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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 ionospheric reflections
h'Es ***h'F***	Minimum virtual height on the ordinary wave for the ***Es*** and ***F*** layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

A Impossible measurement because of the presence of a lower thin layer, for example *Es* (for *foF2*).

C Impossible measurement because of any failure in observation.

G Impossible automatic scaling because of too small ionization density of the layer (for *fEs*).

N Impossible automatic scaling because of complex echoes.

Blank No digital record because of trouble in the automatic data processing system, but existence of film record.

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

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

AUG. 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	63	60		34	58	65	69	80	65			78	78	79	76	80	71	A		A	76			53
2	63	A	40	40	35	36					A		A			77	68	71	60	61	54			
3				40	44		62		A		73	72	71		A	A	A	A	81	84				67
4	64	A	.	66	38	44	56	67	71	73				70	74	82	83	82	78	81	66	67	64	71
5	66	59	64	56		66	70	83	71	72	64		74	71		72	A	A					64	
6				55	54	61	67	78	63		64	A		A		76	75	77	76	77	66	74		66
7	68	A		54	36	63	72	77	A	68	72		70	71	72	72	75	76	76	73	79	71		59
8	58	37		53	54	62	66	72		67			67	68	71	72	72	74	74	74	66	68	63	61
9	58			46		60	77	80	82	68	77	76	72	73	72	78	80	82	A		68	72	65	
10	53	65	62	64	63	68	80			61	71	71	70	77	A	77				73	71	72	73	68
11	65	62		58	53	63		67	72	70	74	72	73	74	72	74	71	72	77		78	65	74	71
12	66	65	65	64	61		89	70		62	57	68		A	62	64	70	66	73	67	72	72		64
13		61	52	54	52		59	58	75	78			76	74	82				71	73	74	72	72	72
14	69	55	62		79	54	66				81	79	70	80				77	80	82	83	82		66
15	66	63	69	52	79	64					A	59	A	67	64	68		71	76	60	75	67	66	61
16		54	55	53	51	63	52			69	A	A			59		56	61	A	58	61	54	55	44
17	40	37	54		35	38	56	A	A	A	A	A	A	67	67	66	75	73	A		A	A	60	54
18	44	35	37	44	36	54		66		49			A		64	64	66	72	71	72	62	66	53	
19	35					36	66	63	A	73		A	75			71	73	68	A	A			54	
20	35	34	60	36	69	70	66	70				72		77	82			A	77	74	63	73		67
21	66	54		36	41	44	65	71	59	59	A	A	70	73	80		77	72	74		60	66	66	60
22	58	54		A	40	A	49				62		83	74	77	81	77	74	73	77	64	62		53
23	62		53	57	59	45	67	71	74	73	82	74	85	80	72	78	73	80	82	80				
24	A	A				66		72	74	75			A	81	80	76	76	82	81	75	76		64	63
25	62				A	70	70	74	66	75	70	78	81	84	81	79	84	81	81	80	66	70	63	53
26	64		A	45	53	69	68	81	80	84		78	82	84	85	84	85	81	76	75	73	64	54	61
27			49	56		71	72	70	72	82	80	105	83	81	82	82	88	84	84	77		67		69
28	55		56			55	76	73		68	72	A		68	73	59	A	74	73	74	76	66	66	65
29			34	52	54	59	61	58	59	71	A		76		72	74	70	73	74	72	67			38
30	61		35	44	40	63	71	74	77	76	78	82	84	82	77	81	83	84	82	72	64		55	66
31	54				56	68	77	83	81	93	80	91	91	92	92	85	77	83	81	73	71	66	71	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	15	16	23	24	27	26	23	16	22	16	15	20	23	24	25	23	25	24	24	25	21	19	24
MED	62	55	54	53	53	63	67	72	72	72	72	76	76	74	74	76	75	74	76	74	68	67	64	64
U Q	65	62	62	56	58	66	72	78	76	75	79	79	82	81	80	80	80	81	81	77	75	72	66	67
L Q	54	37	44	44	40	54	62	67	65	68	67	72	70	71	71	71	71	72	73	72	64	66	55	56

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

AUG. 2002

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	41	60	44	77	80	84	61	G	75	72	66	111	90	98	36	60	79	38
2	42	61	40	35	G	29	46	48	70	67	80	76	82	64	76	G	46	40	G	33	32	41	60	60
3	75	43	46	26	38	59	G	67	72	84		G	48	80	98	132	111	143	99	32	30	66	51	41
4	37	28	41	59	38	G	G	G	42	65	76	95	99	61	46	64	43	44		G	G	34	33	58
5	51	35	48	G	34	30	47	77	65	62	50	65	G	48	109	66	79	116	136	96		33	46	56
6	48	46	39	30	37	30	44	62	75	74	50	88	133	102	82	70	50	70	72	68	59	60	72	50
7	50	50	43	39	30	G	40	53	81	70	66	48	G	G	G	G	G	44	43	G	28	G	G	29
8	33	30	59	29	G	G	39	47	68	59	77	68	59	59	56	66	50	48	49	50	42	59	39	52
9	81	58	34	36	30	G	G	50	60	G	67	69	46	G	45	41	48	56	90		38	G	40	39
10	36	33	24	28	39	38	68	105	178	44	63	68	62	49	107	70	100	39	54	29		42	29	G
11	25	30	46	39	28	33	60		62	55	60	62	53	G	77	G	G	38	40	29	34	59	71	36
12	52	40	45	35	25	38	46	50	58	59	59	67	G	84	48	51	59	44	48	107	69	44	78	60
13	28	28	35	38	24	33	42	52	54	51	47	G	G	G	44	47	77	38		40	70	64	28	G
14	G	G	G	G		83	G	62	51	45	46	G	G	60	68	65	84	66	39	40	G	23	67	26
15	33	31	28	26	G	36	61	45	70	58	62	47	59	51	47	46		67	48	78	73	41	24	30
16	G	G	G	31	26	31	38	61	56	46	44	60	G	G	G	G	39	52	80	39	36	G	G	27
17	28	G	31	G	G	35	45	50	63	60	81	106	97	G	66	52	58	51	87	71	94	87	32	G
18	G	G	G	G	G	G	G	G	45	G	G	G	52	47	47	59	46	49	48	37	G	G	34	72
19	33	45	37	35	39	38	40	48	77	58	64	58	46	46	G	G	40	75	88	78		72	25	
20	G	G	G	G		G	48	50	46	G	G	G	G	G	46	180	96	120	60	97	60	29	25	32
21	28	G	G	G	G	G	44	38	G	50	45	79	47	G	58	73	G	48	56	83	30	40	43	G
22	G	29	33	40	32	44	52	58	60	64	45	G	60	48	G	49	44	40	G	27	28	27	27	G
23	G	G	G	G	G	G	G	69	79	43	G	G	G	G	47	G	41	37	36	32	32	38	78	106
24	79	72	41	45	48	G	60	54	61	60		G	96	G	G	G	G	41	G	44	63		30	32
25	46		G	39	57	43	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	G	G	G
26	32	35	30	32	30	G	G	40	G	44	G	46	G	G	G	G	G	G	44	31	G	27	G	G
27	33	38	34	G	G	G	G	G	58	53	51	G	52	51	60	62	54		35	32	61	42	38	
28	39	G	G	32	G	G	54	69	63	70	G	85	G	62	59	57	90	59	37	66	29	G	G	G
29	G	32	G	G	27	G	G	G	43	G	79	48	G	46	61	49	50	82	G	G	32	72	68	39
30	32	G	G	G	G	G	35	40	46	50	50	56	G	56	50	G	G	39	G	30	44	40	42	58
31	G	41	36	34	29	29	G	G	52	57	50	G	G	G	G	40	G	G	G	26	G	39	38	38
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	29	31	31	30	31	31	29	31	31	31	31	31	30	30	29	30	28	30	31	29
MED	33	30	33	30	27	29	40	50	60	57	50	56	46	46	48	49	47	48	48	38	33	40	38	36
U Q	46	41	41	36	35	36	47	61	70	64	66	69	60	59	68	66	66	67	76	71	59	59	60	54
L Q	G	G	G	G	G	G	G	40	46	44	44	G	G	G	G	G	G	39	18	29	28	27	25	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

AUG. 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	17	18	21	20	18	18	17	17	20	30	22	26	21	20	21	20	21	14	14	14	15	14	14	14
2	14	15	15	14	20	16	20	18	20	20	23	20	23	18	18	21	17	15	14	14	15	14	14	14
3	14	18	14	20	14	18	18	20	24	21	40	34	20	21	20	20	16	14	15	14	14	20	14	16
4	15	20	15	16	14	21	21	18	21	24	22		23	24	23	20	18	14	14	21	15	14	14	14
5	14	17	18	18	14	18	15	14	18	17	20	22	20	21	23	17	18	14	14	14	14	17	14	14
6	14	18	17	18	15	17	17	20	22	18	20	39	21	22	21	20	17	14	14	15	14	16	14	15
7	15	15	20	16	17	22	18	17	18	15	20	26	18	20	20	18	18	16	14	20	17	18	14	14
8	14	20	17	18	18	20	18	20	21	20	18	21	23	21	18	14	15	14	14	14	14	15	14	14
9	14	15	17	17	14	14	16	16	18	23	20	21	33	26	18	18	17	14	14	14	14	17	15	14
10	15	14	14	14	14	14	14	14	20	18	22	23	27	20	23	20	15	14	14	14	14	14	15	17
11	14	14	14	14	14	14	14	14	18	20	20	22	27	20	21	20	15	15	14	14	14	14	14	15
12	15	14	14	14	14	14	15	18	18	20	21	20	22	22	21	20	14	14	14	14	14	14	14	14
13	14	14	14	14	15	14	14	14	18	21	20	20	24	22	22	18	15	15	14	14	14	14	14	15
14	14	14	14	14	15	14	14	17	18	20	21		53		23	18	20	15	14	18	14	16	14	16
15	14	14	15	14	14	14	14	15	18	21	21	28	36	22	18	20	14	14	14	14	14	14	15	14
16	15	14	14	14	14	16	14	14	20	21	23	22	21	21	18	23	18	17	14	14	14	20	20	17
17	15	18	15	21	21	17	20	20	20	22	23	29		22	22	20	20	14	17	14	17	14	18	18
18	18	21	20	18	23	20	21	17	23	22	22	27	23	24	20	20	16	14	14	14	20	18	14	14
19	20	15	18	18	17	17	18	20	20	20	23	22	21	24	22	21	18	14	14	14	17	15	18	14
20	20	22	20	18	18	21	14	18	23	21	14	33		20	20	18	17	14	14	14	14	15	18	14
21	16	18	20	23	18	17	20	20	22	21	21	34	26	22		38	21	14	14	16	20	15	15	18
22	17	17	20	17	17	14	23	20		22	32		32	23	22	20	20	16	15	15	15	14	21	20
23	17	23	21	21	14	21	14	17	23	22	27	20	26	21	18	22	15	15	14	14	15	14	14	16
24	17	18	14	17	16	21	18	18	20	21		14	34	23	20	21	14	17	16	14	14	15	14	20
25	14		21	18	14	16	18	18	20	20	20	18	22	20	21	16	15	14	20	14	14	23	20	22
26	15	17	17	18	18	20	22	17	21	24		24	21	21	21	17	16	14	14	14	15	16	15	17
27	17	14	14	20	20	21	14	15	16	16	21	23	21	22	21	17	16	14	14	14	14	15	15	14
28	14	21	18	17	22	22	16	16	18	20	20	20	21	20	20	20	17	14	14	14	14	18	14	15
29	23	20	21	20	18	27	26	18	18	21	22	32	29	39	22	20	18	15	14	14	15	15	14	14
30	16	20	21	16	18	20	14	14	20	21	23	22	26	21	20	14	15	14	14	16	14	14	15	14
31	18	14	15	16	18	16	16	14	18	20	22	21	22		20	18	16	14	14	17	15	15	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	31	31	31	31	31	31	30	31	29	28	29	29	30	31	31	31	31	31	31	31	31	31
MED	15	17	17	17	17	17	17	17	20	21	21	22	23	21	21	20	17	14	14	14	14	15	14	14
U Q	17	20	20	18	18	21	20	18	21	22	23	27	27	22	22	20	18	15	14	15	15	17	15	17
L Q	14	14	14	14	14	14	14	15	18	20	20	20	21	20	20	18	15	14	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

AUG. 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				58	52			A	92	94	98	79	85	94	90	91	93		102		75	66	56	55
2	52		75			A		71	73	75	A		A	86	88	91	100	81	75	A	52	52	53	53
3	54		52		54	54	69	77	83	83	92	91	96	93	98	92	88	86	83	88	85	75	74	77
4	76		76	74	54	55	70	76	75	83	89	93	96	92	87	96	103	99	101	84	73	59	66	55
5	69	55		47	54	56	90	98	74	69	76	73	77	83				92	100	103	85		74	74
6	65			54	54	65	119	86	86	80	69		A		85	91	96	93	97	85			53	
7	74			54	54	57	82	104	93	73			80	81	84	87	84	90			84	78	55	
8					46	56	74	78	82	73		81	81	76		84	90	87	92	84	54	54	72	57
9	54	55	55	45	46	59	81	81	75	77	76	78	77		90	92	85	82	85	78	73	75		
10		65			66	73					75										74			89
11	64	89		55	54	79							86								80	75	80	72
12	77	74	68	67			78														66	69	89	66
13	89	66	66					89												85			74	
14	66	67		79	55					84		91									84	84	99	
15	75		63	64	59		99	89	99			73	74	77								74	78	76
16	66	67	55	61	55	54	58					60	67	76	78	77	74	72	83	76	66	58	54	
17	A	A	54	54				52		A	A		82	81	86	82	85	85	86	81	66	64	61	54
18	64	54	46		59	55	86	82	83	82	82	80	82	82	87	85	83	86	86	84	72	66		64
19			54	48		56	70			93	86	A	103	92	83	85	90	78		82	67	55		
20		59	59	55	53	57	72	85	92	106	89	91	103	104	101	95	97	101	94	77				
21	73	73	52	55	38	68	77	87	84	82	90	101	110	106	100	101	95	91	85		66	64	54	
22		54	48	54		52	57	63			84		100	110	108	103	94	91	81	83	74	73	76	57
23	54	52		54	52	57	76	85	85	87	91	88	96	93	98	101	101	101	96	83		74	66	54
24	A			53		56	85	88	98	94			102	97	95	92	92	93	90	84	80	77	74	54
25	A	54		54	A	71		91	90	84	94	94	92	93	104	102	97	96	96	84	73	78		66
26	74	52	A	55	55	69	77	85	82	92	82	90	97	98	105	108	107	105	105		78	77	76	54
27	74		48		61	76	71	78	83	100	98	96	101	108	95		107	104	102	85	65	72	54	75
28	56	76		54	55	55	77	100	96	98	98	120	117	96	93	101	91	82	85	83		74	71	77
29	65	56	56	46	48	52	63	76	80	73		82	78	92	90	82	85	80	85	85	66	74	64	
30	56		58	55	48	54	77	75	82	82	88	94	91	94	93	87	92	100	114	85	73	78	73	64
31		66	54	55	55	60	81	93	87	91	93	100	103	102	100	104	93	97	96	84	81	78	77	72
	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	18	18	24	23	24	23	24	22	23	19	20	25	24	23	23	24	24	23	21	25	26	25	21
MED	66	62	55	54	54	56	77	85	84	83	89	90	92	93	93	92	92	91	92	84	73	74	72	64
U Q	74	67	63	56	55	66	82	89	92	93	93	94	101	97	100	101	97	98	100	85	80	77	76	74
L Q	56	54	52	54	52	55	70	76	82	77	82	79	80	82	87	85	86	83	85	82	66	64	55	54

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Kokubunji

AUG. 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	84	61	28	52	41	51	74	90	107	116	103	58	51	69	G	G	61	68	35	54	31	G	G	45
2	34	30	33	39	43	50	110	53	59	79	79	120	173	60		82	102	95	74	80	35	32	G	28
3	30	62	46	60	48	45	49	G	G	53	65	63	60	82	60	61	57	53	48	G	G	G	41	30
4	26	G	59	26	G	G	G	G	G	G	G	75	62	65	78	103	53	62	53	36	24	G	33	G
5	35	G	G	31	G	G	G	38	60	88	102	G	61	G	140	150	154	131	131	59	85	82	49	53
6	36	53	33	32	50	G	39	105	126	G	G	53	73	58	46	G	G	G	71	69	34	135	G	80
7	46	80	60	38	G	G	45	50	52	70	88	68	47	G	G	G	66	84	124	134	33	34	G	91
8	79	56	51	33	G	G	G	51	61	70	85	66	64	82	92	61	62	G	34	33	28	G	G	G
9		G	35	38	33	26	41	43	67	56	58	78	53	103	71	60	56	67	57	51	56	43	136	92
10	61	82	60	60	38	61		44	58	52	53	63	110	80	91	97	71	62	33	11	31	22	G	27
11	45	G	26	31	28	33	60	53	102	71	63	63	87	48	47	G	G	G	33	91	60	53	34	34
12	29	26	24	33	26	G	G	46	60	54	66	62	G	57	G	G	G	39	92		27	G	26	46
13	33	34	28	35	33	25	41	51	52	82	94	60	47	G	93	45	46	36	G	26	36	92	60	29
14	G	26	G	G	G	22	G	39	G	62	58	54	46	G	53	56		92	61	41	51	33	41	31
15	27	30	G	31	29	30	37	43	68	56	71	57	69	G	G	175	132	113		112	68	52	40	28
16	52	G	34	34	26	27	G	47	60	G	G	G	47	G	G	G	40	52	48	39	39	52	31	60
17	60	40	G	G	28			52	G	49	58	G	50	47	G	G	60	77	71	80	33	57	27	58
18	62	G	G	G	36	G	G	G	47	56	57	G		G	47	52	G	41	G	G	72	59	52	G
19		G	G	G		G	G	45	61	73	77	124	64	75	G	49	55		57	52	52	25	60	69
20	60		G	28	G		G		60	61	62	47	55	63	88	89	88	96	59	57	81	91	107	49
21	54	29	34	28	G	15	49	G	53	63	62	70	50	G	G	G	G	34	G	G	G	26	38	31
22	35	G	G	G		G	G			60	79		76	64	70	53	G	35	32	38	30	30	40	G
23	28	G	25	G	G	G	G	G	G	56	70	55	54	G	G	G	42	G	G	34	33	29	G	G
24	26	G	28	G		G	G	43				G	G	G	G	G	G	34	30	G	G	G	G	G
25	27	G	47	30		G	G	G	G	G	G	G	G	G	G	G	G	G	35	29	31	G		G
26	G	G		G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	25	G	G
27	G	G	G	G	G	G	G	G	47	62	G	61	51	70	77	99	107	53	40	35	29	G	49	60
28	49	43	G	G	G	G	48	59	56	G	G	G	55	55	53	57	46	35	G	31		49	43	53
29	34	31	G	G	G	G	G	G	G	G		46	49	47	46	63	60	44	49	84	49	40	G	33
30	34	35	26	G	G	29	G	G	G	G	G	60	50	60	47	G	G	37	33	47	50	52	50	53
31	88	35	29	G	G	G	G	G	G	53	79	68		G	54	60	50	52	61	59	31	33	27	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	31	27	29	29	28	29	30	29	30	29	31	30	31	30	30	30	30	30	31	30	31
MED	35	28	27	28	G	G	G	43	53	56	62	59	53	48	47	52	52	48	44	40	33	33	34	31
U Q	57	40	34	34	33	28	43	51	60	70	79	66	64	65	71	63	62	68	61	59	51	52	49	53
L Q	27	G	G	G	G	G	G	G	G	G	G	G	47	G	G	G	G	34	32	29	29	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

AUG. 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	20	20	21	18	28	20	30	17	28	33	31	30	30	40	46	22	24	18	14	13	15	22		20
2	17	21	20	18	20	22	17	22	26	37	39	33	36	36	42	22	31	13	13	15	14	15		20
3	20	20	20	20	18	18	17	20		40	40	42	40	37	37	20	18	13	14	20	18	14	17	21
4	17		20	22	22		34	18		43	48	40	39	37	37	29	24	18	13	13	14	15	17	
5	17		30	14	21	21	18	18	21		33	31	33		39	22	21	13	13	13	14	13	17	17
6	15	18	20	20	20		18	20	28	28	42	37	31	26	24	21	17	18	13	13	13	14		15
7	20	18	17	18	17		21	17	21	33	26	36	23	29		20	18	13	13	13	14	17	20	15
8	17	17	20	20				20	33	33	31	30	33	29	29	22	18	14	13	13	13	17		21
9	20		20	21	17	21	15	15	20	34	35	35	37	31	39	34	26	15	14	21	17	13	18	15
10	15	13	13	13	13	13	13	15	20	28	38	37	39	38	28	21	17	17	14	15	13	13	13	13
11	14	17	17	13	13	13	13	14	20	30	34	34	36	34	25		18	14	13	14	13	13	13	13
12	13	13	13	13	13	15	14	21	20	25		35	34	36	33	21	20	14	14	13	13	13	14	13
13	13	13	14	13	13	17	13	15	22	28	35	37	38	41	33	29	20	13	14	13	13	13	13	13
14	14	13	13	13	13	18	13	14	18	20	25	42		52	30	25	20	15	13	13	13	13	13	13
15	13	13	17	13	14	13	13	14	20	36	37	37	40	40	52	23	21	15	15	13	13	13	13	13
16	14	14	13	13	14	17	14	17	20	28	31	42	38	30	44	52		18	14	14	18	15		20
17	21	22			21		20	20	21		34	43	42	42		23	20	17	18	15	15	13	18	17
18	13			21		29		21	31	35	39	43		49	40	38	20	15	22	18	17	14	14	18
19	25							20	28	39	36	36	42	38	42	38	21	14	13	14	18	20	18	15
20	18			21		34	18	18	21	36	38	40	44	42	39	31	18	15	13	18	15	13	14	17
21	20	15	17	17			20	18	36		40	40	42	44		50	23	15	13	14	15	28	17	13
22	14			21		21		17	36	39	40		39	39	37	31	22	17	13	13	13	14	18	20
23	20		18	15		18	31	20	40	37	38	34	35	43	28	48	20	15	14	13	13	13	21	
24			21				20	18	21	34		74	60	47	46	54	15	14	18	29	17	18	26	
25			18	17		20	17	17				43	42			24	18	13	14	17	13	15	13	
26	17			20	21	30	35	15	20	47	68	43	50	44	43	20	20	14	15	13	28	17	30	
27	20		18			21	31	15	18	37		39	40	39	39	20	17	15	13	14	13	17	14	15
28	15	20		21	37		20	15	21		31		40	37	35	17	18	13	20	15	14	14	17	17
29	18	17			20	31	25	17				54		40	38	24	18	14	13	15	14	14	23	18
30	13	18				15	18	18		44		31	42	22	28	14	20	15	13	18	14	14	17	17
31	15	20	13	20	26	33	28	17	31	36	34	36	31		25	20	18	13	14	14	14	13	13	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	19	22	25	20	22	27	31	26	25	25	29	28	28	27	30	30	31	31	31	31	31	26	26
MED	17	17	18	18	19	20	18	17	21	35	36	37	39	38	37	23	20	15	14	14	14	14	17	16
U Q	20	20	20	20	21	22	25	20	28	38	39	42	42	42	42	31	21	15	14	15	15	17	18	18
L Q	14	13	14	13	13	17	14	15	20	29	32	34	34	35	29	21	18	13	13	13	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

AUG. 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	78				75	70	80	90	78	81	80	87	84	81	80	89	110	88		78			64	75
2	76			69			50	67	75	C	74		71	77	A	79	81	80		A	44	51	A	55
3				54			61	66	68	75	77	85	77	88	79	87	87	100		92	78	85	79	
4	78	94	80	77	72		75	73	74	80	81	80	86	84	87	A	108		121	86	79		66	71
5		54	A		52	54	72	88	72	70				87	84		A	A		75	78	77		77
6	A		A	59	52	64	73		72	72	58		78	83	85			113	94	85	78	66	61	66
7		64				51		87	78	66	A		79	78	85	86	87	A		79		80	76	77
8	60		49		52	51	67	92	80		76			82	81	100	107	109	86	86	77	74	78	78
9		59		52	50		74	81	66	71	A	A	80	81	87	88	88	88	86	80		78		66
10	A	53	62	79	72	66	78		92	74	76	67	80	84	102	A	117	114	119	91	80	89	86	84
11	64	74	70	75	70	64	76		78	79			97	86			96		99	86	77	83	71	80
12	86	96	72	71	72	64	77	99		79	82		98	94	108		123	110	129	109	88	76	76	85
13	74	79	74	76	87	66	70	94	82	97	111	93				126	110			78	88	78	88	86
14	84	81	75	77	64	67	85			80	94		79	99		126	130	112	120	90	88	87	122	101
15	102	76	66	75	68	73	65	73		79	98	97	80	81		110				80	A	A	A	86
16	75		64	59	61	54	56	70	67	58	A	74	81	70	86	84		86	109	86	77	77	67	66
17	51	66	62	65	54	54	54	58	60			76	80	80	82	84	84	87	96	87	78		73	76
18	70			58	54	60	75	90	76	81	78	80		87	86	86	88	92	87	86	79		75	76
19	76	67	55	64	67	62	69	79	81	79		79	88	86	80	113	104	86	81	85	78	52		65
20		60	73	76	52	54	67	80	84	C	C	82	85		111		111	116	111	117	77	80		79
21	78	84	82	80	66	66	74	80	92		85	84	116	87		114	112	112	107	87	77	73	67	78
22	77	71	72	72	56	50	69	72	72	78	80		113	128	140	146	148	142	116	110	80	78	77	66
23	73	74	72	67	62	55	67	80	78	80	77	82	86	86	87		112	111	133	85	80	78	80	78
24	80	77	76	76	72	66	80	82	86	81			87	84	82	79	115	111	116	117	87	82	82	76
25	78	76	72	65	70	57	75	82	81	81	81	81	84	87	113	111	108	103	96	86	78	80	78	76
26	78	76	76	73	78	64	66	93	81	84		78	87	112	101	112	114	135	124	110	81	76	78	74
27	77	77	59	52	68	67	74	91	85	94	87	84	84		99	110	111	113	116	86	78	74		67
28	73	73	74	60	55	55	67	81	86	84	82	111	112	86	A	114	A	114	A	97	78	82		87
29	86	84	79	78	68	51	66	84	84	78	76	80	86	87	90	100	109	104	105		78	80	78	77
30	78	73	76	62	62	60	67	94	76	C	78	80	88	109	111		107	115	126	110	77	73	76	76
31	74	76	66	53	54	56	75	78	78	79	82	86	85	104	108	112	115	126	111	85	80	78	82	78
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	24	23	27	28	27	30	27	28	25	21	20	27	28	24	22	26	25	23	29	27	26	23	30
MED	77	75	72	69	65	60	71	81	78	79	80	82	85	86	87	105	110	111	111	86	78	78	77	76
U Q	78	78	76	76	71	66	75	90	83	81	83	85	88	87	105	113	114	114	120	94	80	80	80	79
L Q	73	66	64	59	54	54	67	73	73	74	76	79	80	81	83	86	96	90	96	85	77	74	71	71

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Yamagawa

AUG. 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	64	73	72	71	57	54		63	63	69	76	63	52	59	G	G	62	58	52	52	72	86	42	36
2	G	30	58	40	52	30	36	44	44	C	59	55	65	82	91	G	55	66	88	86	G	34	59	35
3	36	54	43	43	51	40	50	42	G	G	52	G	61	66	60	G	G	59		41	46	52	27	72
4	48	30	G	27	39	28	G	G	50	G		69	51	49	75	88	145			60	61	59	42	58
5	39	G	81	58	28	G	33	39	48	60	89	86	121	63	84	77	135	150	152	61	44	48	80	52
6	30	G	39	34	36	30	G	G	56	49	60	72	74	54	G	G	54	46	63	46	50	29	26	G
7	G	45	58	60	72	34	81	38		62	96	118	G	54	79	59	73	160	128	66	59	34	54	34
8	G		G	G	G	G	G	44	60	84	65	90	91	78	61	50	60	76	60	60	49	42	29	30
9	G	G		G	G	G	27	42	52	43	119	111	G	G	57	72	60	68	46	56	33	39	39	60
10	103	59	40	44	41	49	49	38	43	43	G	58	49	63	67	83	80	59	92	42	36	40	36	35
11	36	28	26	26	23	G	30	40		71	84	54	59	80		48	46	43	G	28	G	G	G	33
12	53	39	31	G	G	G	29	38	56	58	68	86	G	G	G	56	89	78	58	55	27	78	G	G
13	G	41	33	32	28	32	G	G	51	49	57	84		62		51	49	40	G	G	40	34	67	94
14	94	G	26	G	G	G	G	G	44	G	G		G	G	G	73	78	89	36	25	39	G	28	G
15	29	30	24	G	27	28	G	G	G	60	53	71	61	57	60	66	84	93	92	67	102	93	116	81
16	61	79	29	32	25	G	38	56	64	56	86	G	83	G	G	G	122		58		79	40	30	24
17	27	G	G	G	G	G	G	G	G	G		G	G	G	G	G	51	46		34	60	72	28	40
18	46	58	60	35	41	34	27	G	46	60	58	52		G	G	G	56	44	73	44	94	134	66	59
19	49	29	28	G	G	G	30	35	G		70	63	G	G	58	G	58	50	40	30	29	24	70	41
20	61	61	41	40	32	32	38		39	C	C	62	G		G	71	81	91		40	33	40	90	71
21		30	27	33	40	G	G	G	58	82		71	57	G	G	G	50	G		40	29	26	43	49
22	38	27	34	26	26	23	29	G	41	59	68		85	75	88	84	G	G	G	G	G	26	G	23
23	57	27	25	G	25	G	G	G	G	G	G	47	G	G	G	105	73	G		28	40	29	26	26
24	G	G	G	G	G	G		G	39	G			G	G	G	G	G	G	39	G	G	28	G	26
25	34	G	30	33	34	36	27		G	G	G	G	G	G	58	44	47	59	37	30	39	G	G	29
26	23	G	25	G	G	G	29	G	G	G		G	G	60	52	59	54	42	33	29	25	G	G	G
27	G	G	G	G	G	G	G			G	G	G	G	48	54	55	57	46	39	27	G	23	23	G
28	G	G	G	G	G	G	27		44		80	61	86	84	107		119	73	110	53	24	50		60
29	72	49	33	31	33	29	28	60	G	G	G	G	G	57	57			54	60	58	82	71	43	40
30	32	27	26	G	G	G	G		G	C	51	48	G	60	G	G	G	37	G	25	37	41	32	24
31	24	31	33	34	28	24	G	G	G	56	G	56	60	71	60	G	44	82		72	54	43	36	28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	31	31	31	29	26	28	26	25	28	29	30	29	29	30	29	24	30	31	31	30	31
MED	35	30	30	27	27	G	27	18	44	49	59	60	49	56	57	50	58	58	55	42	39	40	34	35
U Q	53	45	40	35	39	32	31	42	51	60	78	71	63	63	64	71	80	77	80	58	59	52	54	58
L Q	G	G	25	G	G	G	G	G	G	G	G	24	G	G	G	G	49	42	36	28	27	26	26	24

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

AUG. 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	14	14	17	18	17	17	14	16	22	36	41	34	34	34		58	35	21	16	15	17	15	15	15
2	20	20	17		17	16	15	15	24	C	34	38	44	43	44		34	27	15	14	16	15	14	15
3	15	14	16	15	17	15	14	16		28			42	45	44		22	17	15	15	15	16	17	15
4	15	15		16	15	18					29	34	43		42	35	27	14	15	15	14	15	16	14
5	15		21	21	15		14	14	18	21	33	41	38	36	40	29	26	21	14		15	15	14	14
6	16	17	16	15	18	16	22	22	21		33	44	35	36	32			17	14	15	14	15	18	15
7		15	21	27	18	14	14	15	20	22	28	40	32	28	29	23	21	30	14	14	14	14	14	14
8	16		16		17	15	14	15	21		36	34	35	33	29	26	21	16	14	14	14	14	15	14
9		32		17	17	16	20	15	21		38	38		60		39	26	17	14	14	15	15	15	18
10	14	14	14	14	14	14	14	15	17	21	28		42	43	32	36	21	18	15	14	14	14	14	14
11	14	14	15	14	15	15	15	16	16	21	34	34	38	35	32	30	18	14	14	16	15	14	14	14
12	14	14	14	14	15	14	14	15	17	21	28	39					32	17	15	15	14	14	15	14
13	14	14	14	14	15	14	14	16	18	22	38	39		42		29	23		14	18	14	14	14	14
14	14	14	14	16	15	14	16	14	16	20				53		35	23	17	15	14	14	16	14	15
15	14	14	18	14	14	14	20	16	17	24	24	39	44	42	40	39	28	20	15	14	14	14	14	14
16	14	14	14	14	14	14	14	15	17	21	37	60	34			58		17	15	14	14	14	14	15
17	14	15	15	15	15	15	20	15	17	20		62					33	18	14	14	14	14	15	14
18	14	14	14	14	14	14	15	14	17	21	41	39						18	15	14	14	14	14	14
19	14	14	14	14	14	15	15	16	17	33	33	40			43	32	21	20	14	14	14	15	14	14
20	14	14	15	14	14	14	14	14	18	C	C	43	68		55	40	22	16	15	14	14	14	14	14
21	14	14	15	14	14	15	20	14	14		40	44	43		62	59	40	18	14	14	14	15	14	14
22	14	14	14	15	14	15	15	14	18		42		43	44	43	39		20	15	17	14	15	14	15
23	14	14	14	14	15	15	23	16	21		53	40	53			44	28	17	16	14	14	14	14	15
24	15	15	15	15	15	16	14	14	17				74		50	62	38	18	17	18	15	14	20	15
25	14	15	15	14	14	15	15	15	18	18				51	42	30	18	17	15	14	14	14	14	14
26	14	15	14	15	15	15	14	15	15	42		54	53	41	39	24	17	17	16	14	15	15	15	14
27	15	15	14	15	14	14	16	15	15	18					39	34	20	15	15	14	14	15	15	17
28	14	14	15	14	15	14	14	14	14	21		40	42	43	38	21	20	15	14	14	14	14	15	14
29	14	14	14	14	14	14	14	14	17	20	51	59	64	41	44	38	14	17	14	14	14	14	14	14
30	14	14	14	15	15	14	21	15	17	C	34	38	60	38	50		23	18	14	15	14	14	14	17
31	14	14	14	14	14	14	17	14	17	22	43		42	44	33	29	21	16	14	14	14	14	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	31	30	30	30	29	20	22	23	22	20	22	24	27	30	31	30	31	31	31	31
MED	14	14	15	14	15	15	15	15	17	21	35	40	42	42	41	35	23	17	15	14	14	14	14	14
U Q	15	15	16	15	15	15	17	16	19	23	41	44	53	44	44	39	28	18	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	17	20	33	38	38	36	33	29	21	17	14	14	14	14	14	14

HOURLY VALUES OF foF2 AT Okinawa

AUG. 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	80		69	75		82	88	109	101	90	97	107	104	98	106	130	137	112		110	A	75	74	78
2			73		50	54	54	74	86	89	90	83		92	96	86	101	94			63	54		54
3		53				53	56	64	74	82	82	100	93	102	108	104	110	115	123	105	85	80	86	
4	87	85	89	79	87		75	73	80	88	92	88	100	116	A	108	120	131	140	89		72	72	83
5	72	74		61	57	64	75	82	72	71	71	77	92		A		102	118			86	85	88	
6	A			74	71		82	75	74	66	72	86	85	87	101	113	115	117	117	108	77	73	64	75
7	82	92	92	73	72	75	98	90	68	72	75	76	92	101	99	104	114	121	128		112		100	108
8			83	83	71	65	71	98	85	80	81		108	112	A	128	128	121	112	102	87	92		
9			74	85	83	78	94	80	63	75	87	84	88	98	101	109	110	115	112	101	87	87	86	74
10	81		66	66	66	71	76		76	106	92	74	76	107	102		105	124	126	102	87	86	87	86
11	78	79	80	73	67	61	74		90	86			100	116	118	117	115	117	129	137	85	80	78	80
12	85	100	78	77	80	74	72		100	103	85	98	104	102	110			140	149		89	96	88	86
13	87	87	86	84	80	76	76	87	102	113	92	100			108	A	135	151	132	103	90	87	86	90
14	88	93	88	75	60	61	66				82	100	114	132	124	125	122	141	138		130	146		108
15	105	98	81	70	82	66	72	85	114	115	101				106	113		129				87	87	
16		84	76	72	71	54	59	81	81	93	88	84	91	104	107	112	A	122	141	107	100	108	83	85
17			74	67	58	46	54	68	63	68	78	88	94	100	102	107	116	121	118	108	87	88	80	
18	74	73	66	66	63	53	62	91	77	85	92	88	100	108	120	115	111	120	118	100	96	84	86	86
19	A	75	74	70	67		60	83	98	81	64	101	108	102	102	105	115	108	94	106	87	76		74
20	80		72	73	46	46	60	81	C	91	92	92	117	134	136	141	144	143	152	134			89	93
21	A	96		87		64	73	98	86	86	101	111	132	124	119	132	130	130	132	108	90	78		
22	82	72	74		46	46	60	93	90	97	103	106	132	150	152	172	174	172	172	138	130	108	109	104
23		75	79	80	73	72	73	93	84	86	84	89	106	110	108	121	126	134	123	106	96	83		86
24	96		83	84	84	73	76	87	93	90			106	108	120	124	134	137	147	135	109		97	84
25	76	82	76	74	75	66	67	78	86	90	81	91	96	107		125	122	116		100	84	100	86	85
26	86		75	74	85	63	57	77	85	83	74	91	100	101	102	123	130	136	156	142	89	84	77	80
27	80	86		66	75	73	93	87	93	92	87	94	107	108	114	112	128	127	131	107	86	85	81	71
28	76	76	77	72		54	62	91	90	94	94	121	120	115	121	C	C	137	C	109	98	104	103	C
29	87	C	C	C	C	C	C	C	C	C	82	C	C	C	C	110	C	C	140	109	99	92	89	C
30	C	86			75	60	64	84	85	84	88	106	117	128	145	148	145	147	163	140	98		97	88
31	84	89	69	70	52	63	72	84	81	84	88	100	104	110	120	130	152		158	138				
	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	20	24	26	26	27	30	26	28	29	29	26	27	27	26	26	26	29	25	25	26	26	24	22
MED	82	84	76	74	71	64	72	84	85	86	87	92	104	108	108	116	122	124	132	108	89	86	86	85
U Q	87	90	82	79	80	73	76	91	91	92	92	100	108	116	120	128	134	137	148	134	98	92	89	88
L Q	79	75	73	70	60	54	60	78	76	81	81	86	93	101	102	109	114	117	120	102	86	80	80	78

