	276	238	A	A	A	E A 222	296	216	E A E 262	A 242	A	A	E A 212	246	252	248	E A 272	A E 318	A E 342	A E 300
9	E A E 342	A E 296	A E 298	A E 298	A E 312	240	218	A	A	A	E A 216	246	204	198	A	218	A E 266	A	264	268	266	E A 366	A E 344	
10	E A E 290	A E 290	272	260	266	242	220	228	216	212	216	206	E A 266	A	E A 308	A	228	E A 276	A E 270	260	270	E A 280	A E 352	A E 348
11	E A E 314	A E 310	A E 310	276	E A 294	A E 256	A E 238	220	226	228	A	C	E A E 238	A E 258	A E 230	214	E A E 266	A E 242	A E 278	274	252	254	E A 294	A E 334
12	E A E 282	A E 320	272	E A 302	E A 298	A	A	218	A	A	A	A	214	E A E 242	A E 260	212	A	222	220	238	258	E B 288	280	286
13	270	E B 292	E A E 280	A E 286	270	244	206	A	A	A	218	196	208	234	A	A	A E 284	A	224	E A U 430	R E 456	A E 336	314	
14	E A 310	252	E A 292	A E 350	E A 294	246	C	A	E A 262	A	E A 262	A	A	A	A	A	A E 244	A	248	E A 318	A E 402			
15		A E 292	A E 306	E A 288	250	236	224	A	A E 310	A	196	A	A	A	E A 250	E A 270	A	A E 254	E A 280	E A 274	A E 334	330	260	
16	276	E A E 282	A E 344	A E 304	E A E 284	A E 254	222	208	214	232	200	230	E A 316	A	E A 312	A	A	A	240	240	212	E A E 344	A E 320	E A 322
17	E A E 290	A E 330	A E 314	A E 284	A E 274	250	A	210	218	A	A	A	A	A	234	228	A	A	A	260	260	E A E 304	A E 360	A
18	E A E 322	A E 284	A E 278	A E 326	A E 290	A E 254	A	A	E A 266	A	E A 244	222	236	E A 286	208	224	E A 260	A	E A 262	232	236	E A 284	A E 344	E A 344
19	E A E 402	A E 296	240	E A 278	E A 306	264	230	A	A	214	A	A	A	A	A	236	A	E A E 276	A E 288	256	E B 282	258	E A E 330	A E 324
20	E A E 310	A E 292	A E B 312	258	254	244	240	244	224	212	216	228	218	A	A	A	226	E A E 262	A E 306	A E 296	A E 430	A E 316	E A E 300	A E 312
21	E A E 312	A E 300	A E 284	A E 258	A E B 280	270	E A 254	A E 234	214	H 216	190	200	H 194	200	A	A	A	A E 252	A	E A 240	E A 304	A E 294	276	E A 300
22	E A E 310	A E 296	A E B 270	262	254	248	224	222	A	A	A	A	196	206	232	218	A E 266	A	A E 292	A E 304	A E 304	A E 302	A E 316	
23	E A 310	270	E A E 296	A E 298	268	258	A	238	204	214	200	186	B	E A 296	224	234	E A 268	210	248	258	236	E A E 258	A E 318	A E 350
24	E A E 350	A E 304	A E 272	270	254	E A 290	234	A	A	A	A	204	198	208	208	218	E A 256	A	A E 292	A E 282	A E 288	A E 330	A E 334	A E 330
25	E A E 308	A E 298	276	E B 286	E A 280	252	220	218	214	212	A	A	A	A	E A 248	220	232	E A 244	A E 258	260	244	270	E A E 294	A E 316
26	E A E 362	A E 288	A E 280	276	E A E 310	A E 262	A E 230	A	E A 232	222	230	A	218	E A E 266	A E 240	A	226	A E 240	254	E A 290	260	E A E 312	A E 298	
27	E A 316	272	270	264	E B E 298	A E 250	A E 236	224	E A 258	A	212	196	198	E A 234	238	H 200	E A 238	216	A E A 284	A	A E 308	A E 340	A E 328	
28	E A 274	216	E A E 274	B 294	E A E 304	A 294	A	A	228	198	214	A	A	A	A	A	A	A E 272	A E 300	A E 288	A E 298	A E 298	A E 288	
29	266	252	E A 268	252	E A 296	248	226	214	220	210	202	E A 236	A	A	A	A	A	A	A E 276	266	E A E 284	A E 296	A E 284	
30	E A E 294	A E 286	264	248	244	224	228	194	E A 236	A	A	A	A	A	210	A	A	A E 316	A E 270	A E 310	A E 376	A E 308	264	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	30	29	22	19	18	18	19	18	18	17	20	17	16	15	20	30	28	29	29	28
MED	E A E 310	A E 292	A E 280	A E 281	E 282	248	228	220	220	214	211	203	206	E A 240	223	219	U 226	E A E 246	A E 260	250	E A E 283	A E 302	A E 318	A E 316
U Q	E A E 331	A E 302	A E 296	A E 302	A E 298	260	238	E A 234	E A 236	224	E A 230	228	E A E 236	A E 262	A E 253	231	E A E 263	A E 266	A E 275	A E 276	A E 307	A E 326	A E 341	A E 330
L Q	E A 290	283	272	264	268	245	222	216	216	210	202	196	198	207	217	216	227	228	244	242	262	279	E 296	E 299

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 2002 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						B 110	118		114	110	110	116	A	B	116	112	112	116	114	B				
2						B 126	114		B	B	B	A	B	A	120	120	112	A	B					
3						R 112	112		114	B	118	118	A	A	114	116	116	110	110					
4						E B 132	112	110	108	112	A	A	A	B	B	A	A	A	A					
5						A	A	A	A	A	116	110	112	112	122	114	114	108	116					
6						A 118	114		A	A	A	A	A	A	A 114		114	120	112					
7						112	116	A	A	A	A	A	A	A	A	A	116	116	112					
8						A	A	A	A	A	A	A	110	110	114	112	108	110	A					
9						A	A 114		110	114	B	B	B	118	114	116	116	112	110					
10						B 110	110		A	A	A	A	A	A	A	A 114	114	114	112					
11						128	118	112	108	A	116	C	B	112	116	116	114	A	A					
12						A 112	108		A	A	A	A	A	116	A	114	114	112	A					
13						A 112	A		A	A	A	A	A	110	108	112	114	A	A					
14						120	C	A	108	A	A	A	A	A	A	116	114	114	A					
15						120	112	116	110	A	A	A	A	A	A	114	118	112	110					
16						A	A	A	A	A	A	114	A	A	A	A	A	A	122					
17						122	112	110	110	A	A	A	A	A	A	114	116	112	A					
18						A	A	A	A	112	A	112	B	B	B	120	116	112	A					
19						120	114	A	A	A	A	A	A	118	118	120	114	110	A					
20						116	112	112	114	A	A	108	A	A	A	A	A	114	114					
21					B	A	A	A	A	108	114	114	116	112	118	118	118	112	A					
22						B 112		A	A	A	A	A	112	A	A	114	112	112	110					
23						A	A	A	A	A	112	118	B	B	116	112	110	108	120					
24						A 112		A	A	A	A	A	A	110	110	116	114	114	116					
25						120	120	120	118	116	114	A	A	116	116	114	114	118	112					
26						118	A	A	A	112	114	A	A	A	116	116	120	116	A					
27						118	A 112		A	A	A	A	110	A	116	114	120	118	110					
28						122	118	108	108	114	114	112	A	A	A	A	A	A	A					
29						A 112		A	114	A	114	114	A	A	A	118	A	A	A					
30						E B 134	112	108	108	108	A	A	108	112	108	112	A	A	A					
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						13	20	16	13	9	10	10	6	11	16	24	24	22	15					
MED						120	112	112	110	112	114	114	111	112	116	114	114	112	112					
U Q						125	117	114	114	114	116	116	112	116	117	116	116	116	116					
L Q						118	112	110	108	109	114	112	110	110	114	114	114	112	110					

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

IONOSPHERIC DATA STATION Kokubunji

JUN. 2002 h'Es (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	100	100	B	B	B	B	146	124	120	140	G	124	106	B	130	100	120	112	104	106	102	104	104	98
2	96	98	96	B	B	B	130	124	112	110	100	102	106	106	116	102	114	100	100	98	100	104	102	98
3	98	98	94	98	94	104	134	G	124	B	114	130	104	102	G	106	G	112	104	102	100	104	B	104
4	98	98	98	102	104	124	116	108	104	106	102	104	100	104	102	98	102	96	94	94	106	110	110	108
5	104	108	100	96	112	106	106	104	104	106	114	132	114	126	120	122	124	112	106	102	108	106	100	100
6	98	96	96	98	98	100	118	112	102	102	104	104	104	104	104	124	132	120	116	112	108	110	110	100
7	96	94	94	90	B	116	114	104	96	98	100	106	104	106	106	122	114	108	104	108	102	104	100	108
8	98	102	98	102	102	102	98	102	94	102	94	114	112	114	110	116	108	106	100	102	102	104	102	106
9	98	96	96	94	94	98	104	120	116	108	118	112	120	G	108	116	110	116	106	100	98	B	94	96
10	92	90	90	B	B	B	114	110	102	104	104	100	100	96	98	112	120	114	108	94	92	92	96	104
11	98	98	100	100	100	124	122	118	116	104	112	C	120	114	114	G	112	106	102	100	102	B	108	100
12	98	100	102	102	104	102	116	112	104	100	96	102	102	116	106	120	104	116	104	104	100	B	B	B
13	B	B	102	100	100	102	102	98	96	98	98	106	110	118	112	108	110	104	104	100	102	98	98	102
14	96	96	96	94	96	100	C	108	110	104	102	98	98	100	104	114	108	112	100	100	96	98		
15		98	96	90	98	150	132	116	108	102	102	102	106	104	102	136	124	110	106	100	100	100	104	102
16	98	102	98	100	100	100	96	98	96	136	98	154	102	98	100	104	100	102	104	B	98	100	98	100
17	94	96	86	88	90	G	120	116	114	102	98	98	96	96	98	120	102	104	98	98	94	92	102	100
18	98	108	96	96	96	104	104	94	104	122	124	118	B	114	B	120	114	106	102	102	96	102	102	98
19	96	98	96	94	96	G	118	104	98	134	98	118	106	112	118	116	112	116	100	102	B	98	90	94
20	90	92	B	B	B	126	110	110	110	108	104	106	106	98	100	98	102	114	106	102	96	102	100	100
21	96	90	96	96	B	170	100	96	98	98	100	102	104	G	116	108	106	108	98	96	98	100	90	98
22	96	96	96	98	102	110	114	110	100	100	100	98	110	100	104	102	112	112	106	96	98	102	98	98
23	96	94	92	96	102	104	102	100	100	100	98	102	B	108	G	130	120	110	102	110	96	96	96	96
24	92	92	88	88	B	108	110	98	98	96	96	100	102	G	98	126	116	108	108	108	102	106	106	104
25	102	100	100	B	100	G	104	106	128	102	118	100	128	114	120	100	124	112	112	108	108	94	92	110
26	104	104	104	104	100	96	100	94	94	114	110	102	106	104	124	116	122	110	108	104	98	100	100	100
27	98	98	B	100	B	G	98	100	102	100	102	104	100	100	98	100	102	118	108	102	100	104	114	112
28	106	104	102	B	122	130	114	120	122	120	122	108	100	102	96	100	98	98	96	92	92	92	96	98
29	B	110	100	100	96	104	98	102	102	106	102	114	104	102	104	106	102	100	98	98	100	104	104	104
30	106	98	98	98	B	156	G	132	120	122	120	116	112	114	126	106	104	98	102	104	96	100	100	102
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	27	24	21	23	28	29	30	29	29	29	28	26	27	29	29	30	30	29	29	27	27	28
MED	98	98	96	98	100	104	112	108	104	104	102	104	105	104	106	112	112	110	104	102	100	102	100	100
U Q	98	101	100	100	102	124	118	116	114	112	113	115	110	114	116	120	120	112	106	104	102	104	104	104
L Q	96	96	96	94	96	102	102	100	98	100	98	102	102	100	100	102	103	104	100	98	96	98	96	98

