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IONOSPHERIC DATA IN JAPAN

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CONTENTS

COMMUNICATIONS RESEARCH LABORATORY
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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

MAR. 2003

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	42	58	53	45	44	37	38	54	64	77	85	93	93	92		81	84	77	70	62	54	54	54	54
2	53	54	53	52	48	42	45	66	78	81		88	81	86	103	93	90	85	74	61	54	47	42	44
3	45	54	53	46	46	48	54	81	81	81	93	93	94	92	83	93	93	81	73	66	66	54	62	54
4	54	52	53	52	42	44	54	70	83	84	92	93	93	101	91	90	90	91	81	76	54	54	53	53
5	53	44	40	46	48	45	52	70	84	84	91	104	94	94	92	93	91	85	66	62	66	52	53	52
6	47	39	44	48	45	44	61	81	91	93	91	92	84	95	92	92	93	92	84	62	54	66	54	54
7	54	54	50	52	52	53	66	79	90	111					94		94	91	80	66	53	47	42	53
8	52	38	47	44	44	41	52	84	92	93	C	C	C	C	C	C	92	90	82	64	54	53	44	45
9	43	59	53	53	45	47	60	84	84	84	94			94	92	92	92	90	80	59	54	54	53	53
10	53	53	58	55	54	52	70	85	90	94			93		92	95	92	93	83	76	54	51	54	54
11	42	54	54	42	46	45	66	79	81	94	95	89		92	94	92	93	91	83	82	66	48	45	53
12	54	54	52	60	58	54	69	84	92	94	94	106	93	94		94	93	93	84	71	66	52		54
13	52	44	54	53	53	51	61	81	92	94	93		92	94	93	94	93	90		66	54	54	54	53
14	60	54	57	45	45	45	54	84		94			94		105	92	93	91	81	64	54	52	53	53
15	50	59	51	41	38	34	46	62	67	83	101	94	94	91	92	92	83	85	82	66	54	51	52	53
16	47	44	44	44	40	41	51	66	80	82	87	91	92	92	92	90	90	84	84	54	54	54	54	52
17	43	40	53	47		38	35	53	62	71	74	71	72	81	83	84	78	81	76	65	54	53	52	53
18	52	54	52	44	34	32	40	58	59	66	70	67	70	66	71	71	76	74	65	58	54	60	54	54
19	54	53	40	38	36	40	55	66	76	84	92	90	90	91	81	90	90	77	75	57	53	53	53	53
20	44	53	45	50	53	52	58	66	76	81	78	84	93	82	82	72	66	70	72	60	54	52	46	44
21	52	42	42	32	35	28	47	58	70	65	82	65	85		83	77	76	78	80	62	58	52	54	52
22	54	52	36	34	34	36	43	50	57	62	63	66	69	65	64	62	61	62	57	48	45	44	48	42
23	44	46	51	44	40	38	48	60	70	81	76	78	75	77	76	76	68	66	66	58	53	53	52	44
24	53	50	54	40	30			62	67	81	C	80	82	81	84	83	80	75	68	66	53	44	44	45
25	44	42	40	46	34	38	53	63	72	81	84	81	80	90	84	93	76	78	73	62	51	45	53	53
26	53	54	52	46	43	44	62	68	78	84	93	84		94	84	C	C	C	82	70	54	50	51	52
27	53	52	52	52	45	50	66	74	84	C	C	C	C	C	C	C	77	76	78	70	74	54	51	54
28	C	58	55	53	53	54	46	62	69	81	91		90		93	81	79	76	78	72	66		54	50
29	43	43	54	54	54	54	64	82	72	92	77	81	82	93	94	94	84	85	81	73	54	49	53	42
30	51	51	48	46	48	49	52	68	72	81		82	84	93	90	78	91	85	82	82	76	63	64	53
31	51	45	53	54	47	44	54	70	77	84	93	94	93	94	93	93	80	91	81	80	76	66	54	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	30	31	31	31	30	30	30	31	30	30	23	23	25	24	27	27	30	30	30	31	31	30	30	31
MED	52	52	52	46	45	44	54	68	78	84	91	88	90	92	92	92	90	85	80	65	54	52	53	53
U Q	53	54	53	52	48	50	61	81	84	93	93	93	93	94	93	93	92	91	82	71	66	54	54	54
L Q	44	44	45	44	40	38	47	62	70	81	78	80	81	84	83	81	78	77	73	61	54	50	51	50

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

MAR. 2003

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	34	26	G	G	G	G	G	41	40	G	G	G	G		G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	30	36	39		40	G	G	G	G	G	G	37	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	46	G	G	G	G	34	28	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	36	G	G	G	G	G	G		G	G	27	G	G	G	G	27
8	28	G	G	G	27	G	G		G	G	C	C	C	C	C	C	G	G	G	G	G	G	G	G
9	G	G	G	G	26	G	G	31	G	G	48	G	G	G	G	G	G	G	G	G	G	G	G	G
10	G	G	G	G	G	G	28	G	G	G	G	47	G	G	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	80	G	G	G	G
12	G	G	G	27	G	24	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G
13	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	25	23	27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26	30
15	30	30	G	G	G	G	31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	24	G	G	G	G	G	G	G	G	G	G	G	G	G	27	33	24	G	G	G
17	G	G	G	G	27	G	G	33	40	50	G	52	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	25	G
19	G	G	G	G	G	G	G	G	G	39	42	G	G	G	G	G	G	36	27	G	G	G	G	G
20	G	G	38	28	G	G		G	G	44	46	45	G	G	G	G	G	29	25	G	G	G	G	32
21	G	24	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G
22	24	25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
23	G	25	31	32	G	G	G	G	G	G	43	45	G	G	G	G	G	G	G	G	G	G	G	27
24	24	G	G	26	26	29		G	G	45	C	G	46	G	G	G	G	39	37	G	G	G	G	G
25	G	G	G	G	G	G		G	G	49	G	G	42	G	G	G	G	G	G	G	G	G	G	G
26	G	25	G	G	G	G			G	G	G	G		G	G	C	C	C	G	G	G	G	G	G
27	29	31	25	G	G	G	G	G	G	C	C	C	C	C	C	C	G	37	28	G	G	G	G	G
28	C	G	27	G	G	G	G	34	G	50	70	G	G	G	G	G	G	G	26	G	G		G	G
29	G	G	G	G	G	G	G	G	44	50	61	63	42	46	G	40	60	39	32	30	40	28	G	G
30	G	G	G	G	G	G	35	43	43	70	115	43	G	G	G	G	G	G	G	G	G	G	G	G
31	G	29	G	G	G	G	G	G	G	47	51	45	G	G	G	G	G	G	G	G	G	G	29	26
	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	31	31	31	31	31	27	28	31	30	27	29	27	28	27	27	30	30	31	31	31	30	30	31
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	24	G	G	G	G	G	G	G	44	43	44	G	G	G	G	G	G	26	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

MAR. 2003

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

MAR. 2003

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	48	51	51	47	44	42	48	98	101	96	97	112	127	118	104	91	84	90	80	52	47	52	49	44
2	44	37	46	46	41	36	42	79	100	97	90	98	110	115	118	120	113	102	81	51	53	48	47	34
3	42	48	48	47	39	34	48	77	97	87	93	106	127	120	107	98	100	96	86	63	54	62	54	59
4	52	54	54	52	50			78	94	101	110	124	124	116	110	111	100	106	90	76	63	52	52	52
5	52	54	53	52	53	53	53	80	96	111	115	128	137	134	132	121	106	106	98	65	78	73	54	54
6	49	53	50	44	47	47	52	88	98	104	112	121	128	127	117	117	117	102	84	66	66	73	52	54
7	54	54	52	52	51	52	64	104	114	122	128	136	135	137	140	140	136	108	85	77	70	54	66	54
8	52	54	51	49	44	42	51	86	121	111	108	121	123	127	122	118	114	107	91	66	52	52	51	54
9	53	53	52	48	51	47	54	87	106	110	124	130	130	124	123	116	108	100	83	66	54	54	52	54
10	63	54	53	54	52	49	52	91	105	108	117	127	122	120	116	121	121	114	97	76	73	54	54	48
11	52	54	52	51	45	47	54	97	114	117	131	138	137	125	121	116	107	111	104	81	66		52	54
12	52	52	54	52	52	47	59	85	108	116	120	130	131	128	131	125	116	107	86	73	63	54	52	54
13	54	52	52	55	48	47	51	85	103	101	118	124	118	C	117	123	104	87	86	80	63	52	54	54
14	54	54	59	49	46	48	52	91	104	111	115	125	128	131	127	124	121	121	104	78	70	53	54	64
15	54	54	54	57	41	42	49	87	111	122	117	115	126	122	116	111	100	87	91	76	59	52	52	53
16	51	54	51	44	46	45	59	78	102	101	112	121	128	128	120	114	112	107	98	66	53	54	52	49
17	53	51	49	50	41	45		64	83	84	95	115	117	116	97	105	107	105	77	52	54			
18			54	54			59	67	77	107	121	121	C	C	C	C	C	C	71	51	52	49	51	49
19	48	51	48	48		34	54	73	97	98	C	C	C	C	C	C	C	84	66	57	54	53	53	53
20	51	47	47	45	44	43	54	82	88	105	105	112	108	97	100	84	81	76	77	71	46	44	44	32
21	43	43	34	34	38	40	50	62	84	97	91	108	97	98	108	91	84	90	83	54	44	52	54	54
22	53	54	34	34	34	36	52	78	75	68	77	92	98	112	85	86	84	92	76	54	46	47	43	
23	43	42	44	36	32	34	53	66	69	84	86	98	97	100	95	84	79	77	67	57	54	51	59	53
24	51		51	44	30	32	54	80	82	83	91	100	107	100	97	90	105	87	77	64		47	42	
25		36	48	49			53	69	72	77	82	102	112	120	120	110	100	85	76	51		44	50	51
26		53	48	42	43	43	58	76	81	91	97	106	124	131	117	100	96	104	91	71	54	53	52	52
27	53	52	51	48	43	44	52	78	82	107	117	112	112	114	114	100	84	86	82	78	78	74	62	52
28	53	59	54	49	51	57	76	65	93	101	111	116	110	111	105	101	100	97	92	72	64	54	62	
29	53	52	52	49	52	53	69	84	101	101	113	111	122	128	123	125	120	108	90	72	52		51	52
30	50	51	53	54		50	63	82	98	107	130	121	121	108	98	91	93	106	107	91	84	54	52	54
31	54	52	52	53	47	44	66	88	104	106	121	125	121	126	120	118	107	101	90	76		74	65	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	29	31	31	27	28	29	31	31	31	30	30	29	28	29	29	29	30	31	31	28	28	30	26
MED	52	52	51	49	45	44	53	80	98	101	112	118	122	120	117	111	105	102	86	66	54	53	52	53
U Q	53	54	53	52	51	47	59	87	104	110	118	125	128	127	121	120	113	107	91	76	66	54	54	54
L Q	49	51	48	45	41	41	51	76	83	96	95	108	111	113	104	94	94	87	77	57	52	51	51	51

HOURLY VALUES OF fEs AT Kokubunji

MAR. 2003

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	46	53	52	62	42	G	G	G	37	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	50	G	G	G	G	G	35	35	G	G	27	G	G	G
3	G	G	G	G	G	G	G	G	G	40	43	G	G	G	G	G	38	G	G	G	G	G	G	29
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	G	44	G	45	G	G	G	28	G	G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	45	G	47	45	39	31	27	G	G	G	G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	39	34	35	31	34	G	G	G
9	G	G	G	G	G	G	G	G	G	G	G	G	43	G	G	G	G	G	G	24	G	G	G	G
10	G	G	G	G	G	G	G	G	G	G	G	47	G	G	57	G	G	35	31	35	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	G	G	G	42	G	62	52	30	26	G	54	28	G
12	G	G	G	G	G	G	G		G	G	G	43	46	48	59	46	60	53	34	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	C	G	G	G	34	28	G	G	G	G	G
14	G	G	G	G	G	G	25	G	G	G	G	G	G	G	G	G	G	36	G	G	G	G	G	G
15	24	33	31	G	27	24	G	G	G	G	G	48	G	48	53	G	76	56	39	33	G	33	G	G
16	G	G	G	G	G	G	G	G	G	G	46	50	46	58	54	48	39	34	52	29	G	G	29	G
17	35	34	30	G	27	G	G	G	G	45	45	46	52	67	57	42	G	35	29	26	G	27	27	28
18	G	G	G	G	G	G	G	G	G	G	G	G	C	C	C	C	C	C	26	G	G	G	G	G
19	G	G	27	G	G	G	G	G	G	G	C	C	C	C	C	C	C		G	G	G	G	G	G
20	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	41	44	28	26	G	G	26	G
21	G	G	G	G	G	G	G	G	G	G	G	G	G	G	47	G	G	31	20	27	G	30	33	32
22	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29
23	G	G	G	24	G	G	G	G	G	G	G	G	G	G	G	G	G	47	31	G	33	G	G	G
24	G	G	G	G	24	G	G	G	G	G	G	59	56	G	G	G	43	38	G	G	36	32	G	
25		G	G	G	G		30	G	40	G	43	60	83	79	50	47	42	G	G	G	46	30	G	G
26		G	G	G	G	22	G	G	G	48	45	48	G	G	G	G	G	37	23	G	26	G	G	G
27	G	G	G	G	G	G	G	G	G	50	53	48	G	G	52	G	G	35	32	24	30	39	33	G
28	G	G	G	G	G	G	G	G	53	G	G	G	53	G	G	41	48	55	31	33	45	44	27	59
29	31	26	G	G	G	G	G	G	G	41	47	G	53	69	47	50	82	73	43	94	40	50	G	25
30	G	G	G	G		G	G	G	G	G	G	G	50	46	G	G	G	G	G	27	G	G	G	G
31	G	G	G	G	G	G	G	38	42	48	51	52	53	51	49	47	G	G	G	29	53	83	52	26
	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	31	31	31	30	30	31	30	31	31	30	30	29	28	29	29	29	29	31	31	31	31	31	30
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	34	26	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	45	48	48	47	49	41	41	41	31	27	30	30	26	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Kokubunji

MAR. 2003

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	13	28	26	14	14	17	14	23	15	17	20	26	22	20	17	23	15	22	14	13	13	15	14	14
2	13	21	13	13	13	14	14	14	15	18	20	21	23	26	21	18	13	14	13	14	14	14	14	13
3	15	14	15	13	13	15	14	13	13	15	21	24	22	20	20	14	14	13	14	13	14	13	14	13
4	14	13	14	14	13	14	26	23	14	15	18					21	15	23	14	14	14	14	13	14
5	14	15	13	25	14	14	14	25	13	17	18	21	25	23	18	15	17	14	13	13	13	15	14	13
6	14	13	13	13	17	14	15	13	15	18	17			26		20	18	24	13	14	13	14	14	14
7	18	14	14	14	18	14	15	13	15	20	20	25	29		17	22	17	13	13	14	13	14	14	14
8	15	14	14	14	14	14	15	14	13	17	20			26	24	22	14	13	13	13	14	15	15	17
9	14	14	13	13	13	15	15	13	15	18	24	22	26	26	22	18	15	14	15	15	14	14	13	14
10	14	14	14	14	13	15	17	14	15	17	21	28		37	25		14	14	13	14	13	14	14	20
11	17	13	14	14	15	14	17	13	13	15	21	18		23	25	21	13	13	13	14	20	13	13	14
12	14	14	13	14	13	14	17	13	14	17	23	23	25	21	18	17	13	13	13	13	14	14	14	13
13	14	13	17	14	13	14	17	14	14	17	23	24	40	C		17	15	18	13	14	14	14	14	14
14	13	14	14	13	13	15	18	13	17	18	21	22			24	18	17	18	14	14	14	14	14	14
15	14	13	13	25	14	14	17	14	13	22	18	22	21	28	28	18	18	14	13	13	28	13	15	14
16	13	22	14	14	13	17	20	24	20	20	22	29	36	31	26	20	14	13	14	14	14	14	14	14
17	13	13	13	13	13	17	17	14	15	18	22	33	22	22	33	17	20	13	13	14	14	13	13	13
18	13	13	25	13	14	17	18	14	18	18		40	C	C	C	C	C	C	14	14	25	14	14	14
19	14	13	13	14	25	17	17	14	17	25	C	C	C	C	C	C	C	13	14	14	14	15	17	15
20	17	15	14	15	15	14	18	14	17	21			44	39	18	17	13	15	13	15	14	14	15	17
21	15	14	14	13	14	18	18	13	17	21				35	33	20	20	13	17	14	13	13	14	15
22	17	18	14	14	14	14	17	24	34	31							20	29	17	13	14	17	22	14
23	14	14	14	14	17	18		14	17	17	20		20		41	34	20	13	15	14	13	14	17	17
24	15		15	14	13	18	18	14	18	20		29	29	47	40		17	21	15	14	13	13	17	
25		14	17	13	14		15	13	17	21	20	31	33	28	33	33	15	14	18	14	13	14	14	14
26		14	18	18	21	13	13	14	17	21		26	43	45	43	22	18	13	22	14	17	15	17	15
27	17	14	18	13	18	14	21	15	37	18	34	33	47	39	34		21	14	14	15	13	14	18	15
28	14	17	14	17	15	14	22	17	17			44	33			26	17	14	14	17	17	13	13	14
29	13	14	14	14	17	14	25	14	17	20	34		34	26	31	30	17	17	14	15	14	14	14	14
30	13	15	15	20		21	22	14	18	21		45	31	29	21	21	15	28	22	14	13	17	14	15
31	20	18	14	14	14	15	22	30	20	21	34	35	33	35	33	30	18	18	17	13	14	13	14	17
	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	31	31	30	30	30	31	31	30	22	22	21	22	24	25	29	30	31	31	31	31	31	30
MED	14	14	14	14	14	14	17	14	17	18	21	26	29	27	25	20	17	14	14	14	14	14	14	14
U Q	15	15	15	14	15	17	18	15	17	21	23	33	35	35	33	22	18	18	15	14	14	14	15	15
L Q	13	13	13	13	13	14	15	13	14	17	20	22	22	23	20	17	14	13	13	13	13	13	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Yamagawa

MAR. 2003

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	52	52	51	48	42	41	37	72	105	87	87	113	135	120	113	104	104	104		74	46	50	52	48
2	43	36	34	42	43	36	39	64	84	104		88	115	128	140	137	128	128	111	82	80	78		54
3	53	53	52	54	53		28	52	90	79	82	86	126	114	100	89	105	112		77	53	78	54	52
4			50		36	43	49	65	82	87	113	113	128	111	114	111	111	113	108	80	77	77	53	42
5	53	50	47	36	51	28	36	66	84		105	109	131	152	136	115	111	128	128				78	67
6	52	52	52	51	46	36	34	66	82	107	110	114	114	130	116	123	118	110	87	78	77	78	66	53
7	54	54	52	51	47	52	53		91	120	136	126	131	143	143	144	146	124			86	77	77	73
8	52	54	54	52	45	34	42	66	103	112	111	114	128	129	138	131	115	113		81	73	54	52	52
9	52	59	61	52	47	44	47	65	82	111	124	129	128	128	116	113	113	112	87	84	77	52	51	53
10	53	52	54	50	51	44	47	73	87	110	114	112	120	120	129	133	123	110	111	85	77	77	51	54
11	59	54	66	54	44	43	48	78	110	112	127	117	136	130	128	131	128	129	111	82	77	66	53	64
12	52	54	54	66	55	44	44	72	104	112	87	114	137	137	139	140	128	114	111	84	78	76	54	53
13	53	51	52	54	50	43	44	72	C		115	130	114	114	128	115	100	86	86	86	78	54	62	66
14	66	67	66	51	51	48	50	77	98	111	110		130	136	136	130	130	114	110	86	78	54	54	66
15	54	54	54	56	34	34	36	72	116	108	112	113	115	130	127		113	90	105	84	74	54	50	52
16	42	51		47	48	42	47	65	99	104	86	111	128	129	128	128	114	110		81	76	66	65	
17	54	53	53	53	37	36	41	58	78	85	95	130	135	130	114		112	126	81	51	53	52	47	53
18	52		42	51	37	36	37	61	77	87	115	128	111		126	89	90	86		78	52	48	50	40
19	53	42		51	34	30	35	58	84	106	108	128	142	138	128	114	111	87	84	73	66	52	50	
20	54	53	36	44	C		44	66	79	91	103	131	114	114	111		90	86	87	76	51	49	37	36
21	43	52	42	34		29	36	74	75	86	88	105			113	91	98	84	86	73	53		53	58
22	51	66	34	32	32	32	34	64	94	71	82	113	126	130	114	89	98	106	107	78	66	42	43	36
23	34	36	36	37	32		34	63	80	84	85	87		110	111	103	92	82	77	72	66	36	53	
24	54	52	50	51	36	28	29	72	75	80	85	110	120	114	112		108	104	88	80		52	53	
25	43	32	43	47	32		32	61	76	80	80	87	115	144	151	144	115	88	86	74	52	52	53	54
26	66	53	52	50	37	37	41	68	77	84	87	114	130	144	147	140	130	128	110	84	76	54	52	52
27	53	54	54	52	41	37	41	70	82	99	113	114	112	114	114	111	88	82	86	85	78	66	63	54
28	54	54	53	46	48	52	54	74	86	86	85	78	80	88	106		106	109	105	81	73	54	52	51
29	52	53	54	A		47	52	76	83	84	112	111	115	133	130	131	139	130	111	87	73	54	54	52
30	53	61	52	51	52	36	52	76	106	87	114	130	128	114	111	85	108	111	111		81	53	54	52
31	54	52	58	52	47	44	53	82	88	88		114	115	128	136	C	C	C	C	C	C	C	C	C
	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	29	29	28	27	31	30	30	29	29	30	29	29	31	25	30	30	24	27	28	28	29	26
MED	53	53	52	51	44	37	41	67	84	88	108	114	126	129	127	115	112	110	105	81	75	54	53	53
U Q	54	54	54	52	49	44	48	73	98	109	113	126	130	134	136	132	123	114	111	84	77	71	54	54
L Q	52	51	45	46	36	34	36	64	80	84	86	110	115	114	113	103	104	88	86	76	59	52	51	52

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Yamagawa

MAR. 2003

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	43	44	69	60	G	G	G	G	28	27	34	29	G	G
2	G	G	G	G	G	G	G	G	G	G		G	55	G	G	41	60	60	26	G	28	G		G
3	G	25	G	G	G	G	G	G	G		G	44	45	G	G	G	43	36	32	42	33	34	27	39
4	44	40	24		G	G	G	G	G	G	G	G	G	G	G	G	40	40	27	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	27	33	25	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	32	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	G	27	G	G	G	G	G
8	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	50	45	40	G	G	G	G	G	G
9	G	G	G	G	G	G	G	G	35	39	G	G	48	53	48	44	G	34	35	27	G	23	G	G
10	G	G	G	G	G	G	G	52	G	G	G	G	G	G	52	44	40	38	G	40	G	G	G	G
11	G	G	G	G	G	G	G	G	G	G	G	49	51	G	64	51	43	38	30	G	28	27	G	26
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	43	35	29	28	28	G	28	G
13	G	G	G	G	G	G	G		C		G	G	G	G	G	G	G	G	G		G	26	G	G
14	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	40	33	23	28	24	G	G
15	G	G	G	G	G	G	G	G	G	G	G	50	48	G	G	G	G	37	G	G	25	G	G	G
16	G	G	46	29	29	27	G	G	G	G	G	G	68	58	54	56	G	34	44	34	24	23	G	80
17	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
18	23	50	30	24	27	G	G	G	G	G	G	G	53	76	G	G	G	G	G	24	G	G	G	G
19	29	G	39	G	G	G	G	G	G	G	G	G	G	G	G	63	43	37	39	33	G	G	58	33
20	33	29	G	G	C	G	G	G	G	G	G	G	G	G	G		G	38	29	28	G	G	24	33
21	G	35	G	G		G	G	G	G	G	G	48			G	G	G	G	G	26	G		G	28
22	39	25	27	G	26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	G	G	G
23	G	26	G	G	G	G	24	G	G	G	G	G	G	G	G	52	43	38	30	G	G	G	G	
24	G	G	G	G	G	G	G	31	G	G	G	G	G	G	G		G	41	40	34	59	36	27	24
25	G	G	G	G	G		22	G	G	G	G	G	48	G	G	G	G	G	G	G	G	43	26	G
26	23	24	G	G	G	G	G	G	G	G	G	G	G	G	55	G	39	40	41	43	49	30	32	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	37	54	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	33	26	23	27	24	29
29	35	40	30	84	57	G	23	G	G	G	G	G	G	G	G	G	49	40	38	G	G	34	26	29
30	28	40	53	27	32	28	G	36	43	45	G	52	G	G	G	G	G	45	40		25	G	G	G
31	24	G	G	G	G	G	G	34	50	52		51	52	54	51	C	C	C	C	C	C	C	C	C
	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	30	29	30	31	30	30	28	29	30	30	30	31	27	30	30	30	28	30	29	29	29
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	28	26	12	G	G	G
U Q	24	25	G	G	G	G	G	G	G	G	G	G	48	G	G	44	43	40	33	32	28	28	25	27
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

MAR. 2003

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	15	14	15	14	14	14	18	15	16	22	29	28	27		22	15	15	14	14	14	15	15	15
2	15	16	15	15	14	15	18	20	15	21		24		35		24	22	16	16	15	14	15		15
3	15	15	15	15	14	16	15	20	14	17	21	28	33	40	26	21	18	14	15	15	15	15	16	15
4	14	14	15		15	15	15	16	16	16	18			30	40	20	15	16	16	15	14	15	14	15
5	15	15	14	15	14	15	16	22	27		20	24		29		24	17	16	15	14	15	16	15	15
6	15	14	15	15	15	15	15	27	15	18	18	43				36	22	17	15	14	15	15	14	15
7	15	15	15	16	15	16	15		15	17	21		29		43		17	15	14	14	15	14	15	15
8	15	15	15	15	15	17	15	18	15	17	20				42	34	22	15	16	15	15	27	16	16
9	15	15	15	15	14	16	15	21	15	18	20	24	34	33	30	28	18	15	15	15	15	16	15	16
10	15	15	16	15	15	16	15	18	16	17	22				32	21	18	15	20	14	15	15	15	15
11	17	15	14	14	15	14	14	15	15	17	20	33	34		34	21	18	15	15	15	15	14	14	14
12	15	15	15	15	14	15	15	22	14	18	21	21				16	14	14	14	15	14	14	14	15
13	15	15	15	16	15	15	15	15	C		20			23	18	17	15	17	21	15	15	15	18	14
14	15	15	14	14	14	14	15	22	14	16	18		45				18	15	16	15	14	16	15	15
15	15	15	15	15	15	16	14	21	14	17	17					23	18	16	14	14	14	15	15	15
16	15	14	14	14	14	14	14	16	15	18	20	45	34	33	32	18	18	14	15	14	15	15	14	15
17	15	15	15	15	16	15	15	15	15	20					34		17	16	17	15	15	17	16	16
18	14	15	15	15	15	15	15	17	15	22	43	45	34	44		62	18	17	20	15	15	15	15	15
19	15	15	14	15	15	15	15	22	16	35	22	43	46	60	44	33	22	16	14	14	15	15	14	14
20	15	15	15	16	C		15	21	16	18	21		44		44		16	17	14	14	15	15	17	14
21	15	15	15	15		15	15	16	16	17	18	22				34		17	14	16	17		14	15
22	14	14	14	15	15	14	15	21	28	16	20			43		20	18	16	20	15	15	16	15	15
23	16	15	16	14	15	15	14	21	14	15	21	21	23			33	18	16	14	15	15	17	15	
24	15	17	15	14	15	15	15	17	15	18		18			45		17	16	16	14	15	14	15	17
25	17	15	15	15	15		15	20	15	17	24	33	34		31	32	18	16	22	15	15	15	14	15
26	15	15	16	16	15	15	15	16	16	17				46	28	17	17	17	15	15	14	14	14	16
27	17	15	15	15	14	15	14	16	15	18	21	48	38	45			22	15	15	15	14	14	14	15
28	15	14	14	15	15	15	15	17	14	20	18		38	45			18	16	17	16	15	14	15	15
29	15	14	14	14	15	15	15	17	15	17	26						21	17	15	14	15	14	15	14
30	15	15	15	15	14	15	15	14	15	18	20	29	29	27	27	18	15	14	14		14	15	14	15
31	15	15	15	15	14	15	15	15	15	17		35	35	34	35		C	C	C	C	C	C	C	C
	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	30	29	29	31	30	30	29	26	18	16	16	17	22	29	30	30	29	30	29	29	29
MED	15	15	15	15	15	15	15	18	15	17	20	29	34	34	34	22	18	16	15	15	15	15	15	15
U Q	15	15	15	15	15	15	15	21	16	18	21	43	38	44	42	33	18	16	16	15	15	15	15	15
L Q	15	15	14	15	14	15	15	16	15	17	20	24	31	29	29	20	17	15	14	14	14	14	14	15

HOURLY VALUES OF foF2 AT Okinawa

MAR. 2003

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	51	54	54	47	42	40	30	54	105	105	107	121	144	135	131	140	136	128	125	101	71	54	66	53
2	50	49	49	44	47	36	29	54	90	104	112	118	138	146	159	172	170	170	172	144		144	131	87
3	86	88	87	85	80	43	26	54	88	87	92	110	125	131	117	110	117	127	110	100	87	90	87	75
4	54	43		45	43	42	47	66	90	110	120	126	137	120	118	124	136	127	130	108	103	87	76	53
5	52	53	36	47	51			58	100	111	104	121	142	154	147	146	147	170			142	147		127
6	107	86	84	77	61	47	32	58	88	108	118	128	141	146	145	141	134	122	126	107	107	89	86	63
7	54	54	65	64	50	58	51	63	97	128	142	133	134	148	150	151	150	145	144	144	137		101	88
8	81	66	54	58	46	37	40	62	100	110	125	130	136	146	146	147	146	141	137	131	125			88
9	87	87	88	82	54	53	53	66	90	118	141	134	131	141	131	128	125	127	130	110	108	87	80	73
10	65	66	54	62	53	42	38	66	94	110	116	122	121	131	142	146	140	136	130	109	107	105	84	75
11	89	88	88	65	36	41	44	73	113	124	117	112	127	137	138	145	146	144	128	108	107	87	84	81
12	78	76	72	76	61	43	42	66	98	110	120	126	143	142	151	148	147	146	142	138	122	106	100	86
13	80	76	72	65	45	42	43	66	90	102	118	132	136	132	136	136	121	108	110	122	107	86	74	74
14	73	76	72	66	50	42	42	66	97	112	118	126	132	142	144	148	145	142	131	124	108	84	77	82
15	72	76	76	45	29		29	65	108	110	108	122	134	136	140	142	129	131	131	131	110	87	73	76
16	72	64	64	54	47	42	47	65	90	111	107	111	136	144	136	146	145	134	121	110	108	88	87	86
17	78	83	78	78	36	30	34	54	96	99	102	141	151	145	136	137	145	141	101	87	76	74	63	66
18	61	54	53	51	44	28	31	60	76	112	131	132	118	130	137	132	110	108	107	110	87	62	51	65
19	66	55	64	79	36		30	58	90	114	121	130	150	150	147	146	144	144	137	121	108		76	64
20	60	63	46		47	42	43	62	82	104	118	120	135	136	141	131	117	116	110	81	72	72	66	52
21	52	66	64	53	30			72	74	88	105	106	125	126	125	125	111	112	118	78	65	66	65	87
22	74	76	49	30	29	30	30		77	88	90	114	131	137	145	146	146	148	147	143	120	88	87	88
23	86	88	78	66	53	44	42	66	81	88	101	97	108	121	136	131	122	107	90	87	86	72	64	77
24	73	66	47	58	26			75	78	81	94	117	131	145	146	150	142	135	131	106	80	62	66	53
25	48	42	47	51	30		28	60	75	87	94	109	132		175	173	171		146	128	106	88	88	88
26	90	83	76	66	52	47	35	61	74	90	106	112	138	163	173	171	171	171		147	129	107	87	87
27	88	88	88	66	36	36	38	71	87	101	117	111	116	131	131	131	118	110	110	109	87	80	78	73
28	83	82	77	41	46	48	55	86	97	98	100	111	107	106	100	110	120	122	109	106	80	73	66	
29	64	67	66	48	36	44	47	72	100	101	121	114	120	143	140	141	148	146	141	126	87	66		65
30	73	72	66	51	54	48	53	80	104	100	112	145	130	125	131	128	125	131	130	130	109	88	76	73
31	66	72	74	71	48	43	51	80	89	106	126	132	131	145	146	147	147	144	130	108	87	87	87	87
	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	30	30	31	25	28	30	31	31	31	31	31	30	31	31	31	30	29	30	30	28	28	30
MED	73	72	66	60	46	42	41	66	90	105	116	121	132	139	140	142	142	134	130	110	107	87	78	76
U Q	83	83	77	66	52	45	47	71	98	111	120	130	138	145	146	147	147	144	137	130	109	88	87	87
L Q	60	55	54	48	36	38	30	60	82	98	104	112	125	131	131	131	122	122	110	106	87	72	66	65