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

AUG. 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	26	G	G	G	85	56	70	56	48	75	73	116	92	G	G	G	95	80	136		89		G	G
2		G	G	G	G	28	G	38	46	52	49	50		56	70	73	60	62	87		51	G		G
3	G	41	52	48	53	38	G	33	G	G	G	51	54	57	80	G	49			49		56	52	92
4	53	G	44	G	25	32	92	61	56	54	60	G	61	94	128	79	99	90	79	62	44	G	G	G
5	G	33		G	G	G	G	G	45	58	65	76	98	127	122	101	83	70	57	52	G	G	G	G
6	29	G	G	G	G		G	G	G	G	G	59	64	G	47	51	52	48	103	61	73	G	G	G
7	G	G	G	G	G	G	G	G	55	57	54	76	60	74	92	54	65	94	95	94	88		51	58
8	38		G	G	G	G	G	39		78	77	105	62	94	167	100	116	63	66	56	72	79	34	G
9	G		G	G	G	G	G	G	42	49	53	G	60	54	62	73	61	72	50	64	50	G	G	50
10	G	52	32	46	G	26	36	34	46	50	46	54	61	54	70	65	59	66	54	50	36	G	48	28
11	26	29	24	G	G	G	G	36	44	51	59	56	58	51	73	54	G	G	44	40	29	24	G	G
12	28	46	46	34	42	G	G	38	G	48	51	48	54	50	G	54	54		42	36	46	56	G	G
13	28	30	25	37	34	26	G	G	44	G	53	G	108	69	83	83	60	72	34	29	42	47	G	26
14	31	72	50	34	24	G	G	G	G	G	G	G	G	G	52	66	74	57	48	50	92	56	36	35
15	34	57	40	G	G	G	G	39	G	G	G	G	109	126	79	84	98	67	62	28	44	42	68	34
16		110	57	51	45	24	32	49	66	68	76	50	G	G	82	68	153	65	68	71	36	34	25	G
17			G	G	G	G	26	G	G	G	G	G	G	G	G	G	G	54	51	67	29	G	G	
18	48	25	G	G	G	G	26	G	46	67	70	64	67	G	G	G	53	55	60	58	38	43	G	G
19	47	G	G	G	G	G	G	38		51	50	G	G	60	76	63	53	51	51	38	G	G	45	36
20	56		33	G	G	28	27	52	C	56	54	G	G	63	60	61	56	50	55	40	25	G	59	50
21	124	66	42	39		34	29	G	47	55	58	72	52	G	52	52	71	G	G	38	G	G		G
22	28	G	G	G	G	G	G	40	50	52	62	G	86	65		62	61	46	38	30	G	G	G	43
23	24	54	G	G	G	G	G	G	G	G	49	G	G	63	50	G	52	51	49	28	29	34	G	G
24	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	44	41	29	28	G	G	G
25	G	G	G	G	G	G	G	36	G	G	51	G	G	49	G	53	48	50	35	72	28	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	62	60	51	73	66	61	60	38	35	G	27	G	29
27	G	G	G	G	G	G	G	G	G	46	48	60	63	63	65	53	42	45	36	34	41	46	G	G
28	G	G	G	G	G	G	G	36	G	52	73	84	52	G	64	C	C	94	C	52	28	28	G	C
29	91	C	C	C	C	C	C	C	C	C	47	C	C	C	C	61	C	C	55	35	39	26	G	C
30	C	G	G		G	G	G		45	49	55	54	49	77	G	47	47	44	37	32	30	40	40	G
31	G	G	G	G	G	G	G	N	G	G	53	56	69		48	59	59	G	G	G	G	34	43	36
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	29	29	29	29	30	28	27	30	30	29	29	29	29	30	29	28	29	29	30	29	29	28
MED	26	G	G	G	G	G	G	34	42	50	53	51	60	54	64	60	59	56	51	40	36	26	G	G
U Q	38	46	36	17	12	26	26	38	46	55	60	63	65	67	79	68	72	68	64	59	46	42	41	35
L Q	G	G	G	G	G	G	G	G	G	G	47	G	G	G	24	51	50	47	38	33	28	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

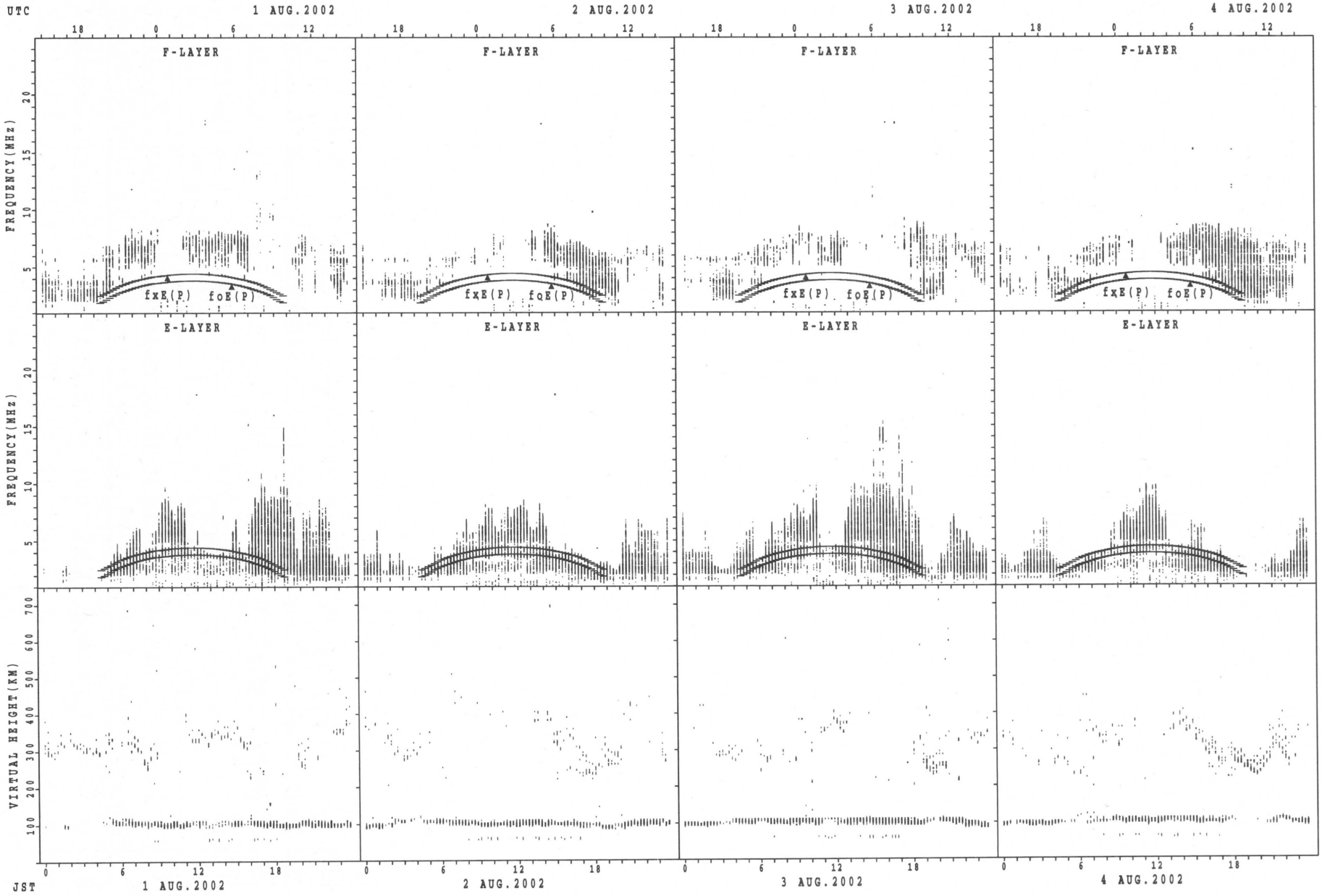
AUG. 2002

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	18		21	17	17	16	17	22	29	39	42	42		60	32	28	23	18	16	15	15	20	27
2		42	40	28		16	20	18	20	28	33			40	42	40	27	20	17	20	14	17		23
3		18	18	16	17	15	20	17	43	24		44	43	42	42		28	18	16	15	15	16	15	16
4	16	15	20	21	15	18	18	18	22	28	34		46	44	44	39	26	23	14	20	17		33	42
5	20			39	22	18	24	15	18	20	29	35	38	42	42	33	26	20	16	17	18	14	27	
6	18			27	30		20	29	22	28		42	40	53	58	38	35	18	14	17	17	17	28	20
7		21	27	20	20		18	16	18	23	30	39	43	43	29	29	26	18	15	14	16	15	14	14
8	16		21	26	17	20	20	17	18	27	33	33	41	35	34	29	21	17	14	14	14	15	15	24
9	32		30	18	18	17	21	16	29	22	28	28	43	44	42	39	21	18	16	14	14	22	18	16
10	15	14	14	14	14	14	14	14	17	20	27	40	42	42				16	18	14	14	15	14	15
11	14	14	14	15	17	15	16	14	18	21	28	45	33	34	29	27	22	15	14	14	15	14	14	16
12	14	14	14	14	14	15	16	14	15	22	27		40	43	55	39	26	20	15	15	14	14	17	28
13	14	14	15	14	14	14	16	14	18	28	28	50	43	40	42	41	21	15	14	14	15	14	15	15
14	14	15	14	14	14	14	14	14	15		40	62	70	53	42	35		20	16	15	14	14	14	14
15	15	14	14	16	14	14	17	16	18		47		63	38	36	29	29	20	15	14	14	14	14	14
16	14	14	14	14	14	14	14	16	18	20	28	33		32	29	46	41	18	17	14	15	14	18	
17			18	28	21	21	17	18		42	57	56	56	55	58	55	51	20	15	18	15	17		
18	28	18		18			15	28		38	39	43	39	57	58	55		20	14	16	14	14	20	18
19	15		17	20	18		20	18	20				60	45	42	32	29	20	16	14	17	18	18	18
20	18		40	26	17	15	14	14	C	24		60	60	43	43	42	27	20	15	15	17	14	16	18
21	18	15	18	15		20	17	16	20	27	40	43	43		43	43	38	18	18	15	16	17		
22	45	21	30	20	22	29	30	21	20	36	40	70	45	45	42	40	40	23	17	17	17	17	21	18
23	15	16		24	21	20	29	14		22	43		62	45	57	58	37	23	18	15	15	15		42
24			30	18	28		20	16		22			74	60	54	63		22	18	17	17	20	28	21
25	22		22	21	20	22	18	14	17	18					56	29	24	17	14	14	15	16	28	21
26	30		20	17	18	18	18	29	20	42	60	43	43	40	28	23	27	18	18	15	20	14	17	14
27	17	22		20	22	18	18	27	34	29	40	40	40	42	40	38	33	18	15	14	14	15	17	18
28	22	28	21		20	20	18	23	17	22		39	42		42	C	C	17	C	14	14	14	20	C
29	17	C	C	C	C	C	C	C	C	C	40	C	C	C	C	34	C	C	14	14	14	15	29	C
30	C				20		18	20	29	34	37	36	42	40		33	29	18	16	15	17	14	16	20
31		17	29	18		20	18	27	35	38	39	40	42	44	42	38	28	20	16	17	17	14	14	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	19	23	28	26	24	30	30	25	27	24	22	27	26	28	28	25	30	30	31	31	30	27	25
MED	16	16	20	19	18	18	18	16	20	27	38	42	43	43	42	38	28	19	16	15	15	15	17	18
U Q	21	21	29	22	21	20	20	20	22	29	40	45	56	45	54	41	34	20	17	17	17	17	21	22
L Q	15	14	14	15	15	15	16	14	18	22	28	39	41	40	41	32	26	18	14	14	14	14	15	15

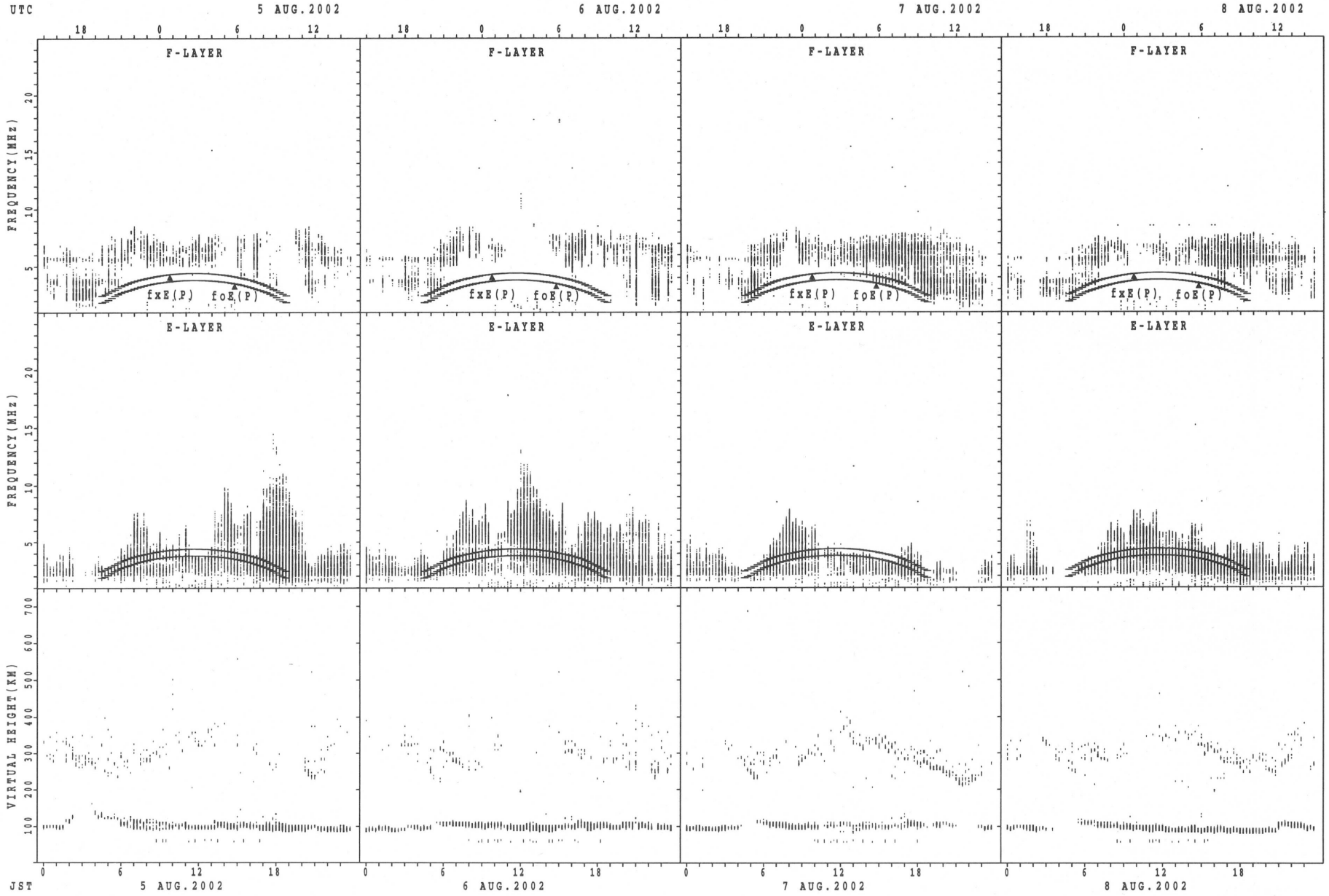
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

SUMMARY PLOTS AT Wakkanai



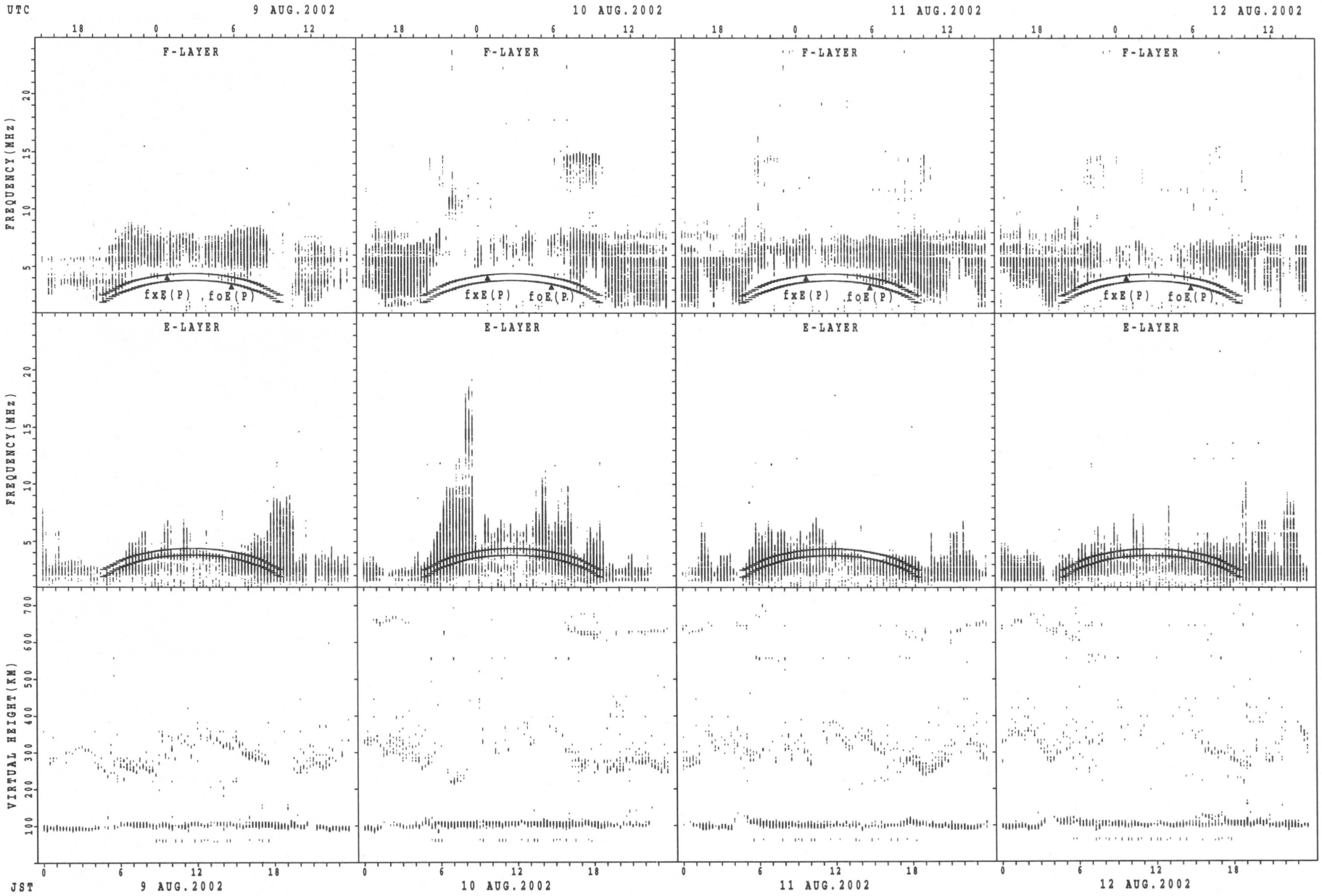
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



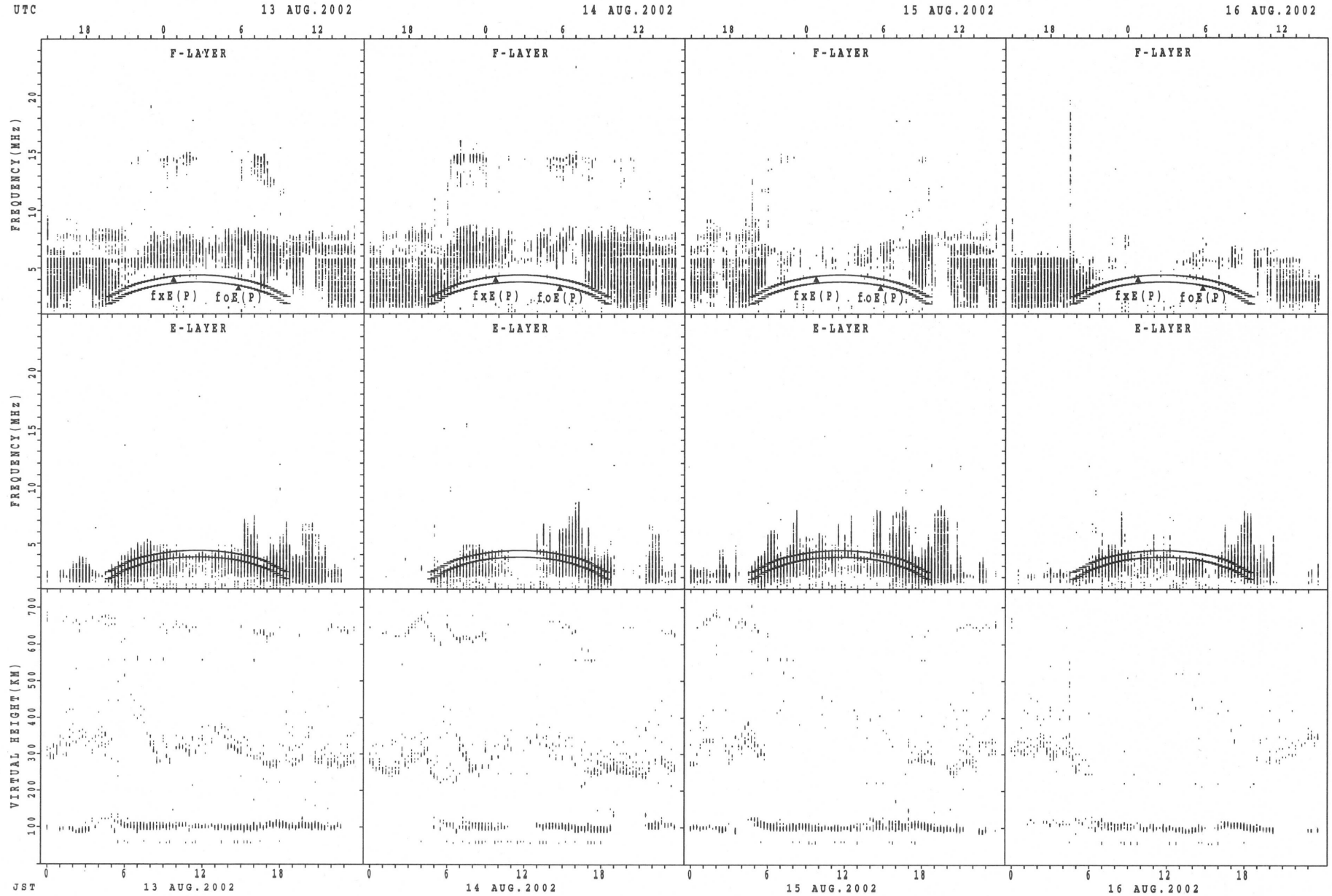
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



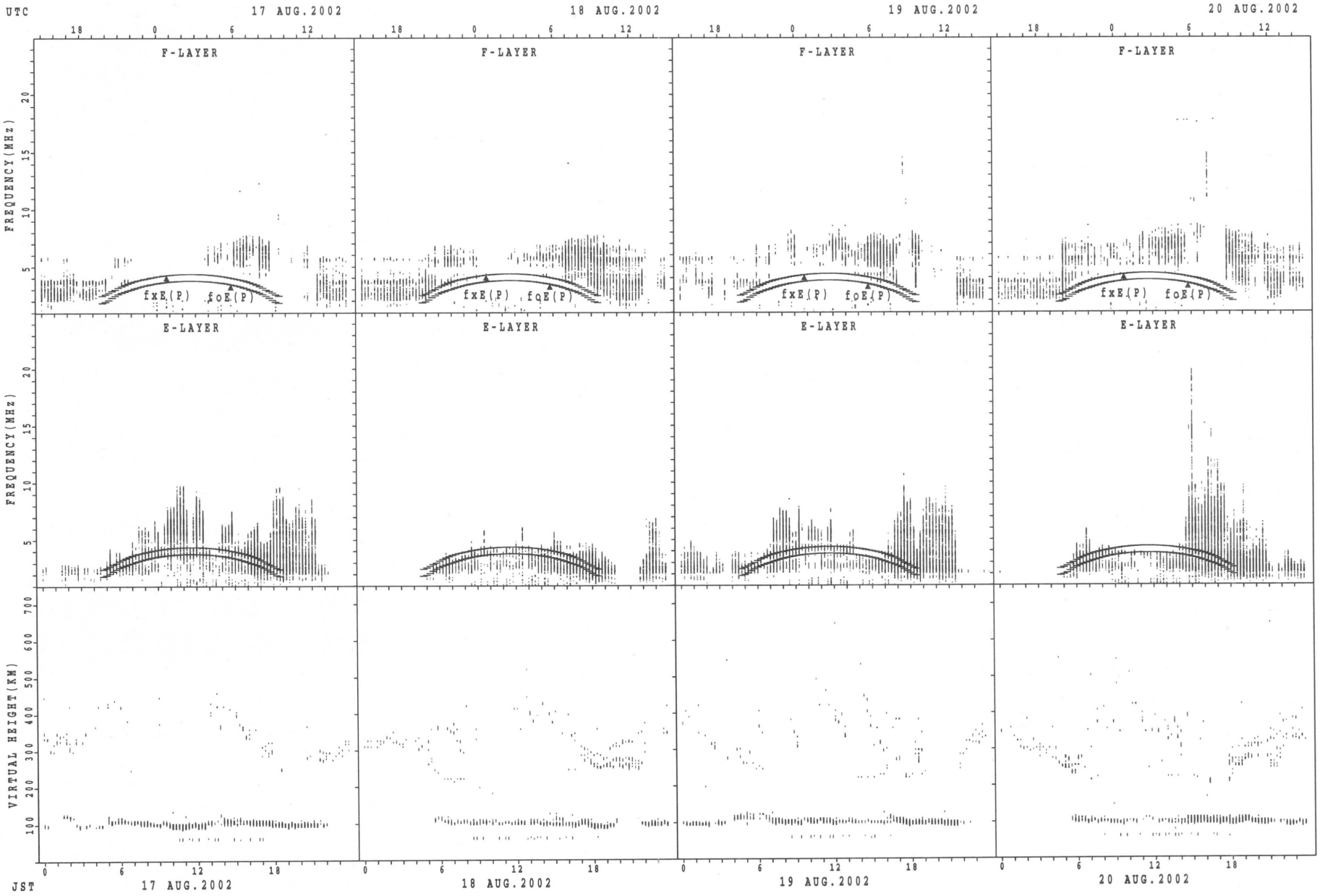
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



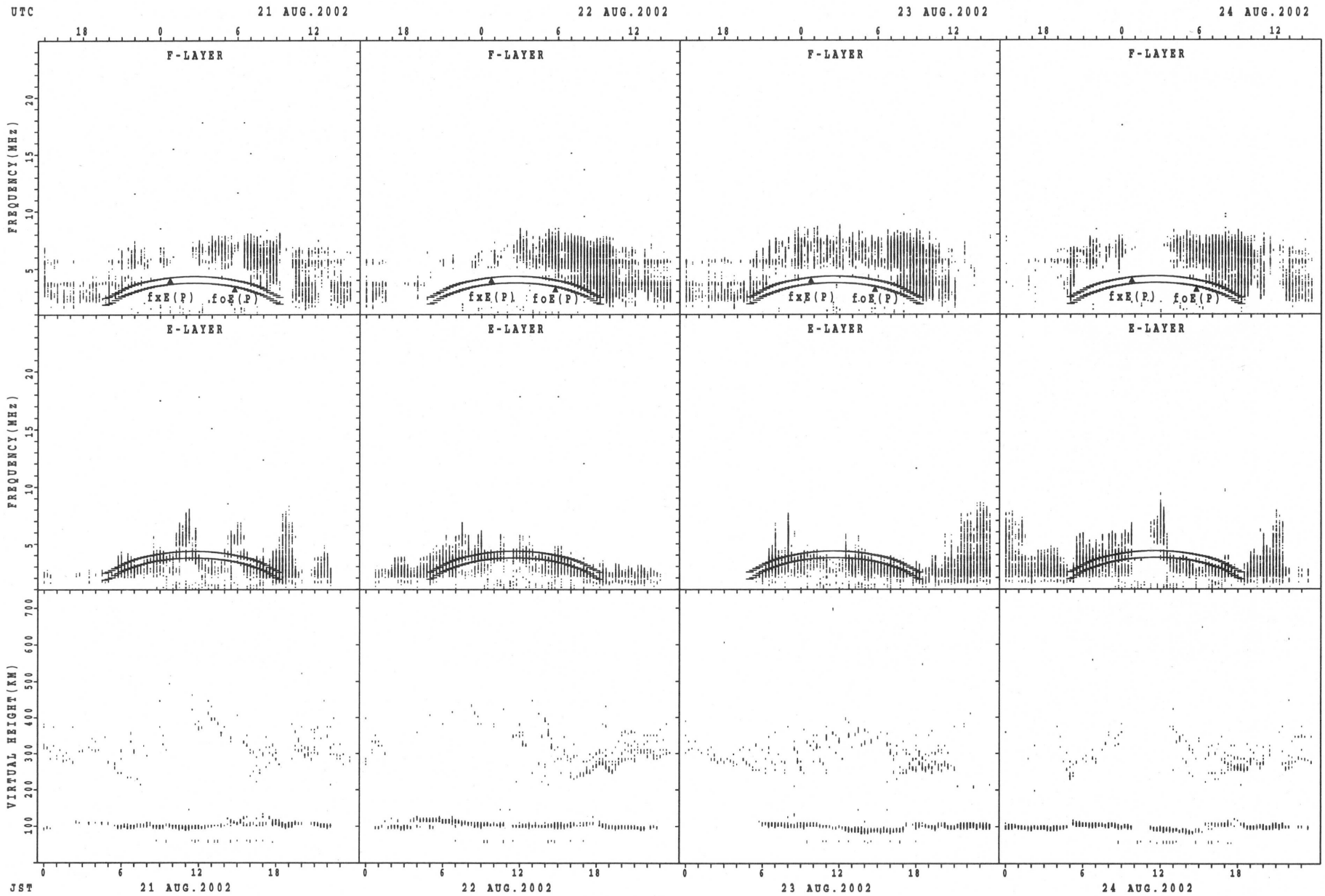
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



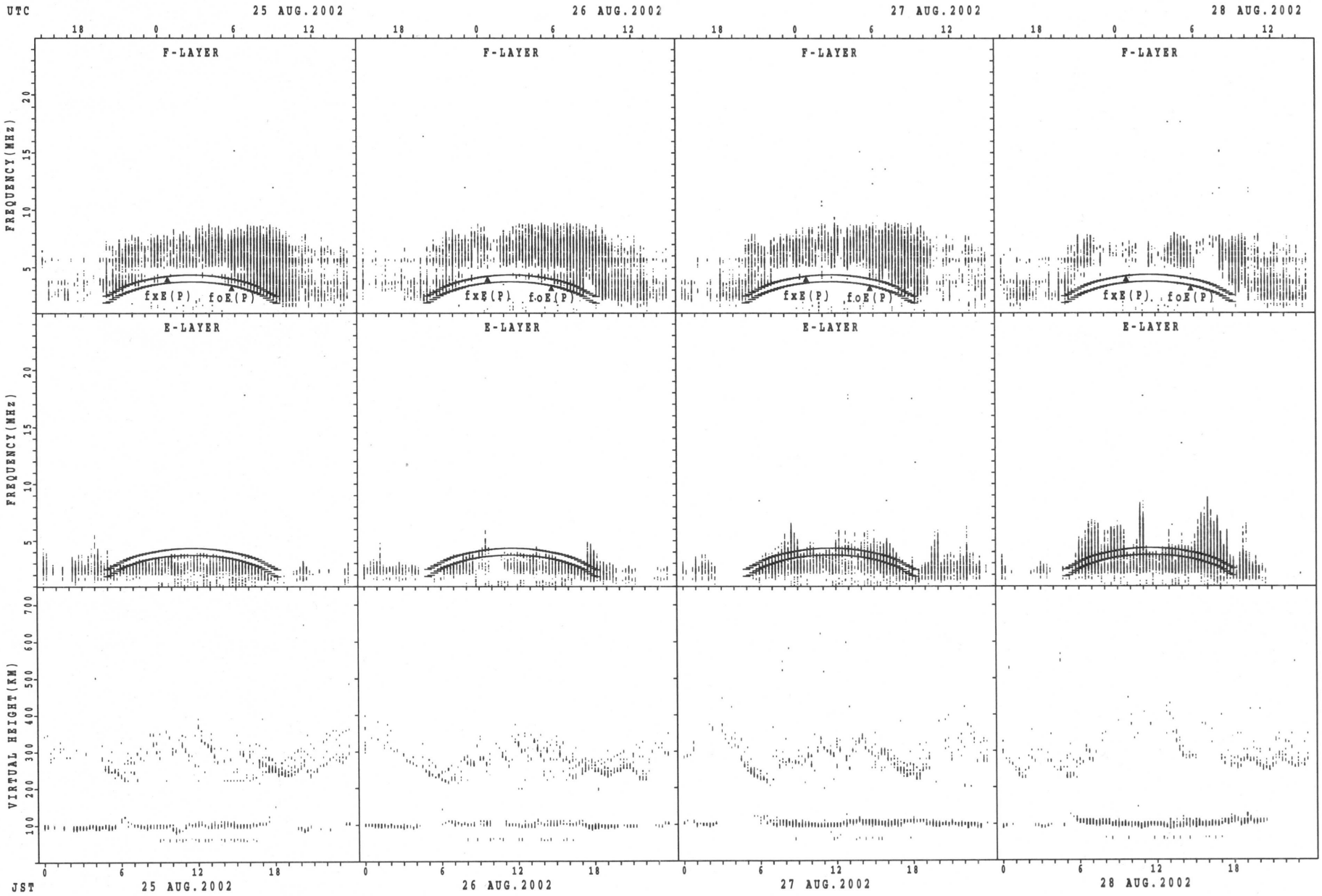
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



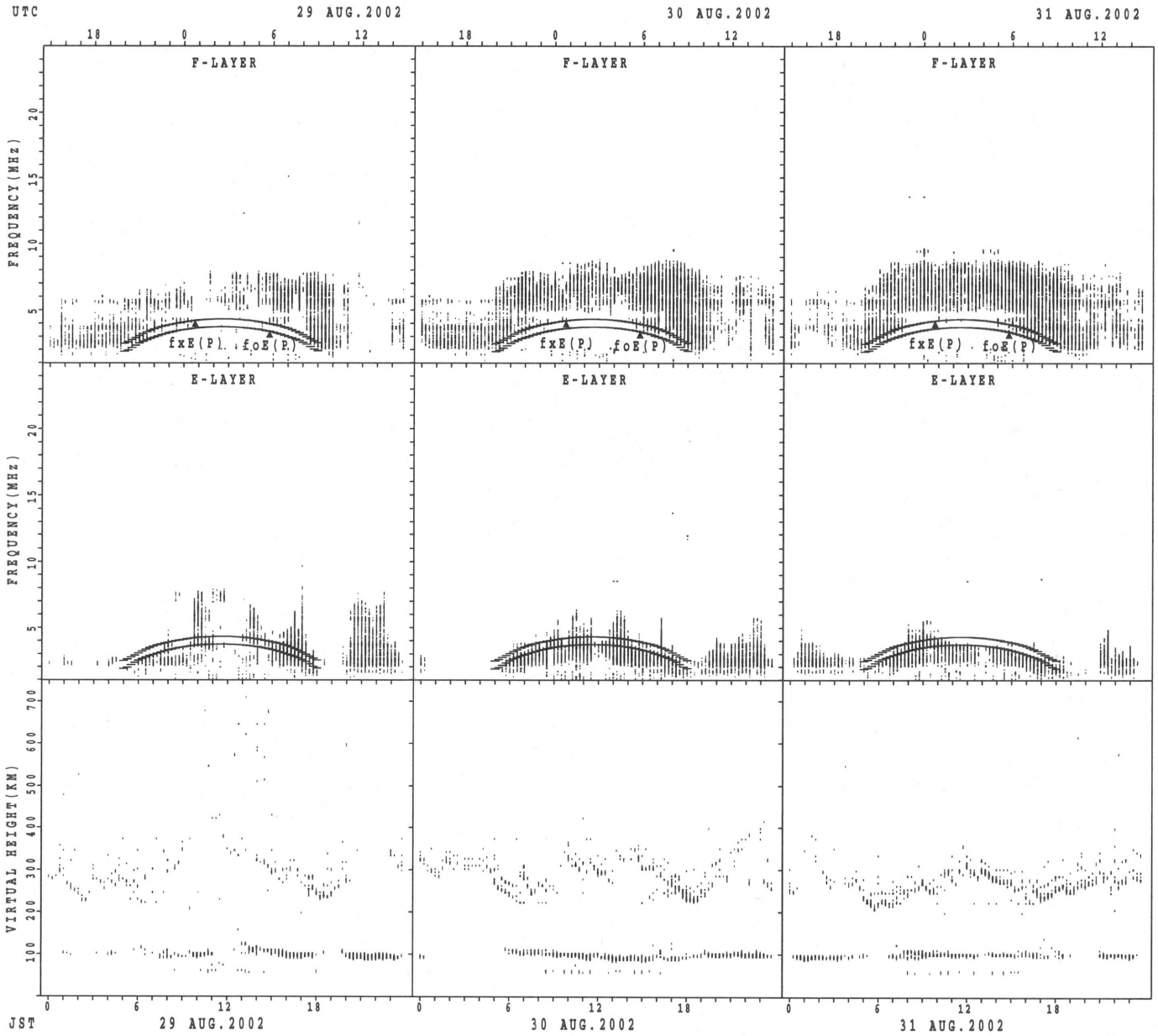
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