IONOSPHERIC DATA STATION Kokubunji

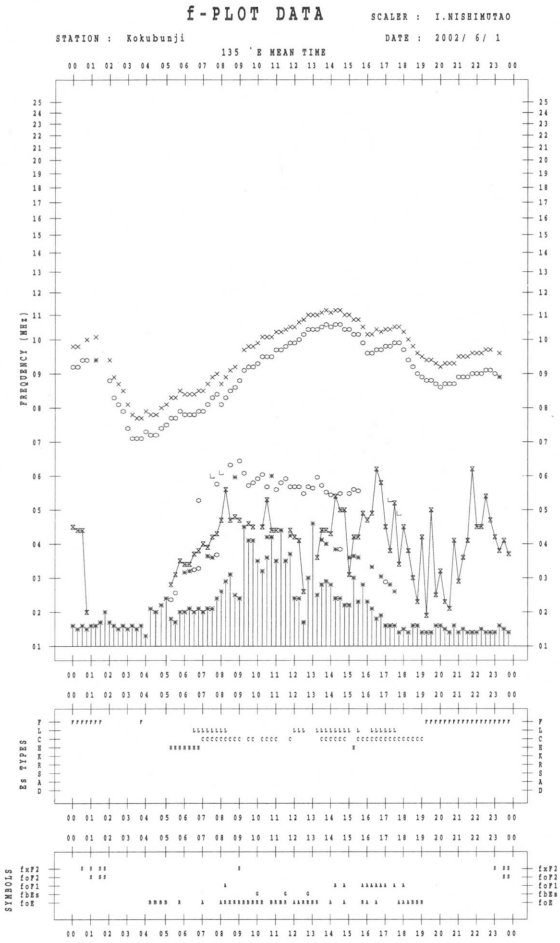
JUN. 2002 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

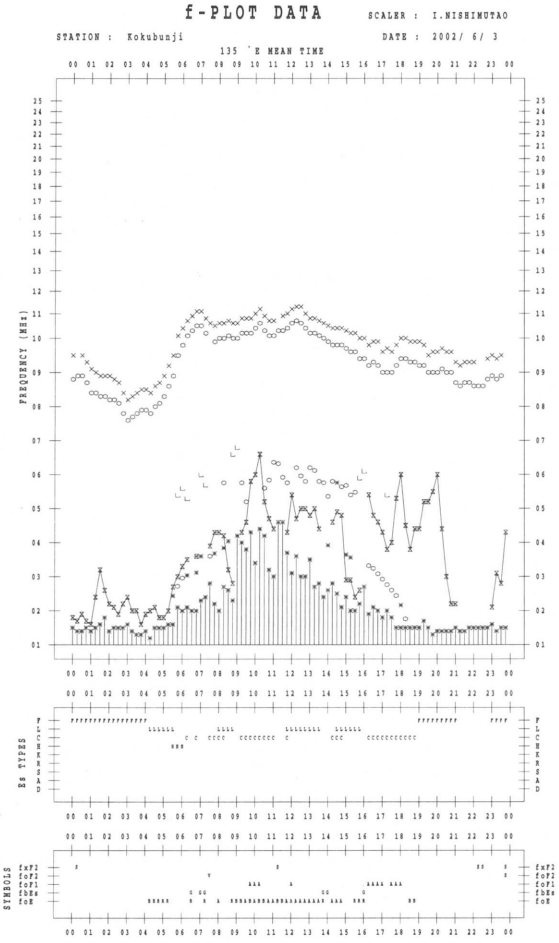
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

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	F3	F1					H1	CL11	CL21	C1		C1	L1		CL11	L1	C2	CL31	C2	C2	F2	F2	F3	F3
2	F2	F2	F1				CL11	C1	C2	C1	L2	L2	L2	L2	C1	L1	CL11	L2	L2	F2	F4	F2	F4	F4
3	F2	F2	F2	F2	F2	L1	H1		CL11		C2	C1	L2	L1		L1		C2	C3	F3	F4	F2		F1
4	F3	F2	F3	F3	F1	C1	C2	C2	C2	C2	L2	L1	L1	L1	L2	L2	L3	L4	L3	F4	FF24	FF33	FF22	F2
5	F2	F2	F2	F3	FF33	L2	L2	L3	L2	L1	C1	C1	C2	C1	C2	CL21	CL21	C2	C4	F4	F3	F3	F2	F2
6	F4	F3	F2	F1	F2	L1	CL11	CL11	L2	L2	L1	L1	L1	L1	L1	CL11	CL11	CL21	C2	F5	F2	F2	F2	F2
7	F2	F2	F1	F1		C1	CL21	L2	L2	L1	L1	L1	L1	L1	L1	CL11	CL21	CL31	CL41	F3	F4	F2	F2	F2
8	F2	F2	F1	F2	F2	L2	L3	L2	L3	L1	L2	CL11	C2	C2	C2	C3	C1	C2	L2	F1	F2	F2	F3	F2
9	F2	F2	F2	F1	F2	L1	L1	CL11	CL21	CL31	C1	C1	C1		CL11	CL11	CL21	C2	C2	F2	F3		F3	F3
10	F2	F2	F1				C1	C1	L1	L1	L1	L1	L2	L2	L2	CL21	CL11	CL21	C3	F2	F3	F1	F3	F4
11	F2	F3	F2	F1	F2	C2	CL11	C1	C2	L1	CL21		C1	C1	C1		C2	L2	L2	F2	F1		F3	F3
12	F4	F4	F3	F2	F2	L2	C2	C1	L2	L2	L2	L2	L1	C1	L1	CL11	LC31	CL11	L1	F2	F1			
13			F1	F3	F3	L1	L2	L2	L2	L2	L1	L1	C1	C1	C2	CL31	CL31	L2	L2	F4	F5	F6	F2	F4
14	F3	F3	F3	F3	F3	L1		L1	CL21	L1	L2	L2	L2	L2	L3	CL21	CL21	C2	L3	F2	F4	F5		
15		F3	F2	F2	F2	H1	HL11	CL11	CL21	L2	L2	L1	L1	L2	L2	HL11	CL11	C2	C2	F4	F3	F3	F3	F3
16	F1	F1	F2	F2	F2	L1	L2	L2	L1	HL11	L1	HL11	L2	L2	L2	L3	L2	L2	L1		F2	F3	F4	F3
17	F2	F3	F3	F2	F1		C1	C1	CL11	L3	L3	L2	L2	L3	L1	CL11	CL31	LL41	L3	F2	F2	F2	F3	F2
18	F3	F2	F2	F2	F2	L2	L2	L2	L2	CL11	CL11	C1		C1		C1	C1	C2	L2	F3	F2	F2	F3	F3
19	F3	F1	F2	F2	F1		CL11	L3	L3	CL12	L2	CL11	L2	CL31	CL21	CL21	C2	C2	L3	F2		F1	F3	F2
20	F2	F1				C1	C1	C1	C1	L1	L1	L1	L1	L2	L2	L2	L2	C2	C3	F2	F5	F2	F2	F3
21	F2	F1	F2	F1		HL11	L2	L2	L1	L1	L1	L1	L1		CL11	CL21	CL21	CL31	L3	F2	F3	F2	F1	F2
22	F3	F2	F1	F2	F2	C1	C1	L1	L2	L2	L2	L2	C1	L1	L1	L1	CL21	CL21	CL31	F4	F3	F2	F2	F4
23	F3	F2	F2	F2	F1	L2	L2	L1	L1	L1	L1	L1		L1		C1	C1	C2	L1	F2	F2	F3	F2	F4
24	F3	F3	F2	F2		L2	C1	L2	L2	L3	L2	L1	L1		L1	CL11	CL11	C3	C2	FF22	FF32	F2	FF32	F2
25	F2	F3	F1		F1		L1	L1	CL11	L1	CL11	L2	CL11	CL21	CL11	L1	CL11	CL21	C2	F2	F2	F1	F1	FF22
26	F4	F3	F2	F2	F3	L2	L2	L2	L1	CL11	CL11	L2	L1	L2	CL11	CL21	CL11	CL21	L1	F3	F5	F2	F2	F3
27	F3	F1		F1			L2	LC11	L2	L2	L1	L1	L1	L2	L1	L1	L1	CL11	C3	F3	F6	F2	F2	F3
28	F4	F1	F2		FF22	C2	CL31	C2	CL11	CL11	C1	C2	L3	L3	L3	L2	L2	L3	L4	F3	F2	F2	F1	F2
29		F1	F2	F2	F3	L1	L1	L1	L1	L1	L1	CL11	L2	L2	L2	CL21	L2	L3	L4	F4	F3	F2	F2	F2
30	F1	F1	F2	F1		H1		H1	CL11	C2	CL11	CL21	CL21	CL11	CL11	C2	L2	L3	L3	F2	F3	F4	F3	F3
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