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

MAR. 2003

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	25	G	G	G	G	G	49	67	52	48	45	G	29	33	G	G	G	G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	44	56	67	65	113	G	G	G	G	G	G
3	G	G	G	G	G	11	G	G	G	G	G	G	G	52	48	66	102	49	G	33	G	G	G	28
4	27	30	40	39	G	G	G	G	G	G	G	G	52	G	G	46	44	49	G	G	G	G	G	G
5	G	G	G	G	G	25		G	G	G	G	G	G	G	G	G	G			33	G	G		G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	52	55	44	40	45	49	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	36	G	26	G	G	G	G
8	G	G	G	G	G	G	G	G		38	G	G	G	G	G	G	G	37	G	G	G	G		G
9	G	G	G	G	G	G	G	G	G	G	G	G	56	55	G	G	46	44	34	G	G	G	G	G
10	G	G	G	G	G	G	G		G	G	G	G	51	51	G	G	G	G	G	G	G	G	G	G
11	G	G	G	G	G	G	G	29	G	G	G	49	52	49	51	47	45	36	G	G	G	G	G	G
12	G	25	G	G	G	G	G	G	G	G	G	G	52	46	G	42	44	38	29	25	G	28	G	G
13	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G	39	38	36	26	G	G	G
14	23	G	G	G	G	G	G	G	G	G	G	G	G	54	G	G	46	49	41	39	G	G	G	G
15	G	G	G	G	G		G	G	G	G	G	G	52	51	44	50	52	50	32	23	G	G	G	G
16	G	G	G	G	G	G	G	G	G	45	54	G	64	G	G	G	50	39	36	43	39	G	G	G
17	G	30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	28	28	34	G	G	G	G	G	G	G	G	G	G	G	G	G	39	G	G	G	34	G	49
19	G	G	25	33	G		G	G	G	G	G	G	G	G	G	53	G	36	38	42	26	29	24	G
20	G	G	28	61	24	G	G	G	G	G	G	G	G	G	G	G	G	43	G	30	29	G	G	G
21	G	30	24	G	G			G	G	G	G	G	G	G	G	50	G	43	31	G	G	G	G	G
22	G	39	28	26	G	G	G	G	G	G	G	G	G	G	G	G	G	41	G	32	G	G	G	G
23	G	49	30	G	G	G	G	G	G	G	G	G	G	G	54	53	50	48	36	29	G	27	34	24
24	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	40	40	36	57	26	35	G
25	G	G	G	G	G		G	G	G	G	G	50	G	G	G	G	G	G	G	G	G	G	22	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	45	46	48	43	37	36	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	57	30	38	37
28	34	23	G	G	G	G	G	32	G	G	49	G	G	G	G	G	G	G	G	28	40	24	G	30
29	31	33	G	28	G	G	G	35	G	G	G	52	48	50	G	G	G	G	G	G	G	50	70	33
30	G	27	G	G	G	32	G	40	41	45	47	47	G	46	48	G	48	44	36	39	37	58	32	G
31	G	G	G	G	G	G	G	G	39	G	47	G	52	52	G	G	44	G	34	30	28	34	G	29
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	26	29	30	30	31	31	31	31	31	31	31	31	30	30	31	31	31	29	31
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	15	28	G	G	G	G
U Q	G	27	G	G	G	G	G	G	G	G	G	G	51	50	44	48	46	44	36	36	28	27	11	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

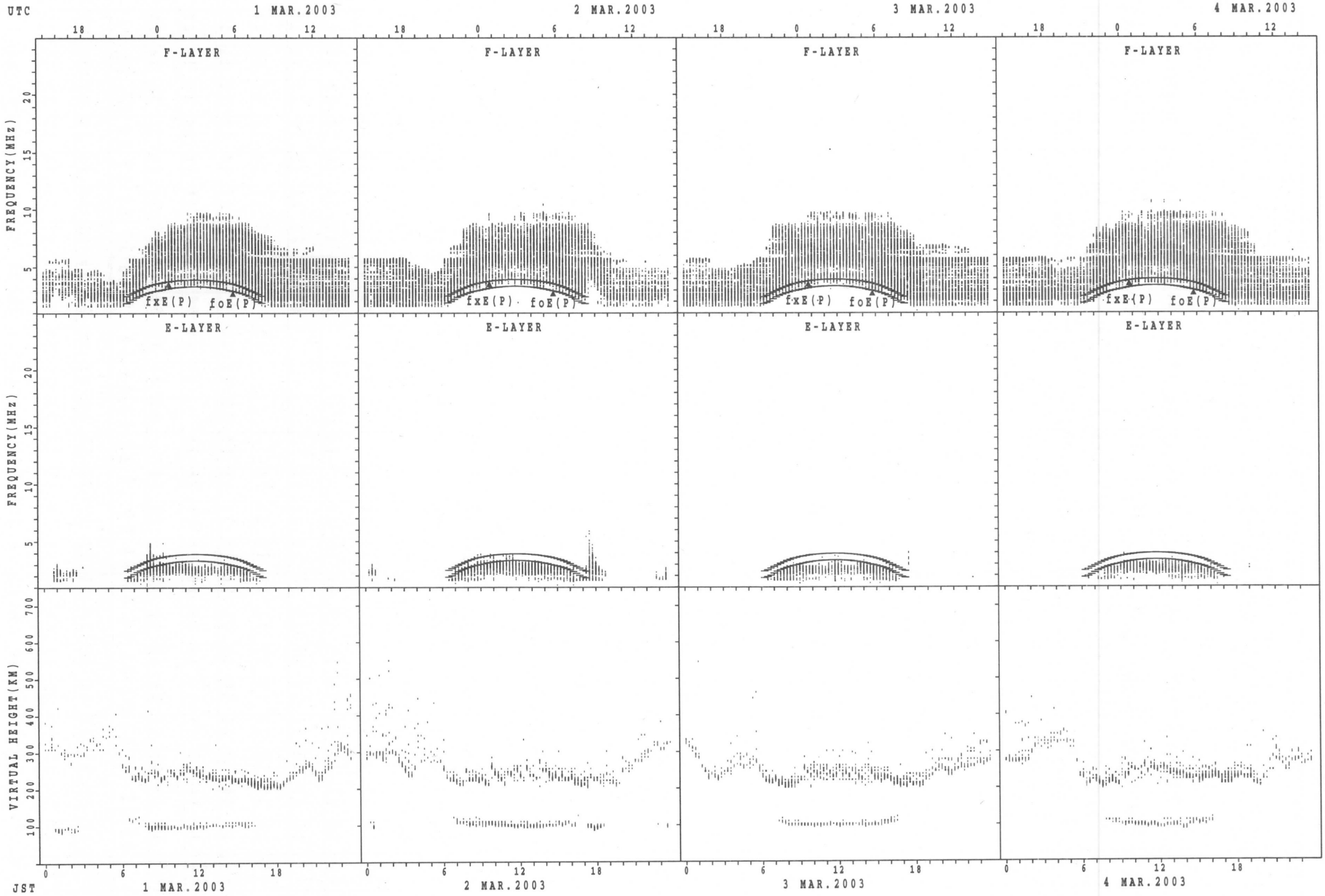
MAR. 2003

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

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

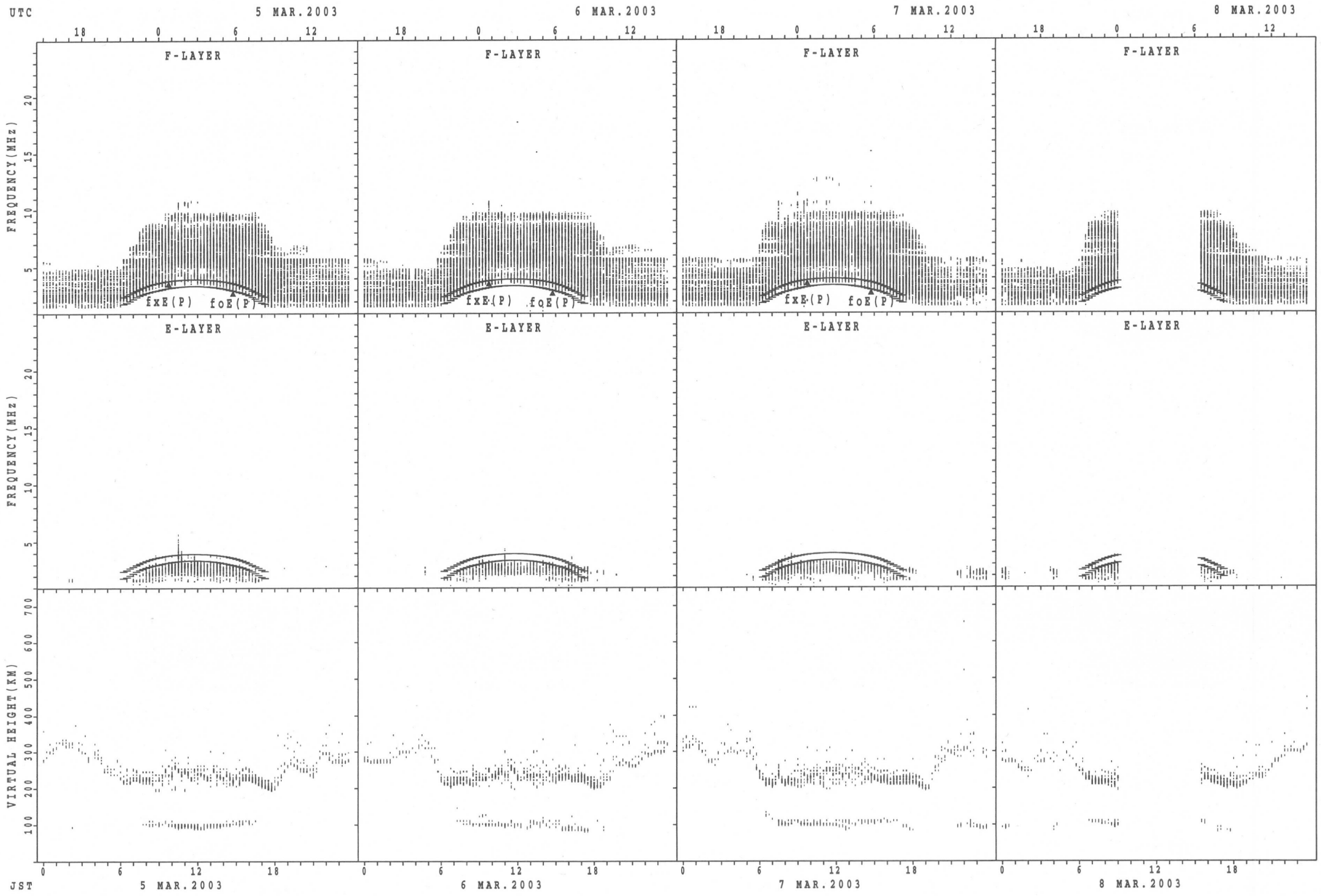
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

SUMMARY PLOTS AT Wakkanai



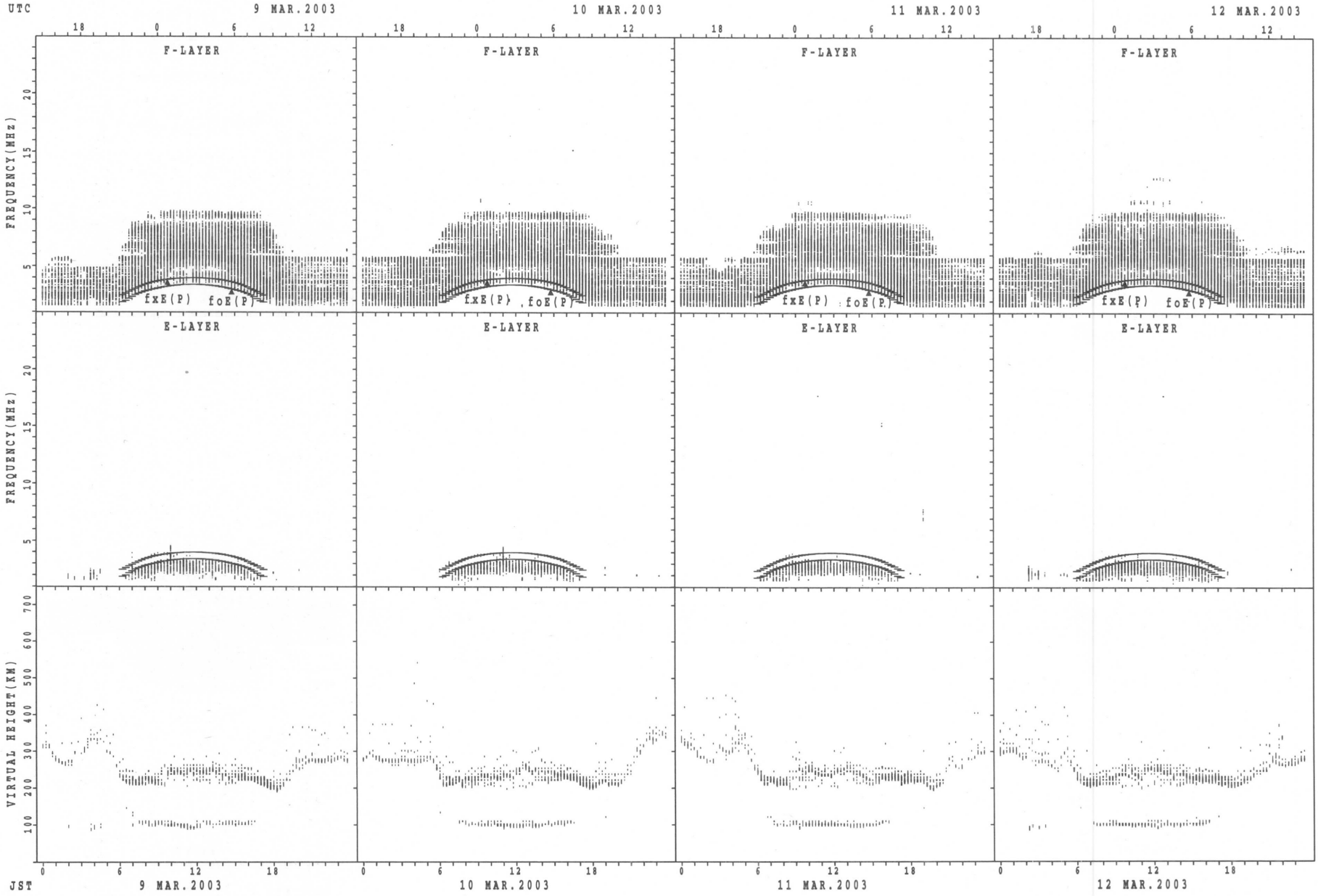
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



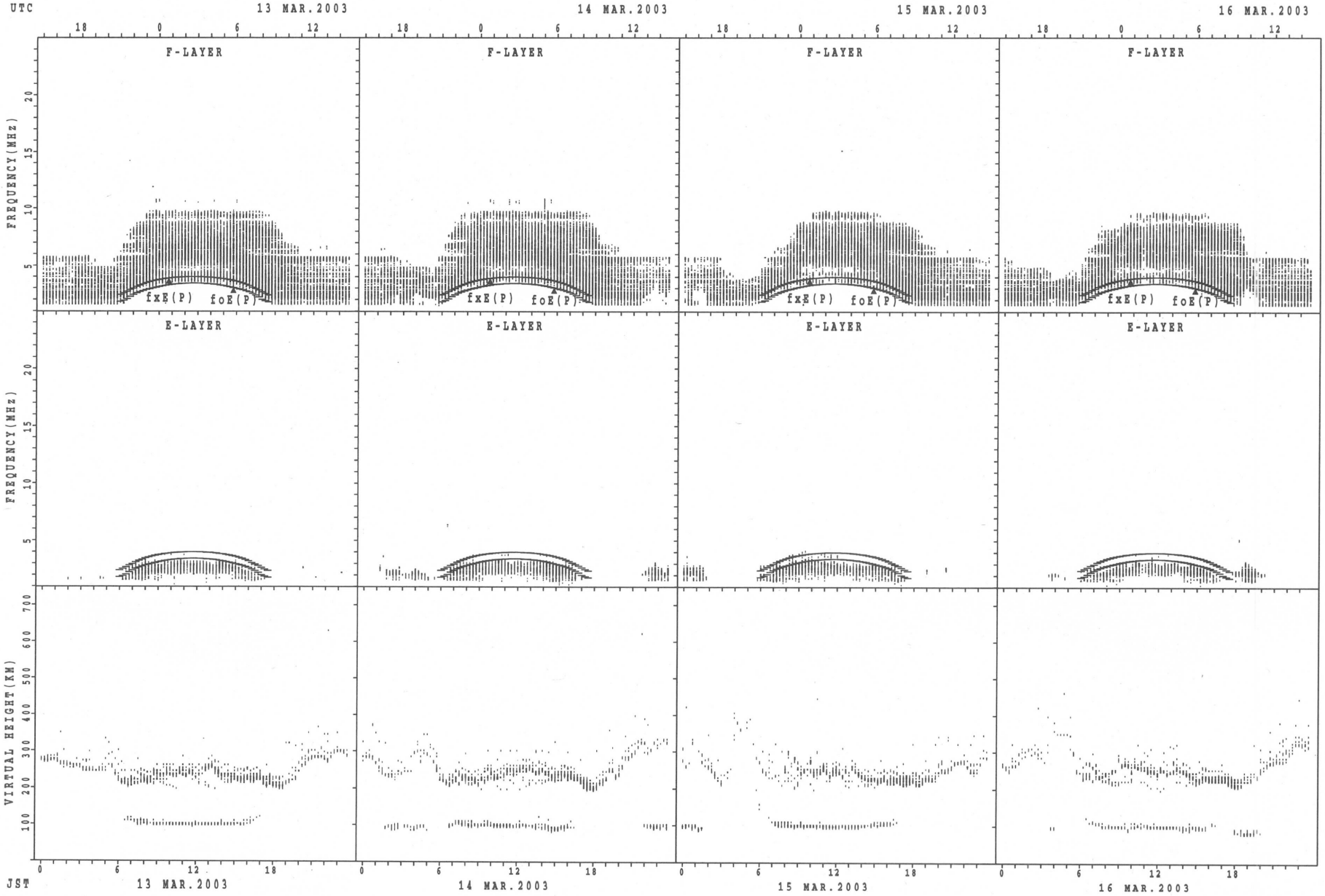
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



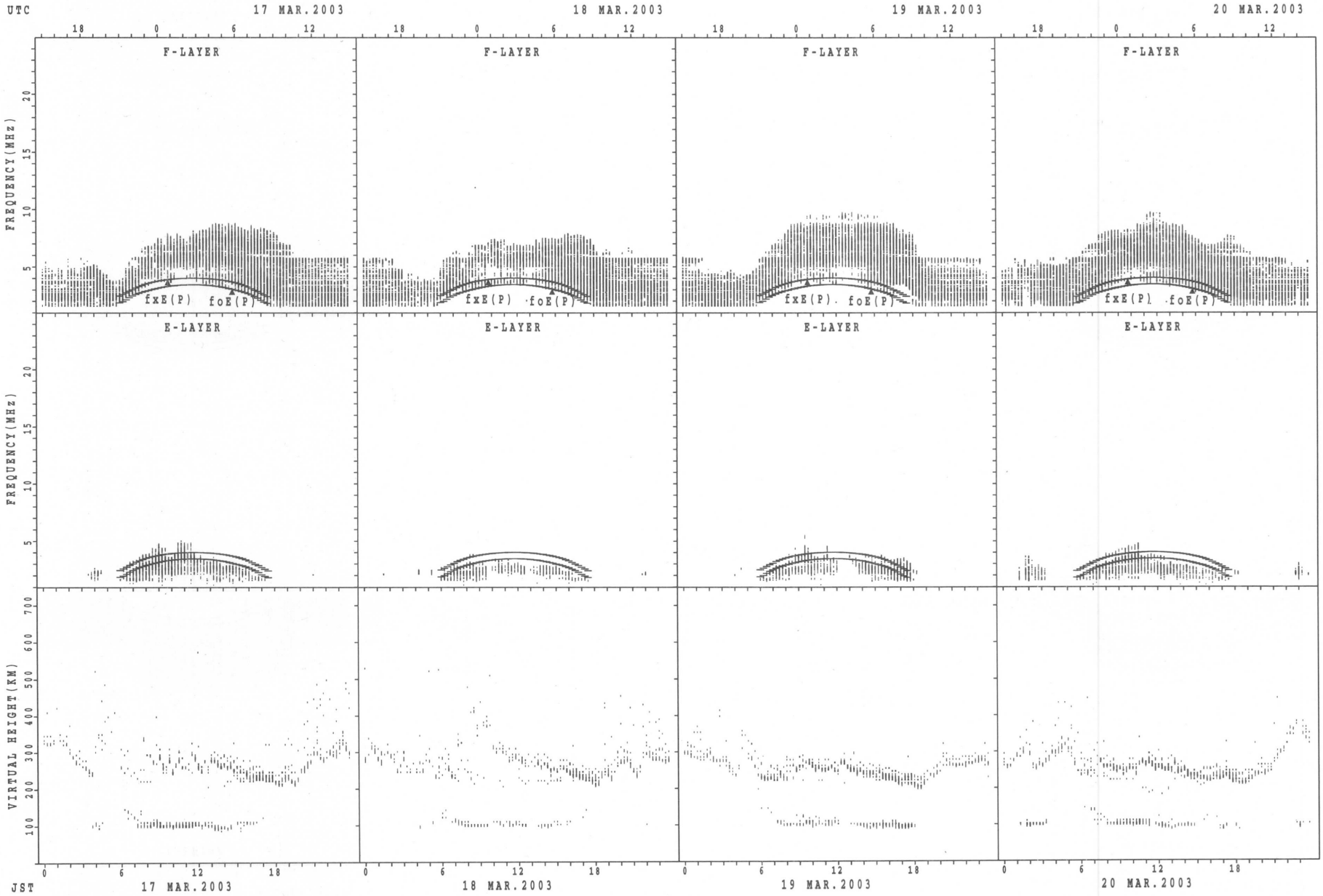
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



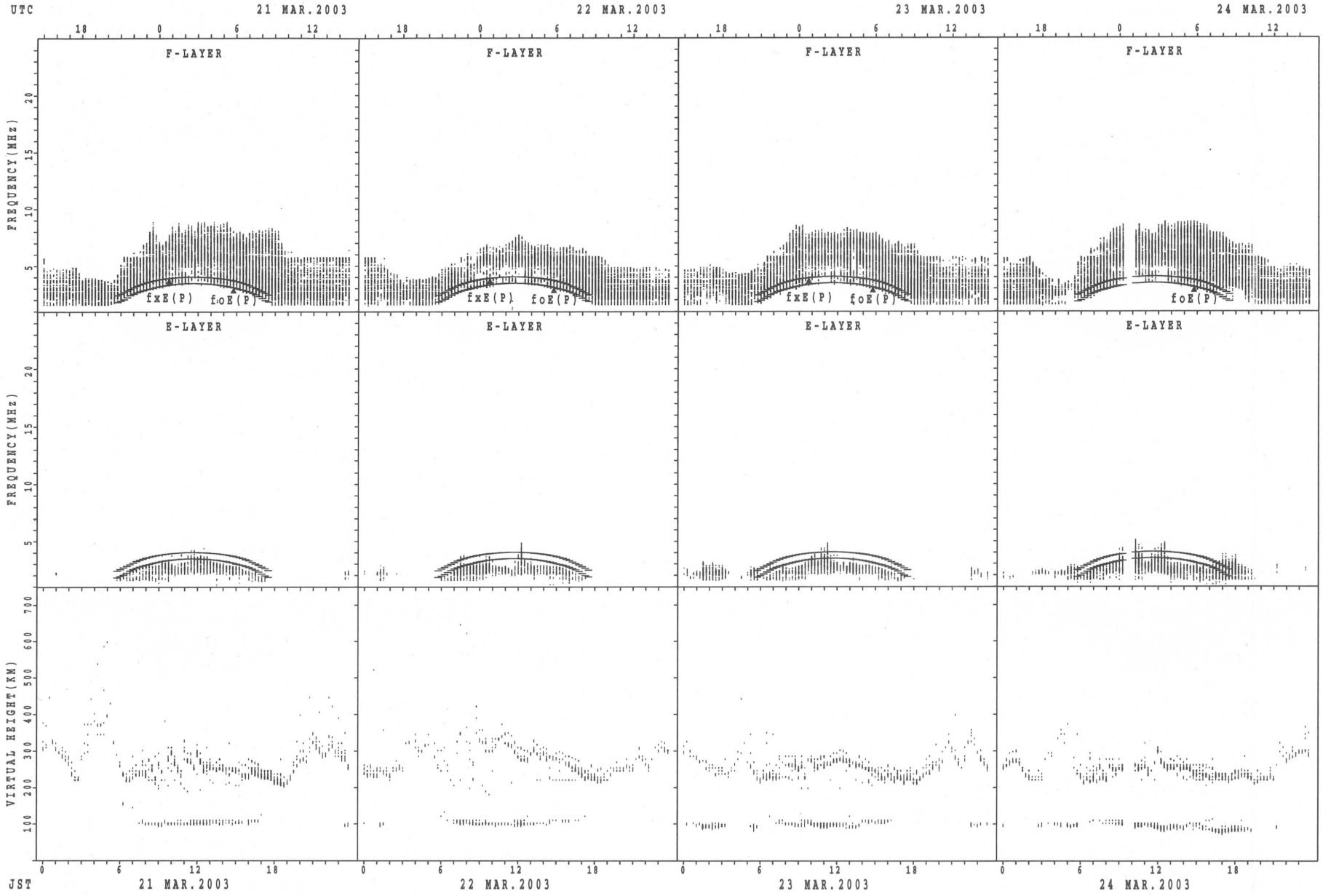
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



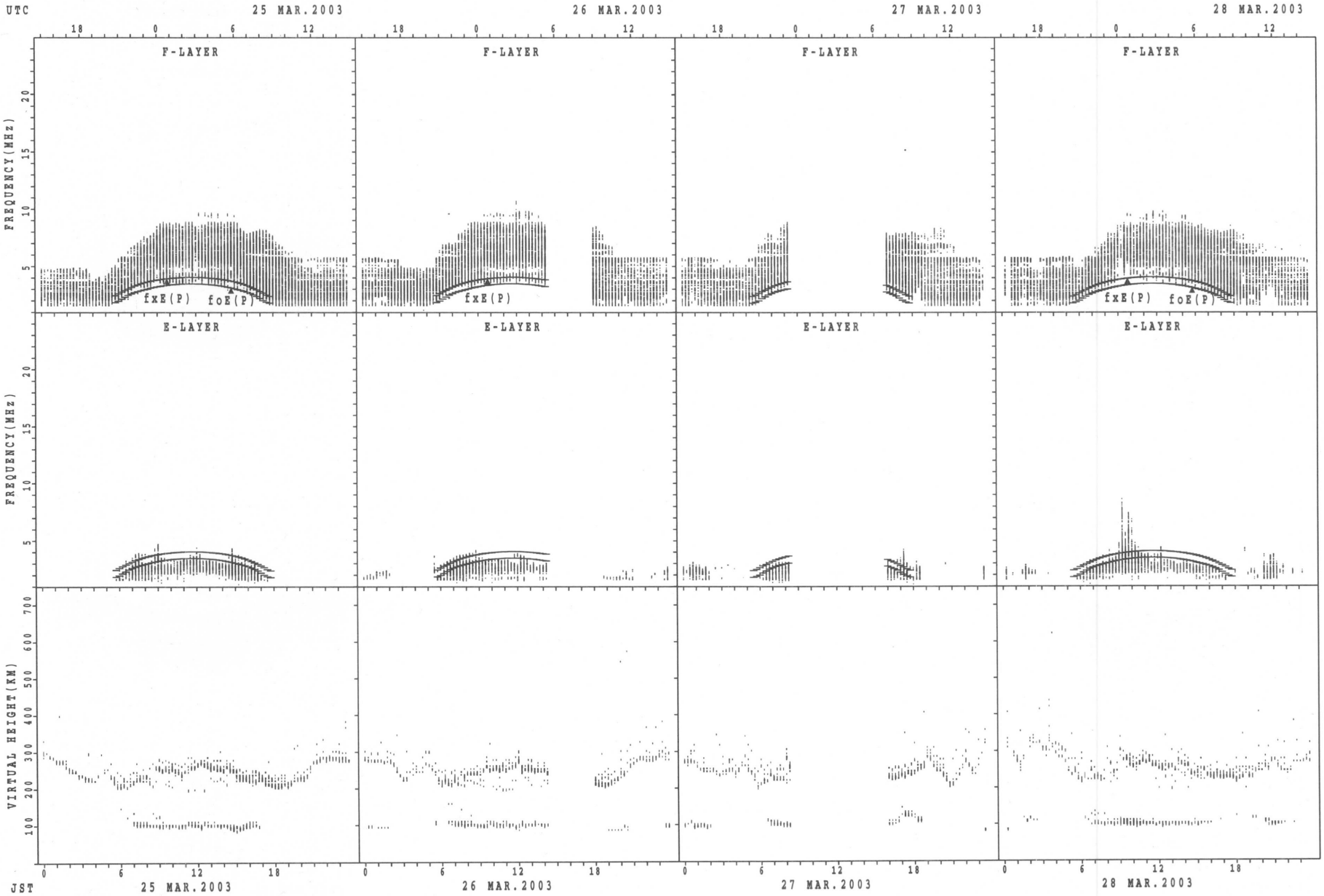
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



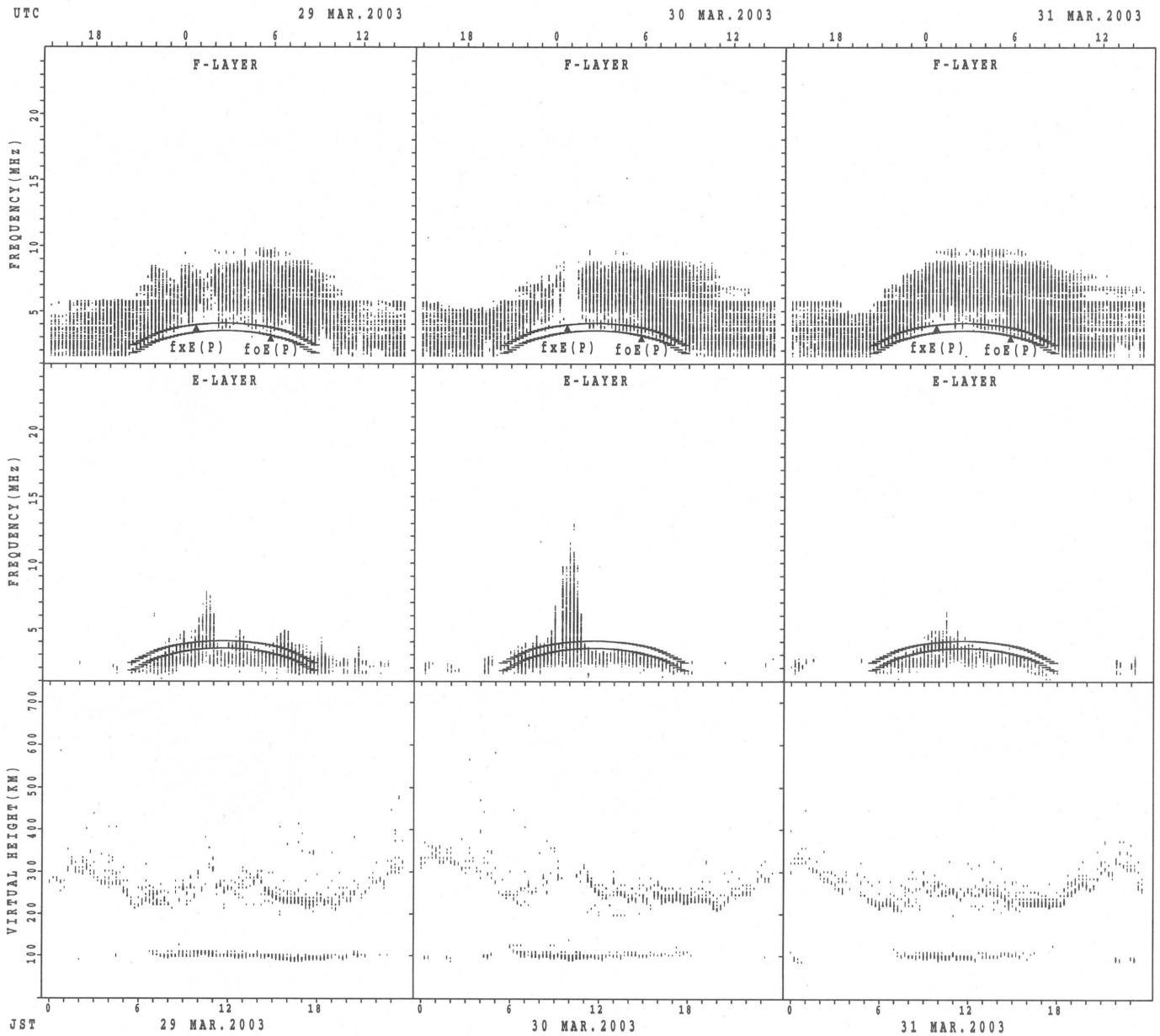
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



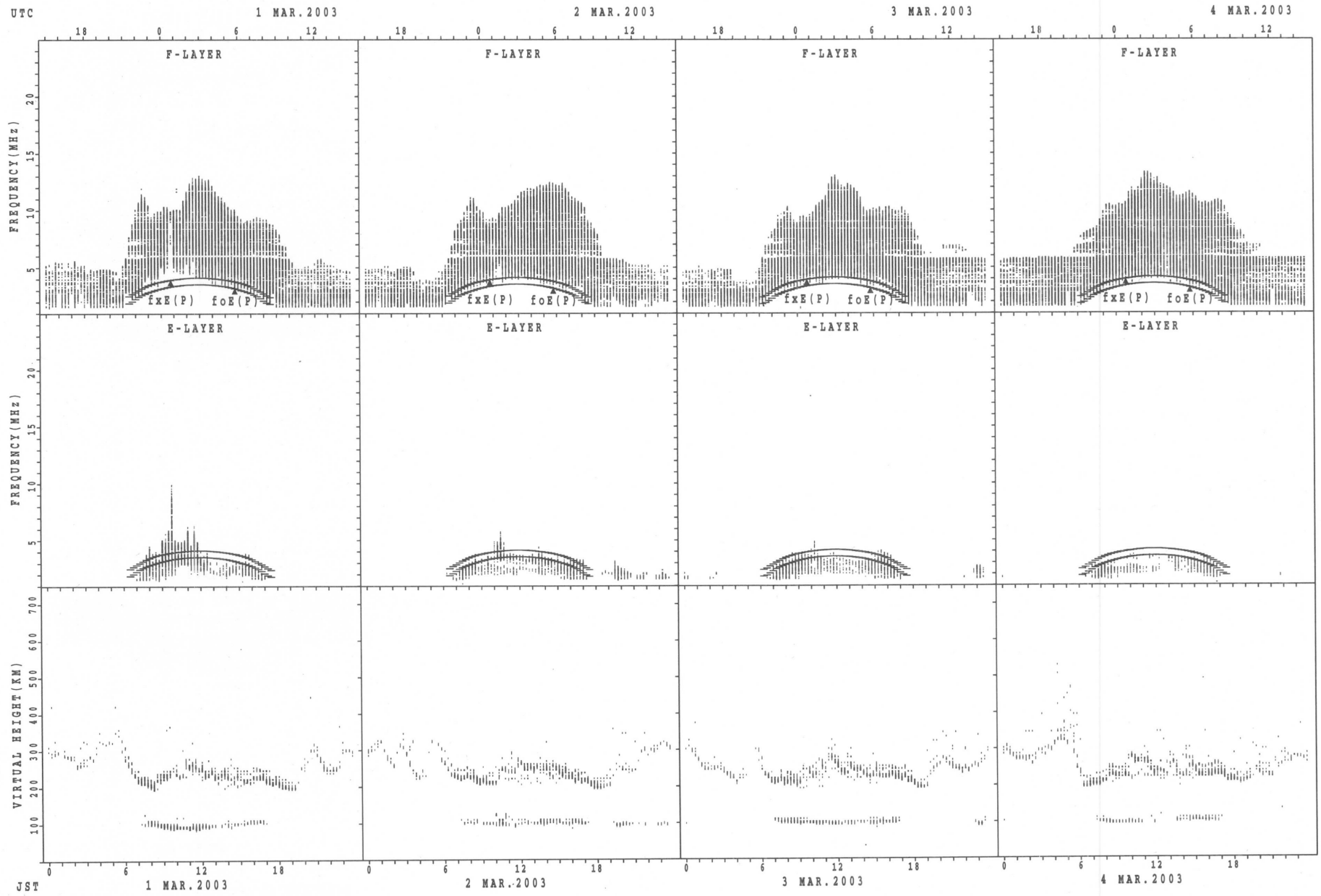
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