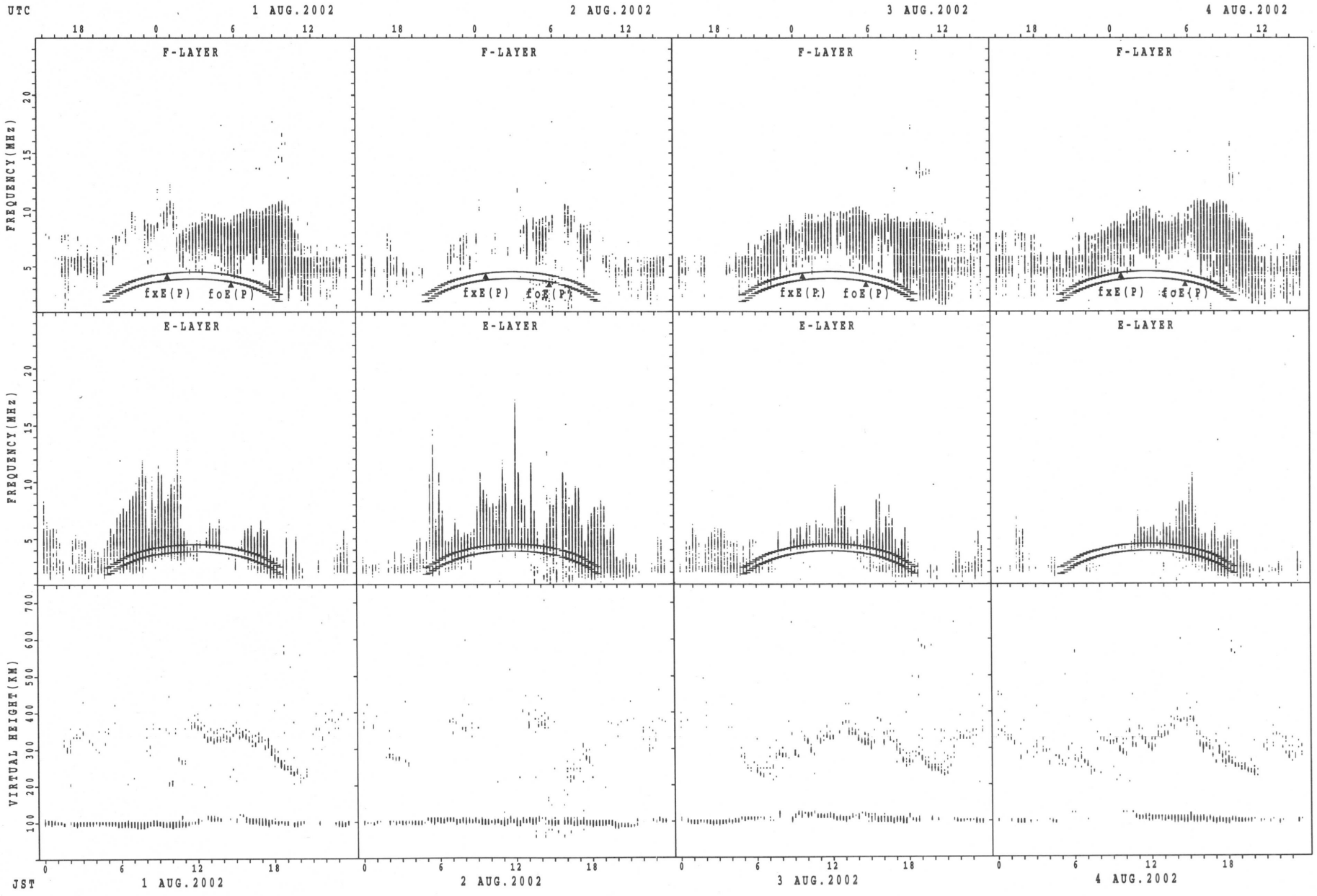
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



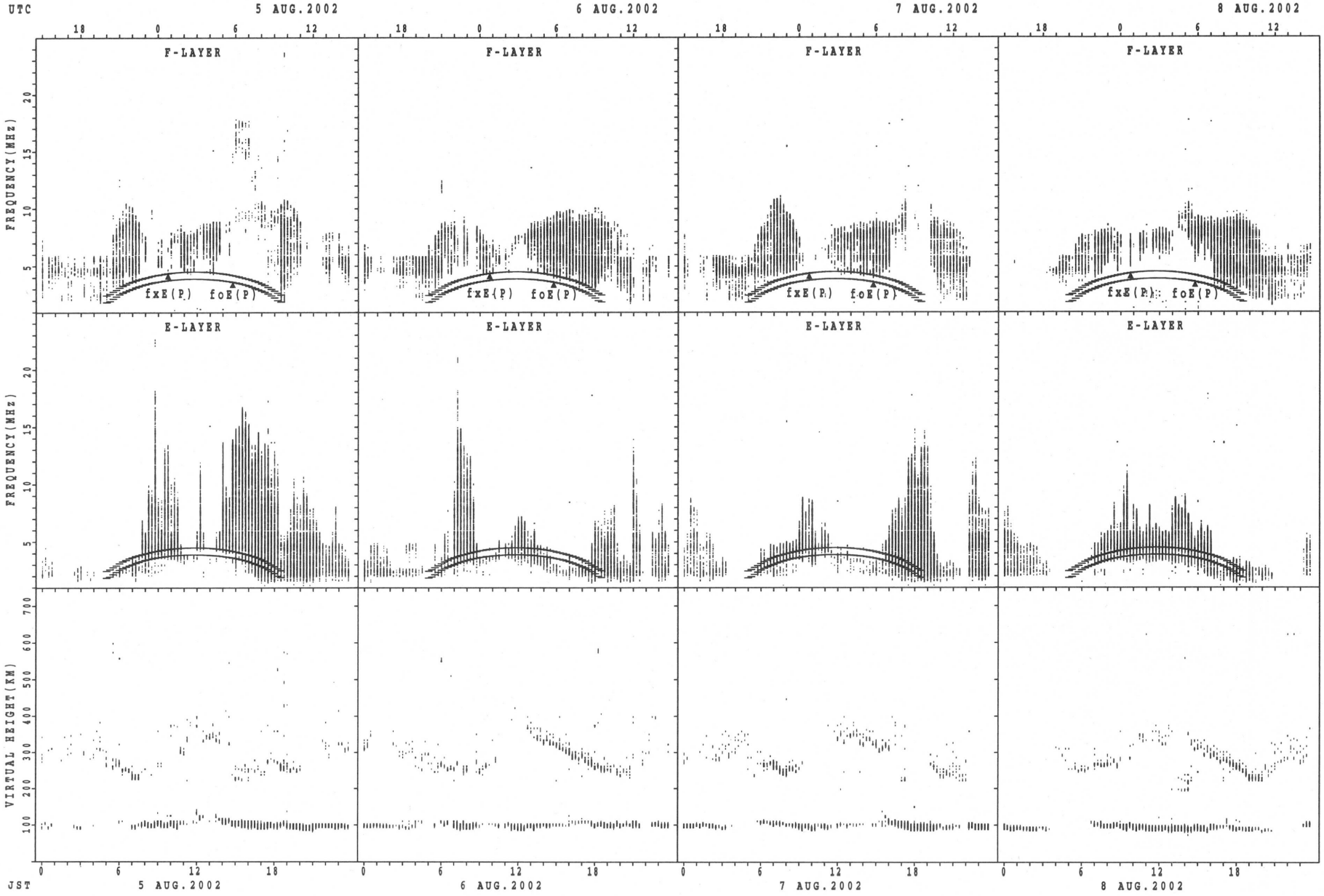
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



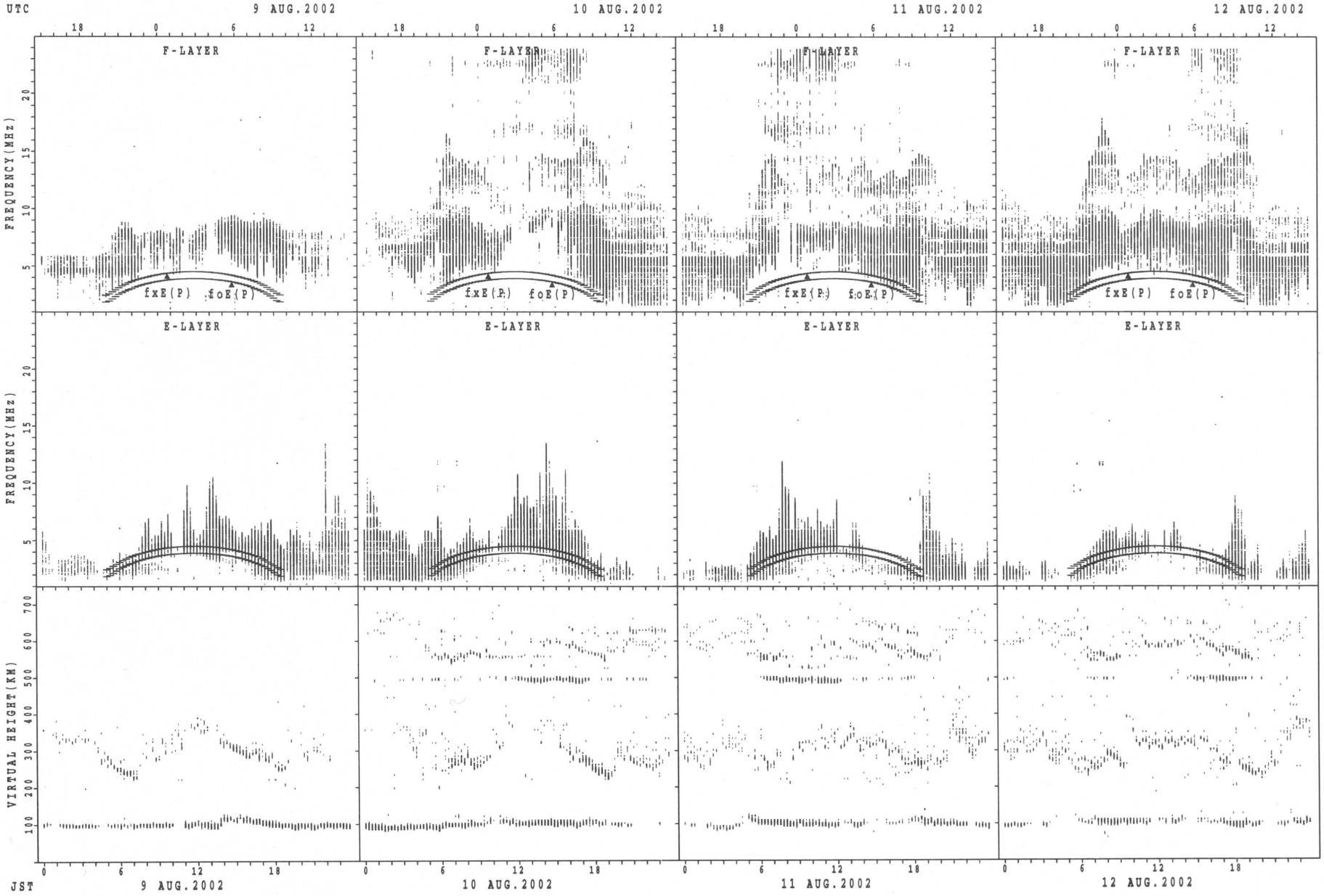
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



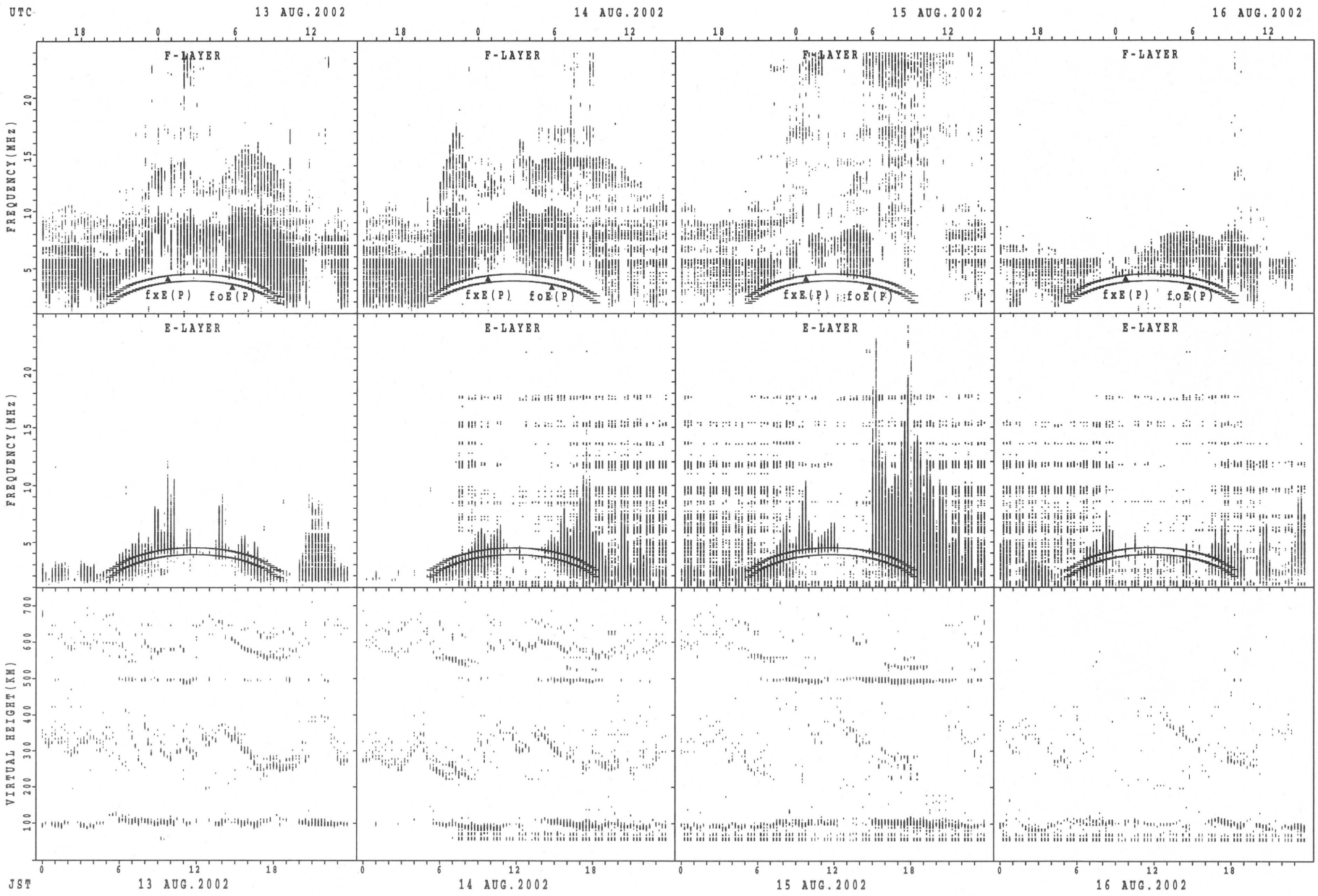
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



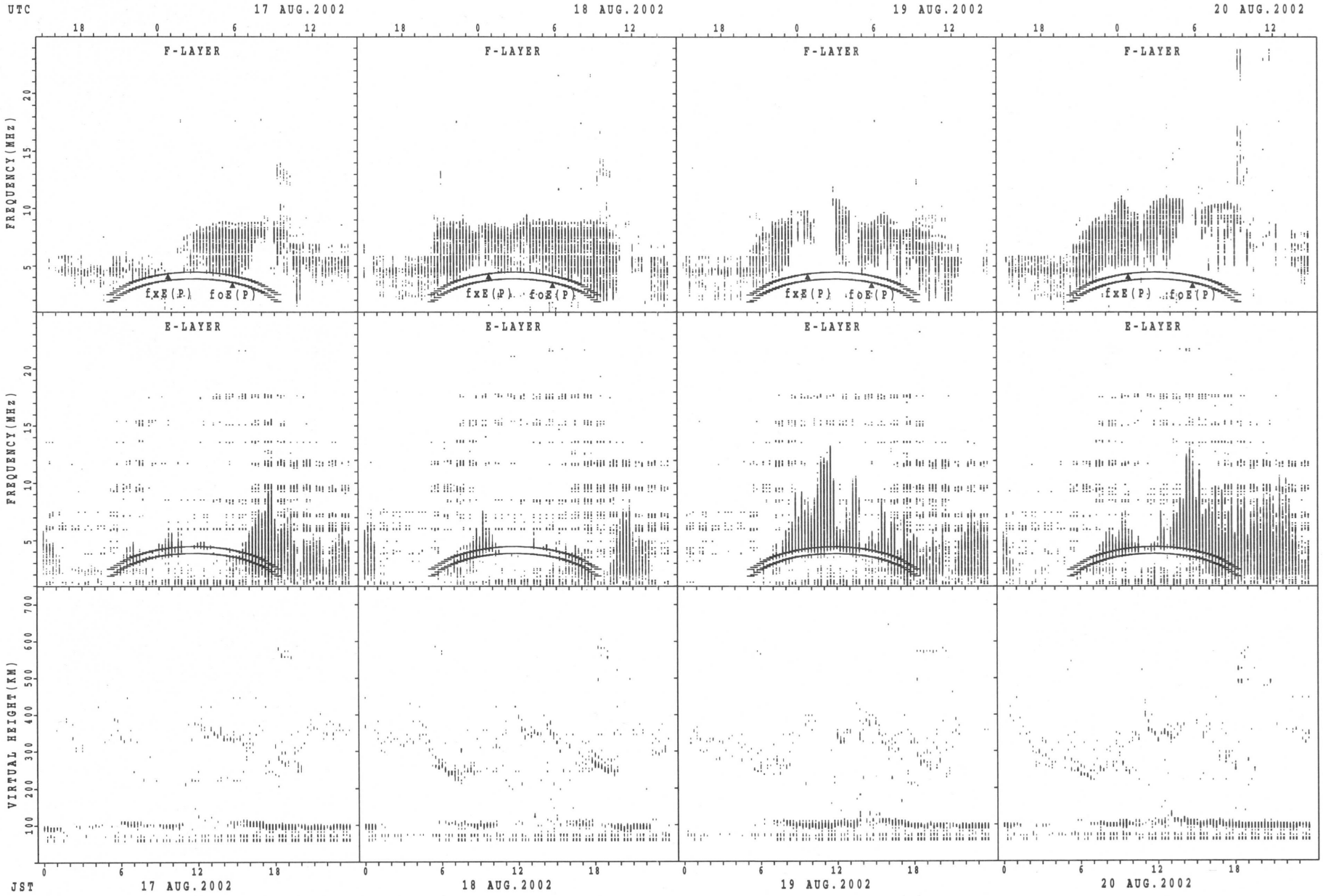
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



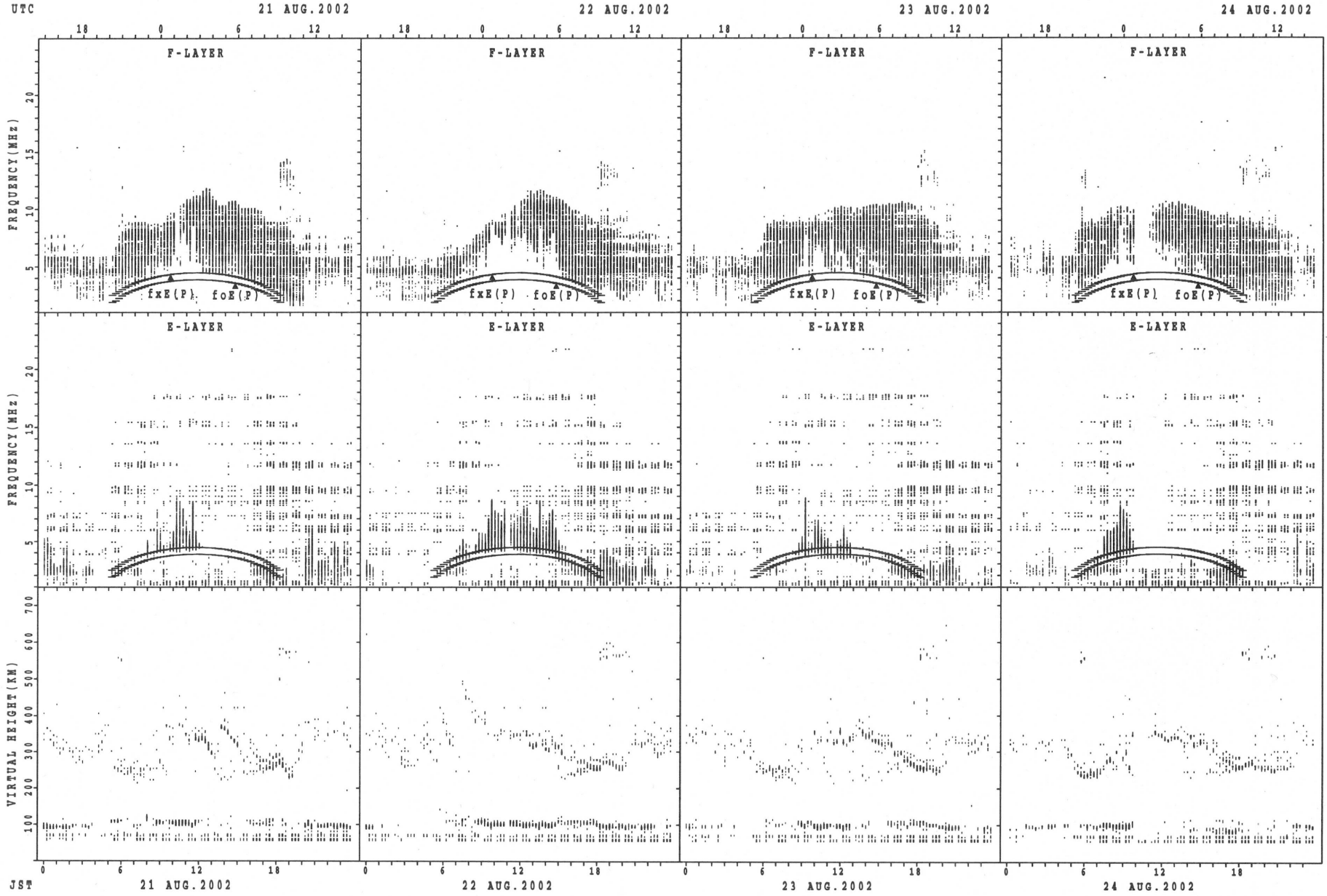
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



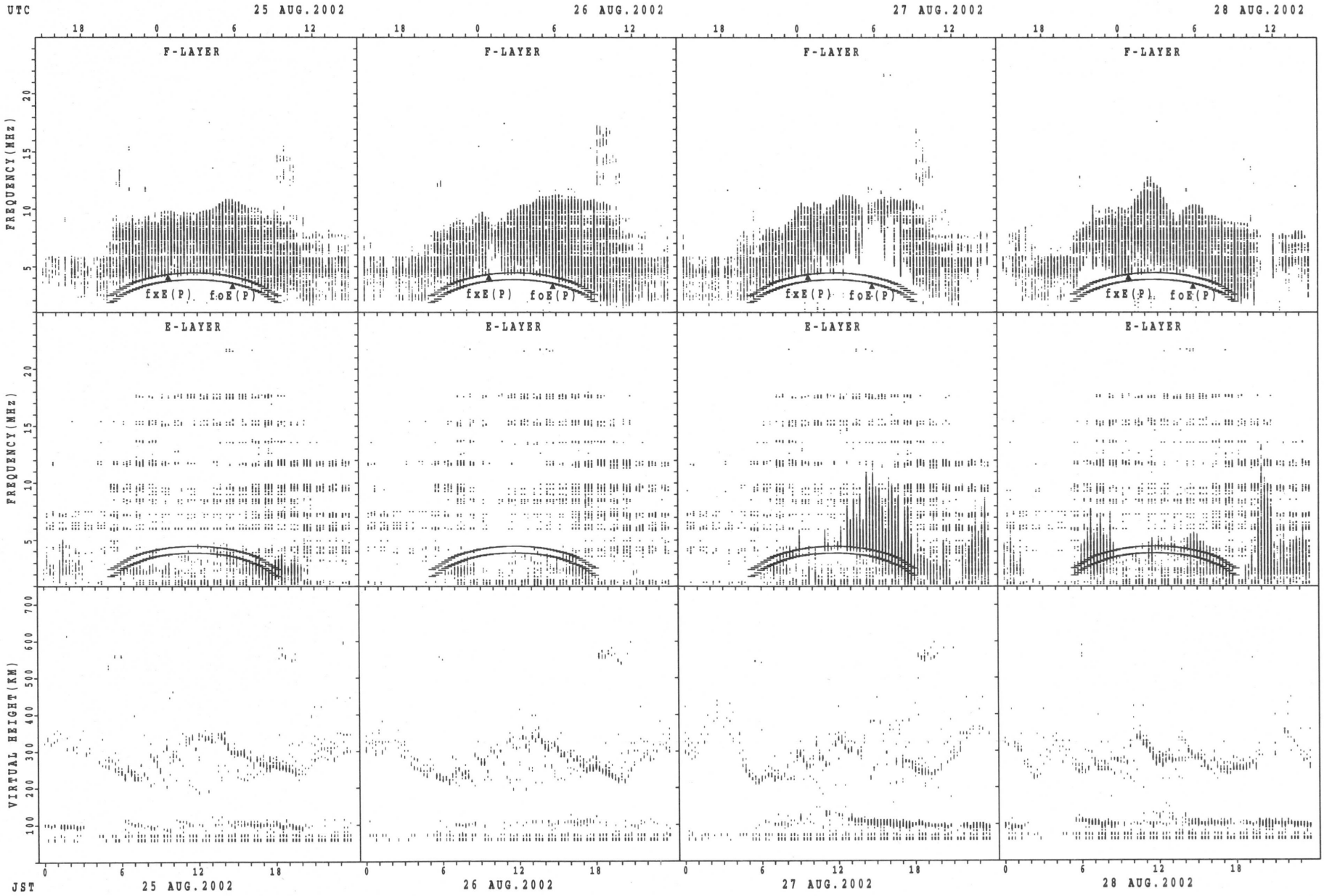
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



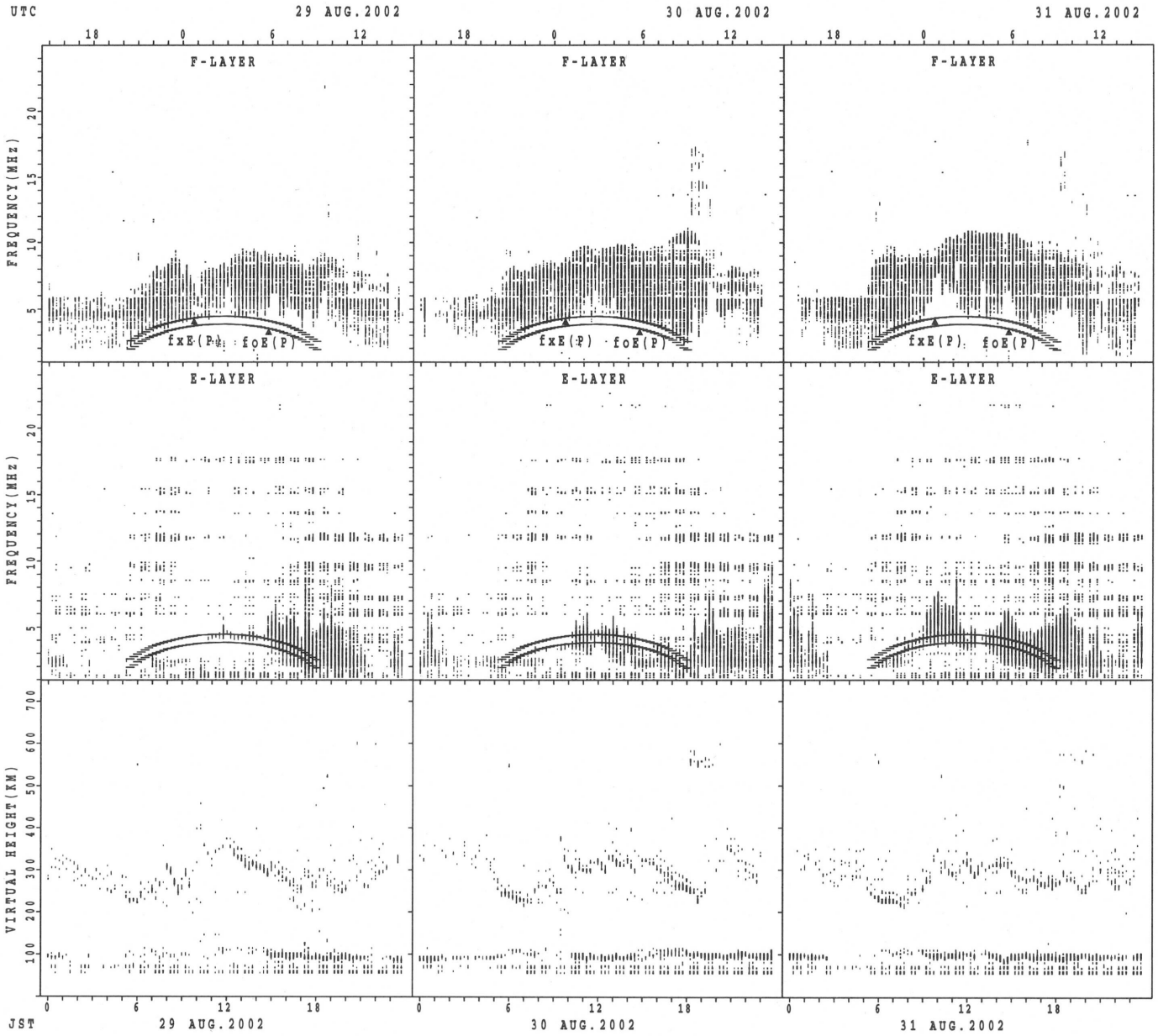
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



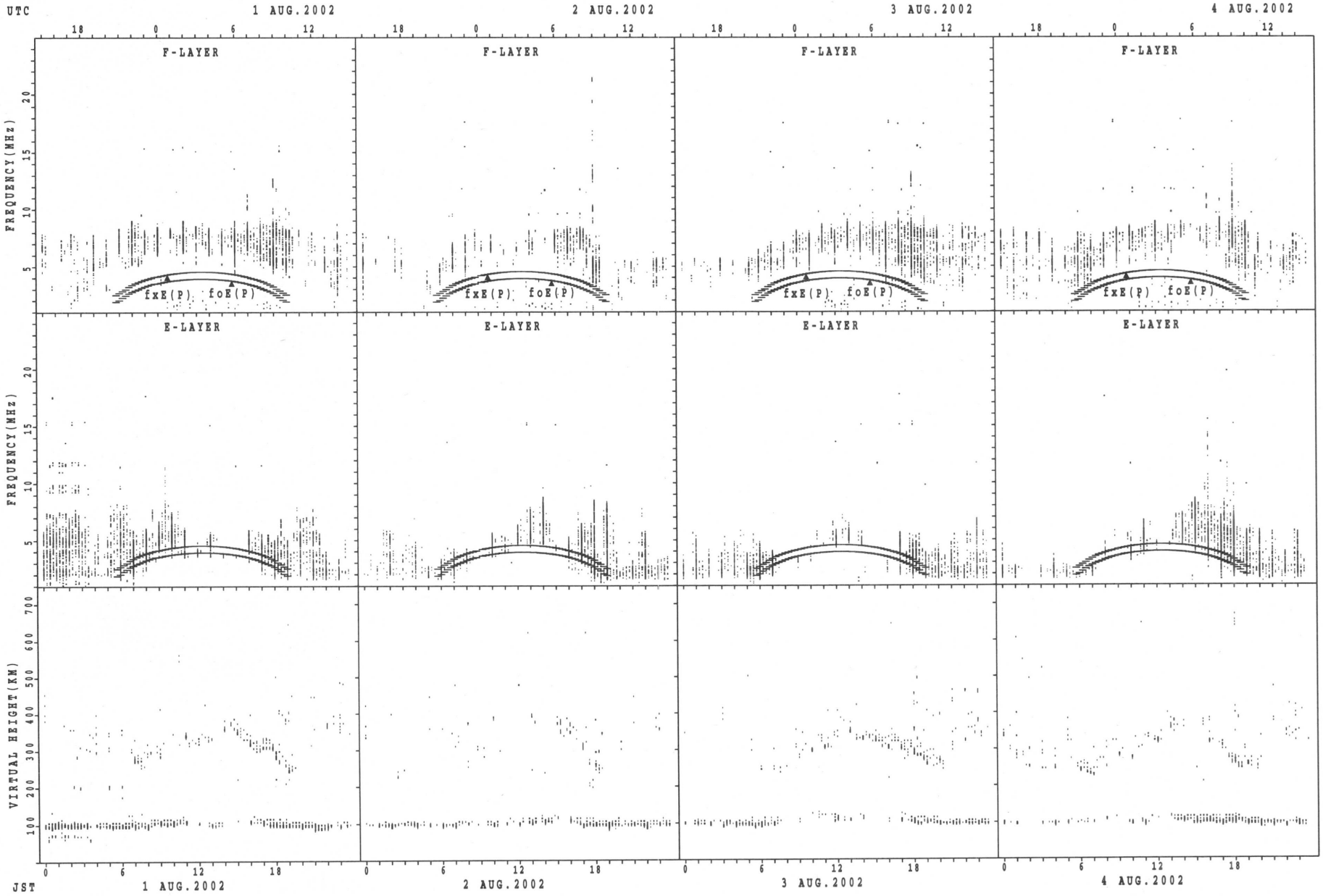
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



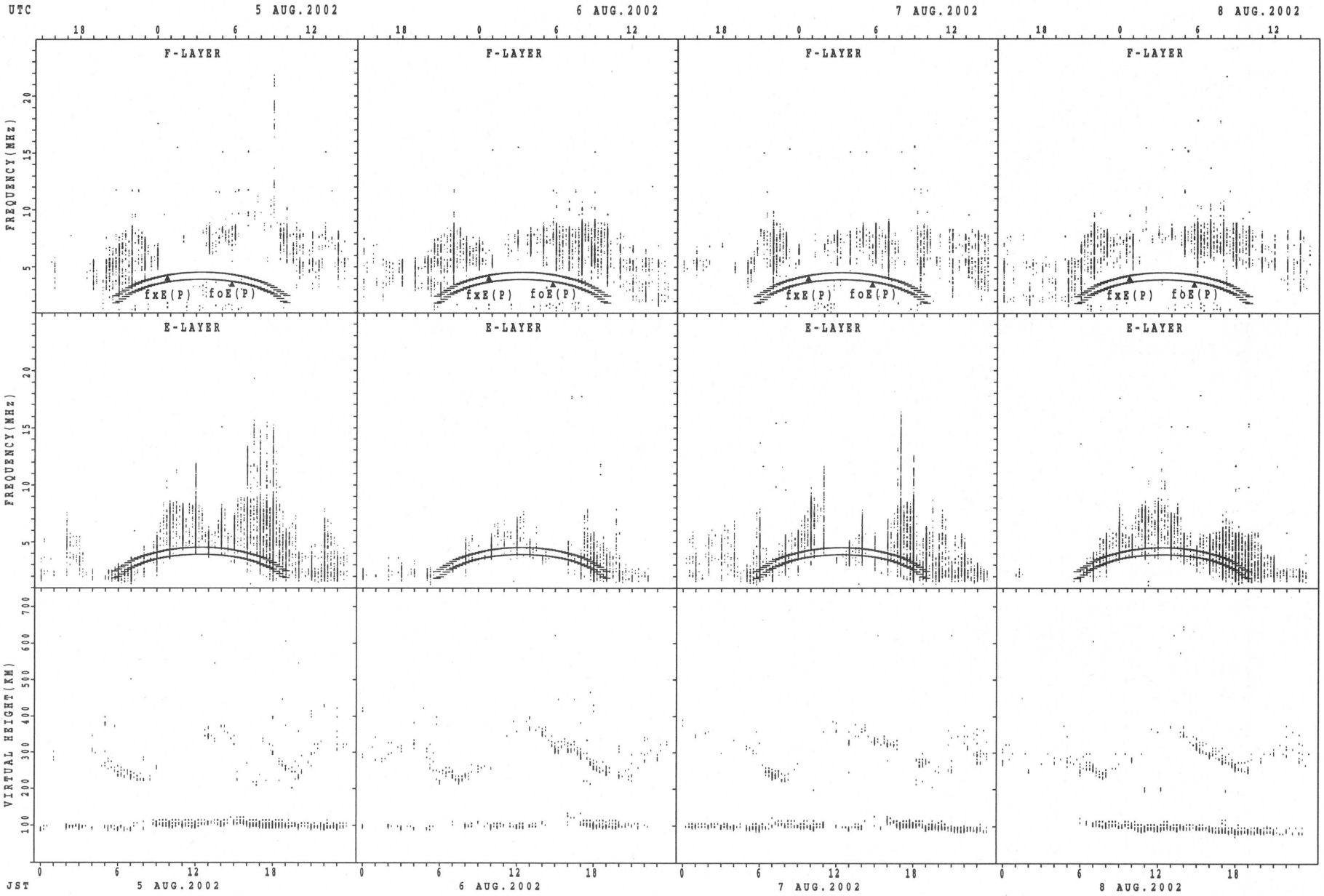
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



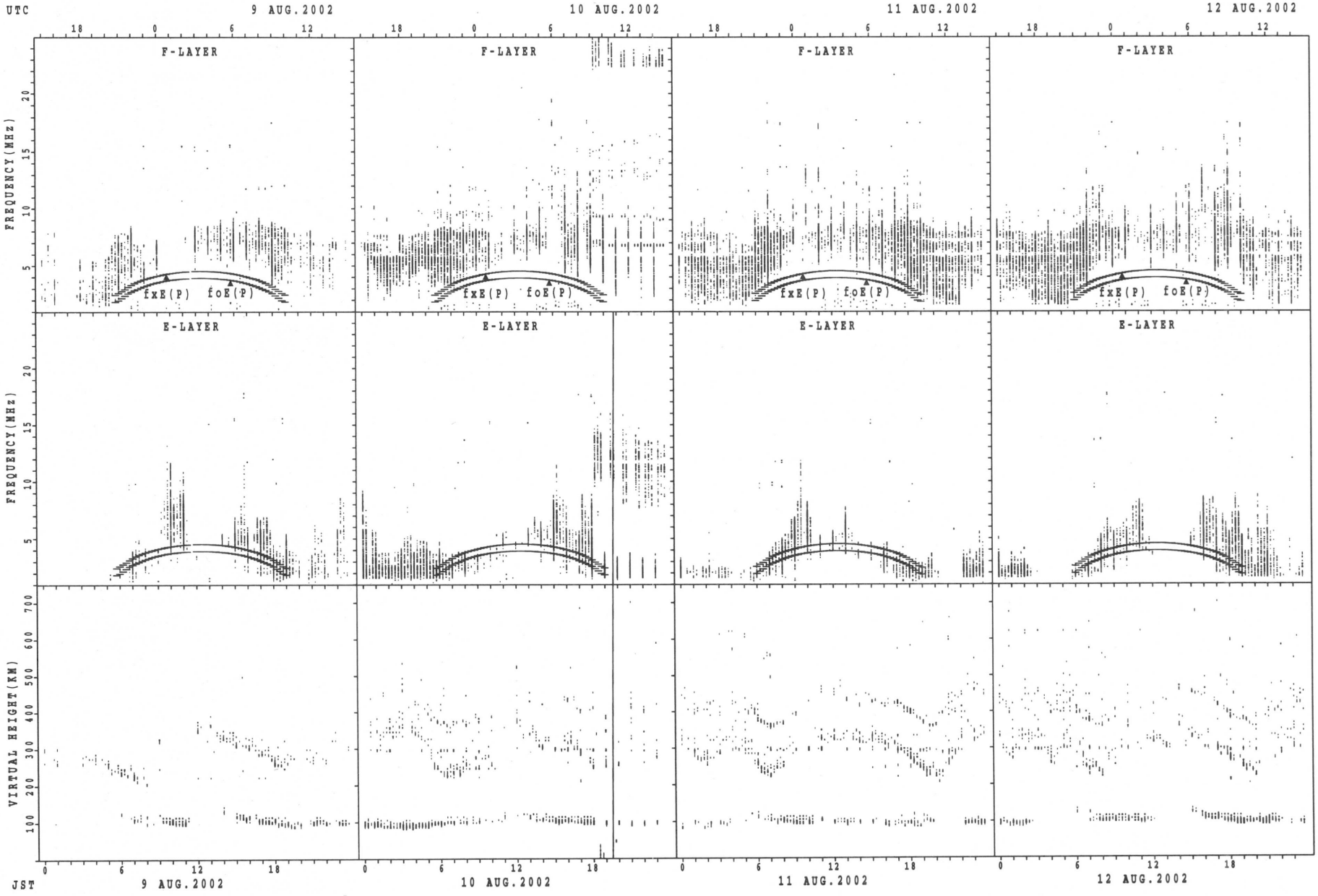
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



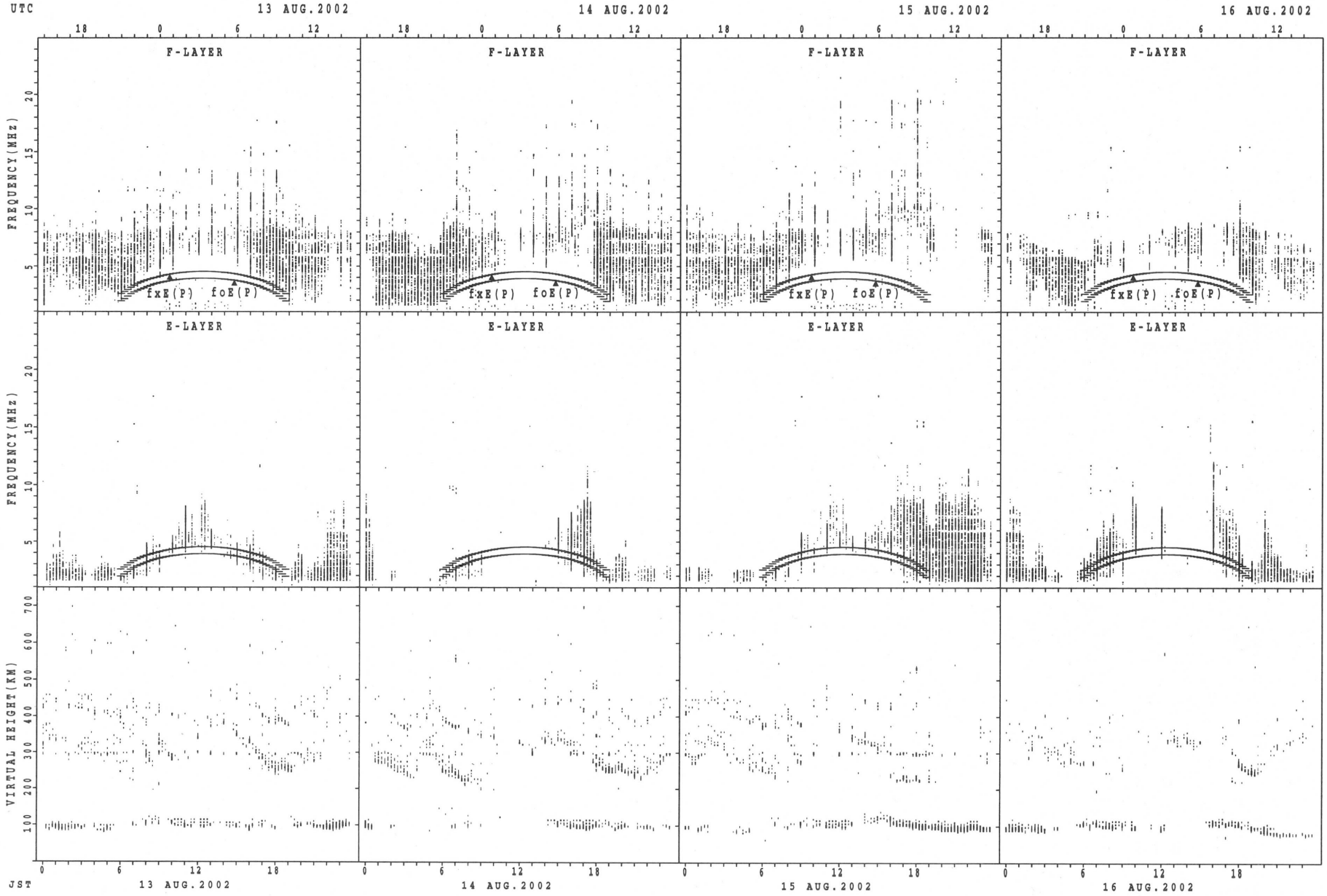
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

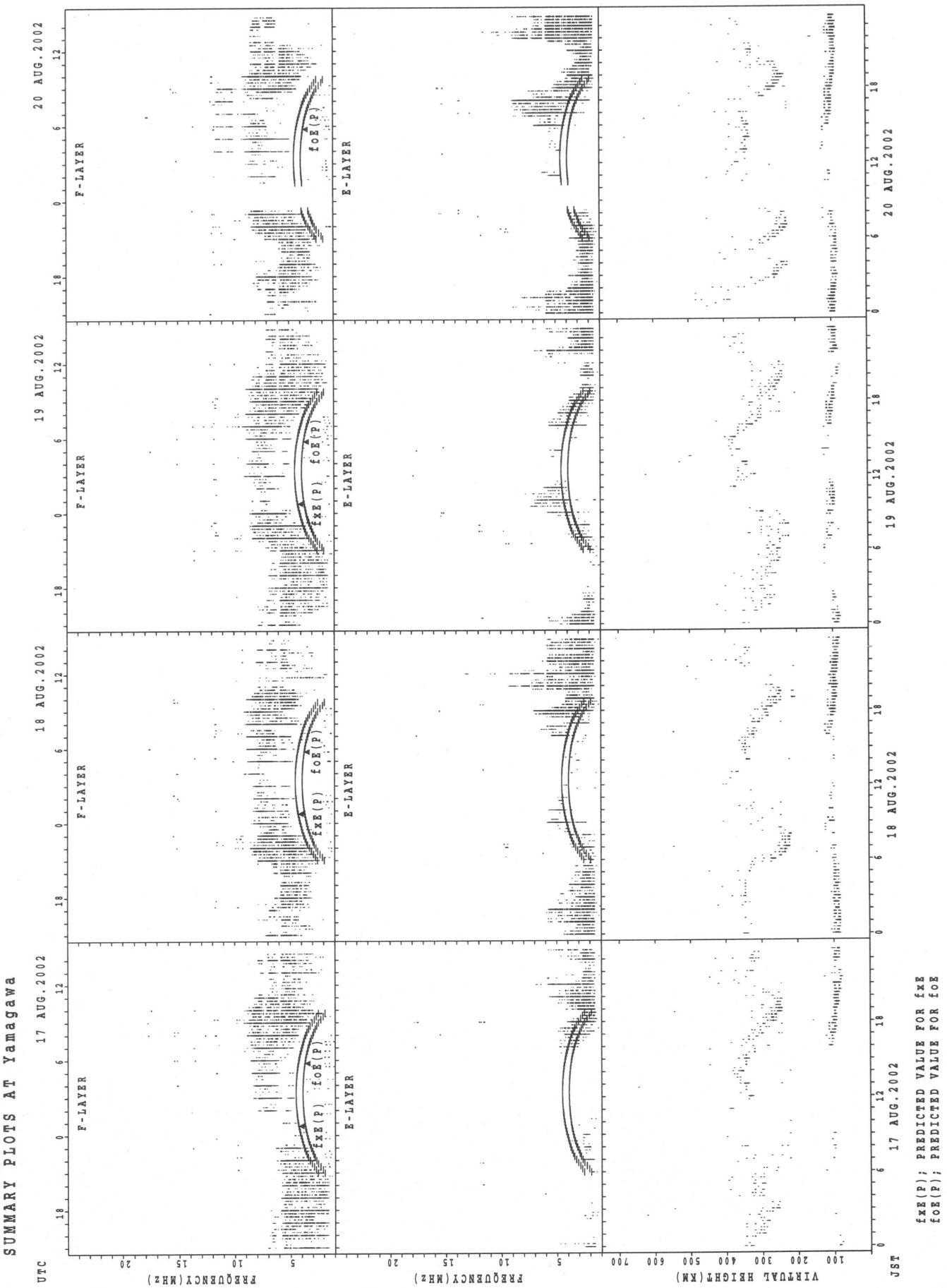


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

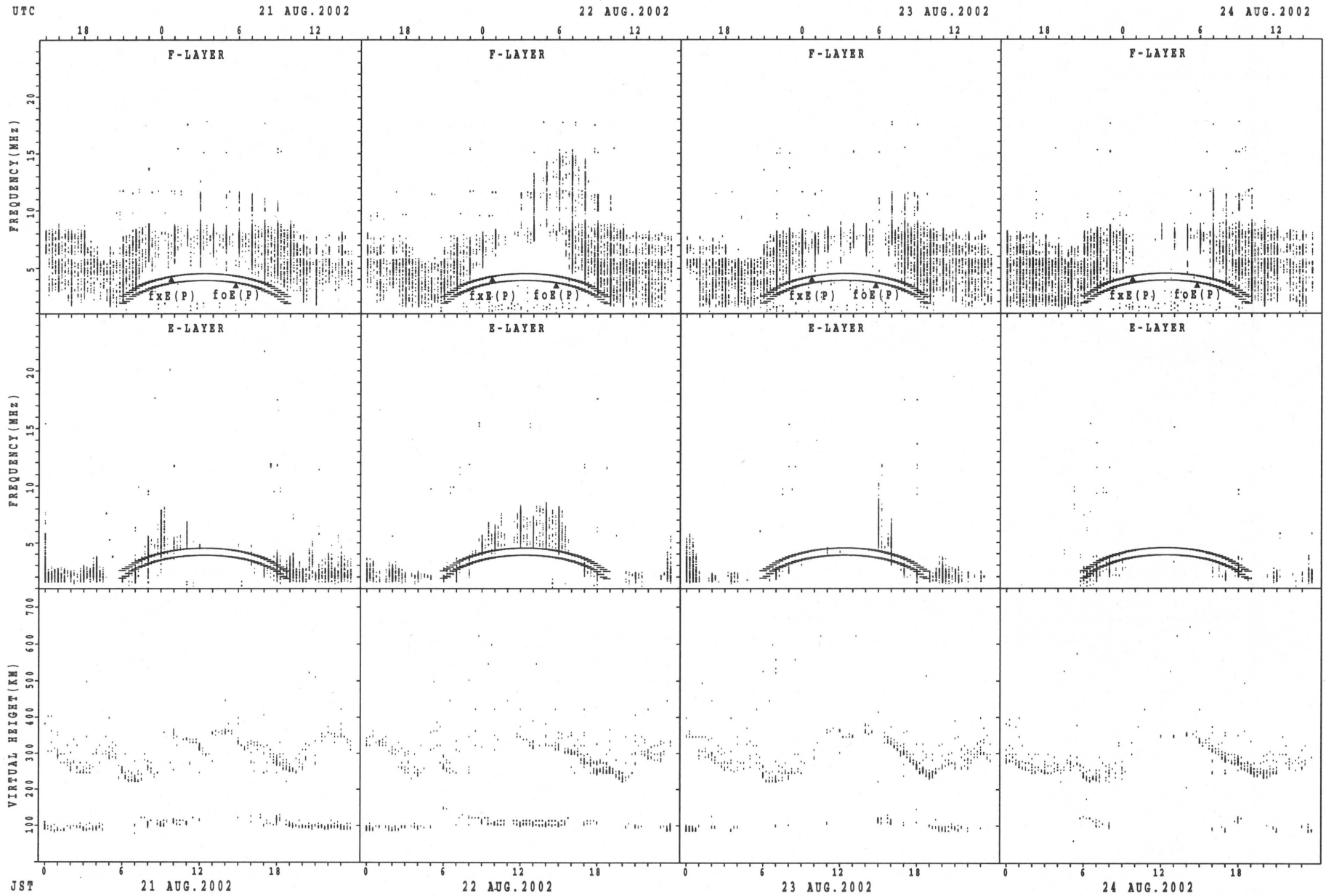
SUMMARY PLOTS AT Yamagawa



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

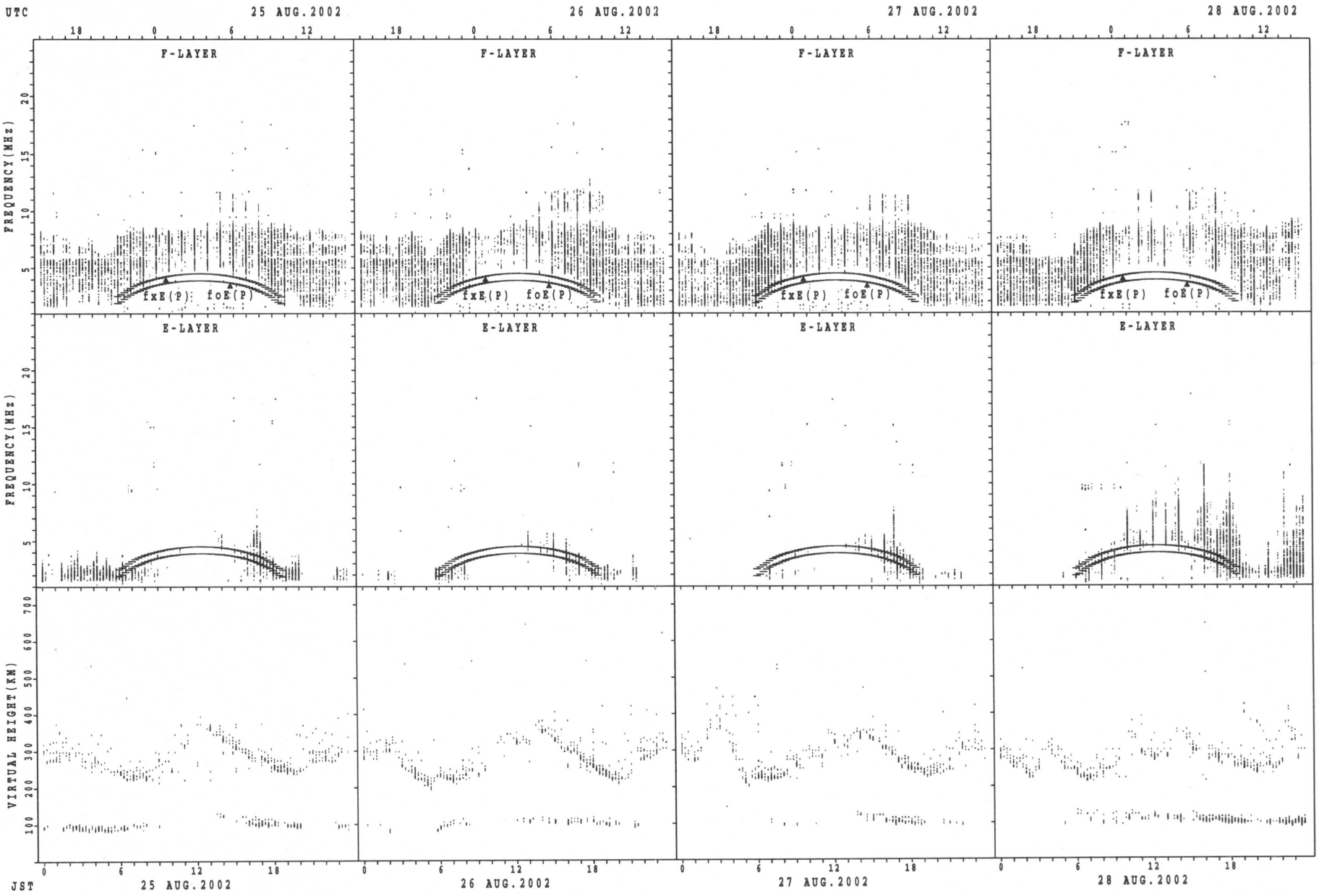

SUMMARY PLOTS AT Yamagawa
UTC
17 AUG.2002
18 AUG.2002
19 AUG.2002
20 AUG.2002
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

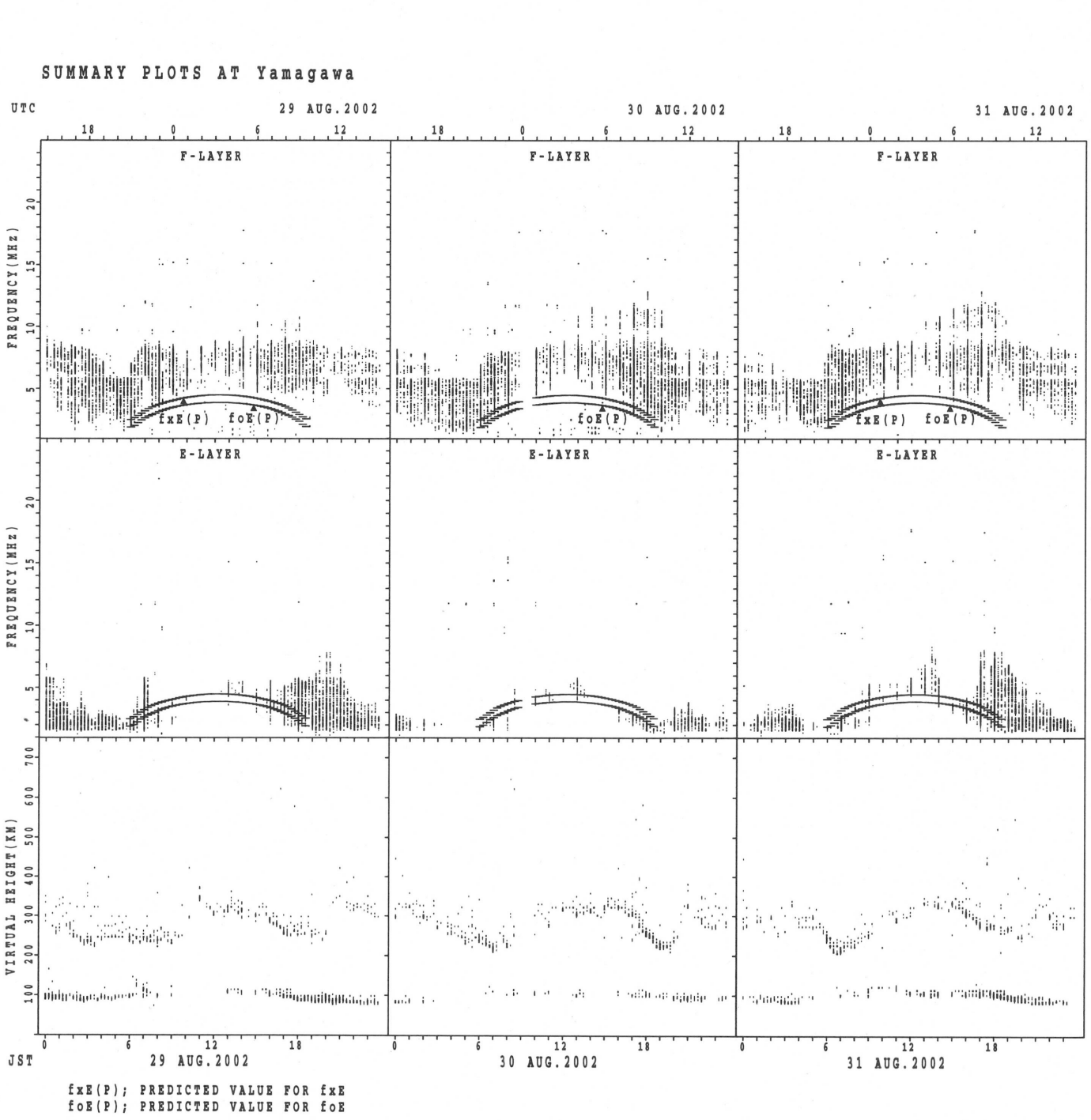


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

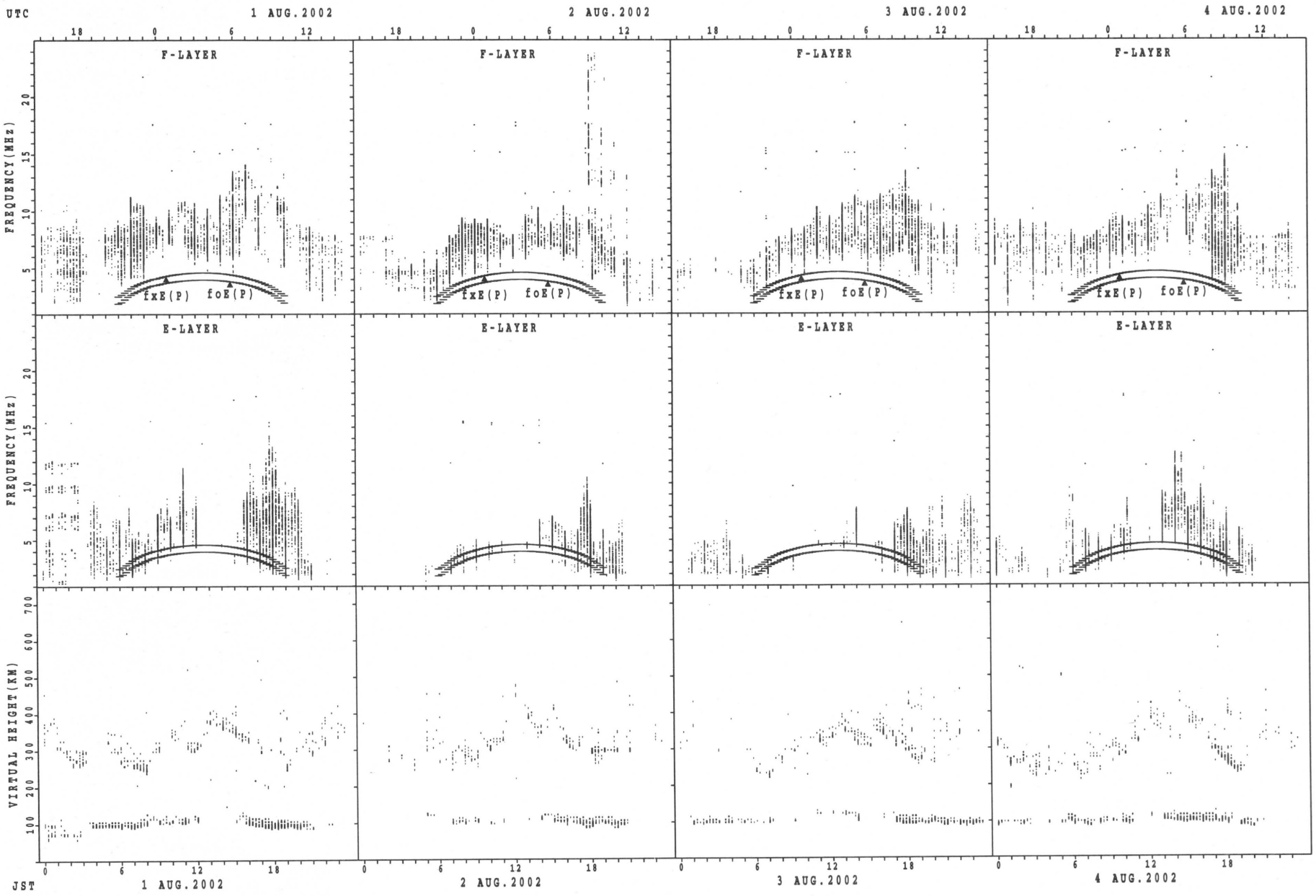
SUMMARY PLOTS AT Yamagawa



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

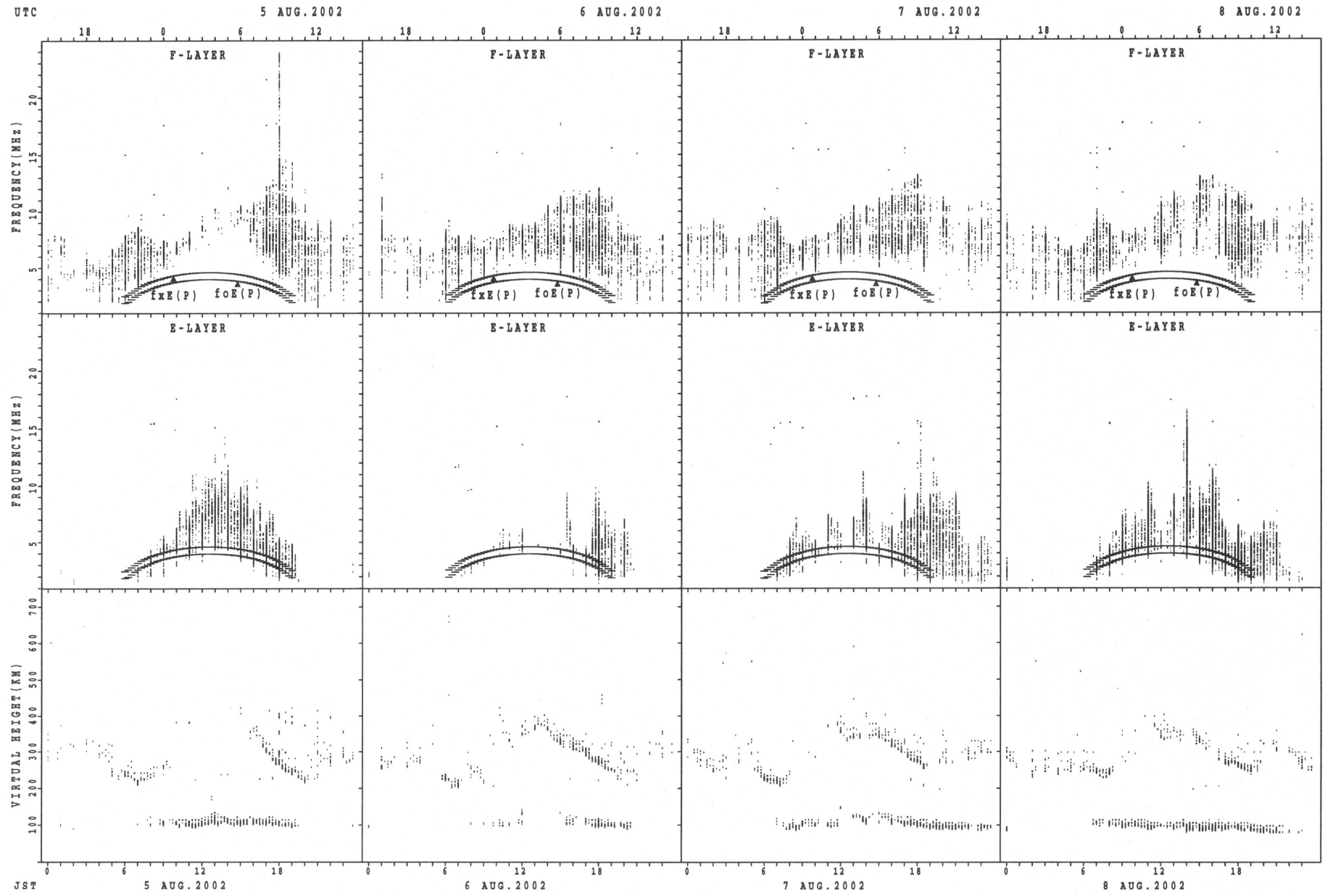

SUMMARY PLOTS AT Yamagawa
UTC
29 AUG.2002
30 AUG.2002
31 AUG.2002
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
JST
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



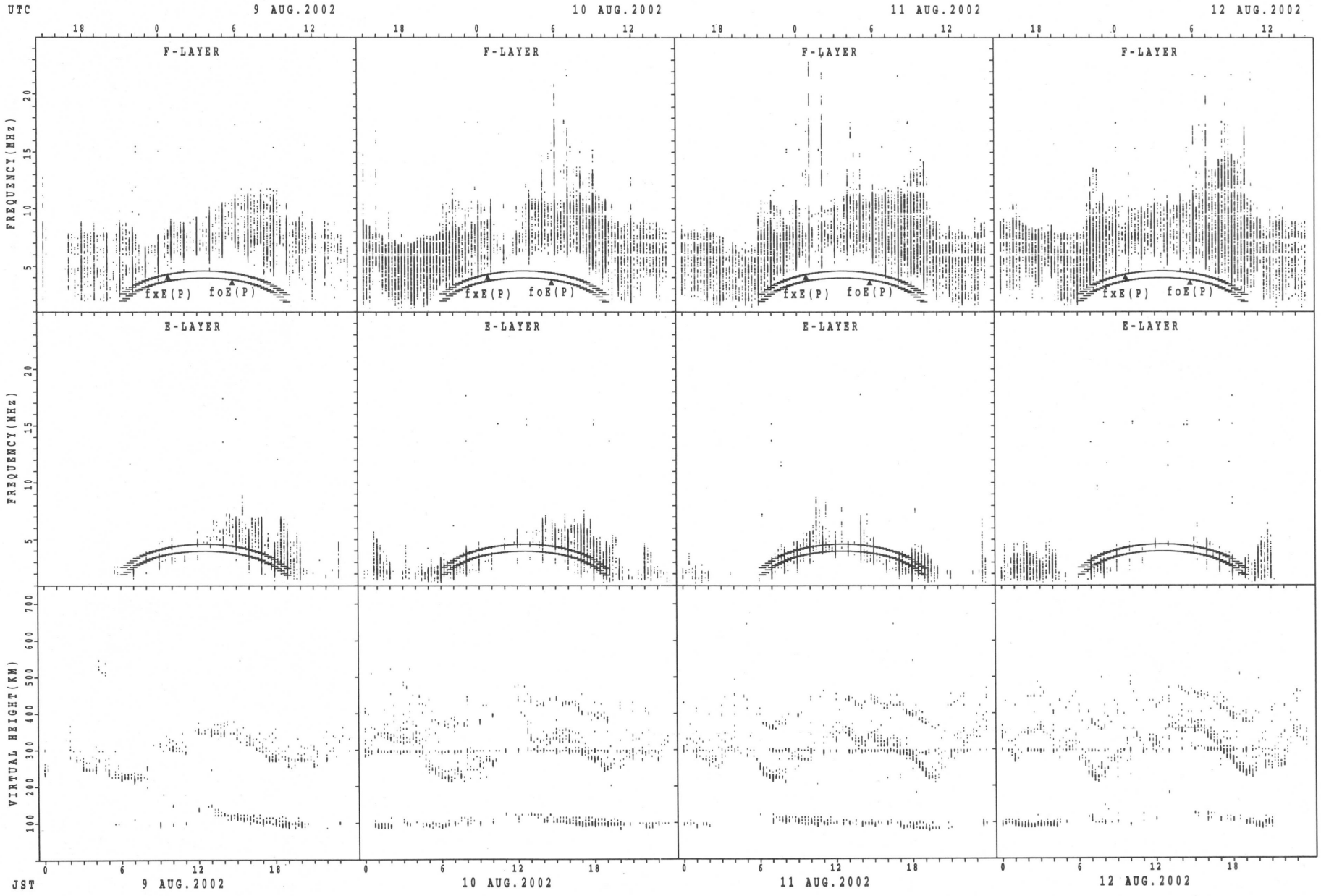
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



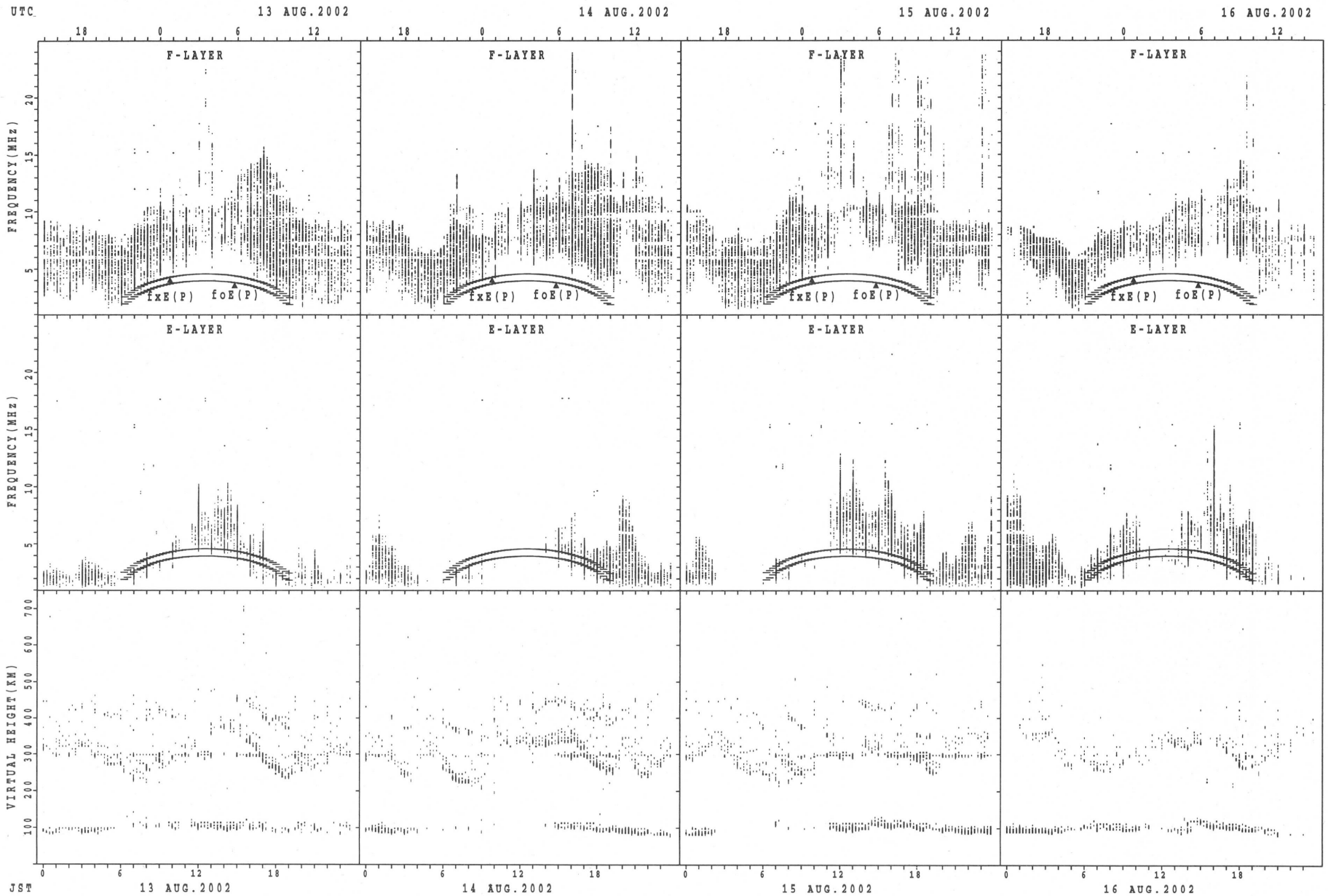
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



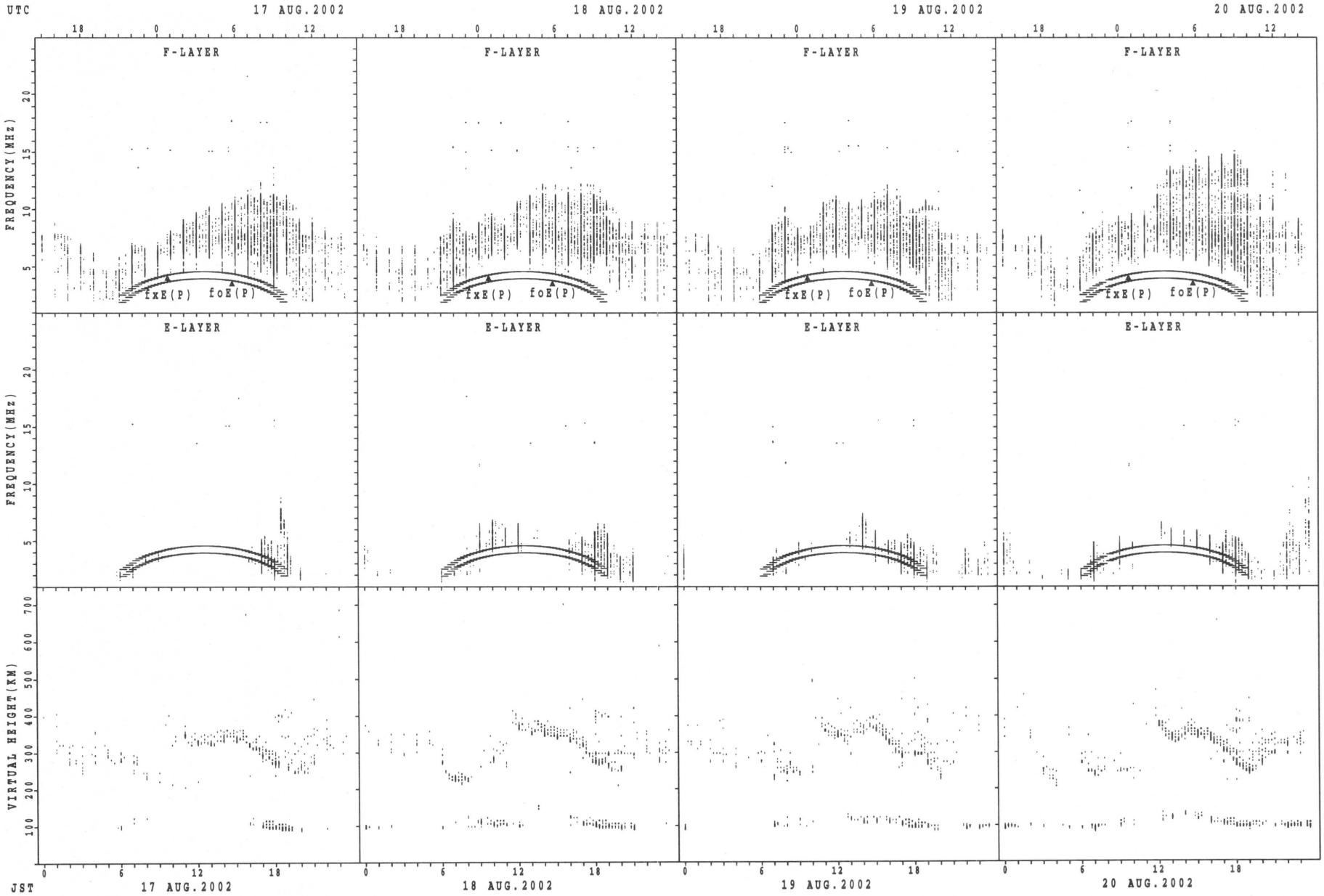
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



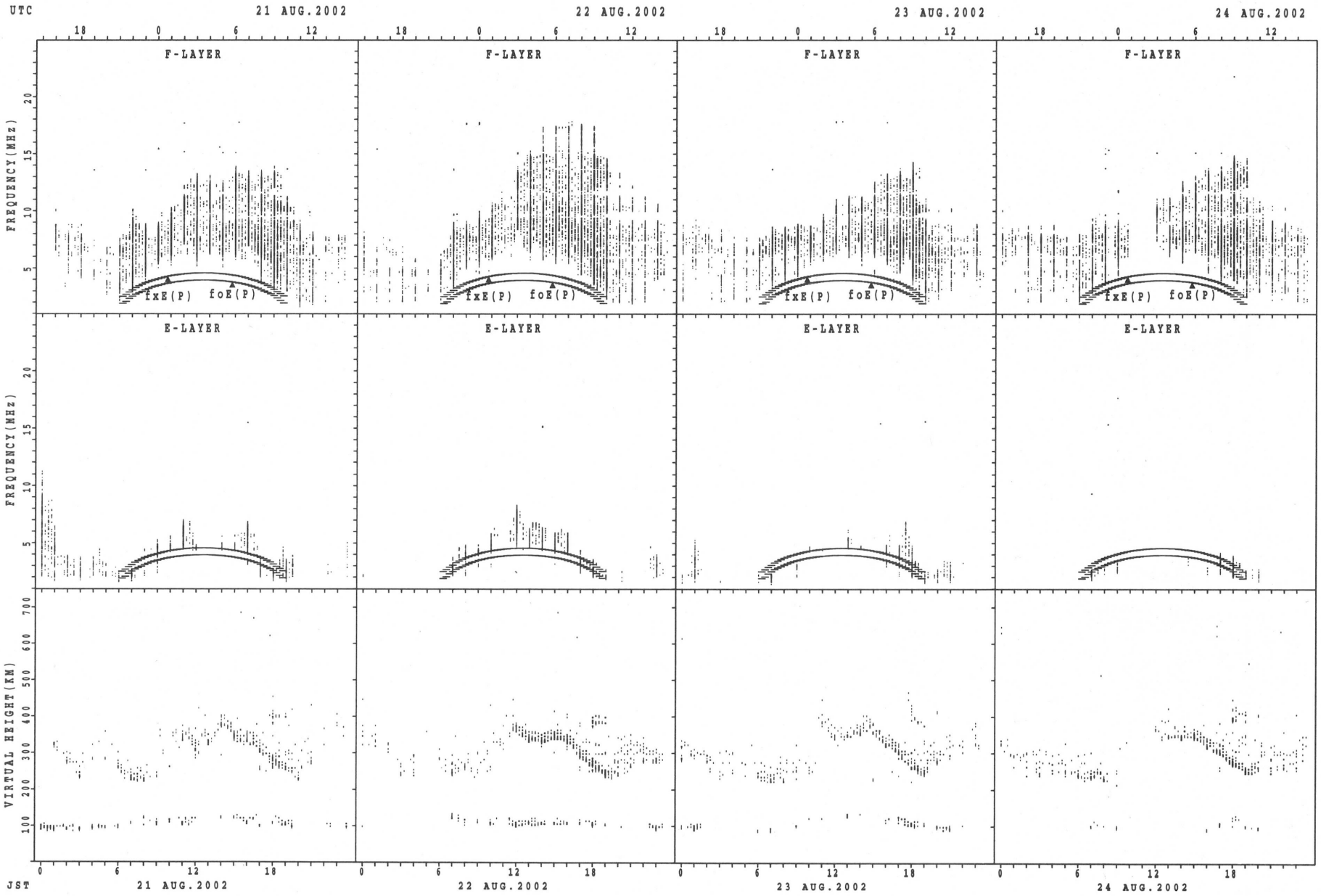
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



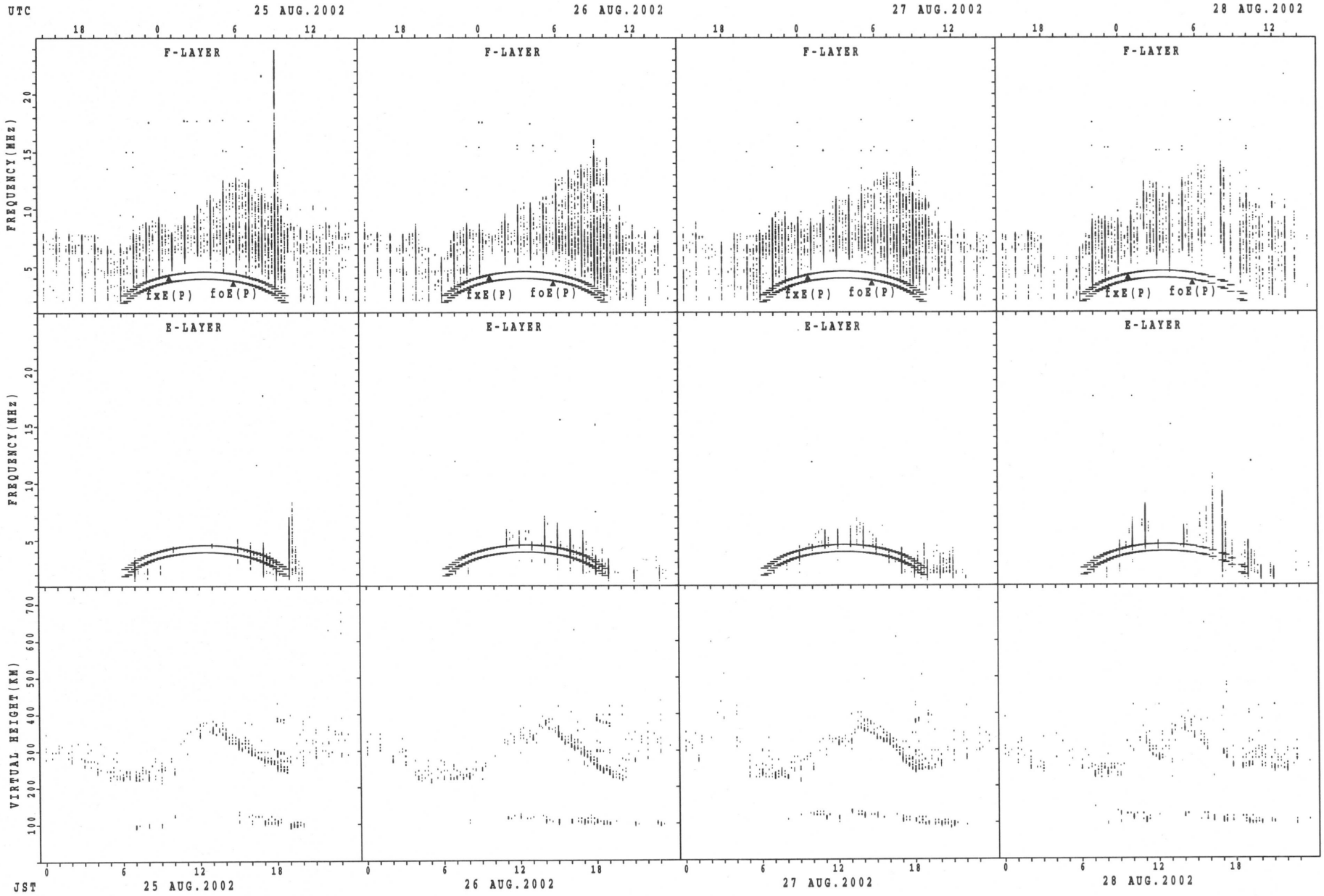
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



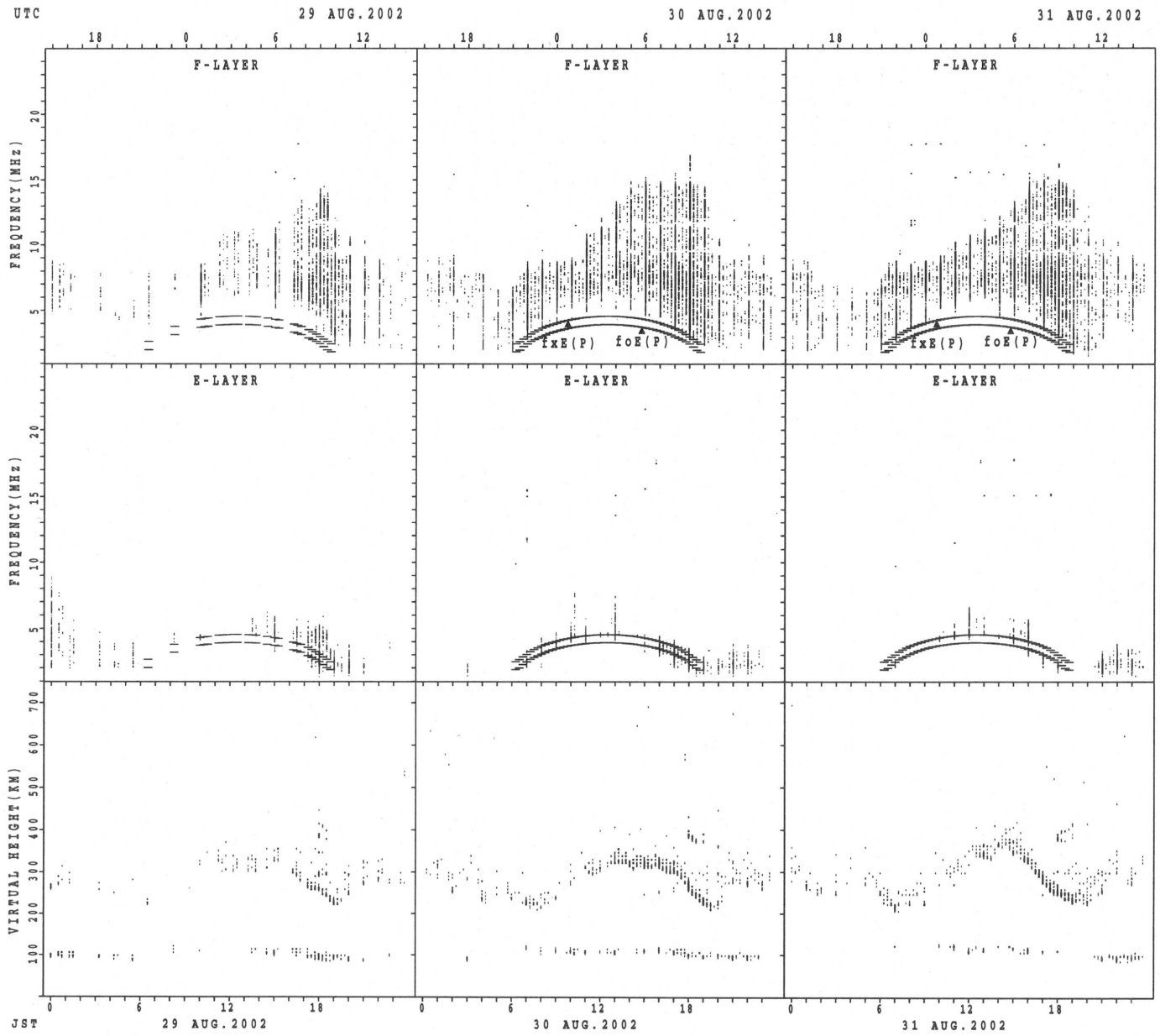
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

AUG. 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	4					9	19	16	7							4	17	18	21	15	12	9	6	2
MED	327					284	294	286	272							297	288	290	292	288	300	320	324	332
U Q	333					326	312	312	320							303	298	308	307	300	308	335	348	332
L Q	317					279	276	251	270							282	273	284	270	278	288	295	314	332

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	20	20	20	18	16	20	23	28	26	23	20	17	17	23	21	22	27	22	26	23	24	26	21
MED	99	99	99	97	105	109	109	107	105	103	103	103	103	105	105	107	104	105	103	103	103	103	103	101
U Q	103	103	102	102	113	115	113	109	109	105	105	105	105	110	113	115	113	113	107	105	109	106	105	103
L Q	95	97	95	95	99	106	107	103	103	103	103	98	98	103	95	103	99	101	99	99	99	99	99	96

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	5	4	3	1	1	4	20	25	26							4	30	30	29	23	7	4	8	5
MED	354	333	334	338	308	281	266	258	273							299	295	278	272	276	272	309	359	332
U Q	416	365	350	169	154	327	292	279	296							309	310	294	283	296	314	334	392	357
L Q	326	266	304	169	154	239	253	246	254							286	278	264	259	258	264	283	340	316

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	26	17	19	18	12	11	11	18	19	22	21	22	25	18	18	18	20	24	24	25	26	23	20	22
MED	97	95	99	97	101	107	107	106	103	104	101	100	105	107	109	105	104	103	101	101	99	101	99	99
U Q	101	100	101	99	105	113	111	113	107	107	105	107	111	115	113	113	112	107	103	103	103	105	103	101
L Q	95	93	97	95	96	97	97	103	99	101	97	97	99	103	103	99	102	99	95	97	97	95	97	97

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	8	8	9	8	6	4	17	27	26	16							28	29	28	30	16	14	10	14
MED	366	346	314	298	396	401	284	250	254	268							306	288	260	264	302	347	358	354
U Q	391	391	385	331	416	417	302	272	272	287							325	303	278	268	338	404	380	368
L Q	356	329	295	279	370	357	267	236	240	251							302	277	253	254	279	296	348	340

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	22	20	24	18	20	15	17	13	18	16	18	21	15	19	17	17	26	25	20	27	26	27	24	26
MED	97	97	95	94	95	95	97	107	105	106	105	105	105	107	109	109	110	107	104	99	97	97	95	97
U Q	99	102	99	99	97	99	122	113	113	110	107	111	115	111	117	119	113	110	107	103	103	101	97	99
L Q	91	92	91	91	91	93	95	103	103	103	99	103	101	103	105	102	105	103	101	97	95	91	91	93

MONTHLY MEDIANS OF h'F AND h'Es

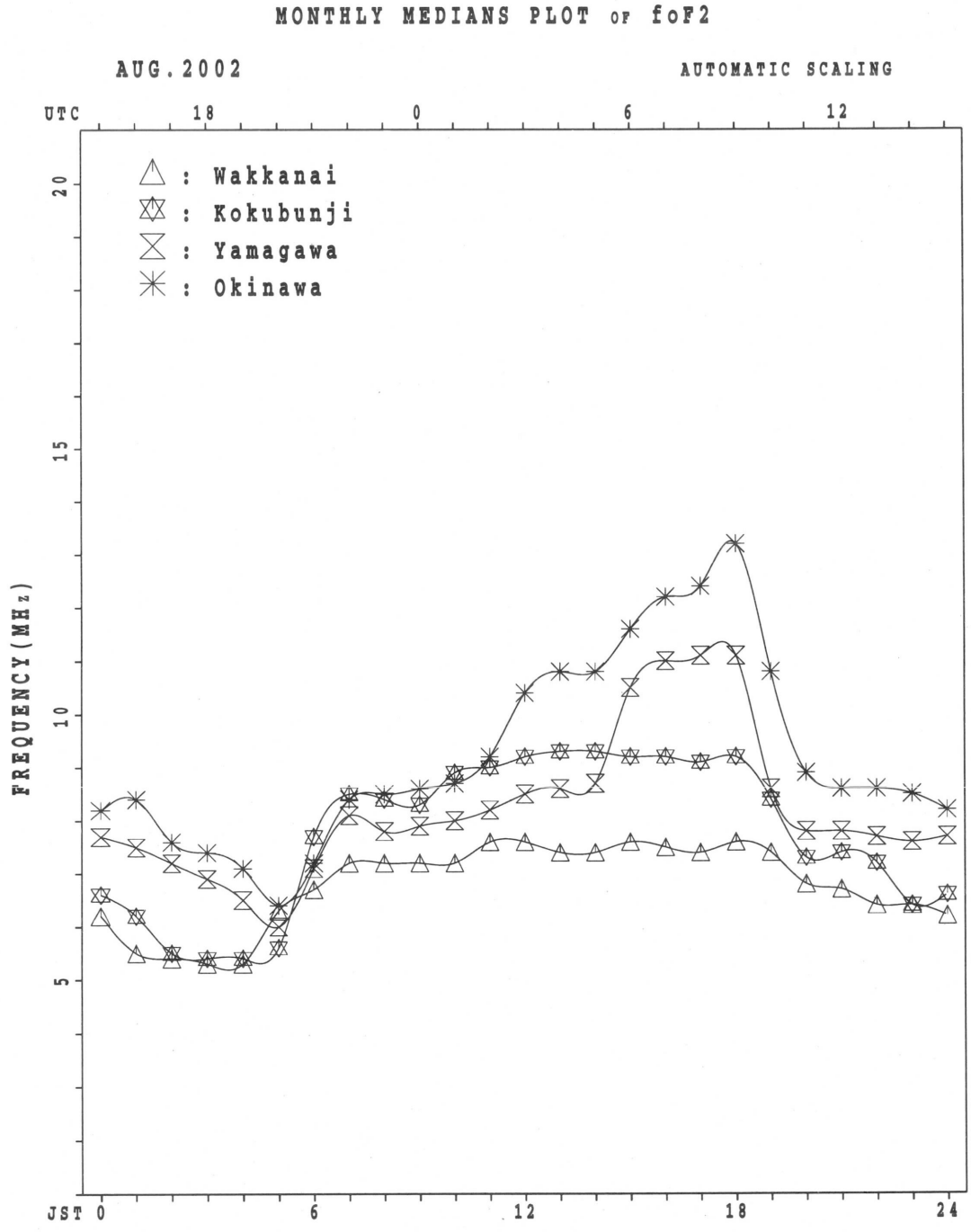
AUG. 2002 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	20	19	21	18	14	9	18	28	28	26							28	30	29	30	27	27	23	20
MED	332	306	296	292	296	290	280	246	248	257							318	294	268	256	296	302	304	319
U Q	360	320	322	302	318	332	310	263	262	280							326	302	274	270	306	328	336	340
L Q	305	294	280	272	272	273	260	235	238	250							295	278	258	244	280	294	296	297

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	16	12	11	7	7	9	8	15	14	19	24	18	21	20	22	24	26	25	27	28	24	16	11	12
MED	95	97	95	95	97	97	99	103	112	109	111	107	115	116	114	114	111	107	103	99	97	95	95	96
U Q	99	100	97	103	101	103	106	119	119	115	116	115	121	131	121	123	115	112	105	103	99	103	97	97
L Q	95	92	93	89	93	97	96	97	103	105	104	105	103	109	107	108	109	103	99	95	91	95	91	95


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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	92	90	89	X 78	X 74															X 108	X 83	X 75	X 75	X 75
2	X 73	X 73	X 88	O X 78	X 54															A	X 68	X 68	O X 68	X 66
3	X 68	A	X 64	O X 66	X 64															X 103	X 96	X 89	X 86	X 86
4	X 83	O X 87	X 84	X 81	X 77															X 97	X 82	X 76	X 80	X 77
5	X 77	X 72	X 67	X 66	X 65															X 110	X 92	X 80	X 85	X 81
6	79			X 77	X 72	X 74														X 97	X 85	X 78	S 62	A
7	84	O X 77	X 76	X 68	O X 64															A	X 100	X 90	X 75	A
8	A	O X 70	O X 67	O X 68	X 64															X 96	X 77	X 78	X 80	X 78
9	X 73	X 69	X 68	O X 69	X 68															X 85	X 86	X 84	X 84	A
10	X 81	X 72	76	X 71	X 72															X 86	X 83	X 84	X 82	X 77
11	X 76	X 76	X 70	X 66	X 64															X 93	X 84	X 84	X 87	X 84
12	X 84	X 81	X 75	X 74	X 73															X 98	X 75	X 76	X 74	X 76
13	X 75	X 74	X 74	X 71	X 69															X 84	X 80	X 82	X 80	X 81
14	X 77	X 76	X 73	X 69	X 65															X 97	O X 95	X 92	X 88	X 82
15	X 83	O X 75	X 74	X 76	X 71															A	X 83	X 82	X 84	X 83
16	X 75	X 74	X 71	X 70	X 69															X 82	X 77	X 72	X 74	X 70
17	O X 70	O X 71	X 68	X 68	X 58															X 86	X 78	X 73	X 74	X 74
18	X 72	X 72	X 66	X 65	X 64															X 92	X 78	X 76	X 80	X 78
19	X 74	X 75	X 71	X 67	O X 66															X 89	X 82	X 74	X 73	X 72
20	X 70	X 68	X 76	X 72	X 64															X 89	X 81	X 86	X 88	X 84
21	X 80	X 81	X 78	X 72	X 68															X 86	X 78	X 80	X 78	X 78
22	X 79	X 75	X 73	X 71	X 60															X 91	X 81	X 81	X 84	X 82
23	X 78	X 76	X 74	X 70	X 67															X 95	X 82	X 83	X 85	X 82
24	X 83	O X 81	X 74	X 74	O X 70															X 97	X 90	X 87	X 82	X 80
25	O X 78	X 78	O X 76	X 74	X 73															X 99	X 81	X 84	X 83	X 82
26	X 83	X 77	X 74	X 76	X 74															X 107	X 89	X 84	X 84	X 78
27	X 82	X 77	X 68	O X 68	X 74															X 93	X 82	X 81	X 80	X 80
28	X 82	X 86	X 85	X 66	X 68															X 90	X 84	X 80	X 80	X 83
29	X 76	X 72	X 75	X 69	O X 67															X 96	X 80	X 82	X 79	O X 77
30	X 73	X 71	X 69	X 67	X 65															X 100	X 81	X 85	O X 83	X 80
31	X 77	X 78	X 74	X 70	X 69															X 98	X 91	X 89	X 91	X 83
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	31	31	1														28	31	31	31	28
MED	X 78	X 75	X 74	X 70	X 68	X 74														X 96	X 82	X 82	X 80	X 80
U Q	X 82	X 78	X 76	X 74	X 72															X 98	X 86	X 84	X 84	X 82
L Q	X 74	X 72	X 69	X 68	X 64															X 89	X 80	X 76	X 75	X 77

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 2002 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	72	68	67	76	S	91	95	S 98	81	S 87	94	90	92	98	96	102	102	77	69	S 69	69
2	S 67	67	S 82	72	48	S 48	A	70	74	76	S 68	A	A	90	89	90	80	A	74	A	S 62	62	S 62	60
3	S 62	A	58	60	58	63	S 69	77	82	90	94	92	94	93	98	92	89	91	85	97	90	83	80	80
4	77	S 81	78	75	71	64	72	75	76	86	88	93	96	92	93	98	104	100	100	91	76	70	S 74	S 71
5	71	66	61	60	59	U S 68	90	98	73	69	76	76	80	84	A	A	A	92	99	103	86	S 74	79	75
6	F	S 64	S	S 70	S 66	S 68	81	90	86	S 80	69	S 66	73	83	87	92	96	93	94	91	79	72	S	A
7	F	S 71	J S 70	S 62	58	59	80	102	92	71	A	71	79	81	84	86	84	90	A	A	94	84	69	A
8	A	S 64	S 61	S 62	58	64	72	76	80	73	72	76	80	77	A	89	88	87	92	90	71	72	74	72
9	67	S 63	61	S 63	62	66	81	80	75	75	76	77	78	82	89	91	86	87	86	79	80	78	78	A
10	75	66	F	65	66	71	80	S 91	97	83	78	80	A	91	96	92	98	99	99	80	77	78	76	71
11	70	70	64	S 60	58	60	78	76	A	82	80	85	85	82	82	80	81	82	84	87	78	78	81	78
12	78	75	69	68	67	66	78	94	93	85	S 84	95	95	90	84	81	84	84	89	92	69	70	68	S 70
13	S 69	68	68	65	63	58	60	69	79	93	93	94	88	90	88	95	100	89	82	77	74	76	74	S 74
14	71	70	66	63	58	66	85	103	87	84	84	S 94	105	96	94	100	93	S 95	88	91	89	86	82	76
15	S 77	69	68	70	65	62	63	H 60	62	70	76	73	74	80	83	80	84	A	A	A	S 77	76	78	77
16	68	68	65	64	62	57	57	56	58	S 60	S 62	S 68	S 70	75	78	78	74	72	81	76	71	66	68	S 64
17	S 64	S 65	62	62	52	50	59	S 52	S 61	S 60	S	S 70	76	80	85	82	84	85	86	80	72	67	S 68	68
18	66	66	60	58	58	S 63	88	88	84	82	83	80	87	89	87	86	83	86	85	86	72	70	74	72
19	68	S 69	65	61	60	62	75	88	91	94	91	A	105	95	84	87	90	80	86	83	76	68	67	S 66
20	64	62	70	66	58	61	73	85	93	106	93	92	103	107	103	98	98	100	99	83	75	80	82	78
21	74	75	72	66	62	59	77	88	84	83	93	105	109	108	100	100	97	91	85	80	72	74	S 72	72
22	73	69	67	65	54	55	62	62	68	77	88	96	104	111	S 110	106	96	91	86	85	S 74	75	78	76
23	72	70	68	64	61	61	78	87	86	88	91	94	98	96	98	100	100	100	95	89	76	77	79	76
24	77	75	S 68	68	S 64	70	86	89	98	98	S 98	98	102	101	98	95	92	92	91	91	84	81	76	S 74
25	S 72	72	S 70	68	S 67	68	87	88	91	90	94	94	93	96	102	102	97	95	94	93	75	78	77	76
26	77	S 71	68	70	68	70	77	84	82	93	89	91	96	100	108	109	107	105	104	101	83	78	78	S 72
27	76	71	62	62	68	76	70	78	83	99	98	S 97	103	108	98	102	105	104	103	87	76	75	74	74
28	76	80	79	60	62	66	83	98	96	98	100	119	116	96	94	99	90	87	86	84	S 78	74	74	77
29	70	66	69	63	S 61	60	64	75	80	S 78	70	77	81	90	89	88	87	81	83	89	S 74	76	73	S 71
30	67	S 65	63	61	59	63	77	75	81	82	88	93	92	93	94	90	93	100	107	93	S 75	79	77	S 74
31	71	72	68	64	63	66	87	93	90	91	93	99	105	103	102	103	96	96	95	92	85	82	85	77
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	28	31	31	31	30	30	30	31	29	29	29	31	29	30	30	29	29	28	31	31	30	28
MED	71	69	68	64	62	63	77	84	84	83	88	92	93	92	93	92	92	91	89	89	76	76	75	74
U Q	76	72	70	68	66	67	81	90	91	93	93	94	103	96	98	100	98	98	99	92	80	78	78	76
L Q	67	S 66	62	62	58	60	70	75	76	76	76	76	80	83	86	87	84	86	85	83	74	70	72	71

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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							A	A	A	L	A	L 600	556	L 564	U L 520	L 556	A	A	L					
2						A	A	L 448	A	A	A	A	A	L 536	536	A	A	A						
3								L	L	L 500	A	A	A	576	L 556	A	L 500	L						
4							L	L	L 548	L	L 524	A	A	A	A	L 520	L 512	L						
5							L	L	A	L 552	L 548	L 520	548	L 572	A	A	A	A						
6		A	A				L	A	A	480	572	560	A	524	L 504	L 528	L 484	L						
7								L	L	A	A	A	L 524	L 552	L 520	L 512	L 488	A	A					
8							L	L	A	A	A	A	A	A	A	L	L 492	L						
9							L	L	A	L	L	A	540	A	A	L	L	A	A					
10								L	E A	L	L 588	L 608	A	E A	E A	L	L	L						
11							A	A	A	L 560	A	A	A	L 544	L	L	L	L	L					
12							L	L	L	L	A	L	L 572	L	L 532	L	L	L	A					
13						L	L	L 472	L 560	A	L	L 608	L 556	L 568	L 580	L 548	L	L						
14								L	L	L 632	L	U L 560	L 580	L 588	L	L	A	A						
15									A	536	A	L	A	560	L 572	L 568	A	A	A					
16							L 408	L 476	A	U L 544	L 536	L 592	L 560	568	L 576	L		L						
17							L	L 468	468	U L 512	U L 580	U L 612	L 608	L 592	L 552	U L 568	L	A	A					
18									L	L	L		600	L 612	L 608	L 564	L	L						
19								L		A	A	A	600	L	L 584	L 604	L	L						
20								L	A	L	L	L 648	A	L	A	A	L	A						
21											L	L	L 588	L	L	L	L							
22							L 436	L	L 528	L 596	A	E B	A	L	L	L								
23									L	L	A	L 600	L	L	L	L	L	L						
24									A	A	E B	E B	L 632	L	L	L	L							
25											L 580	L	L 636	L 580	L 564	L	L	L						
26										E B	E B	L	L	L 600	L	L 548	L							
27									L	L	L	A	L	A	A	A	A	A						
28								L	L	L	L	L 592	L 540	A	L	L	L							
29								L	L	L	L 568	L 536	U L 608	L 532	L 528	A	A	L						
30									L	L	L 568	L 560	A	L	L 576	L	L	L						
31										L	A	A	556	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	4	4	9	9	13	17	16	15	10	5							
MED							L 422	L 470	L 538	L 544	L 568	L 592	L 572	L 568	L 556	L 552	L 492							
U Q								L 474	L 554	L 578	L 580	L 608	L 604	L 584	L 576	L 568	L 506							
L Q								L 458	L 498	L 506	L 542	L 560	552	L 548	L 528	L 528	L 486							

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

IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	A	A	A	A	A	A	A	U A 392	372	352		A	A				
2						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
3						B	A	U R 332	U A 364	A	A	A	A	A	A	364	332		A	A				
4						B	U R 268	U A 284	R	B	R	A	416		A	A	A	A	A	B				
5						U R 148	U A 252	A	A	A	A	U R 400	420		R	A	U A 364	A	A	B				
6	A	A	A				A	A	A	A	U R 408	A	A	A	A	U R 356	A	U R 296	A					
7						B	244	U A 300	A	A	A	A	A	R	U R 388	360	332		A	A				
8						B	A	A	A	A	A	A	A	A	A	A	A	U R 268	A					
9						B	A	A	A	A	A	A	A	A	U A 384	360	U A 336	276	184					
10						A	A	296	A	A	A	U A 392	A	A	A	A	A	A	U A 204					
11						B	U A 252	296	A	A	A	A	A	A	A	U R 352	U R 328	288	U A 196					
12						B	248	U A 304	A	U A 364	A	A	R	A	U R 380	U R 364	344		A	A				
13						U A 176	252	U A 324	U A 348	A	A	A	B	A	A	A	A	A	208					
14						176	264	U A 316	A	A	A	A	A	B	A	A	A	A	A					
15						B	A	312	A	A	A	A	B	R	B	A	U A 344	280	A					
16						B	252	312	U A 356	A	R	A	A	R	R	B	U R 344	U A 276	A					
17						B	U A 224	A	A	A	A	B	B	U R 400	U R 384	U R 368	A	A	A					
18						B	U R 260	U A 304	A	A	A	B	U R 424	B	U R 400	376	U A 344	276	U R 192					
19						B	R	328	A	A	A	A	A	A	U R 396	376	U A 344	A	A					
20						B	260	304	A	A	B	B	B	A	A	A	U A 340	A	A					
21						B	A	U A 328	U A 356	A	A	A	B	B	R	B	U R 340	R	U A 204					
22						B	U A 240	312	A	B	A	B	A	B	A	A	348	300	A					
23						B	U R 252	304	B	A	A	A	A	R	U R 380	B	R	U R 292	220					
24						B	260	316	A	A	B	B	B	B	R	B	U R 340	U A 292	U A 192					
25						B	U R 248	U A 296	R	R	R	U A 392	R	A	U A 380	A	A	U R 272	U A 172					
26						B	U R 236	U R 308	U A 344	B	B	R	R	U R 380	A	U R 352	U A 324	284	B					
27						B	240	288	A	A	R	B	U A 412	400	A	A	A	A	A					
28						B	224	A	A	U R 376	R	R	U A 412	U A 388	A	A	A	A	184					
29						B	232	300	R	R	B	B	B	B	A	A	A	A	A					
30						B	A	U R 284	A	B	R	A	A	A	A	U R 364	328	U A 252	B					
31						B	244	296	A	A	A	A	U R 424	R	A	A	A	A	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	20	23	5	2	1	3	6	4	9	13	16	13	10					
MED						U 176	250	304	U A 356	U 370	U R 408	U A 392	U 418	U 394	U R 384	U 364	U 340	U 280	U 194					
U Q						U A 176	256	U 316	U A 360			U R 400	U R 424	400	U R 394	370	U 344	U 292	204					
L Q						U R 148	240	296	U A 346			U A 392	U A 412	U 384	U R 380	U R 358	332	U 274	184					

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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 79	JA 56	JA 28	JA 46	JA 39	50	JA 67	JA 84	JA 101	JA 110	JA 96	JA 52	50	JA 65	45	G 34	JA 55	JA 62	29	JA 52	JA 26	EB 15	EB 19	JA 46
2	JA 32	JA 32	JA 30	JA 34	JA 44	JA 47	JA 104	JA 47	JA 55	JA 73	JA 72	JA 114	JA 166	JA 54	44	JA 78	JA 96	JA 89	JA 68	JA 74	35	JA 33	23	JA 27
3	JA 31	JA 63	JA 42	JA 55	JA 47	JA 40	JA 42	G 27	42	JA 54	JA 59	63	JA 54	JA 76	53	JA 56	JA 52	JA 47	JA 43	EB 15	22	EB 16	JA 38	JA 26
4	JA 26	JA 22	JA 64	JA 22	23	26	G 21	33	G	44	45	JA 71	JA 57	JA 58	JA 70	JA 98	JA 52	JA 57	JA 50	JA 40	JA 20	JA 20	JA 33	EB 15
5	JA 31	26	21	JA 25	25	G	30	37	JA 54	JA 84	JA 96	G 38	JA 54	G	JA 135	JA 144	JA 147	JA 130	JA 126	56	JA 83	JA 86	JA 46	JA 52
6	JA 32	JA 51	38	JA 32	JA 46	JA 24	JA 34	JA 98	JA 125	44	G 39	JA 47	68	JA 54	JA 41	G 32	38	G 27	JA 68	JA 65	JA 28	JA 144	27	JA 83
7	JA 41	JA 82	JA 54	JA 33	JA 23	EB 17	44	JA 44	JA 45	JA 63	JA 82	JA 62	46	G 34	G 34	G 34	JA 59	JA 82	JA 144	JA 143	JA 29	JA 30	JA 21	JA 103
8	JA 83	JA 54	JA 48	JA 42	JA 26	26	28	JA 44	JA 54	JA 80	JA 78	JA 60	JA 57	JA 70	JA 86	JA 54	JA 63	G 22	30	JA 27	JA 24	22	EB 20	18
9	JA 86	JA 28	JA 31	JA 41	33	20	JA 35	JA 37	JA 60	JA 50	JA 52	JA 71	JA 47	JA 96	JA 64	JA 54	50	JA 60	JA 51	JA 44	JA 52	JA 40	JA 132	JA 102
10	JA 64	JA 83	JA 61	JA 62	JA 33	JA 56	JA 64	37	JA 52	46	46	JA 56	JA 104	JA 74	JA 98	JA 84	JA 72	JA 58	26	23	JA 26	23	EB 16	JA 22
11	JA 50	22	JA 22	JA 27	JA 22	JA 28	JA 54	JA 47	JA 96	JA 66	JA 57	JA 56	JA 80	47	JA 44	G	G	32	26	JA 87	JA 53	JA 48	JA 28	JA 30
12	JA 25	JA 22	JA 21	JA 28	JA 22	EB 17	31	38	JA 54	JA 51	JA 59	JA 54	G	JA 52	G	42	G 27	32	JA 86	JA 27	JA 27	EB 15	JA 21	JA 40
13	JA 26	JA 28	JA 28	JA 29	JA 26	25	34	JA 46	45	JA 76	JA 88	JA 56	46	43	JA 86	40	36	JA 31	G	JA 20	JA 29	JA 86	JA 54	JA 26
14	EB 16	JA 21	19	EB 16	JA 25	22	29	39	40	JA 58	JA 52	53	47	EB 46	47	JA 50	JA 59	JA 87	JA 56	JA 36	JA 48	JA 28	JA 40	JA 25
15	JA 22	JA 26	JA 20	JA 26	JA 26	JA 25	JA 31	35	JA 61	JA 49	JA 64	JA 52	JA 63	G	EB 44	JA 181	JA 125	JA 108	JA 237	JA 124	JA 65	JA 46	JA 38	JA 22
16	JA 47	JA 22	JA 29	JA 28	JA 21	20	G 24	39	JA 55	43	G	44	46	G	GE B 44	40	JA 46	JA 42	JA 34	JA 34	JA 51	JA 27	JA 67	
17	JA 62	JA 44	32	JA 23	JA 25	25	29	JA 46	38	41	52	EB 45	49	46	G	GJ A 53	JA 73	JA 66	JA 75	JA 30	JA 51	JA 24	JA 53	
18	JA 58	EB 18	EB 14	EB 15	EB 20	EB 17	G	35	41	JA 50	JA 50	EB 44	G	45	47	46	38	34	GJ A 19	JA 65	JA 53	JA 54	EB 15	
19	EB 15	EB 15	EB 20	EB 15	EB 16	EB 18	JA 31	41	JA 59	JA 67	JA 74	JA 118	JA 60	JA 71	45	49	JA 49	JA 39	JA 51	JA 48	JA 54	JA 19	JA 69	JA 74
20	JA 54	JA 22	23	JA 22	EB 16	EB 20	G	36	JA 53	JA 54	55	46	55	57	JA 83	JA 83	JA 82	JA 90	JA 52	JA 50	76	85	JA 115	JA 48
21	JA 49	JA 24	JA 32	JA 24	24	EB 20	JA 47	36	48	JA 58	61	JA 64	50	EB 46	GE B 43	G	G	26	20	JA 16	26	JA 33	31	
22	36	JA 19	25	EB 16	EB 19	25	29	37	41	JA 53	JA 73	EB 78	JA 70	JA 60	JA 64	46	G	G	JA 26	JA 32	JA 26	JA 24	JA 42	JA 20
23	JA 25	JA 24	26	JA 21	24	EB 19	G	GJ A 27	JA 40	JA 50	JA 64	JA 48	JA 49	G 38	GE B 35	GE B 43	G 30	G	GJ A	JA 29	JA 28	JA 26	EB 20	22
24	JA 21	JA 21	JA 29	JA 25	25	24	G 22	37	61	JA 74	EB 88	EB 75	EB 56	EB 46	GE B 34	E B 45	G 28	33	30	26	E B 15	EB 15	EB 19	EB 20
25	JA 35	JA 22	JA 42	32	E B 15	22	G	34	G 25	G 26	G 24	43	G	44	43	38	34	GJ A 32	JA 24	JA 26	JA 15	EB 16	EB 19	
26	EB 16	18	EB 16	EB 16	EB 14	EB 16	G	G 20	37	EB 46	EB 55	G	G	G	39	G	37	GJ A 26	EB 14	24	JA 19	22	EB 12	
27	EB 16	EB 14	EB 15	EB 16	EB 20	EB 16	G	34	40	JA 55	G 33	JA 56	51	JA 65	JA 71	JA 92	JA 100	JA 46	40	JA 30	JA 23	18	JA 44	JA 63
28	JA 50	JA 38	18	EB 15	EB 22	EB 20	JA 42	JA 52	JA 54	G	G 36	G 34	50	48	46	JA 51	JA 40	29	GJ A 25	JA 126	JA 43	JA 44	JA 55	
29	JA 32	JA 26	EB 16	22	E B 16	24	G	G 24	G 24	G 27	44	46	49	46	46	JA 56	JA 54	JA 39	JA 44	JA 98	JA 44	JA 38	22	JA 44
30	JA 36	JA 44	JA 32	JA 26	JA 28	JA 24	29	G	36	EB 42	G	JA 53	50	JA 54	JA 44	G 25	37	30	JA 27	JA 41	JA 44	JA 49	JA 54	JA 54
31	JA 84	JA 35	JA 29	EB 14	EB 14	EB 20	G	32	39	JA 46	JA 72	JA 63	G	G 43	GJ A 50	JA 54	JA 44	JA 45	JA 62	JA 55	JA 26	JA 29	JA 26	JA 21
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	JA 35	JA 26	JA 28	JA 25	24	22	29	37	JA 48	JA 51	JA 56	JA 54	50	47	45	46	JA 49	JA 39	JA 42	JA 36	JA 29	JA 29	JA 28	JA 30
U Q	JA 54	JA 44	JA 32	JA 32	JA 26	JA 25	JA 42	JA 44	JA 55	JA 66	JA 73	JA 63	JA 57	JA 60	JA 64	JA 56	JA 59	JA 62	62	56	JA 52	JA 49	JA 44	JA 54
L Q	25	22	E B 20	E B 16	E B 20	E B 20	G	G 34	40	44	G 45	46	G 46	G 43	G 39	G 38	G 36	G 29	26	25	JA 26	EB 19	EB 21	EB 21

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

IONOSPHERIC DATA STATION Kokubunji

AUG.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	54	48	19	35	30	44	65	55	62	49	87	45	44	47	43	G 34	53	52	26	41	20	E B 15	E B 19	28
2	28	28	23	31	33	40	A A 104	39	48	56	60	A A 114	A A 166	49	43	65	69	A A 89	54	A A 74	31	21	18	19
3	21	A A 63	20	42	29	31	31	G 27	40	44	55	60	52	51	50	49	41	33	23	E B 15	E B 16	E B 16	33	24
4	17	20	21	19	20	23	G U Y 20	32	G	42	43	54	52	57	55	45	37	33	28	22	16	E B 15	27	E B 15
5	18	21	E B 16	20	20	G	28	37	52	42	43	G 38	47	G	A A 135	A A 144	A A 147	63	40	25	38	45	36	41
6	28	40	35	24	20	20	29	53	46	42	G 39	46	60	42	39	U Y 32	37	G 26	30	20	22	20	24	A A 83
7	24	23	23	30	E B 14	E B 17	39	41	42	52	A A 82	59	44	G 34	G 34	G 34	42	53	A A 144	A A 143	17	21	E B 15	A A 103
8	A A 83	44	45	40	24	U Y 26	26	38	52	51	52	57	55	62	A A 86	47	36	G 21	21	24	20	E B 15	E B E B 20	E B 14
9	30	24	30	24	32	20	33	32	56	48	52	56	45	56	60	42	42	56	48	40	43	36	42	A A 102
10	40	51	39	23	25	27	30	35	48	42	42	55	A A 104	68	63	48	36	31	24	E B 14	20	E B 14	E B E B 16	E B 15
11	E B 16	17	19	20	17	24	42	44	A A 96	42	53	54	63	42	42	G	G	31	25	E B 16	22	30	E B 16	18
12	20	16	E B 15	19	E B 15	E B 17	27	35	46	44	54	48	G	48	G	40	G 27	30	48	22	E B 15	E B 15	E B 14	24
13	21	E B 14	E B 15	19	24	G 17	33	37	43	65	43	44	44	42	46	39	36	30	G	16	20	28	34	18
14	E B 16	E B 15	E B 15	E B 16	E B 16	19	28	33	38	48	48	52	47	E B 46	45	45	57	63	52	20	19	24	22	E B 15
15	19	E B 15	E B 15	22	E B 15	19	26	34	52	46	54	48	60	G	E B 44	43	67	A A 108	A A 237	A A 124	26	20	19	18
16	34	E B 15	20	24	18	19	G 24	37	50	42	G	43	44	G	G	E B 44	38	36	31	31	20	32	26	42
17	55	36	32	22	21	23	29	35	U Y 38	U Y 41	52	E B 45	47	44	G	G	46	65	62	42	18	36	20	35
18	23	E B 18	E B 14	E B 15	E B 20	E B 17	G	35	40	45	44	E B 44	G	45	45	44	37	34	G	16	50	29	45	E B 15
19	E B 15	E B 15	E B 20	E B 15	E B 16	E B 18	26	38	51	63	56	A A 118	55	45	44	48	46	37	47	27	31	17	36	44
20	42	21	E B 20	21	E B 16	E B 20	G	35	49	46	54	45	53	55	79	78	46	87	50	49	43	41	43	41
21	35	20	24	23	21	E B 20	30	34	46	48	59	58	48	E B 46	G	E B 43	G	G	23	E B 15	E B 14	20	25	30
22	35	E B 15	20	E B 16	E B 19	E B 20	29	36	41	52	70	E B 78	55	55	52	45	G	G	23	29	20	20	30	E B 14
23	18	20	20	E B 14	E B 14	E B 19	G	G 27	40	46	56	46	45	U Y 38	U Y 35	E B 43	G 30	G	G	23	24	22	E B 20	E B 16
24	21	19	20	21	21	20	G 20	34	57	69	E B 88	E B 75	E B 56	E B 46	U Y 34	E B 45	G 26	G 25	28	21	E B 15	E B 15	E B 19	E B 20
25	24	19	36	30	E B 15	E B 17	G	32	G 24	U Y 26	U Y 24	42	G	43	43	37	34	G	21	22	21	E B 15	E B 16	E B 19
26	E B 16	E B 16	E B 16	E B 16	E B 14	E B 16	G	G 20	36	E B 46	E B 55	G	G	G	U Y 39	G	35	G	19	E B 14	21	E B 15	20	E B 12
27	E B 16	E B 14	E B 15	E B 16	E B 20	E B 16	G	31	38	52	U Y 33	52	48	62	60	91	67	41	35	28	21	E B 16	29	23
28	20	26	E B 16	E B 15	E B 22	E B 20	38	38	38	G	G U Y 36	34	47	46	45	46	37	27	G	21	43	30	32	38
29	22	22	E B 16	20	E B 16	22	G	G 24	G 24	G 27	44	45	48	45	45	55	49	36	42	36	23	27	20	24
30	28	39	28	22	21	23	28	G	36	E B 42	G	46	U Y 50	44	39	G 22	36	29	24	38	42	28	20	28
31	43	23	24	E B 14	E B 14	E B 20	G	32	38	44	68	61	G	U Y 43	45	45	37	36	41	44	E B 16	23	E B 14	E B 16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	23	20	20	21	20	20	28	35	43	46	52	47	48	44	44	44	37	33	28	24	21	21	20	23
U Q	35	28	24	24	22	23	31	38	51	51	56	58	55	51	52	48	46	53	48	40	31	29	32	38
L Q	E B 18	E B 16	E B 16	E B 16	E B 16	G	G	G 32	38	42	43	45	G 44	G 42	G 39	G 37	G 35	G	23	E B 20	E B 18	E B 15	E B 19	E B 16

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	17	13	16	15	15	20	20	17	24	33	28	31	31	31	34	23	23	20	14	15	15	15	19	20
2	15	15	14	14	16	16	17	22	24	30	29	30	31	30	31	27	23	16	14	16	16	13	15	15
3	16	14	15	14	13	15	14	20	30	32	28	29	33	35	29	20	18	15	15	15	16	16	14	14
4	13	14	16	14	14	17	18	19	21	39	31	36	36	33	30	25	19	16	15	14	12	15	15	15
5	13	15	16	14	14	12	20	20	20	21	21	30	32	30	34	20	21	14	13	15	14	15	14	16
6	16	15	14	16	14	15	19	21	21	23	34	35	28	29	22	20	16	17	16	14	15	15	13	15
7	16	14	16	18	14	17	20	19	20	34	27	31	23	22	21	20	19	14	12	14	14	15	15	13
8	14	15	16	14	15	16	13	20	20	24	28	27	33	30	30	23	18	15	14	14	15	15	20	14
9	16	16	14	16	15	14	16	16	21	23	36	32	36	33	33	24	22	16	15	16	15	15	16	16
10	14	15	14	14	15	15	12	15	18	20	29	30	31	22	21	20	19	16	16	14	15	14	16	15
11	16	13	15	14	15	15	15	15	20	22	24	29	36	34	26	24	21	15	15	16	14	16	16	15
12	15	16	15	14	15	17	16	17	21	20	18	22	32	30	24	20	19	15	14	14	15	15	14	14
13	15	14	15	15	15	13	14	16	20	20	24	31	40	28	28	20	20	14	15	14	14	15	16	14
14	16	15	15	16	16	16	16	17	21	21	24	36	36	46	28	24	20	20	14	13	15	14	16	15
15	14	15	15	15	15	15	14	13	20	23	25	34	42	34	44	22	19	16	16	16	14	15	14	14
16	15	15	16	15	14	13	14	18	20	21	24	32	36	26	31	44	22	18	15	14	18	15	16	16
17	16	16	16	16	16	14	18	20	21	22	36	45	43	32	31	22	20	20	14	14	13	14	14	15
18	15	18	14	15	20	17	20	18	20	23	31	44	36	42	36	23	20	16	15	13	15	16	16	15
19	15	15	20	15	16	18	21	20	23	31	32	33	40	35	31	25	21	14	14	15	15	13	15	14
20	14	14	20	14	16	20	15	19	20	24	40	41	45	34	34	22	17	17	13	16	16	15	14	16
21	15	16	16	14	14	20	19	17	21	31	24	36	43	46	24	43	21	16	15	15	14	15	15	15
22	14	15	13	16	19	20	20	17	20	39	40	78	40	41	35	25	22	17	14	14	14	16	16	14
23	15	15	16	14	14	19	20	20	36	26	38	34	34	34	28	43	21	16	16	14	14	15	20	16
24	14	13	15	15	13	15	16	18	20	22	88	75	56	46	28	45	16	16	14	15	15	15	19	20
25	16	14	17	14	15	17	16	16	20	21	20	29	31	34	28	20	19	15	12	13	14	15	16	19
26	16	16	16	16	14	16	17	15	17	46	55	34	30	30	24	22	17	16	18	14	19	15	16	12
27	16	14	15	16	20	16	16	14	18	23	20	42	29	34	29	20	17	16	15	14	14	16	15	16
28	15	14	16	15	22	20	16	16	20	20	24	26	24	30	22	19	19	15	14	14	14	15	14	16
29	16	16	16	12	16	17	20	20	18	20	40	41	44	41	32	22	19	16	14	15	15	16	16	16
30	16	14	15	15	15	13	14	20	21	42	35	31	32	24	25	16	20	16	15	15	14	15	16	15
31	14	16	14	14	14	20	16	16	23	26	30	36	32	36	24	20	20	15	15	14	16	14	14	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	15	15	16	16	18	20	23	29	33	34	33	29	22	20	16	15	14	15	15	16	15
U Q	16	16	16	16	16	18	20	20	21	31	36	36	40	35	32	25	21	16	15	15	15	15	16	16
L Q	14	14	15	14	14	15	15	16	20	21	24	30	31	30	24	20	19	15	14	14	14	15	14	14

IONOSPHERIC DATA STATION Kokubunji

AUG. 2002 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F	F	F	272	278	278	276	S	305	294	S 302	287	S 286	296	287	279	280	285	288	312	282	259	S 254	255
2	S 257	258	S 298	320	285	S 256	A	288	293	309	S 286	A	A	275	275	292	284	A	317	A	S 256	256	S 271	265
3	S 264	A	262	263	271	319	S 344	310	325	319	291	298	289	283	287	296	289	294	274	294	300	278	266	266
4	261	S 281	281	285	304	315	315	349	294	299	285	294	302	279	267	268	285	278	310	298	300	266	S 266	S 281
5	284	279	275	277	285	S 300	311	342	326	303	294	299	279	289	A	A	A	295	292	310	320	S 276	275	281
6	F	S 277	S	S 292	S 294	S 298	320	333	343	S 365	317	S 271	281	288	284	288	301	303	300	312	296	269	S	A
7	F	S 291	S 287	S 293	273	280	297	328	338	334	A	285	291	284	292	294	293	290	A	A	304	298	287	A
8	A	S 292	S 286	S 300	294	319	327	323	331	315	S 323	310	300	289	A	295	305	304	310	321	302	276	278	292
9	271	S 276	281	S 277	286	304	324	335	314	292	307	305	281	294	297	300	301	299	309	291	281	282	286	A
10	276	268	F	268	276	287	287	S 324	316	301	287	276	A	282	291	293	300	304	309	308	273	284	285	285
11	278	283	292	S 263	279	273	291	307	A	309	298	310	304	298	302	298	311	315	301	302	300	254	266	266
12	275	275	266	265	275	258	269	307	305	339	S 290	297	295	301	289	287	295	311	299	320	279	274	254	S 260
13	S 260	261	271	265	260	271	313	290	281	295	301	295	295	299	280	286	298	306	306	293	279	277	257	S 278
14	268	274	285	288	265	284	317	321	328	293	282	S 280	303	290	284	302	298	S 261	291	296	285	287	279	269
15	S 274	273	256	261	260	293	291	H 289	289	266	292	302	294	293	297	300	303	A	A	A	S 258	257	264	274
16	265	265	261	270	276	280	278	263	247	S 261	S 277	S 268	S 292	284	287	290	290	278	302	292	270	256	263	S 247
17	S 240	S 271	273	278	254	268	292	S 320	S 266	S 250	S	S 276	281	293	295	291	297	294	301	298	279	256	S 263	259
18	261	263	271	261	255	S 288	328	328	327	313	302	291	269	288	275	297	293	295	299	301	275	260	268	267
19	256	S 265	274	285	280	293	307	301	283	271	271	A	283	279	275	274	294	277	284	276	277	256	261	S 260
20	259	251	281	295	286	294	319	300	293	289	272	272	280	282	283	285	288	293	304	292	253	254	266	262
21	268	278	282	285	270	259	311	314	303	289	276	273	276	289	274	290	286	297	289	293	250	251	S 263	256
22	265	262	270	285	269	268	272	292	257	263	296	280	276	280	S 287	289	289	298	301	286	S 278	255	262	268
23	262	259	269	280	276	278	308	321	309	291	288	274	279	277	276	284	286	292	298	304	268	264	268	269
24	267	290	S 282	288	S 273	287	324	309	312	301	S 270	282	278	275	276	289	292	296	296	297	282	278	279	S 262
25	S 264	275	S 280	276	S 284	295	328	316	297	293	296	287	284	280	286	299	301	305	305	307	279	268	276	270
26	277	S 273	277	285	303	321	342	326	327	318	315	286	276	277	284	289	292	305	304	309	295	267	280	S 266
27	273	276	246	255	274	326	301	328	313	308	294	S 305	280	291	282	277	293	297	310	310	276	272	265	266
28	277	286	315	272	284	284	318	314	288	280	268	295	312	297	292	310	302	313	305	291	S 291	277	269	300
29	287	280	291	300	S 295	309	314	318	304	S 319	276	289	278	299	308	306	318	314	305	302	S 287	287	275	S 275
30	278	S 279	277	269	275	300	330	325	316	325	302	300	299	289	288	281	285	288	307	315	S 274	265	286	S 277
31	269	285	288	292	285	279	328	338	322	307	292	301	293	291	287	295	294	301	296	297	290	278	290	278
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	29	28	31	31	31	30	30	30	31	29	29	29	31	29	30	30	29	29	28	31	31	30	28
MED	268	275	278	278	276	287	314	319	307	301	292	289	284	289	287	290	294	297	301	300	279	268	268	268
U Q	276	280	286	288	285	300	324	328	325	315	302	300	295	293	292	297	301	304	306	310	295	278	279	278
L Q	261	265	270	268	271	278	292	307	293	289	280	278	279	280	278	286	289	291	296	293	274	256	263	262

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IONOSPHERIC DATA STATION Kokubunji

AUG. 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

DAY \ HOUR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							A	A	A	L	A	L 360	395	L 352	U L 386	L 341	A	A	L					
2						A	A	L 344	A	A	A	A	A	L 321	357	A	A	A						
3								L	L	L 378	A	A	A	337	L 345	A	L 342	L						
4							L	L	L 366	L	L 385	A	A	A	A	L 340	L 325	L						
5							L	L	A	L 371	L 384	L 403	361	L 329	A	A	A	A						
6		A	A				L	A	A	419	367	381	A	405	L 361	L 333	L 339	L						
7								L	L	A	A	A	L 398	L 344	L 409	L 372	L 343	A	A					
8							L	L	A	A	A	A	A	A	A	L	L 345	L						
9							L	L	A	L	L	A	366	A	A	L	L	A	A					
10								L	E A	L	L 345	L 330	A	E A	E A	L	L	L						
11							A	A	A	L 346	A	A	A	L 367	L	L	L	L	L					
12							L	L	L	L	A	L	L 354	L	L 366	L	L	L	A					
13						L	L	L 350	L 347	A	L	L 346	L 362	L 365	L 342	L 340	L	L						
14								L	L	L 340	L	R 376	L 348	L 343	L	L	A	A						
15									A	377	A	L	A	371	L 339	L 350	A	A	A					
16							L 323	L 348	A	U L 337	374	L 344	L 382	360	L 354	L		L						
17							L	L 349	392	U L 383	U L 318	U L 345	L 349	L 342	L 354	U L 334	L	A	A					
18									L	L	L		356	L 338	L 333	L 330	L	L						
19								L		A	A	A	327	L	L 345	L 321	L	L						
20								L	A	L	L	L 340	A	L	A	A	L	A						
21											L	L	L 369	L	L	L	L							
22							L 301	L	L 341	L 322	A	E B	A	L	L	L								
23									L	L	A	L 343	L	L	L	L	L	L						
24									A	A	E B	E B	L 333	L	L	L	L							
25											L 355	L	L 343	L 352	L 339	L	L	L						
26										E B	E B	L	L	L 348	L	L 334	L							
27									L	L	L	A	L	A	A	A	A	A						
28								L	L	L	L	L 340	L 370	A	L	L	L							
29								L	L	L	L 349	L 365	U L 335	L 359	L 355	A	A	L						
30									L	L	L 362	L 353	A	L	L 338	L	L	L						
31										L	A	A	373	L	L	L	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							2	4	4	9	9	13	17	16	15	10	5							
MED							L 312	L 348	L 356	L 371	L 362	L 346	L 361	L 350	L 354	L 337	L 342							
U Q								L 350	L 379	L 380	L 379	L 370	L 372	L 362	L 361	L 341	L 344							
L Q								L 346	L 344	L 338	L 347	L 342	L 346	L 340	L 339	L 333	L 332							

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IONOSPHERIC DATA STATION Kokubunji

AUG. 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							E A 382	E A 310	298	312	336	348	362	332	336	350	326	312	280					
2						E A 460	A	346	354	322	E A 376	A	A	364	366	314	E A 386	A						
3								292	286	286	316	320	330	346	326	304	318	310						
4							278	256	336	322	290	332	300	332	378	350	302	314						
5							292	238	246	312	342	302	370	340	A	A	A	E A 316						
6		E A 328	E A 320				276	256	250	246	336	422	E A 386	360	328	316	302	296						
7								262	244	258	A	E A 386	340	348	322	320	314	308	A					
8							272	272	268	272	294	314	330	E A 356	A	312	292	302						
9							262	240	286	288	326	314	372	336	312	308	290	292	262					
10								266	286	264	362	392	A	E A 328	324	320	296	290						
11							282	246	A	314	310	312	298	338	312	318	294	284	294					
12							338	284	296	262	356	328	310	328	324	342	310	280	288					
13						362	306	340	368	320	280	330	290	316	338	336	300	276						
14								272	250	330	336	334	308	306	344	306	284	E A 402						
15									E A 344	418	346	328	368	348	322	344	312	A	A					
16							394	400	518	476	444	434	360	378	358	334		342						
17							338	314	U R 510	508	482	422	374	360	334	332	322	E A 330	E A 294					
18									278	322	308		388	346	336	328	324	310						
19								312		E A 310	330	A	342	350	346	378	318	316						
20								290	264	312	346	398	336	340	346	E A 348	326	E A 358						
21											354	352	334	302	366	322	318							
22							384	338	452	374	324	E B 358	334	318	312	324								
23									276	318	334	336	354	330	348	334	326	290						
24									282	284	E B 392	E B 334	346	342	330	330	314							
25											308	338	340	332	326	300	286	282						
26										270	278	334	324	342	314	308	300							
27									272	304	310	266	336	304	326	E A 412	316	272						
28								278	270	294	346	314	276	268	330	290	278							
29								276	312	258	322	332	370	324	308	302	280	256						
30									270	276	312	308	320	330	320	328	318	304						
31										280	E A 318	290	320	314	318	296	288	284						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		1	1			2	12	21	25	29	30	28	29	31	29	30	28	24	5					
MED		E A 328	E A 320			411	293	277	284	310	328	331	336	334	328	322	308	296	284					
U Q							360	313	340	322	346	355	365	348	345	336	318	E A 315	294					
L Q							277	259	269	274	310	314	320	324	321	308	293	284	271					

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

IONOSPHERIC DATA STATION Kokubunji

AUG. 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 426	E A 342	E A 288	E A 322	E A 288	E A 316	A	A	A	A	A	234	H 202	236	196	214	A	A	E A 252	246	210	276	E B 330	E A 350
2	E A 358	E A 358	278	256	E A 320	A	A	E A 278	A	A	A	A	A	E A 330	214	A	A	A	E A 270	A	E A 332	E A 334	E A 312	E A 300
3	E A 330	A	E A 346	E A 366	E A 324	E A 264	236	226	E A 230	E A 240	A	A	A	E A 288	E A 280	A	E A 232	E A 244	E A 238	270	236	222	E A 314	E A 302
4	E A 316	E A 300	264	266	252	252	236	228	214	228	202	A	A	A	A	236	224	E A 236	256	242	224	E B 282	E A 310	256
5	E A 274	E A 276	E A 284	E B 294	E A 282	262	222	A	A	198	192	186	E A 234	208	A	A	A	A	E A 278	246	240	E A 342	E A 296	E A 306
6	E A 298	A	A	274	262	264	222	A	A	204	210	198	A	H 180	216	220	230	230	258	236	228	E A 258	E A 266	A
7	E A 262	E A 280	E A 300	E A 276	E B 286	246	E A 262	A	A	A	A	A	H 202	236	H 186	H 192	E A 258	A	A	A	234	230	214	A
8	A	E A 322	E A 340	E A 324	E A 290	242	226	222	A	A	A	A	A	A	A	A	226	224	E A 252	226	220	240	E B 280	264
9	E A 288	E A 320	E A 318	E A 308	E A 298	256	A	210	A	E A 240	A	A	224	A	A	E A 274	A	A	A	E A 266	E A 308	E A 296	E A 292	A
10	E A 320	E A 388	E A 358	E A 314	E A 282	E A 280	226	E A 234	A	E A 232	212	E A 314	A	A	A	A	218	234	248	224	E A 276	266	256	256
11	274	268	268	E A 290	E A 284	E A 274	A	A	A	214	A	A	A	214	232	214	206	224	252	252	238	E A 344	E B 294	E A 298
12	E A 292	E B 280	E B 290	E A 320	266	272	238	230	E A 242	E A 238	A	E A 256	216	E A 294	220	226	232	236	A	246	220	248	E B 312	E A 340
13	E A 324	E B 306	E B 294	E A 292	E A 320	E A 290	E A 254	230	232	A	E A 246	218	202	196	220	212	230	220	254	248	E A 268	E A 302	E A 346	E A 278
14	264	278	250	250	E B 294	282	236	216	204	E A 246	E A 244	E A 260	E A 230	222	232	A	A	A	E A 280	254	254	238	262	E B 268
15	E A 282	E B 282	E B 310	E A 322	268	270	238	226	A	222	A	E A 256	A	204	222	224	A	A	A	A	E A 290	E A 304	E A 306	E A 284
16	E A 336	E B 290	E B 310	E A 310	E A 284	272	240	230	A	240	210	212	202	208	H 192	230	230	E A 254	E A 270	264	262	E A 330	E A 324	E A 400
17	E A 434	E A 338	E A 346	276	E A 320	E A 304	E A 268	236	206	214	E A 314	212	214	212	216	216	A	A	A	264	248	E A 342	E A 302	E A 344
18	E A 332	E B 304	E B 276	E B 292	E B 322	280	250	224	212	214	212	214	208	228	230	E A 242	222	238	262	248	E A 316	E A 304	E A 342	E B 284
19	E B 306	E B 298	E B 290	268	258	262	242	236	E A 250	A	A	A	E A 238	218	226	E A 258	E A 274	E A 260	E A 300	256	256	E A 272	E A 334	E A 374
20	E A 374	E A 348	E B 286	254	248	258	240	220	A	E A 234	E A 248	210	A	A	A	A	E A 266	A	E A 250	E A 268	E A 348	E A 356	E A 324	E A 346
21	E A 326	E A 302	276	262	E A 294	E A 286	E A 246	216	238	E A 250	A	E A 310	212	E B 256	224	E B 230	232	242	260	234	282	E A 320	E A 320	330
22	E A 318	E B 304	276	250	258	E B 300	258	242	236	E A 304	A	B	A	A	E A 280	240	234	244	252	264	248	E A 304	E A 316	E B 282
23	E A 302	E A 312	E A 302	260	278	E B 282	244	228	228	210	A	H 192	216	208	224	240	250	238	250	254	250	E A 284	E B 292	E B 290
24	E A 298	272	274	274	280	268	230	234	A	A	B	B	E B 282	E B 254	232	E B 242	234	250	254	262	246	244	244	E B 282
25	E A 308	E A 290	E A 312	E A 302	264	254	236	226	226	204	200	H 202	H 192	196	238	230	212	232	260	250	236	270	270	286
26	E B 290	278	278	272	242	230	220	216	222	B	B	226	208	H E A 200	244	216	232	240	254	234	216	252	272	E B 298
27	E B 282	274	E B E 354	B E B 352	E B 302	230	220	218	214	A	212	A	E A 250	A	A	A	A	A	246	232	244	278	E A 314	E A 316
28	278	E A 296	232	228	E B 290	E B 272	234	234	218	H 208	216	210	E A 232	A	224	E A 252	E A 230	234	248	250	E A 270	270	E A 324	E A 286
29	260	270	262	250	240	E A 254	222	E A 238	218	214	224	218	E A 266	E A 240	E A 244	A	A	A	266	262	240	E A 268	E A 274	E A 294
30	E A 290	E A 350	E A 318	E A 316	E A 294	262	240	220	210	208	198	E A 230	A	224	206	220	232	242	252	232	E A 284	E A 318	E A 278	E A 282
31	E A 326	E A 292	E A 274	248	260	E B 280	230	222	218	226	A	A	214	U R 210	216	E A 254	E A 236	A	E A 254	E A 274	244	E A 280	250	266
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	29	30	31	31	30	27	26	18	22	15	19	20	23	24	22	22	19	26	28	31	31	31	28
MED	E A 304	E A 298	E 289	E 276	E 284	261	235	226	218	216	207	210	208	213	221	223	231	236	253	248	241	E A 280	E A 302	E A 292
U Q	E A 326	E A 321	E A 312	E A 314	E A 294	E A 280	E A 244	234	232	E A 240	E A 244	E A 256	E A 233	E A 240	E A 232	E A 242	E A 234	E A 244	E A 262	263	E A 276	E A 318	E A 320	E A 323
L Q	282	279	276	260	262	256	226	220	214	210	202	210	205	208	216	216	226	232	252	239	236	258	272	282

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IONOSPHERIC DATA STATION Kokubunji

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

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1						A	A	A	A	A	A	A	A	110	112	116	112	A	A					
2						A	A	A	A	A	A	A	A	A	A	A	A	A	A					
3						B	A	114	114	A	114	112	114	112	112	118	112	112	A					
4						B	118	110	112	B	110	108	112	A	A	A	A	A	B					
5						E B 148	112	A	A	A	A	126	114	114	A	112	A	A	B					
6	A	A	A				112	A	A	A	120	A	A	A	A	120	118	122	A					
7						B	110	108	A	A	A	A	A	108	114	116	114	A	A					
8						B	A	A	A	A	A	A	A	A	A	A	A	112	A					
9						B	A	A	A	A	A	A	A	A	114	112	114	110	108					
10						A	A	122	A	A	110	118	A	A	A	A	A	A	116					
11						B	120	114	A	A	A	A	A	A	A	116	106	116	114					
12						B	116	112	A	108	A	A	112	A	112	112	114	A	A					
13						124	110	112	110	A	A	A	B	A	A	A	A	A	112					
14						E B 152	118	112	A	A	A	A	A	B	116	A	A	A	A					
15						B	A	112	A	A	A	A	B	118	B	A	116	114	A					
16						B	116	118	114	A	112	A	A	110	112	B	112	112	A					
17						B	112	A	A	A	A	B	B	120	116	110	112	A	A					
18						B	114	116	A	A	A	B	116	B	116	116	116	114	110					
19						B	120	118	A	A	A	A	A	A	110	114	114	A	A					
20						B	114	106	A	A	B	B	B	114	116	A	108	A	A					
21						B	A	110	110	A	A	A	B	B	118	B	112	112	116					
22						B	126	108	114	B	A	B	A	B	A	A	114	112	A					
23						B	114	114	B	A	A	A	A	112	110	B	114	118	116					
24						B	116	116	112	A	B	B	B	B	R	B	112	112	108					
25						B	114	108	116	114	112	110	108	110	114	110	108	112	108					
26						B	118	114	120	B	B	112	112	112	112	114	110	112	B					
27						B	110	110	114	114	A	B	110	116	114	A	A	A	A					
28						B	114	A	A	112	114	A	116	114	114	A	A	A	112					
29						B	120	116	112	112	B	B	B	B	112	A	A	A	A					
30						B	A	114	A	B	112	A	A	A	A	116	116	116	B					
31						B	112	112	110	A	A	A	112	A	A	A	A	A	B					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						3	22	23	12	5	8	6	10	13	18	14	20	15	10					
MED						E B 148	114	112	113	112	112	112	112	112	114	115	113	112	112					
U Q						E B 152	118	116	114	114	114	118	114	115	116	116	114	116	116					
L Q						124	112	110	111	110	111	110	112	110	112	112	112	112	108					

IONOSPHERIC DATA STATION Kokubunji

AUG. 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	98	100	96	98	102	100	98	98	96	100	96	100	102	114	120	106	110	100	102	100	100	B	B	98
2	100	100	100	98	100	104	106	104	102	100	100	100	98	106	108	100	100	100	100	96	88	90	92	102
3	108	102	102	98	100	108	106	104	124	106	120	114	114	110	114	116	112	110	112	B	106	B	102	104
4	102	100	98	98	100	100	104	120	G	118	122	108	110	104	104	106	104	98	98	98	100	102	94	B
5	100	98	96	92	96	G	122	98	106	106	104	102	134	G	110	108	100	96	100	102	96	94	96	96
6	100	100	96	96	110	106	112	100	98	100	102	102	94	98	100	100	118	108	102	100	100	106	100	104
7	98	102	96	92	96	B	108	108	100	100	96	98	100	98	102	102	116	104	94	94	100	96	98	98
8	98	94	92	94	92	90	90	104	100	104	100	96	94	94	92	96	96	96	114	92	90	90	B	88
9	102	102	98	98	98	94	100	102	100	100	102	102	104	102	118	118	116	108	102	100	98	94	102	100
10	98	92	92	92	94	96	96	122	118	118	120	114	102	104	104	102	104	102	110	106	102	102	B	102
11	98	90	94	96	92	120	110	110	102	104	98	102	102	102	104	G	G	132	116	102	104	104	98	98
12	94	96	100	100	116	B	136	116	104	112	104	98	G	106	G	126	102	106	96	100	100	B	100	104
13	98	98	100	98	96	130	112	114	112	100	104	110	108	104	102	102	98	102	G	104	106	100	102	98
14	B	96	94	B	104	102	152	118	98	92	92	94	96	B	116	106	98	102	94	98	106	98	94	102
15	96	98	100	94	100	94	94	128	104	104	104	104	104	G	B	108	108	108	102	102	104	102	100	96
16	100	160	92	88	98	110	108	116	114	106	G	104	100	G	G	B	130	118	104	100	102	92	96	94
17	96	92	94	94	98	108	114	102	102	104	98	B	126	124	G	G	110	100	100	100	98	96	98	98
18	98	B	B	B	B	B	G	114	106	100	100	B	G	150	126	116	118	110	G	102	96	96	98	B
19	B	B	B	B	B	B	130	114	104	104	100	102	106	104	132	126	118	108	100	98	98	100	98	98
20	98	98	98	92	B	B	G	112	100	104	102	100	106	124	112	104	108	98	98	100	100	98	98	96
21	98	96	98	98	102	B	110	132	118	108	106	104	106	B	G	B	G	G	126	108	108	106	100	100
22	94	96	96	B	B	144	136	126	118	106	106	B	104	104	102	100	G	G	102	98	98	98	96	112
23	98	98	96	96	94	B	G	100	118	102	102	100	98	100	96	B	100	G	G	104	98	98	B	94
24	88	100	96	96	102	102	102	114	108	98	B	B	B	B	96	B	92	92	110	94	B	B	B	B
25	100	100	96	96	B	98	G	112	96	94	92	110	G	116	116	114	108	G	120	100	92	B	B	B
26	B	92	B	B	B	B	G	92	132	B	B	G	G	G	116	G	124	G	120	B	104	94	98	B
27	B	B	B	B	B	B	G	128	116	116	104	124	126	118	114	100	104	100	102	98	98	102	100	98
28	96	94	90	B	B	B	112	104	104	G	100	102	120	116	122	102	102	102	G	106	102	100	106	100
29	96	96	B	96	B	96	G	98	96	94	124	114	112	114	108	100	98	102	96	96	98	94	94	92
30	92	92	92	94	94	94	98	G	104	B	G	98	96	94	92	94	116	114	108	102	98	98	104	100
31	98	100	96	B	B	B	G	130	116	108	98	100	G	104	100	98	100	98	100	94	100	96	96	98
	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	26	23	21	19	23	30	30	28	27	26	25	24	26	24	28	26	27	29	30	26	25	26
MED	98	98	96	96	98	102	108	112	104	104	102	102	104	104	108	103	106	102	102	100	100	98	98	98
U Q	100	100	98	98	102	108	114	118	116	106	104	108	111	115	116	111	116	108	110	102	102	102	100	102
L Q	96	95	94	94	95	96	100	102	100	100	98	100	99	102	102	100	100	100	100	98	98	94	96	96

AUG. 2002 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

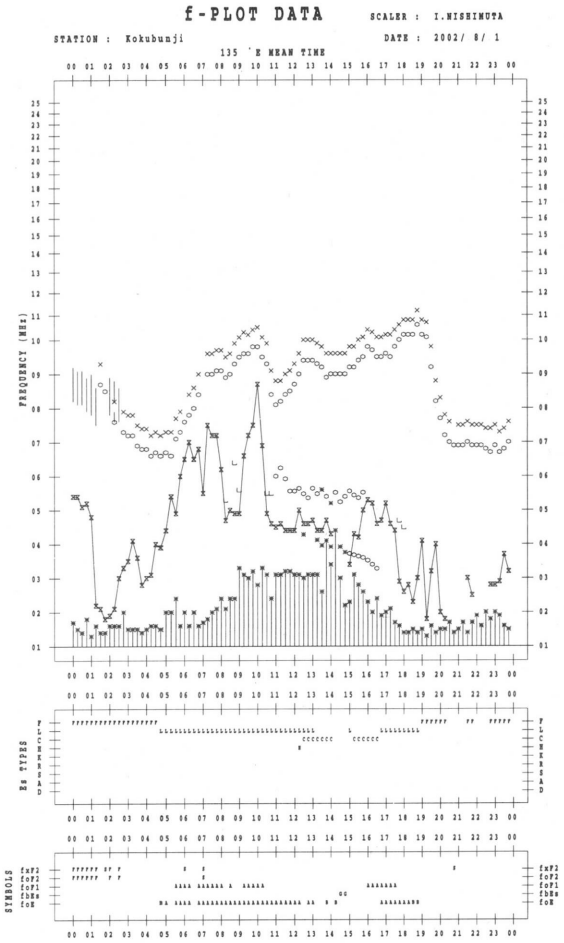
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

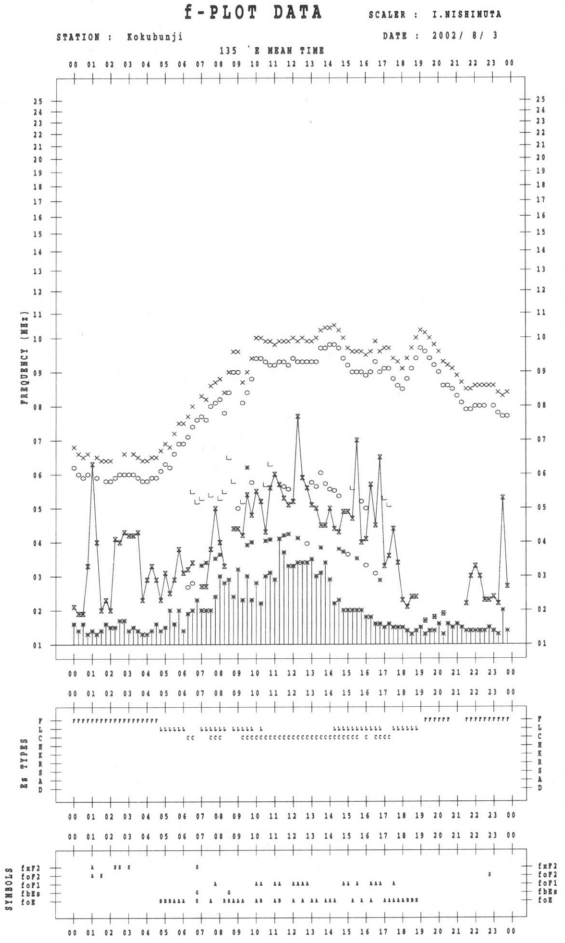
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F3	F4	F2	F3	F2	L2	L2	L3	L2	L2	L2	L1	L1	CL11	C1	L1	C2	L3	L3	F2	F2			F2
2	F2	F2	F2	F2	F3	L2	L2	L2	L2	L2	L2	L2	L2	L2	L1	L2	L3	L3	L4	F3	F4	F3	F1	F1
3	F1	F2	F2	F3	F2	L2	L1	L1	CL11	L1	C1	C1	C1	C2	C2	CL21	CL21	C2	L2		F1		F3	F3
4	F2	F1	F2	F2	F2	L1	L1	C1		C1	C1	C1	C2	L2	L2	L1	L1	L1	L2	F2	F1	F1	F2	
5	F2	F2	F1	F2	F1		C1	LC21	L3	L1	L1	L1	H1		L2	C3	L3	L3	L2	F2	F3	F2	F2	F3
6	L2	L2	L2	F2	FF11	L1	C1	L2	L2	L1	L1	L1	L2	L1	L1	L1	CL11	L1	L3	F2	F3	F3	F1	F3
7	F3	F2	F2	F3	F2		C2	C2	L2	L2	L2	L1	L1	L1	L1	L1	CL21	L3	L4	F3	F1	F2	F1	F2
8	F2	F2	F2	F1	F1	L1	L1	L2	L2	L2	L2	L2	L2	L3	L3	L3	L1	L1	CL12	F3	F3	F2		F1
9	F1	F1	F3	F2	F3	L2	L2	L2	L3	L2	L2	L2	L1	L2	C2	C2	C2	C2	C4	F3	F3	F3	F2	F4
10	F3	F3	F4	F3	F4	L3	L2	CL22	CL22	CL21	CL11	CL21	L2	L2	L2	L2	L1	L2	C2	F1	F3	F2		F2
11	F2	F1	F2	F2	F2	C2	C3	CL21	L3	L1	L2	L2	L2	L1	L1			CL11	C2	F4	F3	F3	F1	F2
12	F4	F2	F2	F3	F1		H1	CL11	L2	C2	L2	L2		L2		CL11	L1	L2	L4	F2	F2		F2	F5
13	F3	F2	F2	F3	F3	C1	C2	C1	C1	L2	L1	L1	C1	L1	L2	L1	L1	L1		F1	F2	F3	F3	F3
14		F1	F1		F1	L1	HL11	CL11	L2	L2	L2	L1	L1		C1	L2	L3	L3	L3	F3	F2	F3	F2	F1
15	F2	F2	F1	F2	F1	L2	L3	CL12	L2	L2	L2	L1	L2			L2	LC31	C4	L4	F4	F3	F2	F2	F3
16	F3	F1	F3	F4	F2	C2	L1	CL21	CL21	L1		L1	L1				C1	C2	L3	F2	F2	F2	F2	F2
17	F2	F2	F1	F1	F1	L1	C1	L1	L1	L1	L2		C1	C1			C2	L4	L3	F3	F2	F3	F2	F3
18	F3							CL11	L1	L2	L1			H1	C1	CL11	CL11	C1		F2	F3	F3	F3	
19							C1	C1	L2	L2	L2	L2	L2	L2	C1	C1	C2	L2	L4	F3	F3	F2	F3	F3
20	F3	F3	F1	F2				C1	L2	L1	L2	L1	L1	C1	C2	L3	C2	L2	L5	F5	F4	F3	F3	F3
21	F4	F4	F2	F2	F1		L1	CL11	CL11	L1	L1	L2	L1						C1	F1	F1	F2	F2	F2
22	F4	F1	F1			H1	H1	C1	CL11	L1	L2		L1	L2	L2	L2			L2	F5	F4	F2	F2	F1
23	F1	F1	F1	F1	F1			L1	C1	L1	L1	L1	L1	L1	L1		L1			F2	F3	F2		F1
24	F1	F1	F1	F1	F1	L1	L1	CL11	CL21	L2					L1		L1	LC11	CL11	F1				
25	F2	F1	F3	F3		L1		C1	L1	L1	L1	CL11		C1	C1	C1	C1		C1	F2	F3			
26		F1						L1	CL11						C1		C1		C1		F1	F1	F1	
27								C1	CL11	CL21	L1	C2	C1	C2	C2	L2	L3	L3	L3	F3	F2	F1	F3	F2
28	F2	F2	F1				C2	L2	L1		L1	L1	CL11	C1	CL11	L2	L2	L2		F2	F3	F3	F3	F3
29	F2	F3		F2		L1		L1	L1	L1	C1	C1	C1	C1	C1	L2	L2	L2	L4	F2	F3	F3	F1	F2
30	F3	F2	F2	F1	F2	L2	L1		L1			L2	L1	L2	L1	L1	CL11	CL11	C3	F2	F5	F2	F2	F3
31	F3	F2	F2					C1	C1	L1	L2	L2		L1	L1	L2	L1	L2	L3	F3	F2	F4	F2	F1
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT																								
MED																								
U Q																								
L Q																								

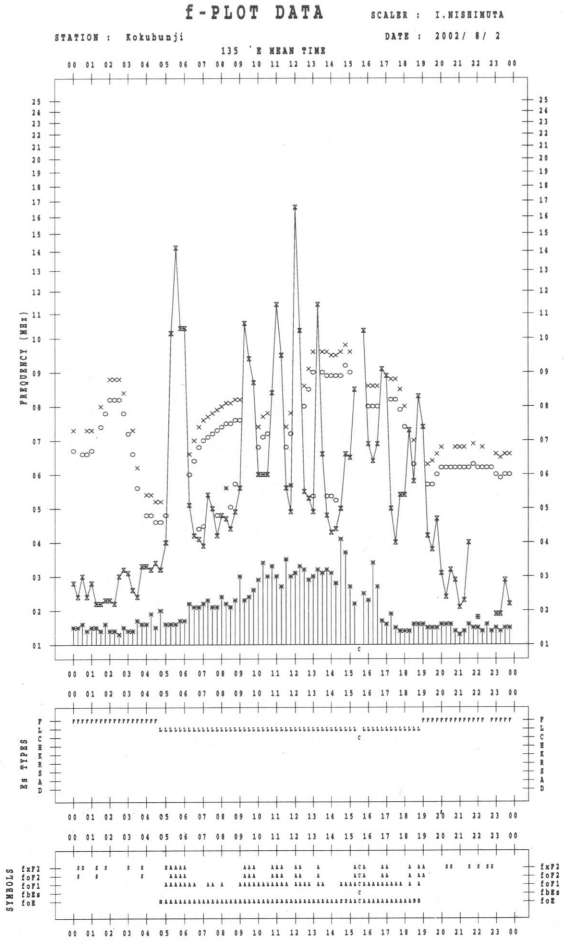
AUG. 2002 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

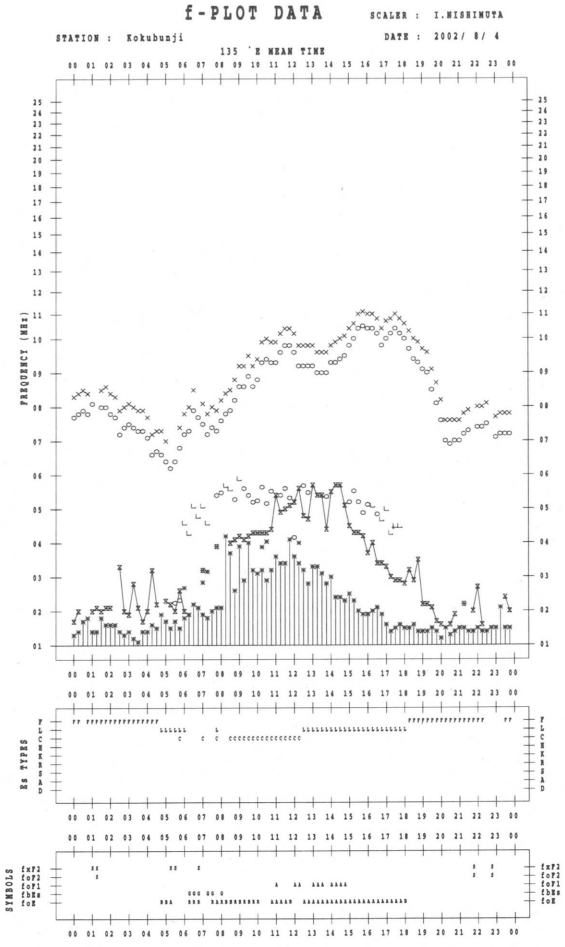
f-PLOTS OF IONOSPHERIC DATA

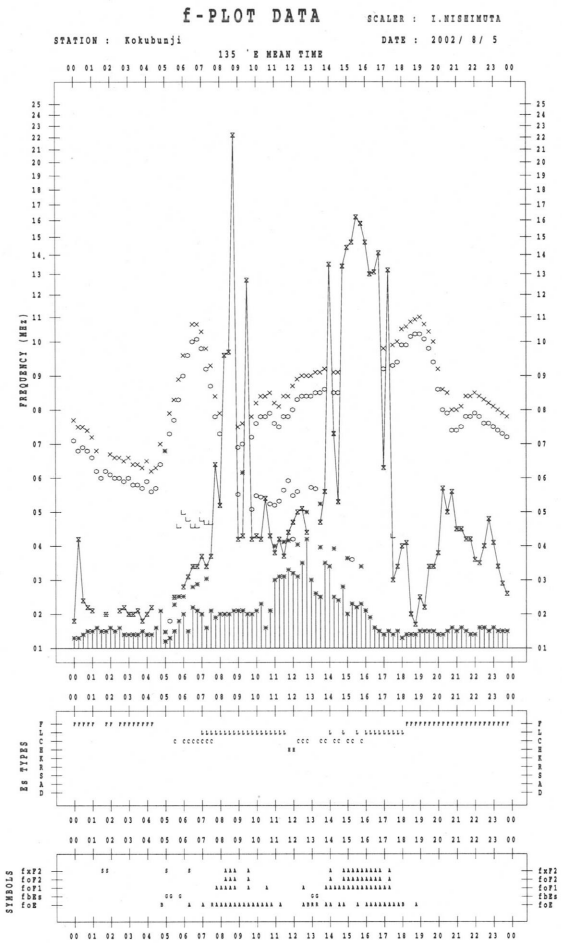
KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

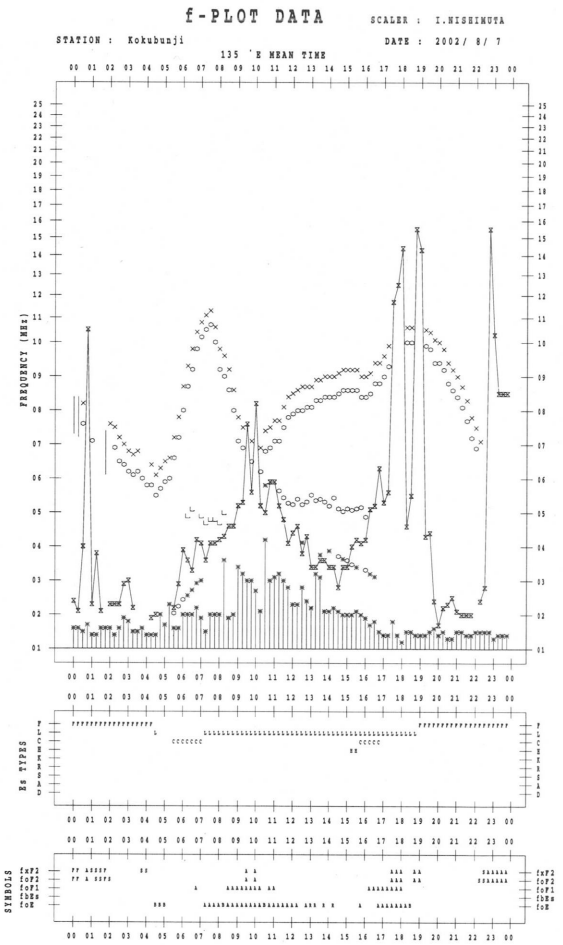

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

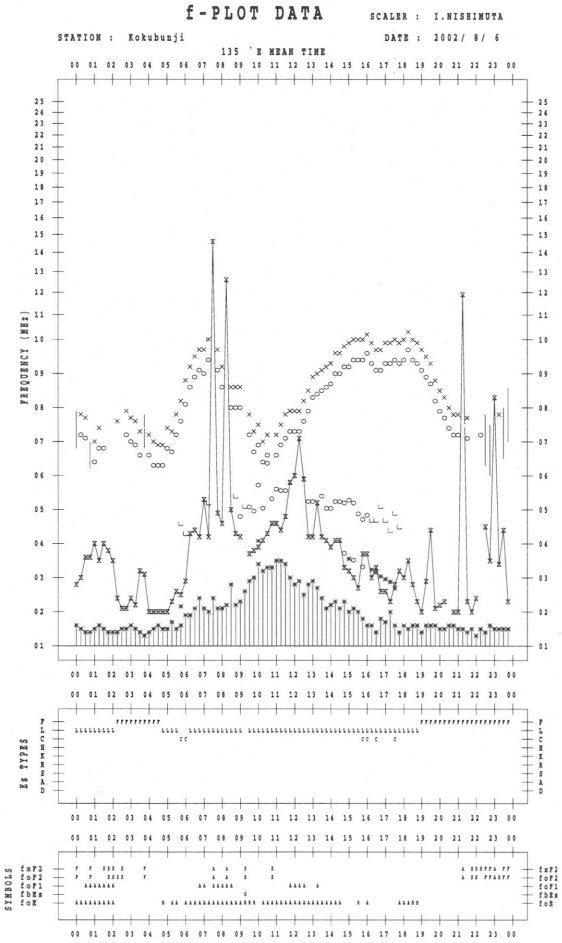

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

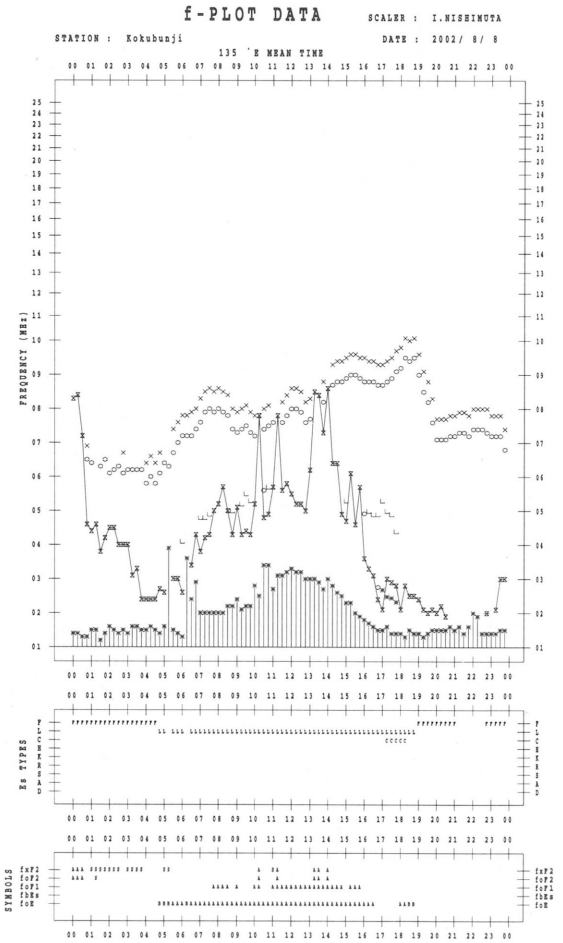

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

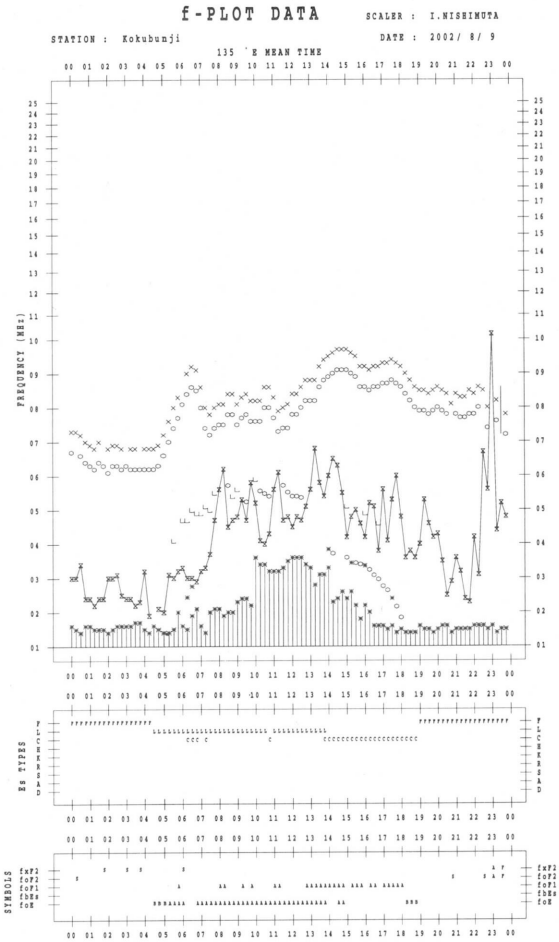

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

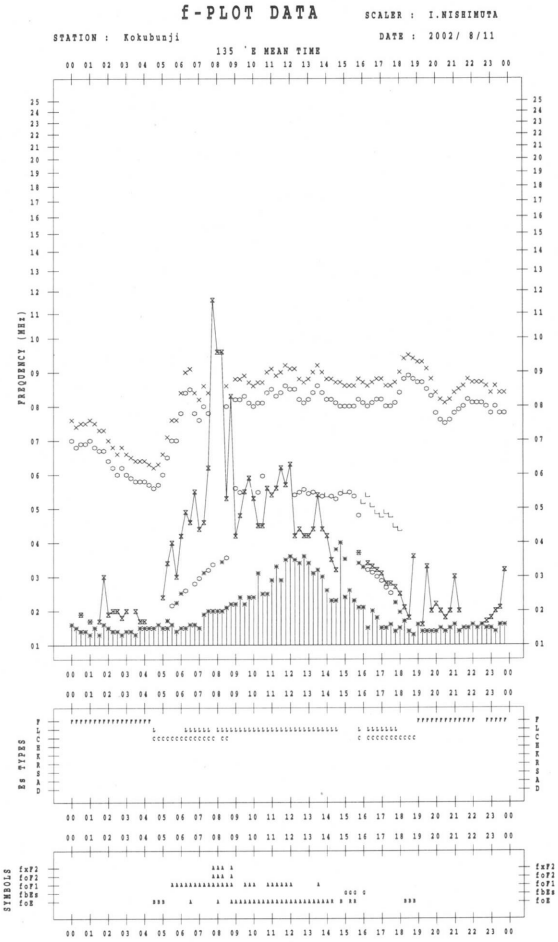

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

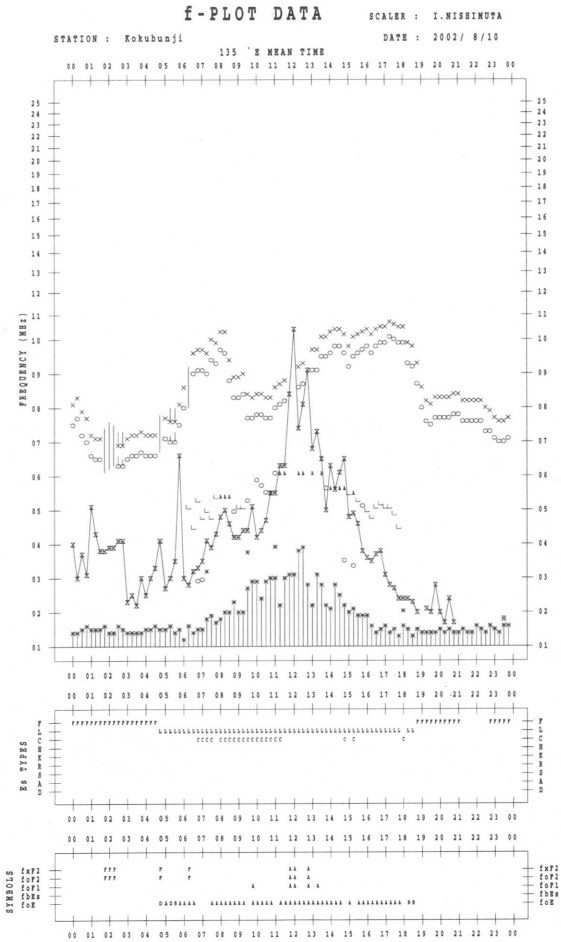

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

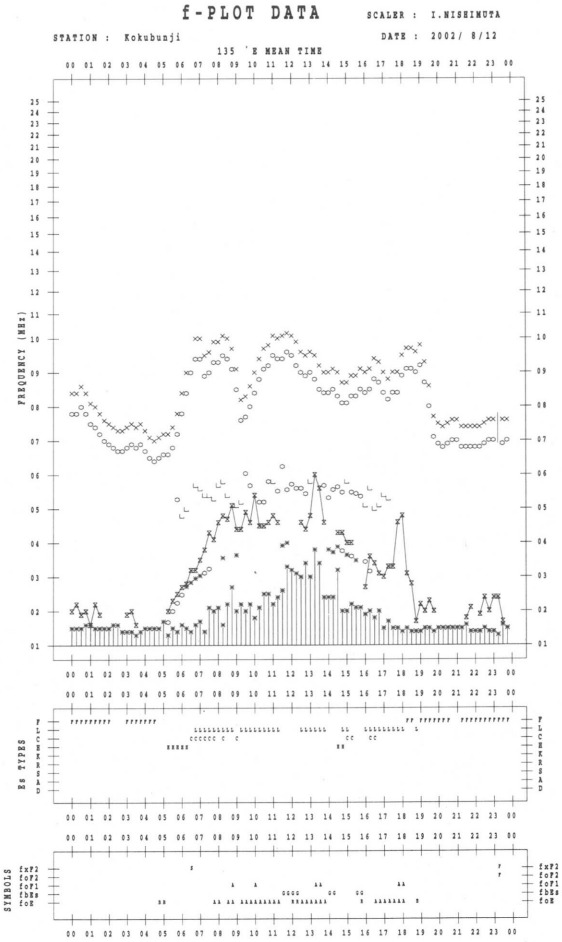

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

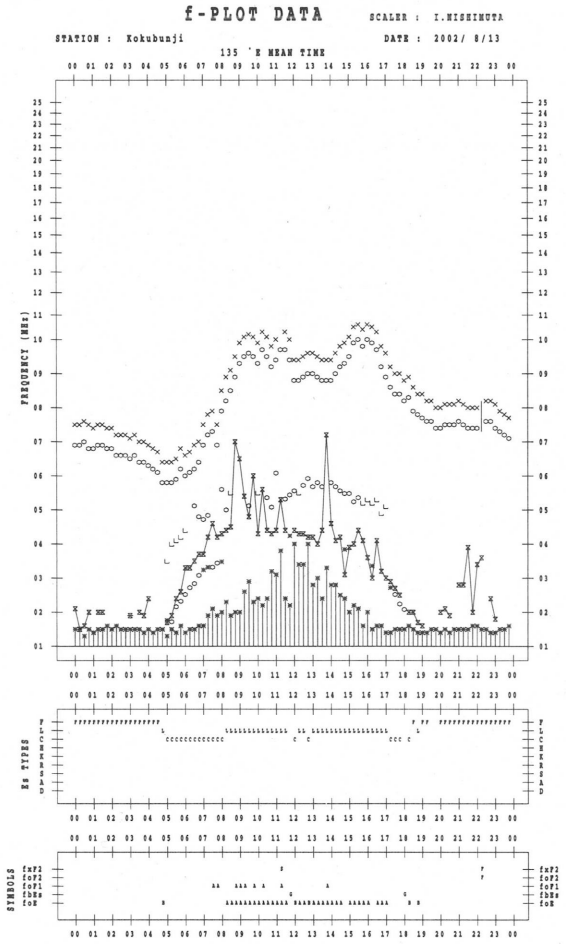

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

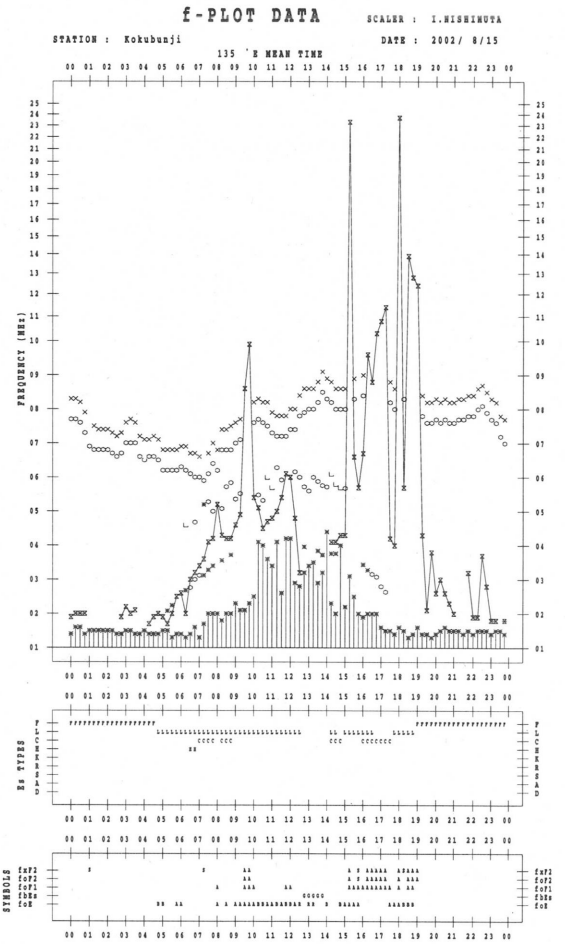

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

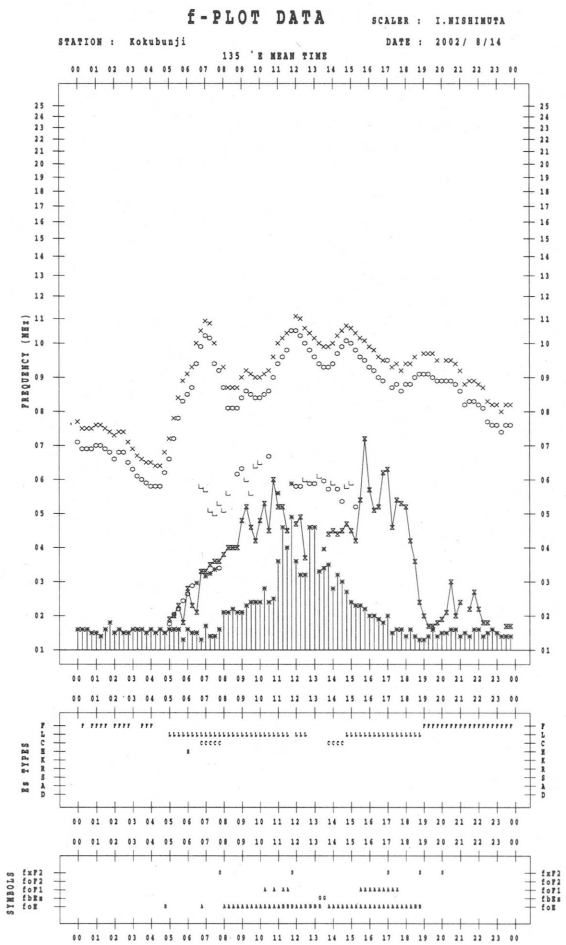

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

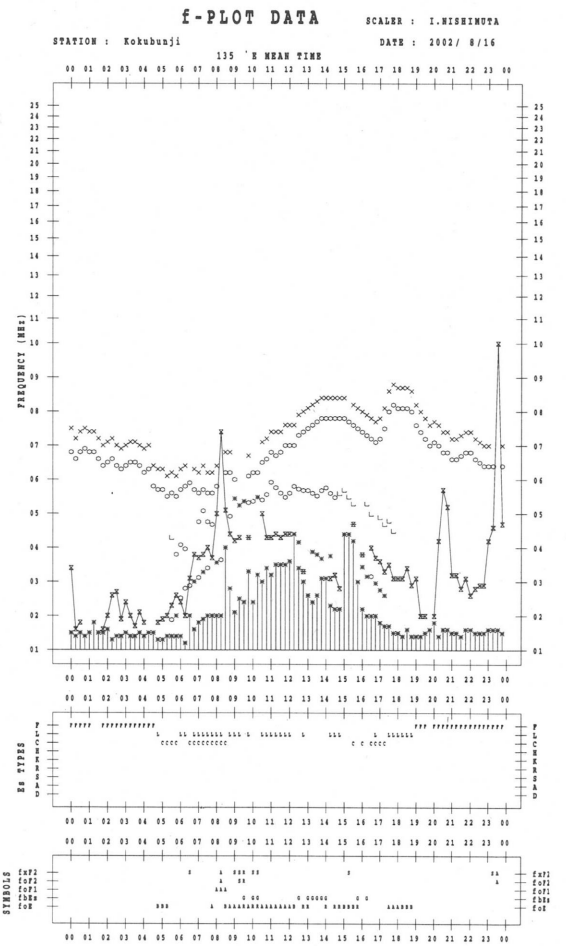

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

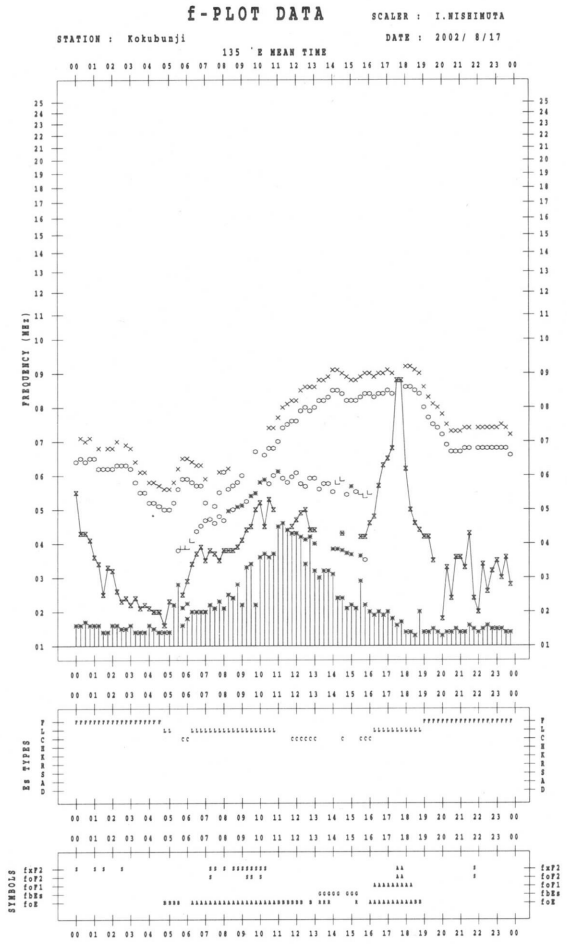

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

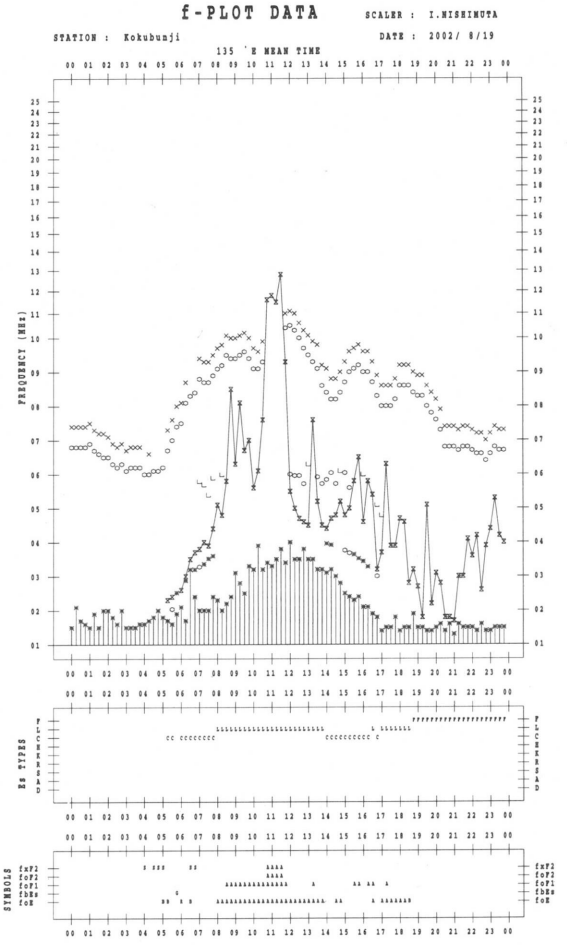

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

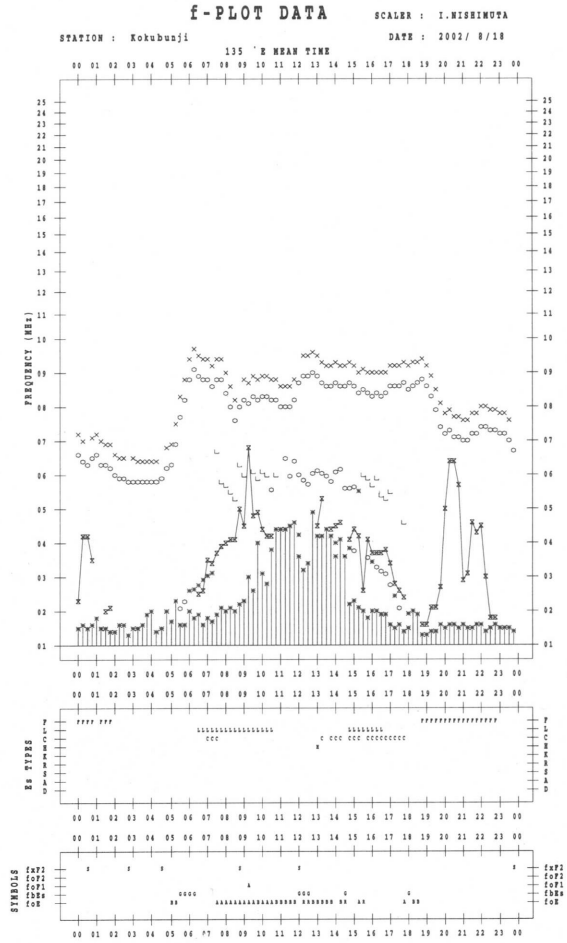

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

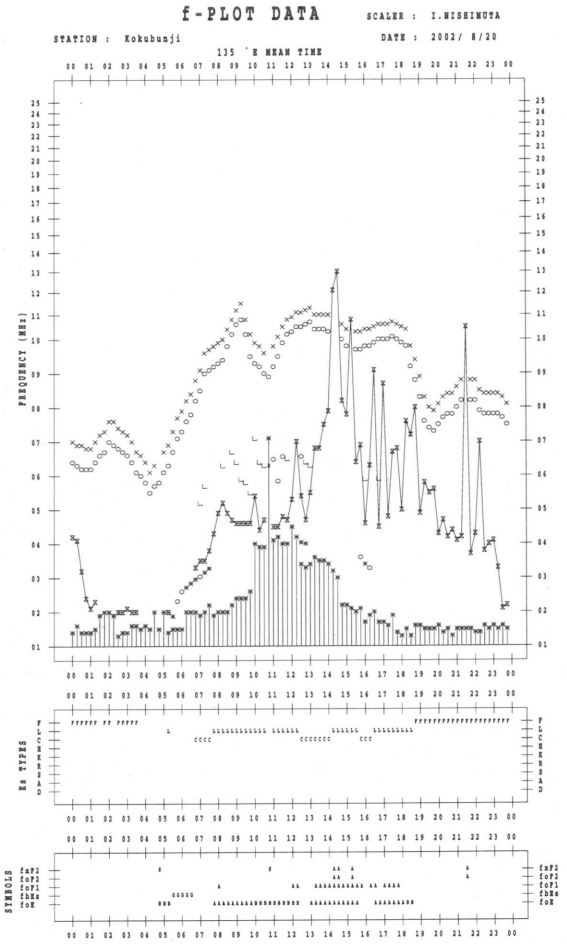

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

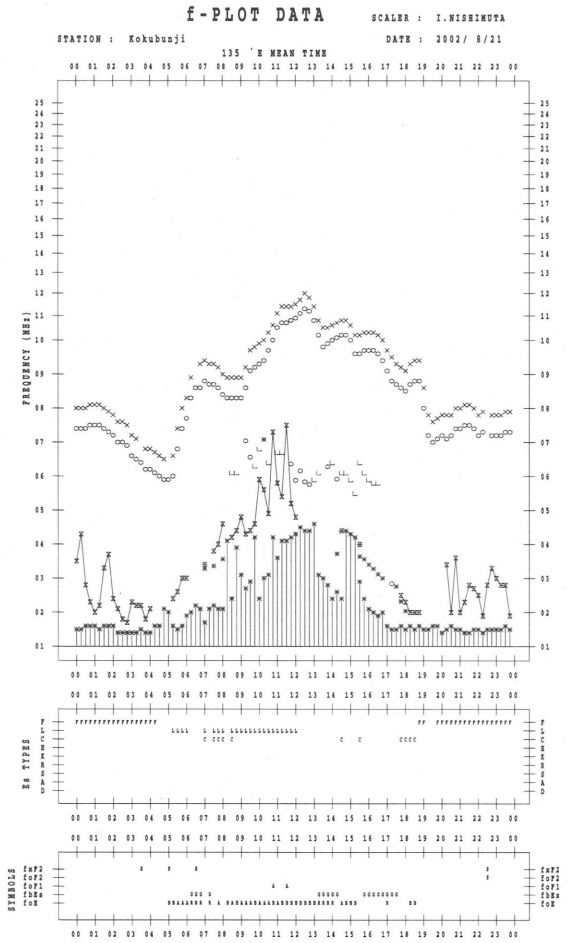

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

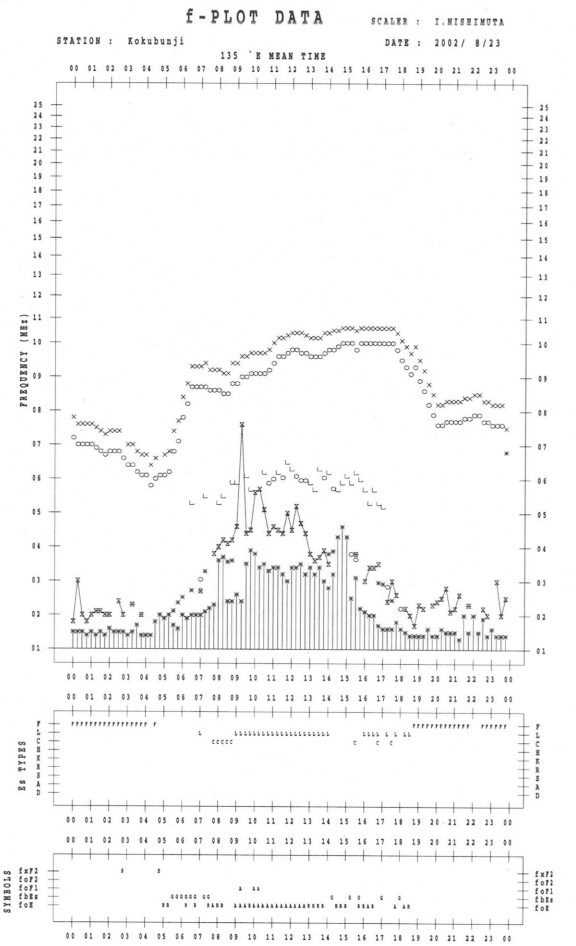

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

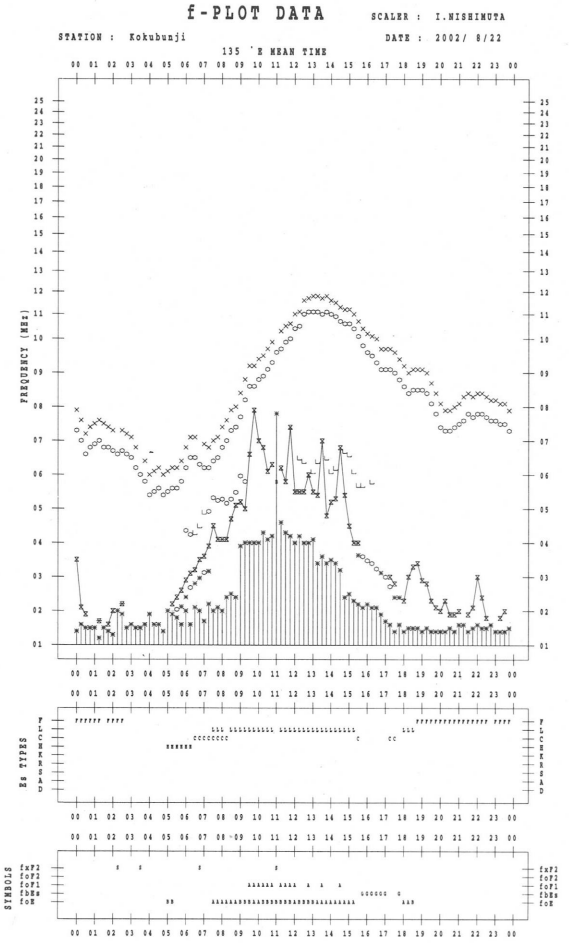

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

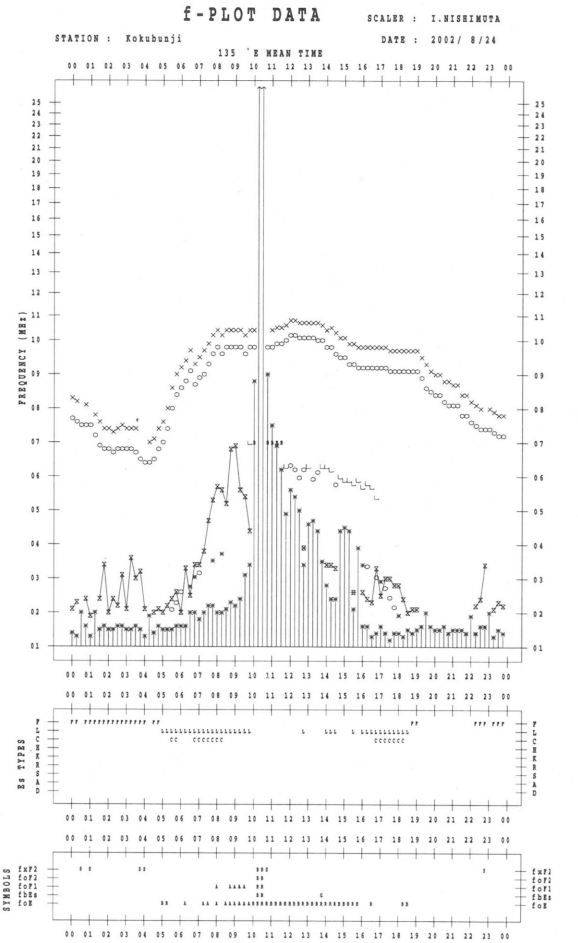

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

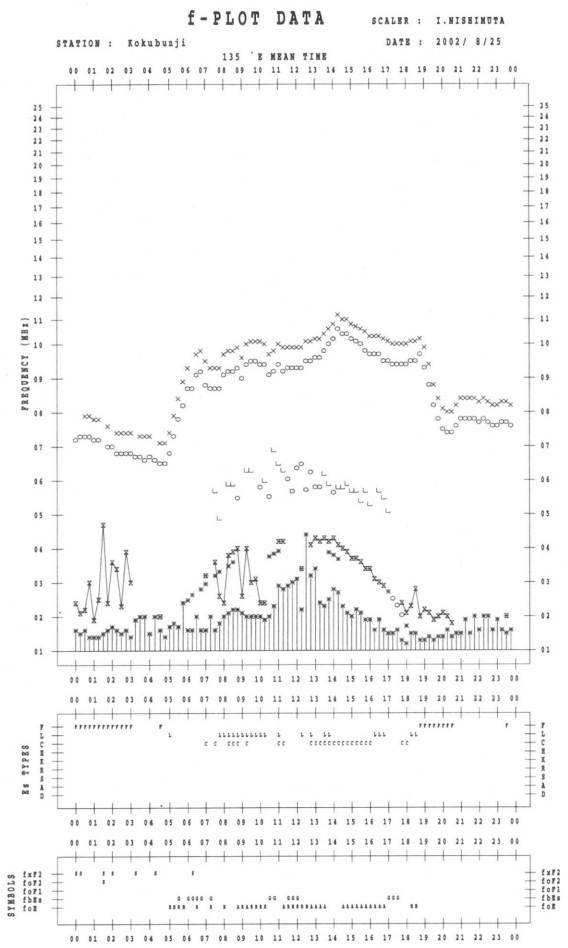

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

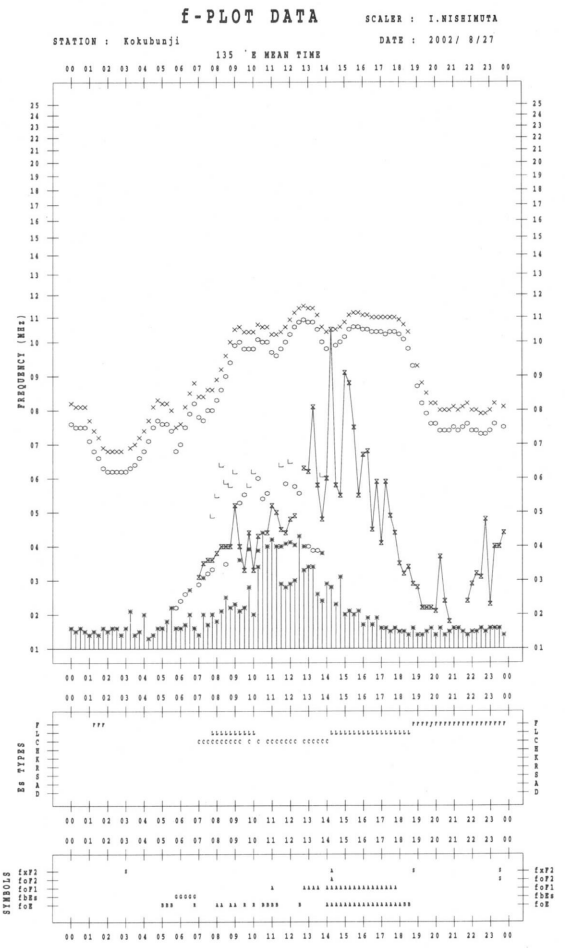

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

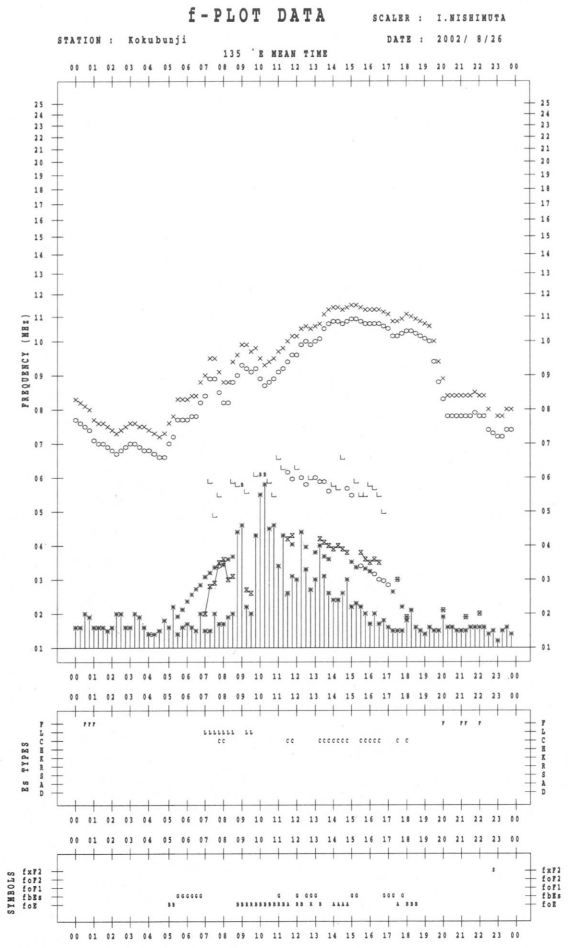

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

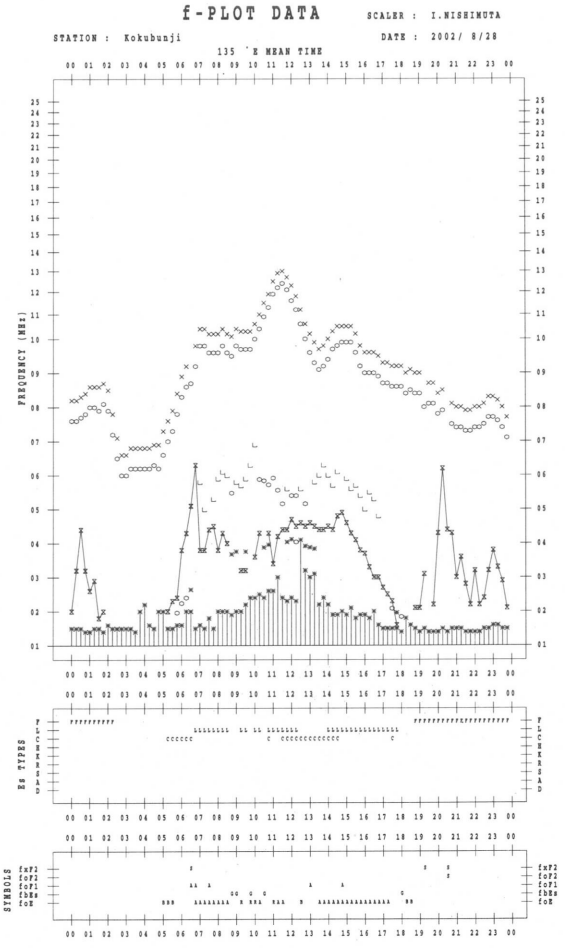

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

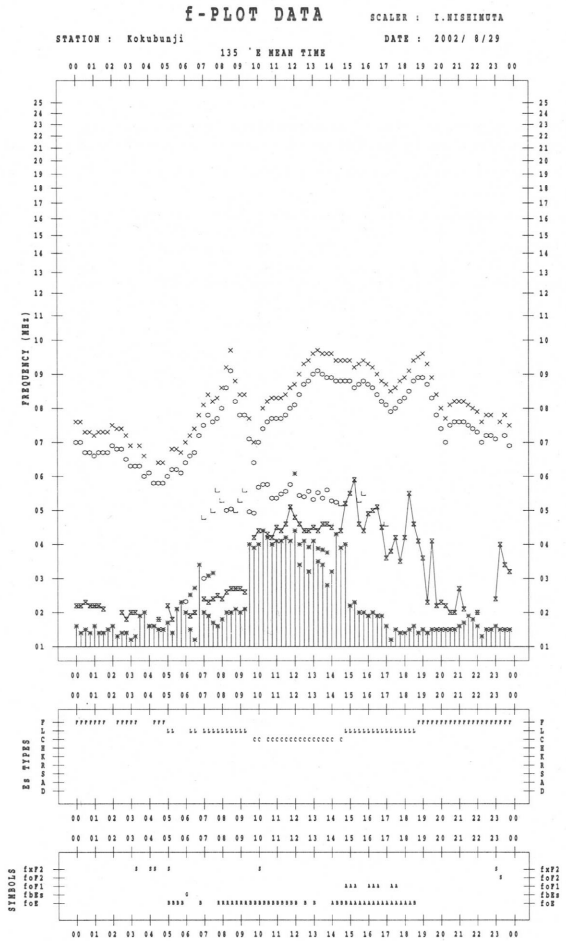

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

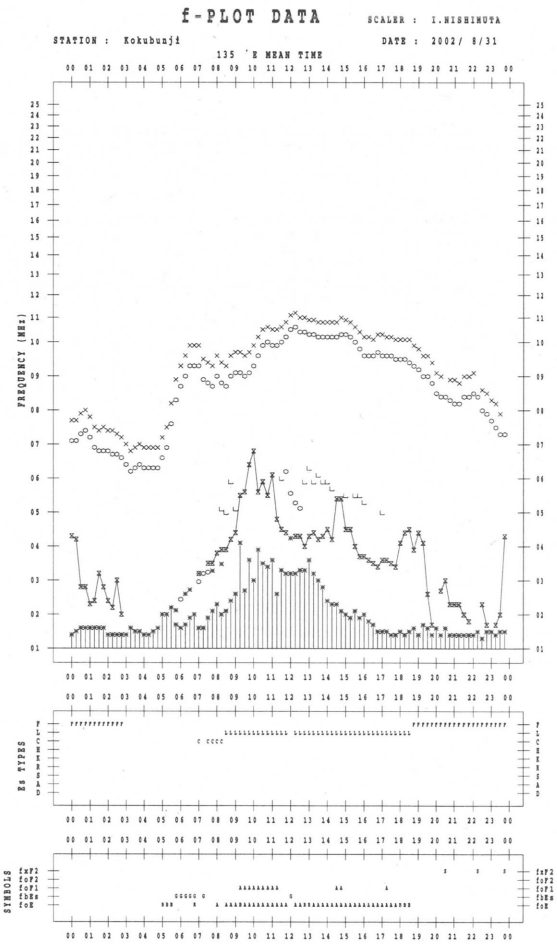

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

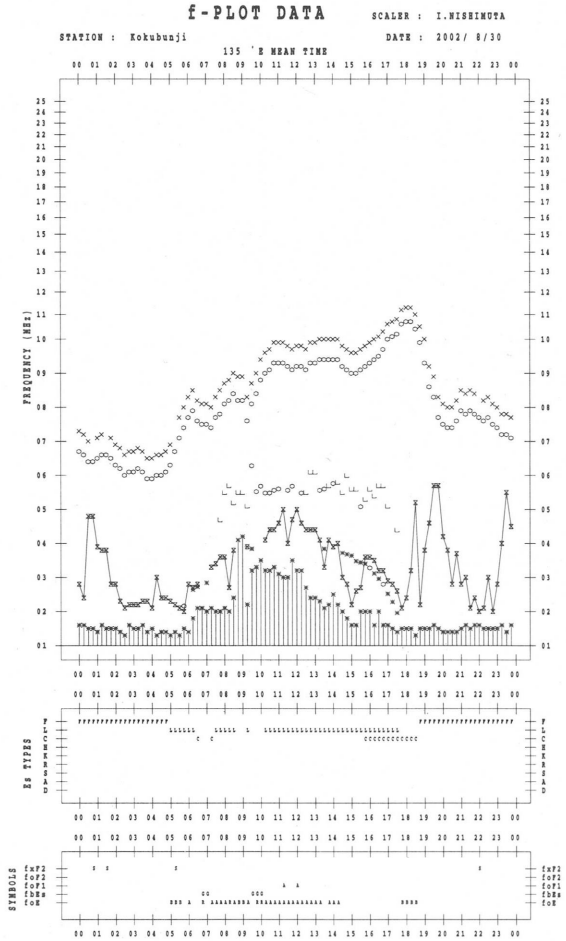

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2002/ 8/30
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 August 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	47	49	44	38	44
2	37	39	41	39	39
3	39	39	39	37	39
4	35	32	36	34	34
5	32	31	31	33	32
6	31	30	31	37	32
7	39	33	33	-	35
8	-	-	-	-	-
9	-	-	-	-	-
10	-	-	-	-	-
11	-	-	-	-	-
12	37	36	36	36	36
13	35	34	34	38	35
14	36	37	38	39	37
15	38	36	36	38	37
16	38	38	39	48	41
17	38	36	35	33	36
18	36	36	37	38	37
19	39	39	37	39	39
20	38	37	37	40	38
21	39	39	39	45	41
22	47	47	47	71	53
23	47	45	46	44	45
24	44	41	42	45	43
25	40	44	41	41	41
26	41	42	42	37	40
27	36	34	35	34	35
28	33	32	33	33	33
29	32	33	34	34	33
30	33	32	32	35	33
31	37	35	34	36	36

Note: No data is available during the following periods.
7th 1950 - 12nd 0100
A superscript * stands for being superposed on a burst.

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso August 2002

Single-frequency observations

Normal observing period: 1955 - 0930 U.T. (sunrise to sunset)

AUG. 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	8 S	23270	23230	1.0	35	-	
2	2800	1 S	06190	06200	4.0	35	-	
2	200	8 S	06520	06520	1.0	350	-	0
2	500	8 S	09080	09100	3.0	215	-	ML
3	500	8 S	00380	00390	2.0	30	-	WR
3	500	7 C	05220	05240	9.0	15	-	0
3	500	8 S	21470	21480	2.0	20	-	0
3	500	7 C	22290	22310	4.0	15	-	0
4	500	4 S/F	04440	04460	4.0	20	-	0
4	200	47 GB	09090	09130	7.0	550	-	0
4	200	8 S	20500	20520	1.0	50	-	0
5	2800	4 S/F	21150	21190	5.0	55	-	0
6	2800	4 S/F	01370	01390	4.0	40	-	0
6	500	8 S	03430	03430	1.0	280	-	0
6	500	8 S	05100	05100	1.0	20	-	0
6	2800	4 S/F	05150	05160	4.0	40	-	0
6	500	8 S	07510	07510	1.0	425	-	0
7	500	8 S	06360	06360	1.0	15	-	0
7	500	7 C	07120	07140	5.0	35	-	0
12	200	8 S	07520	07520	1.0	15	-	WR
12	200	8 S	22190	22190	1.0	20	-	0
13	200	8 S	01060	01060	1.0	20	-	0
13	200	8 S	07130	07130	2.0	135	-	0
13	200	8 S	07190	07190	1.0	75	-	0
13	200	8 S	07470	07470	1.0	35	-	0
14	2800	7 C	01430	02030	41.0	120	-	0
14	500	7 C	01450	02030	60.0	65	-	0
14	500	8 S	06220	06220	1.0	220	-	0
14	500	8 S	08390	08390	1.0	145	-	0
15	500	42 SER	01110	01110	6.0	70	-	0
15	500	8 S	01430	01430	1.0	205	-	0
15	500	8 S	02420	02420	1.0	15	-	0
15	2800	3 S	06030	06050	6.0	155	-	0
16	500	4 S/F	05470	05510	19.0	35	-	
16	2800	21 GRF	05480	05560	52.0	55	-	0
16	500	7 C	06140	06290	36.0	55	-	
16	2800	1 S	07200	07220	18.0	30	-	
16	200	8 S	08350	08350	1.0	20	-	
17	200	8 S	06380	06390	1.0	25	-	0
17	200	8 S	23230	23230	1.0	70	-	0
18	500	8 S	00060	00060	1.0	50	-	0
18	500	8 S	01430	01430	1.0	415	-	0
18	500	8 S	01550	01550	1.0	145	-	0
18	500	47 GB	03280	03310	11.0	1125	-	0
18	200	7 C	03280	03300	5.0	190	-	0
18	500	8 S	03420	03420	1.0	80	-	0
18	200	8 S	03420	03420	1.0	65	-	0

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso August 2002

Single-frequency observations

Normal observing period: 1955 - 0930 U.T. (sunrise to sunset)

AUG. 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
18	500	8 S	06340	06340	1.0	170	-	0
18	200	8 S	06340	06340	1.0	15	-	0
18	200	8 S	08360	08360	1.0	120	-	0
18	2800	47 GB	21130	21210	17.0	645	-	0
18	500	7 C	21130	21170	16.0	220	-	0
18	500	7 C	21440	21470	7.0	155	-	0
18	200	8 S	22000	22000	1.0	100	-	0
18	500	8 S	23110	23110	1.0	1595	-	0
18	200	8 S	23110	23110	1.0	185	-	ML
18	200	8 S	23150	23150	1.0	45	-	WL
19	500	8 S	05180	05180	1.0	60	-	WR
19	500	8 S	05250	05250	1.0	65	-	0
19	500	42 SER	21010	21010	3.0	25	-	0
19	200	42 SER	21010	21040	5.0	85	-	0
19	200	8 S	22560	22570	1.0	320	-	0
19	200	8 S	23000	23000	2.0	325	-	0
19	200	8 S	23480	23480	1.0	60	-	0
20	500	47 GB	01370	01390	6.0	1280	-	0
20	200	47 GB	01370	01390	10.0	2715	-	0
20	500	7 C	02050	02100	8.0	60	-	0
20	200	7 C	02060	02100	5.0	50	-	0
20	2800	3 S	02080	02090	5.0	115	-	0
20	200	7 C	02580	02580	14.0	150	-	0
20	200	8 S	05100	05100	1.0	60	-	WR
20	200	8 S	05230	05230	2.0	45	-	WR
20	200	7 C	05360	05360	17.0	90	-	0
20	200	7 C	06380	06410	4.0	155	-	0
20	200	7 C	07070	07110	5.0	70	-	0
20	200	7 C	07550	07570	18.0	120	-	WR
20	2800	8 S	08250	08260	2.0	170	-	WL
20	500	8 S	08250	08260	3.0	40	-	0
20	200	8 S	08250	08260	2.0	205	-	WR
20	200	8 S	08450	08450	1.0	30	-	MR
20	500	8 S	08470	08490	5.0	25	-	0
20	500	7 C	21110	21120	3.0	50	-	0
20	200	8 S	21170	21190	2.0	140	-	0
20	200	8 S	23100	23100	1.0	105	-	0
20	500	8 S	23150	23150	1.0	35	-	0
21	200	47 GB	01380	01390	4.0	645	-	0
21	2800	3 S	01390	01390	3.0	160	-	WL
21	500	4 S/F	01390	01390	6.0	295	-	0
21	200	8 S	01540	01540	1.0	70	-	0
21	500	8 S	03580	03590	1.0	70	-	0
21	500	8 S	04480	04480	1.0	35	-	0
21	200	8 S	04480	04480	1.0	25	-	0
21	2800	3 S	05310	05320	7.0	490	-	0
21	500	7 C	05320	05330	4.0	390	-	0

B. Solar Radio Emission

B2.Outstanding Occurrences at Hiraiso

Hiraiso August 2002

Single-frequency observations

Normal observing period: 1955 - 0930 U.T. (sunrise to sunset)

AUG. 2002	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
21	200	47 GB	05320	05320	1.0	1145	-	0
21	200	8 S	06050	06050	1.0	15	-	0
21	200	8 S	06320	06320	1.0	30	-	WR
21	500	8 S	07520	07520	1.0	240	-	0
21	500	8 S	08130	08130	1.0	40	-	0
21	500	8 S	08210	08210	1.0	65	-	0
22	2800	7 C	01490	01520	17.0	285	-	0
22	500	7 C	01500	01540	8.0	90	-	0
22	200	8 S	01530	01540	2.0	60	-	0
22	500	8 S	04080	04100	2.0	20	-	0
22	500	8 S	05070	05080	1.0	30	-	0
23	2800	7 C	05410	05490	10.0	60	-	0
23	500	7 C	05410	05420	12.0	145	-	0
23	200	8 S	07300	07310	1.0	205	-	0
23	500	7 C	07570	08070	54.0	50	-	0
23	2800	7 C	08020	08460	46.0	90	-	0
23	200	8 S	08330	08330	1.0	320	-	0
23	200	8 S	08540	08540	1.0	50	-	0
23	200	8 S	09020	09020	1.0	150	-	0
24	2800	47 GB	00480	01140	73.0	875	-	0
24	500	47 GB	00530	01050	26.0	750	-	0
24	200	7 C	00590	01060	15.0	160	-	0
24	2800	7 C	05360	05460	14.0	80	-	0
24	500	7 C	05390	05470	33.0	55	-	0
24	200	7 C	05400	06000	79.0	90	-	WL
24	200	8 S	23380	23390	2.0	85	-	0
25	500	7 C	03170	03190	4.0	35	-	0
25	200	7 C	03330	03360	4.0	25	-	0
25	200	8 S	04470	04480	1.0	140	-	WL
25	500	8 S	22450	22450	1.0	85	-	0
25	2800	1 S	22480	22520	5.0	30	-	0
25	200	47 GB	22500	22520	6.0	930	-	0
25	500	4 S/F	22510	22520	5.0	40	-	0
25	2800	1 S	23420	23470	10.0	35	-	0
25	500	7 C	23470	23530	56.0	40	-	0
26	500	8 S	02350	02350	1.0	65	-	0
26	500	8 S	07560	07560	1.0	375	-	0
27	200	8 S	07470	07470	1.0	65	-	0
27	200	8 S	09040	09040	1.0	125	-	WL
28	200	8 S	07250	07260	1.0	35	-	
28	2800	3 S	21420	21440	7.0	190	-	
28	500	3 S	21420	21430	6.0	25	-	
28	200	8 S	21420	21430	2.0	150	-	
29	2800	7 C	02140	02160	4.0	40	-	
29	500	8 S	02160	02160	1.0	20	-	
29	200	8 S	02160	02160	1.0	25	-	
29	2800	7 C	02470	02520	10.0	115	-	

B. Solar Radio Emission

B2.Outstanding Occurrences at Hiraiso

Hiraiso August 2002

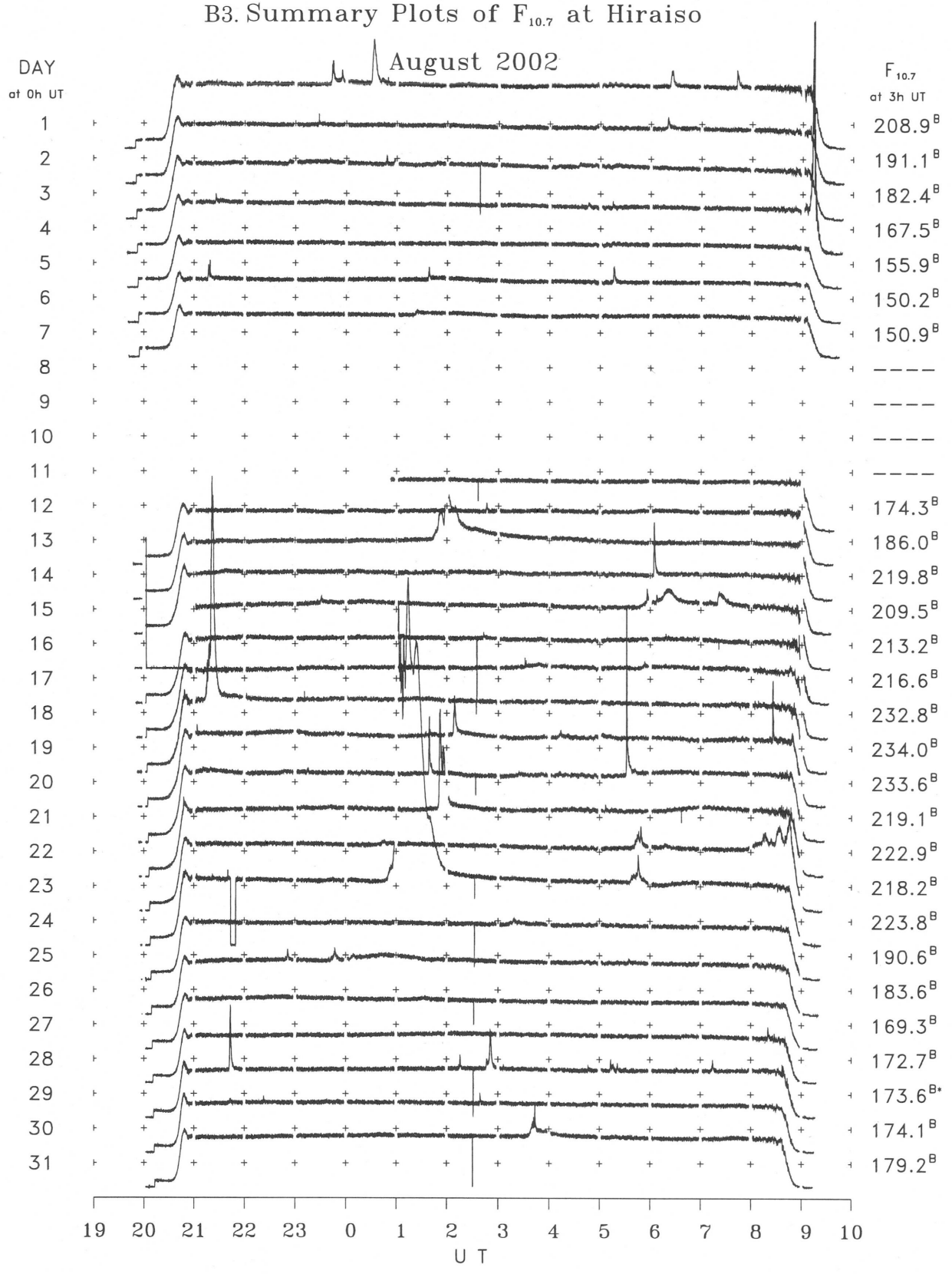
Single-frequency observations

Normal observing period: 1955 – 0930 U.T. (sunrise to sunset)

AUG. 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
29	200	8 S	02480	02480	1.0	35	–	
29	500	8 S	02500	02510	2.0	420	–	
29	200	8 S	03060	03060	1.0	20	–	
29	200	8 S	04090	04090	1.0	70	–	
29	500	4 S/F	04450	04470	9.0	30	–	
29	2800	7 C	05120	05130	11.0	30	–	
29	500	8 S	05130	05130	1.0	10	–	
29	500	1 S	05460	05490	6.0	10	–	
29	200	8 S	07070	07070	1.0	70	–	
29	200	8 S	07120	07120	1.0	30	–	
29	500	7 C	07130	07180	8.0	20	–	
29	500	8 S	22230	22230	1.0	60	–	0
29	200	8 S	22230	22230	1.0	190	–	0
30	2800	1 S	02400	02400	2.0	30	–	0
30	200	8 S	04500	04500	1.0	20	–	0
30	500	8 S	04560	04590	3.0	80	–	0
30	500	8 S	23280	23280	1.0	20	–	0
30	200	8 S	23280	23280	1.0	20	–	0
31	500	8 S	00040	00050	2.0	30	–	0
31	2800	4 S/F	03350	03440	12.0	85	–	0
31	500	8 S	22350	22350	1.0	190	–	0
31	500	8 S	23110	23110	1.0	380	–	0
31	200	8 S	23150	23150	1.0	275	–	0

B. Solar Radio Emission

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



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

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