f-PLOTS OF IONOSPHERIC DATA

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


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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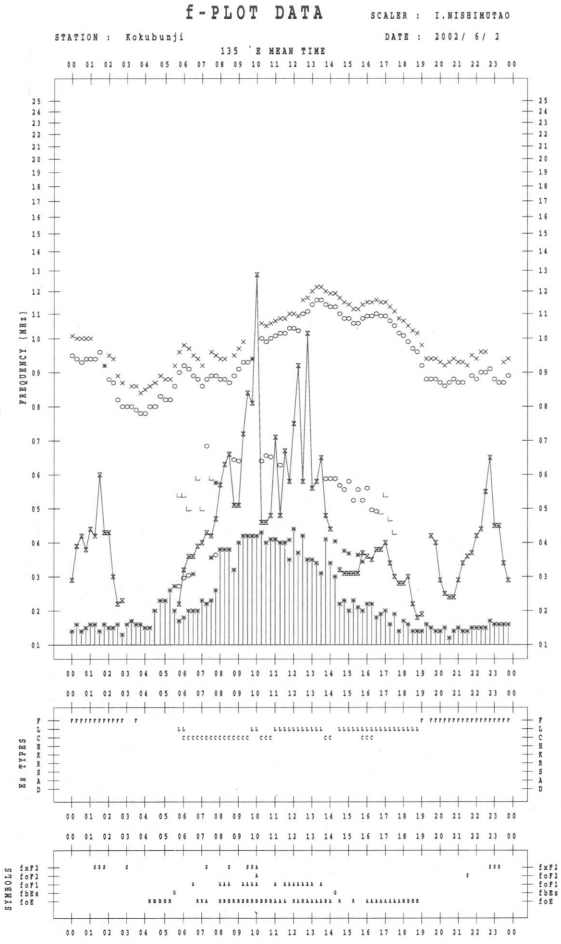
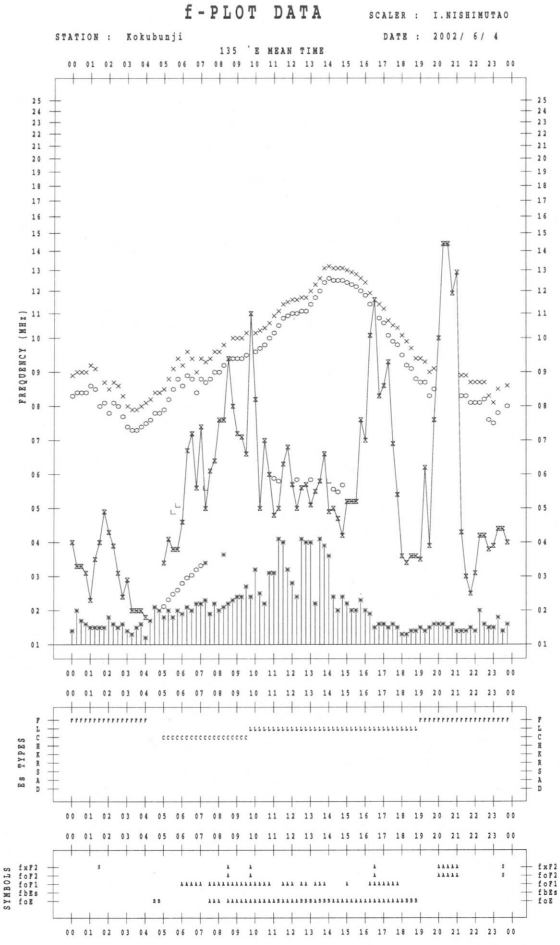
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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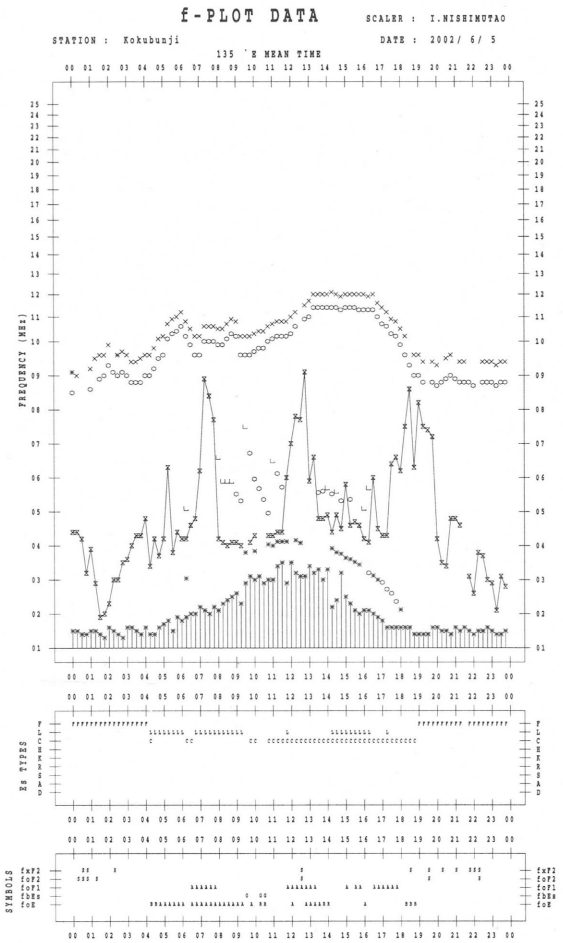
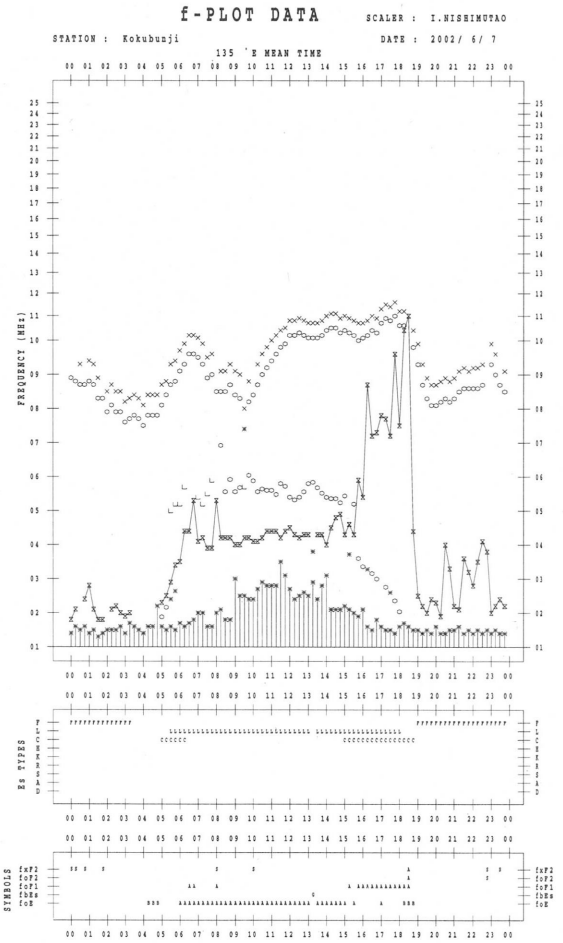
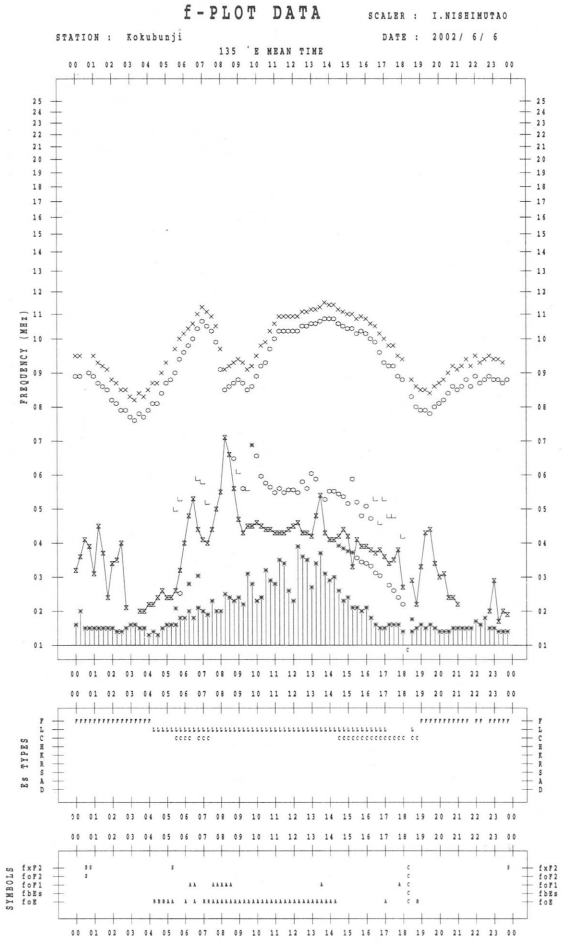
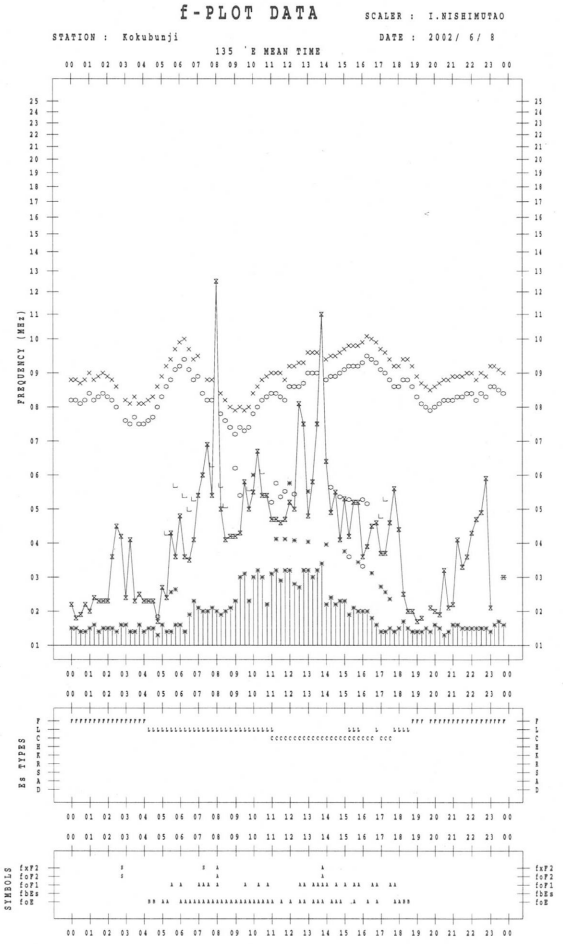
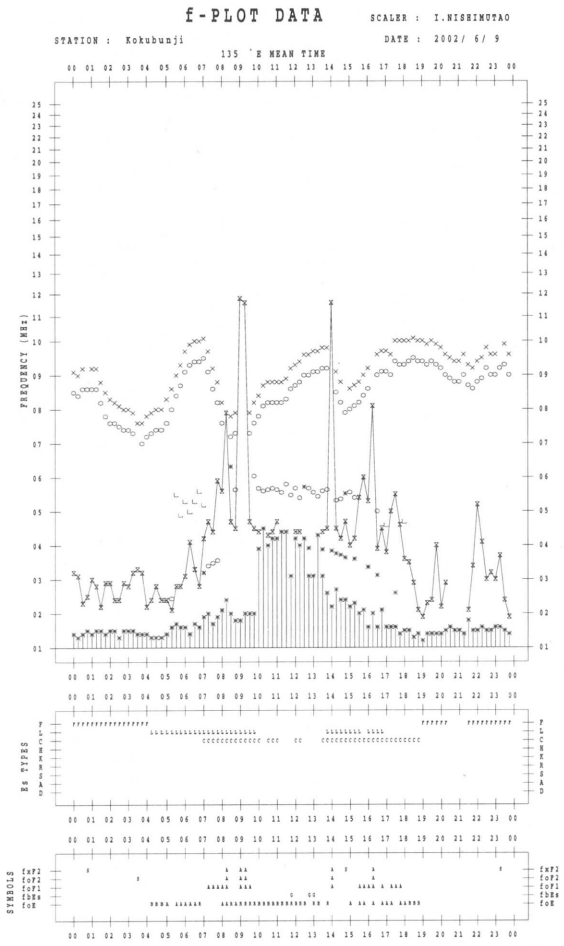
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