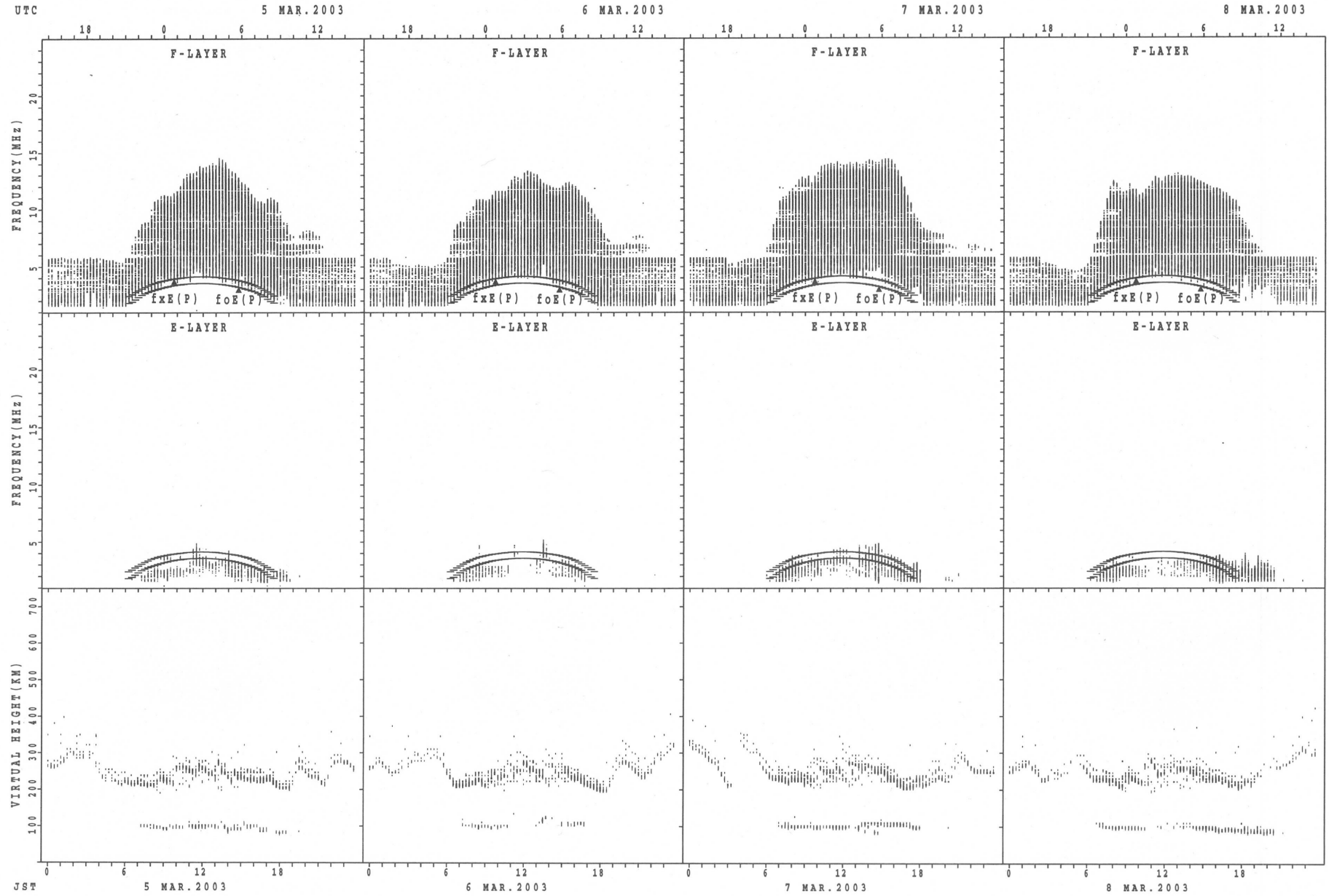
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



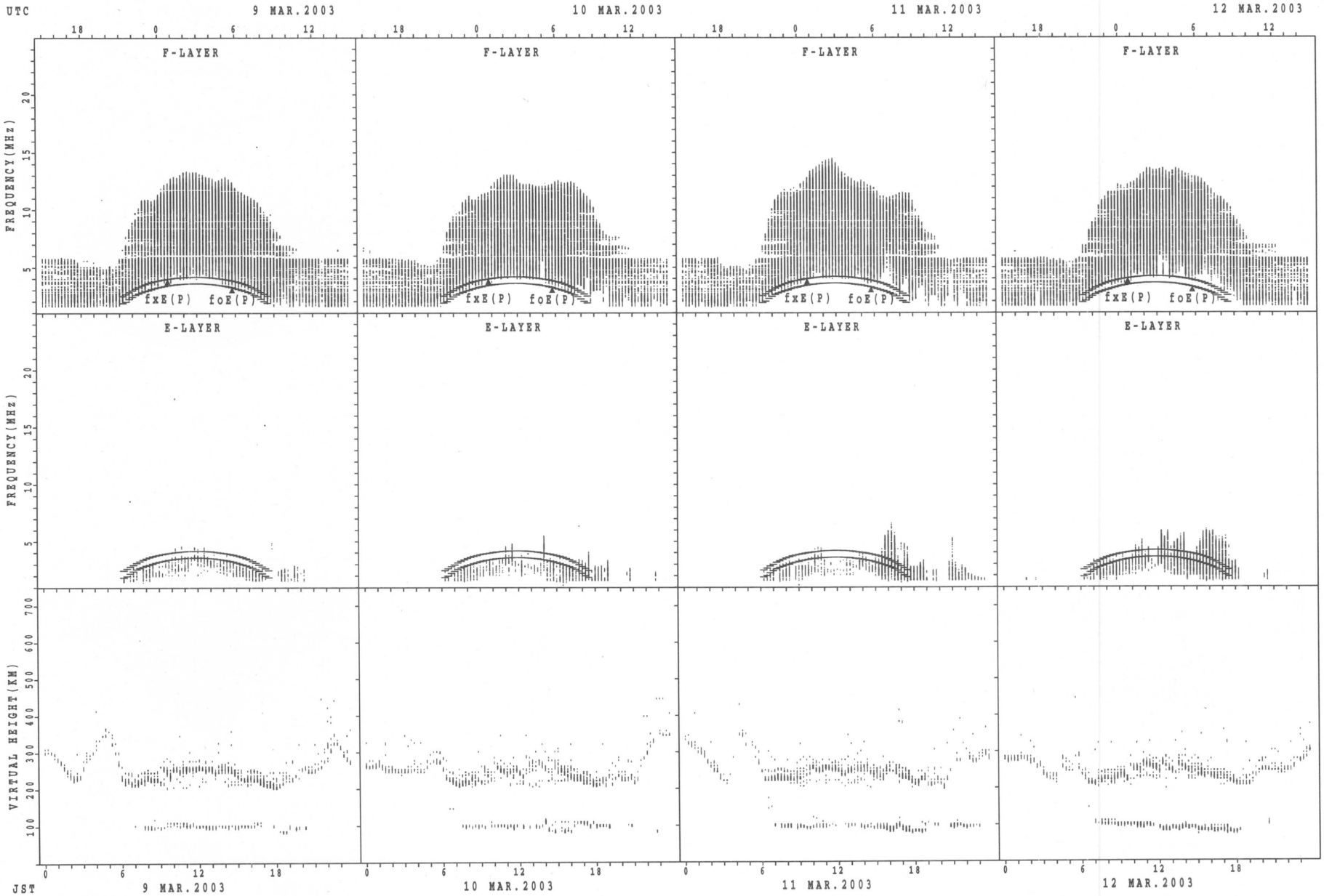
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



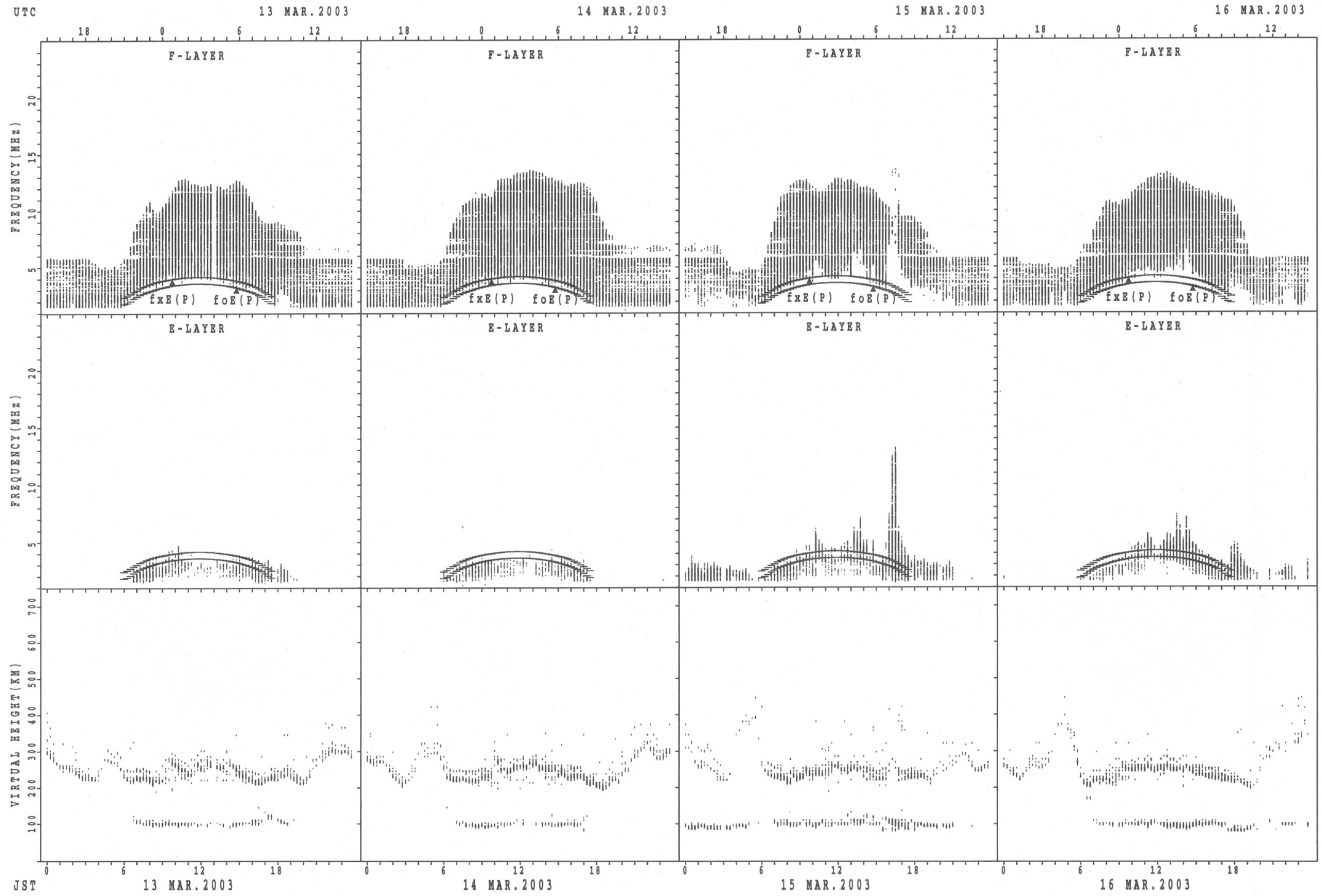
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



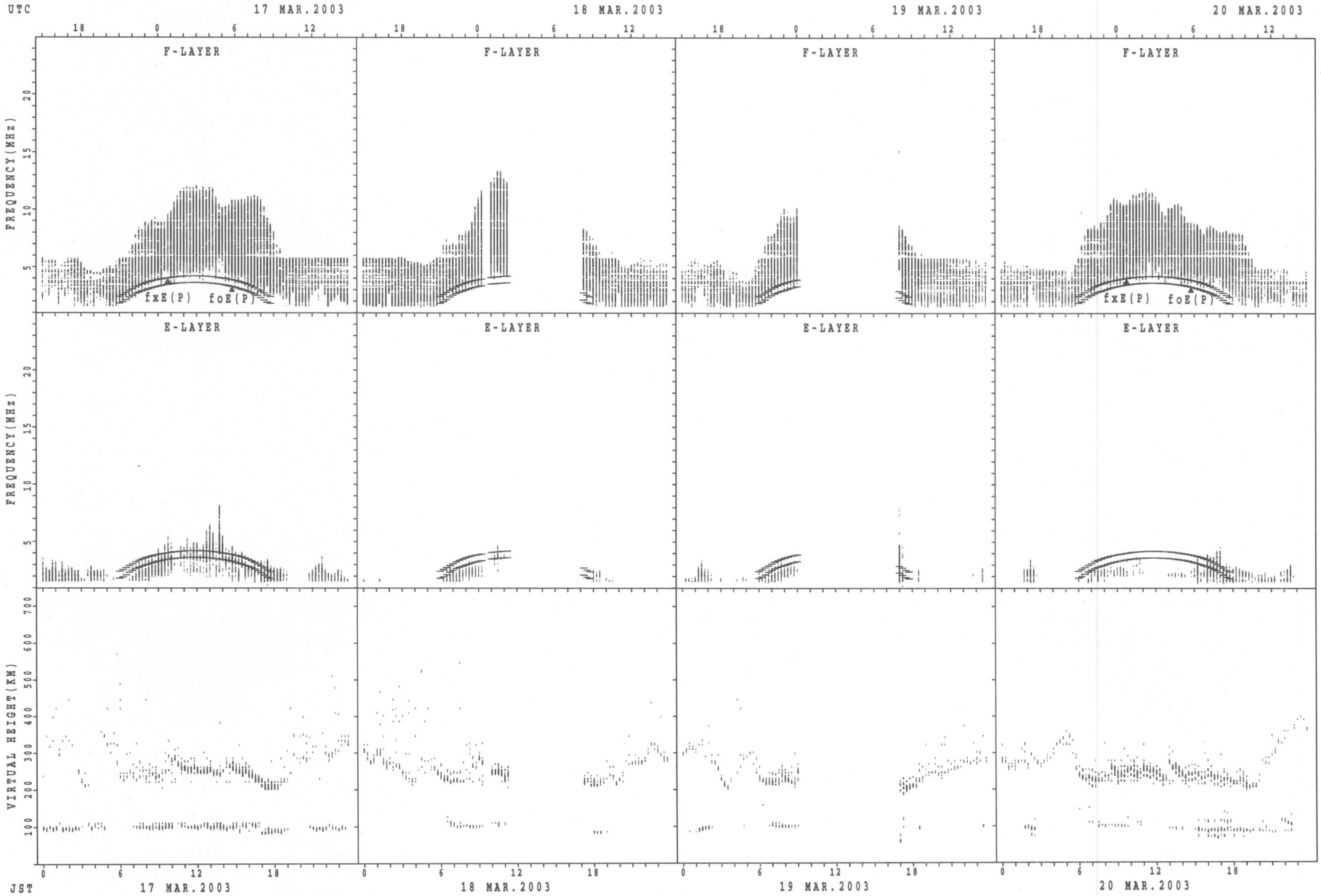
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



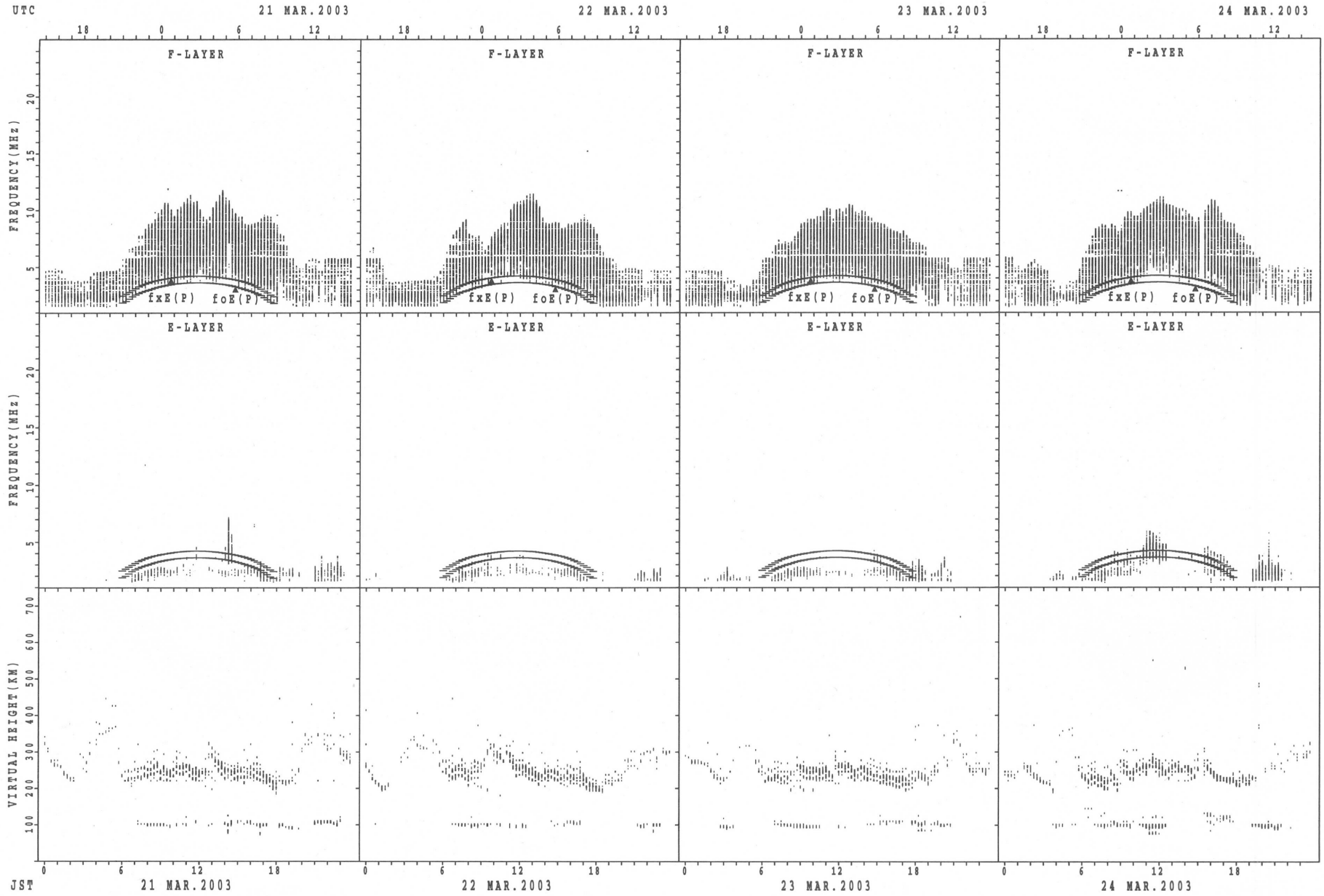
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



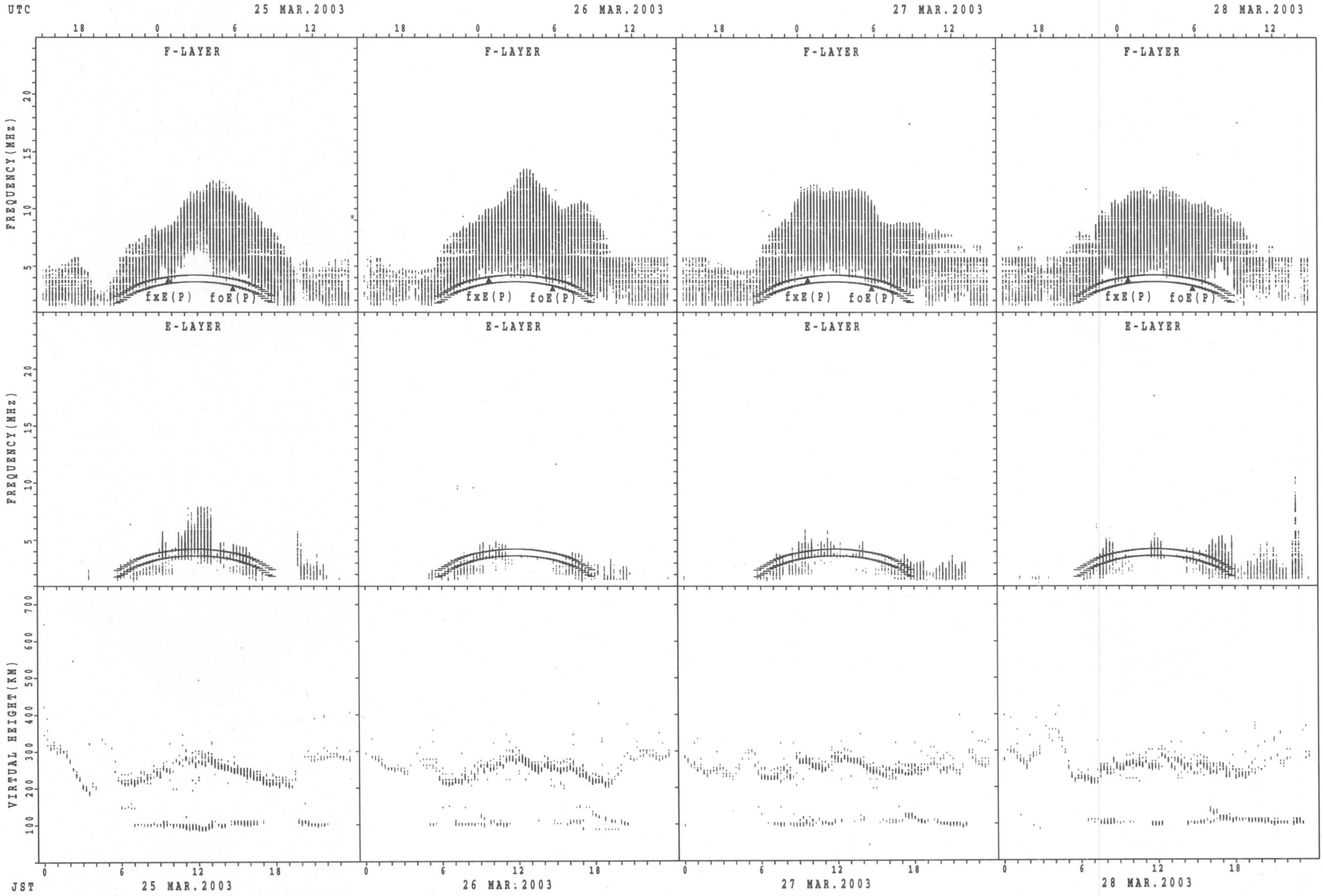
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



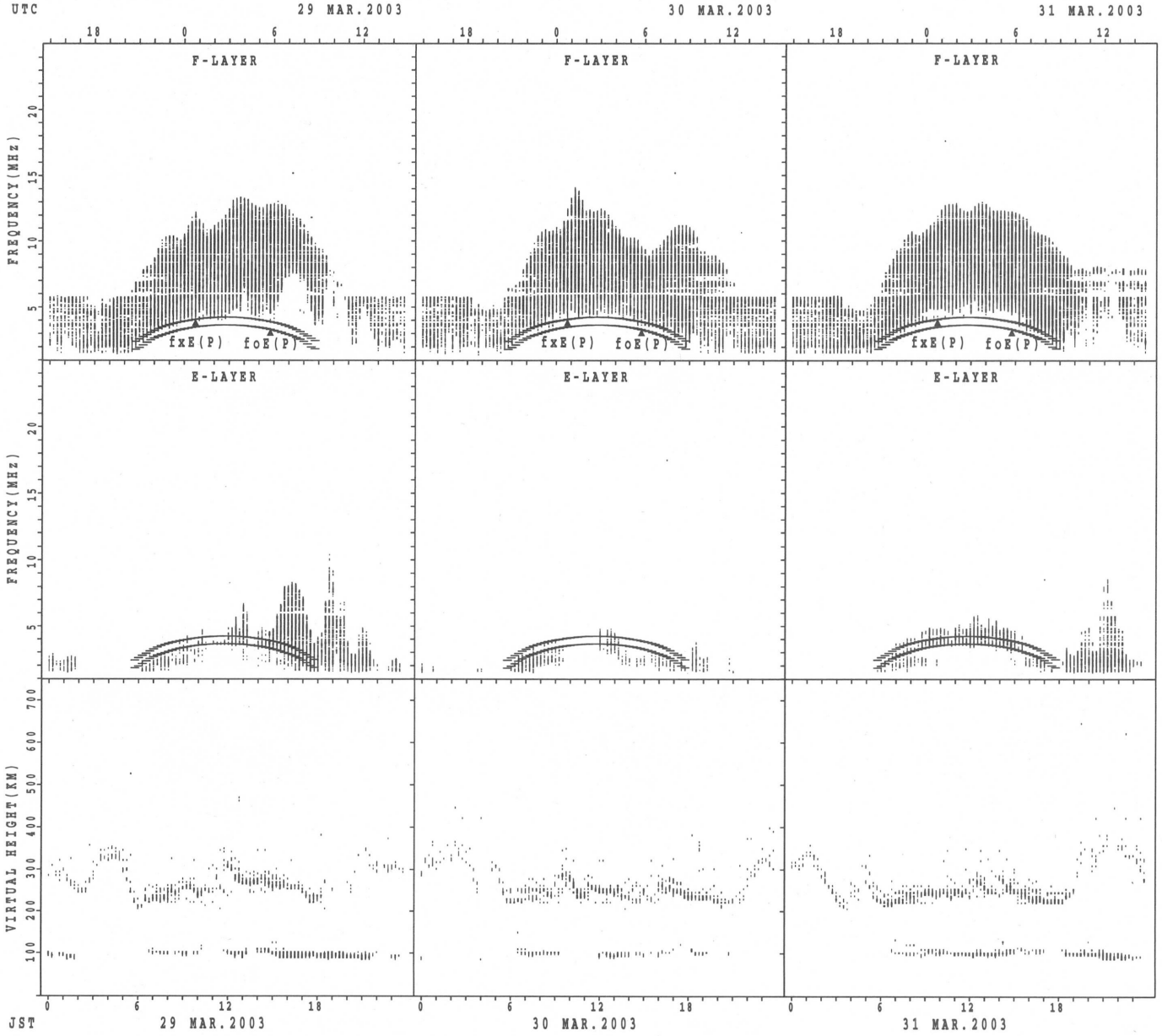
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



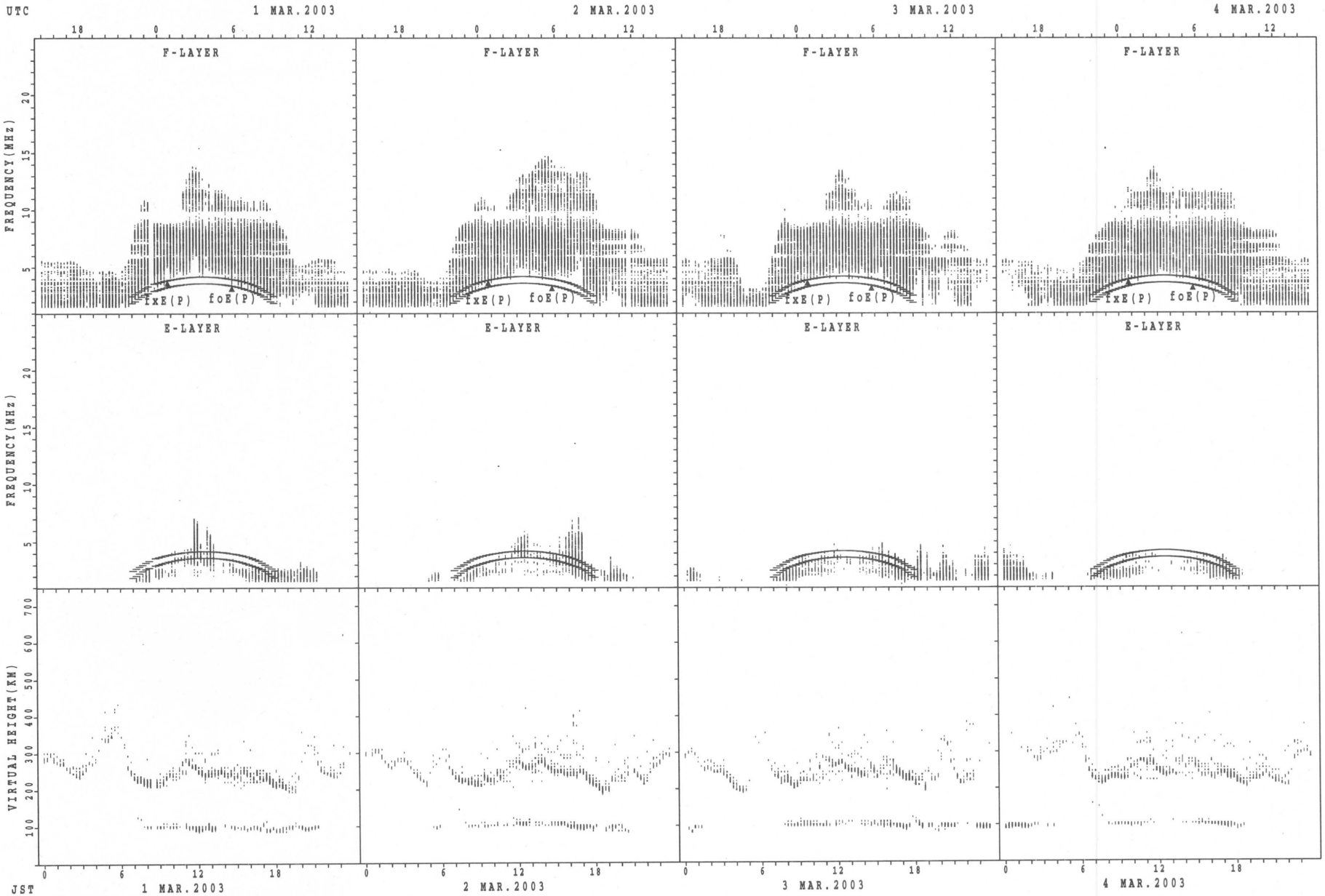
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



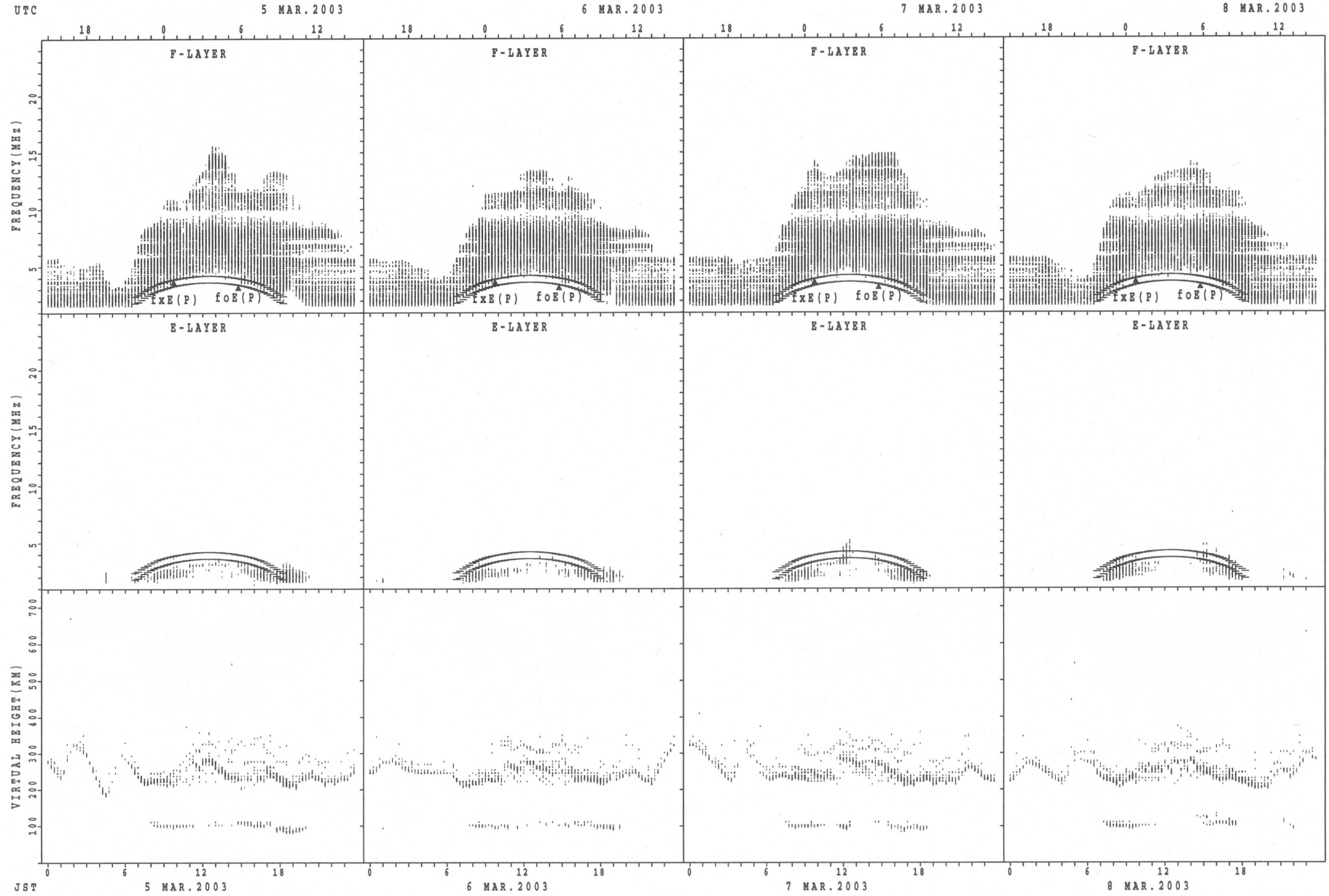
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



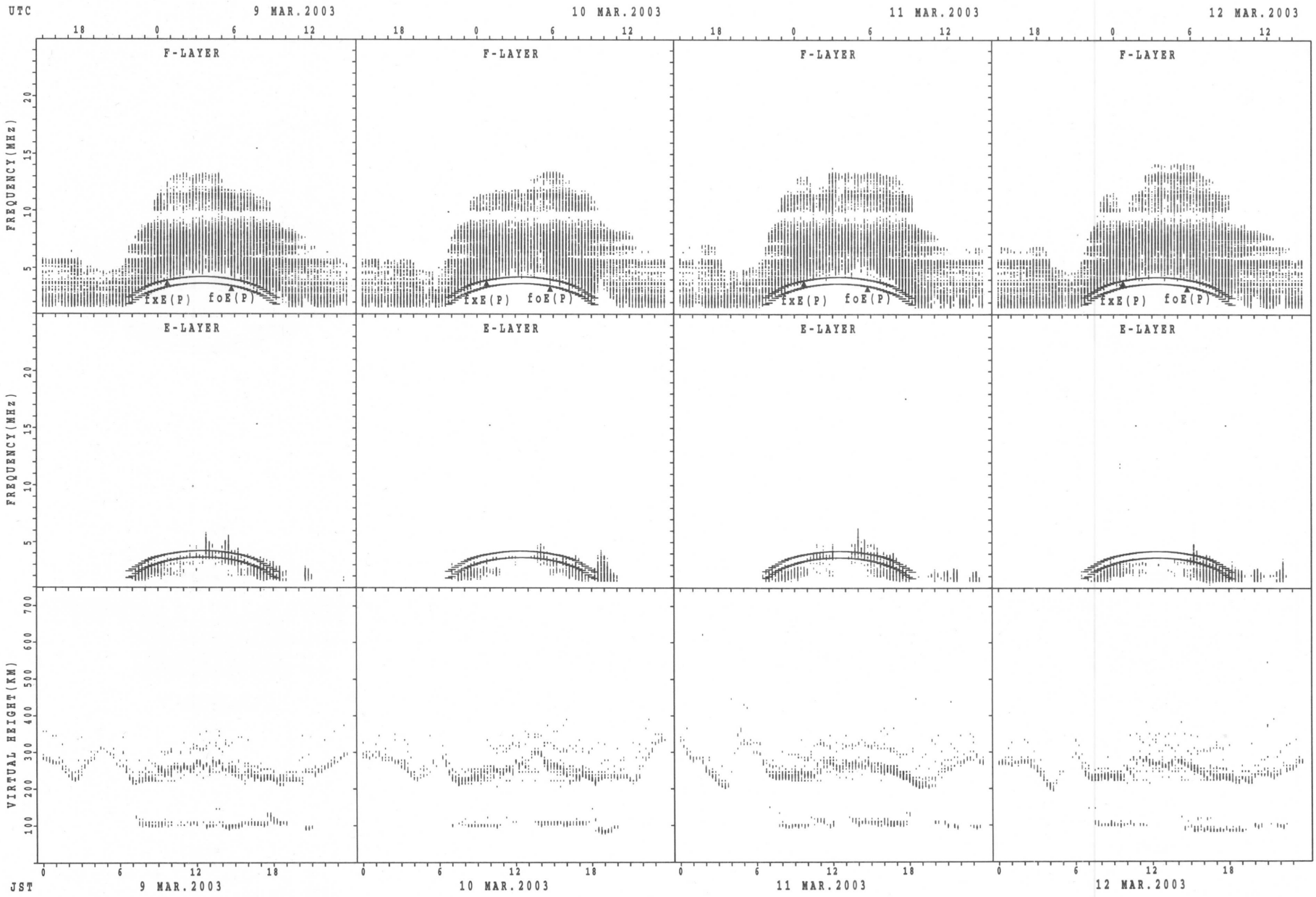
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



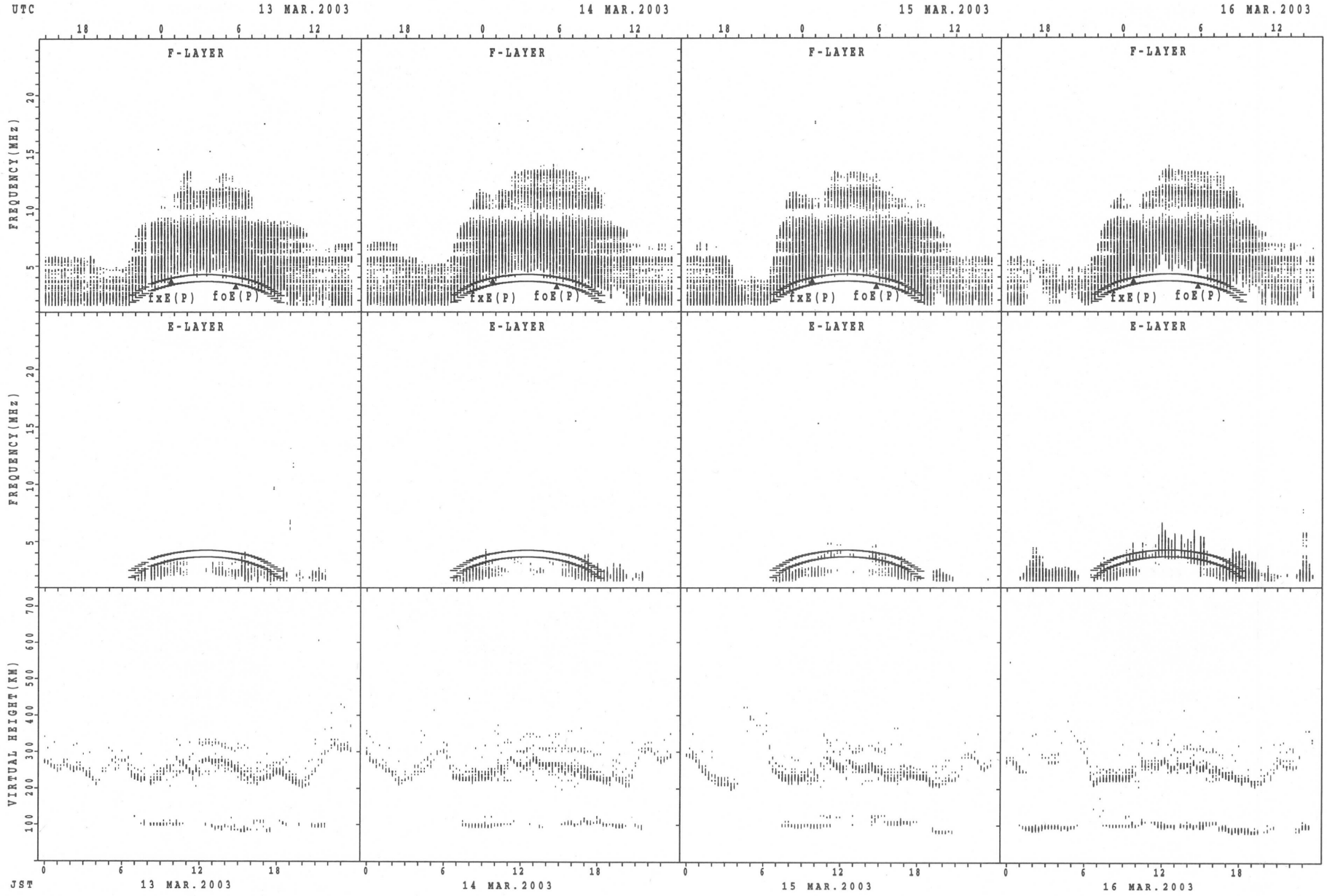
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



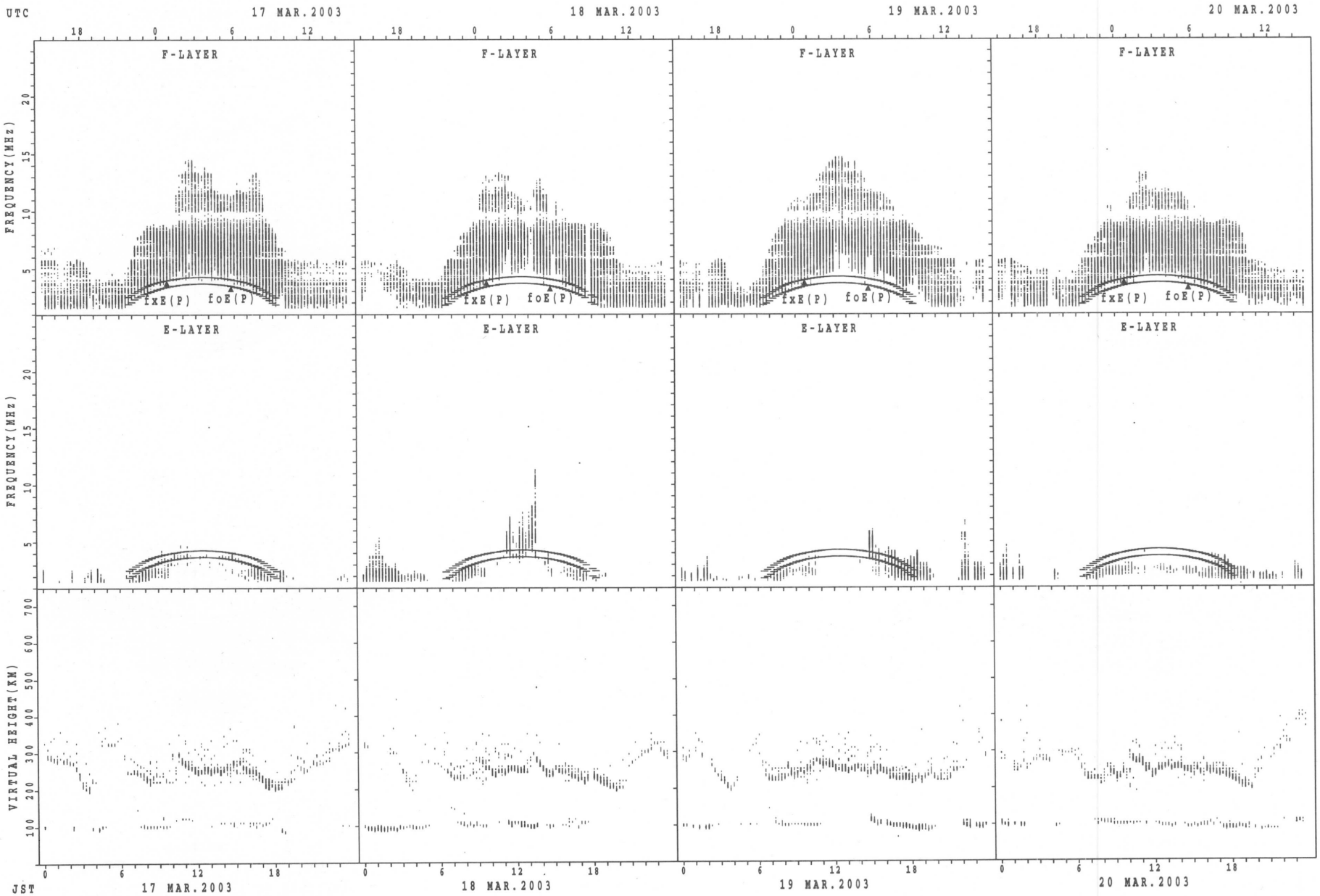
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



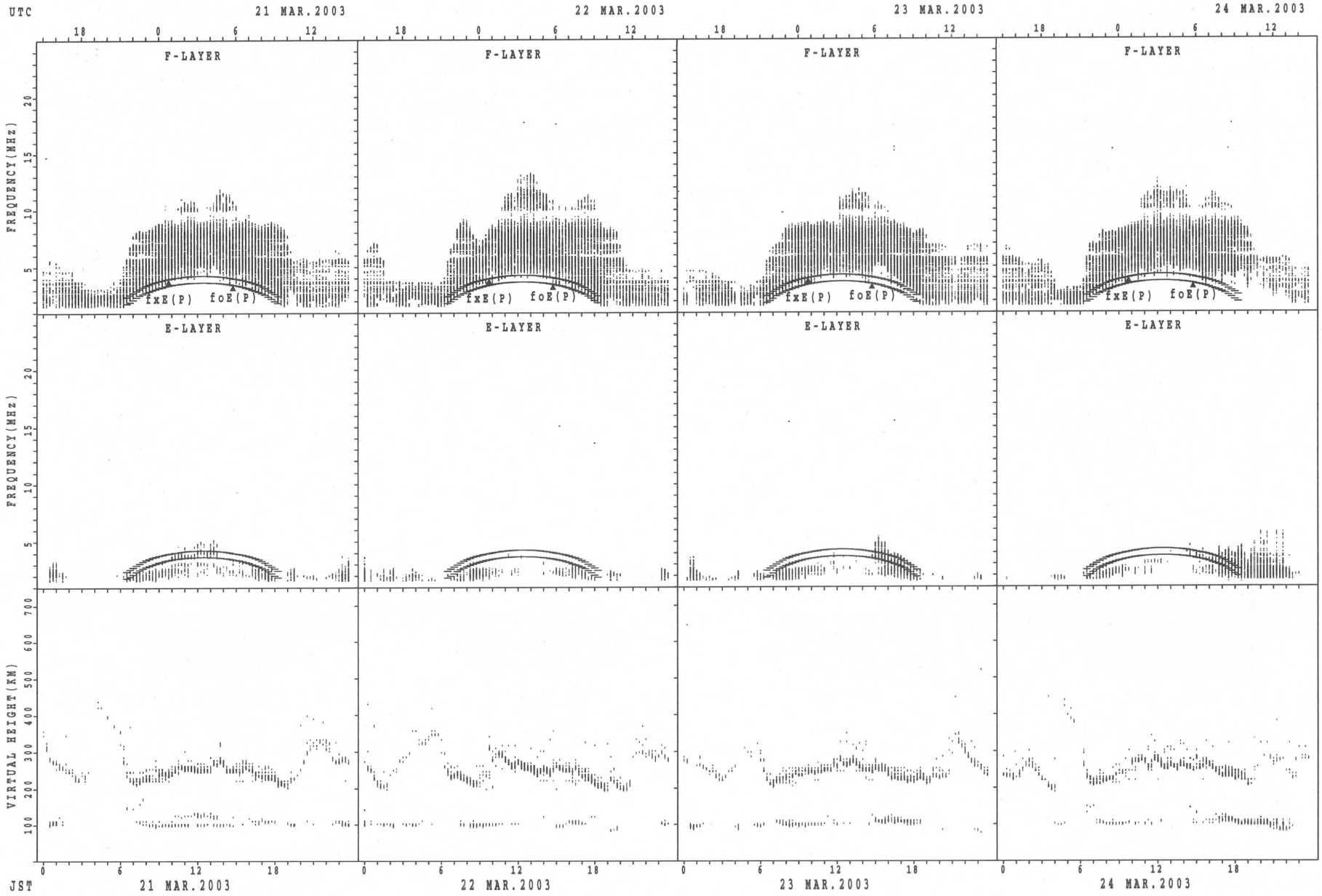
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



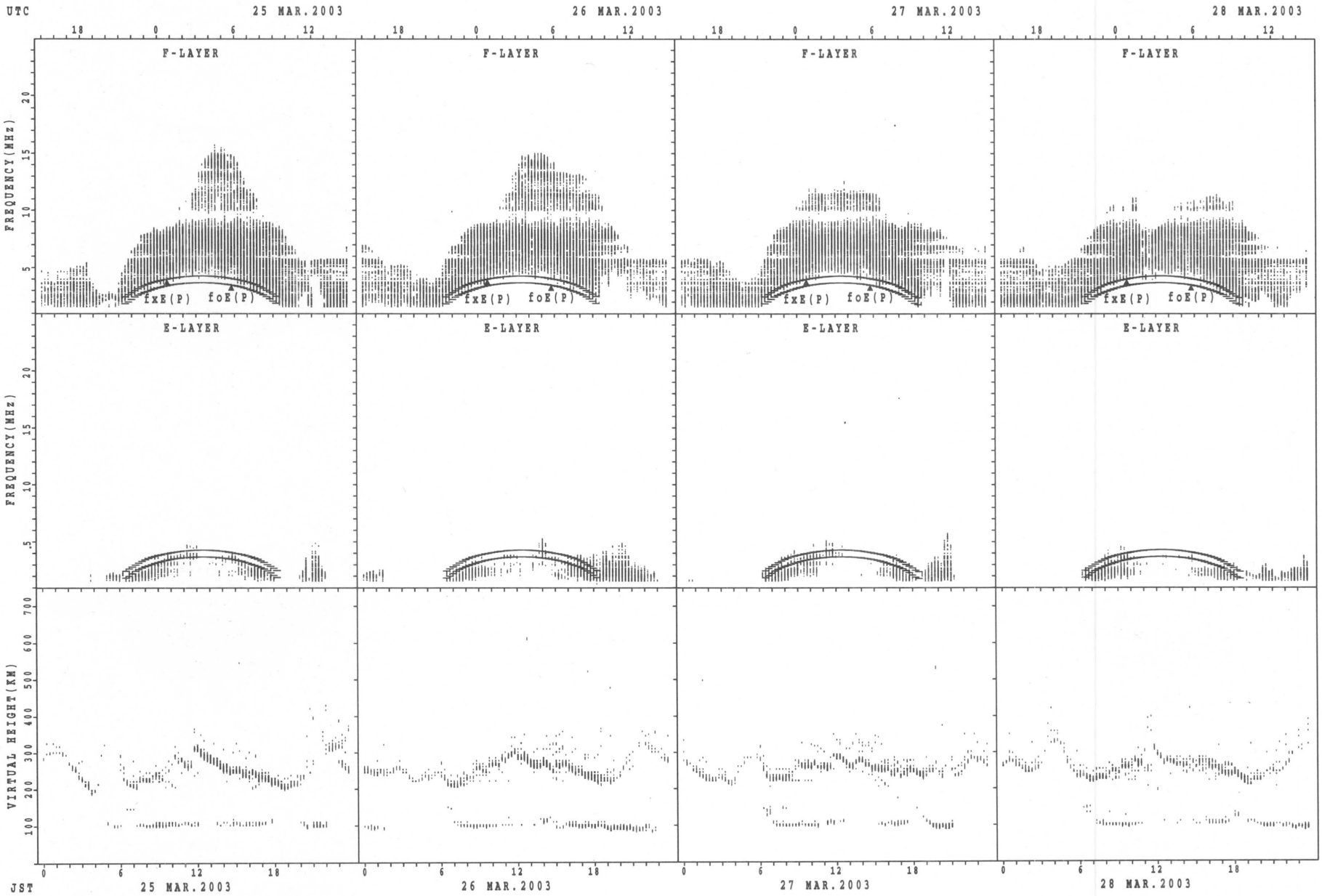
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



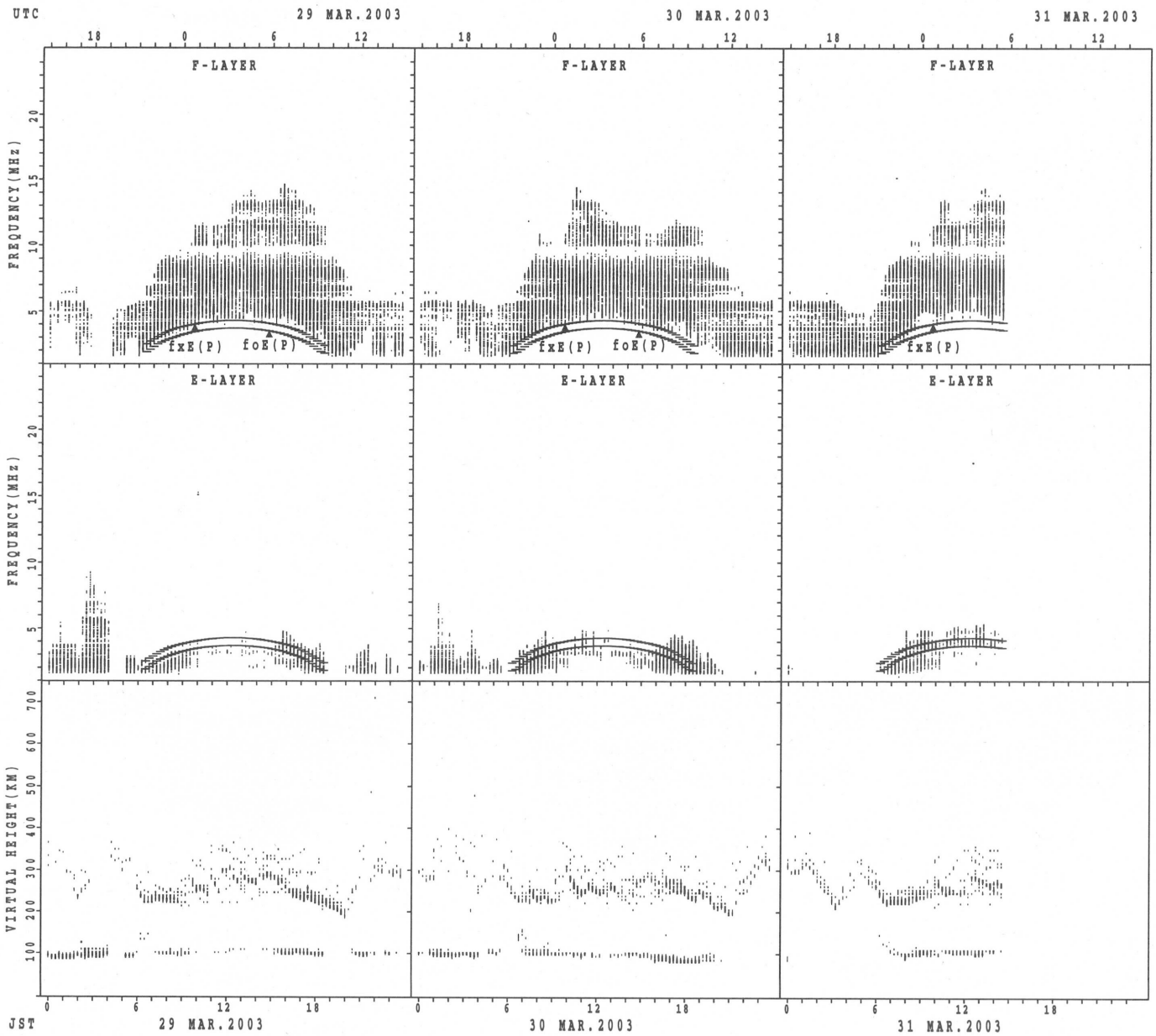
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



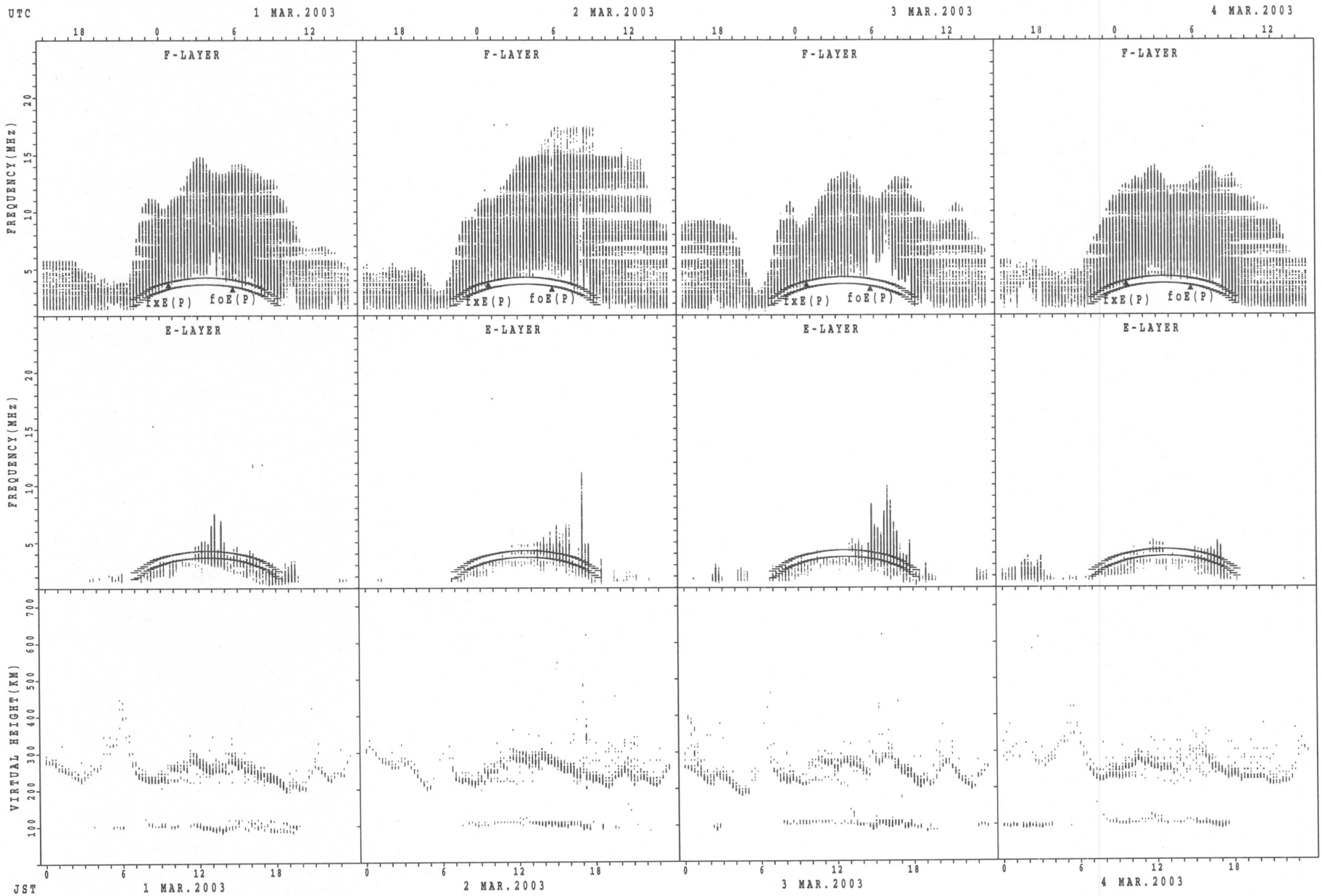
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



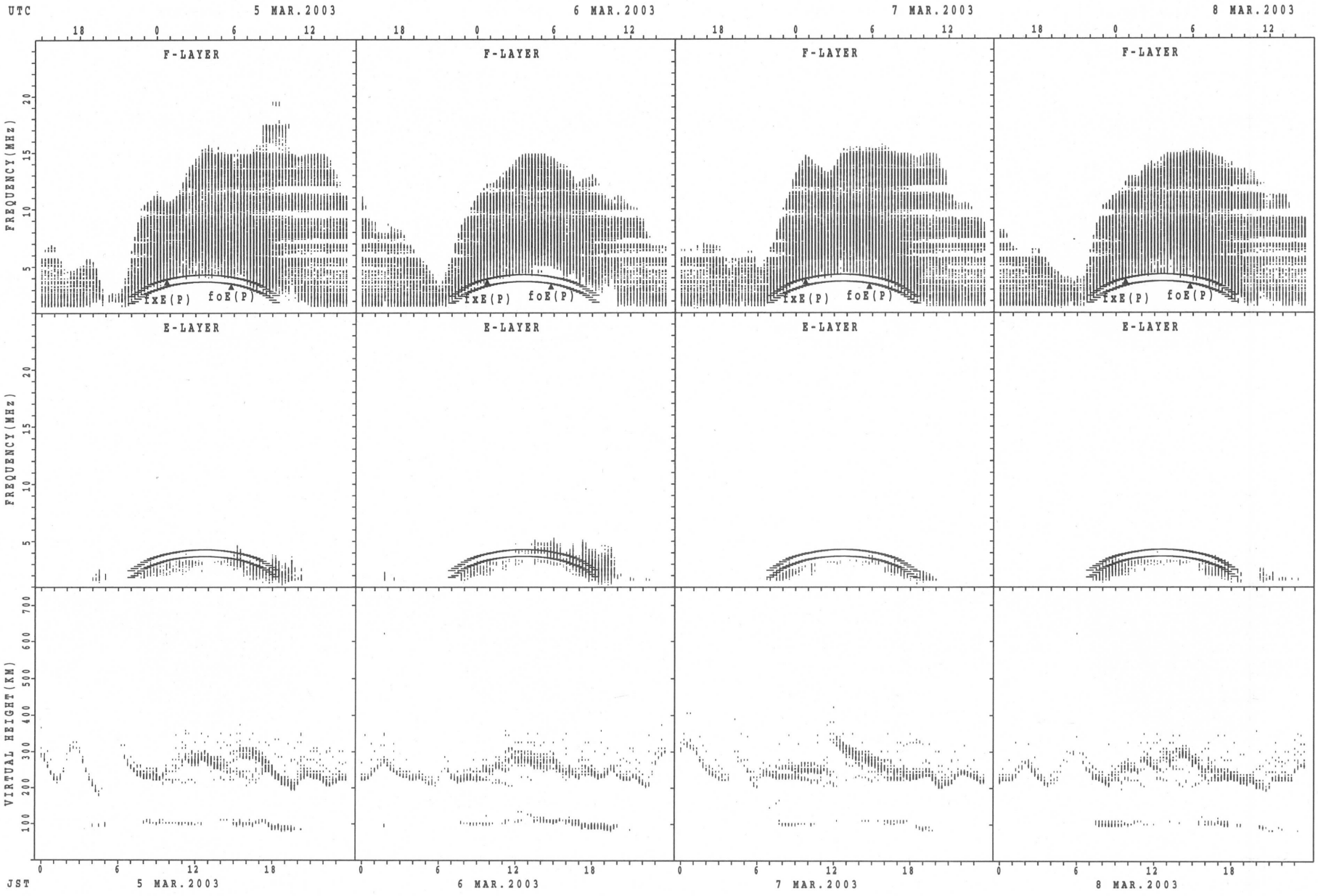
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



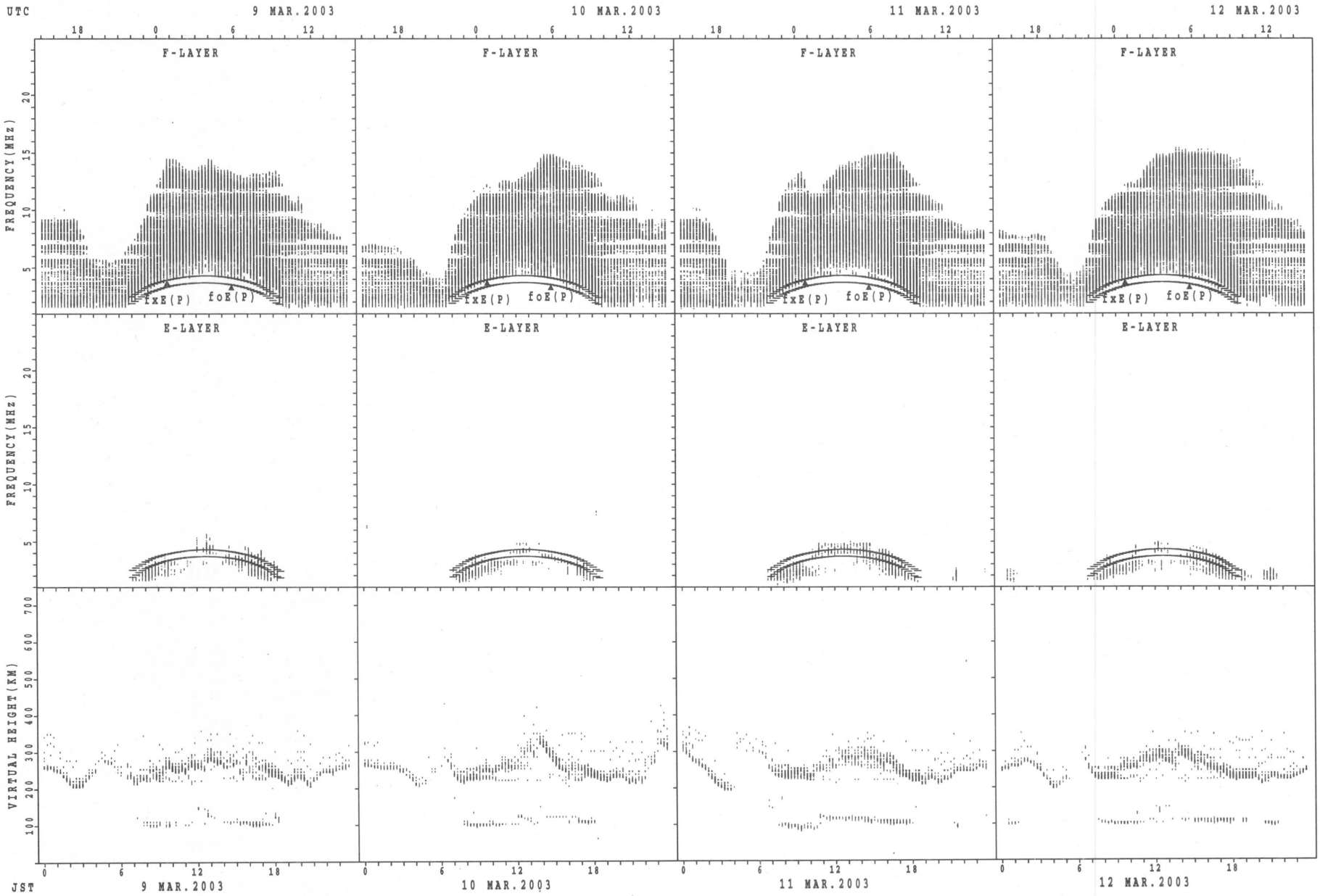
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