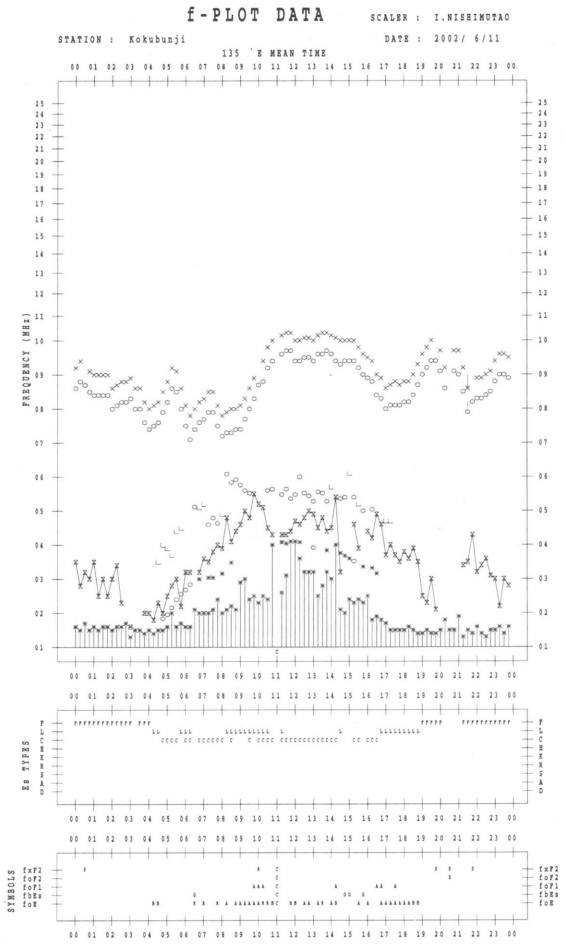

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

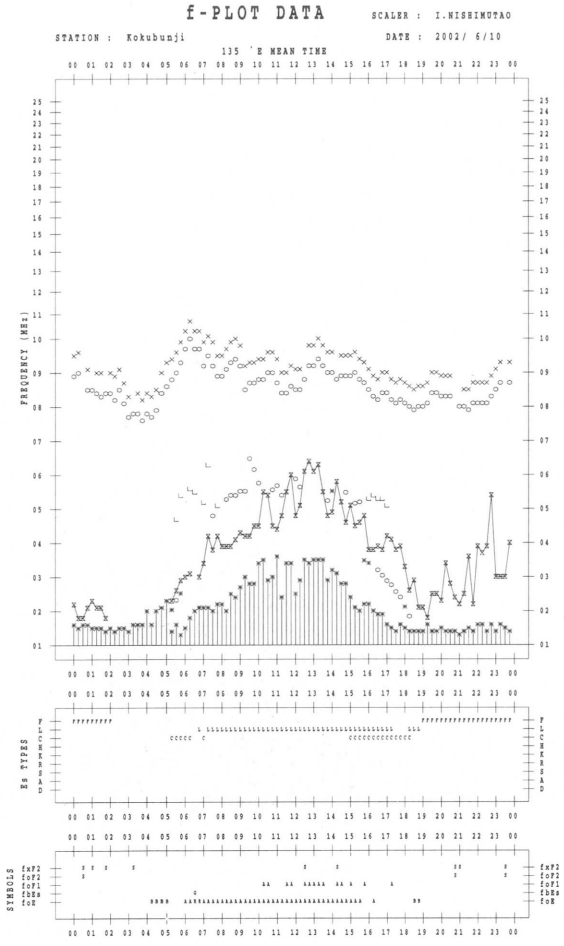

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

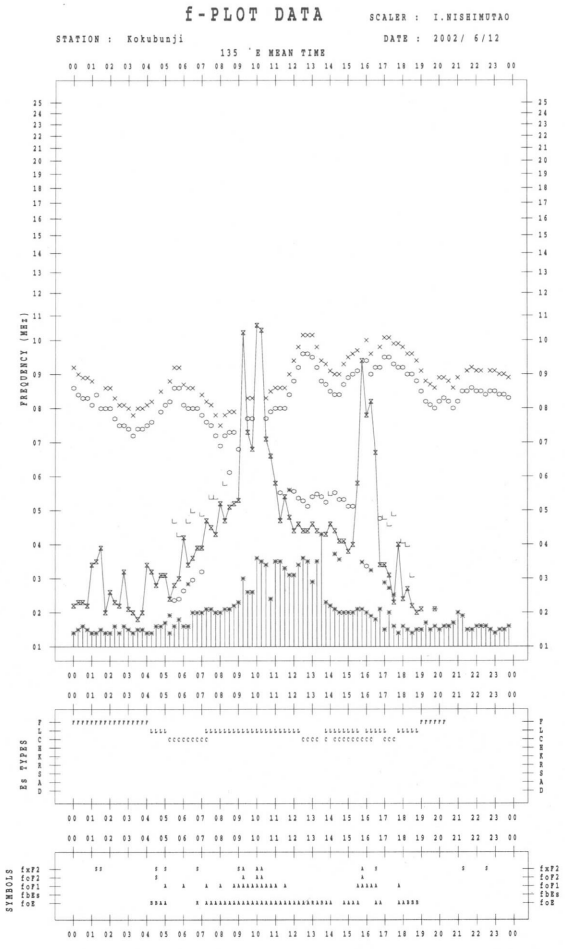

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

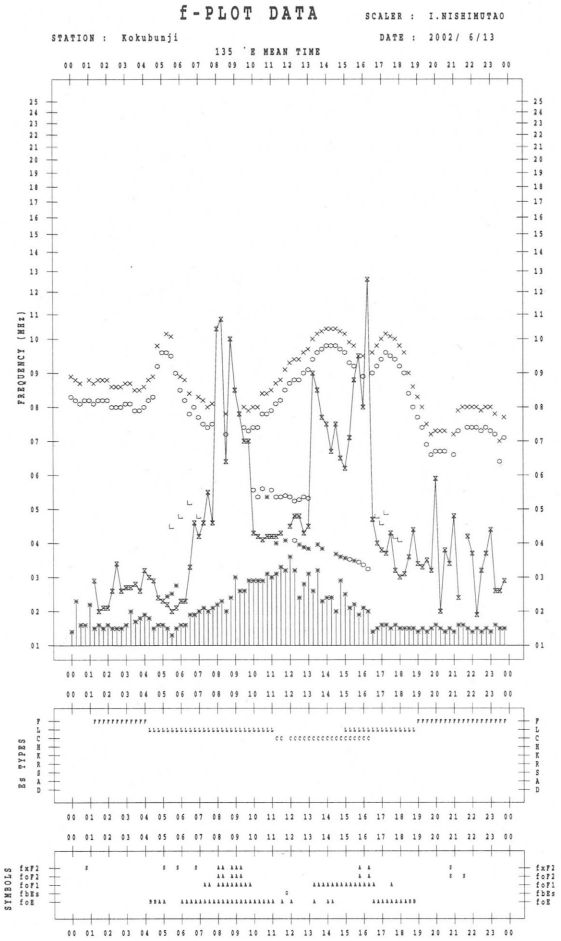

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

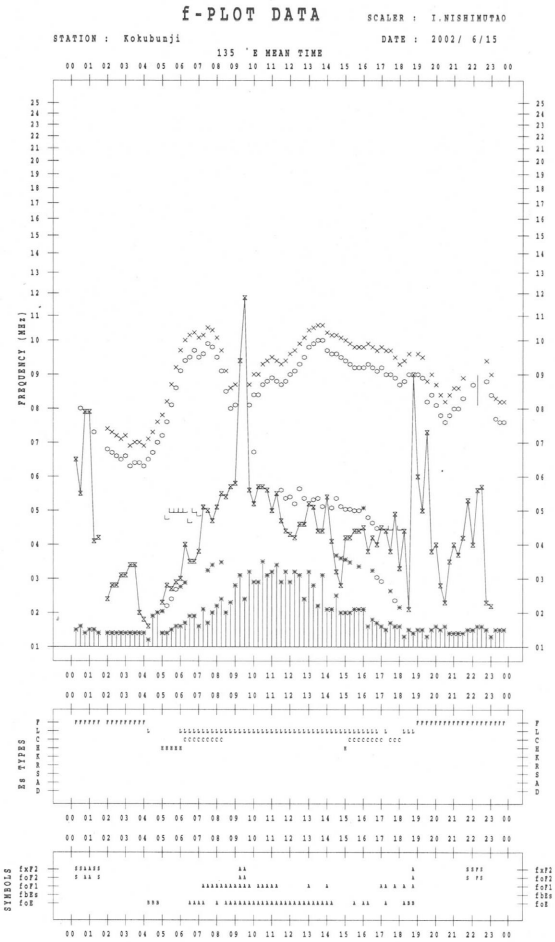

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

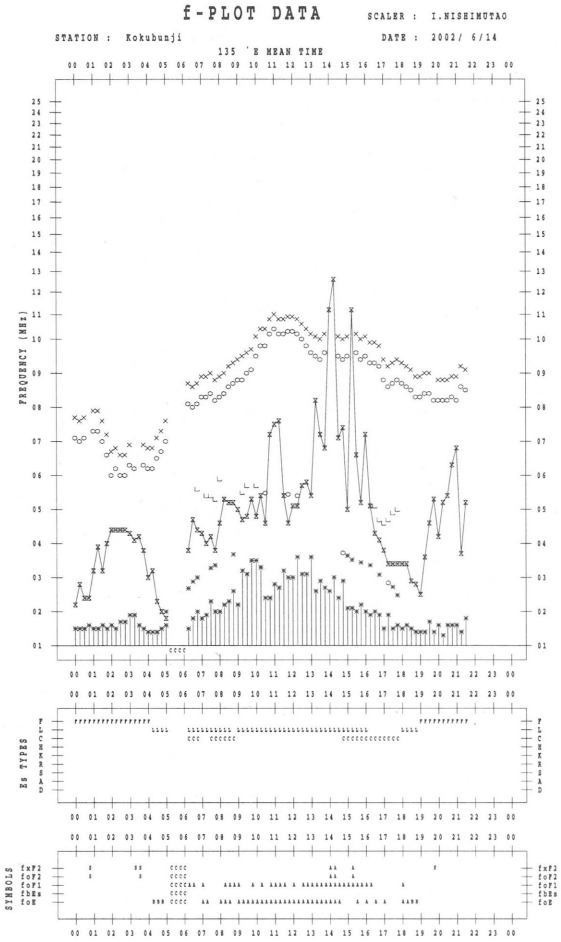

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

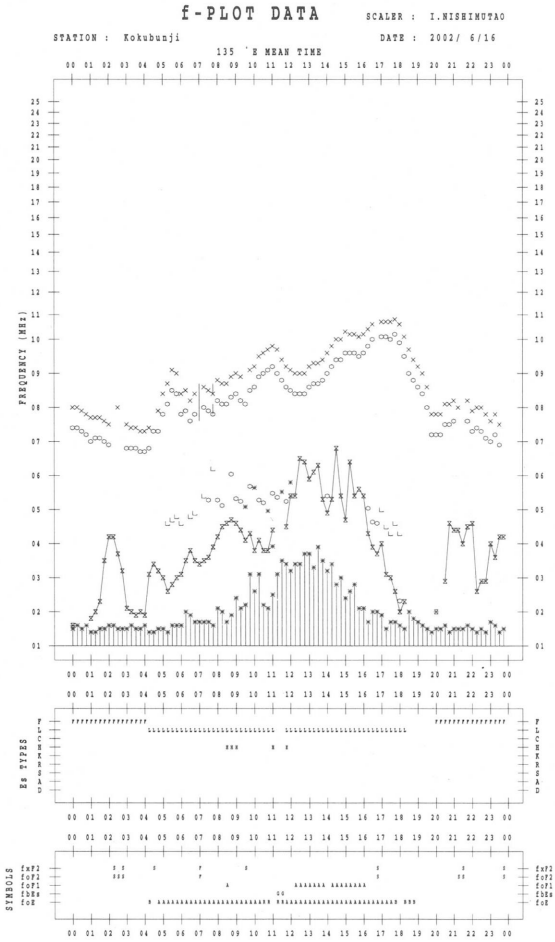

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

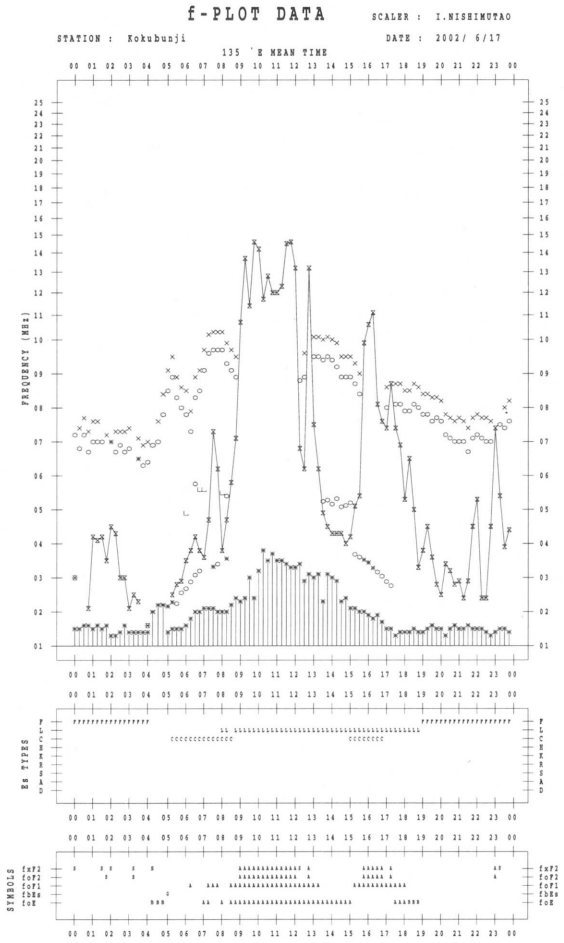

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