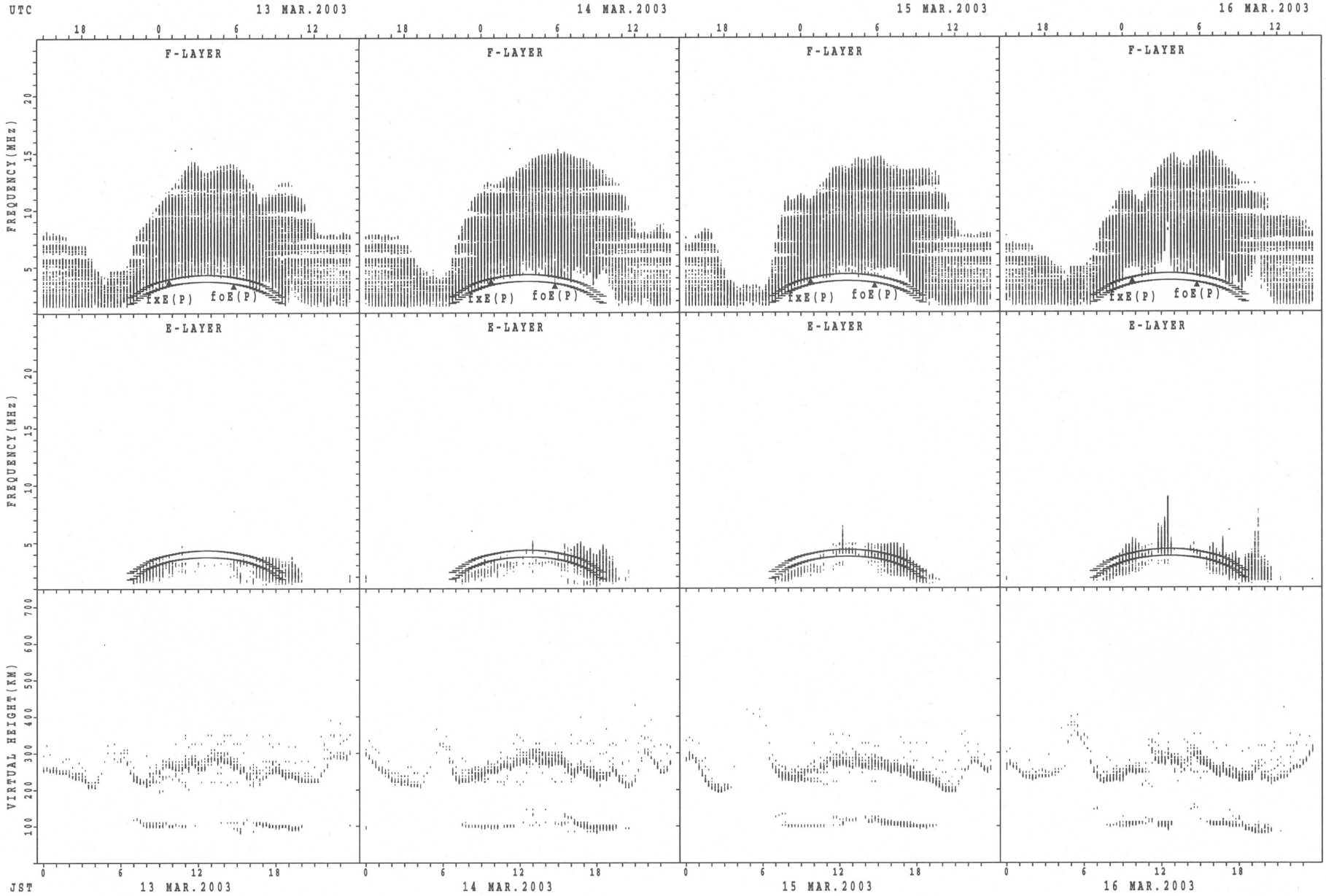
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



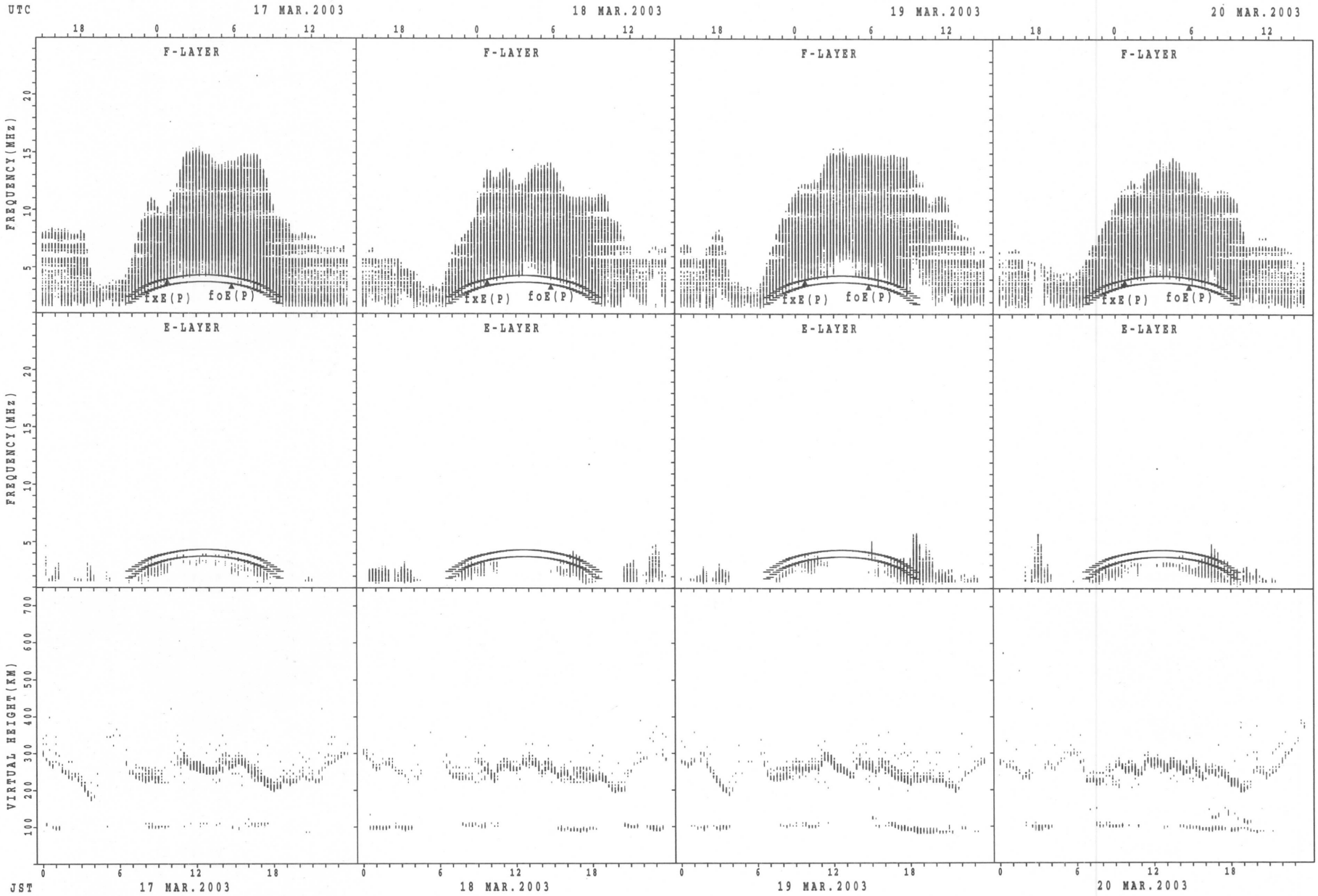
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



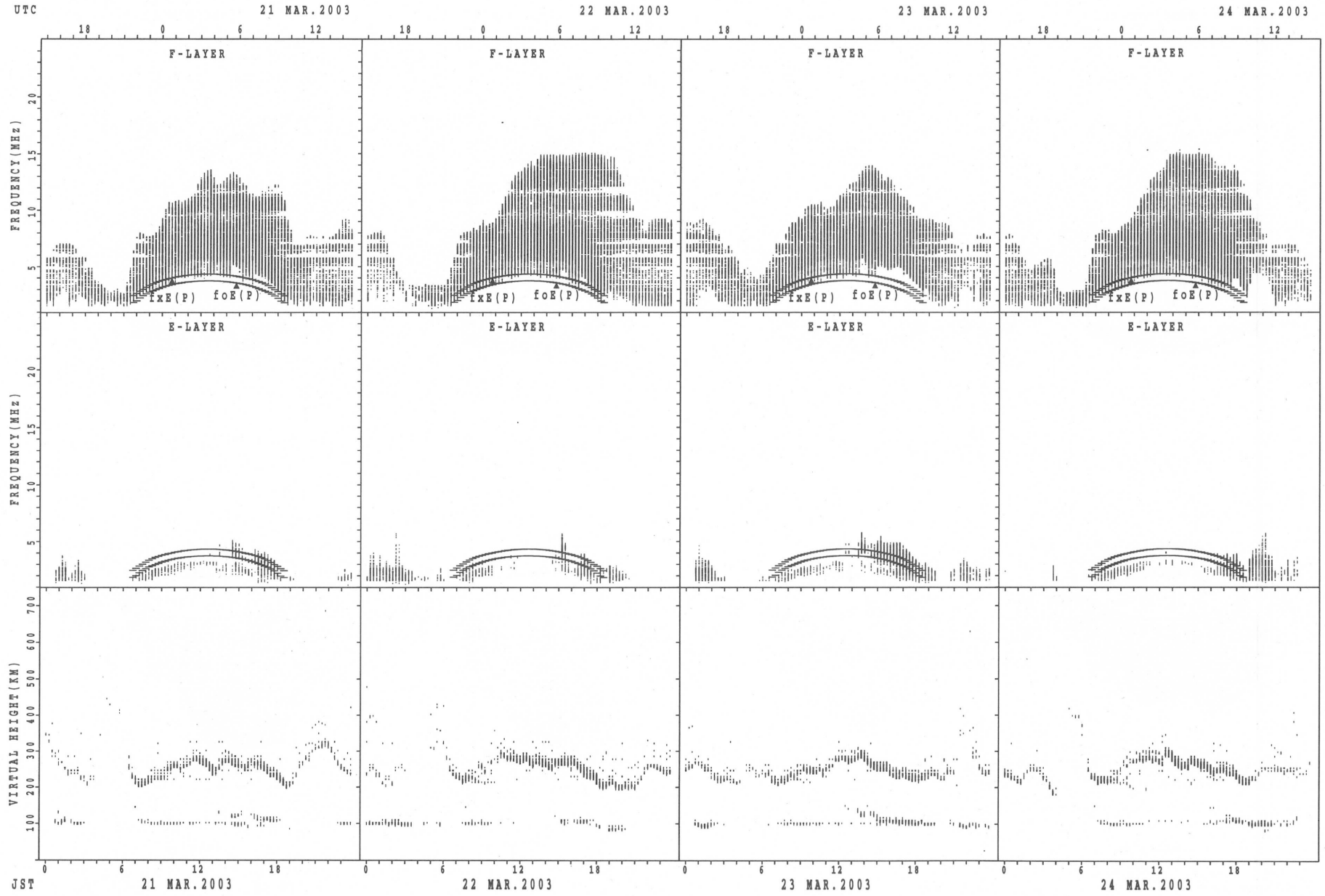
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



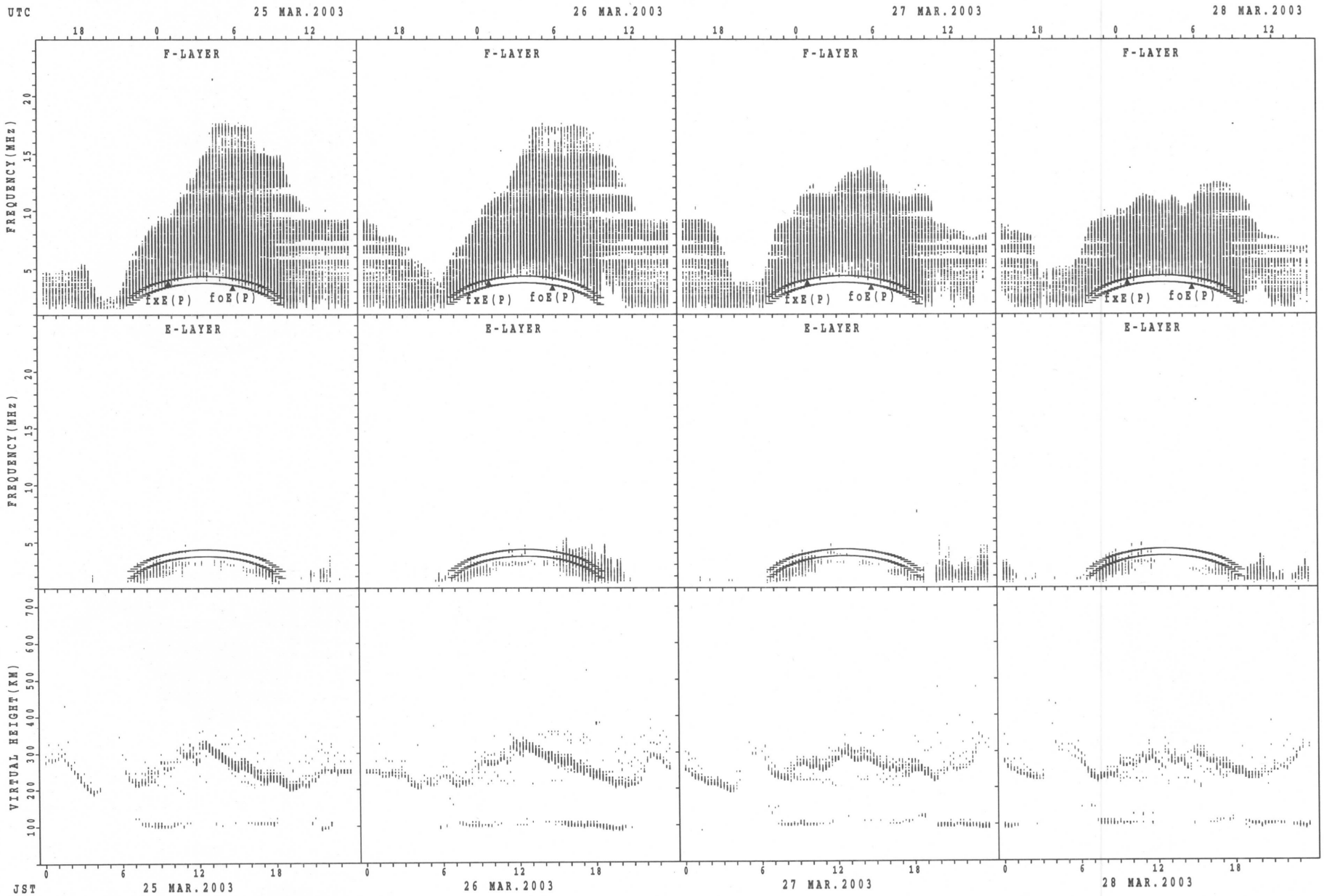
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



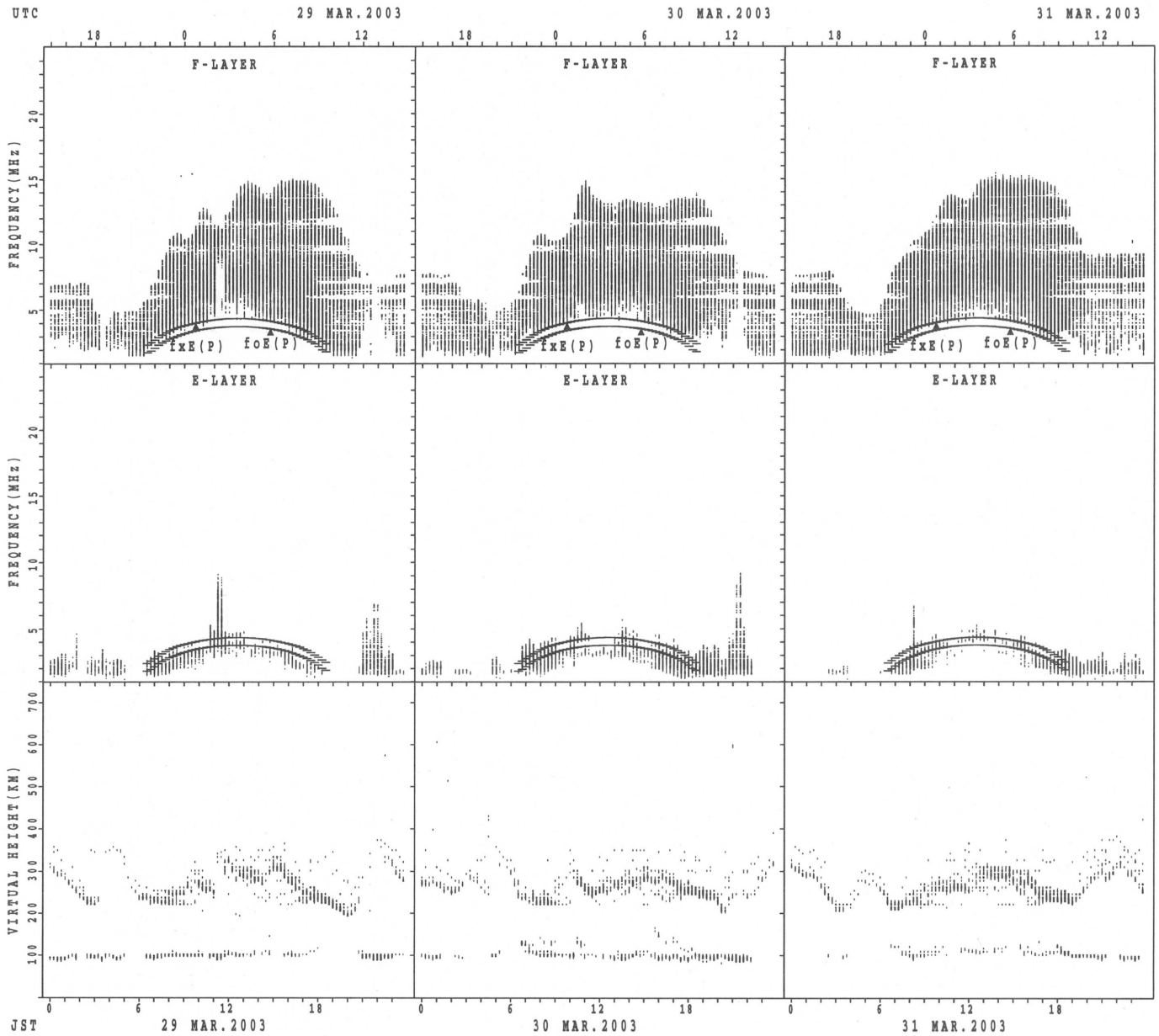
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

MAR.2003 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							6	21	28	19	1				9	27	30	29	28	11	3	1		
MED							293	238	241	238	246				240	242	238	238	248	272	284	322		
U Q							300	251	269	258	123				251	248	254	253	256	290	348	161		
L Q							284	231	229	232	123				236	238	234	231	238	260	256	161		

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	5	7	6	5	6	2	4	5	7	11	8	9	3	1		1	2	6	9	2	2	1	3	5
MED	99	97	96	99	94	97	130	125	107	107	103	103	99	101		97	91	93	95	95	95	107	105	97
U Q	102	105	99	100	101	97	146	134	119	107	108	106	101	50		48	95	93	110	103	99	53	107	99
L Q	97	95	95	96	89	97	123	112	103	105	102	98	93	50		48	87	91	90	87	91	53	97	97

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								29	30	20						29	29	30	24	8	3	1		
MED								240	236	238						244	238	224	241	260	284	272		
U Q								252	244	241						254	255	238	250	283	292	136		
L Q								231	224	229						238	230	222	225	243	254	136		

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	3	3	4	1	3	2	2	1	4	7	10	11	13	8	13	9	15	19	18	14	10	10	8	7
MED	95	97	97	97	101	103	159	129	105	107	105	99	99	100	103	103	105	103	94	96	104	101	102	95
U Q	97	99	98	48	107	103	169	64	109	113	107	107	103	104	109	110	107	119	101	103	105	105	108	113
L Q	95	95	96	48	95	103	149	64	105	101	103	97	96	96	96	101	95	95	89	95	97	99	98	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								8	30	29	6					10	30	30	29	22	8	3	1	
MED								271	241	244	245					254	254	241	240	256	281	306	272	
U Q								282	252	255	252					262	262	246	250	266	290	312	136	
L Q								241	236	236	238					246	242	238	230	246	276	272	136	

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	10	10	7	4	5	2	3	4	4	3	1	7	11	5	6	8	11	18	19	17	15	13	9	9
MED	102	98	97	100	103	101	105	134	105	107	105	109	107	101	104	110	105	106	99	95	95	99	103	97
U Q	105	103	105	104	107	105	105	146	116	119	52	121	109	104	113	112	107	111	105	109	101	102	109	109
L Q	95	97	95	97	97	97	99	117	100	107	52	103	101	97	103	103	103	95	91	89	91	97	93	97

MONTHLY MEDIANS OF h'F AND h'Es

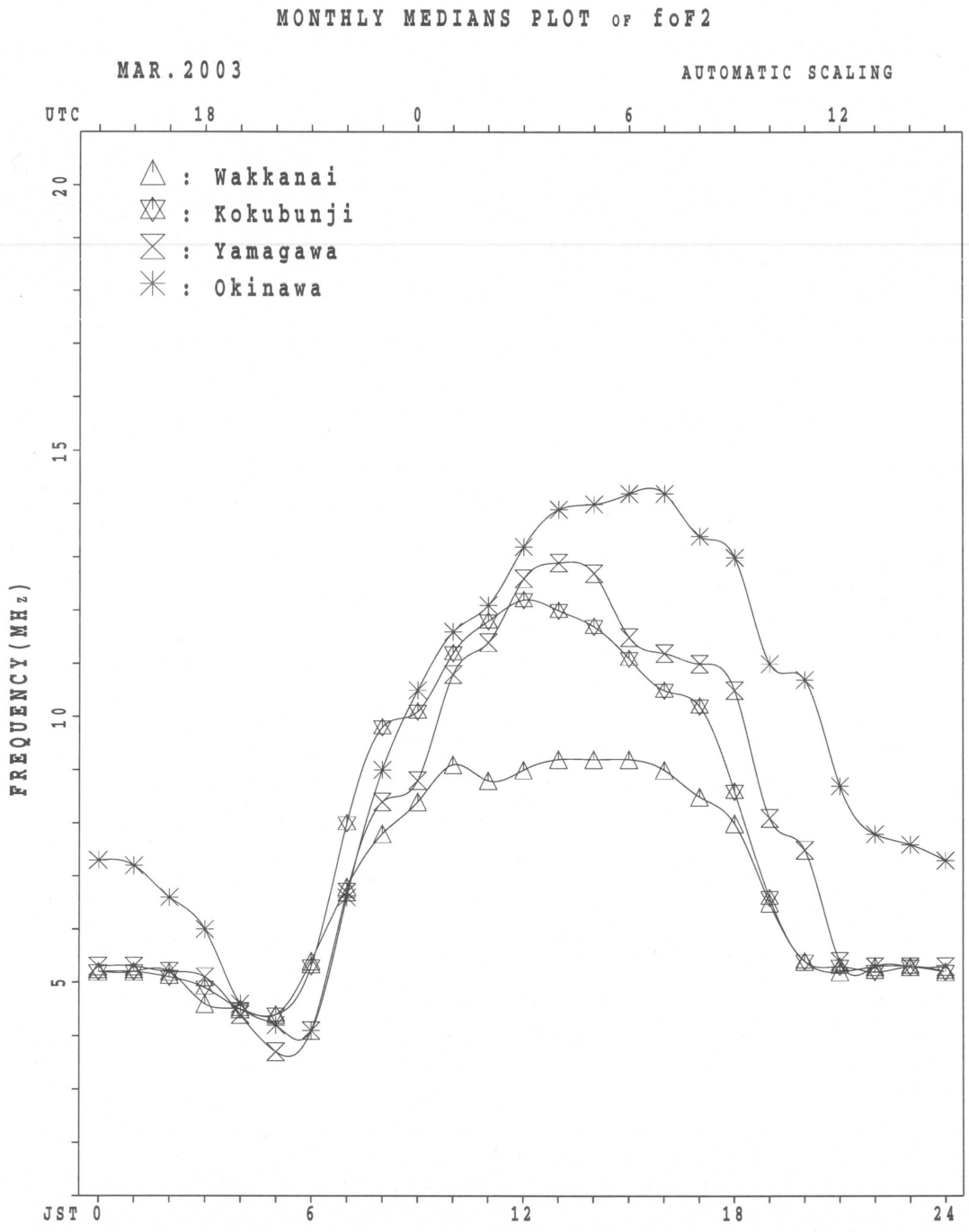
MAR. 2003 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	14	15	11	7	1			12	30	31	13						31	31	30	31	25	21	13	18
MED	293	284	262	244	218			250	238	246	254						254	248	236	238	248	262	288	292
U Q	306	308	288	262	109			263	248	258	259						270	254	240	250	259	283	295	312
L Q	270	264	238	238	109			234	230	238	246						246	240	228	232	236	248	250	270

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	10	7	6	1	2	1	4	3	3	4	4	10	12	8	12	15	22	15	19	10	10	7	7
MED	95	99	103	97	103	100	103	137	113	111	111	112	111	117	109	111	109	106	103	95	97	102	97	97
U Q	97	103	105	99	51	103	51	154	119	119	114	119	117	131	121	115	113	113	109	103	103	103	103	97
L Q	95	97	101	97	51	97	51	111	113	103	105	107	107	108	100	107	105	103	101	91	91	97	95	95


MONTHLY MEDIANS PLOT OF foF2
MAR. 2003
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

MAR. 2003 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 55	X 57	X 58	X 55	X 51	X 51													X 86	X 63	X 53	X 58	X 56	X 52
2	X 53	X 52	X 49	X 51	X 46	X 44													X 89	X 65	X 60	X 55	X 56	X 53
3	X 53	X 53	X 53	X 51	X 45	X 40													X 92	X 68	X 68	X 74	X 70	X 63
4	X 60	X 61	X 62	X 58	X 58	64	76												X 97	X 82	X 75	X 67	X 64	X 62
5	X 65	X 64	X 61	X 60	X 60	X 58													X 104	X 81	X 84	X 78	X 63	X 64
6	X 61	X 60	X 55	X 54	X 54	X 54													X 90	X 74	X 77	X 79	X 69	X 67
7	X 68	X 68	X 67	X 59	X 59	X 59													X 92	X 82	X 76	X 68	X 72	X 68
8	X 65	X 62	X 63	X 56	X 51	X 48													X 97	X 73	X 65	X 65	X 64	X 62
9	X 61	X 62	X 64	X 54	X 54	X 54													X 89	X 73	X 68	X 67	X 64	X 66
10	X 70	X 65	X 63	X 61	X 58	X 55													X 105	X 82	X 78	X 67	X 63	X 62
11	X 62	X 63	X 65	X 57	X 52	X 53													X 110	X 88	X 75	X 62	X 65	X 64
12	X 65	X 65	X 64	X 64	X 60	X 57													X 98	X 79	X 75	X 73	X 68	XO 66
13	X 66	X 64	X 65	X 60	X 54	X 53								C					X 93	X 87	X 75	X 69	X 69	X 70
14	X 70	X 67	X 69	X 57	X 54	X 56													X 111	X 83	X 76	X 71	X 70	X 74
15	X 71	X 70	X 73	X 64	X 49	X 50													X 96	X 82	X 69	X 64	X 65	X 66
16	X 63	X 62	X 56	X 54	X 52	X 52													X 105	X 74	X 59	X 60	X 62	X 60
17	X 60	X 58	60	X 54	X 47	X 51	58												X 82	X 59	X 60	64	65	65
18	63	63	X 58	64	56	X 53							C	C	C	C	C	C	X 77	X 64	X 58	X 55	X 54	X 56
19	X 55	X 55	X 53	X 55	X 44	X 41					C	C	C	C	C	C	C		X 72	X 64	X 64	X 61	X 60	X 58
20	X 58	X 55	X 53	X 52	X 50	X 50													X 83	X 77	X 51	X 51	X 52	X 47
21	X 52	X 52	X 43	X 42	X 46	X 47													X 89	X 64	X 55	X 58	X 61	X 60
22	X 64	X 62	X 39	X 38	X 40	X 40													X 82	X 63	X 52	X 53	X 51	X 52
23	X 51	X 51	X 50	X 45	X 40	X 40													X 74	X 64	X 63	X 58	X 66	X 60
24	X 62	X 56	X 56	X 50	X 36	X 38														X 70	X 56	X 54	X 50	X 51
25	X 53	X 52	X 56	X 56	X 33	X 32														X 64	X 57	X 57	X 56	X 59
26	X 60	X 58	X 56	X 53	X 50	X 49														X 77	X 62	X 62	X 64	X 65
27	OX 63	X 62	X 57	X 55	X 51	X 49													X 90	X 85	X 86	X 81	X 69	X 71
28	X 65	X 67	X 64	X 58	X 62	X 66													X 92	X 82	X 71	X 71	X 68	X 67
29	X 66	X 65	X 64	X 56	X 58	X 61													X 99	X 80	X 65	X 64	X 64	X 65
30	X 63	X 62	X 59	X 60	X 53	X 56													X 114	X 96	X 91	X 72	X 66	X 65
31	X 67	X 65	X 66	X 66	X 54	X 52													X 97	X 82	X 82	X 82	X 83	X 81
	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	2												28	31	31	31	31	31
MED	X 63	X 62	X 59	X 56	X 52	X 52	67												X 92	X 77	X 68	X 64	X 64	X 64
U Q	X 65	X 65	X 64	X 60	X 56	X 56													X 98	X 82	X 76	X 71	X 68	X 66
L Q	X 58	X 56	X 55	X 53	X 46	X 47													X 88	X 64	X 59	X 58	X 60	X 59

MAR. 2003 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	49	51	52	49	44	45	47	99	101	96	97	112	126	118	103	92	88	89	80	57	47	52	50	46
2	47	46	43	45	40	38	44	78	99	96	90	98	108	114	118	119	111	103	83	58	54	49	50	47
3	47	47	47	45	39	34	46	76	96	87	92	105	126	120	107	97	98	96	86	62	61	68	64	57
4	54	55	56	52	52	F	F	78	94	100	112	124	125	116	109	110	102	106	91	75	68	61	58	56
5	58	57	55	54	54	52	54	78	95	110	114	128	136	138	132	121	106	105	98	75	78	72	56	58
6	55	54	49	48	48	48	58	87	98	103	112	122	128	126	117	117	116	102	84	68	71	72	63	61
7	62	62	61	53	53	53	64	104	114	123	128	137	135	137	139	140	137	108	86	76	70	62	66	62
8	59	56	57	50	45	42	52	86	120	113	109	121	123	126	124	119	113	107	90	67	59	59	58	56
9	55	56	58	48	48	48	56	88	106	110	124	129	130	124	123	115	109	99	82	67	62	61	58	60
10	63	59	57	55	52	49	58	92	106	107	117	127	123	119	117	120	121	114	99	76	72	60	57	56
11	56	57	59	50	46	47	60	95	113	116	130	138	138	124	121	116	108	110	104	82	69	56	59	58
12	59	59	58	58	54	51	58	85	109	117	120	129	131	129	130	125	116	107	92	73	69	67	62	60
13	60	58	59	54	48	47	56	85	103	100	119	124	119	C	117	122	104	88	87	81	69	63	63	64
14	64	61	63	51	48	50	58	91	105	110	115	124	129	131	128	123	120	121	105	77	70	65	64	68
15	65	64	67	58	43	44	52	87	112	122	118	115	126	123	116	111	99	93	90	76	62	58	59	S 60
16	57	56	50	48	46	46	61	78	102	100	111	120	128	128	120	114	111	107	99	68	53	54	56	54
17	54	52	F 50	48	41	45	F	64	82	84	94	114	116	114	97	104	107	105	75	53	54	F	F	F
18	F	F	52	F	F	47	61	68	78	108	121	124	C	C	C	C	C	C	71	58	52	49	48	49
19	49	49	47	49	37	35	53	72	96	98	C	C	C	C	C	C	C	83	66	58	58	55	54	52
20	52	49	47	46	44	44	60	81	86	106	106	S 112	109	98	99	84	80	77	77	71	45	45	46	41
21	46	46	37	36	39	41	51	66	83	98	93	108	97	98	108	91	83	92	83	58	49	54	S 54	54
22	58	56	33	32	34	34	50	76	77	67	78	89	104	110	85	86	83	90	76	57	46	47	45	46
23	45	45	44	39	34	34	51	65	67	84	88	96	96	99	95	86	78	76	68	58	57	52	60	54
24	56	50	50	44	30	32	55	78	78	83	90	97	S 108	100	97	89	104	87	76	64	S 50	48	44	45
25	47	46	50	50	27	26	52	68	71	79	82	103	112	120	120	110	99	86	76	58	51	51	50	53
26	54	52	50	47	44	43	60	75	81	91	96	106	124	130	117	103	98	103	94	71	56	56	58	59
27	57	56	51	49	45	43	58	76	88	107	116	112	112	114	114	100	83	86	84	78	80	75	63	65
28	59	61	58	52	56	60	76	72	94	102	112	116	110	112	105	101	100	97	86	75	65	65	62	60
29	60	59	58	50	52	55	69	83	101	102	114	109	121	129	122	125	120	108	93	74	59	58	58	59
30	57	56	53	54	47	50	63	82	104	108	130	120	121	108	99	90	94	106	108	90	84	65	60	59
31	61	59	60	59	48	46	65	88	103	106	120	124	120	125	120	118	108	100	90	76	76	76	77	75
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	30	30	30	29	31	31	31	30	30	29	28	29	29	29	30	31	31	31	30	30	30
MED	56	56	52	50	46	46	58	78	98	102	112	118	123	120	117	111	104	101	86	71	61	58	58	58
U Q	59	59	58	53	48	49	60	87	105	110	119	124	128	127	122	120	112	107	93	76	70	65	62	60
L Q	52	50	49	47	40	41	52	75	83	96	94	108	111	113	104	94	96	89	77	58	53	52	54	53

MAR. 2003 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 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	L	L			L							
2												L	L	L	L	L								
3												L	L	L	L	L								
4											L	L	L	L										
5											L	L	L		L	L								
6												L	L		L									
7												L		L	L	L								
8										L		L	L	L	L									
9											L	L	L	L	L									
10											L		L	L										
11											L	L	L	L	L	L								
12										L	L	L		L	L	L								
13											L	L	L	C										
14										L	L	L	L	L										
15											L	L	L				A							
16										L	L	L	L		L									
17											L	L	L	L	A	L	L							
18										L	L	L	C	C	C	C	C	C						
19										L	C	C	C	C	C	C	C							
20									L	L	L	L 500	L 484	L	L 468	L	L	A						
21									L	L	L	L	L	L	L	L								
22								L	L	L 468	L 472	L	L 492	L	L	L	L							
23									L	L	L 468	L	L	L 464	L	L	L							
24									L	L	L	L	A	L	L	L	L							
25										L	L	A	A	L	L	L	L							
26										L	L	L	L	L 496	L 476	L 440								
27									L	L		L	L	L	A	L	L							
28									A	L	L	L 536	L 524	L	L	L								
29										L	L	L	L	A	L	L	A	A						
30									L	L	L		L	L	L	L								
31										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										1	2	2	3	2	2	1								
MED										L 468	L 470	L 518	L 492	L 480	L 472	L 440								
U Q													L 524											
L Q													L 484											

MAR. 2003 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	212	UA 268	A	A	A	UR 368	UR 340	R	UR 312	UA 268	UR 212						
2							BUR 228		A	A	A	A	A	A	UR 356	UR 328	UR 280	A						
3							B	204	R	A	A	R	UR 372	R	R	UA 316	A	UA 168						
4								UR 212	UR 284	UR 324	356	R	A	UR 356	R	A	UR 292	UR 208						
5							B	R	UR 280	R	UR 356	R	A	R	R	UR 320	UR 272	UA 212						
6							B	232	284	UR 320	UR 356	UA 360	UR 376	R	A	UA 328	UA 276	UA 196						
7							B	240	UA 292	A	R	A	A	R	A	A	A	A						
8							B	228	UR 292	UR 324	UR 352	R	R	R	R	328	A	A						
9							B	236	UR 288	UR 328	A	A	A	R	UR 356	UR 312	UR 272	212						
10							B	240	UR 300	UR 336	UR 348	A	R	UR 360	A	UR 328	UR 284	UA 208						
11							B	204	R	UR 324	A	A	R	UR 356	UR 348	UR 320	A	UA 212						
12							B	236	UR 288	R	A	A	A	A	A	A	A	A						
13							B	240	R	A	A	R	R	C	UR 340	UR 324	284	216						
14							BUR 232		R	UA 316	A	R	UR 372	UR 340	R	R	UR 272	UA 188						
15							B	236	R	336	A	A	A	A	UA 336	A	288	A						
16							BUR 236		UR 292	UA 324	A	A	A	A	A	A	A	A						
17							BUA 224		R	A	A	A	A	A	A	A	A	A						
18							BUR 244		UR 292	R	UA 340	A	C	C	C	C	C	C						
19							B	240	288	UA 328	C	C	C	C	C	C	C	A						
20							B	224	R	R	A	R	B	R	R	A	A	A						
21							BUR 224		R	R	A	A	R	A	A	A	A	A						
22							B	R	R	R	R	UR 356	R	R	R	R	R	UR 212						
23							B	228	UR 280	R	R	R	R	UR 368	R	UA 312	UR 276	228						
24							B	244	A	A	R	A	A	B	R	UR 316	UA 284	UA 220	B					
25							B	240	UA 300	UA 344	A	A	A	A	A	A	A	UR 220	B					
26							B	244	UR 312	A	A	A	B	A	B	R	R	UA 224	B					
27							192	264	B	A	A	A	A	A	A	UR 336	UR 292	232						
28							176	268	A	R	R	B	A	R	A	A	304	228						
29							B	256	308	A	A	A	A	A	A	A	A	A						
30							BUR 268		R	UR 344	A	B	A	A	R	R	R	236						
31							192	260	A	A	A	A	A	A	A	A	R	UR 256						
	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	29	16	12	6	2	4	6	5	13	14	19						
MED							192	236	UR 290	UR 326	UR 354	U 358	UR 372	UR 356	UR 348	UR 320	UR 282	U 212						
U Q							192	244	UR 296	U 336	UR 356		UR 374	UR 360	UR 356	UR 328	288	228						
L Q							176	226	UR 284	U 324	U 348		UR 370	UR 340	U 338	U 314	UR 272	UA 208						

MAR. 2003 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR.2003 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	J A E C E C E B E B E B E B								J A J A J A J A				J A	G	G	G		G E B E B E B E B					
	16	28	28	14	14	16	15	25	40	48	46	58	42	28	26	24	31	18	15	15	16	16	15	15
2	E B E B E B E B E B E B E B							G			J A				G	G	G J	A E B E B J A				J A	
	16	15	15	14	15	14	15	18	32	36	44	40	40	40	27	26	19	30	15	16	22	19	18	21
3	J A E B			E B E B E B E B				G	G J A			G	G	G	G				E B E B E B E B				J A	
	20	16	19	14	14	15	14		25	35	38	32	31	32	24	35	32	21	16	15	15	15	20	22
4		E B E B E B E B E C						G	G	G		G		G	G		G	G E B E B E B E B				E B	
	19	15	16	15	16	14	28		25	26	38	26	38	25	29	35	27		15	15	16	16	20	15
5	E B E B E B E C E B E B E B							G	G	G	G	G	J A	G	J A	G	G J	A J A E B			E B E B E B			
	14	15	14	28	14	14	15		26	26	28	28	40	32	40	27	19	23	23	16	18	15	15	15
6	E B E B E B E B E B E B E B							G	G	G	G			G					E B E B E B E B					
	15	15	15	14	15	15	15		22	28	30	42	41	29	39	36	32	24	14	15	15	15	15	16
7	E B E B E B E B E B E B E B							G			G J	A		G J	A				J A E B			J A E B E B	
	15	16	16	15	15	15	15	20	34	36	34	41	40	28	42	38	32	25	22	16	20	19	15	16
8	E B E B E B E B E B E B E B								G	G	G	G	G	G	G		J A J A J A J A J A J A J A							
	15	15	16	16	14	15	15	26	20	28	27	25	29	23	26	34	34	28	33	24	30	18	16	16
9	E B E B E B E B E B E B E B								G	G			J A	G	G	G	G	G		J A J A J A E B E B E B				
	15	16	15	15	15	16	16	29	24	26	37	38	42	35	30	30	26		19	27	20	16	15	14
10	E B E B E B E B E B E B E B							G	G	G	G		G	G J	A	G	G		J A J A E B E B E B					
	16	15	15	15	14	14	16		21	26	30	41	31	30	51	22	22	28	25	30	15	15	15	23
11	E B E B E B E B E B E B E B								G	G			G	G J	A	G	J A J A J A J A J A E B				J A J A		
	16	14	15	15	15	15	18	25	26	29	38	37	32	33	36	30	57	46	24	20	16	48	22	20
12	E B E B			E B E B E B E B E B					G	G J	A			J A	J A	J A	J A J A J A E B				E B E B E B			
	15	15	20	15	15	16	18	28	27	32	40	45	45	42	55	39	55	48	28	15	20	15	16	15
13	E B E B E B E B E B E B E B							G	G			G	G	C	G	G			J A J A E B E B E B					
	16	16	16	16	15	15	16		20	35	37	34	33		30	30	33	28	22	16	15	15	15	16
14	E B E B E B E B E B							G	G			G	G		G	G	G		E B E B E B E B E B					
	15	16	16	15	15	16	18	21	23	35	35	27	26	38	28	26	26	24	16	16	15	15	15	15
15	J A J A J A J A J A J A E B								G			J A			J A		J A J A J A J A J A E C				J A		E B
	19	27	26	29	24	20	17	26	20	38	38	42	41	43	47	35	70	50	33	28	28	31	19	16
16		E B E B E B E B E B E B E B							G					J A	J A	J A	J A J A J A J A J A J A							
	20	17	15	15	15	15	14	28	22	36	39	43	42	52	48	42	32	28	47	25	18	16	25	18
17	J A J A J A J A J A E B								G		J A		J A J A J A					J A J A J A E B						
	40	30	24	17	23	20	18	26	26	40	41	40	46	60	51	37	29	30	24	24	16	21	20	21
18		E B E C E B E B E B E B							G	G			C	C	C	C	C	C	J A		E C E B E B E B			
	18	14	28	15	14	15	18	26		26	38	40							21	20	27	15	15	15
19			J A		E B						C	C	C	C	C	C	C	J A E B E B E B E B E B						
	19	20	22	19	15	19	19	27	31	35								27	15	15	16	16	16	15
20	E B E B J A E B E B E B								G	G		G	E B	G	G		J A J A J A J A J A J A J A							
	16	15	22	15	15	15	20	26	20	29	37	28	39	24	25	34	35	40	23	20	18	20	22	15
21	E B E B E B E B E B E B							G	G	G			G		J A			J A J A J A J A J A J A						
	15	16	15	14	14	14	19	18	25	28	36	38	29	37	42	33	30	27	23	22	17	25	26	34
22		J A E B E B E B E B E B						G	G	G	G		G	G	G	G	G	G E B E B E B E B					J A	
	19	19	15	15	16	16	18	21	26	29	26	40	29	28	29	21		20	15	16	16	19	20	23
23	E B E B E B J A J A					E B			G	G	G	G	G	G	G		G		J A		J A E B E B E B			
	16	16	15	19	17	22	16	26	26	28	28	27	25	26	28	37		27	24	18	26	16	16	15
24	E B		E B E B J A								G J	A	J A E B		G					E B J A		J A J A J A		
	15	19	15	14	21	20	19	30	33	35	32	55	53	42	29	37	36	32	17	15	36	26	24	20
25	E B E B			E B E B E B E B								J A	J A J A J A					G E B E B J A J A J A						
	16	15	18	15	16	15	23	29	33	38	37	55	76	73	44	40	34	20	14	16	43	25	16	19
26	E B E B			E B								J A	E B		E B	G	G				J A E B E B E B			
	15	15	18	15	20	22	21	29	35	42	39	42	41	38	36	30	29	31	23	20	20	15	16	15
27		E B E B E B E B E B							E B			J A				G			J A J A J A J A J A E B					
	20	15	15	16	15	15	22	30	36	44	46	42	40	38	47	23	32	29	26	18	23	34	27	15
28	E B E B E B				E B E B				J A	G	G E	B	J A	G				J A J A		J A		J A J A		
	15	15	15	19	14	15	21	31	46	29	30	37	48	27	37	35	41	50	24	32	41	46	24	62
29	J A		E B E B E B E B E B E B										J A J A				J A J A J A J A J A J A J A J A							
	26	25	16	15	15	16	23	30	34	41	41	41	48	63	40	48	76	67	37	90	40	46	21	21
30						E B		G	G	G		E B	J A J A		G	G	G			J A E B		E B E B		
	22	19	19	20	21	15	21	23	30	29	36	45	43	42	28	26	23	28	22	21	15	20	16	16
31	E B E B E B E B E B E B												J A J A J A J A J A				G	G E B J A J A J A J A J A						
	16	15	14	15	15	15	22	32	36	42	44	51	48	46	43	42	27	19	17	24	46	78	53	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	30	30	29	28	29	29	29	30	31	31	31	31	31	31
MED	E B E B E B E B E B E B E B																		J A					E B
	16	16	16	15	15	15	18	26	26	35	37	40	40	35	36	34	32	28	22	18	18	18	16	16
U Q	19	19	19	16	16	16	21	29	33	38	39	42	J A J A J A				J A J A J A J A J A J A J A J A							
													44	42	44	37	34	31	24	24	27	25	22	21
L Q	E B E B E B E B E B E B E B							G	G	G	G	G	G	G	G	G	G	G E B E B E B E B E B E B						
	15	15	15	15	14	15	15		23	28	32	34	32	28	28	26	27	23	16	16	16	15	15	15

MAR.2003 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 16	E C 28	E C 28	E B 14	E B 14	E B 16	E B 15	23	35	43	43	53	G U 31	Y 28	G 25	G 24	30	G 18	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15
2	E B 16	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	G 18	29	34	36	38	39	39	G 27	G 26	G 19	22	E B 15	E B 16	18	E B 15	E B 16	E B 15
3	E B 15	E B 16	E B 15	E B 14	E B 14	E B 15	E B 14	G	G 21	32	36	G 31	G 30	G 29	G 21	33	31	20	E B 16	E B 15	E B 15	E B 15	E B 15	20
4	E B 16	E B 15	E B 16	E B 15	E B 16	E B 14	E C 28	G	G 23	G 26	37	G 26	37	U Y 25	G 29	33	G 26	G	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15
5	E B 14	E B 15	E B 14	E C 28	E B 14	E B 14	E B 15	G	G 23	G 26	G 28	G 28	38	G 31	32	G 24	G 18	G 18	17	E B 16	E B 15	E B 15	E B 15	E B 15
6	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	G	G 22	G 28	G 30	40	40	G 29	38	35	30	23	E B 14	E B 15	E B 15	E B 15	E B 15	E B 16
7	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	G 20	31	35	U Y 34	37	39	U Y 28	40	38	31	24	20	E B 16	E B 15	E B 16	E B 15	E B 16
8	E B 15	E B 15	E B 16	E B 16	E B 14	E B 15	E B 15	25	G 20	G 28	G 27	U Y 25	G 29	U Y 23	G 25	G 30	32	26	30	18	29	E B 16	E B 16	E B 16
9	E B 15	E B 16	E B 15	E B 15	E B 15	E B 16	E B 16	28	G 23	G 26	E B 36	37	39	U Y 35	G 30	U Y 30	G 25	G	E B 15	17	17	E B 16	E B 15	E B 14
10	E B 16	E B 15	E B 15	E B 15	E B 14	E B 14	E B 16	G	G 20	G 26	G 30	41	U Y 31	G 30	48	G 21	G 20	27	19	23	E B 15	E B 15	E B 15	19
11	E B 16	E B 14	E B 15	E B 15	E B 15	E B 15	E B 18	25	G 26	G 28	37	36	G 32	G 33	G 32	G 28	40	G 18	21	19	E B 16	24	19	E B 15
12	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	E B 18	27	G 26	G 30	36	42	41	38	44	34	37	28	24	E B 15	E B 16	E B 15	E B 16	E B 15
13	E B 16	E B 16	E B 16	E B 16	E B 15	E B 15	E B 16	G	G 20	34	36	U Y 34	U Y 33	C	G 30	G 30	32	26	20	E B 16	E B 15	E B 15	E B 15	E B 16
14	E B 15	E B 16	E B 16	E B 15	E B 15	E B 16	18	G 20	G 21	34	35	G 27	U Y 26	38	U Y 28	G 26	G 24	22	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15
15	E B 16	18	18	E C 28	E B 15	E B 16	E B 17	25	G 20	38	38	39	39	42	41	34	68	39	25	23	E C 28	18	E B 15	E B 16
16	E B 16	E B 17	E B 15	E B 15	E B 15	E B 15	E B 14	26	G 22	35	38	41	41	48	46	40	30	26	34	20	16	E B 15	20	E B 15
17	29	E B 15	17	E B 14	E B E 16	B 16	E B 18	26	G 24	36	38	38	44	38	48	36	28	26	16	E B 16	E B E 16	B 16	17	E B 15	17
18	E B 16	E B 14	E C 28	E B 15	E B 14	E B 15	E B 18	25	G	G 25	37	40	C	C	C	C	C	C	18	E B 15	E B 27	C	E B 15	E B 15
19	E B 15	E B 16	16	E B 15	E B 15	E B 15	18	25	30	34	C	C	C	C	C	C	C	24	E B 15	E B 15	E B 16	E B 16	E B 16	E B 15
20	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	19	26	G 20	U Y 29	36	G 28	E B 39	U Y 24	G 25	32	34	36	21	17	E B 16	E B 16	18	E B 15
21	E B 15	E B 16	E B 15	E B 14	E B 14	E B 14	18	G 18	G 24	G 25	35	37	U Y 29	36	41	33	30	24	17	E B 15	E B 16	23	18	E B 15
22	E B 15	E B 16	E B 15	E B 15	E B 16	E B 16	E B 18	G 21	G 25	U Y 29	U Y 26	40	G 29	U Y 28	G 29	G 21	G	G 20	E B 15	E B 16	E B 16	E B 16	E B 14	21
23	E B 16	E B 16	E B 15	16	E B 15	E B 16	16	25	G 26	G 24	U Y 28	U Y 27	G U 25	Y 26	G 28	35	G	26	18	16	21	E B 16	E B 16	15
24	E B 15	18	E B 15	E B 14	E B 15	E B 16	18	28	31	34	G 30	43	46	E B 42	G 29	36	36	31	16	E B 15	29	18	E B 15	18
25	E B 16	E B 15	15	E B 15	E B 16	E B 15	22	28	31	37	36	50	56	44	41	37	32	G 19	E B 14	E B 16	27	16	16	E B 16
26	E B 15	E B 15	15	E B 15	E B 15	E B 15	20	28	34	40	37	41	E B 41	U Y 38	E B 36	G 30	U Y 29	30	20	19	16	E B 15	E B 16	E B 15
27	E B 16	E B 15	E B 15	E B 16	E B 15	E B 15	20	29	E B 36	42	44	40	40	38	47	G 23	32	28	23	17	20	27	23	E B 15
28	E B 15	E B 15	E B 15	16	E B 14	E B 15	20	30	43	U Y 29	G 30	E B 37	42	U Y 27	37	34	38	39	23	29	26	42	20	22
29	E B 15	20	E 16	B E 15	B E 15	B E 16	B E 23	B 29	33	36	40	40	45	58	39	42	72	64	34	50	33	32	E B 15	E B 16
30	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15	20	G 23	G 29	G 29	36	E B 45	40	40	G 28	G 26	G 22	27	21	19	E B 15	17	E B 16	E B 16
31	E B 16	E B 15	E B 14	E B 15	E B 15	E B 15	21	30	35	40	42	49	43	40	40	36	G 27	G E 19	B 17	19	33	32	E B 15	19
	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	30	30	29	28	29	29	29	30	31	31	31	31	31	31
MED	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 18	25	G 26	32	36	38	39	35	32	33	30	25	18	E B 16	E B 16	E B 16	E B 15	E B 15
U Q	E B 16	E B 16	E 16	E 15	E B 15	E B 16	20	28	31	36	37	41	41	40	41	36	33	28	21	19	26	18	16	16
L Q	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	G	G 22	G 28	G 30	G 34	G U 31	Y 28	G 28	G 26	G 26	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15

MAR. 2003 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 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

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	16	E C 28	E C 28	14	14	16	15	14	16	17	16	24	20	20	16	15	15	15	15	15	16	16	15	15
2	16	15	15	14	15	14	15	13	16	18	18	19	20	20	19	20	14	14	15	16	14	16	16	15
3	15	16	15	14	14	15	14	13	15	14	20	19	20	18	16	16	14	13	16	15	15	15	15	14
4	16	15	16	15	16	14	E C 28	16	14	15	18	18	19	17	21	18	16	15	15	15	16	16	15	15
5	14	15	14	E C 28	14	14	15	15	14	16	20	19	21	20	16	15	14	14	15	16	15	15	15	15
6	15	15	15	14	15	15	15	16	16	20	15	20	20	21	21	20	16	14	14	15	15	15	15	16
7	15	16	16	15	15	15	15	15	14	20	20	20	29	20	16	15	16	15	14	16	15	16	15	16
8	15	15	16	16	14	15	15	15	14	18	18	20	20	18	20	20	15	14	14	15	15	16	16	16
9	15	16	15	15	15	16	16	15	14	16	20	19	20	23	20	19	16	16	15	15	14	16	15	14
10	16	15	15	15	14	14	16	14	14	16	20	22	21	24	24	14	14	15	15	14	15	15	15	15
11	16	14	15	15	15	15	18	14	14	14	18	19	20	20	27	20	14	14	15	15	16	15	16	15
12	15	15	15	15	15	16	18	15	15	18	21	23	28	20	16	16	14	12	14	15	16	15	16	15
13	16	16	16	16	15	15	16	16	16	15	20	20	25	C	20	15	18	13	16	16	15	15	15	16
14	15	16	16	15	15	16	14	13	16	17	16	18	22	23	19	20	16	13	16	16	15	15	15	15
15	16	15	14	E C 28	15	16	17	15	15	20	20	21	20	19	28	16	16	14	15	15	E C 28	14	15	16
16	16	17	15	15	15	15	14	14	14	19	21	20	34	24	21	19	15	13	14	14	13	15	15	15
17	16	15	15	14	16	14	18	16	16	19	20	25	21	19	18	16	15	14	15	16	16	14	16	14
18	16	14	E C 28	15	14	15	18	13	19	20	24	34	C	C	C	C	C	C	14	15	E C 27	15	15	15
19	15	16	14	15	15	15	14	14	17	24	C	C	C	C	C	C	C	15	15	15	16	16	16	15
20	16	15	15	15	15	15	15	15	16	19	21	23	39	21	16	16	15	14	13	15	16	16	15	15
21	15	16	15	14	14	14	14	14	15	17	18	20	23	22	18	20	14	15	14	15	16	15	14	15
22	15	16	15	15	16	16	18	14	20	23	19	27	21	23	23	16	16	15	15	16	16	16	14	15
23	16	16	15	14	15	16	16	14	15	15	21	20	20	20	21	19	19	14	11	16	15	16	16	15
24	15	14	15	14	14	16	14	16	15	20	22	30	31	42	25	20	14	14	14	15	15	15	15	15
25	16	15	15	15	16	15	15	14	14	20	18	27	29	22	20	20	16	14	14	16	14	15	16	16
26	15	15	15	15	15	15	15	15	16	21	23	24	41	30	36	21	14	15	13	16	14	15	16	15
27	16	15	15	16	15	15	16	16	36	18	21	22	31	28	23	18	20	14	16	14	14	14	15	15
28	15	15	15	15	14	15	15	15	17	22	20	37	32	22	22	22	16	14	14	16	15	14	14	16
29	15	16	16	15	15	16	23	15	16	20	21	21	26	24	21	21	15	14	14	14	14	15	15	16
30	16	16	16	15	15	15	16	15	16	20	20	45	31	29	18	20	16	16	14	14	15	13	16	16
31	16	15	14	15	15	15	15	15	18	20	28	35	32	24	24	19	18	15	17	14	15	15	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	29	28	29	29	29	30	31	31	31	31	31	31
MED	16	15	15	15	15	15	15	15	16	19	20	21	22	22	20	19	15	14	15	15	15	15	15	15
U Q	16	16	16	15	15	16	17	15	16	20	21	25	31	24	23	20	16	15	15	16	16	16	16	16
L Q	15	15	15	14	14	15	15	14	14	16	18	20	20	20	18	16	14	14	14	15	15	15	15	15

MAR. 2003 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR.2003 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	277	283	303	294	268	268	296	328	367	350	337	318	334	334	344	346	340	348	342	341	285	283	308	277
2	278	280	305	270	305	282	299	347	343	356	339	330	321	321	316	322	341	337	328	313	293	286	281	277
3	274	299	314	316	344	297	319	351	351	332	324	307	330	323	336	327	326	325	345	312	287	306	308	289
4	271	285	290	278	264	F	F	347	328	331	307	307	314	309	310	325	320	329	311	302	291	296	292	284
5	288	286	273	264	290	312	321	345	324	334	317	318	316	302	317	315	319	316	327	275	299	326	288	291
6	289	296	295	283	283	275	312	350	331	325	320	308	305	309	307	304	328	335	318	279	283	314	286	270
7	269	274	289	322	258	270	307	330	328	313	308	311	304	300	300	305	321	329	313	298	309	276	305	300
8	301	292	304	294	294	286	313	323	346	326	313	310	306	308	312	309	317	324	327	310	293	290	285	275
9	279	285	314	282	262	265	306	334	333	316	318	314	312	305	304	313	315	326	320	299	297	290	273	267
10	292	289	299	287	288	281	298	345	329	319	309	312	313	303	297	305	312	321	329	305	311	305	270	253
11	258	269	292	314	265	268	299	323	332	319	318	315	314	305	308	316	313	322	332	324	327	278	280	277
12	295	281	285	302	278	294	303	326	330	333	312	311	307	303	311	309	317	321	320	304	289	305	297	289
13	278	297	310	313	293	286	312	334	349	313	308	319	308	C	302	318	331	317	311	308	313	281	273	276
14	278	281	303	291	273	280	306	339	336	327	307	312	307	310	308	308	310	328	327	313	293	275	263	284
15	271	295	301	334	265	256	269	315	317	328	325	310	319	313	313	326	332	341	329	336	299	282	274	S 305
16	294	332	292	286	262	259	329	326	334	323	319	312	313	314	309	314	324	335	344	345	281	271	276	265
17	266	272	F 275	298	278	264	F 297	284	310	305	302	315	324	329	314	322	329	350	350	284	268	F	F	F
18	F	F	280	F	F	301	324	336	282	296	314	333	C	C	C	C	C	C	330	292	327	290	282	281
19	280	272	280	333	299	281	327	348	352	322	C	C	C	C	C	C	C	355	331	297	304	304	295	296
20	292	293	308	296	278	271	322	342	313	344	317	S 331	331	310	347	341	337	342	326	347	299	290	269	250
21	265	310	311	304	266	267	311	322	330	330	319	328	331	308	334	329	327	335	339	326	275	268	S 265	278
22	304	363	281	289	288	282	329	321	362	337	304	302	314	346	346	353	338	347	355	329	289	292	283	293
23	294	297	324	341	293	288	346	348	345	344	343	343	332	343	336	336	353	353	337	319	293	267	300	300
24	325	313	313	340	298	269	330	356	348	321	336	331	S 330	324	324	320	341	349	358	332	S 345	293	294	299
25	266	281	306	358	379	292	362	372	356	339	317	316	313	318	324	330	342	356	342	331	293	292	296	293
26	286	294	309	315	288	301	346	357	338	333	314	305	309	326	320	321	322	331	341	338	296	285	281	288
27	289	312	314	314	303	297	330	336	329	316	322	314	314	309	317	331	332	324	318	293	293	308	282	293
28	272	292	289	252	260	303	340	306	331	326	316	316	297	309	315	317	323	330	320	319	296	283	286	287
29	287	294	303	278	262	273	318	328	329	308	315	297	293	305	298	306	318	327	323	315	295	284	272	272
30	273	267	263	271	264	278	341	304	317	312	308	312	312	318	317	318	310	312	327	308	322	292	270	265
31	273	256	278	316	289	281	338	340	336	315	309	314	304	309	301	311	322	325	321	286	272	268	266	263
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	30	30	30	30	31	31	31	30	30	29	28	29	29	29	30	31	31	31	30	30	30
MED	278	290	301	297	280	281	318	336	332	326	316	314	313	310	314	318	324	330	328	312	293	290	282	282
U Q	292	297	309	316	293	292	330	347	346	333	320	318	322	322	324	328	334	342	341	329	304	296	294	293
L Q	272	281	285	283	265	269	306	323	328	316	309	310	307	306	308	310	318	324	320	298	289	281	273	272

MAR.2003 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												A	L	L			L							
2												L	L	L	L	L								
3												L	L	L	L	L								
4											L	L	L	L										
5											L	L	L		L	L								
6												L	L		L									
7												L		L	L	L								
8										L		L	L	L	L									
9											L	L	L	L	L									
10											L		L	L										
11											L	L	L	L	L	L								
12										L	L	L		L	L	L								
13											L	L	L	C										
14										L	L	L	L	L										
15											L	L	L				A							
16										L	L	L	L		L									
17											L	L	L	L	A	L	L							
18										L	L	L	C	C	C	C	C	C						
19										L	C	C	C	C	C	C	C							
20									L	L	L	L 380	L 391	L	L 357	L	L	A						
21									L	L	L	L	L	L	L	L								
22								L	L	L 373	L 375	L	L 366	L	L	L	L							
23									L	L	L 378	L	L	L 386	L	L	L							
24									L	L	L	L	A	L	L	L	L							
25										L	L	A	A	L	L	L	L							
26										L	L	L	L	L 376	L 391	413								
27									L	L		L	L	L	A	L	L							
28									A	L	L	L 358	L 378	L	L	L								
29										L	L	L	L	A	L	L	A	A						
30									L	L	L		L	L	L	L								
31										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										1	2	2	3	2	2	1								
MED										L 373	L 376	L 369	L 378	L 381	L 374	413								
U Q													L 391											
L Q													L 366											

MAR. 2003 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 h'F2 (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1												260	252	250			250							
2												268	274	260	264	258								
3												270	258	266	254	262								
4											282	282	256	264										
5											268	264	272		250	256								
6												276	278		282									
7												272		292	292	274								
8										250		278	266	274	266									
9											264	268	270	270	274									
10											284		268	282										
11											266	268	264	264	272	258								
12										254	266	284		258	268	256								
13											270	260	270	C										
14										258	276	256	270	274										
15											250	278	270				258							
16										262	266	266	266		262									
17											294	264	260	262	250	274	252							
18										294	254	248	C	C	C	C	C	C						
19										268	C	C	C	C	C	C	C							
20									264	240	262	256	246	278	242	254	260	228						
21									268	254	258	262	246	296	252	258								
22								258	232	260	296	296	260	242	244	246	242							
23									248	262	248	256	262	250	260	248	244							
24									232	274	250	264	256	266	264	262	254							
25										248	272	288	272	280	258	254	244							
26										268	260	282	286	260	268	256								
27									258	270		262	274	280	266	250	264							
28									242	254	268	274	282	268	264	276								
29										276	254	272	310	276	282	268	264	246						
30									270	274	280		262	264	262	266								
31										268			288	276	292	282								
	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	8	18	22	27	27	24	23	19	10	2						
MED								258	253	262	266	268	268	267	264	258	253	237						
U Q									266	270	276	278	274	277	272	268	260							
L Q									237	254	258	262	260	261	254	254	244							

MAR. 2003 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 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 B 276	E C 306	E C 278	256	E B 308	E B 316	276	220	204	222	230	A	220	200	208	202	212	220	208	194	236	E B 282	236	E B 270
2	E B 286	E B 302	250	E B 288	224	E B 270	266	226	228	214	206	204	208	208	206	214	224	218	202	204	244	236	E B 286	E B 296
3	E B 292	262	244	238	208	260	248	214	212	H 196	196	200	H 190	212	212	208	226	H 198	204	196	252	250	238	248
4	280	272	260	E B 278	E B 300	E B 306	224	202	H 192	214	212	222	216	200	H 198	220	224	232	212	208	232	220	256	266
5	258	258	E B 294	E C 310	246	222	222	216	206	H 188	194	208	212	216	204	204	220	222	208	210	244	228	254	270
6	254	260	238	262	266	E B 286	244	212	214	H 208	H 212	206	206	220	214	206	222	216	200	220	264	246	248	286
7	E B 314	E B 292	264	212	E B 316	E B 290	248	230	222	220	H 190	218	H 214	H 202	224	226	222	208	212	216	220	272	260	248
8	242	254	246	228	224	244	250	222	216	204	H 194	196	212	214	202	222	H 216	214	212	210	E A 264	256	268	E B 300
9	E B 288	E B 278	236	248	E B 308	E B 332	232	216	H 202	218	204	208	216	218	222	212	214	216	204	218	248	244	266	E B 302
10	260	260	246	238	242	256	254	218	214	214	204	222	212	210	E A 246	222	226	222	210	218	222	210	E B 290	E A 348
11	E B 326	E B 302	260	220	E B 288	E B 306	246	224	226	212	200	216	210	210	214	206	230	230	214	210	208	E A 274	E A 292	E B 274
12	E B 276	E B 276	270	242	220	242	236	214	H 204	H 196	H 188	226	228	216	E A 236	212	230	224	212	208	244	236	242	272
13	E B 294	254	246	226	220	264	234	224	220	196	H 184	212	208	C	214	220	222	220	222	228	216	252	E B 290	E B 290
14	E B 276	262	232	208	260	E B 286	252	222	220	206	202	202	202	214	230	226	218	226	206	202	226	E B 276	E B 318	E B 278
15	E B 296	258	248	218	244	E B 352	260	230	218	222	204	204	194	228	226	222	A	226	224	220	E C 258	E A 258	E B 278	242
16	258	232	244	250	E B 290	E B 350	232	220	214	206	218	216	216	250	E A 236	234	224	222	214	202	240	E B 290	E A 298	E B 318
17	E A 336	E B 304	E A 314	212	252	E A 308	238	240	226	216	206	210	A	208	A	224	216	214	204	210	256	E B 284	E B 280	E A 296
18	E B 300	E B 294	264	236	212	246	234	222	212	228	226	214	C	C	C	C	C	C	216	220	218	262	264	E B 300
19	E B 278	E B 298	E A 272	230	254	250	230	218	222	206	C	C	C	C	C	C	C	208	208	234	234	248	258	260
20	266	252	260	252	E B 288	E B 314	240	224	218	206	H 182	194	206	210	200	220	224	A	218	212	212	260	E A 334	E B 360
21	E B 316	260	220	254	E B 310	E B 332	236	H 186	224	218	216	222	204	194	A	220	224	234	210	206	264	E A 322	E A 308	E B 292
22	258	210	226	266	E B 296	E B 294	244	230	A	208	196	210	H 186	E A 222	212	220	206	H 216	204	214	220	256	E B 276	E A 302
23	E B 282	266	240	218	262	E B 290	236	226	202	206	194	H 188	202	190	208	210	198	222	226	214	E A 256	E B 320	260	246
24	232	238	246	216	E A 262	E B 336	234	230	200	194	204	A	A	228	214	210	A	220	214	216	E A 248	246	244	E A 286
25	E B 310	E B 292	E B 268	202	198	E B 292	220	214	216	216	204	A	A	E A 242	E A 230	220	214	220	216	208	E A 274	268	E A 276	E B 276
26	276	274	242	236	248	250	216	216	216	220	208	214	226	204	190	206	244	236	218	206	230	272	E B 282	E B 272
27	274	246	228	234	222	E B 274	230	224	224	210	246	212	206	220	A	H 194	220	238	238	242	240	242	E A 266	256
28	270	E B 278	260	E A 296	E B 324	250	222	216	A	212	210	206	198	196	210	218	236	240	226	232	250	E A 324	E A 270	E A 294
29	E B 276	274	244	260	304	E B 294	212	226	228	220	210	210	222	A	222	E A 242	A	A	218	E A 260	E A 260	E A 310	E B 286	E B 288
30	E B 282	E B 296	E B 322	E B 308	244	E B 280	224	226	224	208	H 196	226	214	204	198	H 200	224	236	238	228	222	222	244	E B 310
31	E B 300	E B 314	E B 276	234	232	260	222	220	224	216	214	E A 242	222	214	216	226	226	230	224	236	E A 316	E A 322	E B 314	E A 322
	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	29	31	30	27	26	27	26	29	26	28	31	31	31	31	31	31
MED	E B 278	U 255	246	234	U 237	E B 286	236	222	216	212	204	210	211	211	212	219	223	222	212	213	235	U 247	E 270	E 286
U Q	E B 296	E B 294	E 268	E 260	E B 296	E B 308	248	226	224	218	212	218	216	220	E A 224	222	226	230	218	220	E 256	E 282	E 290	E B 300
L Q	266	258	242	220	224	256	224	216	209	206	H 196	204	204	204	206	207	216	216	208	208	222	244	256	270