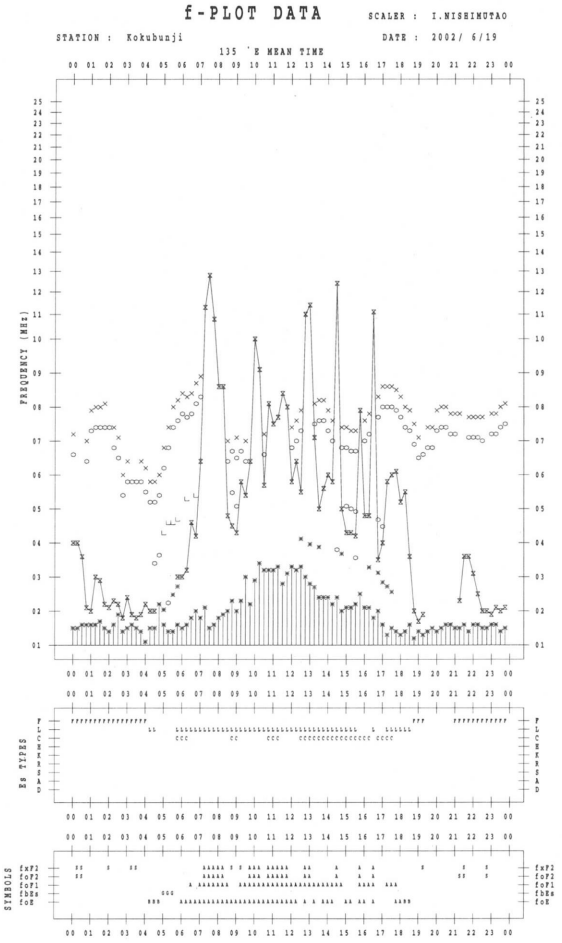

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

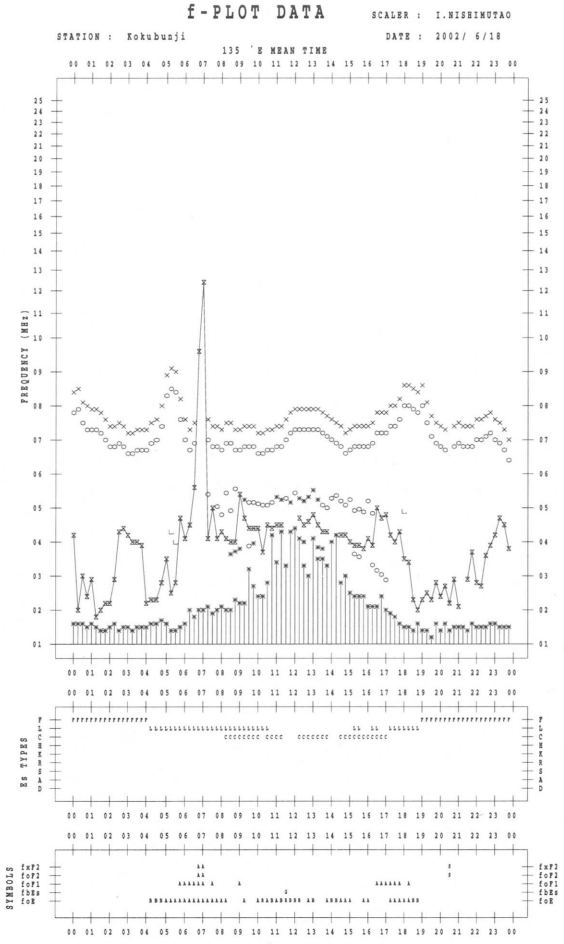

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

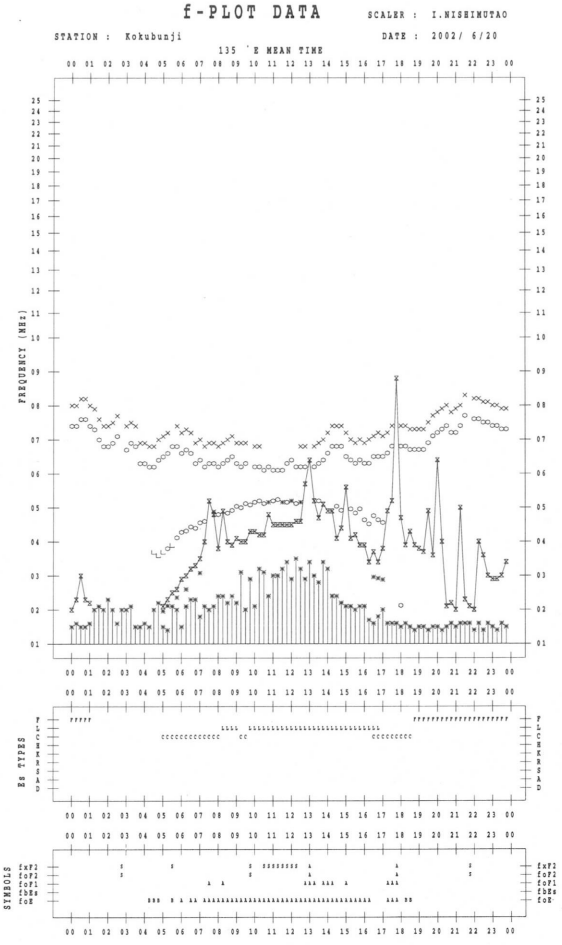

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

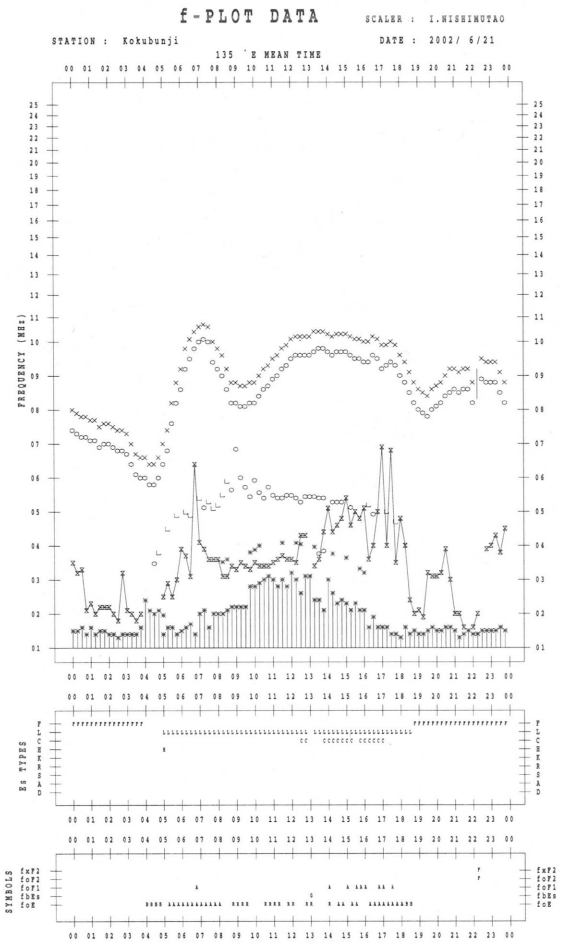

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

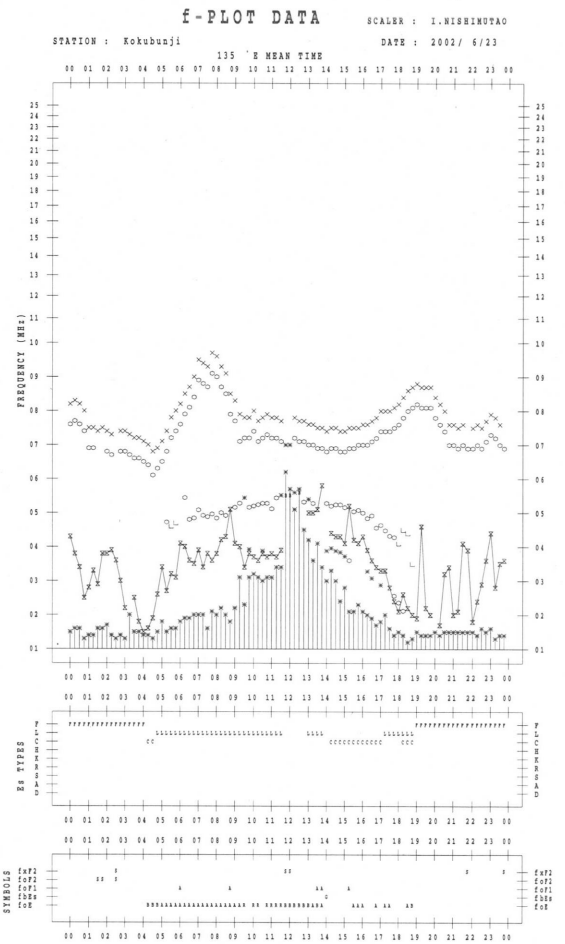

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

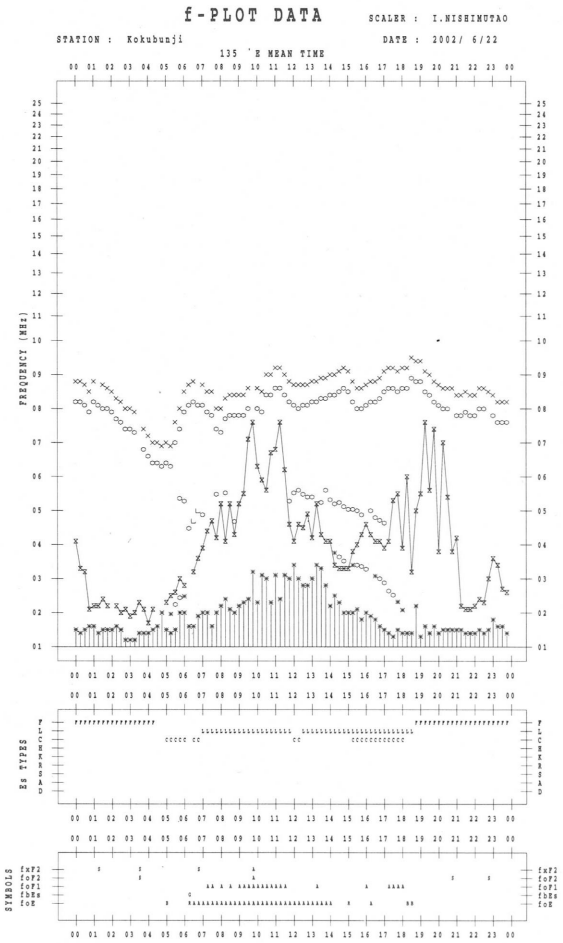

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

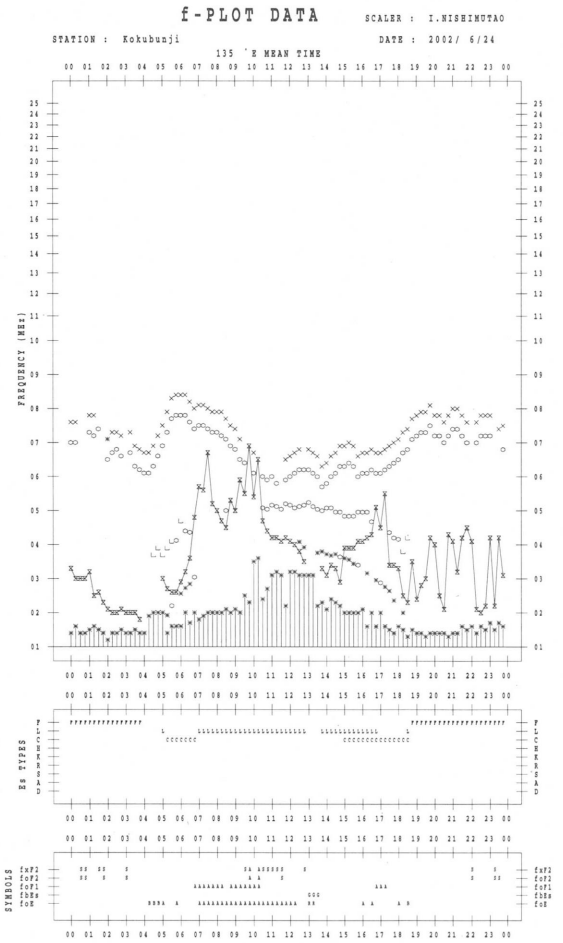

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

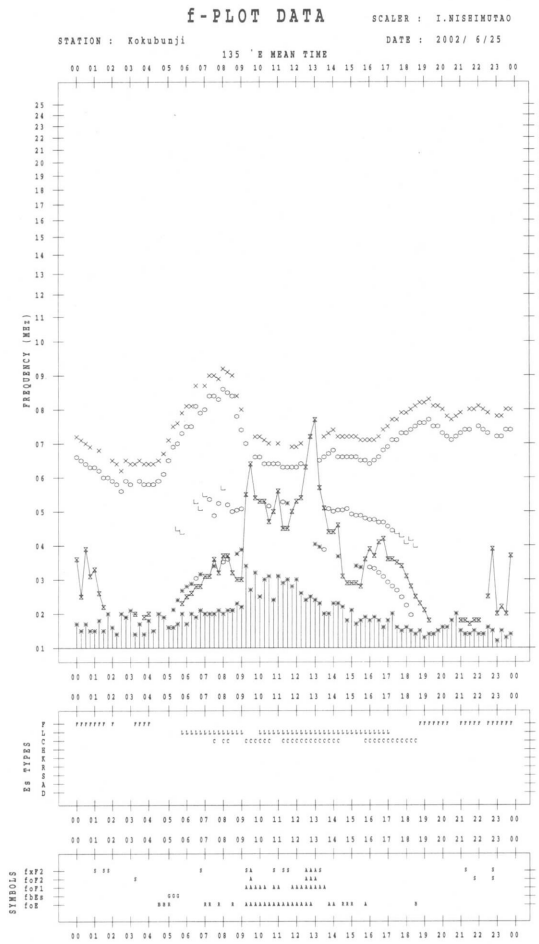

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