MAR. 2003 h'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	116	116	A	A	A	112	110	116	114	112	116						
2							B	118	114	114	114	114	114	A	114	116	112	A						
3							B	112	120	A	A	112	114	112	112	112	112	108						
4								112	114	112	108	114	114	116	114	112	120	114						
5							B	116	114	112	114	114	A	112	110	110	104	110						
6							B	114	114	112	114	114	118	114	114	114	114	114						
7							B	120	116	118	118	A	A	A	A	110	110	A						
8							B	110	110	110	110	112	114	112	114	114	A	A						
9							B	118	112	116	116	A	A	A	114	A	118	114						
10							B	114	112	112	110	A	A	114	114	110	106	114						
11							B	118	120	118	112	112	116	112	116	114	A	114						
12							B	110	118	120	A	A	A	A	A	A	A	A						
13							B	110	116	114	A	A	A	C	112	114	112	116						
14							B	126	112	116	116	112	112	112	112	116	116	112						
15							B	110	114	114	112	A	112	A	114	A	114	110						
16							B	124	112	110	A	A	A	A	A	A	A	A						
17							B	120	124	A	A	A	A	A	A	110	110	A						
18							B	110	112	112	114	108	C	C	C	C	C	C						
19							B	120	122	120	C	C	C	C	C	C	C	A						
20							B	114	112	A	110	112	B	R	110	110	A	A						
21							B	116	114	118	110	110	A	106	A	A	A	A						
22							B	118	120	A	120	112	112	A	118	114	110	120						
23							B	110	116	118	118	118	118	116	120	120	118	114						
24							B	118	116	112	114	A	A	B	124	124	114	112	B					
25							B	112	118	116	A	A	A	A	A	A	A	116	B					
26							B	116	116	116	A	A	B	A	B	116	A	110	B					
27							E B 126	118	B	112	112	A	A	A	110	112	112	112						
28							122	118	A	120	114	B	A	114	A	A	116	116						
29							B	112	112	A	116	112	A	A	A	A	A	A						
30							B	116	122	120	A	B	A	A	A	114	112	112						
31							E B 128	114	112	A	A	A	A	A	A	A	116	116						
	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	31	29	24	20	14	11	12	18	20	20	20						
MED							E B 126	116	114	115	114	112	114	112	114	114	112	114						
U Q							E B 128	118	118	118	116	114	116	114	116	115	116	116						
L Q							122	112	112	112	111	112	112	112	112	111	111	112						

MAR. 2003 h'E (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2003 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	92	C	C	B	B	B	B	134	112	100	96	94	98	98	102	98	112	106	B	B	B	B	B	B
2	B	B	B	B	B	B	B	106	128	116	116	118	114	106	106	106	94	102	B	B	98	98	98	98
3	98	B	98	B	B	B	B	G	104	104	102	98	96	94	96	124	112	110	B	B	B	B	100	98
4	102	B	B	B	B	B	C	G	100	98	136	100	114	100	100	112	104	G	B	B	B	B	130	B
5	B	B	B	C	B	B	B	G	100	98	100	100	100	100	92	92	96	92	86	B	90	B	B	B
6	B	B	B	B	B	B	B	G	100	98	96	150	134	100	124	122	112	124	B	B	B	B	B	B
7	B	B	B	B	B	B	B	106	118	116	106	102	98	102	104	110	108	106	100	B	98	92	B	B
8	B	B	B	B	B	B	B	160	100	98	100	98	98	96	100	100	98	96	108	92	92	98	B	B
9	B	B	B	B	B	B	B	178	100	100	110	104	104	102	100	98	104	G	96	96	98	B	B	B
10	B	B	B	B	B	B	B	G	98	100	102	100	100	98	112	92	90	112	102	100	B	B	B	90
11	B	B	B	B	B	B	B	146	98	98	120	110	102	102	98	100	94	92	86	106	B	100	98	98
12	B	B	98	B	B	B	B	156	104	102	102	100	94	92	94	92	88	86	82	B	108	B	B	B
13	B	B	B	B	B	B	B	G	104	114	104	100	100	C	102	104	138	130	114	108	B	B	B	B
14	B	B	B	B	B	B	146	106	100	118	118	100	98	132	104	102	102	118	B	B	B	B	B	B
15	96	94	94	92	92	100	B	176	102	134	108	106	126	122	114	124	112	106	96	98	C	96	92	B
16	96	B	B	B	B	B	B	172	104	130	104	106	104	96	96	100	100	102	90	90	94	106	104	106
17	100	100	98	100	108	100	B	172	104	104	104	104	100	104	102	112	108	88	92	92	B	98	96	94
18	96	B	C	B	B	B	B	166	G	102	110	108	C	C	C	C	C	C	88	90	C	B	B	B
19	90	90	94	98	B	102	142	166	148	134	C	C	C	C	C	C	C	96	B	B	B	B	B	B
20	B	B	100	B	B	B	142	154	100	102	116	102	B	96	96	110	90	90	92	92	92	90	114	B
21	B	B	B	B	B	B	138	104	102	102	124	116	102	118	104	108	106	100	100	96	94	106	106	112
22	106	104	B	B	B	B	B	102	102	100	100	156	98	98	108	100	G	104	B	B	B	104	100	106
23	B	B	B	96	96	98	B	174	102	102	98	100	100	98	102	124	G	170	112	106	106	B	B	B
24	B	94	B	B	100	102	134	132	122	110	106	100	100	B	108	144	126	118	114	B	100	100	100	90
25	B	B	92	B	B	B	144	144	138	126	102	96	94	100	100	104	106	106	B	B	108	104	102	102
26	B	B	96	B	92	100	140	150	140	116	104	102	B	104	B	104	110	136	126	116	110	B	B	B
27	96	B	B	B	B	B	142	146	B	114	110	104	104	106	118	100	172	136	120	108	104	100	98	B
28	B	B	B	90	B	B	144	142	104	102	102	B	100	102	102	100	138	118	112	110	108	104	102	106
29	94	94	B	B	B	B	B	162	138	106	114	114	102	100	106	106	98	98	98	98	98	92	96	92
30	92	92	92	92	92	B	142	106	104	106	108	B	98	98	98	100	98	150	120	102	B	98	B	B
31	B	B	B	B	B	B	142	126	120	106	102	102	102	102	104	108	106	106	B	104	102	98	100	96
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	12	7	9	6	6	6	11	25	29	31	30	28	27	27	28	29	27	28	21	18	17	17	16	13
MED	96	94	96	94	94	100	142	146	104	104	104	102	100	100	102	104	106	106	100	99	98	98	100	98
U Q	99	100	98	98	100	102	144	166	119	116	110	107	104	104	106	111	112	118	113	106	107	104	103	106
L Q	93	92	93	92	92	100	140	116	100	100	102	100	98	98	99	100	98	97	91	92	94	97	98	93

MAR. 2003 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR.2003 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

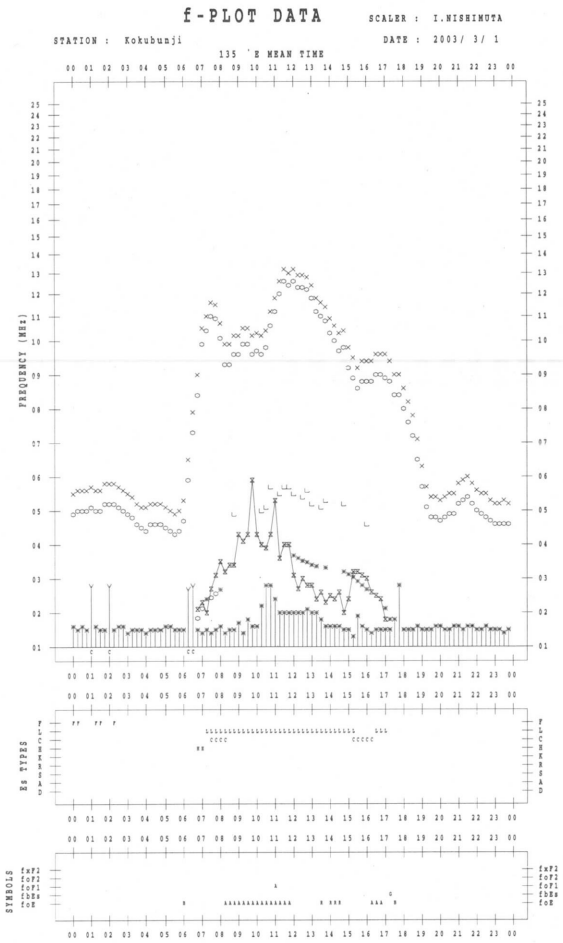
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

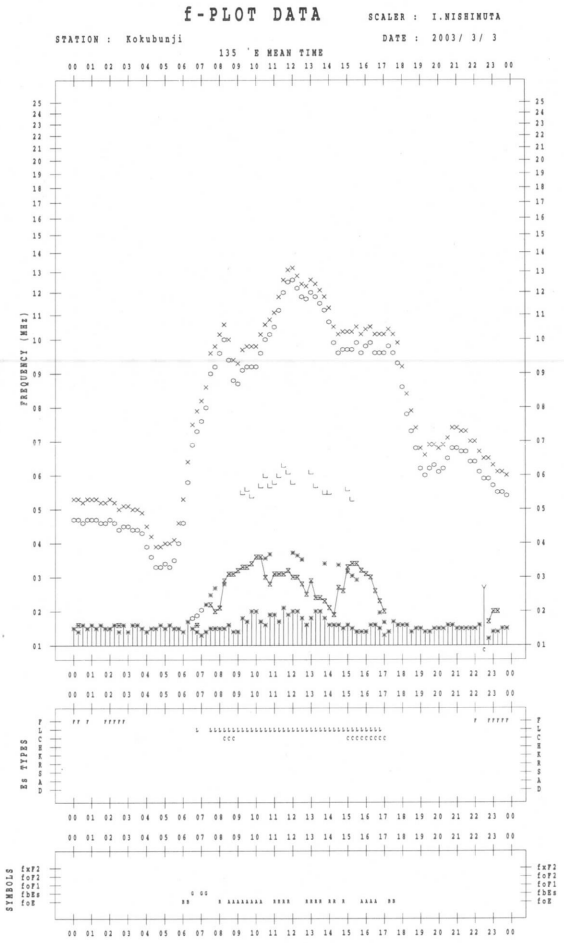
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	F1							H1	CL21	L2	L2	L2	L1	L1	L1	L1	C1	L1						
2								L1	CL11	CL11	CL11	CL11	CL11	L1	L1	L1	L1	L2			F2	F1	F2	F2
3	F1		F1						L1	L1	L1	L1	L1	L1	L1	CL11	CL21	C1					F1	F3
4	F1								L1	L1	CL11	L1	CL11	L1	L1	C1	L1						F1	
5									L1	L1	L1	L1	L1	L1	L1	L1	L1	L2	F2		F1			
6									L1	L1	L1	HL11	HL11	L1	CL11	CL11	CL11	C1						
7								L1	CL11	CL11	L1	L1	L1	L1	L1	CL21	C2	L2	F3		F2	F1		
8								H1	L1	L1	L1	L1	L1	L1	L1	L1	L2	L2	FF23	F3	F3	F1		
9								HL11	L1	L1	CL11	L1	L1	L1	L1	L1	L1		F1	F2	F2			
10									L1	L1	L1	L1	L1	L1	CL21	L2	L1	C2	F3	F2				F2
11								HL12	L1	L1	CL11	CL11	L1	L1	L2	L1	L3	L2	F4	FF12		F5	F3	F2
12			F1					H1	L2	L1	L1	L1	L2	L2	L2	L3	L3	L3	F3		F1			
13									L1	CL11	L1	L1	L1		L1	L1	H1	H2	F2	F1				
14							H1	L1	L2	CL11	CL11	L1	L1	HL11	L1	L1	L1	CL11						
15	F2	F3	F2	F1	F2	F1		H1	L1	HL11	CL11	L1	CL11	CL11	C1	CL11	CL31	CL21	FF31	F3		F2	F1	
16	F1							HL11	L1	CL11	L1	L1	L1	L2	L2	L2	L2	L4	F3	F3	F1	F1	F4	F1
17	F5	F2	F2	F1	F1	F2		HL11	L1	L1	L1	L1	L1	L2	L2	CL21	CL11	L3	F1	F1		F2	F2	F2
18	F2							H1		L1	C1	C1							F2	F1				
19	F2	F2	F3	F2		F1	H1	HL11	HL11	CL11								L2						
20			F2				H2	HL11	L1	L1	CL11	L1		L1	L1	CL11	L3	L3	F2	F1	F1	F2	FF31	
21							H1	L1	L1	L1	CL11	CL11	L1	CL11	L1	L1	L1	L2	F2	F1	F1	F2	F2	F1
22	F1	F1						L1	L1	L1	L1	HL11	L1	L1	L1	L1		L1				F1	F2	F2
23				F2	F1	F2		H1	L1	L1	L1	L1	L1	L1	L1	CL11		H1	F3	F1	F3			
24		F1			F2	F1	H1	HL11	CL11	CL21	L1	L2	L2		L1	HL11	CL21	CL21	C1		F3	F2	F1	F1
25			F1				H2	H1	HL11	CL11	L1	L2	L2	L2	L2	L1	L2	L1			F2	F3	F2	F1
26			F1		F1	F2	H1	HL12	HL11	CL11	L1	L1		L1		L1	L1	HL11	CL21	FF32	F1			
27	F1						H2	HL11		CL11	CL11	L1	L1	L1	CL11	L1	HL11	HL21	F3	F2	F2	F6	F3	
28				F2			H1	HL11	L2	L1	L1		L2	L1	L1	L1	HL21	C3	F3	F4	F3	F5	F3	F3
29	F2	F1						HL11	HL11	L1	CL11	CL11	L1	L2	L1	L2	L3	L4	F3	F5	F4	F3	F1	F2
30	F2	F1	F1	F1	F1		H1	L1	L1	L1	L1		L2	L1	L1	L1	L1	HL11	F2	F2		F2		
31							H1	CL11	CL11	L1	L1	L2	L1	L1	L1	L1	L1	L1		F6	F2	F4	F3	F2
	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																								

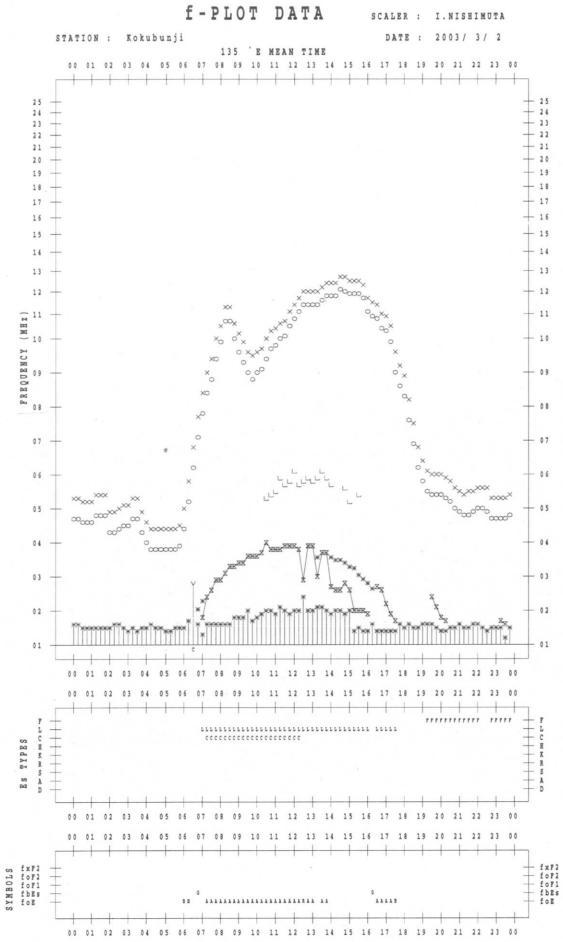
MAR.2003 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

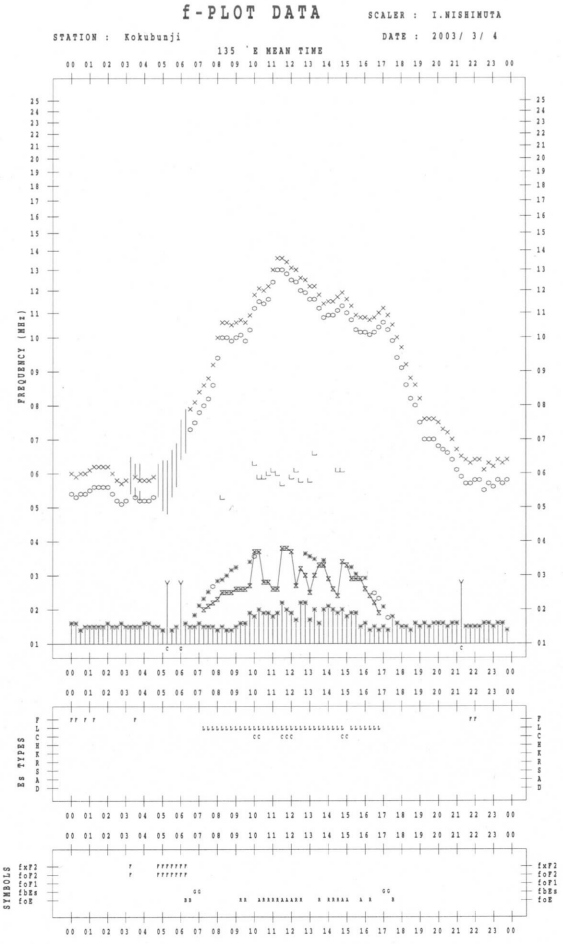
f-PLOTS OF IONOSPHERIC DATA

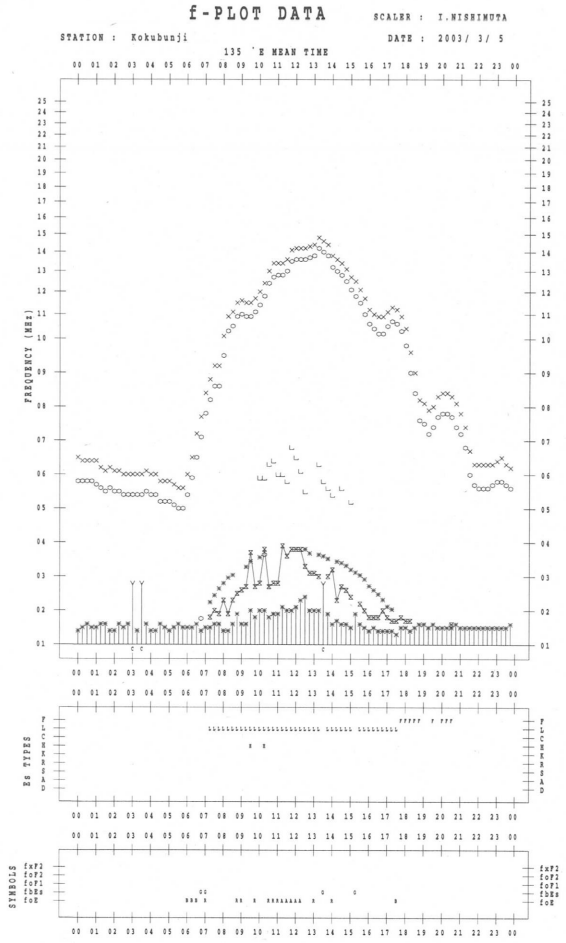
KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