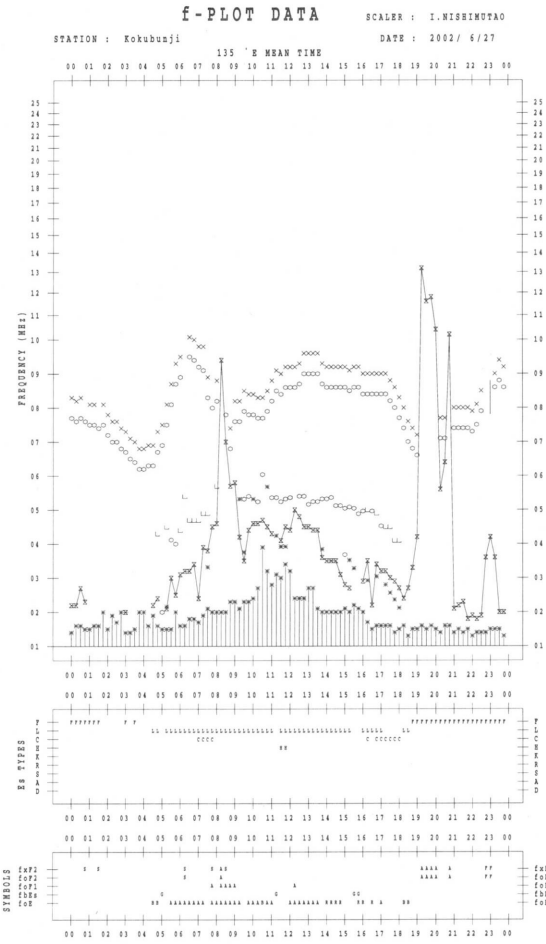

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

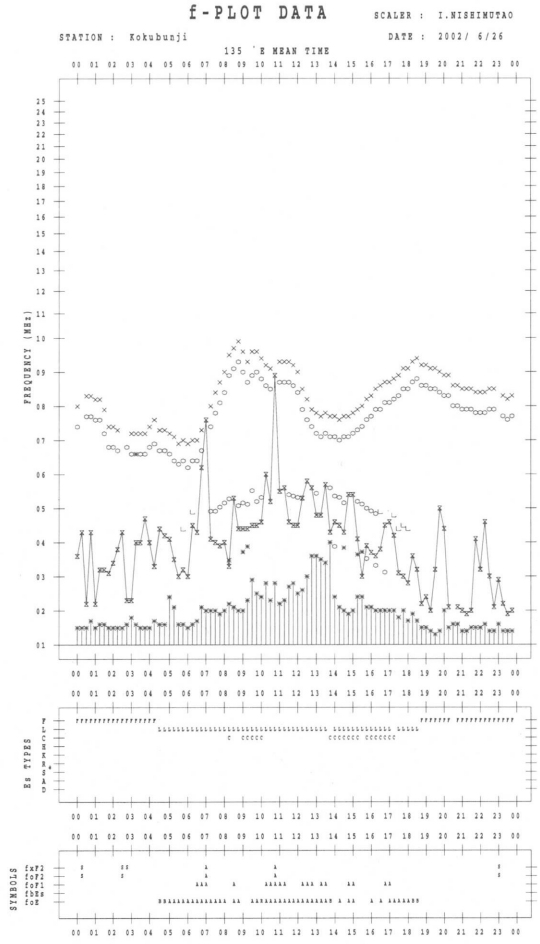

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

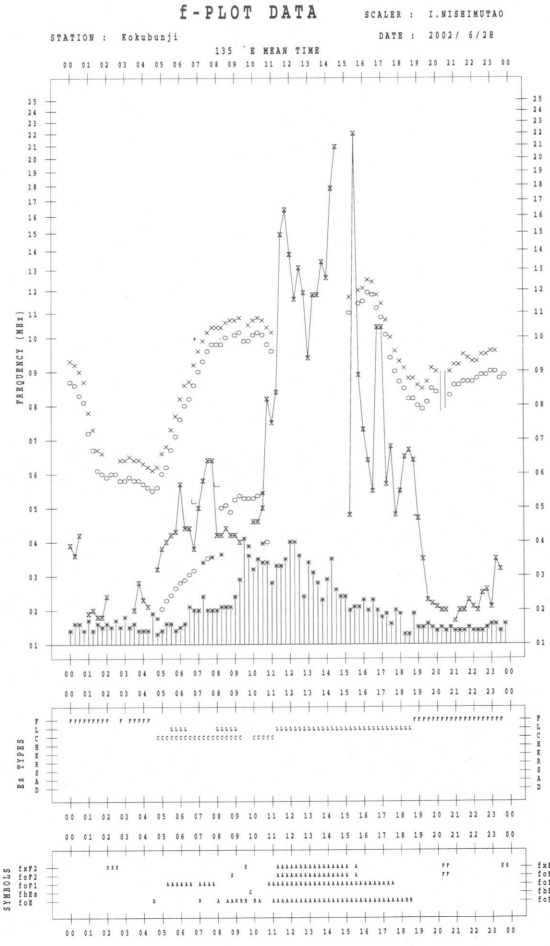

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

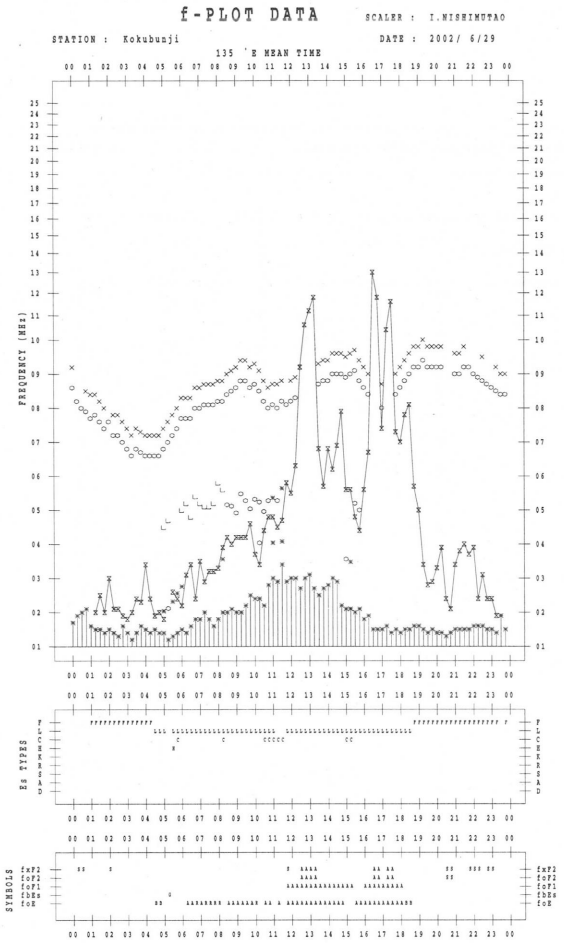

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

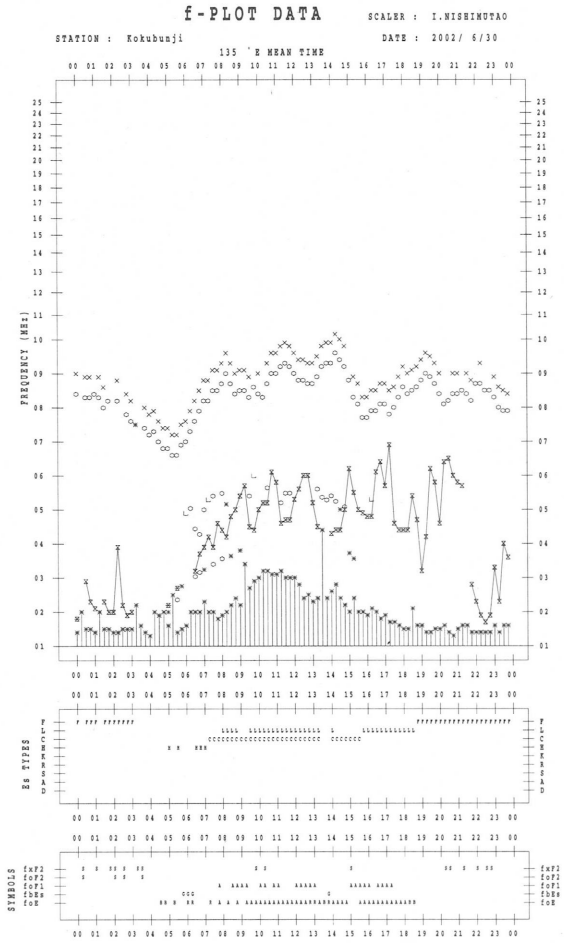

f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/25
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/27
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/26
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/28
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTAO
STATION : Kokubunji
DATE : 2002/ 6/30
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 June 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	44	44	44	44	44
2	43	43	42	46	43
3	45	43	43	44	44
4	42	42	43	43	42
5	43	42	42	44	43
6	43	42	42	42	42
7	41	40	39	42	40
8	40	39	39	43	40
9	41	40	39	45	41
10	44	44	50	38	44
11	42	44	47	41	43
12	43	43	42	41	42
13	39	39	38	40	39
14	39	39	41	38	39
15	39	39	38	38	38
16	37	37	37	36	37
17	37	36	36	36	36
18	35	35	36	39	36
19	38	35	36	39	37
20	37	37	39	38	38
21	37	37	38	38	37
22	39	39	40	41	40
23	41	40	41	42	41
24	41	40	40	39	40
25	39	39	39	40	39
26	39	40	40	42	40
27	41	42	43	44	42
28	42	41	39	41	41
29	40	39	39	40	40
30	42	43	42	37	41
31					

B. Solar Radio Emission

B2.Outstanding Occurrences at Hiraiso

Hiraiso June 2002

Single-frequency observations

Normal observing period: 1915 - 1000 U.T. (sunrise to sunset)

JUN. 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
1	2800	3 S	0352.0	0354.0	7.0	240	-	0
1	500	4 S/F	0352.0	0353.0	12.0	60	-	0
1	200	47 GB	0357.0	0357.0	2.0	755	-	0
1	200	8 S	2327.0	2327.0	1.0	70	-	0
1	2800	3 S	2347.0	2347.0	6.0	245	-	0
1	500	4 S/F	2347.0	2347.0	1.0	190	-	0
1	200	47 GB	2347.0	2347.0	6.0	970	-	0
2	2800	1 S	0433.0	0436.0	5.0	40	-	0
2	500	7 C	0435.0	0444.0	10.0	15	-	0
2	200	8 S	0602.0	0602.0	1.0	15	-	0
2	2800	4 S/F	2034.0	2042.0	19.0	405	-	0
2	500	4 S/F	2036.0	2041.0	11.0	190	-	0
2	200	8 S	2101.0	2101.0	1.0	955	-	WR
3	200	8 S	0439.0	0439.0	1.0	25	-	0
3	200	8 S	0638.0	0638.0	1.0	35	-	0
3	200	8 S	0657.0	0657.0	1.0	35	-	0
3	200	7 C	0724.0	0726.0	5.0	30	-	0
3	500	8 S	0657.0	0657.0	1.0	20	-	0
3	500	4 S/F	0724.0	0728.0	6.0	20	-	0
3	500	4 S/F	0850.0	0853.0	5.0	110	-	0
5	500	7 C	0122.0	0122.0	4.0	50	-	WL
5	500	8 S	0212.0	0213.0	2.0	55	-	0
5	500	8 S	0441.0	0441.0	1.0	20	-	0
5	500	8 S	0545.0	0545.0	1.0	10	-	0
6	200	7 C	0043.0	0044.0	3.0	35	-	WR
7	500	8 S	0223.0	0223.0	1.0	25	-	0
7	2800	8 S	0402.0	0402.0	1.0	35	-	0
7	2800	4 S/F	0412.0	0414.0	3.0	40	-	0
7	500	8 S	0413.0	0414.0	1.0	35	-	0
7	200	8 S	0413.0	0413.0	2.0	135	-	0
9	500	8 S	0413.0	0414.0	1.0	120	-	0
9	500	7 C	0428.0	0429.0	3.0	30	-	0
9	500	8 S	2244.0	2244.0	1.0	20	-	0
10	500	8 S	0203.0	0203.0	1.0	40	-	0
10	500	8 S	0239.0	0239.0	1.0	10	-	0
10	500	4 S/F	0516.0	0521.0	6.0	45	-	0
10	500	8 S	0525.0	0526.0	1.0	290	-	0
10	500	8 S	0534.0	0534.0	1.0	15	-	0
10	500	8 S	0634.0	0634.0	1.0	230	-	0
10	500	8 S	0711.0	0712.0	1.0	35	-	0
11	500	8 S	0632.0	0632.0	1.0	40	-	
12	2800	8 S	2115.0	2117.0	4.0	55	-	0
12	500	8 S	2116.0	2117.0	2.0	20	-	0
13	500	8 S	0412.0	0412.0	1.0	10	-	0
13	200	7 C	2020.0	2022.0	6.0	35	-	0
13	200	8 S	2117.0	2117.0	1.0	15	-	0
16	500	8 S	2106.0	2107.0	1.0	20	-	0

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso June 2002

Single-frequency observations

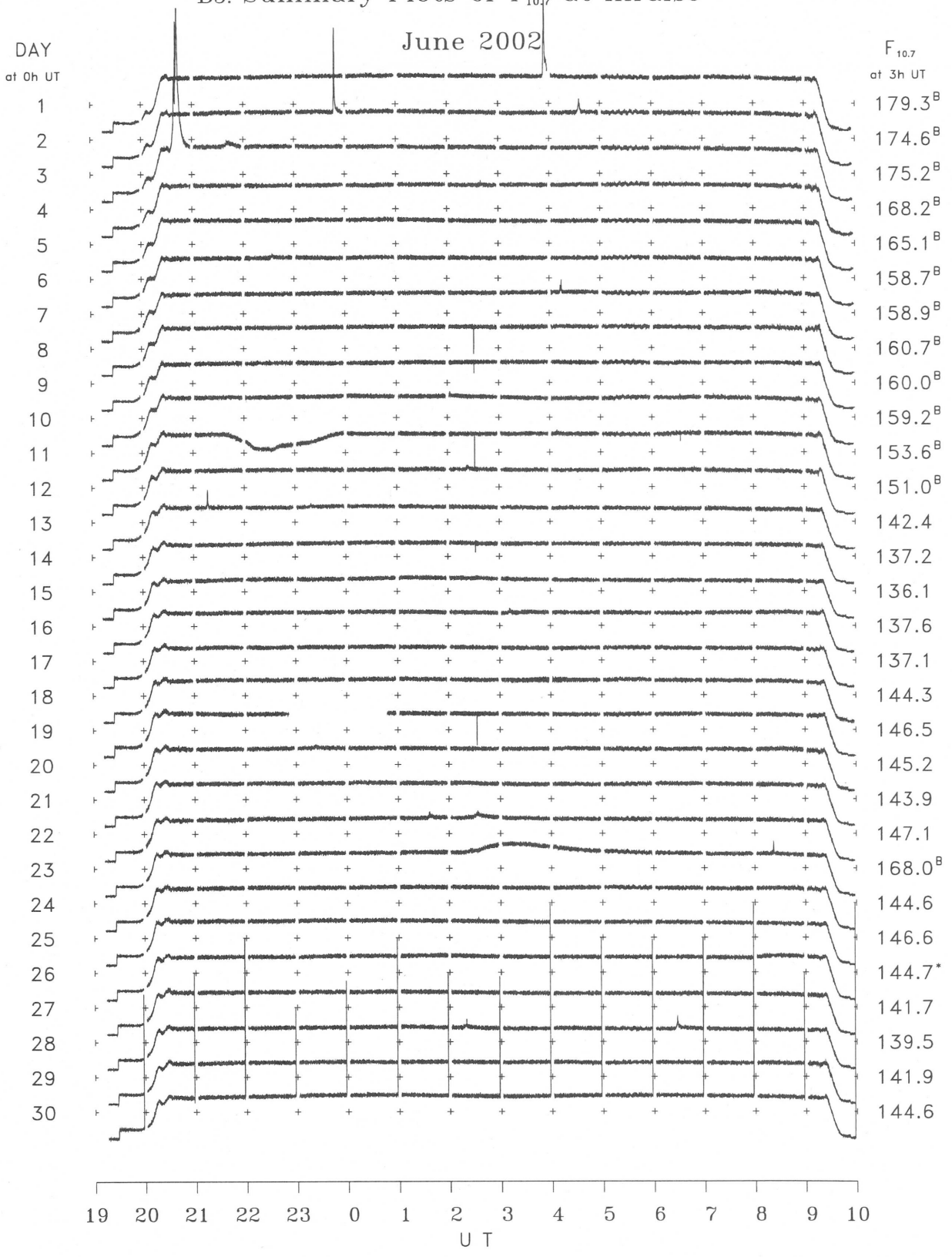
Normal observing period: 1915 - 1000 U.T. (sunrise to sunset)

JUN. 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
16	200	8 S	2235.0	2235.0	1.0	30	-	0
18	200	4 S/F	2052.0	2052.0	3.0	55	-	WL
19	200	8 S	0834.0	0834.0	1.0	235	-	WL
19	200	42 SER	2047.0	2054.0	11.0	10	-	WL
20	200	8 S	2331.0	2331.0	1.0	10	-	0
20	500	1 S	2333.0	2335.0	5.0	10	-	0
22	500	8 S	0336.0	0336.0	1.0	30	-	0
23	200	8 S	0445.0	0447.0	2.0	20	-	0
23	2800	8 S	0822.0	0822.0	1.0	30	-	
23	500	8 S	0822.0	0822.0	3.0	90	-	
24	200	8 S	0505.0	0506.0	1.0	115	-	0
24	200	8 S	2348.0	2350.0	3.0	10	-	0
25	200	8 S	0346.0	0346.0	1.0	10	-	0
25	200	8 S	0407.0	0407.0	1.0	50	-	0
25	200	8 S	0429.0	0429.0	1.0	15	-	0
25	200	8 S	0610.0	0610.0	1.0	200	-	0
25	200	8 S	2053.0	2053.0	1.0	15	-	0
25	200	8 S	2121.0	2121.0	1.0	20	-	0
25	200	8 S	2224.0	2224.0	1.0	15	-	0
25	200	8 S	2240.0	2241.0	1.0	10	-	0
25	200	8 S	2314.0	2314.0	4.0	40	-	0
26	200	8 S	0508.0	0508.0	1.0	20	-	0
26	200	8 S	0616.0	0618.0	2.0	35	-	0
26	200	8 S	0757.0	0757.0	1.0	25	-	0
26	200	8 S	2004.0	2006.0	4.0	270	-	0
26	200	8 S	2046.0	2046.0	1.0	20	-	0
26	200	42 SER	2258.0	2301.0	9.0	275	-	0
27	200	8 S	0007.0	0007.0	1.0	225	-	0
27	200	8 S	0011.0	0011.0	1.0	295	-	WR
27	200	8 S	0016.0	0016.0	1.0	35	-	WR
27	200	8 S	0333.0	0333.0	1.0	10	-	0
27	500	8 S	0337.0	0339.0	3.0	10	-	0
27	200	8 S	0748.0	0748.0	1.0	100	-	0
27	200	8 S	2202.0	2203.0	1.0	15	-	0
28	200	8 S	0044.0	0045.0	1.0	150	-	0
28	500	8 S	0045.0	0045.0	1.0	30	-	0
28	200	8 S	0103.0	0103.0	1.0	25	-	0
28	2800	4 S/F	0214.0	0220.0	7.0	25	-	0
28	200	8 S	0444.0	0445.0	2.0	65	-	0
28	2800	1 S	0625.0	0627.0	5.0	35	-	0
28	200	8 S	0710.0	0710.0	1.0	15	-	0
29	500	8 S	0030.0	0030.0	1.0	50	-	0
29	500	42 SER	0413.0	0413.0	3.0	20	-	0
30	200	8 S	0330.0	0330.0	1.0	60	-	0
30	200	8 S	2213.0	2213.0	1.0	10	-	0

B. Solar Radio Emission

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

June 2002



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

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