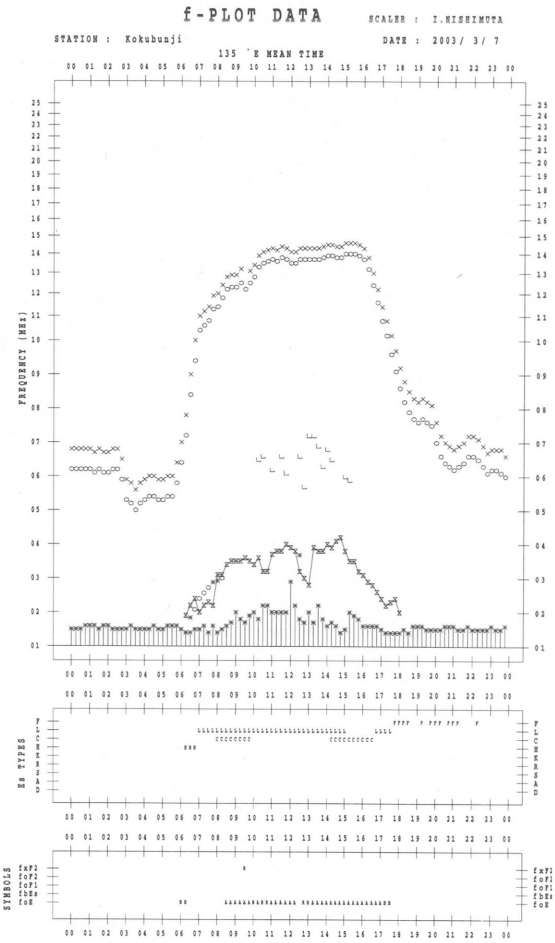

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

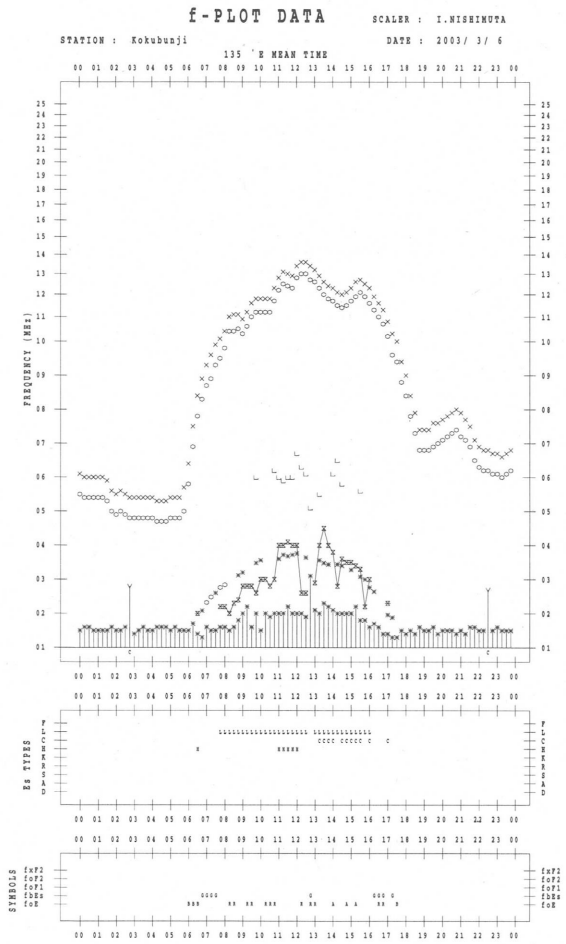

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

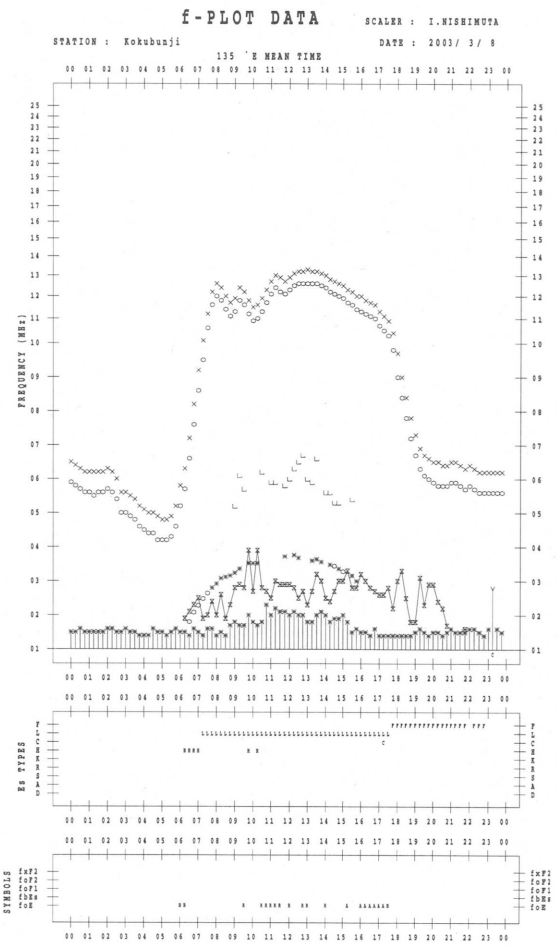

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

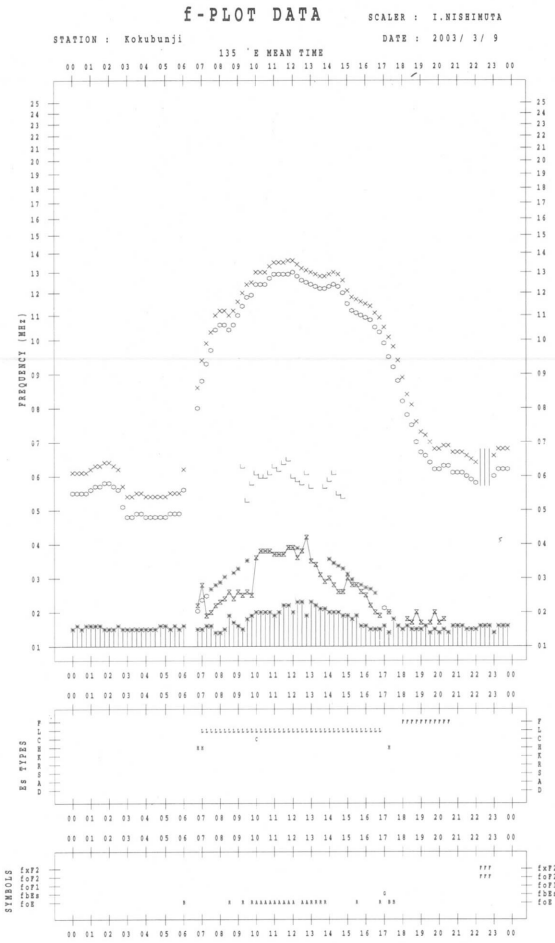

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

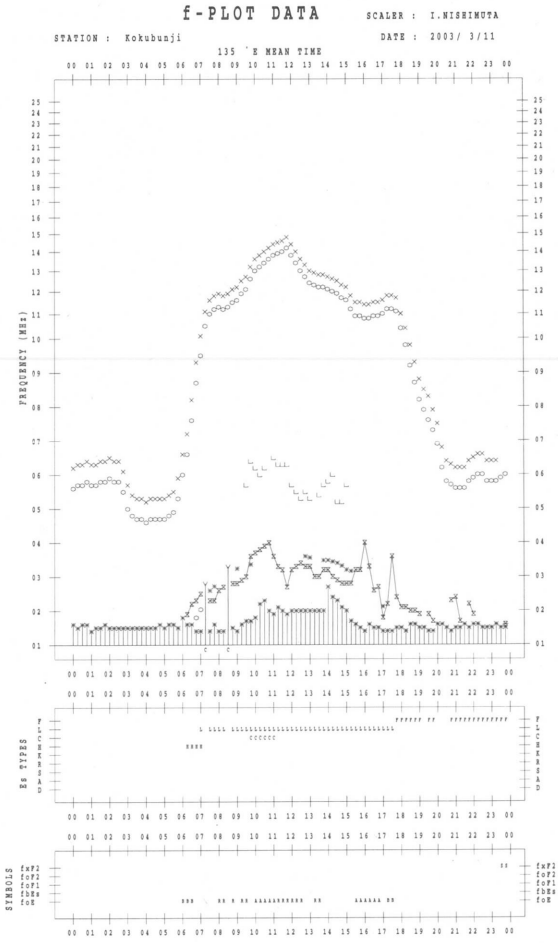

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

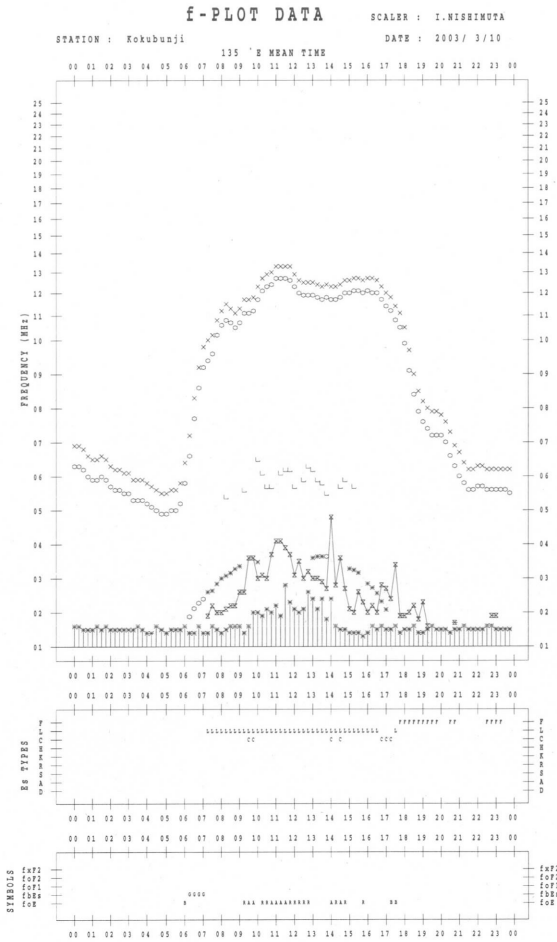

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

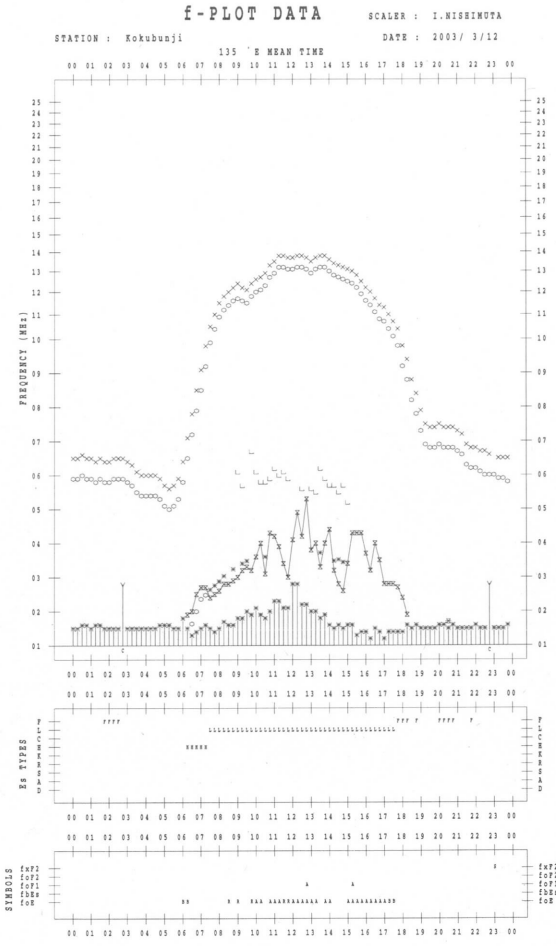

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

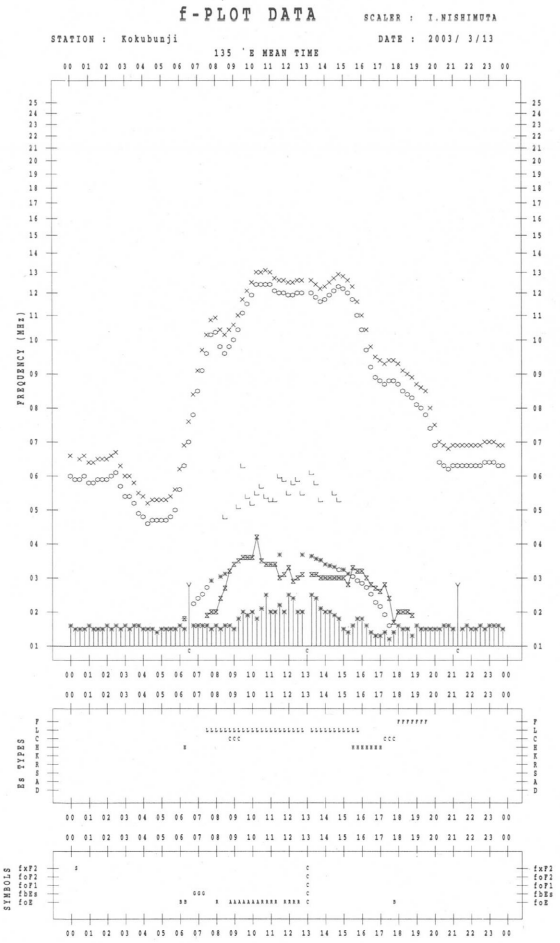

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

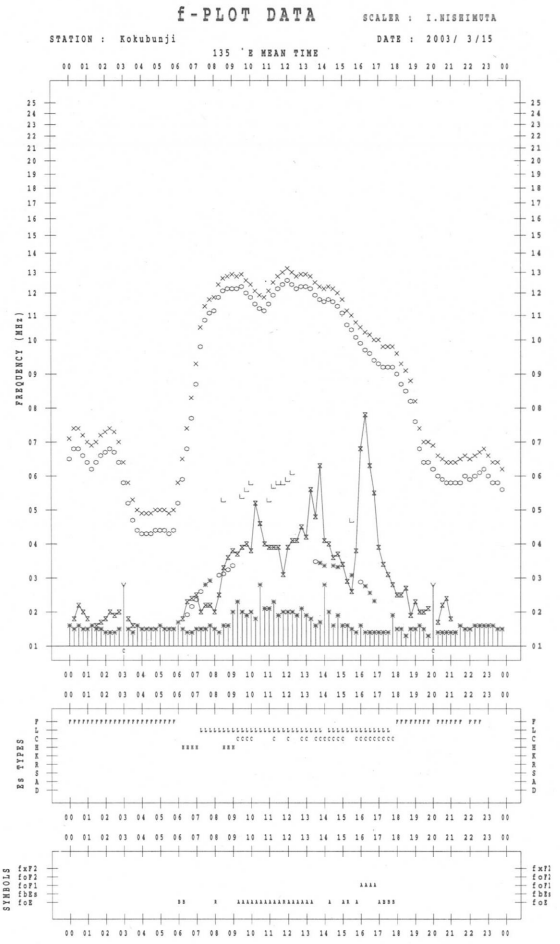

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

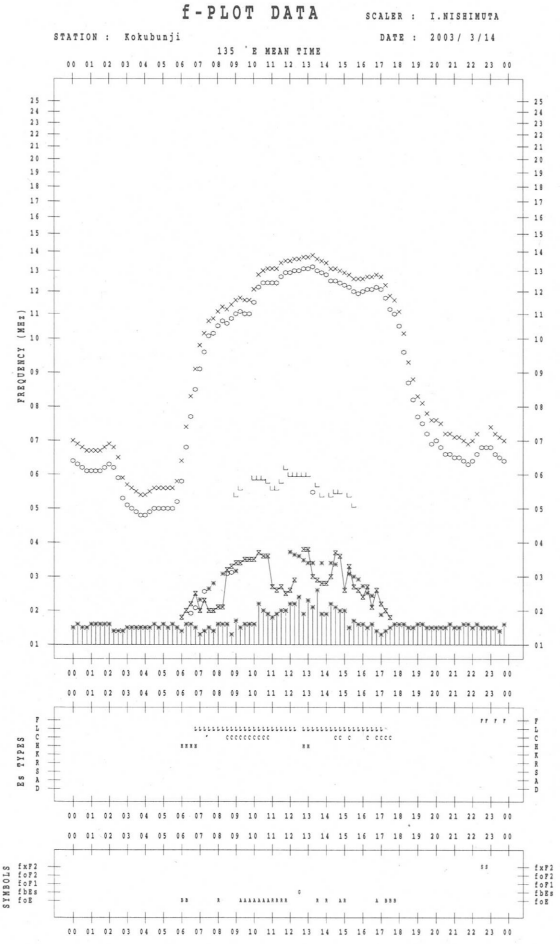

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

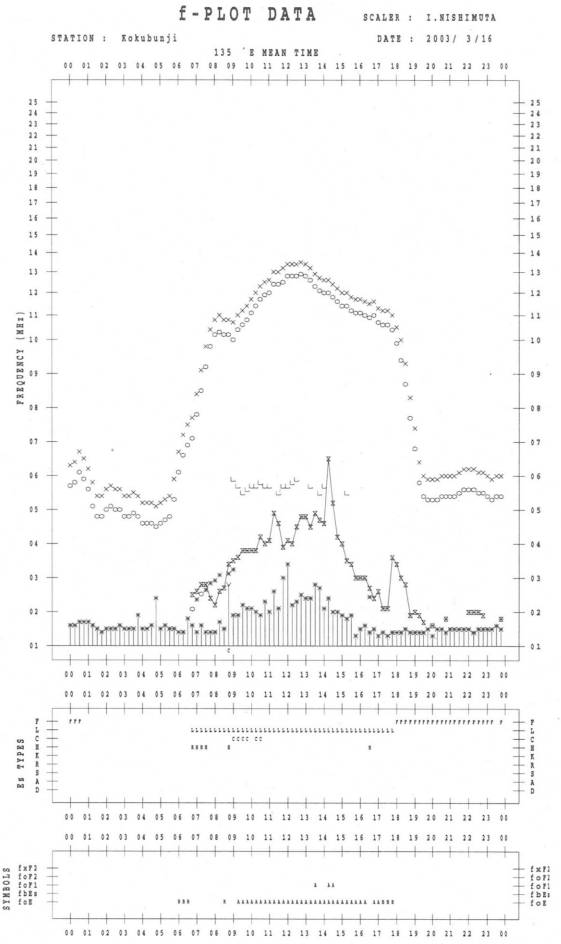

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

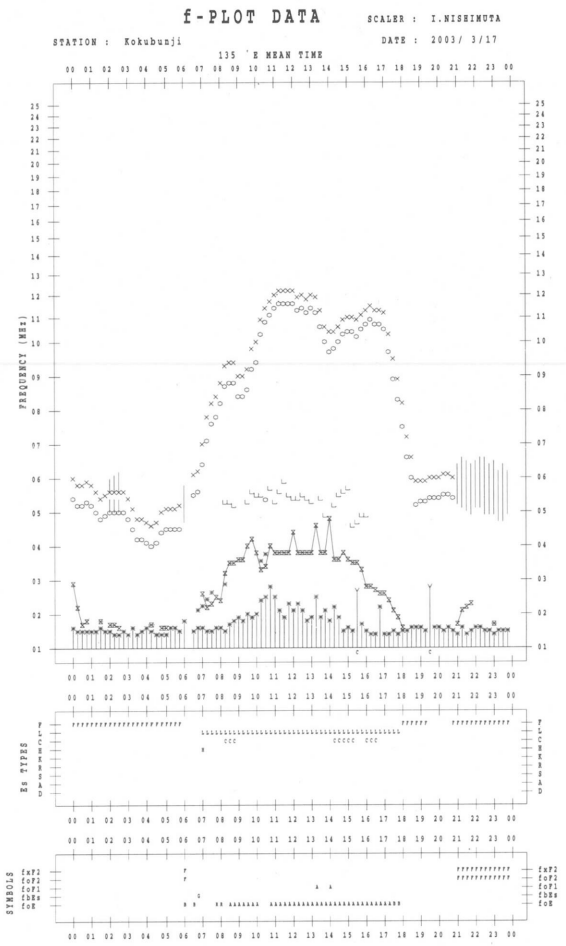

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

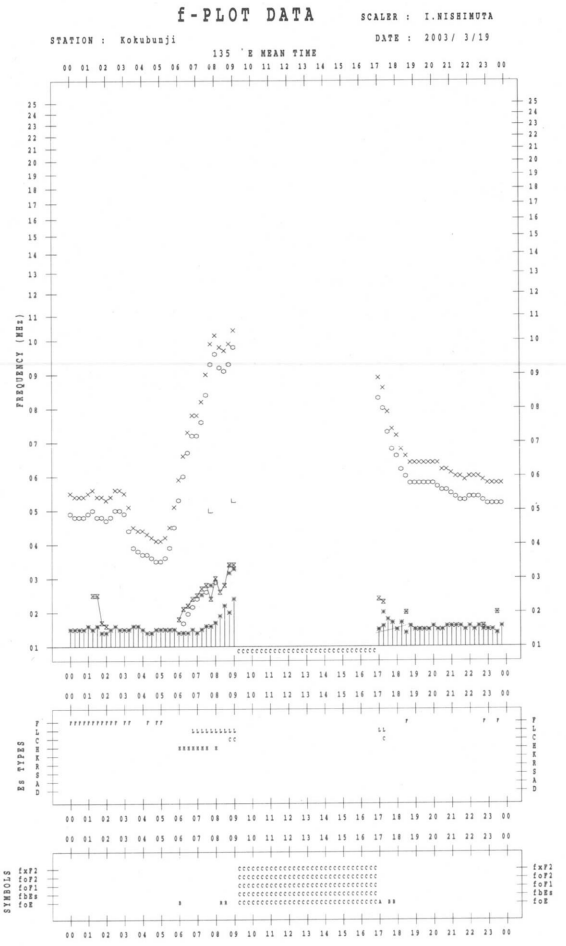

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

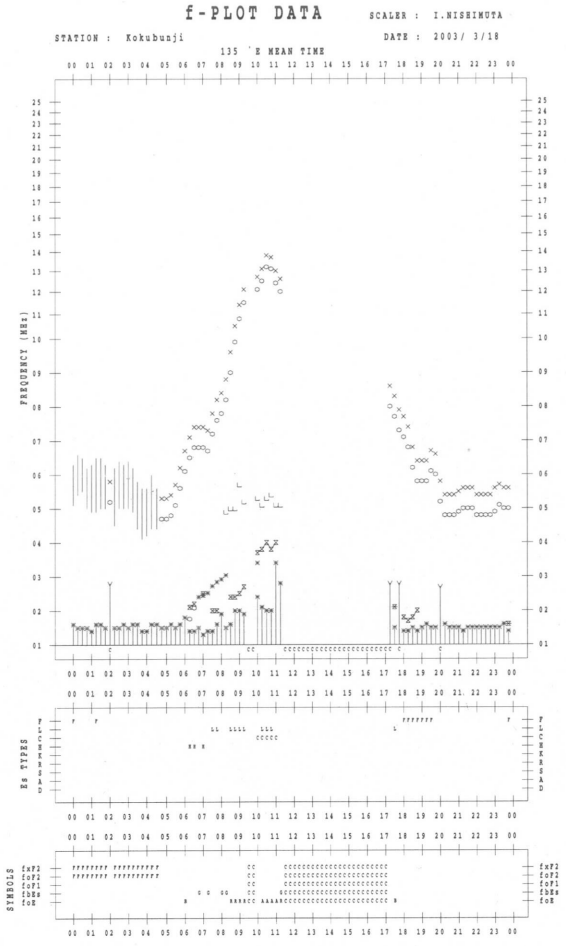

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

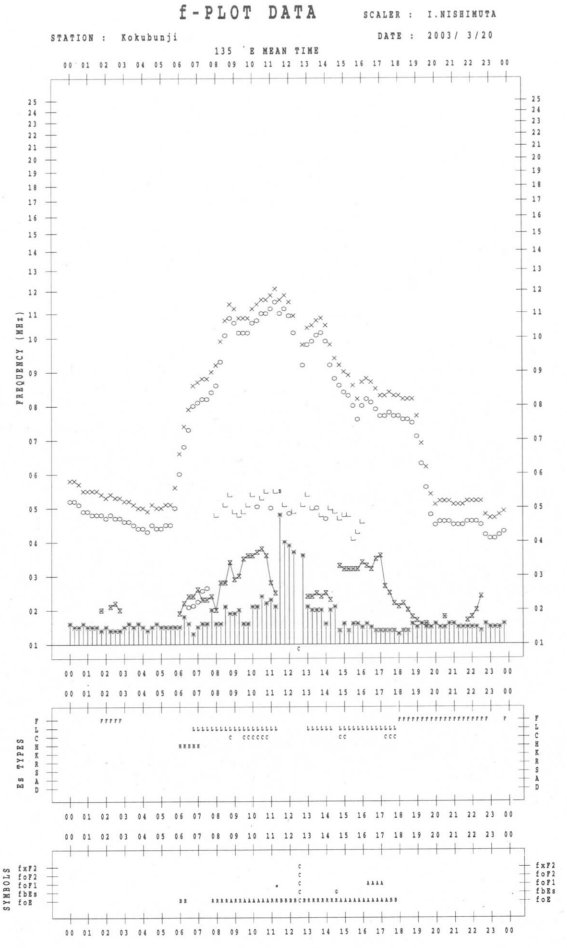

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

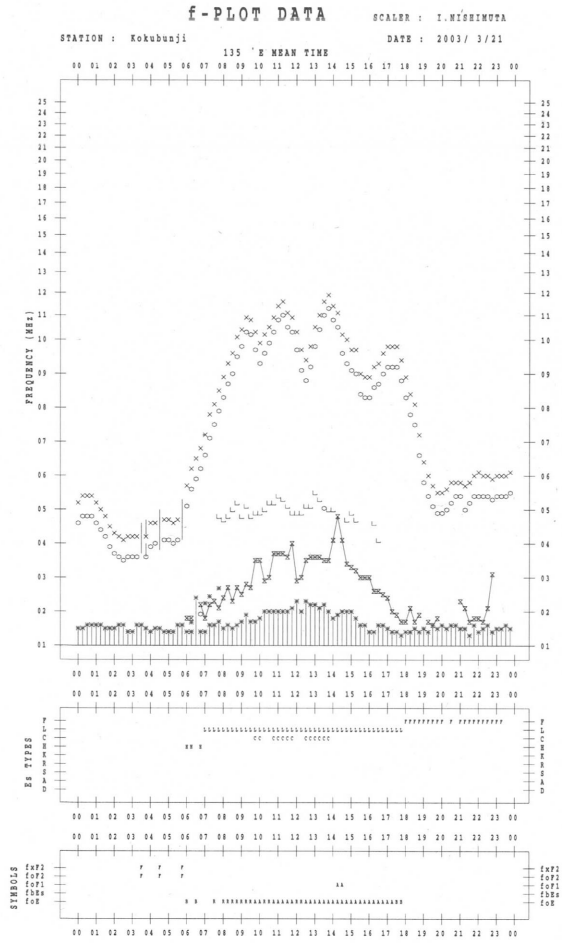

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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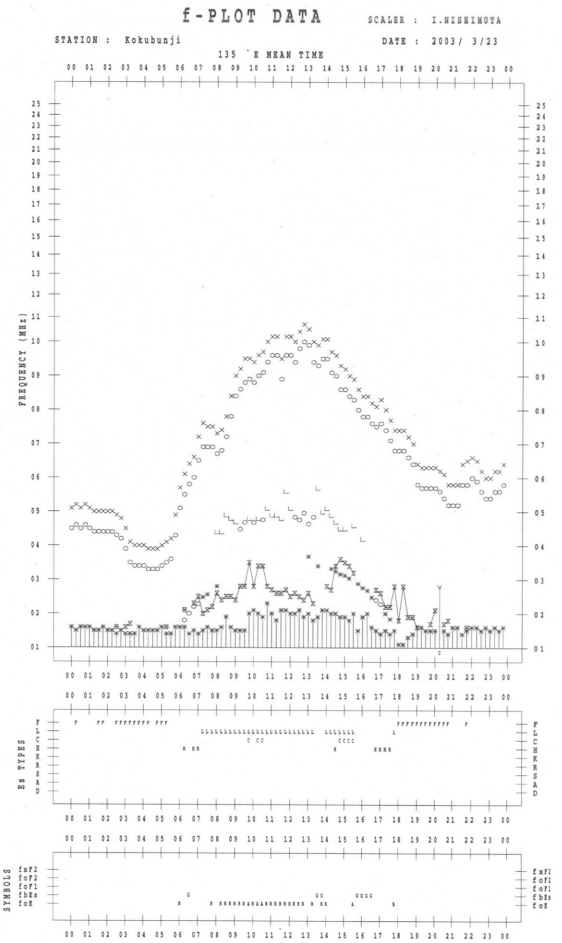
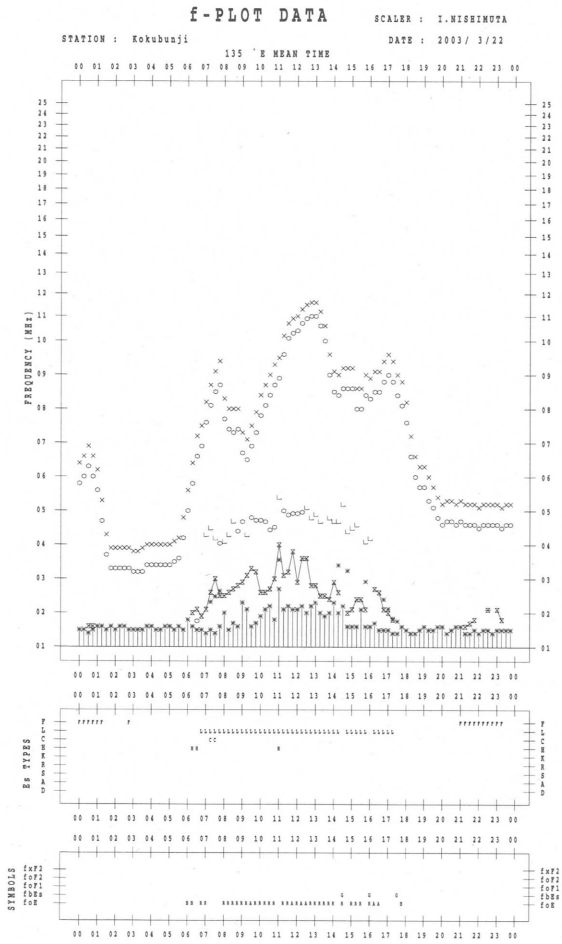
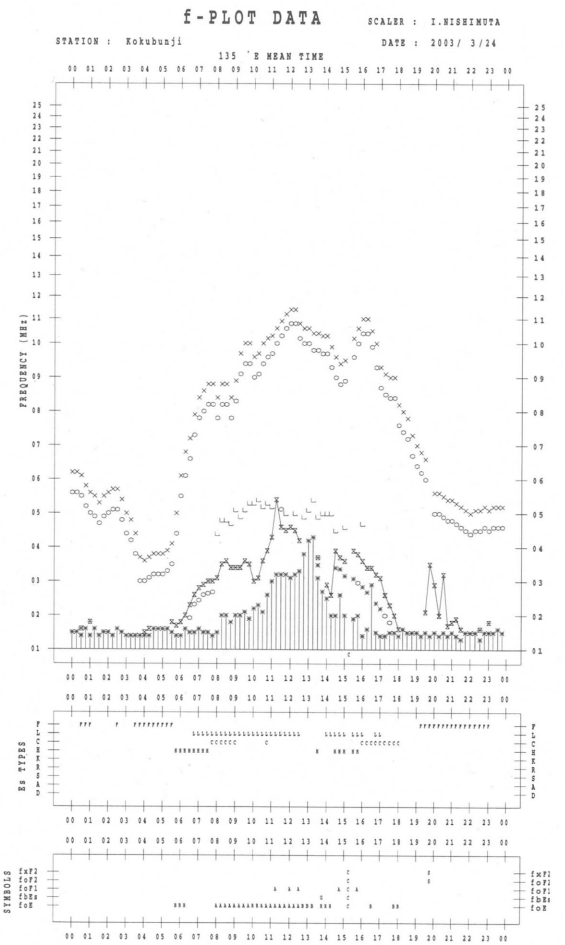
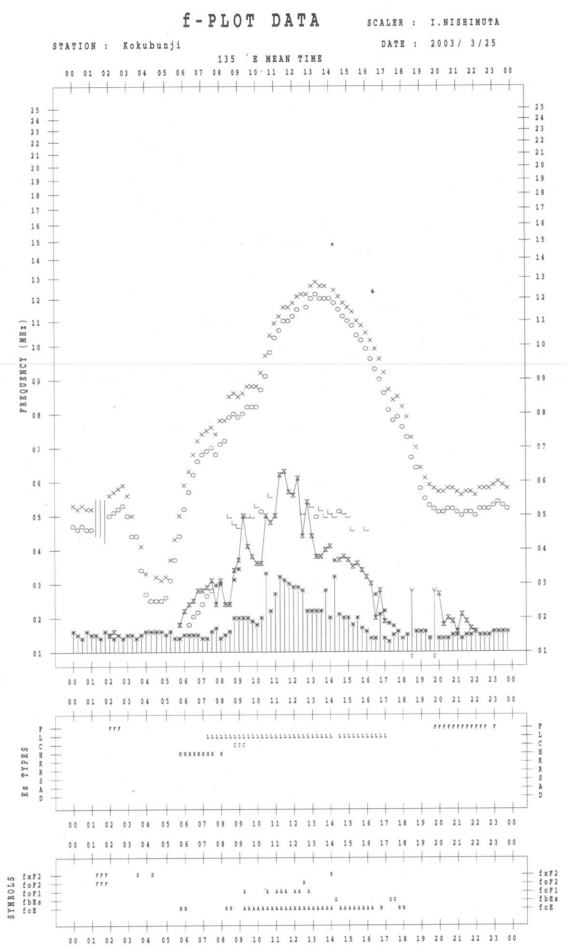
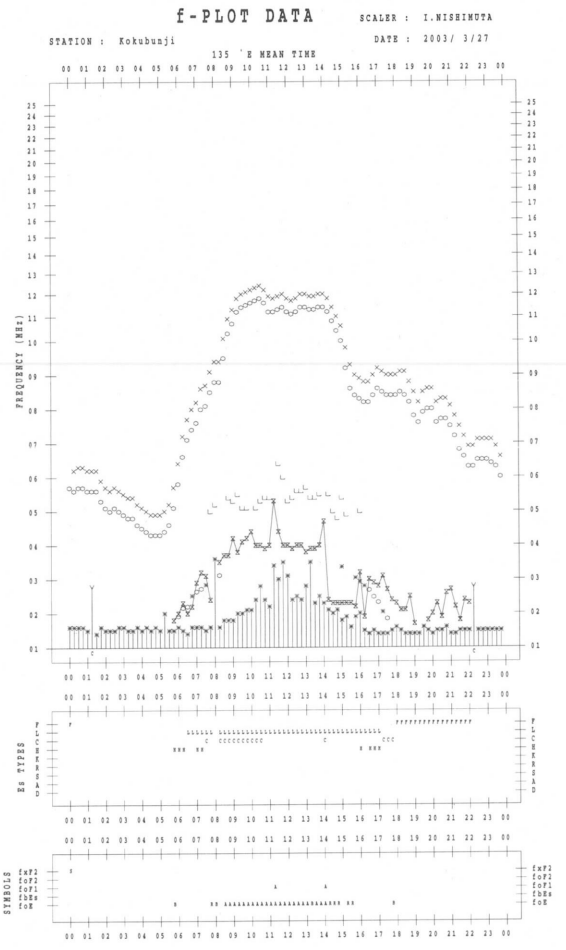
STATION : Kokubunji
DATE : 2003/ 3/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

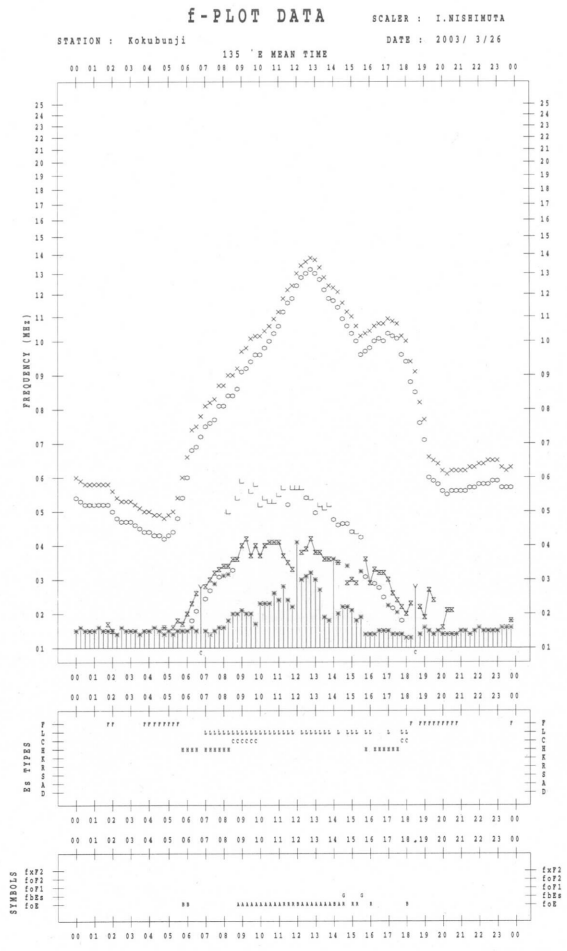

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

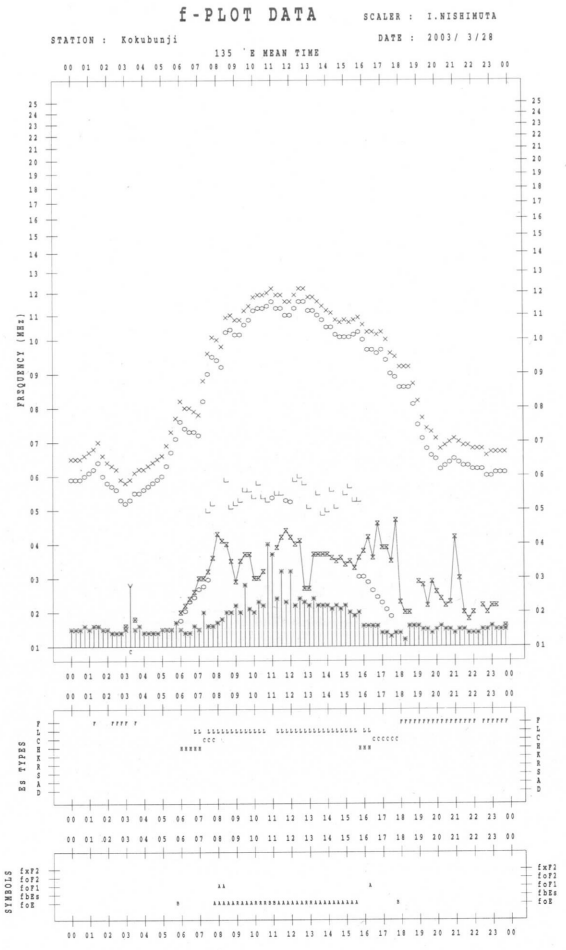

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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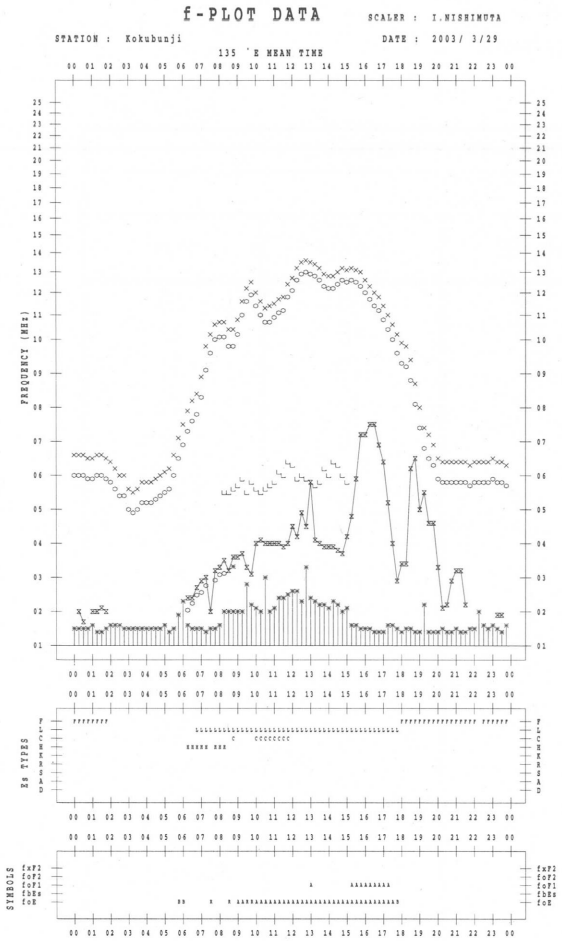
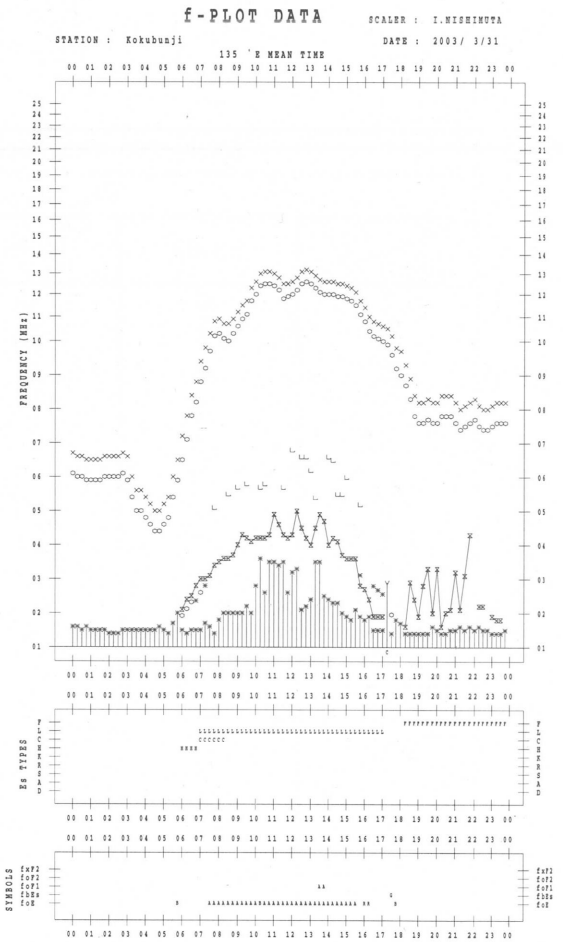
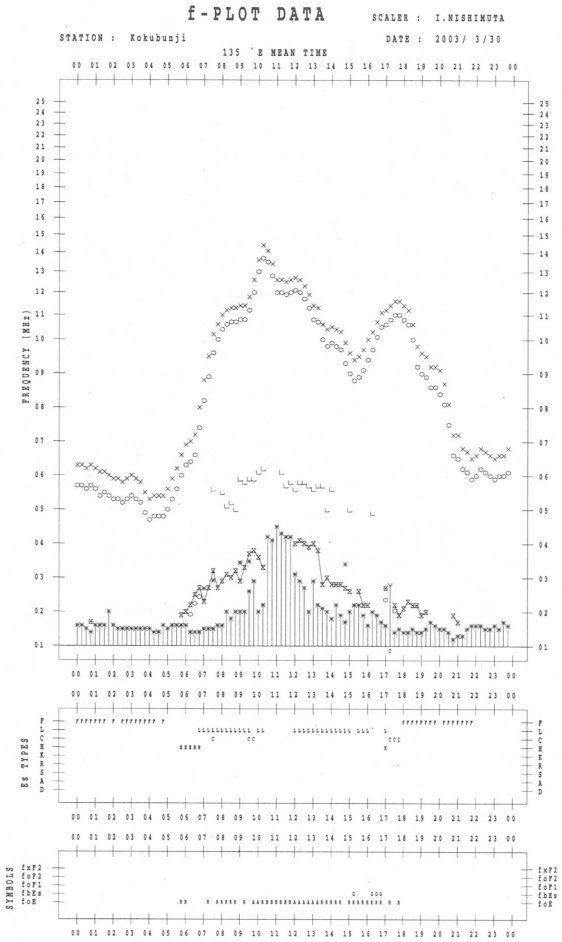
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 3/30
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 March 2003

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

Note: No data is available during the following periods.
15th 0055 - 15th 0845 21st 0110 - 21st 0250 21st 0505 - 21st 0620
A superscript * stands for being superposed on a burst.

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 2003

Single-frequency observations

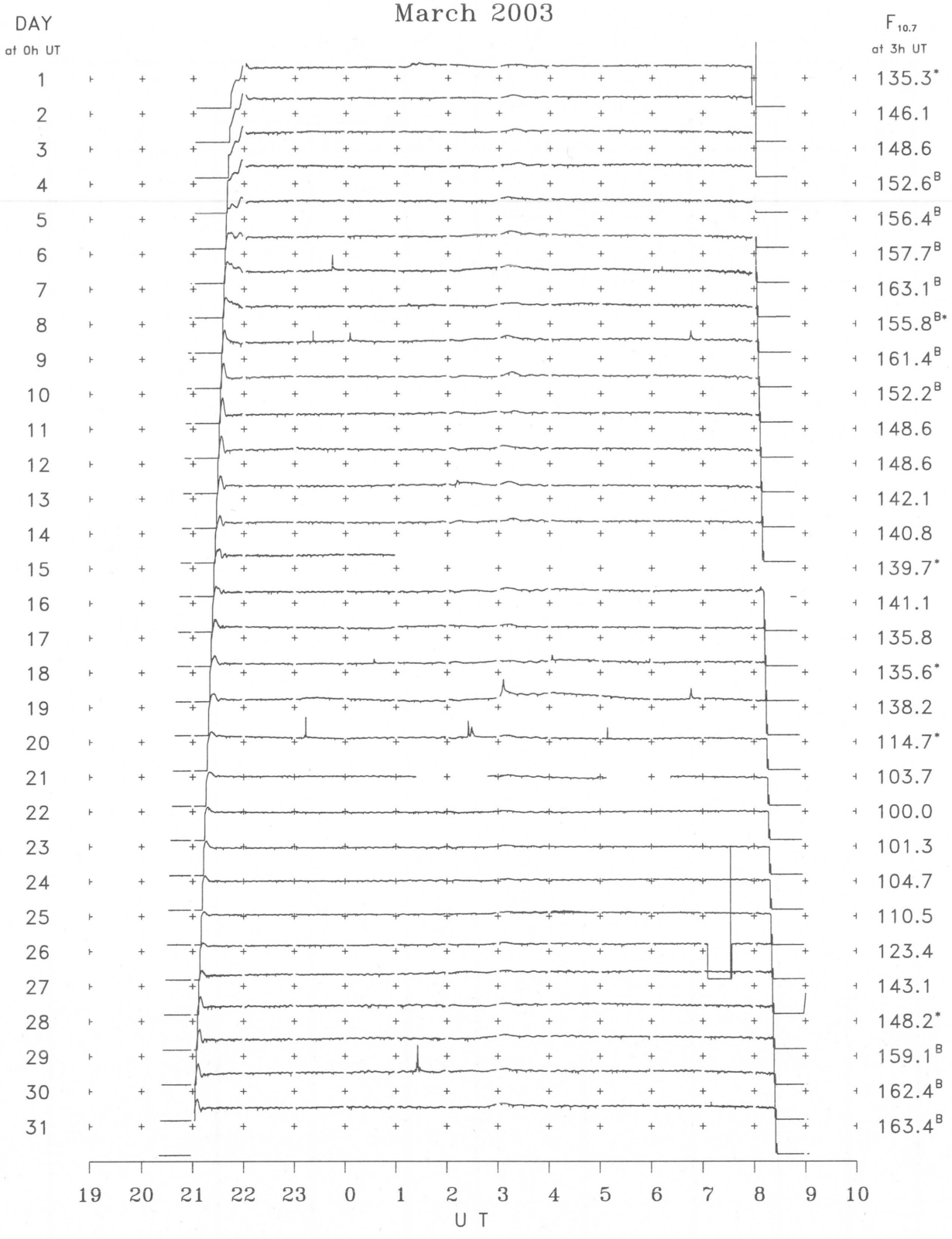
Normal observing period: 2045 - 0850 U.T. (sunrise to sunset)

MAR. 2003	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
4	500	7 C	22100	22110	17.0	25	-	0
4	500	8 S	23450	23450	1.0	30	-	WL
5	500	8 S	02590	02590	1.0	55	-	0
6	500	8 S	23430	23430	1.0	120	-	0
6	2800	8 S	23440	23440	1.0	45	-	0
7	500	8 S	02440	02440	1.0	20	-	0
8	500	8 S	01140	01150	1.0	15	-	0
8	2800	8 S	23220	23220	1.0	30	-	0
9	2800	1 S	00040	00050	2.0	25	-	0
9	500	7 C	00040	00070	4.0	20	-	0
9	500	8 S	00170	00170	1.0	150	-	0
9	2800	1 S	06440	06460	4.0	25	-	0
9	500	3 S	06450	06460	4.0	10	-	0
15	500	7 C	21400	21490	11.0	265	-	ML
18	2800	1 S	00330	00340	2.0	15	-	0
18	500	8 S	00340	00340	1.0	40	-	WL
18	2800	1 S	04030	04030	2.0	15	-	0
18	500	7 C	04050	04060	4.0	20	-	0
18	500	8 S	04520	04520	1.0	35	-	0
18	500	42 SER	05510	05550	9.0	105	-	0
18	2800	4 S/F	05580	06000	3.0	35	-	0
18	500	47 GB	08030	08030	1.0	530	-	0
19	2800	3 S	03010	03060	9.0	50	-	0
19	2800	3 S	06450	06460	4.0	30	-	0
19	500	8 S	21350	21350	1.0	15	-	0
19	2800	1 S	21580	21580	2.0	15	-	0
19	500	8 S	21580	21580	2.0	80	-	ML
19	2800	8 S	23130	23130	1.0	55	-	0
20	500	8 S	01540	01540	1.0	20	-	WL
20	2800	7 C	02240	02250	8.0	45	-	0
20	500	7 C	05070	05080	3.0	30	-	0
20	2800	8 S	05080	05080	1.0	35	-	MR
30	2800	7 C	01240	01250	6.0	70	-	0
30	500	8 S	01580	01580	1.0	40	-	0
30	500	8 S	21460	21460	1.0	15	-	0

B. Solar Radio Emission

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

March 2003



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

IONOSPHERIC DATA IN JAPAN FOR MARCH 2003
F-651 Vol.55 No.3 (Not for Sale)

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☎ (042) (327) ７４７８(直通)

Queries about "Ionospheric Data in Japan" should be forwarded to :
Communications Research Laboratory, Independent Administrative Institution, 2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN