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IONOSPHERIC DATA IN JAPAN

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CONTENTS

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INTRODUCTION

This Series contains data on ionosphere (I) , solar radio emission (S) and radio propagation (P) obtained at the following stations under the Communications Research Laboratory, Independent Administrative Institution in Japan.

Station	Geographic		Geomagnetic		Technical Method	
	Latitude	Longitude	Latitude	Longitude		
Wakkanai	45°23.5'N	141°41.2'E	35.3°N	206.5°	Vertical Sounding	(I)
Kokubunji	35°42.4'N	139°29.3'E	25.5°N	205.8°	Vertical Sounding	(I)
Yamagawa	31°12.1'N	130°37.1'E	20.4°N	198.3°	Vertical Sounding	(I)
Okinawa	26°40.5'N	128°09.2'E	16.5°N	161.7°	Vertical Sounding	(I)
Hiraiso	36°22.0'N	140°37.5'E	26.3°N	206.8°	Solar Radio Emission	(S)
Inubo	35°42.2'N	140°51.5'E	25.6°N	207.0°	Radio Receiving	(P)

A. IONOSPHERE

Ionospheric observations are carried out at the above four stations in Japan by means of vertical sounding using ionosondes. The ionosonde produces ionograms, which are recorded digitally on computer storage medium. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled as well by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five factors of ionospheric characteristics are published for the present. The reliability of these factors has been ascertained by comparison of the automatically-scaled parameters with the manually-scaled values of large amounts of test ionograms.

The published data consist of tabulations of hourly values of three factors (*foF2, fEs, fmin*) and monthly medians of two factors (*h'Es ,h'F*), daily Summary Plots and monthly medians plot of *foF2*.

a. Characteristics of Ionosphere

foF2	Ordinary wave critical frequency for the ***F2*** layer
fEs	Highest frequency of the ***Es*** layer whether it may be ordinary or extraordinary
fmin	Lowest frequency which shows vertical iono-spheric reflections
h'Es ***h'F***	Minimum virtual height on the ordinary wave for the ***Es*** and ***F*** layers, respectively

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

C Impossible measurement because of any failure in observation.

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

N Impossible automatic scaling because of complex echoes.

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

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

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

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

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

fxI	Top frequency of spred ***F*** trace
foF2 ***foF1*** ***foE*** ***foEs***	Ordinary wave critical frequency for the ***F2***, ***F1***, ***E*** and ***Es*** including particle ***E*** layers, respectively
fbEs	Blanketing frequency of the ***Es*** layer, e.g. the lowest ordinary wave frequency visible through ***Es***
fmin	Lowest frequency which shows vertical ionospheric reflections
M(3000)F2 ***M(3000)F1***	Maximum usable frequency factor for a path of 3000 km for transmission by ***F2*** and ***F1*** layers, respectively
h'F2 ***h'F*** ***h'E*** ***h'Es***	Minimum virtual height on the ordinary wave for the ***F2***, whole ***F***, ***E*** and ***Es*** layers, respectively
Types of ***Es***	See below b. (iii)

b. Symbols

(i) Descriptive Letters

The following letters are entered after, or used to replaced a numerical value on the monthly tabulation sheets, if necessary.

A Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.

B Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.

C Measurement influenced by, or impossible because of, any non-ionospheric reason.

D Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.

E Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.

F Measurement influenced by, or impossible because of, the presence of spread echoes.

G Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.

H Measurement influenced by, or impossible because of, the presence of a stratification.

K Presence of particle *E* layer.

L Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.

M Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

P Man-made perturbations of the observed parameter; or spur type spread *F* present.

Q Range spread present.

R Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.

S Measurement influenced by, or impossible because of, interference or atmospherics.

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

V Forked trace which may influence the measurement.

W Measurement influenced or impossible because the echo lies outside the height range recorded.

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

The following letters are entered in the first column before a numerical value on the monthly tabulation sheets, if necessary.

A Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

O Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)

T Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.

U Uncertain or doubtful numerical value.

X Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

When more than one type of *Es* trace are present on the ionogram, the type for the trace used to determine *foEs* must be written first. The number of multiple trace is indicated after the type letter.

The types are:

f An *Es* trace which shows no appreciable increase of height with frequency.

l A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.

c An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)

h An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)

q An *Es* trace which is diffuse and non-blanketing over a wide frequency range.

r An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.

a An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.

s A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.

d A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.

n The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.

k The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

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

Median count (**CND**) is the number of values from which the median has been computed. In addition to numerical values, the count may include certain descriptive letters.

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

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

B. SOLAR RADIO EMISSION

Solar radio observations at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of three parabolic antennas, one with 10-meter diameter for 200 MHz Measurement, one with 6-meter diameter for 500 MHz measurements and one with 2-meter diameter for 2800 MHz measurements, each being equipped with a pair of crossed doublet antennas as a primary radiator, and three appropriate receivers. Each pair of the crossed doublet antennas is used as a polarimeter. Observations are continuously carried out almost from sunrise to sunset.

B1. Daily Data at Hiraiso

The three-hourly mean and daily mean values of the solar radio emission intensities are tabulated for 500 MHz measurements. The intensities are expressed by the flux density in 10^{-22} Wm^{-2} Hz^{-1} unit.

The following symbols are used in the tables, when interference or radio bursts prevented measuring the base-level flux densities or determining the variability indices:

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

Daily data within parentheses mean that the observation time does not exceed one third of the period.

B2. Outstanding Occurrences at Hiraiso

The table is a list of outstanding occurrences of solar radio emission bursts observed at 200, 500 and 2800 MHz during a month.

Listed in the table are the date, frequencies, the type of event, the start time and the time of maximum, both in U.T.

expressed in hours, minutes and tenths of a minute, the duration in minutes, the peak and mean flux densities in 10^{-22} Wm^{-2} Hz^{-1} unit, and the polarization.

The type of event is expressed by a combination of a numerical code and a letter symbol in accordance with the "Descriptive Text of Solar Geophysical Data, NOAA" as defined by H. Tanaka in the "Instruction Manual for Monthly Report of Solar Radio Emission, WDC-C2" in January 1975:

SGD Code	Letter Symbol	Morphological Classification
1	S	Simple 1
2	S/F	Simple 1F
3	S	Simple 2
4	S/F	Simple 2F
5	S	Simple
6	S	Minor
7	C	Minor+
8	S	Spike
20	GRF	Simple 3
21	GRF	Simple 3A
22	GRF	Simple 3F
23	GRF	Simple 3AF
24	R	Rise
25	R	Rise A
26	FAL	Fall
27	RF	Rise and Fall
28	PRE	Precursor
29	PBI	Post Burst Increase
30	PBI	Post Burst Increase A
31	ABS	Post Burst Decrease
32	ABS	Absorption
40	F	Fluctuations
41	F	Group of Bursts
42	SER	Series of Bursts
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

The polarization is expressed by the polarization degree and sense as follows:

R or L	right or left-handed polarization,
W, M or S	weak, moderate or strong polarization,
0	almost zero or unable to detect polarization due to small increase of flux,
00	polarization degree of less than 1

One of the following symbols may be attached after numerical values, if necessary.

D	greater than, or later than,
E	less than or earlier than,
U	approximate, or uncertain.

B3. Summary Plots of F10.7 at Hiraiso

The 10.7 cm solar radio flux at Hiraiso is plotted over a one month period. The 10.7 cm flux ($F_{10.7}$) is determined by adjusting the 10.7 cm radio flux measured at Hiraiso to the Pentincton 10.7 cm radio flux. The figure on the right-hand side shows the $F_{10.7}$ index estimated at Hiraiso.

The following symbols are used in the $F_{10.7}$ index:

*	Measurement made not at 3h U.T..
B	Measurement affected by bursts.

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

The phase values of eight OMEGA radio signals as received at Inubo are depicted for an interval of one month, along with the phase deviation defined as a deviation from a value averaged over the six quietest day within the month. Particulars of the received signals are given in the table below.

In each of the four panels of the figure, the phase (ϕ) is shown in the lower part and the phase deviation ($\Delta\phi$) is shown in the upper part. The phase data are sampled every 30 min, so the curves of the phase and phase deviation are composed of 48 data points per day. The phase delay is measured as a positive value.

The polar cap phase anomaly (PCPA) caused by the solar protons are well detected on the Norway signal. The start, end and maximum times of the PCPA are listed in the table next to the figure, where the times are expressed as day/hour & minute in U.T.. The maximum phase deviation in the list is defined as a phase advance (negative values in the figure) in degrees.

C2. Sudden Phase Anomaly (SPA) at Inubo

Data of sudden phase anomaly (SPA) are prepared from the records of phase measurement of VLF radio waves received at Inubo. The transmitting stations are listed in the following table.

Phase advance is shown in unit of degree at its maximum stage. No transmission or no reception during the period is indicated by -, an indistinguishable record is spaced out, and a multi-peak event is marked by *. The most remarkable or distinct phase advance is underlined and listed in the column of *Time*.

In table (b) SPA, *date* indicates the day to which the *start-time* of the event belongs.

The following letters may be attached to the value, if necessary.

D	greater than,
E	less than,
U	uncertain or doubtful.

Transmitting Stations						
Name	Location (Geographic Coordinates)		Call Sign	Frequency (kHz)	Radiation Power (kW)	Arc Distance from Inubo (km)
Norway	66°25'N	013°08'E	/N	13.6	10	7820
Liberia	06°18'N	010°40'W	/L	13.6	10	14480
Hawaii	21°24'N	157°50'W	/H	13.6	10	6100
North Dakota	46°22'N	098°20'W	/ND	13.6	10	9140
La Reunion	20°58'S	055°17'E	/LR	13.6	10	10970
Argentina	43°03'S	065°11'W	/AR	13.6	10	17640
Australia	38°29'S	146°56'E	/AU	13.6	10	8270
Japan	34°37'N	129°27'E	/J	13.6	10	1040
North West Cape	21°49'S	114°10'E	NWC	22.3	1000	6990

HOURLY VALUES OF foF2 AT Wakkanai

JAN. 2003

LAT. 45°23.5'N LON. 141°41.2'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	40	42	41	40	41		A	47	70	83	93	82		72	71	62	58	52				34	38	39
2		42			40	37	37	46	76	84	90	82		73	72	72	57	54	A		A			
3	A	A	34	34	37	32	32	44	73	94	93	92	90	91	76	70	68	65	37	34	32	34	38	40
4	42	46	47		44	48	34	53	84		93				93	91	82	80	54	25	38	54	54	52
5	44	54	61	62	33	38	29	58	102						82	77	67	66	63		41	45		
6		32	32	32	44	35	35	52	75	90	94	93	88	84	82	66	61	46	43	32	32	34	48	41
7	42	43	45	40	41	43	42	54	70	92	91	88	77	81	82	77	63	46	41	34	32	40	34	45
8		43	42	32		35	36	44	78	93	94	94	84	83	78	85	70	60				41	36	45
9	40	40	43	44	44	42	32	47	82	99	105	96	92	92	84	82	72	63	53	40		37	34	43
10	40	40	44	44	47	42	44	58	81	104		106	93	84	92	91	83	72	62	42	32	40	43	38
11	40	40	34	37	24	26	29	50	102	90		93	92	96	91	92	84	67	57	38	38	38	36	37
12	40	41	40	38	38	34	34	54	84		109			94	92		84	74	66	58	42	45	44	
13	45	44	43	46	42	40	40	54	106	91		124	94	95	92	90	84	61	54	51	38	41	32	40
14	32	40	34	40	37	36	38	54	83	93		93		92	102	92	77	66	53	44	44	44	44	40
15	43	42	38	41	32	40	28	52	81		93	103		103	91	81	72	58	50	32			35	34
16				34	37	34	35	48	75	90	99		91	91	85	77	77	55	48	40	34	36	31	37
17	38	37	36	34	34	34	36	53	89	94			93	91	88	70	71	70	41	35	34	36	36	31
18	37	40	36	34	32	34	38	53	77	94	104			94	91	84	72	63	60	50	40	41	38	30
19	34	37	32	42	34	34	34	47	90	95			104	95	93	81	75	67	49	54	43	34	29	32
20	32	32			32		32	52	84	91	105	94	103	92	91	90	71				32	36	36	34
21	36			34	36			53	87	95	93	94	91	94	93	77	76	60	54		29		34	34
22	40	40	40	41	42	40	40	62	85	92	93	93	90	93	82	80	76	68	54	34		32	32	32
23	32	34	34	34	37	34	32	49	78	88	89	94	81	82	82	84	72	58	46	42	43	31	40	34
24	34	29	32	36	31	37	37	54	81	82	94		90	93	82	80	62	62	49	36	38	44	46	40
25	32	36	32	32	37	37	41	57	81	84	92	93	94	90	93	92		72	53	25	36	37	31	34
26	36	32	34	32	34	31	32		90	93	94	90	93	77	83	72	70	50	50	41	41	32	36	37
27	32	34	34	32	32	34	32	47	81	81	93	94	94	82	90	81	72	71	57	54	42	32	37	38
28	32	32	42	44	40	36	35	53	80	94	92	84	80	82	92	82	75	58	51	57	38	32	40	36
29	34	37	36	37	40	35	31	50	80	84	92	83	80	81	81	76	72	58	53	53	36	28		
30	32	34	34	24	35	32	28	53	91		93	88		92	88	92	72	61	66	52	46	48	50	46
31		45	54	32	32	40	41	52	80	93	91	92	103	91	84	84	76	70	54	50	47	44	42	45
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	28	27	28	30	28	29	30	31	26	24	23	22	29	31	30	30	30	27	25	25	28	28	27
MED	37	40	36	36	37	36	35	52	81	92	93	93	92	91	88	81	72	62	53	41	38	37	36	38
U Q	40	42	43	41	41	40	38	54	87	94	94	94	94	93	92	90	76	68	57	51	42	42	42	41
L Q	32	34	34	33	33	34	32	48	78	88	92	88	88	82	82	77	70	58	49	34	33	34	34	34

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

JAN. 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	G	G	30		66	71	40	G	G	G	G	G	G	G	G	24	33	46	40	32	29	28	28
2	45	34	46	48	34	G	30	G	G	G	G	G		G	46	63	41	28	80	42	50	40	33	35
3	30	30	26	26	29	G	G	26	37	41	G	G	G	G	G	G	30	38	G	G	G	23	G	G
4	30	27	G	G	32	27	G	G	G	G	G			46	35	G	G	60	57	33	30	G	G	G
5	G	G	G	G	G	27	G	43	29		G	G	G	G	G	33	46	52	46	44	40	40	45	43
6	38	G	G	58	39	32	33	38	G	G	G	G	G	G	G	G	G	G	37	G	G	G	32	28
7	G	G	G	G	G	G	G	G	29	G	G	G	G	G	G	G	G	G	G	G	G	28	G	28
8	30	30	27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	47	79	60	37	G	G	G
9	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G	G	G	G	G	G		G	G	32
10	27	G	G	G	G	G	G	G	G	G		38	G	45	40	32	34	G	31	G	G	G	G	29
11	26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	37	33	27	G	28	32	G	G
12	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	25	G	23
13	G	27	29	28	G	G	G	G	34	39	G	G	39	G	G	G	32	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G		G	39		G	G	G	G	G	G	G	26	28	27	33
15	29	G	30	25	G	G	G	39	84		G	G		G	G	G	32	42	38	34	33	32	G	30
16	39	39	32	G	G	28	26	30	36	37	G	G	G	G	39	G	G	G	G	28	29	26	G	G
17	G	G	G	G	G	G	G	G	34	G	46		G	G	G	G	G	28	G	G	G	26	28	34
18	29	28	30	30	G	G	G	30	G		38	G		38	G	G	G	34	29	G	G	G	G	G
19	G	G	G	29	24	27	25	G	29	G		44	44	G	44	33	26	24	27	25	G	G	G	G
20	G	G	26	30	28	33	26	G	34	G	G	G	G	48	46	52	44	61	47	38	G	G	32	29
21	G	37	32	27	33	27	34	34	32	34	G	G	G	44	G	45	62	42	58	36	G	28	G	24
22	G	G	G	27	29	G	G	32	34	G	G	G	G	G	G	G	G	G	G	G	29	26	26	G
23	G	26	G	G	G	G	24	G	G	G	G	G	G	38	G	34	50	31	29	33	G	G	G	G
24	G	G	G	G	G	G	G	28	G	G	G		G	G	G	G	G	G	G	G	G	34	33	26
25	G	G	G	G	G	G	33	29	G	G	G	G	G	G	G	G	G	G	38	33	27	33	26	G
26	G	G	G	G	G	G	G	33	51	G	G	G	G	G	G	G	G	G	G	26	G	G	G	G
27	G	G	G	G	G	G	27	G		G	G	G	G	G	G	G	G	G	G	32	G	G	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
29	G	G	G	G	G	G	29	N	G	37	G	G	G	G	G	G	G	G	G	G	G	G	33	28
30	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	29	G	29	G	32	G	30	26
31	33	G	11	25	G	G	26	G	G	G	G	G	G	G	G	G	G	42	32	35	30	G	27	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	31	31	30	30	26	29	27	26	31	31	31	31	31	31	31	30	31	31	31
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	G	G	G	G	23
U Q	29	27	26	27	24	27	26	30	34	G	G	G	G	G	G	32	32	38	38	34	30	28	28	29
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

JAN. 2003

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	34	38	37					51	75	86	92	100	82	74	67	71	67	53	62	39				
2		35	32	36	31	28	26	54	85	96	97	87	80	81	84	80	78	55	52	58	47	32	34	36
3	32		30	28	27	30	27	54	69	85	117	130	102	80	81	78	74	66	64	34	30	26	34	27
4	34	36	41	34		36	36	58	102	132	135	114	112	102	101	101	104	86	72	58	45	47	45	47
5	48	51	48	48	38	37	36	66	104	125	135	131	122	96	95	82	72	64	53	39	36		38	39
6	43	47	43					50	87	81	107	112	102	84	86	86	71	54	49	48	42	39		42
7	36	34	34	28		31	26	61	73	85	106	102	105	91	96	93	77	51	52	41	36	28		43
8	36	34	25				28	66	87	92	98	107	107	105	98	88	81	55	49	43	36	34	37	
9		39	41	41	34	34	36	66	81	105	118	132	112	116	116	96	76	69	63	54	36	32		41
10	37	38	42	42	39	39	43	66	80	102	101	101	112	121	116	117	92	74		51	42	38	43	42
11		32	46			30	37	64	82	114	116	116	127	102	101	110	97	74	67	63	44	30	A	A
12		34	39	36	30	34	39	51	81	106	140	120	112	105	118	107	94	82	80	78	52	34	43	41
13	43	47	42	47	48	27	30	66	97	131	138	132	126	138	136	127	117	100	83	62	50	39	31	
14	34	36	34	30	27	30	34	63	86	101	112	117	114	112	90	84	81	72	58	56	52	48	44	47
15	43	43		42	42	44	45	71	92	100	135	130	114	101	96	104	85	64	61	54	38	27	38	41
16	43	34	36	34	32	34	28	59	85	92	108	116	120	108	100	88	80	75	51	49	39	31	36	39
17	36	36	34		27	28	27	63	84	105	124	125	102	90	91	88	78	71	66	53	48	41	32	34
18	34	36			30	34	34	54	65	91	113	120	110	91	86	91	80	67	62	61	48	44	37	38
19	36	32	44		27	31		59	94	131	145	142	107	87	88	90	80	63	59	50	50	27	21	34
20	32	34		32		36	32	54	102	122	121	108	117	121	106	107	85	59	35	48	42	31	36	32
21	32	34	32	36		34	31	60	87	108	122	127	110	100	97	98	77	76	51	59		A		32
22	34	36	36	23				69	90	91	98	101	100	84	86	87	81	75	77	48	23	32	27	
23	39	38	34	28	30	28	34	64	84	88	117	117	112	88	95	95	78	62		49	36	38	43	38
24		32	37	34	34	36	39	65	91	96	110	110	97	95	100	92	81	64	54	51		44	45	42
25	35	36	34	37	34	34	35	54	82	104	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	82	C	59	54	51	32	34	34
28		34	42	51	27			54	76	80	C	C	C	C		C	81	69	64	54	34	36	32	39
29	36	32	34	38	34	26	32	66	81	84	81	93	88	85	84	81	82	75	57	49	47			32
30	34	34	32	36			25	58	76	93	115	108	104	101	94	82	85	67	57	64	49	36	34	43
31	39	40	38	30	30	28	36	58	73	101	122	121	98	94	84	84	82	77	64	54	51	49	49	42
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	28	26	22	19	23	24	29	29	29	27	27	27	27	27	27	29	28	27	29	26	25	22	24
MED	36	36	36	36	31	34	34	60	84	100	116	116	110	96	95	90	81	68	59	53	43	34	36	39
U Q	39	38	42	41	34	36	36	66	90	107	124	127	114	105	101	101	85	75	64	58	49	40	43	42
L Q	34	34	34	30	27	28	28	54	78	89	106	107	102	87	86	84	77	62	52	48	36	31	34	34

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Kokubunji

JAN. 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	32	G	30	G			G	G	G	G	G	G	G	G	G	G	G	G	29	32	33	25	28
2	31	22	24	29	G	G	G	G		G	52	51	62	G	G	G	34	39	48	45	24	26	26	24
3	G		G	G	G	G	G	G	G	38	69	G	G	G	G	48	52		33	29	G	G	G	G
4	G	G	G	G		G	G	G	G	G	45	52	67	44	G	36	G	35	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	G	40	G	G	G	G	G	37	29	G	49	29	30	G	G
6	G	G	G				G	G	G	G	G	G	G	G	G	G	35	31	48	48	39	30	33	25
7	G	G	G	G		G	G	G	32	G	G	46	G	G	G	53	46	38	G	G	24	G		G
8	G	G	G		24		G	G	38	53	G	G	G	G	G	G	G	39	58	40	G	G	G	49
9	38	28	30	26	27	24	G	G	35	52	G	G	G	G	G	G	30	31	31	27	23	29	28	30
10	G	G	G	G	G	G	G	G	G	G	G	58	51	G	55	G	G	G	G	G	G	G	G	G
11	23	31	28	28	31	G	G	G	G	G	G	G	G	48	40	G	36	30	29	27	G	G	29	33
12	G	G	G	G	G	G	24	G		39	40	G	G	42	G	G	33	48	31	G	G	G	G	G
13	G	G	G	25	25	24	G	G	G	G	52	60	49	G	G	53	30	32	28	G	G	G	G	
14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	42	31	29	G	G	G	G	G	G
15	G	G	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	23	G	G	G	G	31
16	G	29	G	28	G	G	G	G		39	42	50	G	43	40	G	G	G	G	G	G	G	G	22
17	29	G	G		G	G	G	G	G	37	39	G	G	G	39	G	G	G	G	G	G	G	G	G
18	G	G	G		G	G	G	26	33	G	G	42	G	40	G	41	G	G	24	G	G	G	G	G
19	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	31	31	G	G	30	G
20	G	25	31	G		23	25	G	G	G	G	G	G	51	57	49	39	27	G	44	G	G	G	G
21	25	G	G	G		23	G	G	G	G	47	G	41	G	G	G	31	G	30	40	53	40	39	25
22	G	G	G	25	31	46	52	46	40	61	G	G	G	G	G	G	40	50	47	26	31	26	25	35
23	G	G	G	G	G	27	24	29	37	G	G	46	49	G	G	G	38	60	48	20	G	G	31	30
24	33	28	29	G	26	G	G	G	G	G	G	G	G	G	G	G	59	60	53	G	50	28	26	G
25	G	G	G	G	G	G	G	G	50	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	C	G	G	G	G	G	G
28	29	G	G	G	33		G		G	N	C	C	C	C		C	G	G	G	G	G	G	G	G
29	G	G	G	G	G	G	G	27	35	G	G	G	G	G	G	G		G	27	33	34		G	G
30	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	45	G	53	24	G	G	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	29	24	23	25	28	28	26	28	27	27	27	27	27	27	28	27	29	29	29	28	28	28
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	29	24	G	G	G	G	G
U Q	12	11	G	25	25	12	G	G	33	19	40	46	G	G	G	41	36	39	32	32	26	26	26	26
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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Yamagawa

JAN. 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	41	36	43	34					81	84	81	98		82	80	80	82	68	54	54	66			34
2	34		36	26		29			78	103	107	86	87	79	82	99	86	80	52	53	72	78	53	43
3	44	32	36	36			28	36	73	78	113	130	111	82	81	82	90	80	66		34	43	34	32
4	34	34	41	28	34	37	34	43	81	104	112	111	125	86	86	97	106	81	77	58	50	44	50	44
5	43	43	47	34	32	34	32	47	87		128	141	139	112	86	86	82	81	74	55	49	44	36	34
6	34	40	43	37				41	77	82	104	104	121	108	112	88	82	77	56	A	51			42
7	42	36	37	34	37	29	28	44	81	82	115	114	128		146	146	115	82	66	54	48	50	49	
8		34					23	48	88	102		112	128	138	127	117	111	84	66	53	57	44	34	36
9	34	34	36	36	34	28	28	51	81	81			136	130	138	127	111	78	80	66	54	34	32	42
10	36		36		37	34		52	80	80	106	106	131	146	157	165	165	142		78	76		47	36
11		34	43	37	28		34	47	76	84	111	127	130	111	111	111	113	107	82	73	62	46	32	29
12	36	32	32	36	37	34	34	47	76	82	111	117	111	107	112	115	111	81		80	74	49	36	44
13	42	48	49	48	42	28	37	53	82	107	130	128	121	124	138	142	131	143			87	78	52	37
14	42	36	34	34	30	30	28	38	82	104	87	111	128	111	87	100	86	78	76	62	51	52	43	42
15	42	34	34				32	42	82	103	121	144	127	116	111	112	114	86	78	79	52	34	24	36
16	36		41	34	34	29	28	42	89	102	106	127	130	131	118	109	92	86	80	64	54	51	53	50
17		42	34	30			28	43	87	86	102	130	123	110	86	105	109	85	75	78	77	53	47	36
18	36	36	26	28				40	75	79	88	118	114	88	86	90	91	79	80	66	52	52	47	41
19	34	43	40				34	37	77	113	147	147	113	86	88		85	81	72	58	54		31	34
20	32	34	34	34	32	32	34	37	79	115	120	130	146	152	155	148	128		67	54	51	49	34	34
21		34	34	36	28		26	37	84	88	111	146	132	130	128	130	111	82	78	66	52	38	37	
22	34	28	34	32	29	34	34	47	78	81	86	111	87	81	85	90		84	80	77	54	31		34
23	42	42	38	28		28	34	51	80	82	92	130	131	109	86	86	86	84	74	62	54	41	34	50
24	36	36	36				34	43	81	111	113	119	127	113	111	105		77	78	54	52	48	39	37
25					32	35	34	42	73	84		151	127	111	110	128	130	113	86	76	52	36	44	34
26		36	47				32	50	76	78	114	131	115	126	110	86	77	82	73	52	50	53	49	40
27	34				32	32	36	46	71	81	97	106	111	85	79	C	84	78	77	66	67	49	34	32
28	32	32	34	40	34		26	42	76	70			110	106	89	80	75	80		66	51	42	36	32
29		40	35	41	36	36	38	50	85	84	78	81	86	100	86	86	85	90	70	63	53	54	53	43
30	39	36	34		28		30	36	76	83	107	124	99	105	110	84	82	78		57	53	44	34	34
31	50	42	36	26		28	34	43	76	115	114	114	88	86	86	80	78	81	82	51	52	54	48	34
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	24	26	28	22	18	17	26	29	31	30	27	29	30	30	31	29	29	30	26	28	31	27	28	29
MED	36	36	36	34	33	32	33	43	80	84	111	119	124	110	110	100	91	81	76	62	53	48	38	36
U Q	42	40	41	36	36	34	34	47	82	103	114	130	130	124	118	122	112	85	80	69	62	52	48	42
L Q	34	34	34	30	30	28	28	40	76	81	97	111	111	86	86	86	83	79	67	54	51	42	34	34

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Yamagawa

JAN. 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	G	G	29	26	G				G	G	48	44	46	G	G	G	G	39	43	35	28	G	28	G
2	26	28	G	G	25	G			G	G	42	49	46	64	G	44	G	34	28	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	56	51	45	43	46	38	28	40	68	35	29	28	24
4	G	G	G	G	G	G	G	G	G	39	49	61	56	51	47	44	G	G	G	29	G	24	G	G
5	G	G	G	G	G	G	23	G	G		G	G	G	43	G	G	G	33	32	23	G	G	G	G
6	G	G	24	G		G	G	G	G	G	G	G	43	G	G	57	38	G	43	68	28	60	54	26
7	G	G	G	G	G	G	G	G	G	G	G	G	58		50	G	G	G	28	27	G	G	G	
8		G		G	G	G	G	G	34	44		G	G	49	G	54	G	49	34	41	40	32	25	G
9	28	G	G	G	G	G	G	G	G	G	41		G	G	G	G	38	G	G	G	G	G	G	G
10	G		G		G	G	G	11	32	G	40	G	G	50	G	G	G	G	G	G	40	28	G	G
11	36	G	G	25	G	G	G	24	G	G	G	G	G	G	G	G	G	G	30	28	G	26	G	G
12	G	24	G	G	G	G	G	G	G	G	42	G	G	G	G	G	44	G		G	G	G	G	28
13	G	G	26	G	G	G	G	G	G	G		46	G	61	G	G	50	38	36	33	26	G	G	G
14	G	G	G	G	G	G	G	G	G		G	G	48	G	G	G	G	G	24	26	G	G	G	G
15	G	G	G	37	28	26	G	23	G	G	G	G	G	G	41	G	G	G	34	G	G	33	G	32
16	G	40	G	G	G	G	G	G	G	G	G	G	G	G	42	44	36	G	G	G	G	G	G	28
17	57	28	24	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G
18	G	G	G	G	G			G	G	G	G	G	G	G	53	56	51	48	60	52	28	28	G	G
19	G	G	G	G	25	32	24	G	G	G	G	46	54	G	G	41	39	41	25	G	G	34	G	G
20	G	G	G	G	G	G	24	G	G	G	G	G	49	51	51	40	G		30	24	G	23	33	G
21		G	G	G	G	G	G	G	G	G	G	46	G	G	G	G	G	G	29	30	30	25	G	25
22	G	G	G	G	G	23	G	G	48	57	N	G	G	G	G	40		31	27	G	27	33	28	G
23	G	G	G	G	G	22	G	G	G	G	G	G	50	G	G	G	G	34	40	29	28	33	G	29
24	24	26	G	29	26	30	G	G	G	G	G	G	G	G	G	G	41	32	28	G	G	G	G	34
25		28	25		G	G	G	G	G	G		G	G	G	G		G	G	G	G	G	28	G	26
26	32	24	28	26	23	G	G	G	G	G	G	G	G	G	41	G	G	G	28	G	22	23	29	G
27	23	39	29	29	23	G	G	G	G	G	N	47	61	G	G	C	G	G	28	G	G	25	G	G
28	G	G	G	25	G		G	G		39	G	G	G	G	G	44	42	35	33	G	G	G	G	G
29		G	G	G	G	G	G	G	G	G	G	G	G	G	G	58	40	40	32	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	41	65	27	G	G	G	G
31	G	G	G	G	G	G	G	G	G	G	44	G	49	G	59	48	62	G	23	33	24	24	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	30	30	29	30	28	28	29	30	29	26	30	31	30	31	28	30	30	30	31	31	31	31	30
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	23	G	23	G	G
U Q	23	24	G	13	G	G	G	G	G	G	40	44	49	43	41	44	39	35	34	30	28	28	G	25
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Yamagawa

JAN. 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	16	15	14	16	15				16	15	16	27	28	18	27	18	28	15	15	14	17	16	15	17
2	14	14	16	17	15	15			15	16	17	18	18	17	17	14	15	14	15	15	16	16	17	18
3	15	18	15	15	14	16	17	15	15	16	18	20	32	28	27	17	15	15	14	15	15	14	14	15
4	15	15	17	15	17	15	16	14	15	18	18	33	34	29	24	18	15	21	14	15	16	15	17	14
5	15	15	15	15	16	18	15	15	15		20	22	26	28		18	16	14	14	14	15	16	16	17
6	18	16	15	15		16	17	14	23	18	18	35	23	29	20	18	16	15	15	15	14	15	14	15
7	15	15	14	20	14	14	16	15	14	15		18	35		29	21	20	18	17	14	16	14	15	
8		17		15	15	16	17	15	16	18		24	27	28		21	17	16	16	14	14	14	15	15
9	15	15	15	15	14	16	15	15	23	16	17						15	15	15	17	15	16	15	15
10	16		17		15	15	18	15	15	17	28	29	28	27	18	20		29	18	17	14	15	16	18
11	14	15	16	15	15	15	15	15	24	16	18	18	24	22	26	17	16	15	14	15	16	16	15	15
12	15	15	16	15	15	16	16	15	24	16	14	18	18	17		16	15	14		17	16	16	15	15
13	15	15	14	15	15	14	15	14	27	16	16	17	18	17	21	16	14	15	14	14	15	16	20	15
14	15	16	15	15	15	15	16	15	17	16	17	22		20		21	18	15	16	15	18	16	15	15
15	16	15	15	15	15	14	15	16	22	15	18	18	20	18	18	16	15	16	15	15	15	14	18	15
16	15	15	16	16	14	15	17	15	15	16	17	17	17	21	18	18	15	15	15	15	15	17	20	15
17	14	14	15	15	16	17	16	14	15	15	16	20	18	18	21	20	20	22	15	15	15	15	15	15
18	14	15	15	15	16			15	15	15	18	17		17	17	18	14	15	14	15	15	16	15	15
19	16	15	15	15	16	14	15	15	14	15	15	17	26	18	17	16	14	14	15	15	18	15	16	21
20	15	15	15	15	15	14	15	15	24	15	16	17	22	21	18	16	15		15	15	15	15	14	16
21		15	15	15	15	20	15	15	28	16	18	18			17	21	15	17	15	16	15	15	15	16
22	15	15	15	15	15	15	16	15	14	15	15	15			28	20		15	15	15	15	15	15	16
23	15	14	14	15	16	15	15	15	15	16	18		18		20	16	15	14	15	15	15	15	16	15
24	14	15	15	15	15	14	15	15	14	16	18	22		46	22	18	16	16	15	17	14	15	15	14
25		16	15		18	15	15	15	14	15		27	23	18	17	16	16	14	16	15	15	15	15	16
26	15	15	14	14	16	15	15	14	15	15	17	20		20	28	18	18	15	15	15	15	15	14	15
27	14	14	14	14	15	15	15	15	23	15	16		20	20	18	C	15	14	14	15	14	15	15	14
28	15	15	14	15	14		16	15	15	16	21	17	24	17	14	14	14	17	15	15	14	15	14	14
29		17	16	16	16	17	15	15	15	16	20		18	18	45	20	15	15	14	15	14	14	16	15
30	15	15	15	18	15	18	15	15	16	16	18		24	23	20	18	17	15	15	15	15	15	15	15
31	15	15	15	16	15	15	15	15	24	17	17	18	20	18	18	22	15	15	15	15	16	18	15	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	30	30	29	30	28	28	29	31	30	28	26	24	26	26	29	29	30	30	31	31	31	31	30
MED	15	15	15	15	15	15	15	15	15	16	18	18	23	20	20	18	15	15	15	15	15	15	15	15
U Q	15	15	15	15	16	16	16	15	23	16	18	22	26	27	26	20	16	16	15	15	16	16	16	16
L Q	15	15	15	15	15	15	15	15	15	15	16	17	18	18	18	16	15	15	14	15	15	15	15	15

HOURLY VALUES OF foF2 AT Okinawa

JAN. 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	66	60	47	37				32	88	122	108	88	106	104	94	94	102	91	64	81	105	74	44	34
2	36	38	41	30	A	A		35	81	107	114	107	101	108	123	131	138	127	108	90	97	134	89	51
3	44	43	50	44				36	76	86	120	128	122	100	91	94	104	92	62	70	74	74	53	36
4	34	37	40	34	32	45	40	48	87	110	110	117	124	111	101	106	110	88	86	73	78	66	50	50
5	42	47	54	40			29	45	98	96	118	145	146	145	131	112	102	94	78	60	66	76	54	34
6	38	42	40	40		A		43	90	101	111	124	148	145	150	145	131	108	84	50	66	84	54	
7	42	46	41	46	39			42	101	100	112	138	144	153	153	149	154	141	118	83	82	80	73	64
8	51	46	35					44	98	111	116	134	150	172	174	154	150	146	108	88	86	87	50	
9	54	53	52	51	40			44		105	105	141	148	169	172	173	157	142	123	106	86	76	54	58
10	48	40	41	42	38		29	48	91	90	91	107	146	170	170	156	156	145	134		110	86	53	53
11	40	36	50	36	32		34	54	81	90	101	128	126	121	128	139	146	146	134	108	106		65	36
12	34	36	34	30	34	30	28	45	82	96	114	111	108	110	116	125	114	112	105	87	85	63	51	43
13	40	42	47	34	29			47	89	108	130	125	131	137	144	148	144	150		146	146	141	108	88
14	88	88	65	42	34	30		40	94	120	117	107	128	127	110	108	110	107	101	82	76	82	62	48
15	54	41	36	31				37	94	115	125	137	137	144	147	142	141	136	127	126	102	78	66	42
16	42	40	43	34	30			38	88	110	118	122	134	143	140	134	131	142	131	108	103	108	88	84
17	73	54	43	29				38	98	111	108	130	143	135	131	131	134	131	131	126	131	110	88	66
18	51	54	30				26	47	81	105	107	110	114	108	104	111	114	112	104	87	78	77	73	66
19	50	54	43	30	28			37	81	110	148	152	124	127	131	121	118	105	85	76	73	76	66	53
20	47	40	34	28		34	34	43	84	136	138	145	148	152	161	148	132	132	121	80	76	74	63	47
21	44	34	34	37	35	30	26	36	86	103	122	146	146	151	151	161	152	146	121	87	105	86	44	38
22	41	40	34	34	34		28	44	90	80	91	122	122	107	110	120	108	124	98	87	86	51	42	49
23	42	50	43	36	30	29	34	48	83	98	101	126	135	131	117	110	107	107	82	72	66	63	54	66
24	61	54	44	42	31	34	36	42	88	121	130	132	159	150	170	147	142	131	111	90	88	84	66	50
25	53	42	34	36				41	78	106	118	156	145	150	171	175	170	168	147	131	85	76	73	53
26	42	53	65		30	30	32	47	82	89	102	142	141	152	150	138	130	128	128	98	86	96	87	73
27	64			41	43	37	34	47	81	101	91	111	118	121	102	93	102	101	81	78	81	73	50	37
28	36	38	36	37	30	26		38	78	101	112	118	118	110	118	97	93	104	126	102	74	63	61	47
29	34	36	34	34	30		30	38	85	102	102	96	94	118	131	136	137	130	121	107	88	104	87	72
30	64	54	45				28	36	78	105	110	135	108	118	134	118	102	100	95	62	66	64	53	53
31	54	53	45			30	34	41	73	102	122	120	118	104	104	96	82	96	90	62	64	76	51	47
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	26	18	11	16	31	30	31	31	31	31	31	31	31	31	31	30	30	31	30	31	29
MED	44	42	42	36	32	30	31	42	86	105	112	126	131	131	131	131	131	127	108	87	85	76	61	50
U Q	54	53	47	41	35	34	34	47	90	110	120	138	146	150	151	148	144	142	126	106	102	86	73	65
L Q	40	40	35	34	30	30	28	38	81	98	105	111	118	110	110	110	107	104	86	76	74	74	51	42

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

JAN. 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	33	G	G	50	44	44	G	52	43	46	30	30	28	27	28	G
2	G	G	G	40	52	39	29	G	G	G	G	45	49	60	45	74	53	43	32	G	G	G	G	G
3	G	G	G	G	G			G	G	G	42	54	66	73	62	45	43	36	53	36	G	G	G	G
4	G	G	G	G	G	G	G	G	G	40	49	86	75	56	52	63	59	59	46	30	34	26	G	G
5	G	G	G	G			G	G	G	40	G	G	G	G	G	G	38	32	G	G	G	33	36	26
6	G	G	G	G	G	43		G	G	G	G	49	51	60	52	50	46	46	36	57	26	46	33	28
7	G	32	34	G	G	G		G	G	G	G	47	50	48	46	G	G	G	G	24	69	33	G	G
8	G	G	G					G	33	45	58	74	49	65	46	G	53	31	28	52	60	34	51	50
9	45	G	G	G	G		G	G		G	G	G	G	G	G	G	37	G	G	39	29	G	G	G
10	G	G	G	G	G		G	G	G	G	41	52	51	54	116	104	47	G	G	28	36	34	G	G
11	G	G	29	G	G		G	G	G	G	G	G	G	G	G	G	38	35	G	G	G	37	G	G
12	G	G	G	G	G	G	G	G	G	36	40	43	G	43	G	G	G	G	G	G	G	G	G	G
13	G	23	G	G	G			G	G		41	43	52	52		52	64	54	50	33	G	G	28	23
14	G	G	G	G	G	G		G	G	G	G	G	50	52	46	42	G	G	G	G	G	G	G	G
15	G	29	25	G	30	33	27	G	G	G	G	G	G	G	G	G	40	G	31	G	G	G	G	G
16	G	G	G	G	G	G		G	G	G	G	G	49	G	G	G	G	G	G	G	G	G	G	G
17	G	G	28	G			24	G	G	G	45	G	G	G	G			G	G	G	G	G	G	G
18	G	G	G	G	G		G	G	G	36	G	G	G	G	G	40	G	36	G	29	G	G	G	G
19	G	G	G	G	G	G		G	G		G	G	48	60	51	43	45	38	43	37	26	G	G	G
20	G	G	G	G		G	23	G	G	G	G	G	G	55	50	53	53	40	46	11	G	G	G	G
21	G	G	G	G	24	G	G	G	G	G	G	G	G	G	G	G	G	33	36	41	G	G	G	26
22	G	G	G	G	G		G	G	G	G	40	47	G	46	45	48	G	35	G	28	28	43	G	29
23	25	G	G	G	G	G	G	G	G	G	G	47	G	G	G	G	G	36	G	G	G	30	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	47	41	34	30	11	G	G	G	G
25	G	G	G	G				G	G	G	42	G	G	G	G	G	G	G	G	G	22	G	G	27
26	G	G	G		G	G	G	G	G	G	46	45	G	G	46	46	40	34	G	11	G	G	G	28
27	G	26	36	G	24	G	G	G	G	G	45	54	49	46	G	G	G	G	43	27	25	G	G	G
28	G	G	G	G	G	26		G	G	G	G	G	48	45	G	45	45	G	G	G	G	G	G	G
29	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	G	G	G
30	G	G	G	G		G	G	G	G	G	40	46	51	75	48	G	G	36	G	G	G	26	G	G
31	G	G	G			24	G	G	G	G	40	50	52	63	50	G	78	51	45	33	G	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	28	23	18	20	31	30	29	31	31	31	31	30	30	30	31	31	31	31	31	31	31
MED	G	G	G	G	G	G	G	G	G	G	G	43	44	45	G	20	39	34	G	11	G	G	G	G
U Q	G	G	G	G	G	24	G	G	G	G	41	49	50	56	48	48	46	38	36	33	26	30	G	23
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

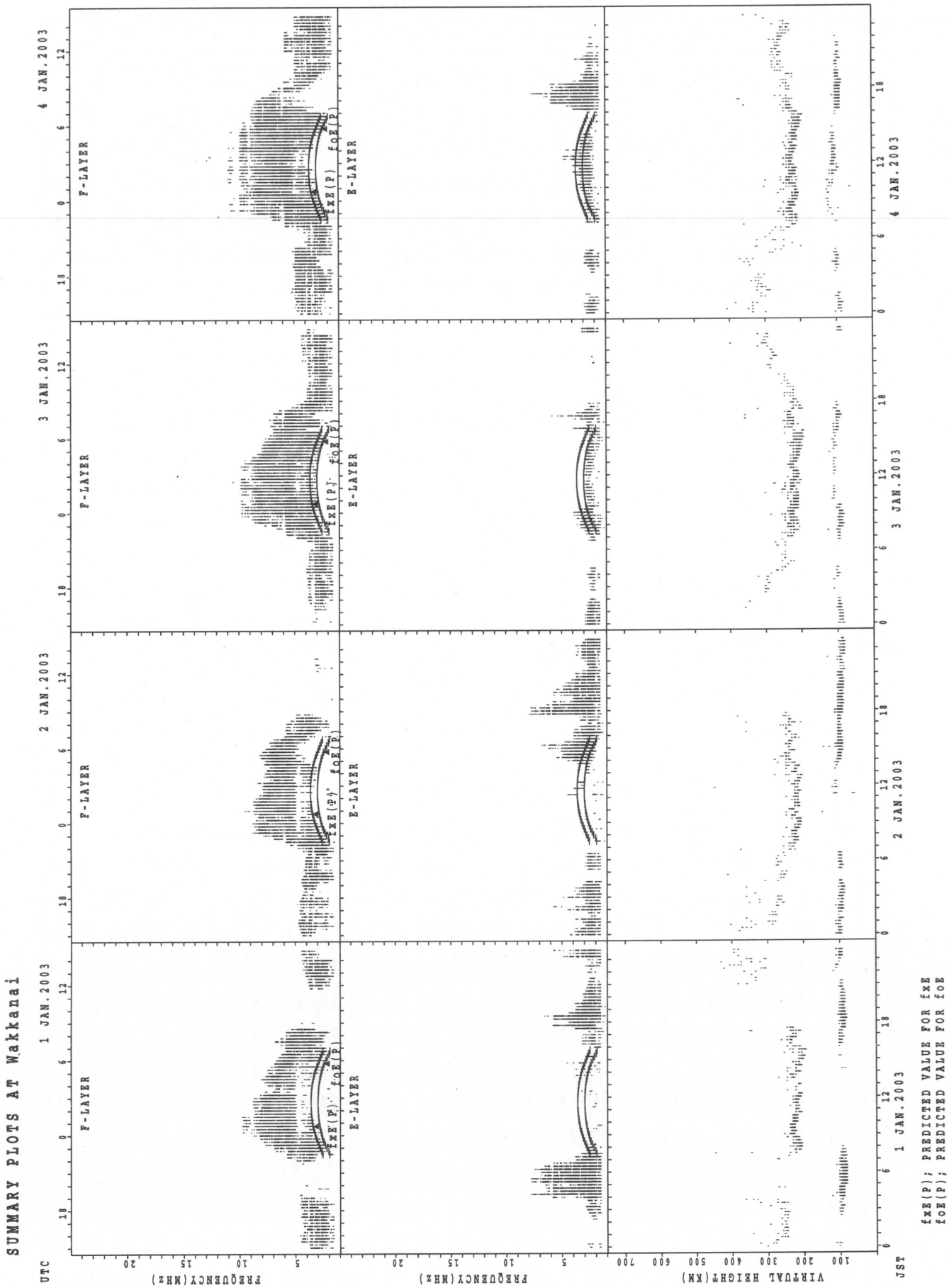
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

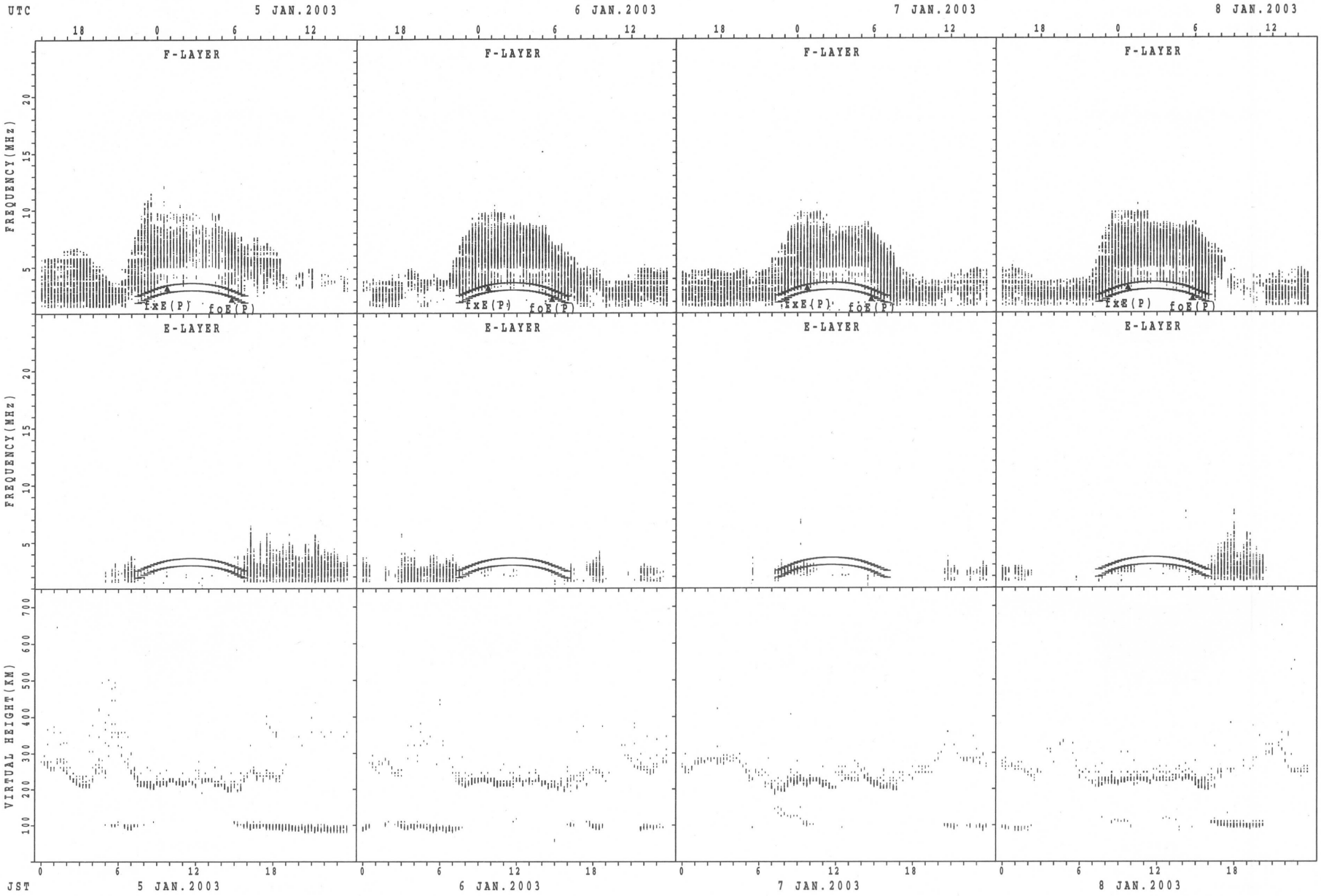
JAN. 2003

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	16				17	14	17	17	20	20	21	20	18	16	14	14	14	14	15	15	18
2	15	18	14	14	14	14	14	14	15	16	18	20	20	20	21	16	14	14	14	17	15	16	18	17
3	17	16	14	14	15			14	14	15	18	22	22	22	22	20	15	14	14	14	21	16	15	15
4	16	15	15	15	16	14	14	14	16	20	21	32	29	28	22	20	17	15	14	14	14	14	17	18
5	15	15	15	14			16	14	14	15	17	22	21	18	18	21	16	14	16	14	15	14	15	14
6	18	14	14	14	14	15		15	20	17	17	20	29	26	24	21	18	14	14	14	16	14	15	14
7	17	15	14	14	15	18		15	15	14	15	27	36	23	34	17	15	18	22	15	15	14	15	15
8	15	16	15					14	16	28	17	30	28	27	24	29	18	15	14	14	14	14	15	14
9	14	16	14	18	17		22	15		15	18	27	22	21	16	29	17	18	17	16	15	18	17	18
10	14	18	22	15	15		18	15	15	18	18	26	26	23	23	17	16	17	14	14	14	16	16	15
11	18	17	14	14	20		14	14	24	16	18	26	28	24	23	21	20	18	17	15	15	15	20	16
12	16	15	14	17	18	14	15	15	27	17	18	22	21	27	24	23	20	20	21	15	17	20	21	16
13	15	14	15	15	17			14	26	17	18	21	20	21	22	17	14	14	14	15	18	17	16	16
14	17	16	15	15	16	15		15	15	15	17	20	18	28	29	26	23	20	17	15	17	16	14	15
15	15	14	15	16	14	14	14	16	26	18	20	23	23	21	20	18	14	17	15	14	15	15	15	17
16	17	15	15	16	18	21		15	15	16	20	18	24	26	27	21	20	17	17	14	15	14	15	15
17	15	17	14	15			14	15	15	15	17	20	23	24	23	20	15	15	16	15	14	14	16	15
18	16	15	14	15	16		17	15	24	18	18	21	18	20	23	20	16	14	17	14	22	16	15	17
19	16	15	15	16	16	17		15	14	15	16	21	20	26	21	22	15	14	15	14	15	16	21	15
20	15	15	15	16		21	14	15	23	16	17	22	24	20	18	17	16	15	16	15	17	16	15	17
21	15	15	14	14	16	15	18	15	18	14	15		18	26	22		15	16	14	14	16	15	15	16
22	15	15	17	16	16		16	15	14	16	14	18	28	30	28	22	17	14	16	14	16	15	20	15
23	16	21	14	16	15	16	14	15	22	17	20		18	22	43	23	15	17	21	15	14	14	14	17
24	15	15	14	15	15	22	14	15	24	20	22	27	28	43	26	21	18	14	14	15	16	15	16	17
25	16	18	18	15				14	14	16	17	20	22	27	22	21	16	14	20	17	16	15	15	15
26	16	16	15		17	14	15	15	14	15	18	24	28	28	29	21	22	17	14	14	15	14	14	14
27	15	14	14	16	15	15	17	14	16	17	18	21	21	26	22	18	15	14	14	14	14	15	15	15
28	16	14	15	15	14	14		15	17	15	18	21	28	30	26	21	18	15	18	15	15	15	18	14
29	16	16	16	17	15		18	14	16	18	22	22			27	24	18	16	18	16	15	14	17	15
30	15	15	15	17		17	18	14	16	14	17	27	22	28	21	26	18	16	17	17	16	15	22	15
31	14	14	14			15	16	15	27	18	22	22	21	24	22	22	16	14	15	14	15	14	15	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	28	23	18	20	31	30	31	31	29	30	30	31	30	31	31	31	31	31	31	31	31
MED	15	15	15	15	16	15	16	15	16	16	18	22	22	25	23	21	16	15	16	14	15	15	15	15
U Q	16	16	15	16	17	17	17	15	23	18	18	26	28	27	26	22	18	17	17	15	16	16	17	17
L Q	15	15	14	14	15	14	14	14	15	15	17	20	20	21	21	18	15	14	14	14	15	14	15	15

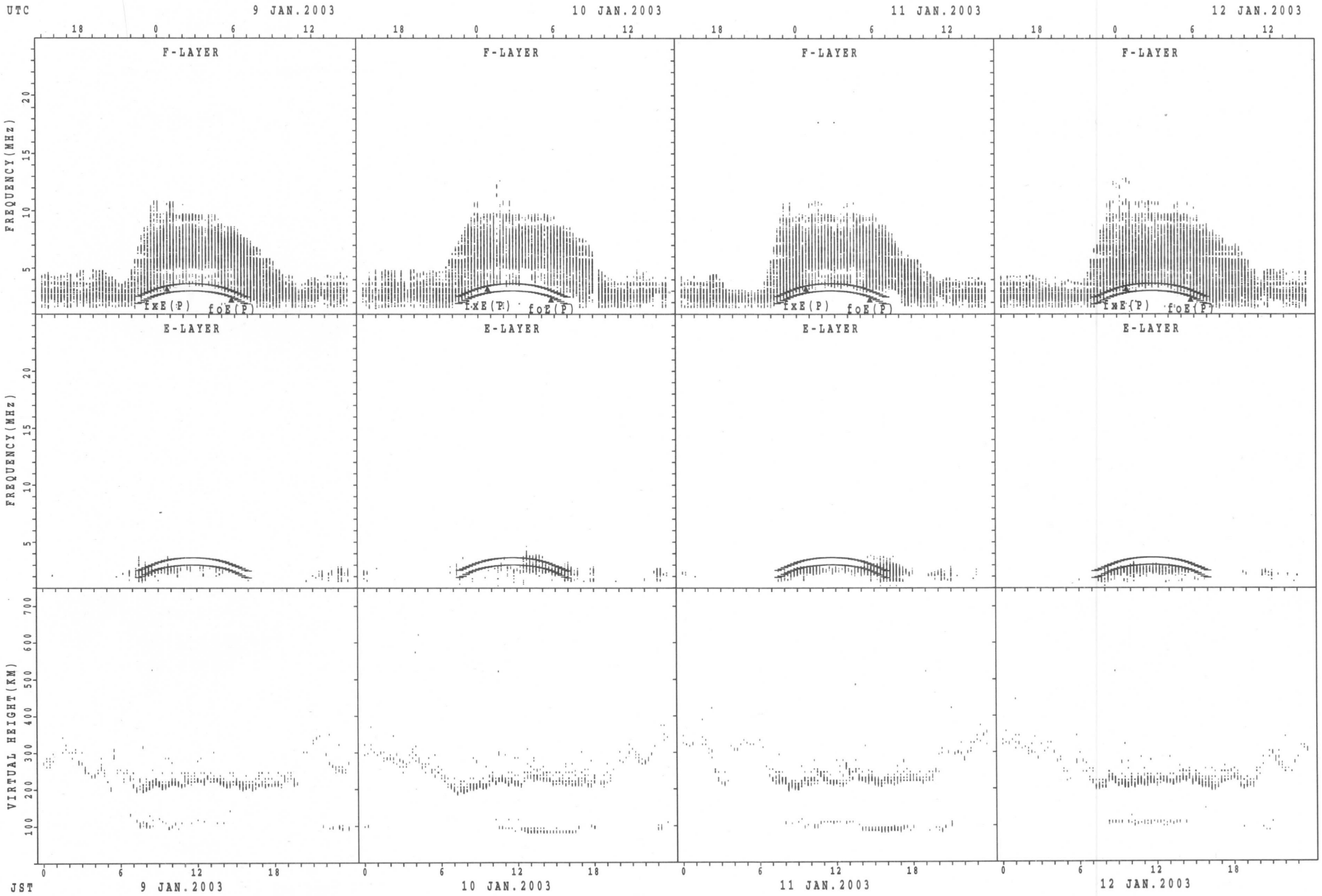

SUMMARY PLOTS AT Wakkanai
UTC
JST
1 JAN.2003
2 JAN.2003
3 JAN.2003
4 JAN.2003
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



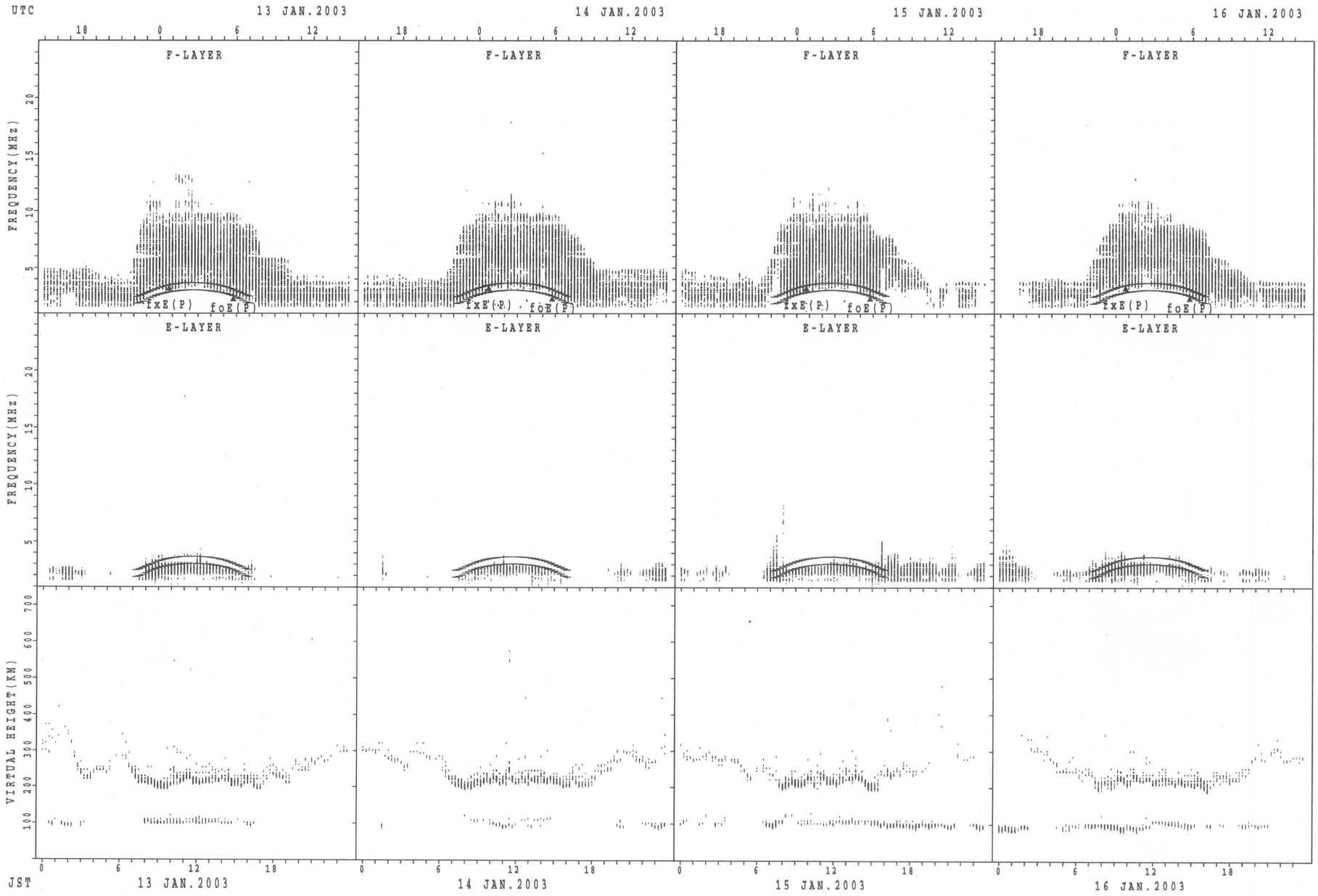
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



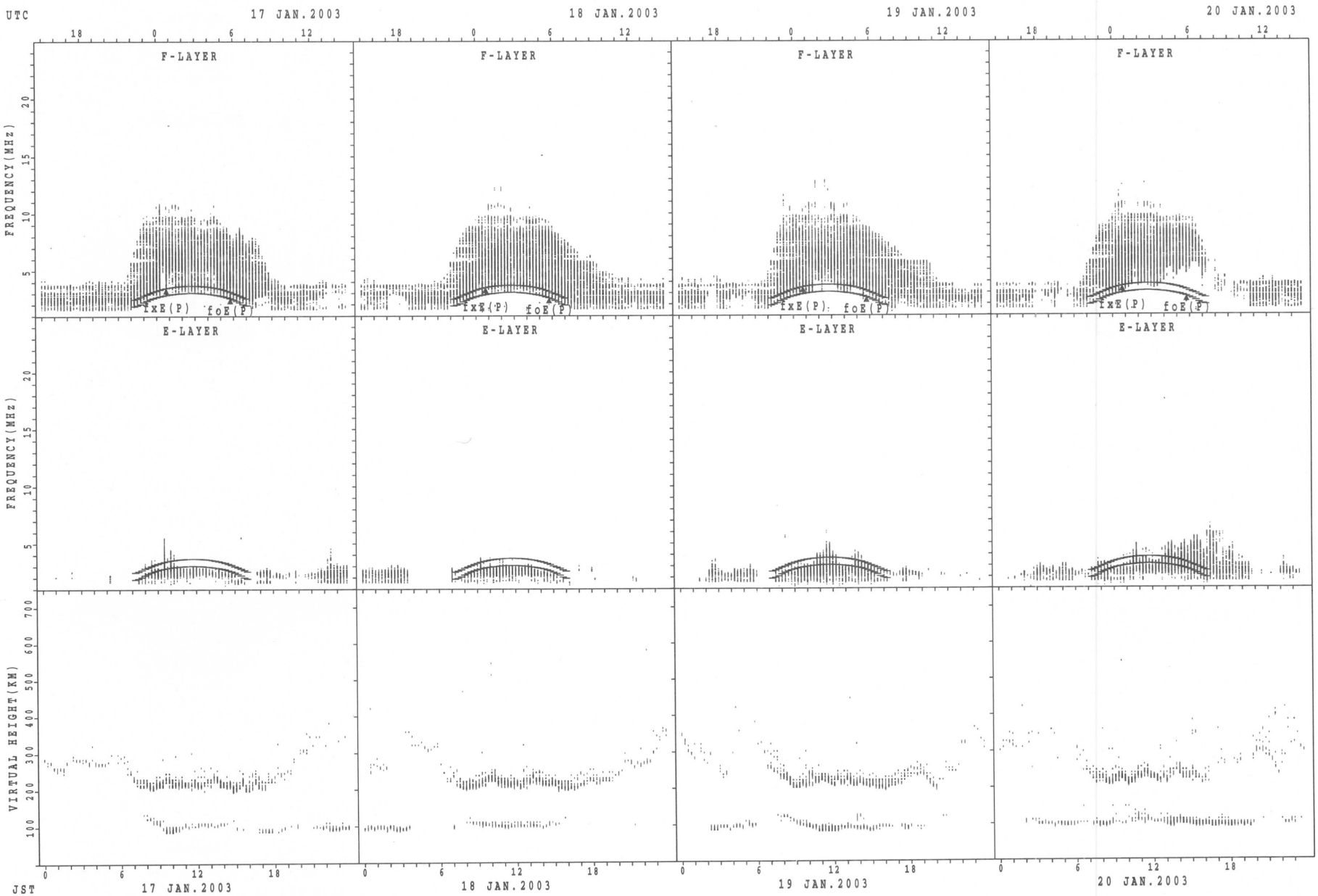
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



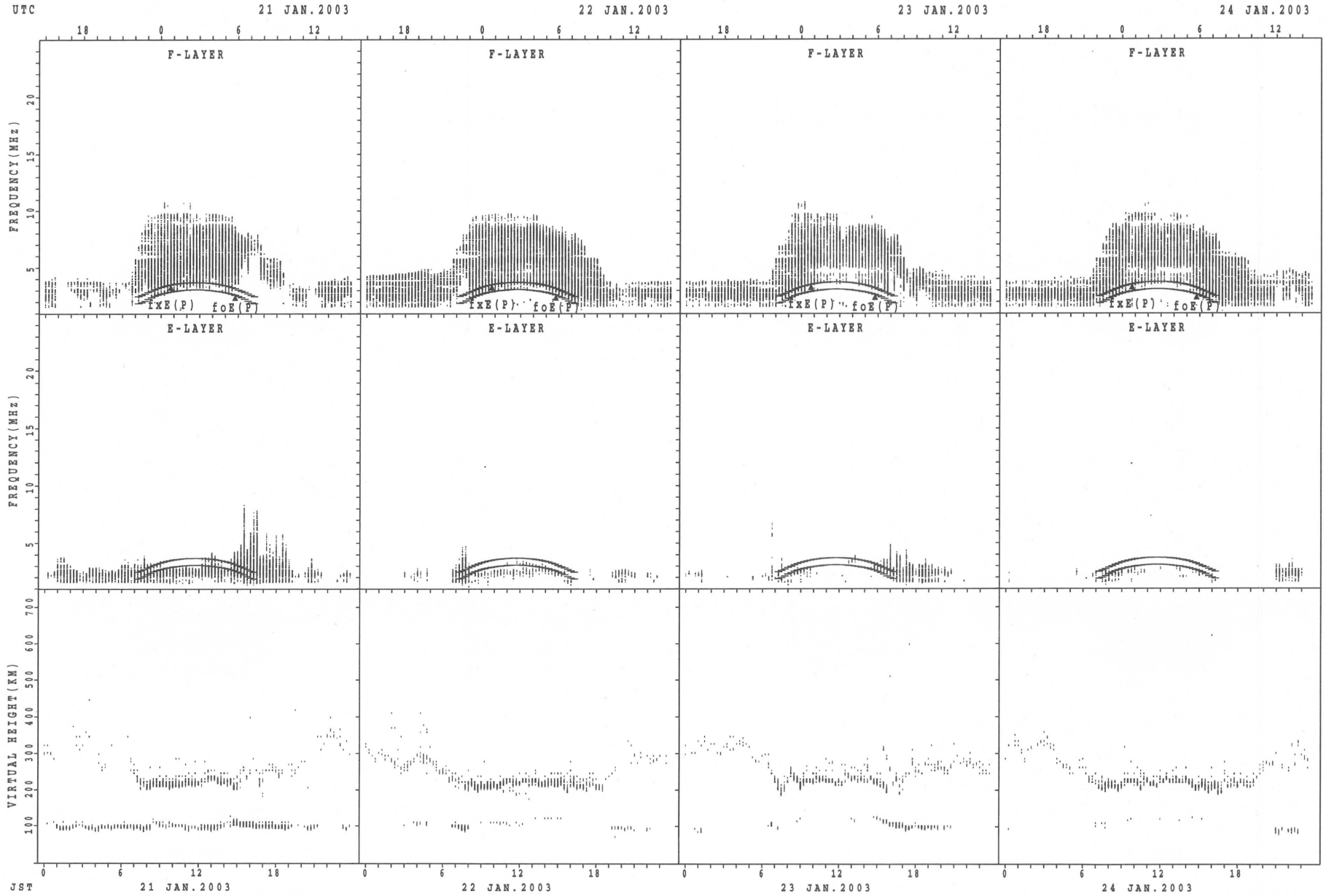
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



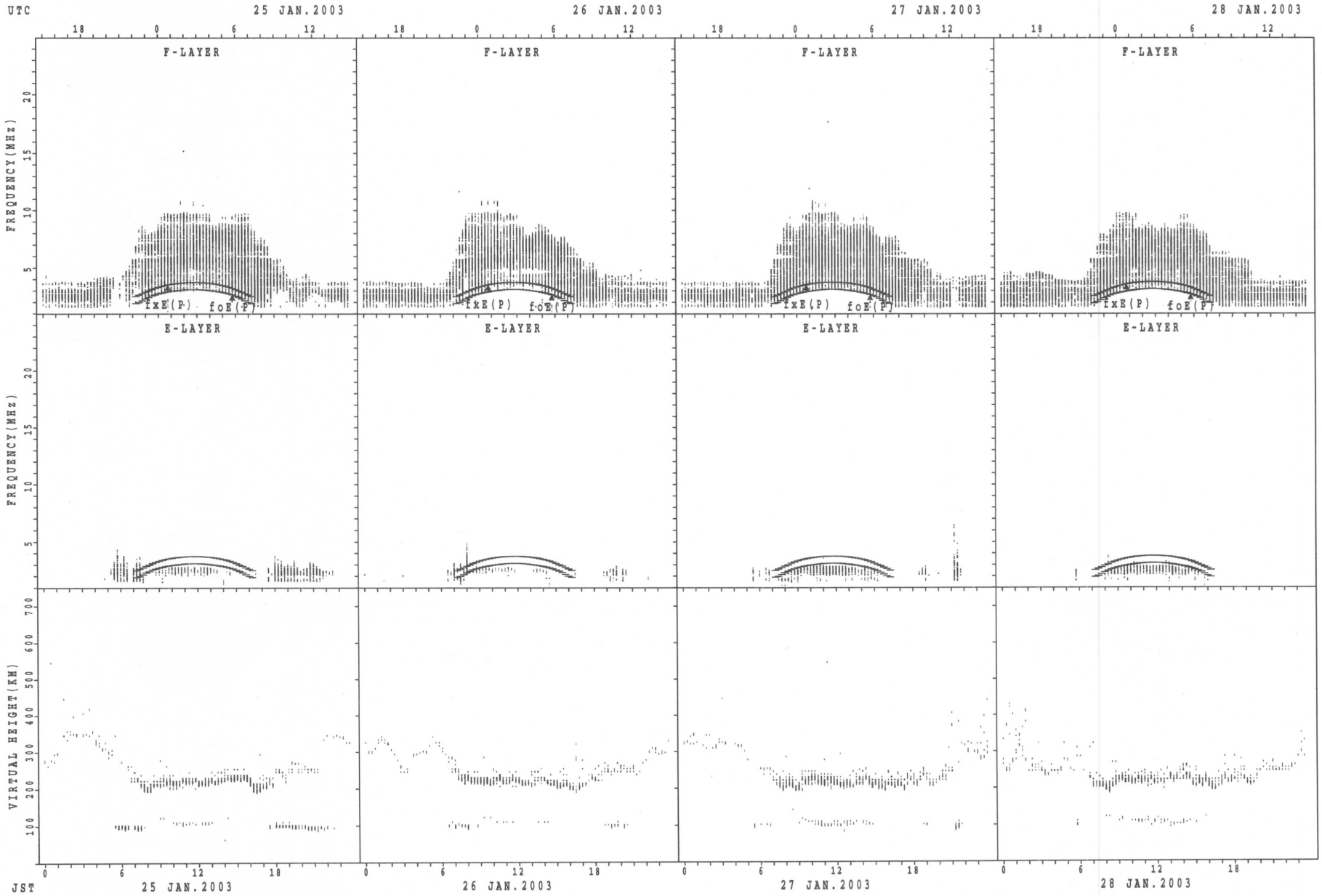
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



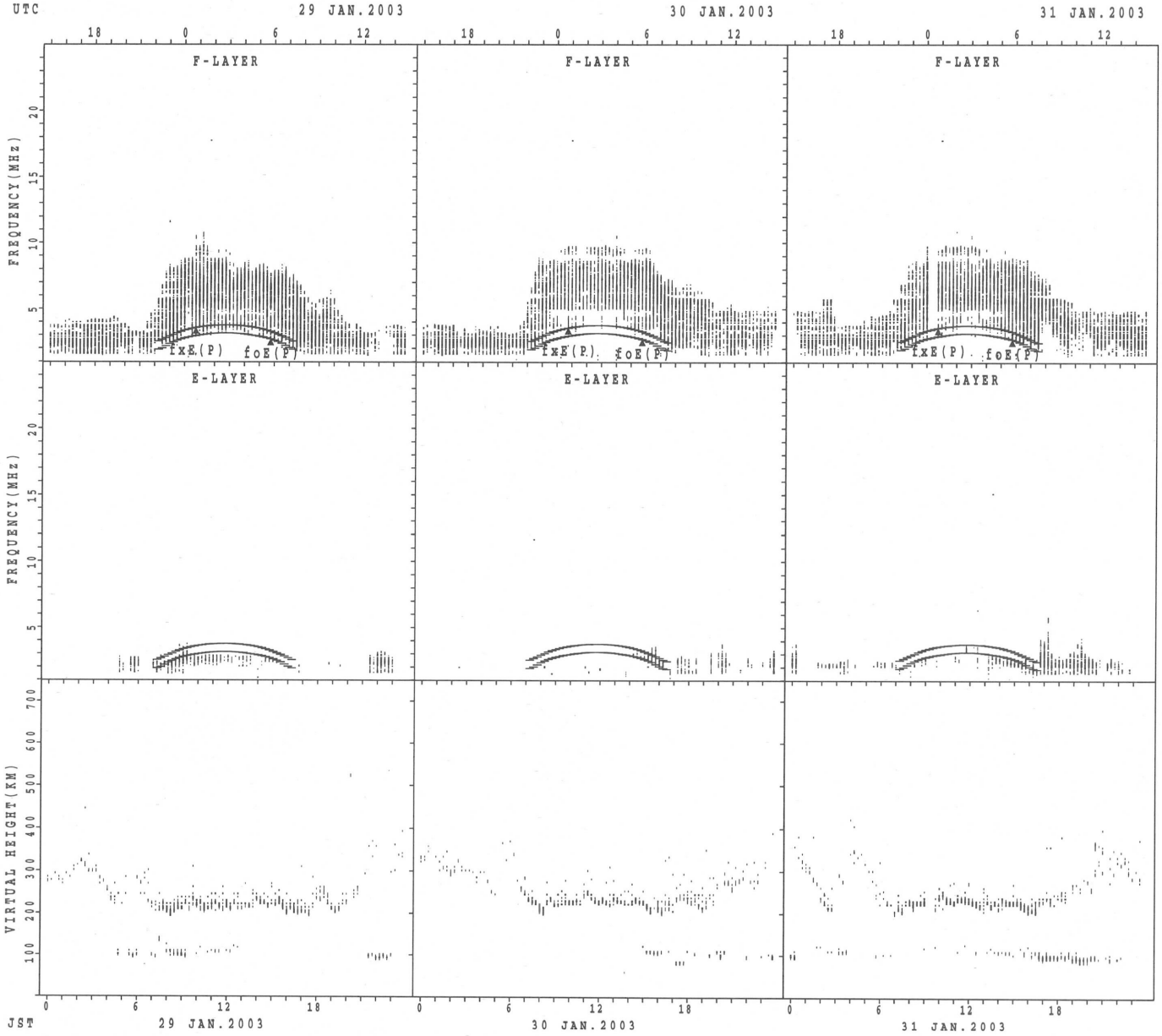
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai

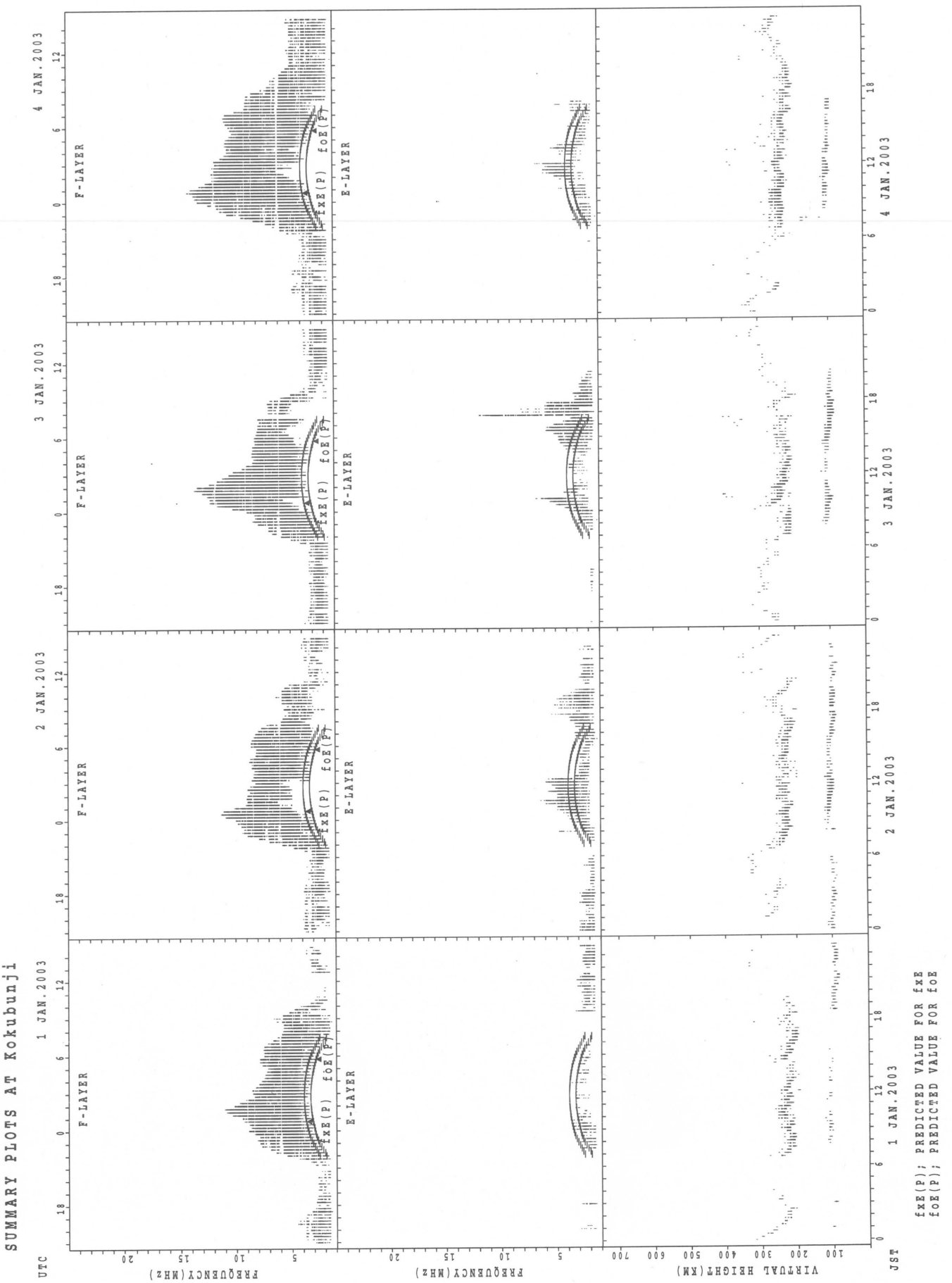


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

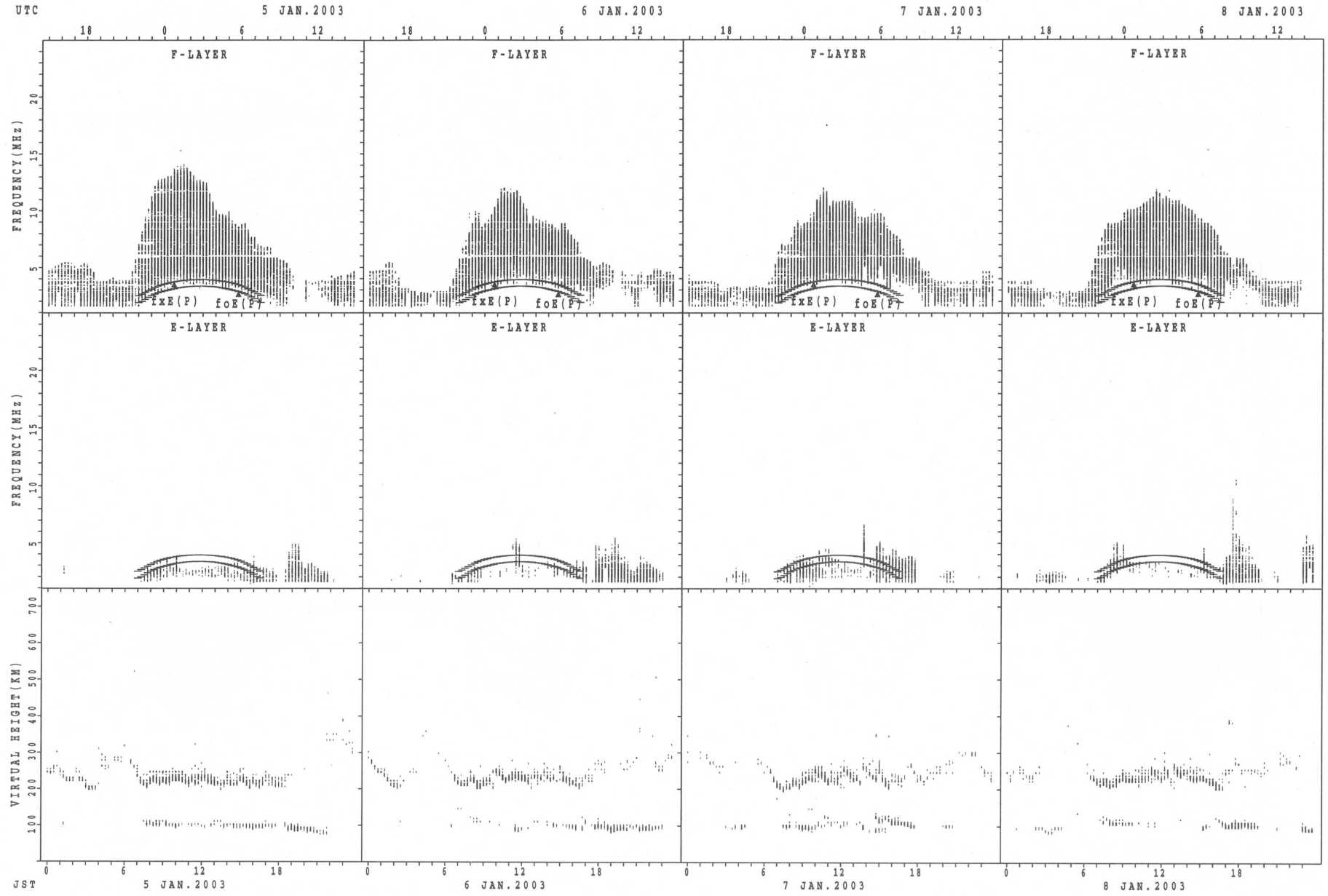
SUMMARY PLOTS AT Wakkanai



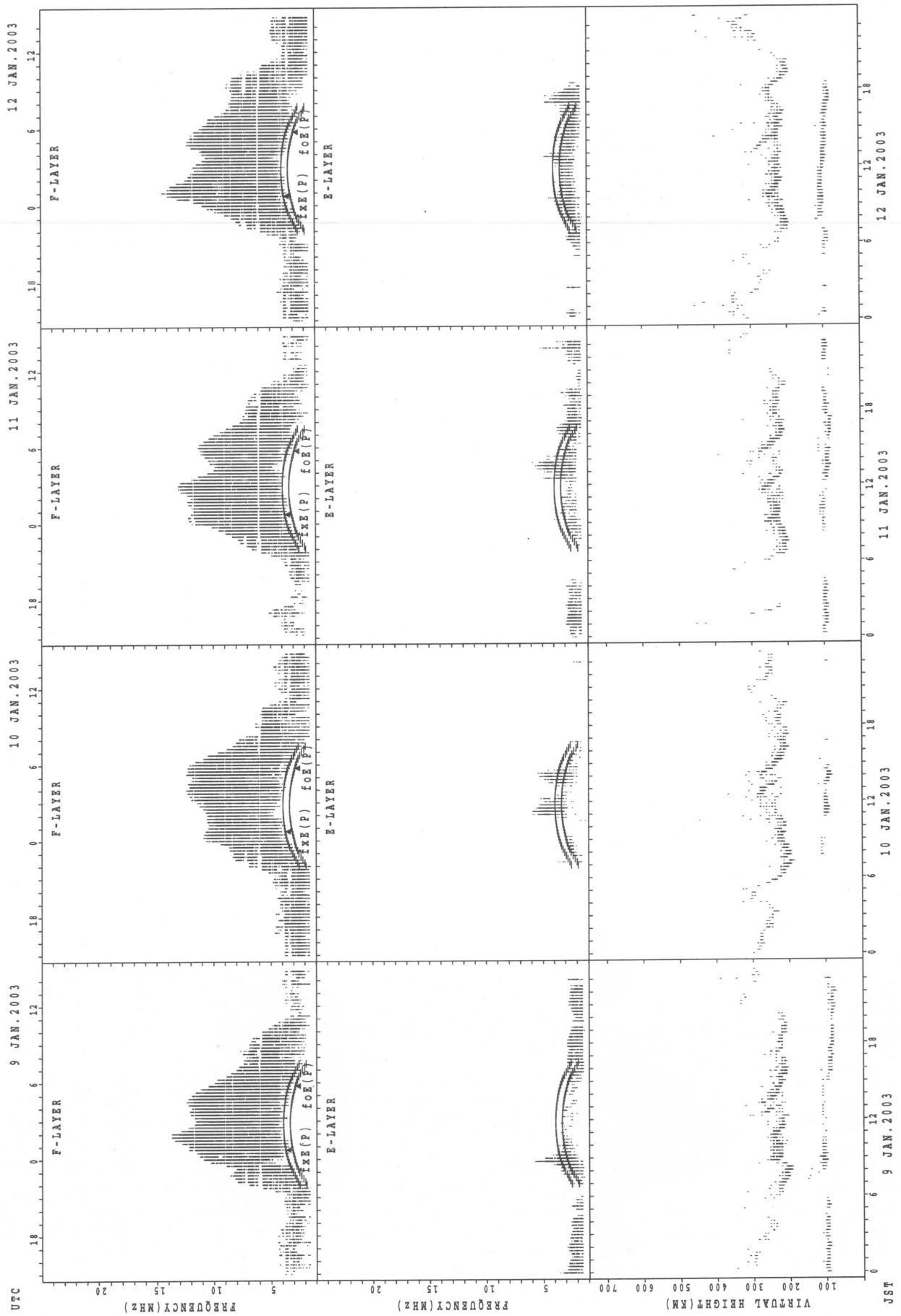
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Kokubunji
UTC
JST
1 JAN.2003
2 JAN.2003
3 JAN.2003
4 JAN.2003
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

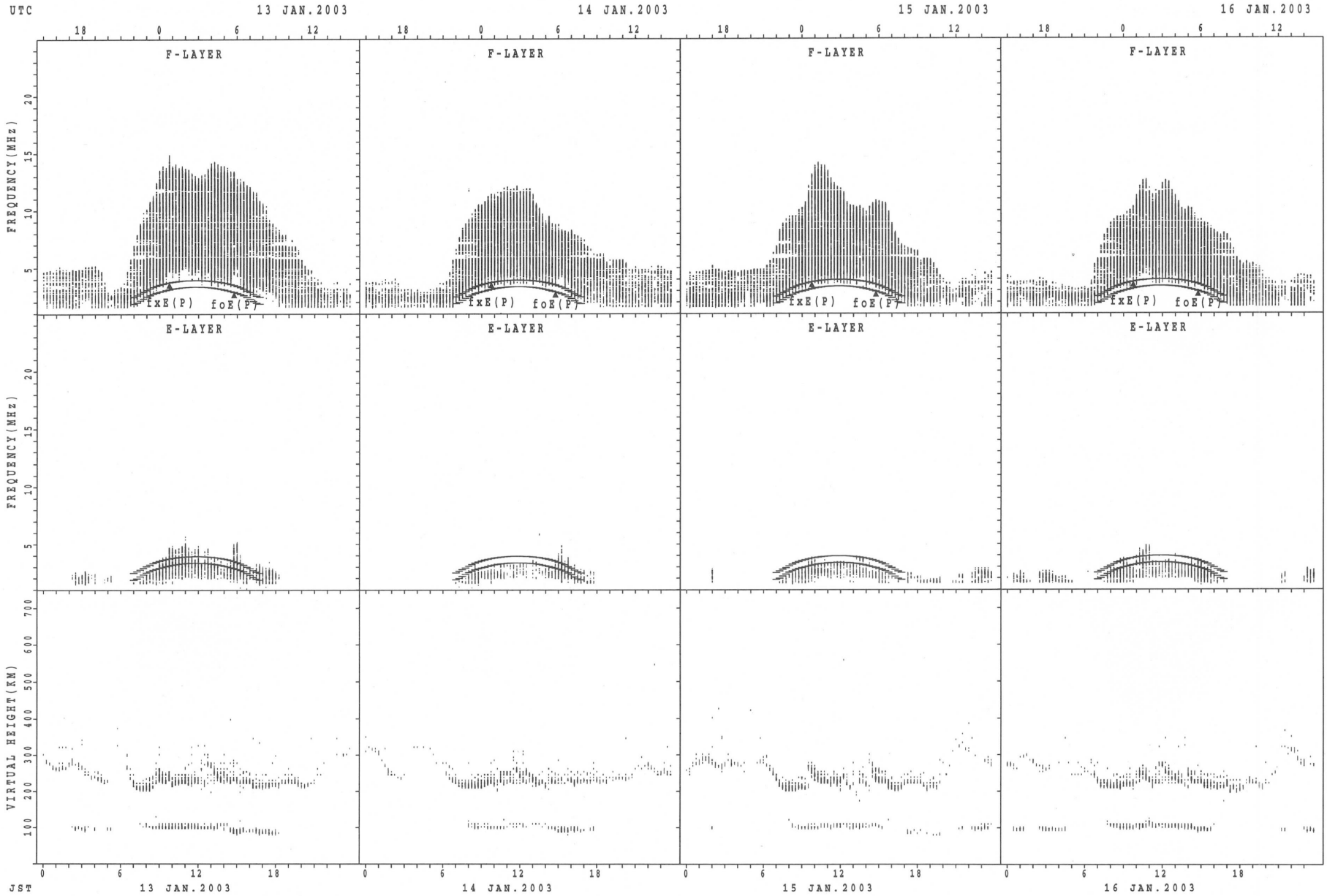
SUMMARY PLOTS AT Kokubunji



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

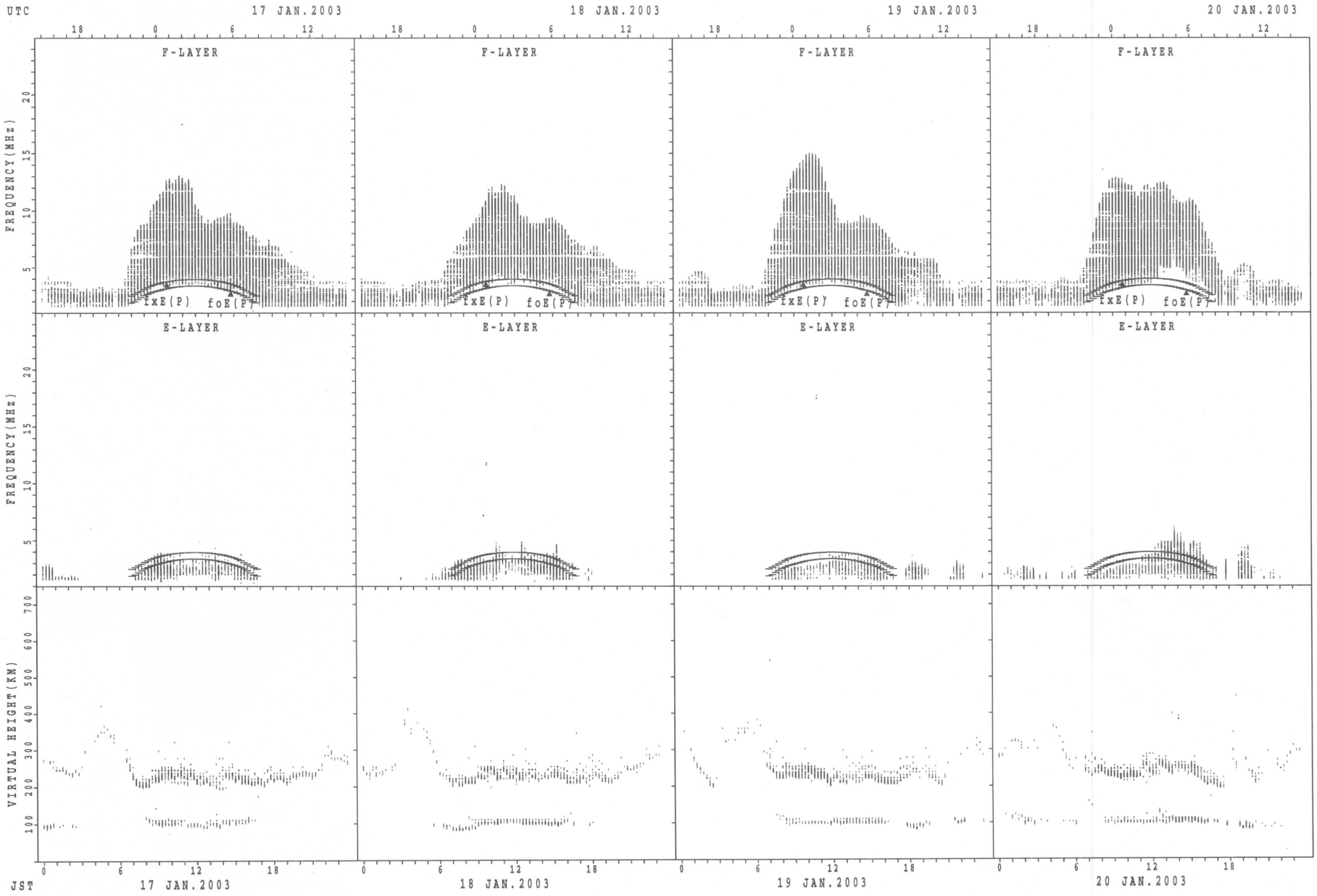

SUMMARY PLOTS AT Kokubunji
UTC
JST
9 JAN.2003
10 JAN.2003
11 JAN.2003
12 JAN.2003
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



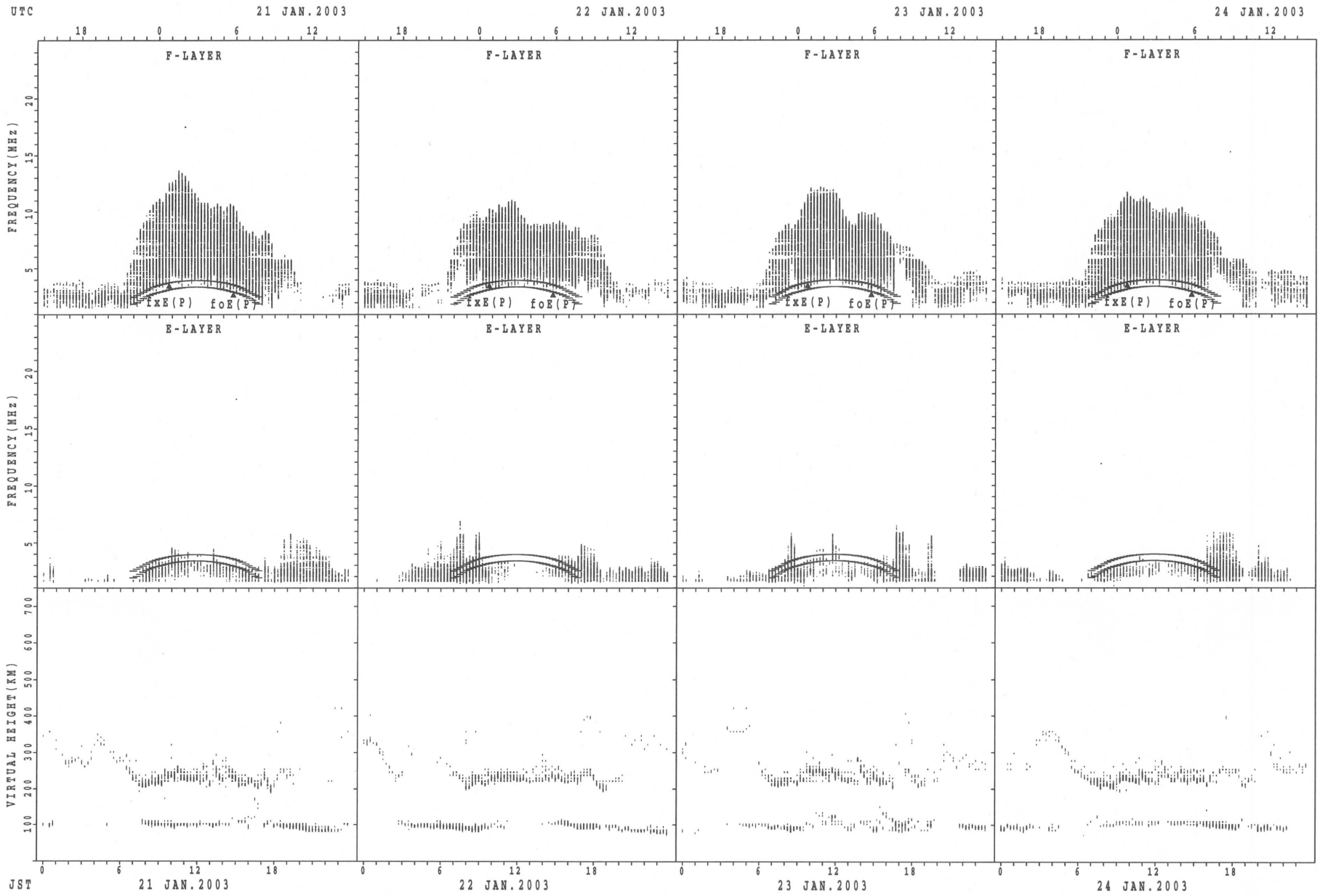
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



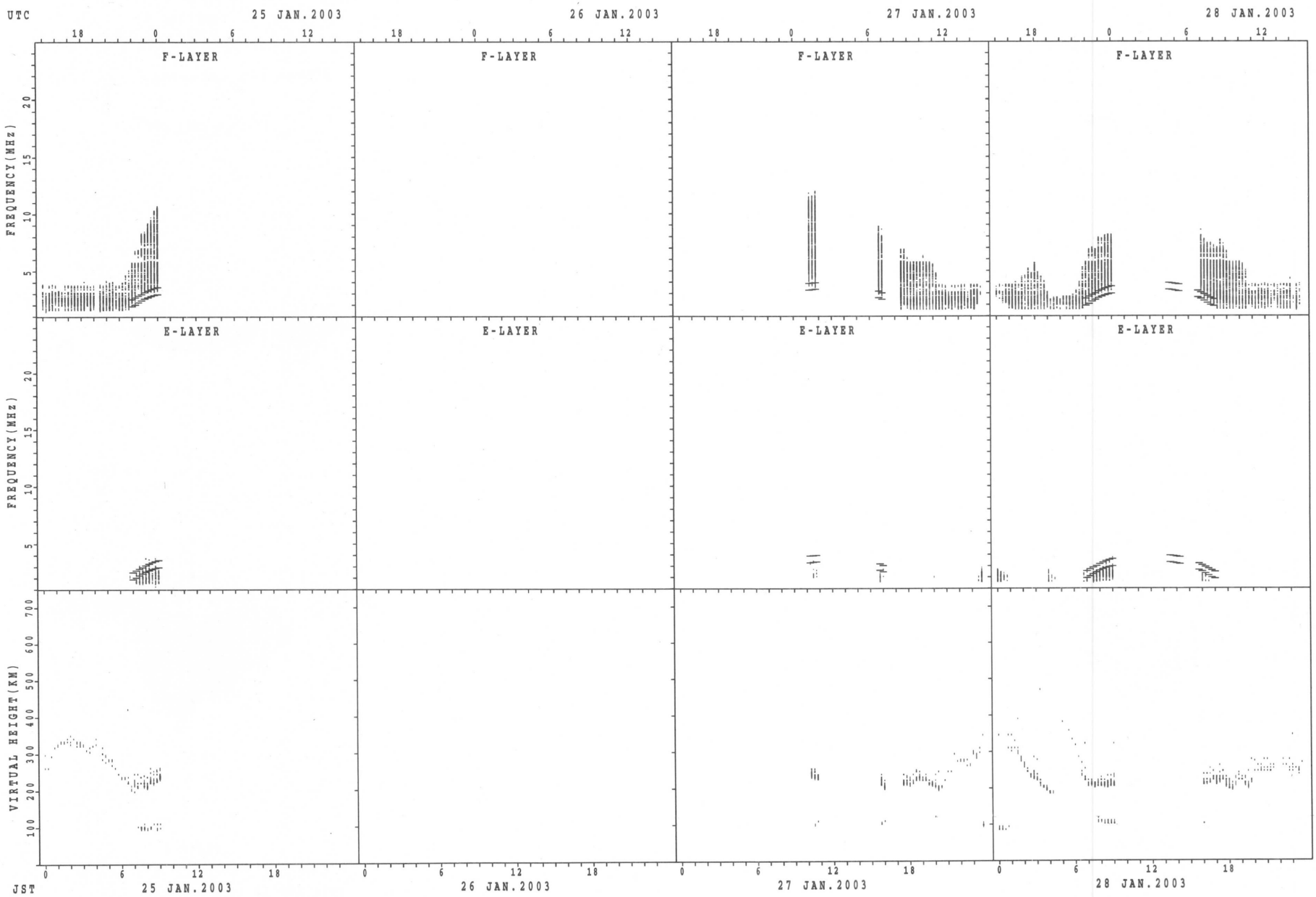
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



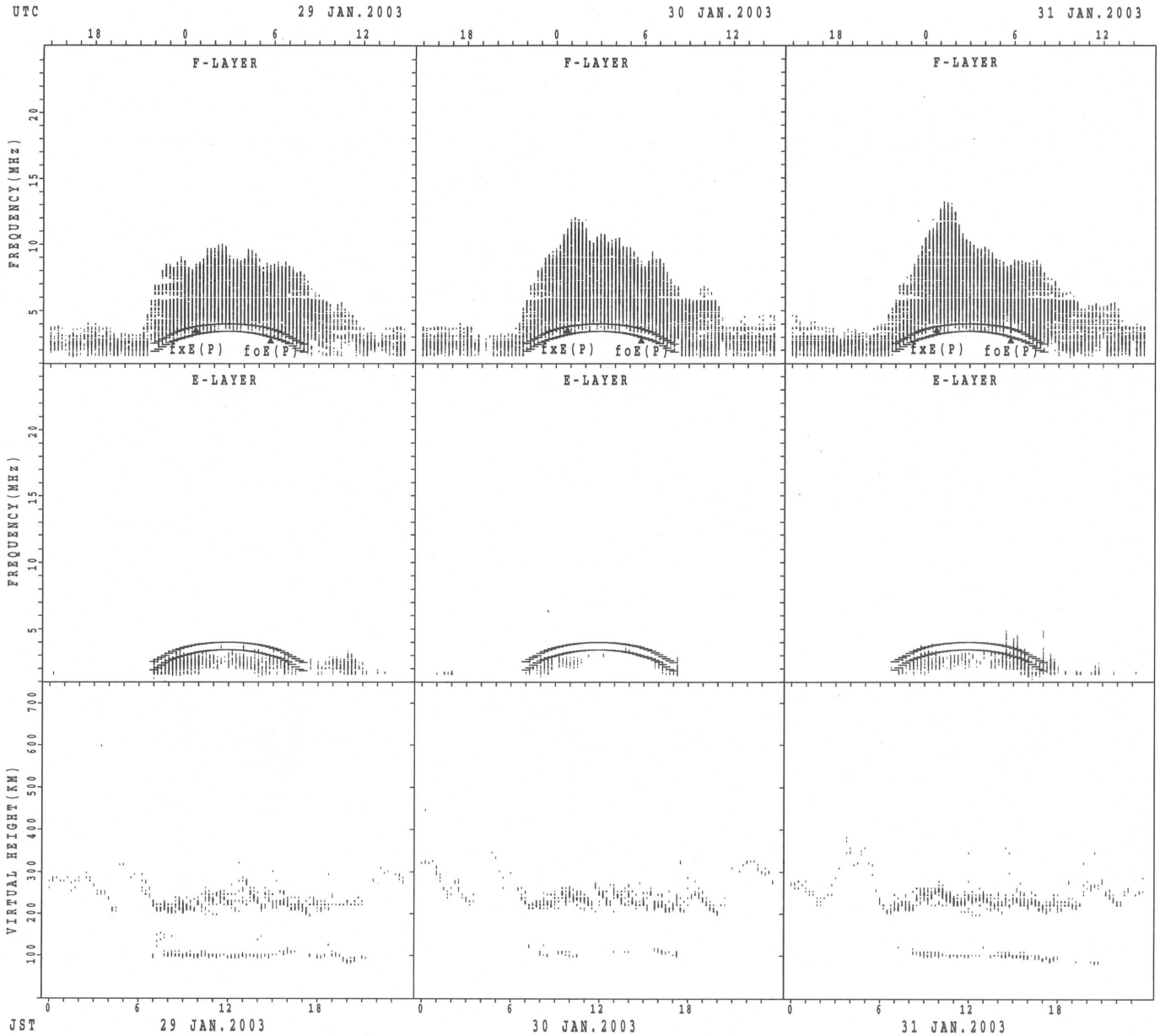
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



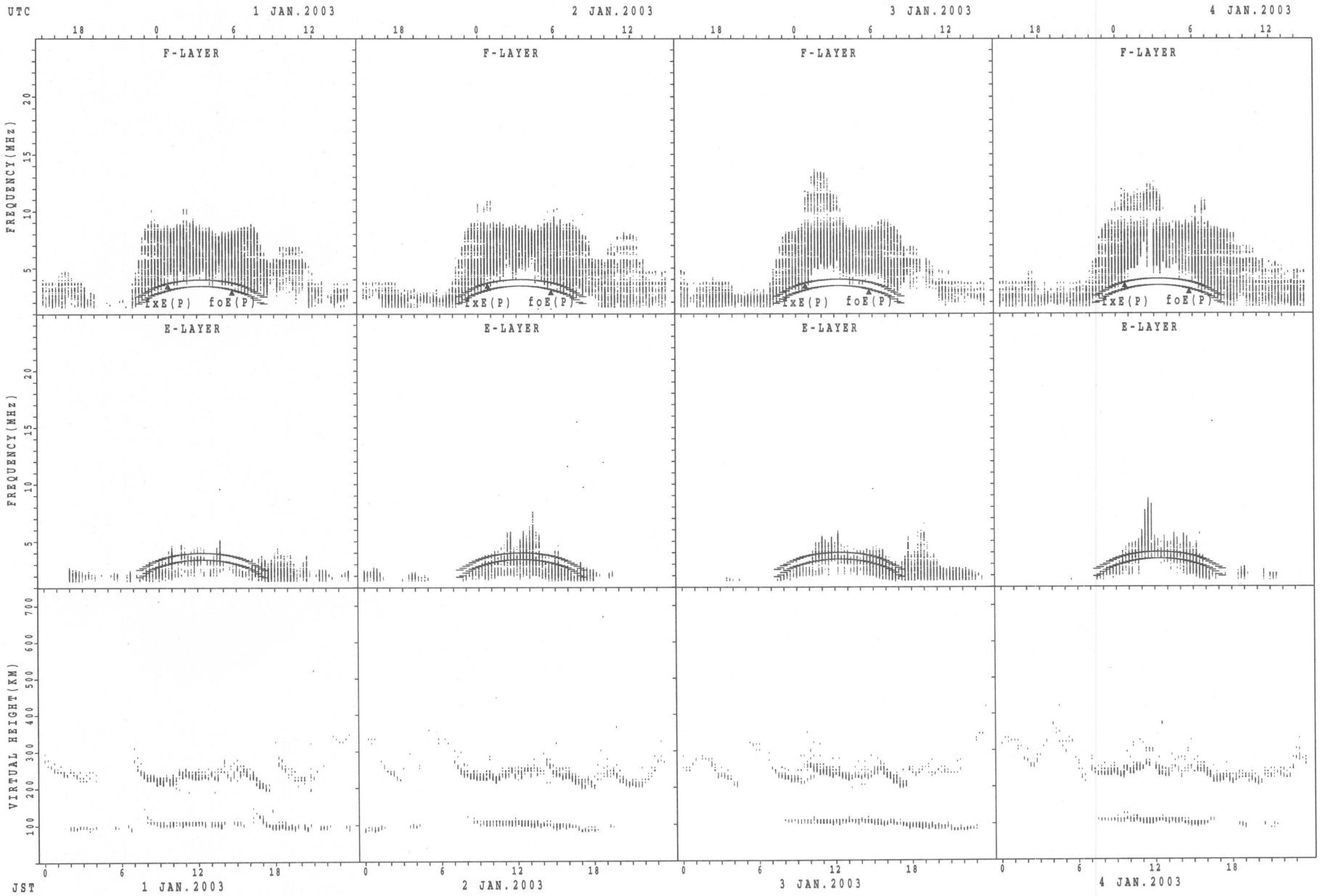
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



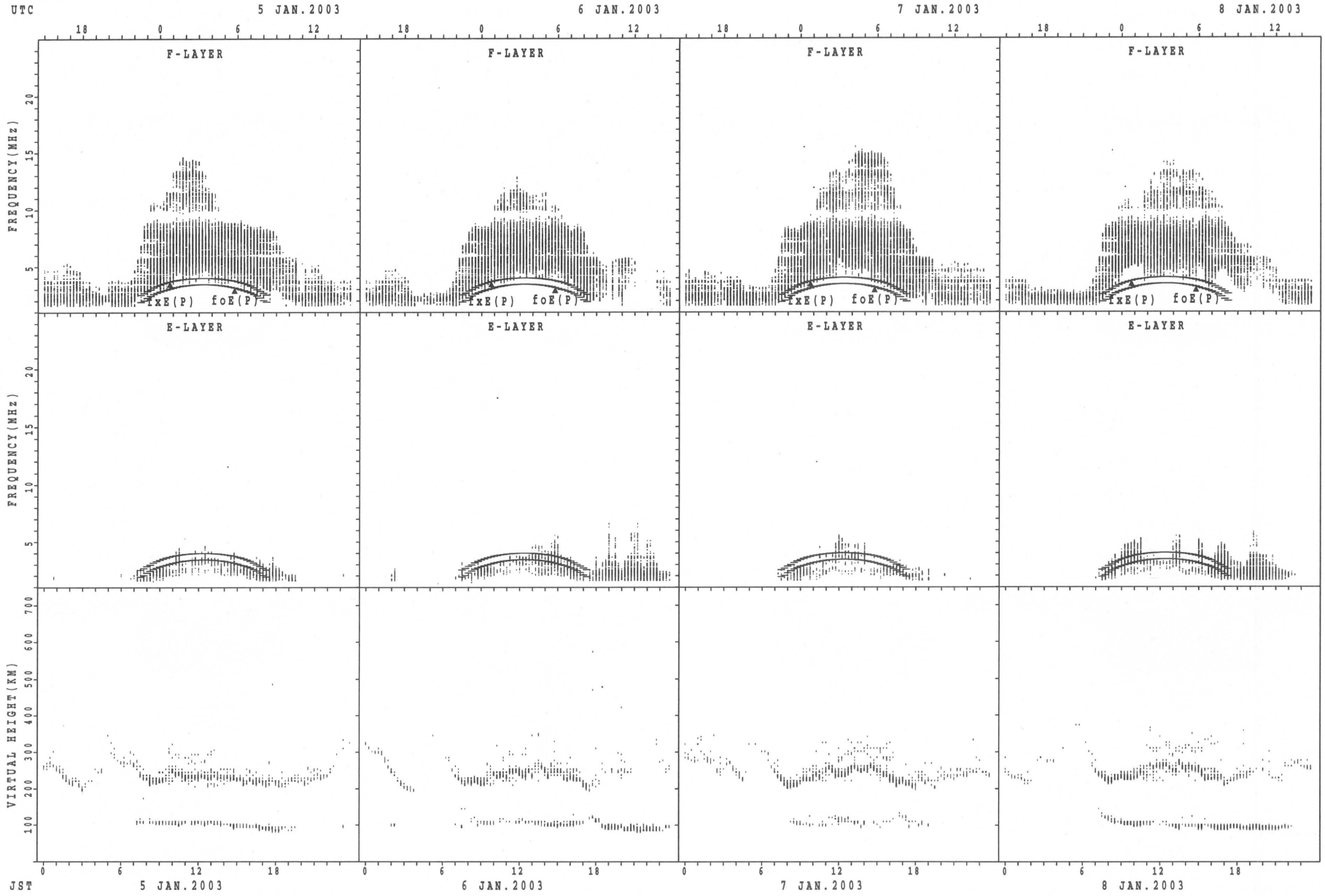
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



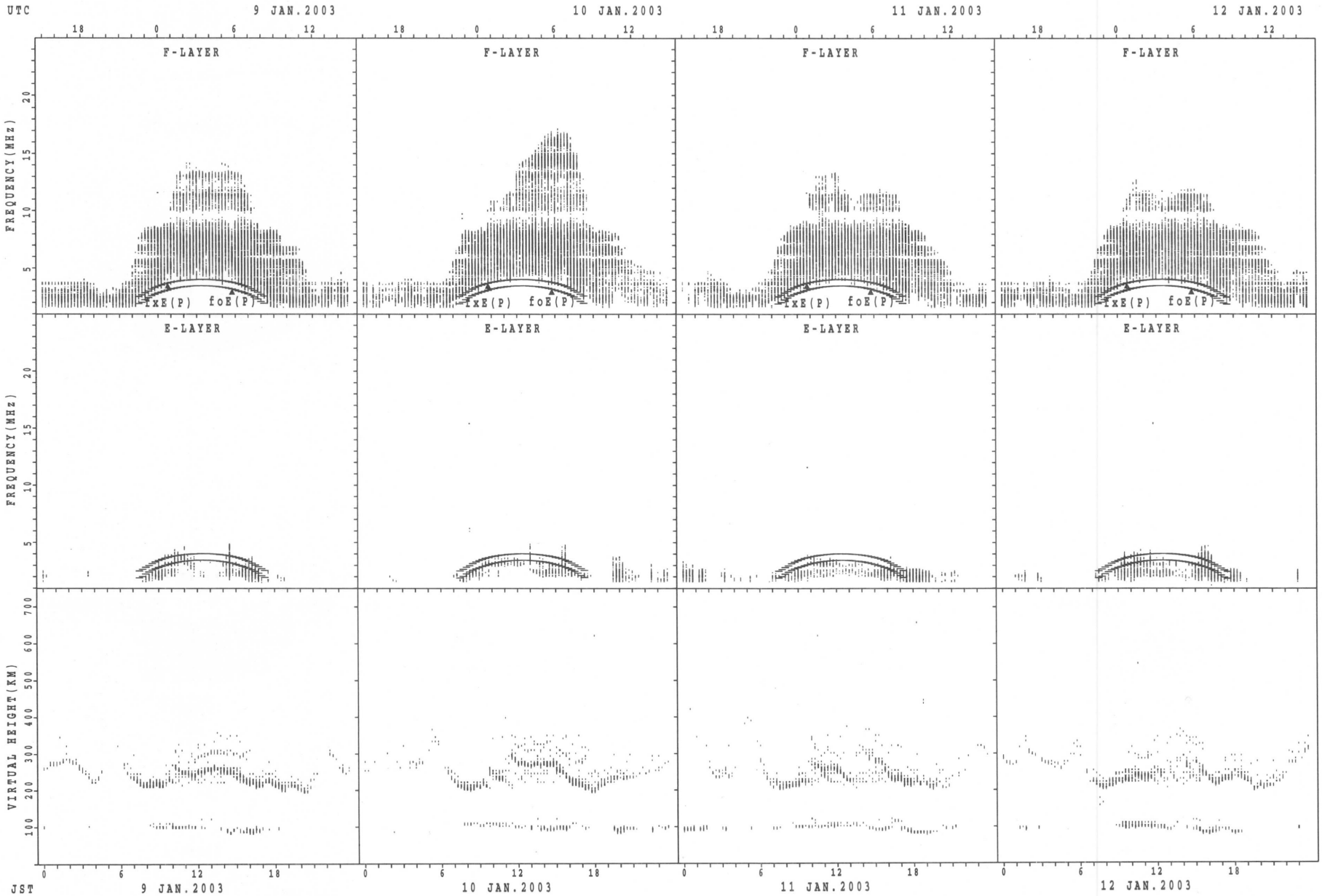
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



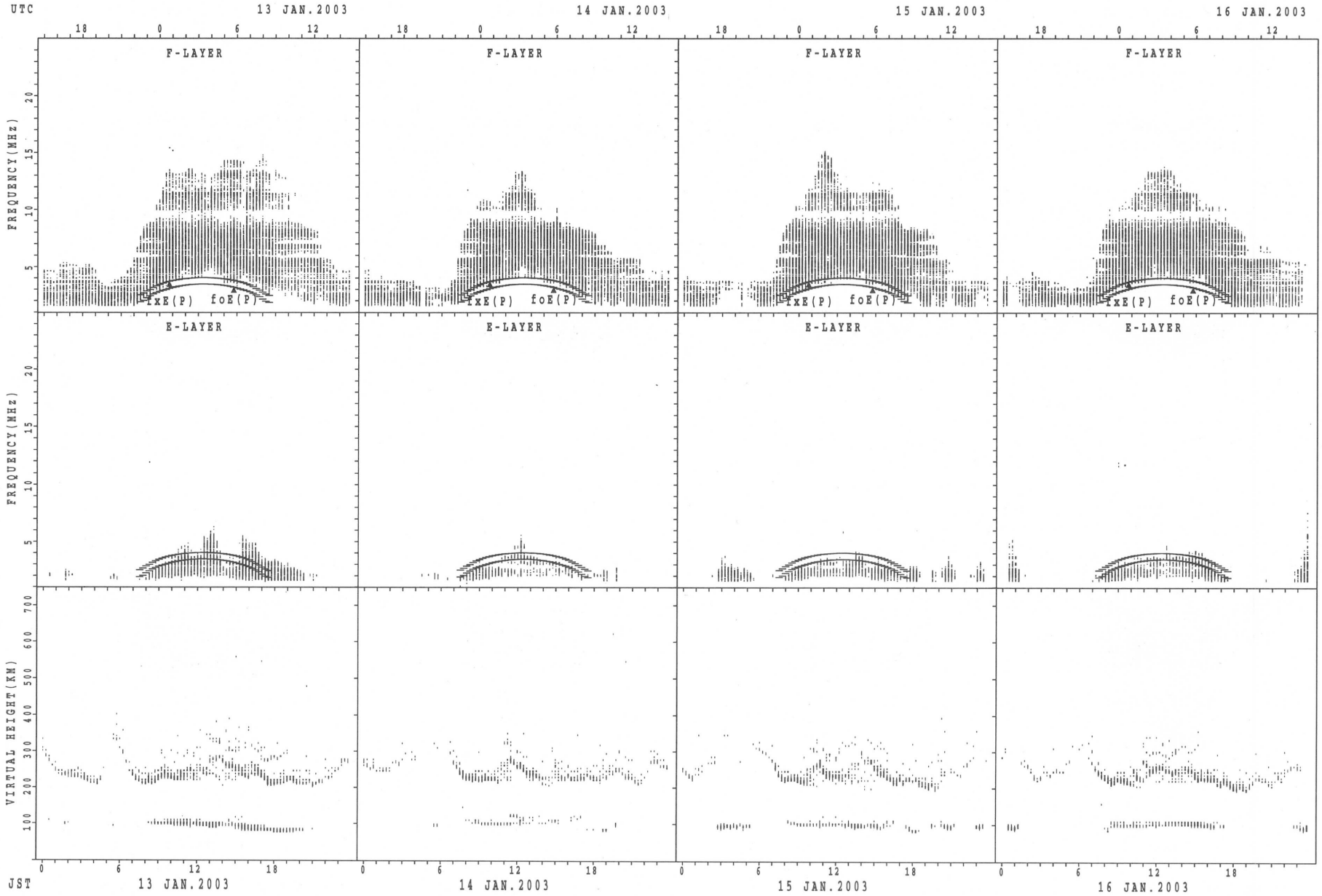
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



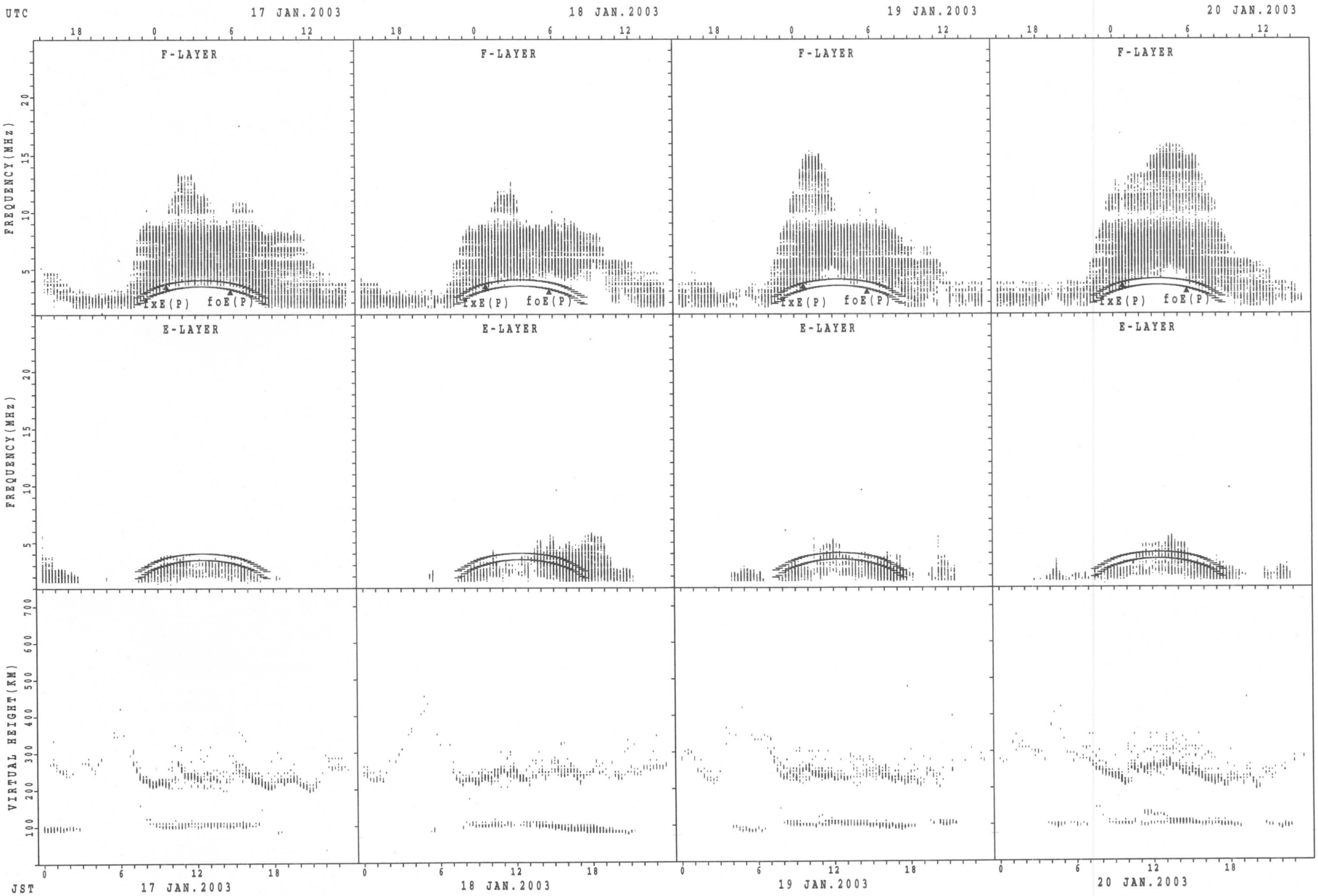
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



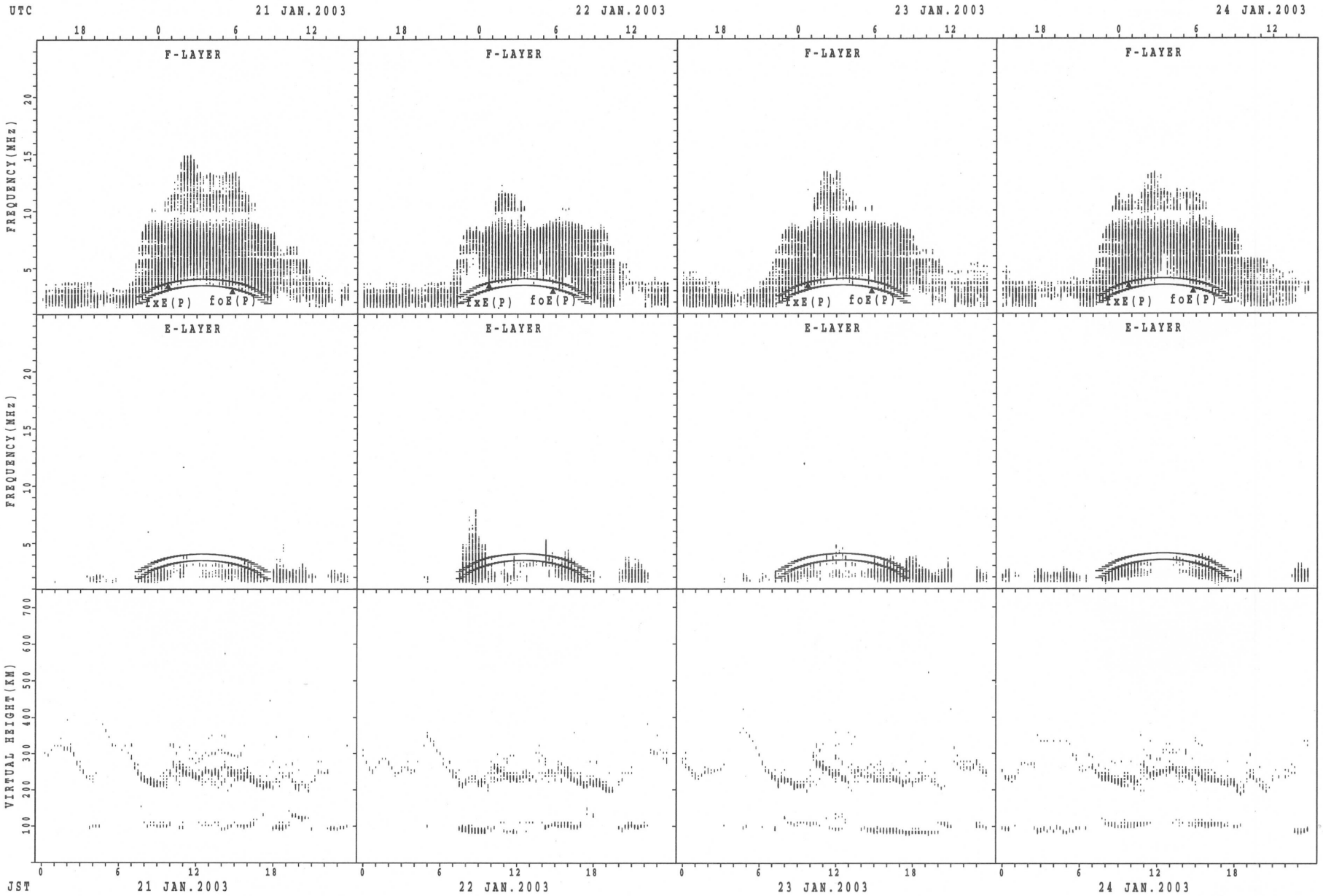
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



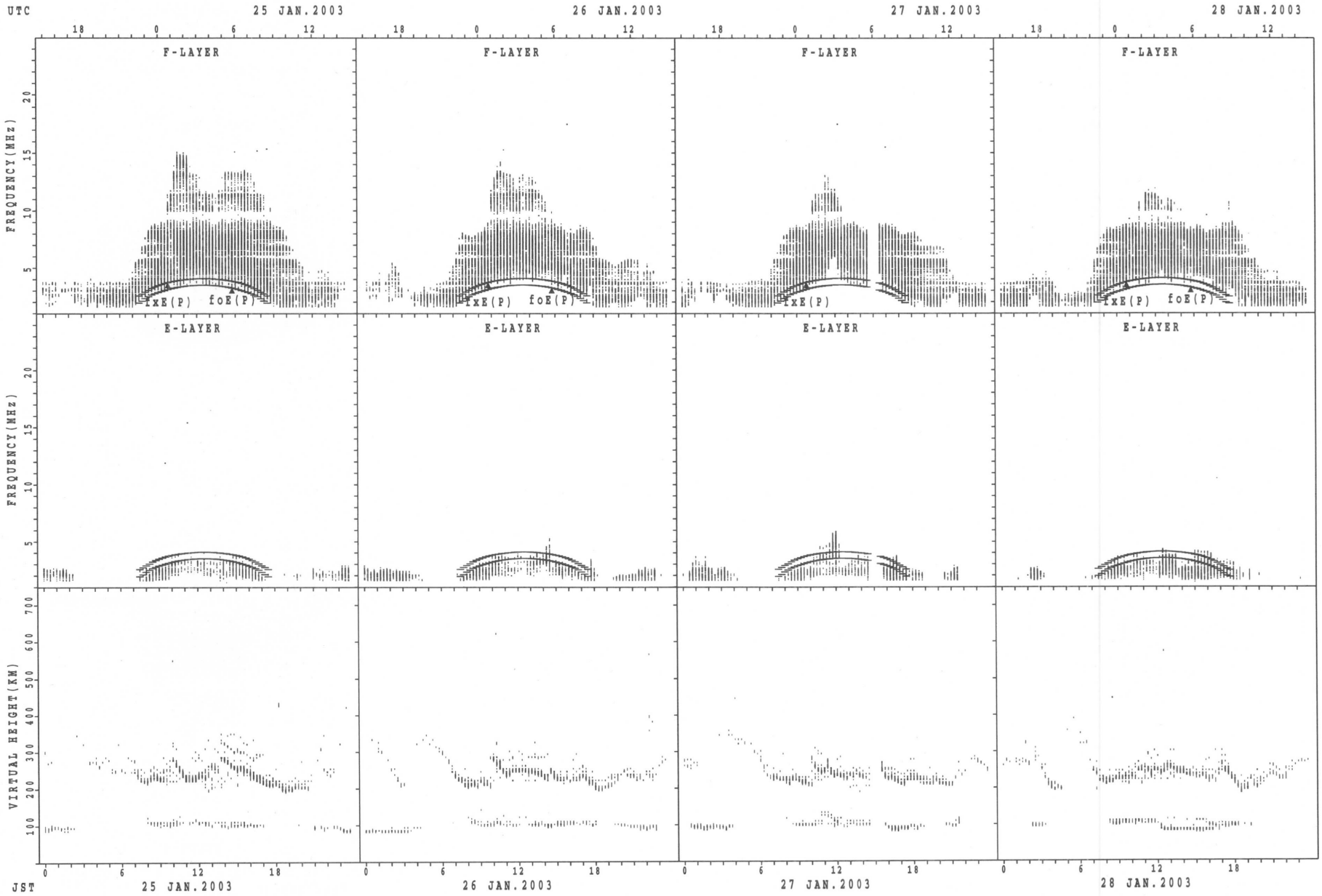
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



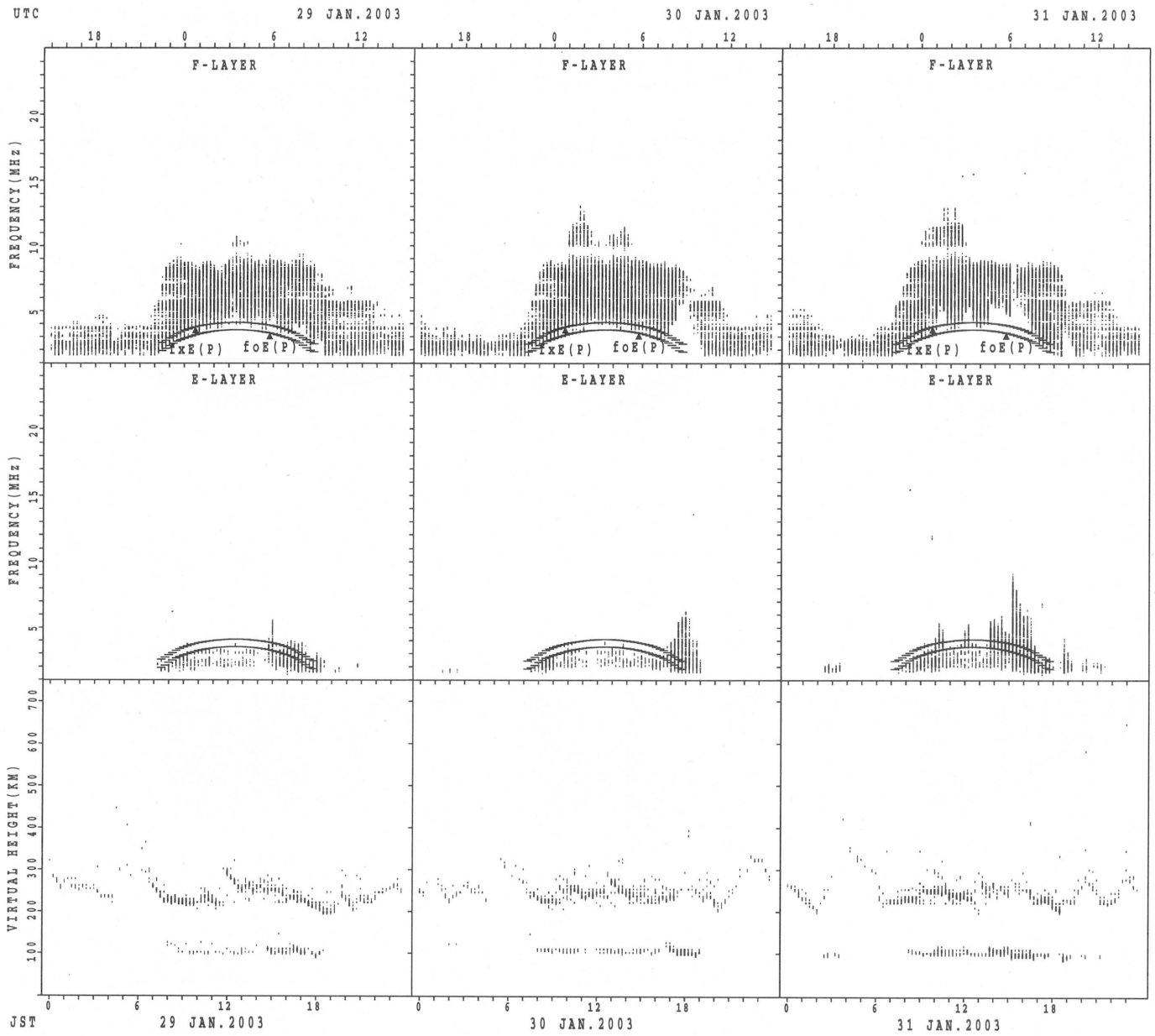
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



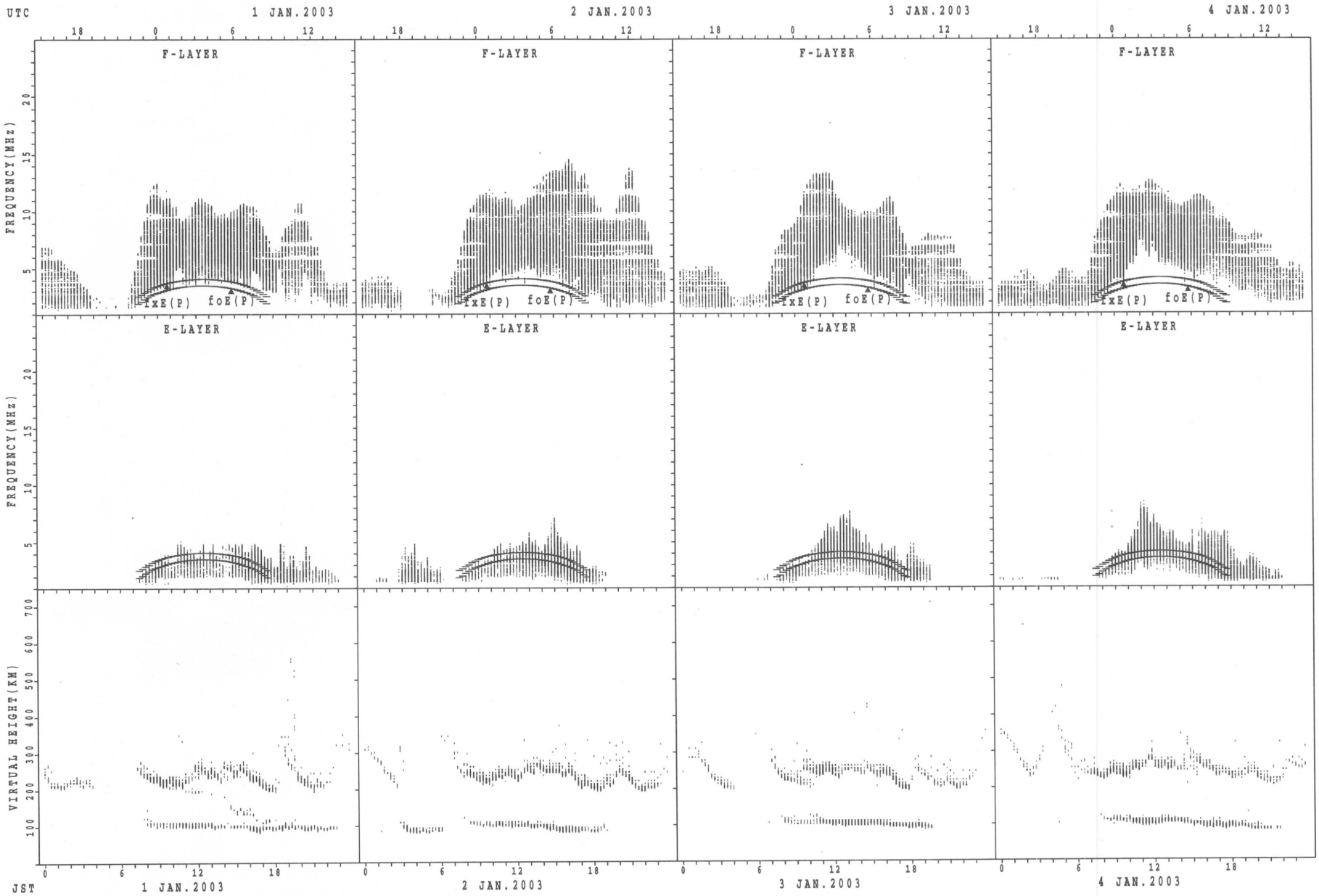
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



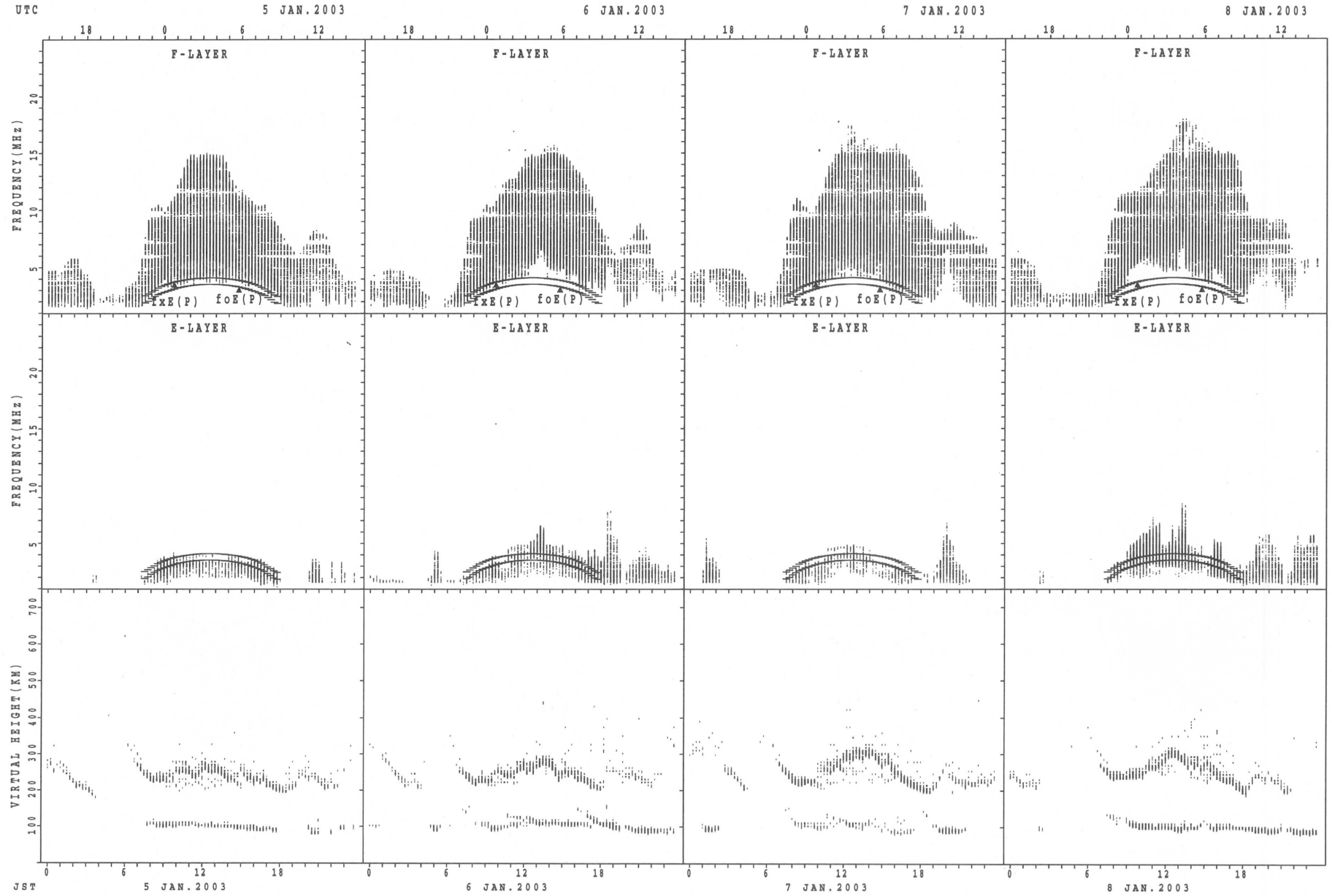
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



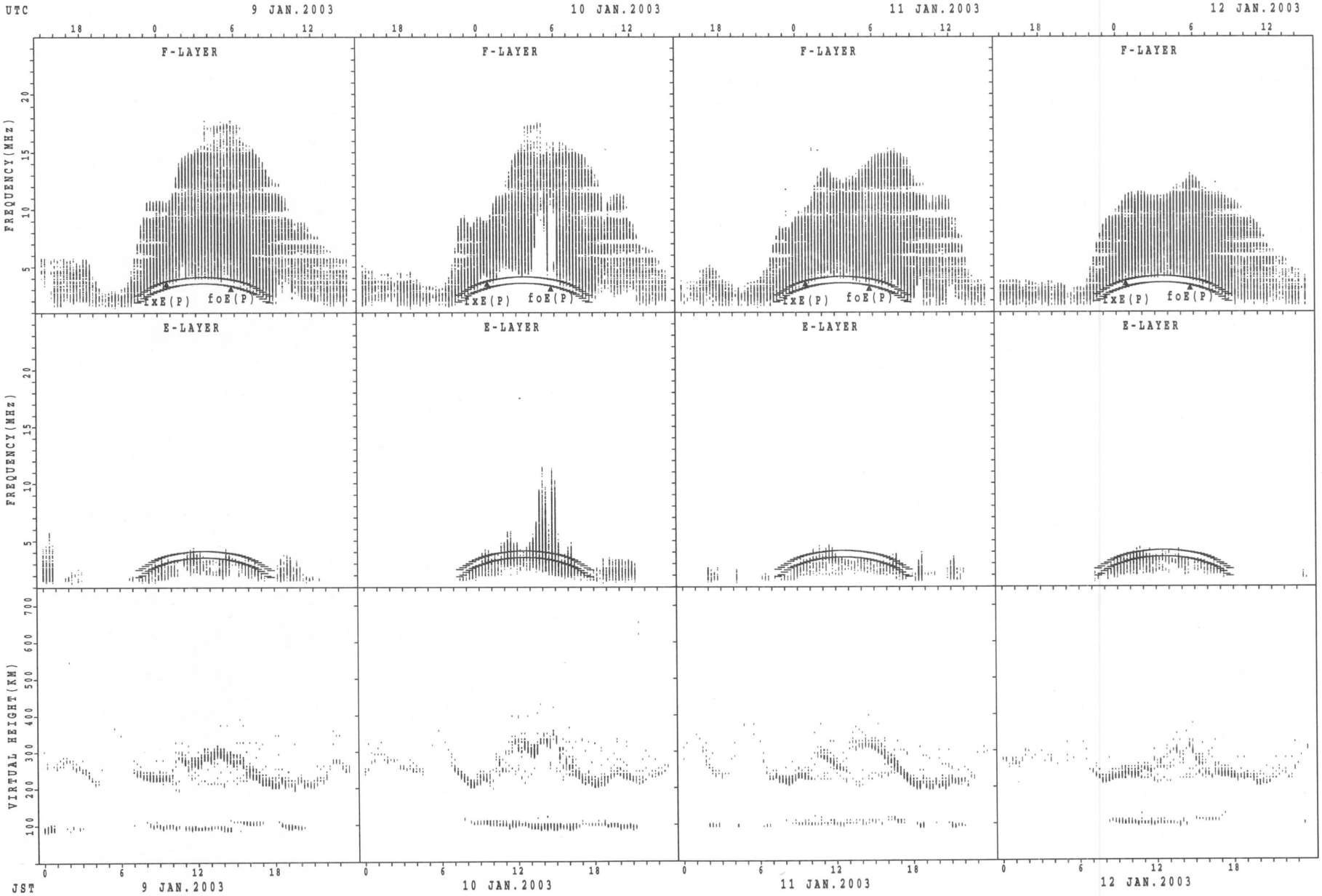
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



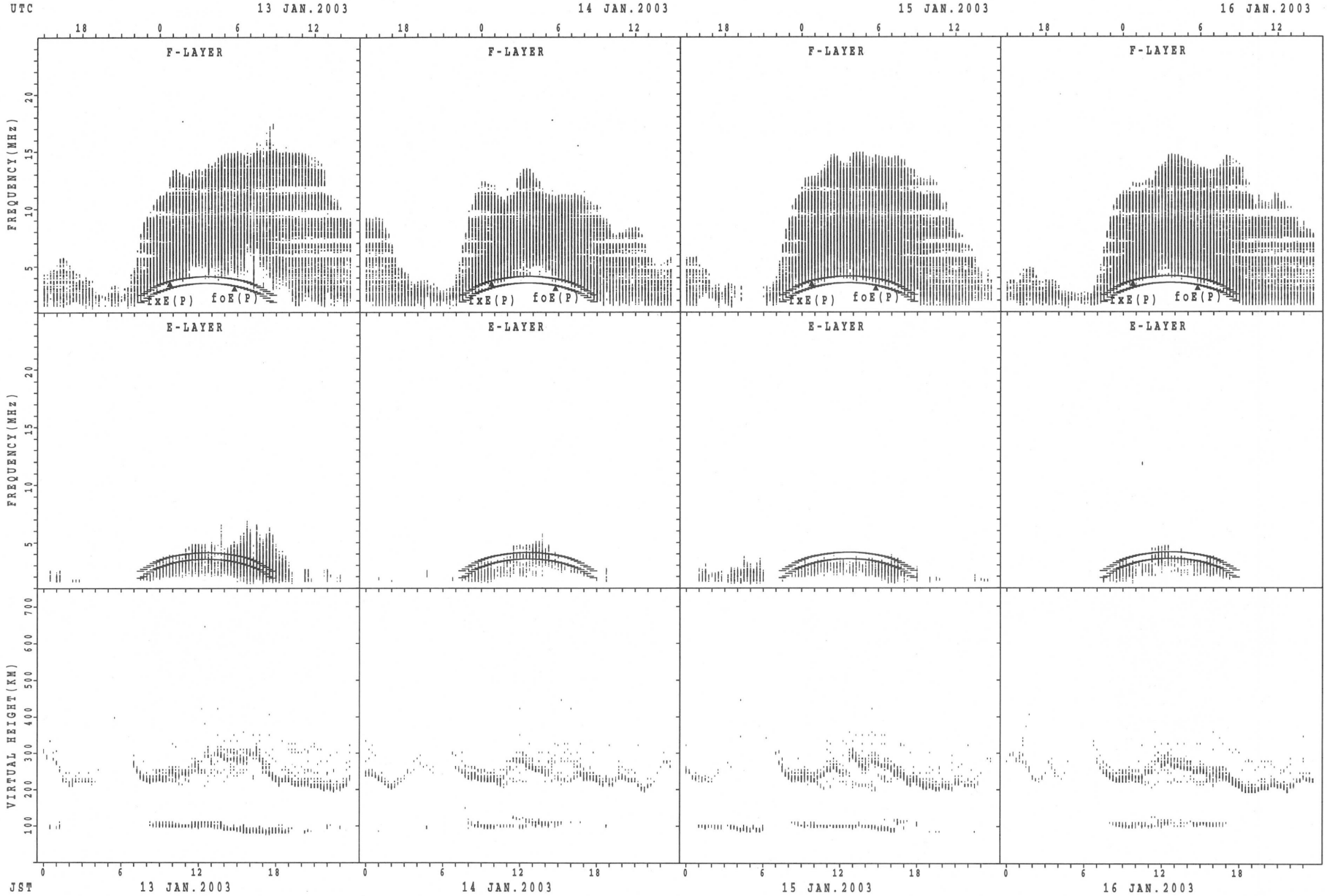
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa

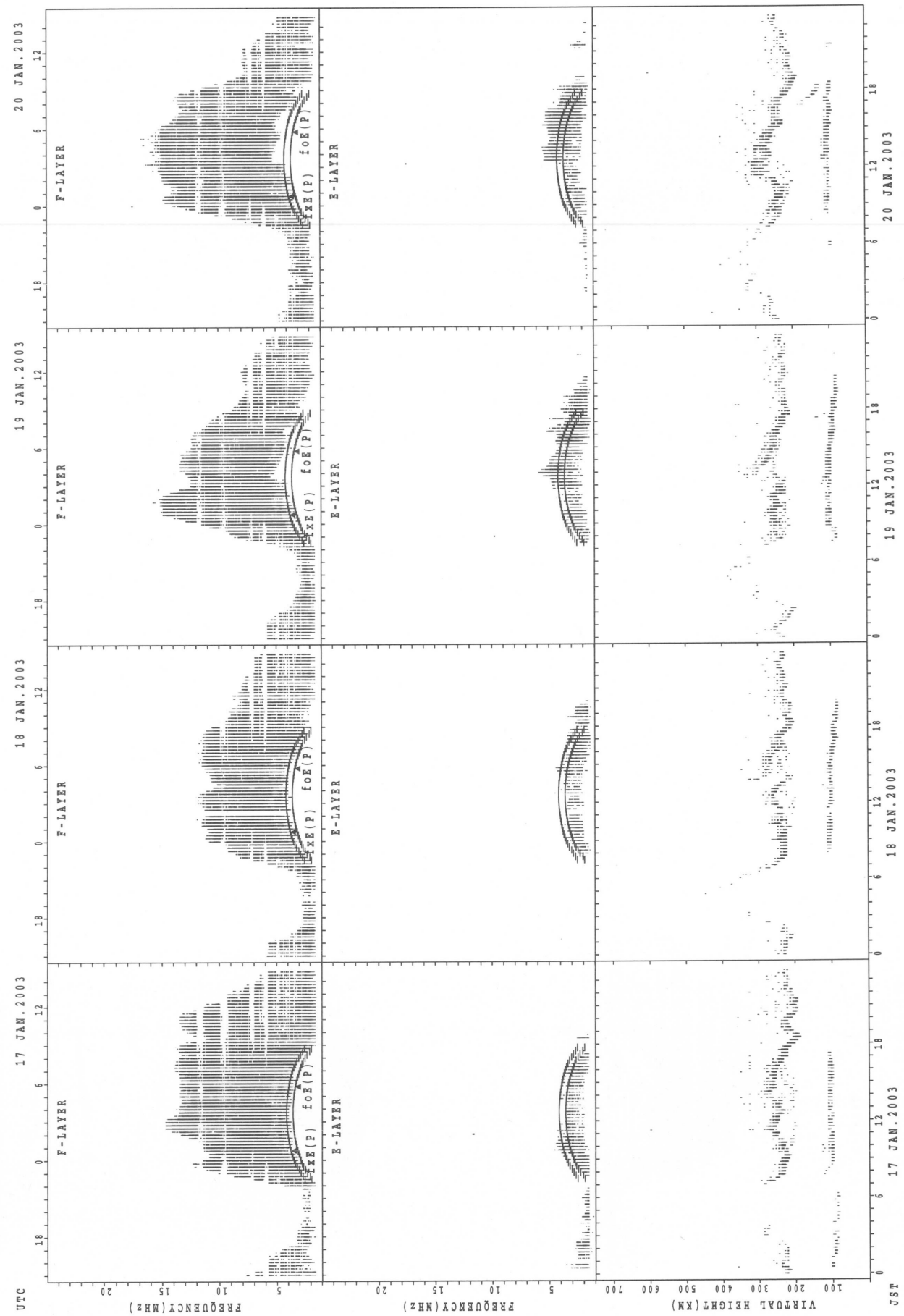


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

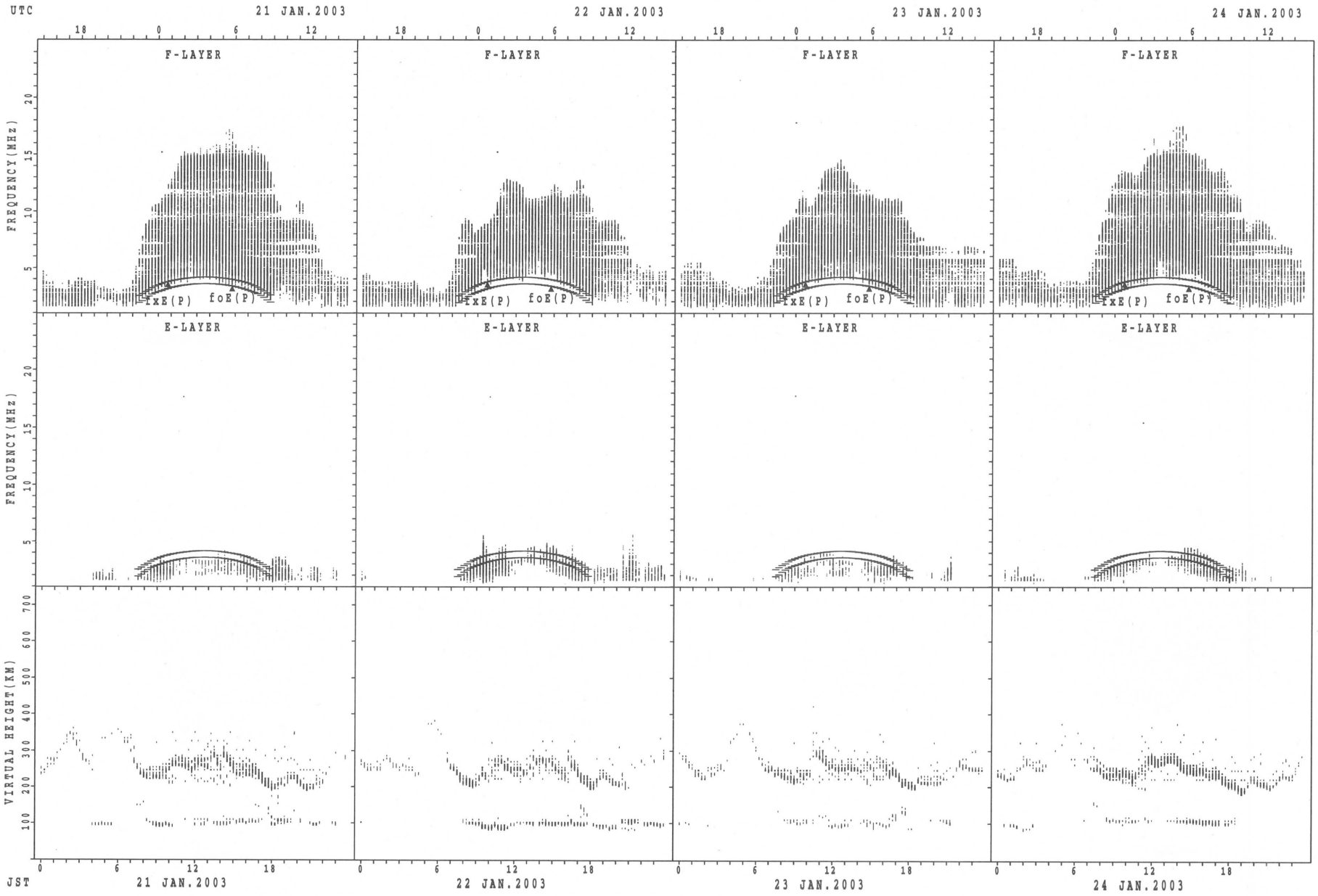
SUMMARY PLOTS AT Okinawa



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

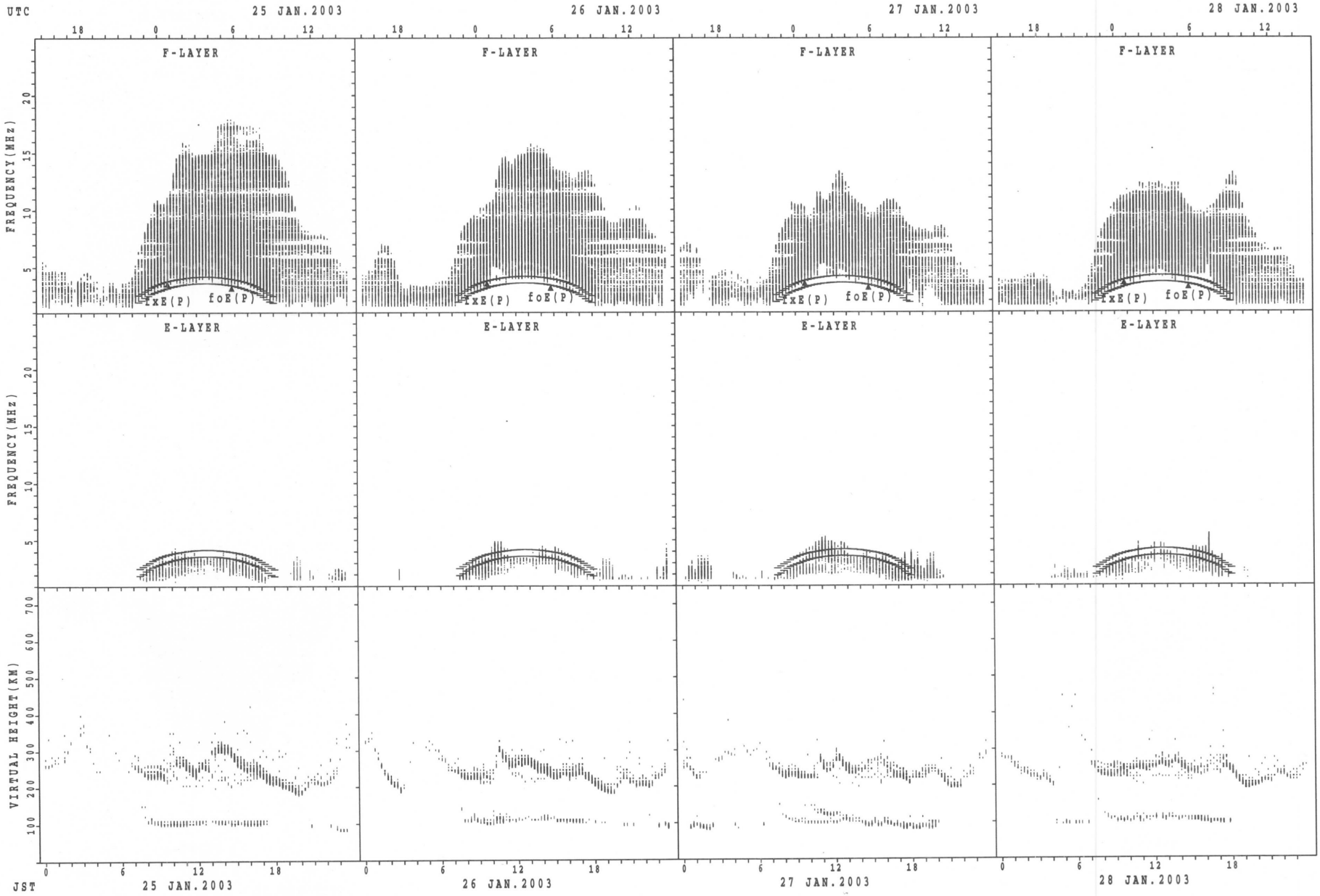

SUMMARY PLOTS AT Okinawa
UTC
JST
17 JAN.2003
18 JAN.2003
19 JAN.2003
20 JAN.2003
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



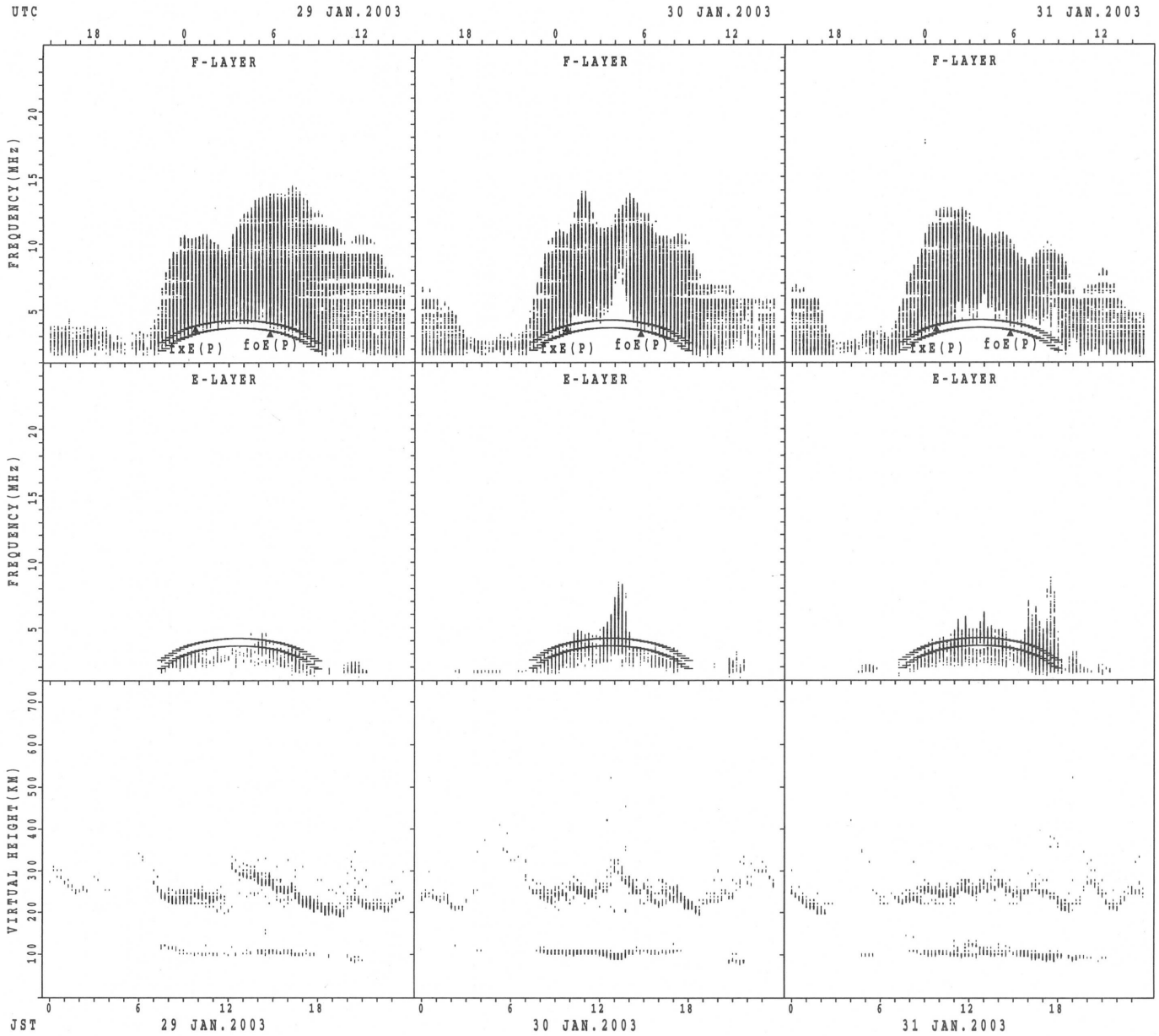
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

JAN.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				1					30	28	29	27	25	30	31	29	26	13	2					
MED				266					224	218	226	222	222	231	230	230	238	254	266					
U Q				133					234	230	226	230	228	238	238	233	248	267	280					
L Q				133					222	214	218	218	216	230	222	222	232	242	252					

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	9	9	12	8	8	12	12	13	5	2	3	2	6	6	8	13	14	17	15	13	15	13	16
MED	95	93	97	103	98	101	100	99	105	103	97	93	95	106	103	101	103	99	97	99	99	95	99	97
U Q	101	101	103	112	103	106	105	99	116	107	103	97	103	113	111	107	105	101	103	103	106	101	105	103
L Q	89	90	95	96	95	96	97	96	96	93	91	87	87	93	99	89	96	97	97	95	93	93	95	95

h'F STATION Kokubunji LAT. 35°42.4'N LON. 139°29.3'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								6	27	29	27	27	27	27	26	27	28	9	5	1				
MED								255	230	230	234	230	238	238	246	240	234	242	248	240				
U Q								268	240	239	246	238	250	252	250	252	240	272	267	120				
L Q								244	214	225	224	224	230	230	236	238	230	230	236	120				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	7	6	7	7	6	4	4	8	7	9	8	6	6	5	8	15	16	17	14	10	8	10	11
MED	95	97	98	97	97	103	102	98	108	107	105	106	102	104	105	102	99	98	97	97	93	88	99	97
U Q	101	105	99	107	101	103	105	100	140	113	109	117	107	109	106	104	111	103	103	97	101	97	101	101
L Q	91	95	95	95	97	95	95	96	95	105	99	103	99	101	91	98	95	91	90	95	89	87	93	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									29	30	29	30	26	25	31	30	28	28	16	5	3	1		
MED									238	230	248	241	243	246	254	251	240	238	257	248	248	274		
U Q									253	240	257	254	254	254	272	262	247	250	281	271	268	137		
L Q									230	222	238	238	236	238	246	246	233	229	243	234	248	137		

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	7	8	7	7	6	5	3	2	4	5	8	8	12	8	9	15	12	14	24	16	12	17	7	9
MED	97	96	95	95	96	97	97	97	115	107	107	109	111	103	107	105	99	96	96	95	95	97	95	95
U Q	103	100	105	97	97	102	113	99	148	109	112	122	118	111	112	105	104	103	103	99	99	101	99	99
L Q	89	92	95	89	95	89	93	95	101	96	104	106	109	100	103	97	90	91	90	88	89	95	89	92

MONTHLY MEDIANS OF h'F AND h'Es

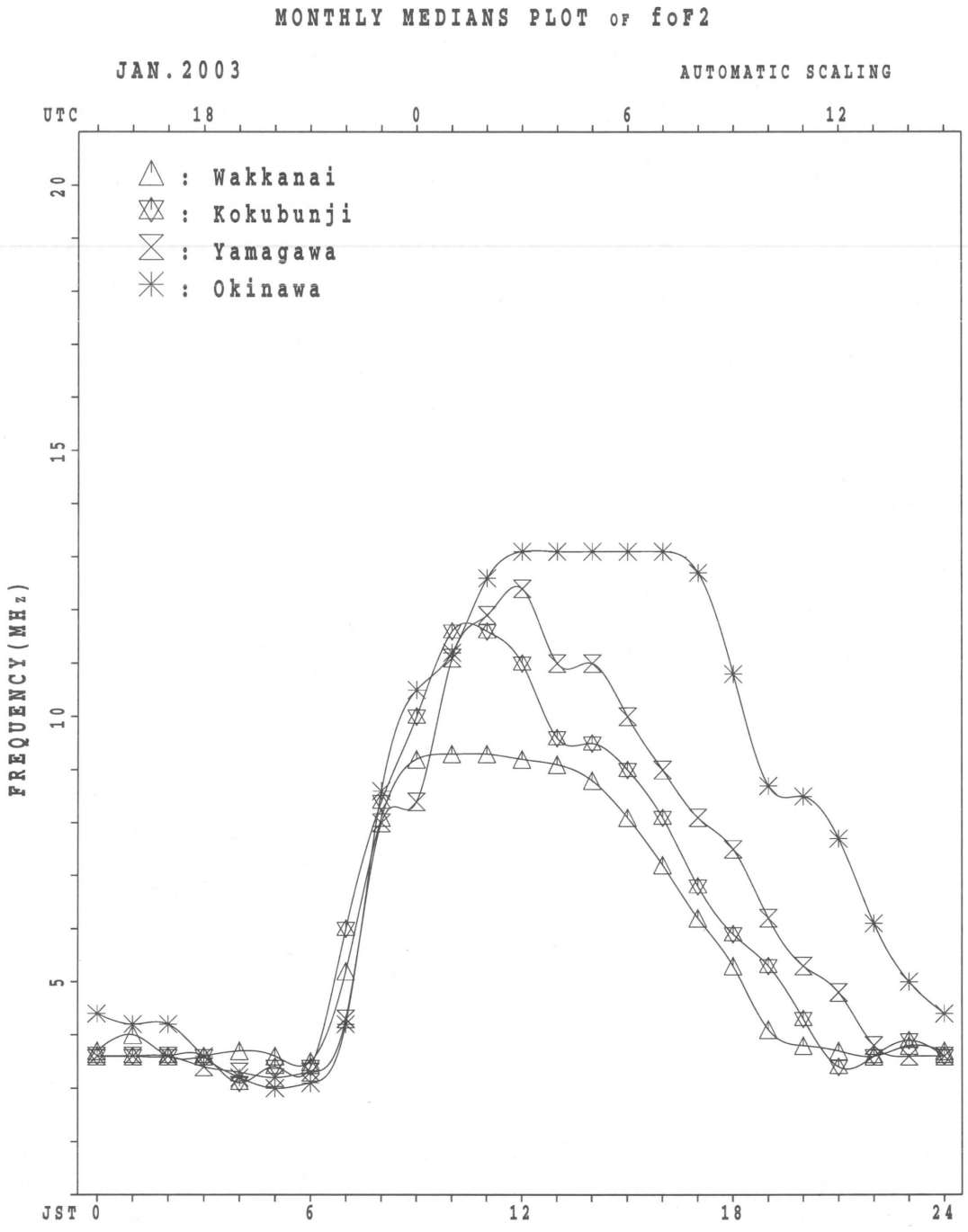
JAN.2003 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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	2	2	1						30	31	31	31	17	14	30	31	31	31	29	22	21	20	8	3
MED	267	255	260						240	234	240	246	256	270	263	262	250	234	222	237	244	237	239	270
U Q	278	256	130						248	238	248	262	262	294	278	268	256	246	230	244	254	252	252	278
L Q	256	254	130						230	230	234	242	250	254	246	246	244	224	214	222	231	230	222	230

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	2	4	5	1	4	5	4		2	7	13	16	16	18	15	16	19	19	14	15	12	11	5	8
MED	96	101	97	95	95	97	92		131	105	107	111	111	105	107	105	103	103	99	95	94	95	93	96
U Q	101	103	101	47	96	100	96		137	111	119	113	116	111	113	111	107	119	105	103	96	105	96	98
L Q	91	98	91	47	93	88	89		125	103	103	106	106	103	101	98	93	95	89	91	92	89	90	91


MONTHLY MEDIANS PLOT OF foF2
JAN. 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

JAN. 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 40	X 44	X 44	X 32	X 28	X 30	X 29											X 59	X 68	X 45	X 32	X 35	X 37	X 38
2	X 39	X 40	X 40	X 42	X 39	X 38	X 36											X 68	X 58	X 65	X 53	X 38	X 40	X 42
3	X 42	X 36	X 36	X 36	X 36	X 36	X 36											X 73	X 71	X 38	X 36	X 38	X 39	X 40
4	X 40	X 42	X 49	X 43	X 44	X 43	X 42											X 93	X 78	X 65	X 50	X 52	X 50	X 53
5	X 54	X 56	X 54	X 56	X 44	X 42	X 43											X 70	X 59	X 46	X 42	X 42	X 43	X 45
6	X 48	X 51	X 48	X 33	X 29	X 30	X 33											X 60	X 55	X 52	X 47	X 43	X 46	48
7	X 39	X 39	X 40	X 36	X 36	X 36	X 36											X 63	X 59	X 45	X 42	X 40	X 43	X 47
8	X 44	X 42	X 38	X 35	X 32	X 32	X 36											X 66	X 61	X 48	X 42	X 41	X 44	X 45
9	X 43	X 45	X 45	X 46	X 40	X 39	X 43											X 76	X 73	X 60	X 42	X 39	X 42	X 42
10	X 44	X 45	X 48	X 46	X 44	X 45	X 49											X 79	C	X 63	X 47	X 47	X 48	X 49
11	X 40	X 43	X 52	X 36	X 32	X 36	X 42											X 78	X 74	X 69	X 51	X 39	X 39	X 41
12	X 42	X 42	X 44	X 43	X 40	X 41	X 46											X 87	X 88	X 84	X 57	X 44	X 48	X 49
13	X 50	X 52	X 51	X 52	X 53	X 36	X 36											X 113	X 92	X 80	X 62	X 47	X 39	X 40
14	X 42	X 42	X 43	X 35	X 36	X 37	X 40											X 77	X 68	X 59	X 58	X 53	X 54	X 52
15	X 47	X 47	53	X 46	X 47	X 48	X 51											X 71	X 66	X 58	X 44	X 40	X 44	X 46
16	X 47	X 43	X 43	X 40	X 38	X 38	X 36											X 81	X 58	X 56	X 46	X 41	X 44	X 45
17	X 45	X 43	X 41	X 34	X 36	X 37	X 35											X 76	X 74	X 62	X 54	X 48	X 42	X 42
18	X 46	X 43	X 39	X 36	X 39	X 41	X 42											X 74	X 69	X 68	X 54	X 50	X 46	X 45
19	X 42	X 47	X 48	X 34	X 37	X 40	X 35											X 69	X 67	X 63	X 62	X 39	X 41	X 39
20	X 41	X 41	X 42	X 40	X 39	X 43	X 40												X 44	X 54	X 48	X 38	X 44	X 38
21	X 39	X 40	X 42	X 42	X 37	X 40	X 39												X 66	X 65	X 39	A	X 38	X 38
22	X 40	X 42	X 42	X 35	X 37	X 39	X 40												X 83	X 55	X 37	X 37	X 41	X 43
23	X 44	X 45	X 41	X 34	X 36	X 36	X 39												X 66	X 54	X 43	X 44	X 48	X 48
24	X 45	X 40	X 43	X 40	X 42	X 44	X 45												X 62	X 56	X 46	X 50	X 50	X 47
25	X 42	X 43	X 42	X 42	X 43	X 44	X 40				C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		C	X 66	X 66	X 58	X 40	X 40	X 40
28	X 40	X 41	X 46	X 58	X 37	X 28	X 31				C	C	C	C	C	C			X 71	X 61	X 46	X 46	X 43	X 46
29	X 41	X 42	X 42	X 44	X 41	X 40	X 40												X 66	X 55	X 53	X 38	X 38	X 41
30	X 39	X 40	X 40	X 41	X 34	X 37	X 37												X 63	X 70	X 55	X 45	X 46	X 48
31	X 50	X 47	X 45	X 38	X 40	X 38	X 44												X 71	X 66	X 56	X 56	X 55	X 48
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29											19	28	29	29	28	29	29
MED	X 42	X 43	X 43	X 40	X 38	X 38	X 40											X 74	X 66	X 60	X 47	X 42	X 43	X 45
U Q	X 46	X 45	X 48	X 44	X 42	X 42	X 42											X 79	X 72	X 66	X 54	X 47	X 47	X 48
L Q	X 40	X 41	X 41	X 35	X 36	X 36	X 36											X 68	X 62	X 54	X 42	X 39	X 40	X 40

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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	34	38	38	26	23	24	23	50	75	85	92	98	82	73	68	71	67	53	62	39	26	29	31	32
2	33	34	34	36	33	32	30	55	90	96	97	86	78	81	82	81	78	62	52	58	46	32	34	36
3	36	E C	30	30	30	30	30	55	74	84	118	130	102	80	79	78	74	67	65	32	29	32	33	34
4	34	37	44	37	37	37	36	60	102	128	134	114	114	102	102	101	103	87	72	59	44	46	44	47
5	48	50	48	50	38	36	37	67	108	125	136	132	122	96	95	84	72	64	53	40	36	36	37	39
6	41	45	42	E C	23	E C	28	56	86	84	107	112	103	90	86	86	71	54	49	46	40	37	40	F 37
7	33	33	33	30	30	30	30	60	72	86	106	102	103	S 99	94	92	75	57	53	39	36	34	37	41
8	38	36	32	29	26	26	30	64	87	94	97	106	108	105	97	89	82	60	55	42	36	35	38	39
9	37	39	39	40	34	33	37	66	79	104	119	133	113	115	116	96	76	70	66	54	36	33	36	36
10	38	39	42	40	38	39	43	66	79	102	101	101	110	120	116	117	93	73	C	56	41	41	42	43
11	34	37	46	30	26	30	36	62	81	111	115	117	126	100	100	109	96	72	68	63	45	32	33	34
12	36	36	38	37	34	35	40	57	80	106	141	120	113	106	118	108	94	81	82	78	52	38	42	43
13	44	46	45	46	47	30	30	66	98	132	138	133	126	139	136	124	118	S 107	86	72	56	41	33	34
14	36	36	37	29	30	31	34	64	91	101	110	117	113	110	90	84	80	71	62	53	51	47	48	46
15	41	41	F	40	41	42	45	70	91	98	134	130	116	100	97	104	84	65	60	52	38	34	38	40
16	41	37	37	34	32	32	30	58	85	93	110	115	120	108	99	87	79	75	52	50	40	35	38	39
17	39	36	35	28	30	31	29	63	84	105	123	125	102	89	91	88	78	69	68	56	48	42	36	36
18	40	37	32	30	33	35	36	55	74	89	114	120	110	91	86	90	80	68	63	62	48	44	40	37
19	36	41	42	28	31	34	29	61	95	131	146	142	107	88	87	89	79	63	61	57	56	33	35	33
20	35	35	36	34	S 33	37	34	55	102	124	120	109	116	120	105	106	85	61	38	48	42	32	37	31
21	32	34	36	36	31	34	33	62	94	108	122	127	109	99	97	97	78	78	59	59	33	A	32	32
22	34	36	36	29	31	33	33	63	87	92	98	101	99	85	87	86	80	76	76	49	30	31	35	37
23	38	39	35	28	30	30	33	64	84	90	116	117	112	89	95	94	77	68	59	48	37	38	42	42
24	39	34	37	34	36	38	39	64	88	97	109	108	97	96	99	90	80	64	56	50	40	43	44	41
25	36	37	36	36	36	38	34	57	81	102	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	77	C	60	60	52	34	34	34
28	34	35	40	51	31	22	25	57	75	78	C	C	C	C	C	C	76	69	65	55	40	40	37	40
29	35	36	35	38	35	34	34	65	81	83	82	94	88	85	85	81	80	74	60	49	47	32	31	35
30	33	34	34	35	J C 28	31	31	58	82	93	114	108	104	100	94	82	86	66	56	64	49	39	40	42
31	44	40	39	32	34	32	38	58	72	101	122	121	99	93	84	83	81	76	65	60	50	50	49	42
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	28	28	29	28	29	29	29	29	27	27	27	27	27	27	29	28	28	29	29	28	29	29
MED	36	37	37	34	32	32	33	61	84	98	115	117	109	99	95	89	80	68	60	54	41	36	37	37
U Q	40	39	41	38	36	36	36	64	91	107	123	127	114	106	100	101	84	74	66	60	48	41	41	42
L Q	34	36	35	30	30	30	30	57	79	90	106	106	102	89	86	84	76	64	56	48	36	32	34	34

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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											L		L											
2												L												
3																								
4																								
5																								
6											L			L										
7											L		L		L									
8														L										
9																								
10														L										
11																								
12														L										
13														L										
14												L	L	L										
15																								
16													L		L									
17															L									
18										L	L	L	L	L										
19											L													
20											L		L	L										
21											L													
22											L		L											
23											L	L			L									
24											L		L		L									
25											C	C	C	C	C	C	C							
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C		C						
28											C	C	C	C	C	C								
29											L	L		L 512										
30											L		L	L	L									
31											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										
MED														L 512										
U Q																								
L Q																								

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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

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								168	U R 260	304		A	R	U R 352		A	A	260	216									
2								B	252		A	A	A	A	U R 320	U R 292	U R 252		A									
3								B	236		A	A	U R 340	U R 348		A	A	260		A								
4								B	244	E C		A	A	A	A	R	A	U R										
5								B	A	R		A	U R 332	U R 348		R	292	U R 264	U A 208									
6								180	244		R	R	R	R	R	A	B	A										
7								U R 172	U A 252	296	332		A	A	R	U R 320	284	220										
8								176	A		A	U R 344	U R 360	R	U R 340	R	R	A										
9								B	256		A	U R 348	R	R	U R 344	U A 300	U R 292	U R 228										
10								B	U R 256		A	R	A	A	R	A	288	U R 232										
11								E C	244		A	U A 340	U R 356	R	U A 336	U A 328	R	A										
12								168	U R 260		A	U R 340	U R 364	U R 356	U A 344	U A 328	U R 300	A										
13								B	244	U R 324		A	A	A	U R 344	U R 304	A	A										
14								B	248	U R 304		A	U R 340	U A 352	U A 336	U R 316	A	U A 252										
15								B	240	U R 292	U R 336	A	U A 360	U R 340	U R 312	U R 276	U R 232											
16								168	260		A	A	A	U R 364	A	U R 324	U R 284	U R 236										
17								B	252		A	U R 332	U R 336	R	U R 332	U R 316	280	228										
18								B	A	U R 304		A	A	U R 352	U R 360	U A 332	A	220										
19								B	236		R	U R 332	R	U A 348	U R 332	R	U A 268	212										
20								188	U R 260		R	U R 312	U A 336	U A 348	A	A	A	A	B									
21								B	U R 244		A	A	U R 340	R	R	U R 312	A	U R 236	B									
22								B	A		A	R	U R 340	R	R	A	288	A	B									
23								B	A	296	328		A	U R 352	U R 328	324	R	236	B									
24								B	248	288	U R 328	U R 348	U R 360	U R 348	R	A	A	B										
25								B	256	296		C	C	C	C	C	C	C										
26								C	C	C	C	C	C	C	C	C	C	C	C									
27								C	C	C	C	C	C	C	C	C	U R 224	C										
28								200	248	296		C	C	C	C	C	240	B										
29								B	228	U R 304		A	U R 344	U R 348	U R 328	U R 312	288	U R 244	B									
30								188	A	B	U R 328		R	R	R	308	A	A	B										
31								U R 176	252	U A 296		A	U A 336	U R 348	R	A	A	232	B										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	23	12	12	13	14	14	16	14	17							
MED								176	248	296	U R 332	U R 340	U R 352	U R 338	U 314	282	U 232							
U Q								188	U R 256	U R 304	U R 340	U R 352	U R 356	U R 344	U A 324	288	U R 236							
L Q								168	244	296	U R 328	U 336	U 348	U R 332	U 306	264	220							

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 14	J A 30	E B 15	J A 24	E B 15	E B 15	E B 15	G	29	G	37	G	G 33	34	30	G 24	G	E B 14	J A 20	J A 23	J A 30	J A 31	J A 20	J A 22
2	J A 29	21	J A 21	J A 25	21	20	19	E B 15	G	35	J A 47	J A 44	J A 58	G 30	G 24	G 24	J A 28	J A 32	J A 47	J A 41	J A 22	J A 22	J A 23	J A 22
3	19	E C 28	E B 16	J A 20	20	E B 15	E B 16	E B 15	E B 15	33	J A 57	G 28	G 29	36	36	41	J A 47	J A 54	J A 32	J A 24	J A E 20	B E 15	B E 16	B E 16
4	18	18	18	J A 21	E B 16	E B 15	19	E B 16	28	33	J A 41	J A 46	J A 62	J A 41	G J A 30	34	G J A 21	32	E B 15	E B 15	E B 15	B E 16	B E 16	B E 16
5	E B 16	E B 14	20	E B 15	E B 14	E B 16	E B 16	E B 16	J A 27	G J A 27	40	37	G 29	G 27	G 25	G J A 23	J A 35	J A 23	J A 20	J A 44	J A 23	J A 29	J A 20	E B 16
6	E B 16	E B 15	19	E C 28	E C 18	E B 28	E B 15	G 17	28	G	G	G	G 32	G 30	35	E B 30	29	J A 24	J A 52	A J 38	J A 34	J A 27	J A 31	J A 22
7	E B 15	E B 14	E B 15	B J A 16	J A 19	J A 18	A E B 15	G	J A 28	34	36	39	36	G 28	G 22	J A 47	J A 40	J A 32	A E C 28	E C 28	J A 19	E B 14	C J A 28	19
8	E C 28	J A 19	J A 17	A J A 20	J A 22	19	20	G	J A 34	J A 47	G	G 33	G 29	G	G	G	28	J A 33	A J A 77	A J A 42	J A 18	J A 20	A E 15	B J A 46
9	J A 33	J A 25	J A 26	A J A 23	J A 23	J A 19	18	21	29	J A 47	G 32	G 35	G 27	G	33	G 23	G 23	J A 26	J A 25	A J A 21	J A 20	J A 26	J A 26	J A 26
10	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	19	E B 16	G 24	35	G 31	J A 53	J A 45	G 28	J A 48	32	G	J A 21	C E	C E 28	C E 28	B E 16	B E 16	J A 18
11	J A 22	J A 26	J A 23	A J A 22	J A 26	E B 16	C 18	28	G 19	31	36	G 28	G 29	J A 43	J A 41	G 26	J A 30	J A 26	A J A 28	J A 25	22	20	J A 24	J A 27
12	19	E B 16	J A 16	A J A 20	E B 16	22	J A 19	J A 24	G	J A 36	G 28	G 33	G 34	J A 40	J A 34	G 26	J A 27	J A 42	J A 27	A E 15	B E 16	B E 15	B E 15	B E 17
13	E B 15	E B 15	E B 15	B J A 21	J A 20	J A 20	E B 15	E B 16	G 19	G 29	J A 46	J A 54	J A 44	36	G J A 26	J A 47	J A 26	J A 28	J A 24	A E 15	B E 15	B E 16	B E 16	B E 16
14	J A 17	E B 16	E B 16	B E 15	B E 14	B E 14	B E 15	B E 15	G 21	G 21	34	G 26	37	37	G J A 26	J A 39	J A 31	J A 24	22	E B 15	B E 15	B E 16	B E 15	B E 15
15	E B 16	E B 15	B J A 26	E B 15	E B 14	E B 15	E B 15	E B 16	G 20	G 26	37	38	38	G 23	G	G 24	G	22	J A 19	22	20	19	19	J A 31
16	J A 19	J A 24	20	J A 22	J A 20	20	E B 14	G	G	34	36	44	G 28	37	G 32	G 24	G E 20	B E 15	B E 16	B E 16	B E 15	B E 14	B E 16	B 21
17	J A 24	20	20	18	E B E 14	B E 15	B E 16	B E 16	G 19	36	G 32	G 26	G 29	G 27	G 28	G J 25	J A 24	E B 16	B E 15	B E 16	B E 15	B E 15	B E 15	B E 14
18	E B 15	E B 15	B E 14	B 20	E B 16	18	19	J A 22	J A 27	G 28	35	J A 38	G 29	G 33	J A 32	J A 39	24	E B 16	J A 23	E B 14	B E 15	B E 16	B E 15	B E 16
19	E B 15	E B 15	B E 15	B E 15	B E 16	B E 15	B E 15	B E 16	G 20	G 22	G 26	J G 29	38	J A 33	G 30	32	23	E B 15	J A 28	A J A 28	A E B 18	19	J A 27	E B 15
20	20	J A 20	A J A 26	A J A 18	21	J A 18	A J A 20	G	G 20	G 23	G 24	37	39	J A 46	A J A 51	A J A 42	J A 35	A J A 22	A J A 21	J A 40	A J A 23	18	J A 18	E B 15
21	J A 20	A J A 24	19	E B 16	19	J A 20	18	20	G J 23	A J A 31	42	G 32	G 34	G 31	G 26	34	G 21	19	J A 24	A J A 38	J A 50	A J A 43	J A 34	A J A 22
22	E B 16	19	E B 16	J A 24	A J A 25	J A 40	A J A 52	J A 42	J A 34	A J A 54	22	G 28	G	G	35	32	38	J A 44	A J A 45	J A 23	J A 30	A J A 23	J A 21	J A 34
23	J A 20	20	E B 16	E B 15	20	J A 21	A J A 20	J A 24	A J A 33	33	37	40	43	G 27	36	26	33	J A 57	A J A 45	22	E B 16	B E 16	B J A 26	J A 26
24	J A J 26	A J A 24	J A 24	21	J A 20	19	19	19	G 20	G 23	G 21	G 32	G 28	G	G 29	32	J A 44	J A 54	A J A 56	J A 20	A J A 55	J A 23	A J A 24	E B 15
25	E B 15	E B 15	E B 15	B E 16	B E 15	B E 14	B E 15	24	33	33	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	C	E B 16	E B 15	22	20	E B 14	E B 15
28	J A 23	A J A 20	E B 14	B E 15	B E 16	B E 15	B E 15	G	28	33	C	C	C	C	C	C	G E 21	B 16	E B 21	E B 15	B E 15	B E 16	B E 15	B E 16
29	20	E B 16	B E 15	B E 15	B E 15	B E 15	B E 15	21	28	G 26	35	G 31	G 28	G 29	37	34	G	E B 19	J A 22	A J A 28	J A 32	A J A 22	J A 21	E B 15
30	E B 16	18	J A 20	E B 15	E C 28	E B 15	B E 16	G	30	E B 30	G 27	G	G	G	35	34	28	20	E B 16	B E 16	B E 16	B E 15	B E 15	B E 15
31	E B 16	B E 16	B E 16	B E 16	B E 16	B E 15	B E 15	G	G	34	34	36	G 28	G 30	34	J A 39	J A 26	A J A 50	J A 20	18	18	E C 27	19	E C 28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	27	27	27	27	27	27	29	28	28	29	29	29	29	29
MED	18	18	16	18	E 18	E B 16	B E 16	G	G	33	35	G	G 34	G	G	32	26	J A 24	A J 23	22	20	18	18	E B 17
U Q	J A 21	A J A 22	J A 20	A J A 22	J A 20	20	19	21	28	34	J A 37	A J A 39	J A 38	A J A 36	35	J A 39	32	A J A 32	A J A 30	A J A 28	J A 26	A J A 23	A J A 24	J A 24
L Q	E B 16	E B 15	E B 15	B E 15	B E 15	B E 15	B E 15	B E 16	G 20	G 28	G 31	G 31	G 29	G 29	G 28	G 25	G E	B 19	E B 20	B E 16	B E 16	B E 16	B E 15	B E 15

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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 14	E B 15	E B 15	16	E B 15	E B 15	E B 15	G	26	G	32	G	G 31	33	29	G 24	G	E B 14	17	19	16	21	16	19
2	18	16	E B 15	18	16	E B 16	E B 15	E B 15	G	31	35	37	36	G 30	G 23	G 24	24	29	17	23	17	16	E B 15	E B 16
3	E B 15	E C 28	E B 16	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15	30	54	G 28	G 29	35	34	39	39	49	16	E B 16	E B 16	E B 15	E B 16	E B 16
4	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	E B 16	E B 16	26	31	35	42	40	35	G 28	28	G 20	20	E B 15	E B 15	E B 15	E B 16	E B 16	E B 16
5	E B 16	E B 14	E B 15	E B 15	E B 14	E B 16	E B 16	E B 16	24	G 26	34	35	G 29	G 26	G 25	G 23	G 18	E B 15	E B 16	28	20	21	E B 16	E B 16
6	E B 16	E B 15	E B 16	E C 28	E B 15	E C 28	E B 15	G 16	27	G	G	G	G U Y 28	30	34	E B 30	27	21	18	19	19	E B 16	19	E B 15
7	E B 15	E B 14	E B 15	E B 15	17	E B 16	E B 15	G	G 21	33	35	38	35	G 28	G 22	40	37	32	E C 28	E C 28	E B 15	E B 14	E C 28	E B 15
8	E C 28	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	28	36	G	G U Y 32	29	G	G	G	24	30	32	E B 15	E B 15	E B 16	E B 15	16
9	E B 15	E B 16	16	E B 15	16	E B 15	E B 15	20	28	33	G 30	G U Y 34	27	G	32	G 22	G 21	21	20	18	17	16	20	22
10	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G 22	34	G 29	40	42	U Y 28	38	31	G	17	C	E C 28	E C 28	E C 16	E B 16	E B 15
11	16	20	17	18	16	E B 16	E B 15	E C 28	G 19	30	G 34	G 24	G 28	G 31	G 30	G 22	28	20	19	18	E B 16	E B 16	19	20
12	E B 15	E B 16	E B 15	E B 14	E B 16	E B 15	E B 15	E B 14	G	31	G 24	G 30	G 30	G 30	G 26	G 19	23	31	24	E B 15	E B 16	E B 15	E B 15	E B 17
13	E B 15	E B 15	E B 15	15	E B 15	E B 16	E B 15	E B 16	G 19	G 29	36	39	36	35	G 24	42	24	22	17	E B 15	E B 15	E B 15	E B 16	E B 16
14	E B 16	E B 16	E B 16	E B 15	E B 14	E B 14	E B 15	E B 15	G 21	G 20	34	U Y 26	36	36	G 25	32	G 20	20	19	E B 15	E B 15	E B 16	E B 15	E B 15
15	E B 16	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 16	G 19	G 26	36	36	37	G 23	G	G 24	G	E B 16	E B 16	16	E B 16	E B 16	E B 15	16
16	E B 16	E B 15	E B 15	E B 16	E B 15	E B 16	E B 14	G	G	32	34	41	G 28	35	G 32	G 21	G 20	E B 15	E B 16	E B 16	E B 15	E B 14	E B 16	E B 15
17	19	16	E B 15	E B 14	E B 14	E B 15	E B 16	E B 16	G 19	G 32	G 31	G 26	G 28	G 24	G 28	G 25	G 19	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15	E B 14
18	E B 15	E B 15	E B 14	18	E B 16	E B 15	E B 15	19	26	G 16	33	35	G 26	G 30	G 28	20	23	E B 16	E B 16	E B 14	E B 15	E B 16	E B 15	E B 16
19	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15	E B 16	G 20	G 22	G 26	G 27	36	G 30	G 28	28	23	E B 15	16	17	E B 18	E B 15	19	E B 15
20	E B 15	E B E B 15	16	E B 15	E B 16	E B 15	E B E B 15	G	G 20	G 20	G 23	36	36	38	40	33	29	16	16	32	E B 16	E B 15	E B 16	E B 15
21	E B 15	E B 16	E B 16	E B 16	E B 15	E B 16	E B 15	19	G 23	28	36	G 31	G U Y 32	31	G 26	31	G 19	17	21	21	20	A A 43	27	18
22	E B 16	E B 16	E B 16	16	E B 16	E B 16	E B 15	20	26	35	G 22	G 24	G	G	34	31	36	30	22	E B 16	21	17	17	24
23	17	16	E B 16	E B E B 15	15	16	E B 15	21	26	32	35	38	40	G 23	35	25	32	55	20	E B 15	E B E B 16	E B 16	E B 15	20
24	21	E B 15	17	E B 16	E B E B 15	E B 15	E B E B 15	17	G 18	G 20	G 21	G 28	G 27	G	G 29	31	31	28	20	E B 16	21	E B 14	E B 15	E B 15
25	E B 15	E B 15	E B 15	E B 16	E B 15	E B 14	E B 15	20	30	32	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	C	E B 16	E B 15	E B 15	E B 15	E B 14	E B 15
28	18	17	E B 14	E B 15	E B 16	E B 15	E B 15	G	27	32	C	C	C	C	C	C	G 20	E B 16	E B 15	E B 15	E B 15	E B 16	E B 15	E B 16
29	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	20	26	G 20	33	G 29	G 27	G 26	34	30	G	E B 19	E B 16	17	20	E B 15	E B 15	E B 15
30	E B 16	E B 15	E B 16	E B 15	E B 28	E C 15	E B E B 16	G	28	E B 30	G 27	G	G	G	35	33	26	19	E B 16	E B 16	E B 16	E B 15	E B 15	E B 15
31	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B E B 15	G	G	32	34	35	U Y 28	G 30	34	31	G 18	17	17	E B 15	E B 16	E B E C 27	E B 15	E B C 28
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	27	27	27	27	27	27	29	28	28	29	29	29	29	29
MED	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	G	G	30	G	G	G 31	G 31	G 30	28	23	20	16	E B 16	E B 16	E B 16	E B 16	E B 16
U Q	16	16	16	16	16	E B E B 16	15	19	26	32	35	37	36	33	34	31	28	28	20	19	18	16	16	18
L Q	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	G 20	G 26	G 29	G 28	G 28	G 28	G 26	G 24	G 20	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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

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

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

IONOSPHERIC DATA STATION Kokubunji

JAN.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	283	323	353	339	312	287	298	342	359	361	347	361	343	349	326	351	366	333	352	354	293	280	287	283
2	280	304	309	328	280	285	289	331	360	345	370	359	333	346	344	340	349	334	320	335	355	297	272	293
3	314	E C	295	299	287	326	312	352	344	308	330	351	348	353	341	347	338	336	357	343	314	302	299	272
4	286	292	322	259	269	282	337	319	330	332	345	329	325	317	321	320	340	335	353	352	311	305	296	307
5	315	321	334	353	289	288	289	333	345	343	338	330	331	345	344	341	344	335	344	358	322	307	291	278
6	290	323	351	E C	275	E C	322	351	359	353	333	340	338	318	319	331	358	322	314	333	330	285	304	F 319
7	293	300	315	303	309	291	318	356	354	347	336	329	318	S 309	316	329	333	320	334	336	305	301	291	318
8	333	324	337	308	281	271	314	349	362	348	331	313	316	321	325	335	348	326	342	343	326	302	311	299
9	297	295	299	322	315	284	330	346	373	345	333	340	295	301	314	321	331	317	336	344	355	276	289	289
10	294	297	312	314	288	280	346	364	355	348	327	318	301	309	295	317	328	324	C	337	320	286	314	315
11	274	253	332	306	266	272	315	362	339	327	328	309	315	316	296	313	325	314	329	338	338	299	276	275
12	284	257	298	293	295	290	349	348	347	331	338	325	314	298	314	314	333	319	310	334	342	292	269	260
13	285	308	299	306	336	342	284	334	345	337	338	318	297	308	310	311	315	S 306	298	309	321	306	286	289
14	275	290	325	319	287	288	309	337	348	337	331	319	318	328	308	322	323	320	313	306	310	288	298	311
15	299	285	F	289	292	280	296	340	355	328	329	331	314	322	303	319	340	316	321	326	297	276	272	290
16	294	292	304	313	293	317	333	335	355	337	316	331	314	333	328	334	334	343	339	328	315	290	279	302
17	305	326	341	298	283	275	282	346	356	334	339	336	347	330	323	337	345	327	337	350	307	318	287	293
18	323	335	333	273	253	264	322	363	346	355	339	335	341	338	322	325	343	327	316	328	318	315	305	305
19	273	312	352	276	279	269	258	310	317	332	330	340	334	322	322	338	348	331	320	322	346	320	298	290
20	299	281	295	274	S 268	295	305	314	334	341	337	317	311	317	308	320	344	349	296	321	347	296	329	291
21	277	291	310	317	275	298	294	329	348	343	329	328	332	299	315	349	335	320	331	352	328	A	311	273
22	271	283	316	312	298	288	326	349	365	355	351	326	345	313	321	323	328	331	348	359	377	290	295	297
23	297	299	326	276	268	274	324	354	353	320	331	326	333	322	328	340	332	331	342	343	302	304	307	323
24	317	296	308	274	277	294	324	348	347	337	349	346	324	327	335	330	351	328	318	348	324	303	321	312
25	308	277	274	278	277	289	305	332	346	341	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	359	C	338	339	368	312	305	307
28	289	279	319	348	392	278	301	357	350	344	C	C	C	C	C	C	344	328	339	334	315	310	310	314
29	302	308	300	303	327	288	296	362	372	369	353	340	349	318	338	336	356	354	343	331	348	342	300	282
30	276	292	311	342	C	284	301	338	330	334	333	342	325	331	340	330	327	332	312	330	359	289	275	286
31	299	307	317	298	273	271	341	345	337	334	329	354	333	341	343	332	333	343	331	346	296	298	337	303
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	28	28	28	28	28	29	29	29	29	27	27	27	27	27	27	29	28	28	29	29	28	29	29
MED	294	296	316	304	285	286	312	346	348	341	333	331	325	322	322	330	340	328	332	337	322	300	298	293
U Q	304	310	332	318	296	290	325	353	358	348	339	340	338	333	335	338	348	334	342	347	346	306	308	309
L Q	282	288	302	284	275	276	296	334	344	333	330	325	314	313	314	320	332	320	317	329	310	290	286	284

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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											L		L											
2												L												
3																								
4																								
5																								
6											L			L										
7											L		L		L									
8														L										
9																								
10														L										
11																								
12														L										
13														L										
14												L	L	L										
15																								
16													L		L									
17															L									
18										L	L	L	L	L										
19											L													
20											L		L	L										
21											L													
22											L		L											
23											L	L			L									
24											L		L		L									
25											C	C	C	C	C	C	C							
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C		C						
28											C	C	C	C	C	C								
29											L	L		L 364										
30											L		L	L	L									
31											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										
MED														L 364										
U Q																								
L Q																								

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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											256		246											
2												242												
3																								
4																								
5																								
6											262			262										
7											266		270		278									
8														276										
9																								
10														276										
11																								
12														294										
13														276										
14												260	260	250										
15																								
16													280		260									
17															252									
18										238	254	256	248	254										
19											256													
20											250		268	270										
21											250													
22											242		240											
23											258	254			266									
24											240		276		264									
25											C	C	C	C	C	C	C							
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C		C						
28											C	C	C	C	C	C								
29											244	252		266										
30											258		264	270	258									
31											268		252	246										
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	13	5	10	11	6									
MED										238	256	254	262	270	262									
U Q											260	258	270	276	266									
L Q											247	247	248	254	258									

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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 286	250	218	234	246	E B 328	E B 312	230	216	216	212	216	196	206	208	H 196	212	200	220	208	258	E A 346	E A 310	E A 312
2	E A 304	E A 270	250	250	234	E B 294	E B 298	238	228	224	216	208	214	206	226	218	220	208	226	236	210	E A 266	E B 306	E B 288
3	244	E C 316	E B 292	E B 268	E B 280	252	246	216	216	212	234	230	216	210	214	224	224	238	208	210	246	E B 252	262	E B 304
4	E B 286	E B 300	238	E B 292	E B 290	E B 268	226	H 188	232	232	228	222	222	220	212	226	216	216	204	210	210	234	242	254
5	236	238	216	212	202	248	E B 282	H 204	H 200	220	228	212	208	212	212	216	216	210	210	242	E A 250	E A 286	E B 288	E B 326
6	E B 278	242	214	E C 306	E B 376	E B C 390	254	220	226	214	204	226	230	H 196	230	224	218	210	230	224	230	254	E A 286	244
7	E B 266	E B 286	262	250	E A 272	E B 296	244	208	198	218	224	218	208	228	226	242	218	226	226	E C 238	248	260	E C 316	256
8	E C 244	238	226	254	E B 318	E B 338	268	222	212	232	222	212	226	208	222	232	222	234	E A 240	214	232	E B 270	260	266
9	254	E B 278	E A 282	248	226	E B 292	232	218	200	220	216	230	220	212	218	222	210	226	220	216	214	E A 298	E A 310	E A 320
10	E B 278	266	252	234	248	E B 298	220	202	204	218	218	224	224	206	222	236	216	218	C	230	236	E B 282	250	238
11	E A 288	E A 374	246	248	E A 298	E B 330	246	212	212	224	228	214	230	218	232	240	224	212	226	228	204	220	E A 330	E A 344
12	E B 290	E B 314	E B 284	250	252	E B 280	220	202	208	224	220	218	220	218	224	222	222	236	242	210	206	236	E B 276	E B 328
13	E B 288	254	260	254	232	206	E B 302	H 184	208	226	220	216	208	200	224	230	226	208	212	222	214	218	272	E B 296
14	E B 298	E B 292	244	224	E B 292	E B 290	252	222	218	216	216	216	222	212	214	216	230	228	230	228	230	248	260	240
15	244	266	E B 278	260	254	258	266	232	210	216	234	224	206	202	218	228	218	214	220	212	234	E A 300	E B 300	E A 284
16	258	262	274	240	240	240	230	226	216	220	214	232	216	222	212	220	216	218	208	220	212	234	E B 292	264
17	E A 266	240	228	238	E B 288	E B E B 328	E B 308	224	206	218	216	216	216	208	H 190	212	218	208	218	214	224	224	E B 262	256
18	238	228	230	E A 328	E B 346	E B 322	224	208	212	208	H 200	212	214	214	206	208	216	216	216	214	218	240	244	266
19	E B 320	264	224	E B 282	E B 306	E B E B 324	E B 340	252	226	230	222	220	200	212	210	222	216	208	224	230	216	226	E A 274	E B 288
20	270	E B 296	E A 298	E B 280	E B 332	E B 292	248	238	240	230	208	210	220	226	230	234	214	202	E A 246	E A 272	214	258	244	E B 286
21	E B 296	E B 300	262	266	E B 302	E B 290	264	228	210	H 190	210	226	222	210	H 204	228	H 202	214	210	222	E A 246	A	E A 336	E A 328
22	E B 310	E B 308	248	232	274	E B 290	246	216	204	218	212	218	204	218	220	228	222	216	218	200	212	E A 288	E A 290	E A 304
23	E A 286	264	238	E B 278	E B 336	E B E A 340	258	216	216	214	218	218	226	220	212	230	218	E A 264	220	210	220	260	258	250
24	E A 264	254	252	E B 312	E B 318	E B 298	232	220	216	206	190	H 178	210	236	218	230	216	210	220	210	226	E B 278	248	238
25	258	E B 302	E B 326	E B 312	E B 320	E B 274	232	216	210	230	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	204	C	210	222	204	224	254	E B 274
28	E A 296	E A 294	254	226	190	E B 326	E B 284	214	208	210	C	C	C	C	C	C	218	216	200	214	234	240	260	244
29	258	252	254	260	224	E B 272	E B 262	220	212	208	196	200	224	184	230	214	222	216	208	220	214	216	262	E B 276
30	E B 306	E B 286	236	228	E C 312	308	E B 272	228	H 200	H 188	210	210	208	210	210	220	220	218	222	236	202	E B 270	E B 300	E B 292
31	266	256	220	E B 256	E B 330	E B 326	230	216	216	230	226	224	210	200	212	214	H 218	206	208	216	252	E C 264	222	E C 276
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	29	29	29	29	29	29	29	29	27	27	27	27	27	27	29	28	28	29	29	28	29	29
MED	E 278	U 247	243	U 243	E 288	E B 294	U 241	218	212	218	216	218	216	212	218	224	218	216	219	218	218	U 239	E 272	E 276
U Q	E B 293	E B 298	E 268	E B 279	E B 318	E B 326	E B 277	227	216	225	224	224	222	218	224	230	222	222	226	229	235	E A 274	E 300	E A 304
L Q	258	253	229	236	243	273	232	210	207	213	210	212	208	206	212	216	216	209	210	211	212	234	256	255

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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

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								E B 138	114	112	118	114	122	A	A	120	124							
2								B	114	112	A	A	A	122	118	116	A							
3								B	114	112	A	120	120	118	118	114	A							
4								B	114	E C	A	A	A	A	120	A	A							
5								B	A	A	A	118	120	114	114	124	118							
6								128	120	118	122	118	118	A	A	B	A							
7								126	122	114	114	116	114	122	122	110	116							
8								116	A	A	118	118	122	116	116	120	A							
9								B	114	A	118	120	118	112	116	112	112							
10								B	124	A	118	A	A	114	A	110	116							
11								E C	120	118	120	120	114	116	114	114	A							
12								118	112	114	118	124	122	118	114	116	A							
13								B	118	122	A	A	A	120	118	A	A							
14								B	124	120	118	118	116	118	122	A	118							
15								B	122	120	120	118	120	114	112	122	122							
16								E B 148	112	116	118	120	118	A	A	116	118							
17								B	120	118	124	120	116	110	116	120	126							
18								B	A	112	112	A	118	122	122	A	124							
19								B	116	116	112	118	122	122	122	120	118							
20								E B 128	118	116	110	124	122	122	A	A	A	B						
21								B	118	A	A	118	118	A	120	120	114	B						
22								B	A	A	112	116	116	116	112	112	A	B						
23								B	A	116	112	118	122	116	114	114	112	B						
24								B	120	120	116	126	122	116	124	120	A	B						
25								B	114	114	C	C	C	C	C	C	C							
26								C	C	C	C	C	C	C	C	C	C	C						
27								C	C	C	C	C	C	C	C	C	110	C						
28								E B 140	114	110	C	C	C	C	C	C	120	B						
29								B	122	120	114	118	114	116	114	118	114	B						
30								124	118	B	110	112	116	112	110	112	114	B						
31								E B 126	118	114	108	116	116	122	114	A	116	B						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10	24	21	21	22	23	22	22	20	18							
MED								122	118	116	118	118	118	116	116	116	117							
U Q								E B 138	120	119	118	120	122	122	120	120	120							
L Q								124	114	113	112	118	116	114	114	113	114							

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

IONOSPHERIC DATA STATION Kokubunji

JAN. 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	B	100	B	94	B	B	B	G	144	G	118	G	112	108	106	110	G	B	104	98	96	88	96	94
2	96	98	96	92	94	94	98	B	G	124	108	106	102	106	106	108	98	96	98	98	96	96	92	98
3	102	C	B	102	100	B	B	B	B	112	100	108	108	116	126	112	100	94	104	104	96	B	B	B
4	116	116	116	98	B	B	152	B	174	122	108	104	106	102	106	102	106	98	B	B	B	B	B	B
5	B	B	100	B	B	B	B	B	106	108	100	150	98	102	104	102	100	100	100	96	92	86	86	B
6	B	B	112	C	102	C	B	104	150	G	G	G	94	104	104	B	100	110	102	92	98	104	96	94
7	B	B	B	98	98	102	B	G	104	156	148	116	116	110	96	120	114	108	C	C	104	B	C	102
8	C	96	94	92	92	98	130	G	110	114	G	106	108	G	G	G	106	104	106	106	106	98	B	98
9	96	94	96	100	96	102	100	156	138	106	104	102	104	G	120	94	92	90	88	90	94	90	88	100
10	B	B	B	B	B	B	110	B	108	108	108	100	98	98	96	108	G	96	C	C	C	B	B	96
11	96	96	98	98	98	B	98	C	106	116	116	104	106	96	96	96	88	90	94	94	92	90	96	96
12	90	B	98	100	B	96	94	94	G	116	106	108	102	100	100	94	100	92	88	B	B	B	B	B
13	B	B	B	100	98	92	B	B	106	102	106	104	104	110	98	94	96	92	90	B	B	B	B	B
14	102	B	B	B	B	B	B	B	106	106	122	108	146	120	104	96	98	98	96	B	B	B	B	B
15	B	B	102	B	B	B	B	B	108	108	156	132	150	98	G	108	G	94	92	92	90	90	94	104
16	110	96	98	96	96	98	B	G	G	116	116	122	106	108	104	100	106	B	B	B	B	B	B	100
17	96	96	98	92	B	B	B	B	106	118	104	102	98	98	102	106	114	B	B	B	B	B	B	B
18	B	B	B	100	B	100	94	90	88	94	118	106	106	106	108	106	124	B	104	B	B	B	B	B
19	B	B	B	B	B	B	B	B	108	100	100	102	144	104	106	114	136	B	94	94	B	90	104	B
20	106	118	104	114	108	106	102	G	104	102	102	134	128	116	104	106	102	102	102	88	90	92	92	B
21	100	104	96	B	102	102	100	100	106	106	104	102	102	104	108	118	98	110	102	100	98	90	88	86
22	B	94	B	104	100	100	100	96	94	90	94	96	G	G	120	130	104	98	96	96	94	92	86	86
23	84	84	B	B	104	98	104	96	94	150	132	122	120	92	152	90	126	106	110	96	B	B	102	98
24	94	94	94	96	90	98	106	106	102	104	102	106	102	G	110	122	106	102	98	106	92	96	94	B
25	B	B	B	B	B	B	B	116	156	158	C	C	C	C	C	C	C	C	C	C	C	C	C	C
26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
27	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G	C	B	B	114	114	B	B
28	92	92	B	B	B	B	B	G	164	160	C	C	C	C	C	C	104	B	100	B	B	B	B	B
29	88	B	B	B	B	B	B	136	140	102	126	102	100	100	132	120	G	B	102	106	92	92	92	B
30	B	90	88	B	C	B	B	G	122	B	104	G	G	G	112	112	118	112	B	B	B	B	B	B
31	B	B	B	B	B	B	B	G	G	116	114	142	102	100	114	102	102	94	94	92	92	C	90	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	15	15	15	16	14	13	13	10	24	26	25	24	25	22	25	25	24	21	22	17	17	15	15	13
MED	96	96	98	98	98	98	100	102	107	110	108	106	106	104	106	106	103	98	99	96	94	92	92	98
U Q	102	100	102	100	102	102	108	116	139	118	118	119	114	108	113	113	110	105	102	102	98	96	96	100
L Q	92	94	96	95	96	97	98	96	105	104	103	102	102	100	103	98	99	94	94	92	92	90	88	94

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

IONOSPHERIC DATA STATION Kokubunji

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

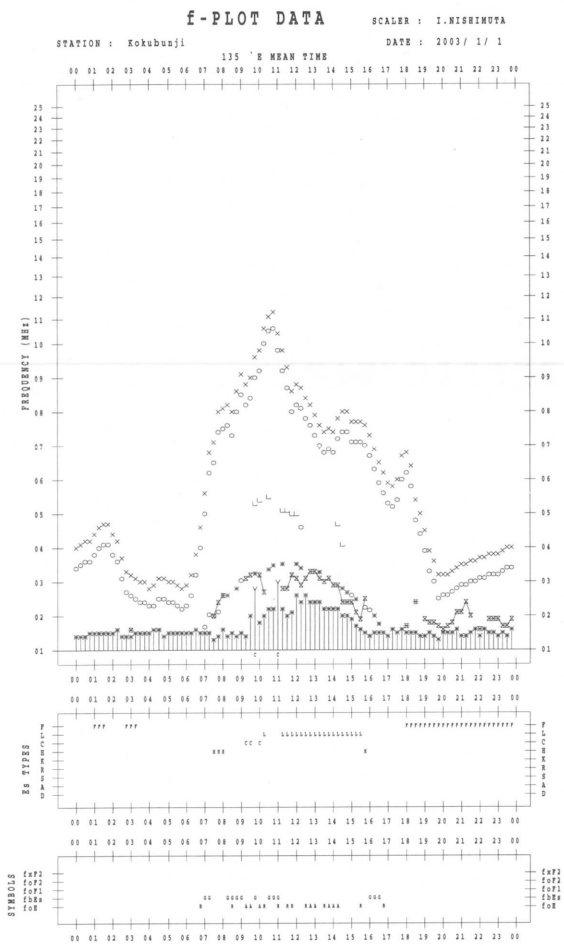
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

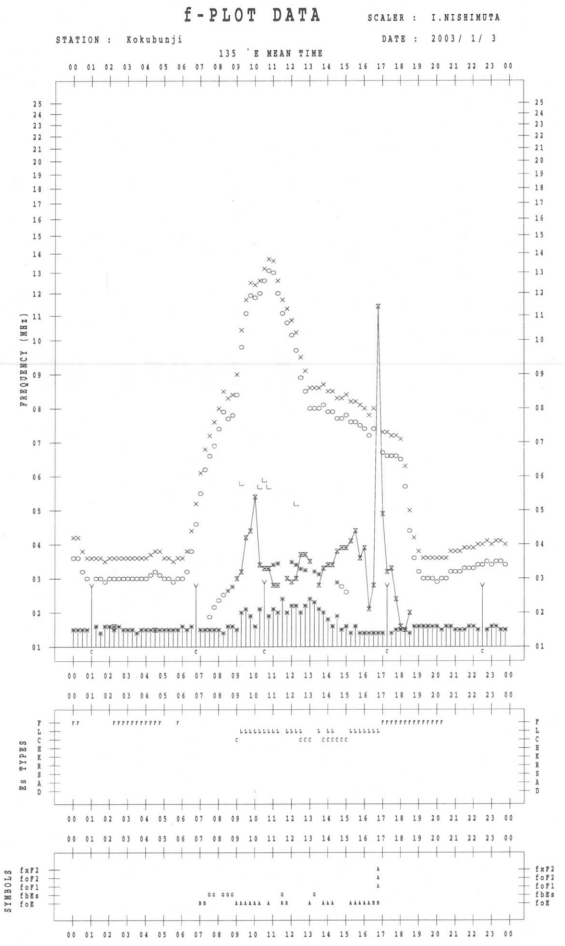
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F 1		F 2					H 1		C 1		L 1	L 1	L 1	L 1			F 1	F 1	F 2	F 2	F 2	F 3
2	F 2	F 1	F 2	F 2	F 2	F 2	F 1			C 1	L 1	L 1	L 1	L 1	L 1	L 1	L 2	F 3	F 2	F 2	F 1	F 2	F 1	F 1
3	F 1			F 1	F 1					C 1	L 2	L 1	L 1	C 1	CL 11	C 3	L 3	F 3	F 1	F 1	F 1			
4	F 1	F 1	F 1	F 1			F 1		H 1	C 1	L 1	L 1	L 1	L 1	L 1	L 1	L 1	F 2						
5			F 1						L 1	L 1	L 1	HL 11	L 1	L 1	L 1	L 2	L 2	F 1	F 1	F 3	F 3	F 2	F 1	
6			F 1		F 1			L 1	H 1				L 1	L 1	L 1		L 1	F 3	F 2	F 3	F 2	F 2	F 2	F 1
7				F 2	F 2	F 1			L 2	HL 12	HL 11	C 1	CL 11	L 1	L 1	CL 22	C 3	F 4			F 1			F 1
8		F 1	F 1	F 2	F 2	F 1	F 1		L 1	L 1		L 1	L 1				L 1	F 4	F 3	F 2	F 1	F 1		F 2
9	F 2	F 2	F 2	F 1	F 2	F 2	F 1	H 1	H 2	L 1	L 1	L 1	L 1		C 1	L 1	L 1	F 3	F 3	F 4	F 3	F 3	F 2	F 3
10							F 1		L 1	L 1	L 1	L 1	L 1	L 1	L 2	CL 11		F 1						F 1
11	F 1	F 2	F 2	F 1	F 2		F 1		L 1	CL 11	CL 11	L 1	L 1	L 1	L 1	L 1	L 2	F 2	F 2	F 1	F 1	F 1	F 2	F 3
12	F 1		F 1	F 1		F 1	F 3	L 1		CL 11	L 1	L 1	L 1	L 1	L 2	L 2	L 2	LF 33	F 3					
13				F 2	F 1	F 1			L 1	L 1	L 2	L 2	L 1	CL 11	L 1	L 3	L 2	F 3	F 2					
14	F 1								L 1	L 1	CL 11	L 1	HL 11	CL 11	L 1	L 2	L 1	F 1	F 1					
15			F 1						L 1	L 1	HL 11	CL 11	HL 11	L 1		L 1		F 1	F 2	F 2	F 1	F 1	F 1	F 2
16	F 1	F 2	F 1	F 2	F 1	F 1				CL 11	CL 11	CL 11	L 1	L 1	L 1	L 2	L 1							F 1
17	F 2	F 2	F 1	F 1					L 1	CL 11	L 1	L 1	L 1	L 1	L 1	L 1	L 1							
18				F 1		F 1	F 1	L 2	L 2	L 2	C 1	L 1	L 1	L 1	L 1	L 1	CL 11		F 2					
19									L 1	L 1	L 1	L 1	HL 11	L 1	L 1	CL 11	HL 11		F 3	F 2		F 1	F 2	
20	F 1	F 1	F 3	F 2	F 2	F 2	F 3		L 1	L 1	L 1	HL 11	CL 11	CL 21	L 2	L 2	L 3	L 2	F 2	F 6	F 2	F 1	F 1	
21	F 1	F 1	F 1		F 1	F 1	F 1	L 1	L 2	L 2	L 1	L 1	L 1	L 1	L 1	CL 11	L 1	L 1	F 3	F 2	F 3	F 4	F 4	F 2
22		F 2		F 1	F 2	F 2	F 2	L 3	L 2	L 2	L 1	L 1			C 1	H 1	L 3	L 3	F 3	F 1	F 3	F 2	F 4	F 3
23	F 2	F 1			F 2	F 3	F 2	L 3	L 1	HL 11	HL 11	CL 11	CL 11	L 1	H 1	L 2	CL 11	LL 42	FF 12	F 2			F 1	F 2
24	F 3	F 2	F 2	F 2	F 3	F 1	F 1	L 1	L 1	L 1	L 1	L 1	L 1		L 1	CL 11	L 2	L 2	F 2	F 1	F 3	F 2	F 1	
25								C 1	HL 12	HL 11														
26																								
27																					F 1	F 1		
28	F 2	F 1							H 1	H 1							L 1		F 1					
29	F 1							HL 12	HL 22	L 1	CL 11	L 1	L 1	L 1	CL 11	CL 11			F 1	F 1	F 3	F 2	F 2	
30		F 1	F 2						CL 11		L 1				C 1	C 1	C 1	C 1						
31										C 1	C 1	HL 11	L 1	L 1	CL 11	L 1	L 1	L 1	F 1	F 1	F 1		F 1	
	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																								

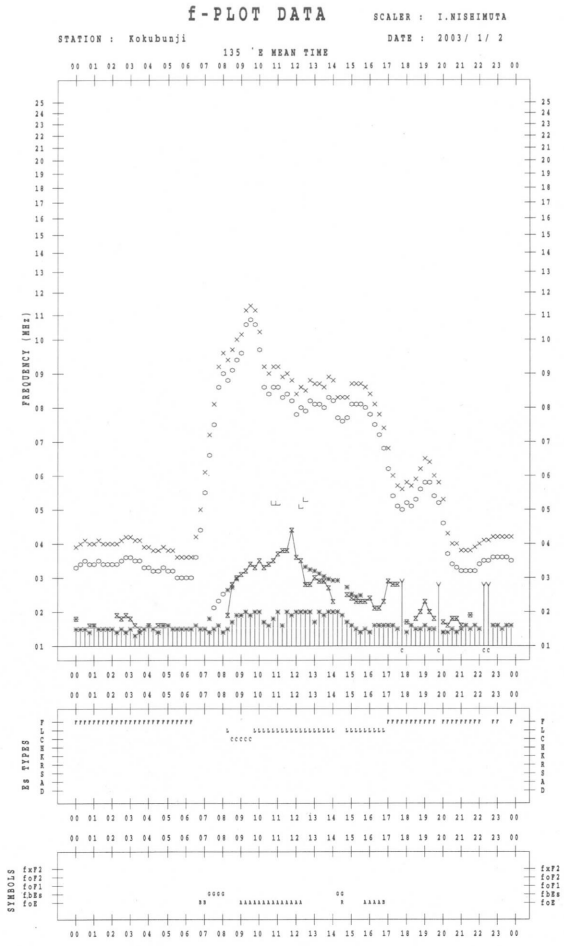
JAN. 2003 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

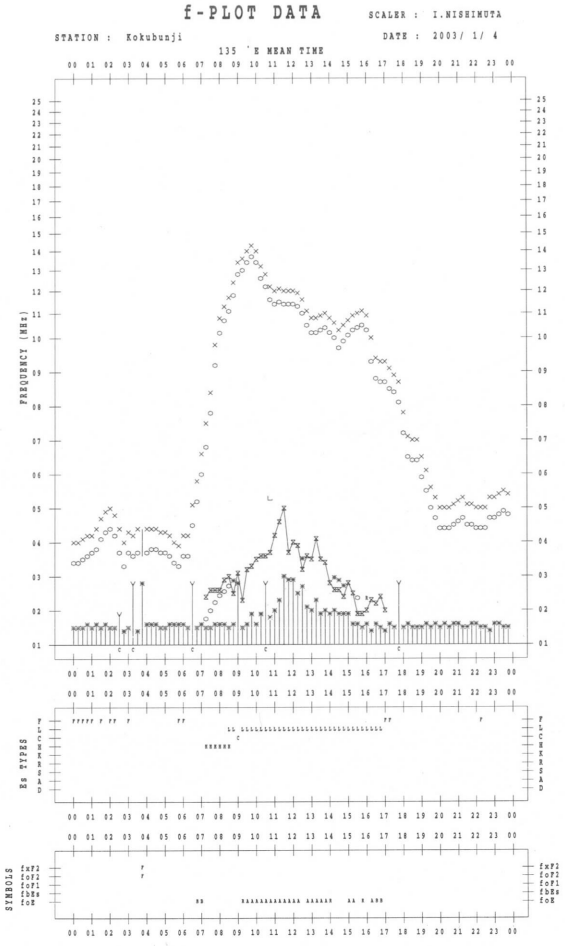
f-PLOTS OF IONOSPHERIC DATA

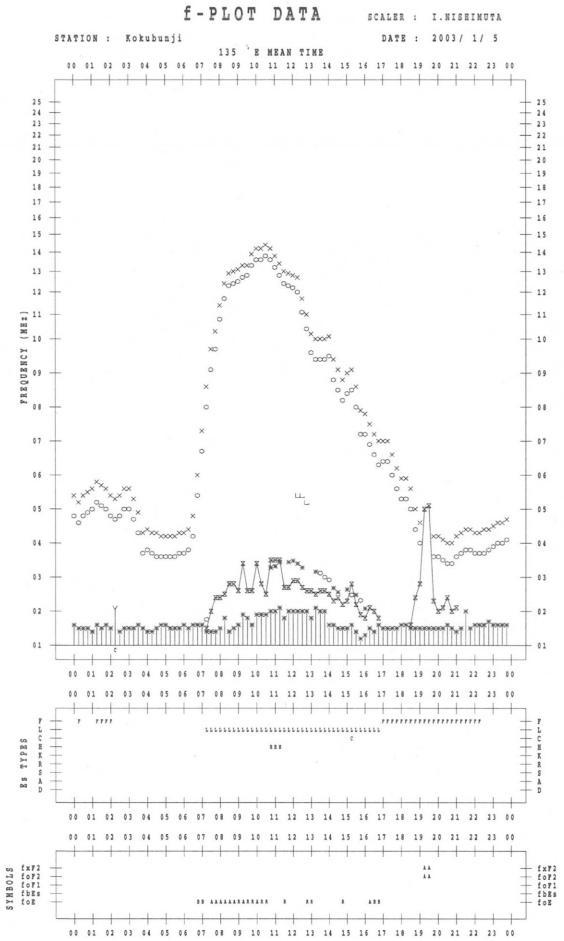
KEY OF f-PLOT	
|	SPREAD
⬡	foF2,foF1,foE
×	fxF2
✳	DOUBTFUL foF2,foF1,foE
⧖	fbEs
⌊	ESTIMATED foF1
⍑,⍒	fmin
∧	GREATER THAN
∨	LESS THAN

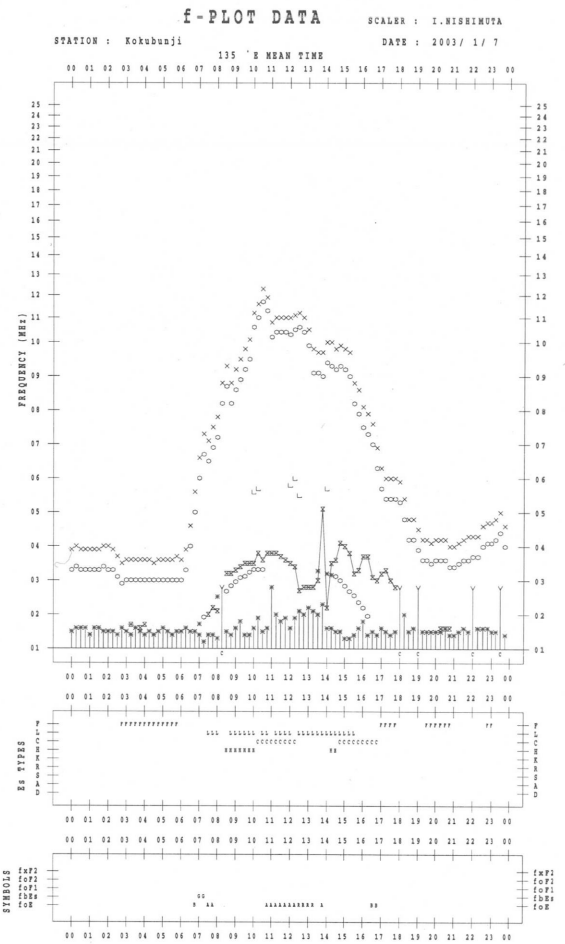

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

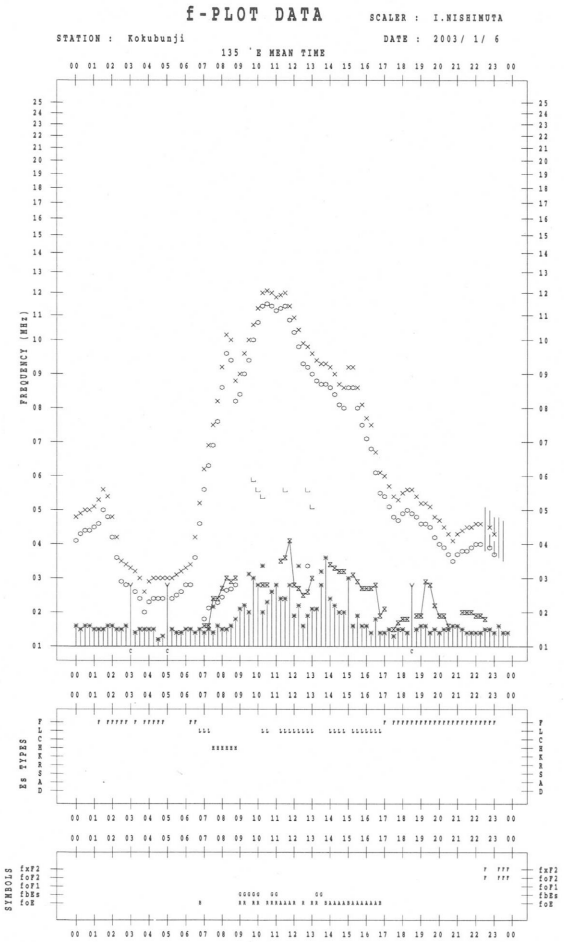

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

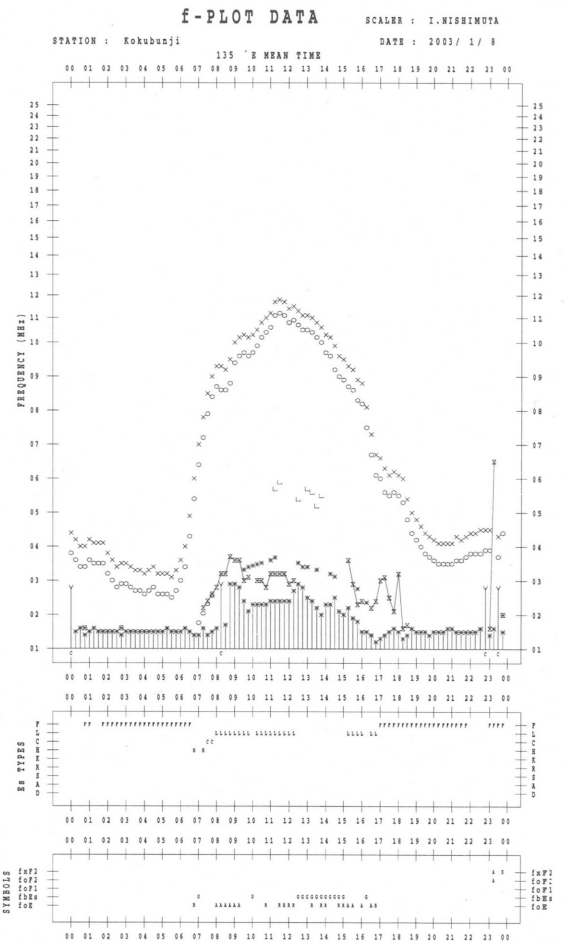

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

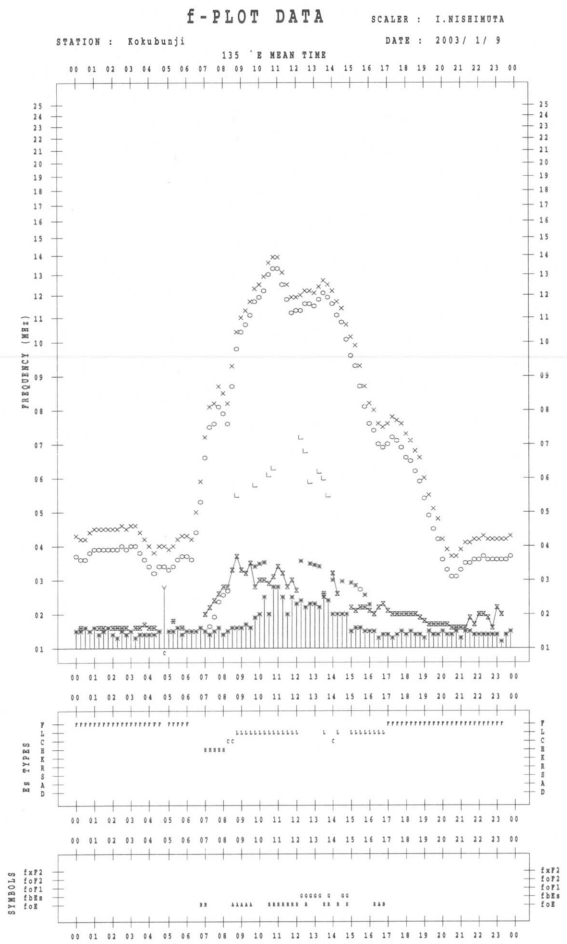

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

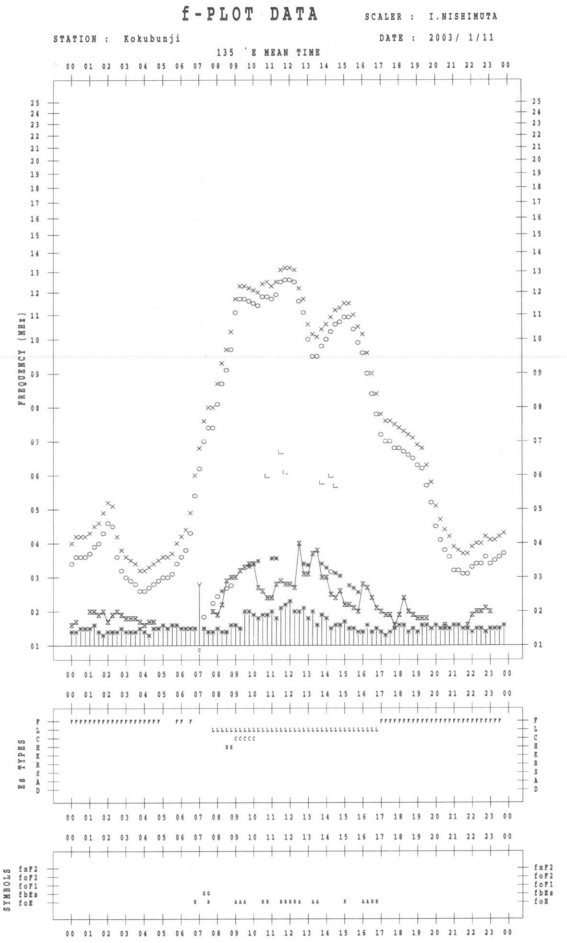

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

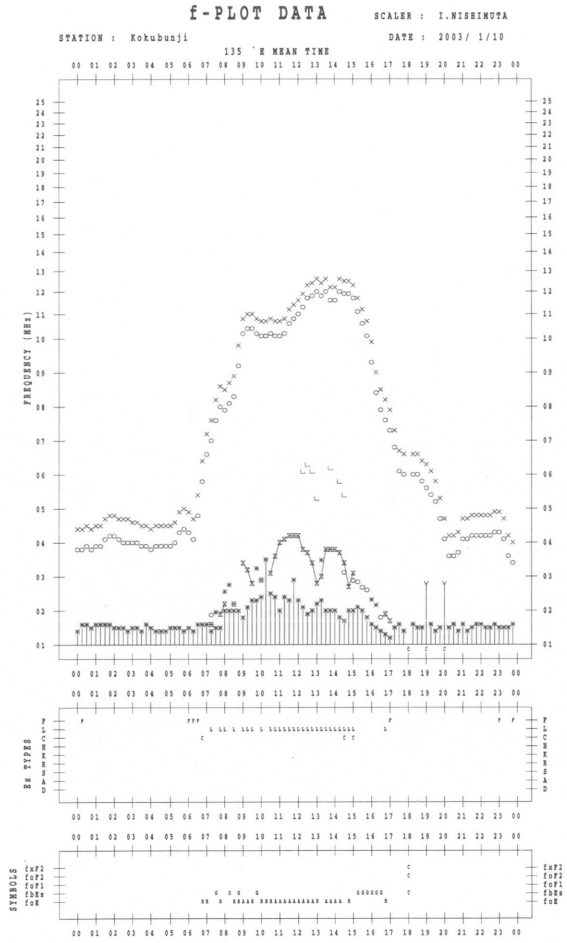

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

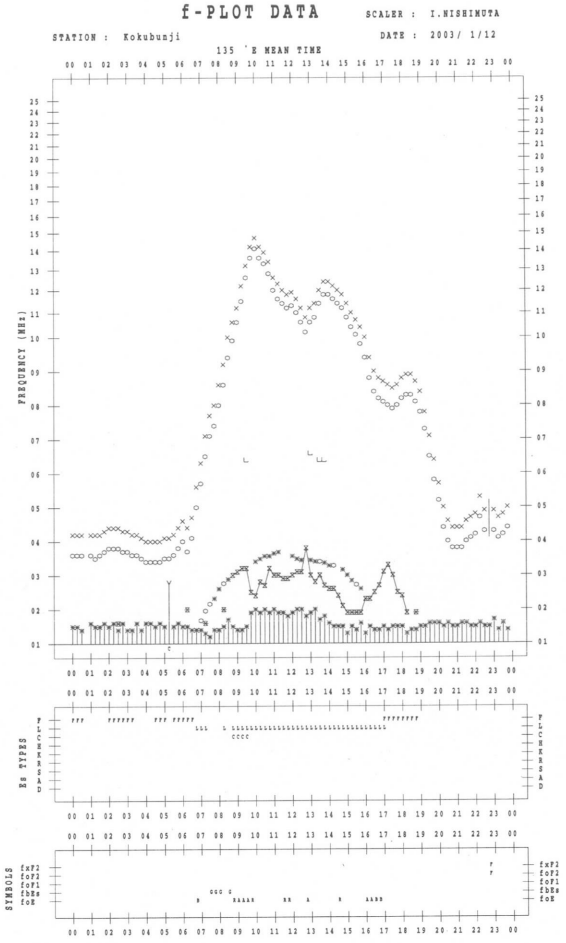

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

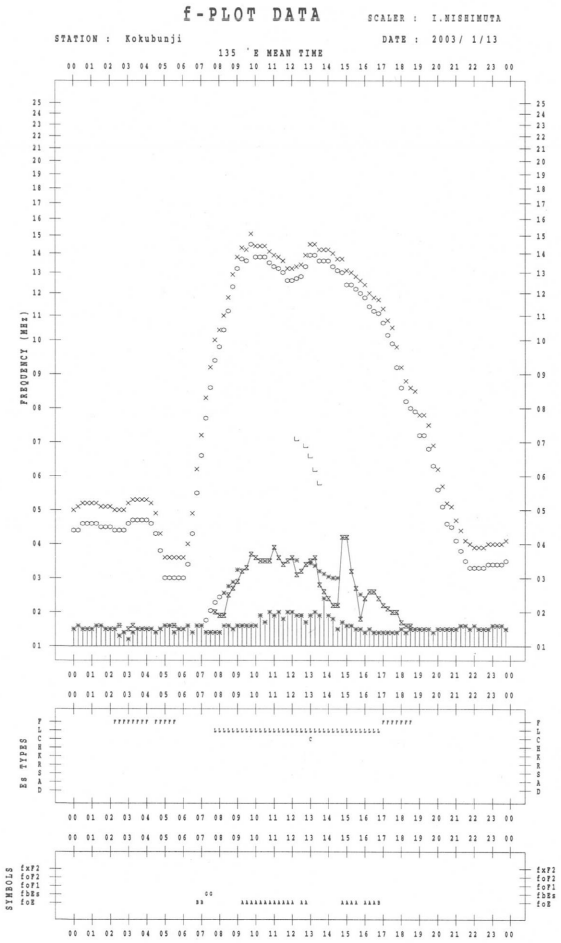

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

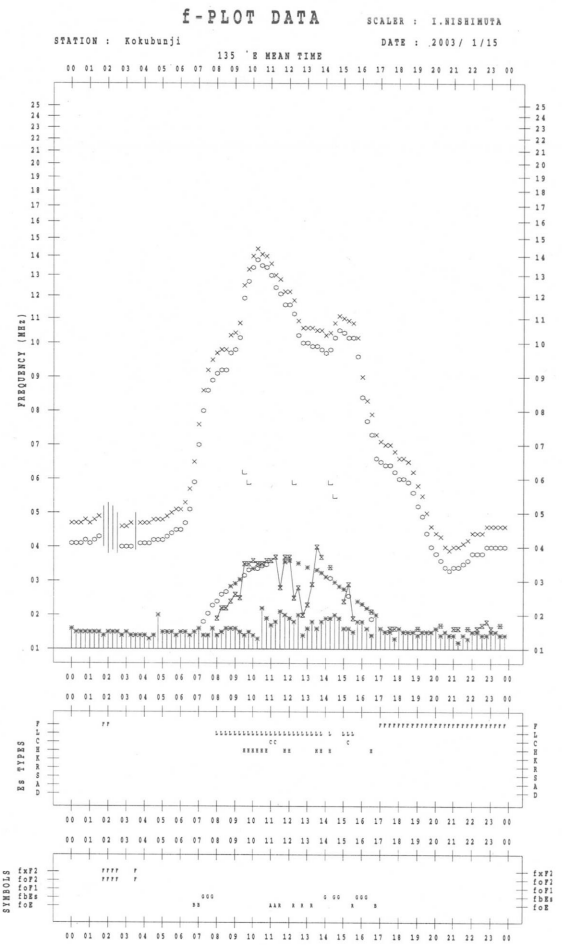

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

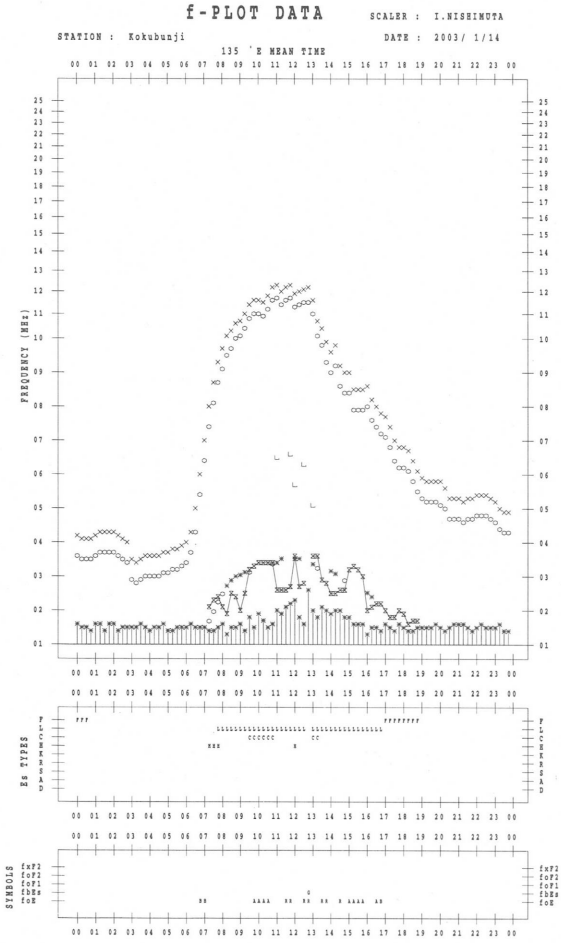

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

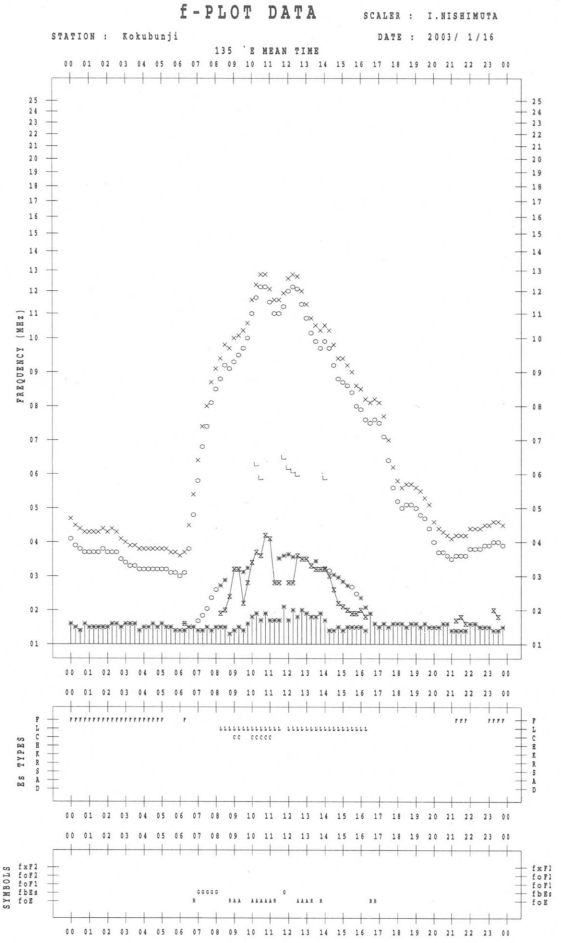

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

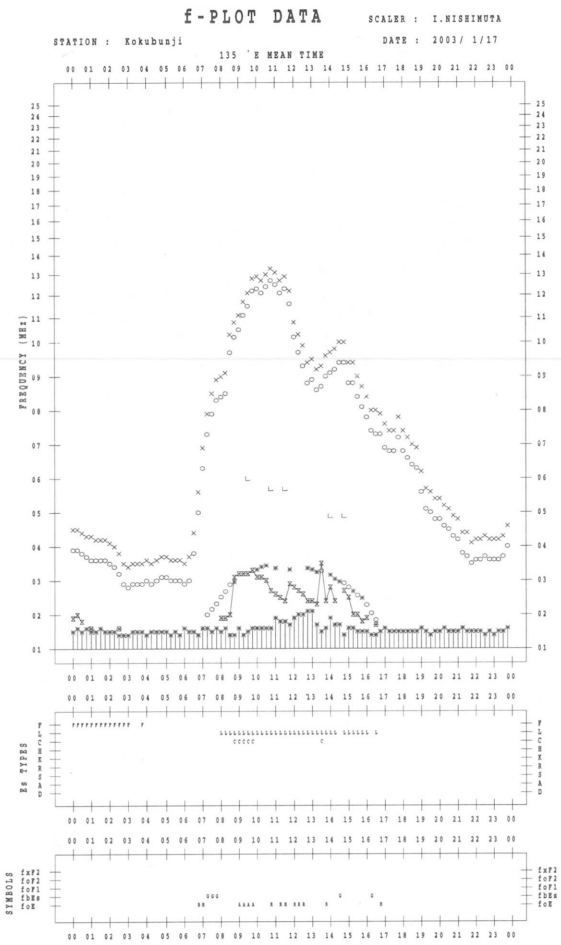

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

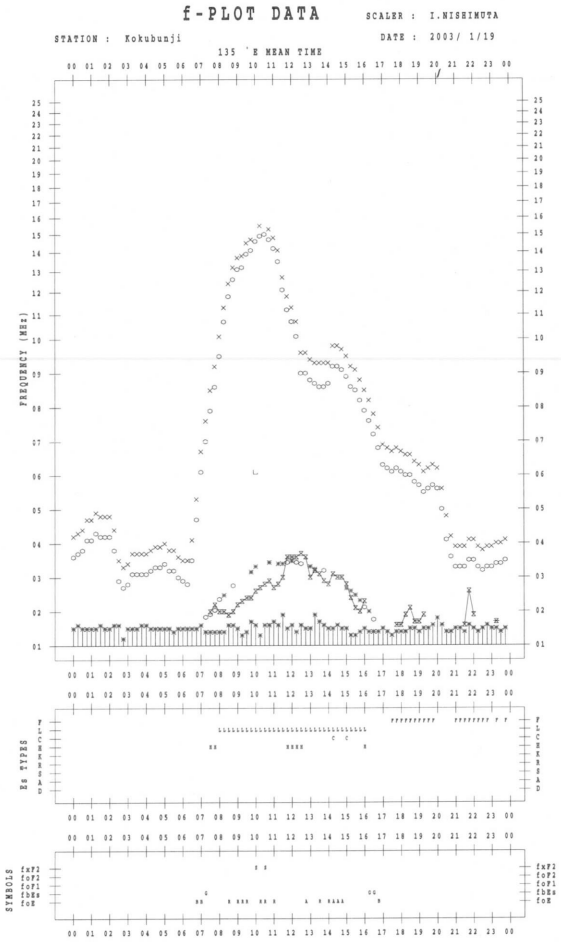

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

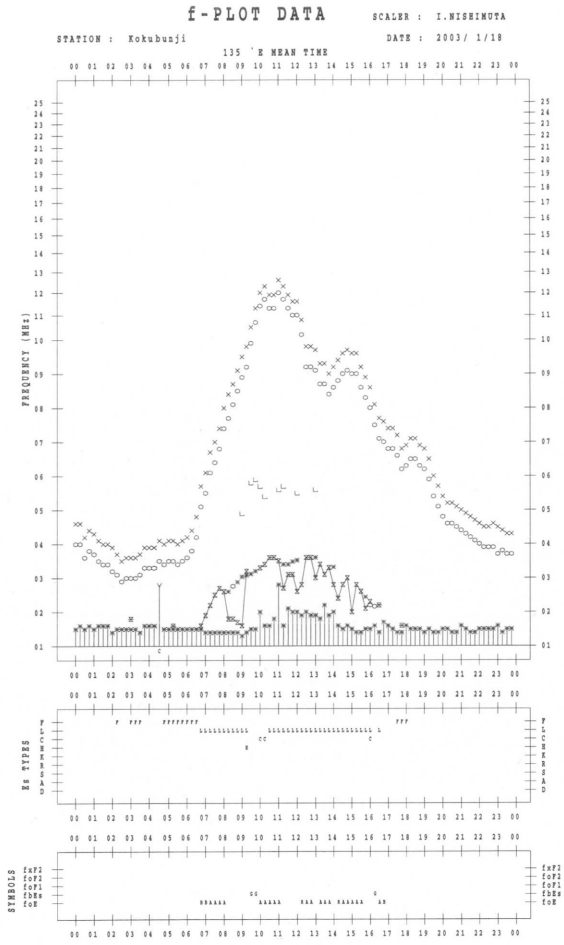

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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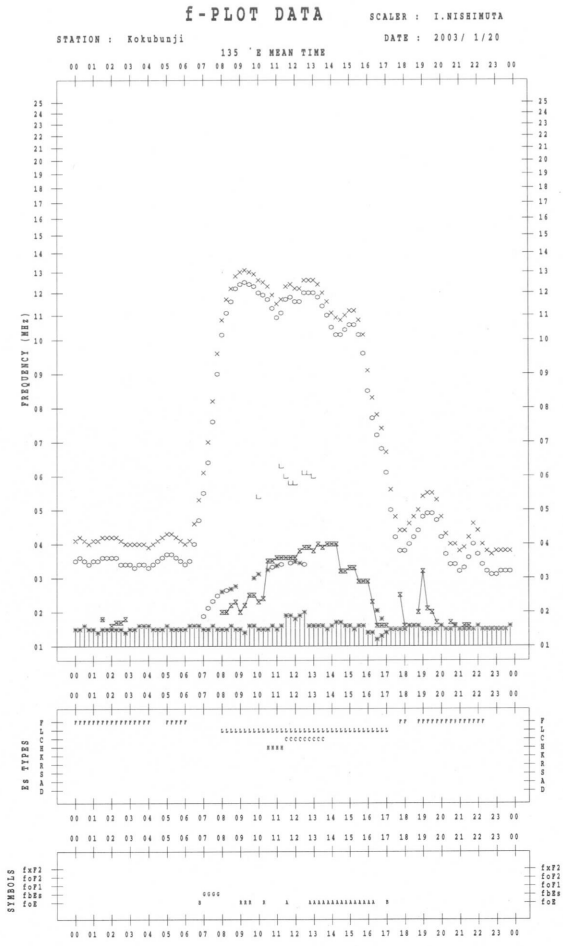
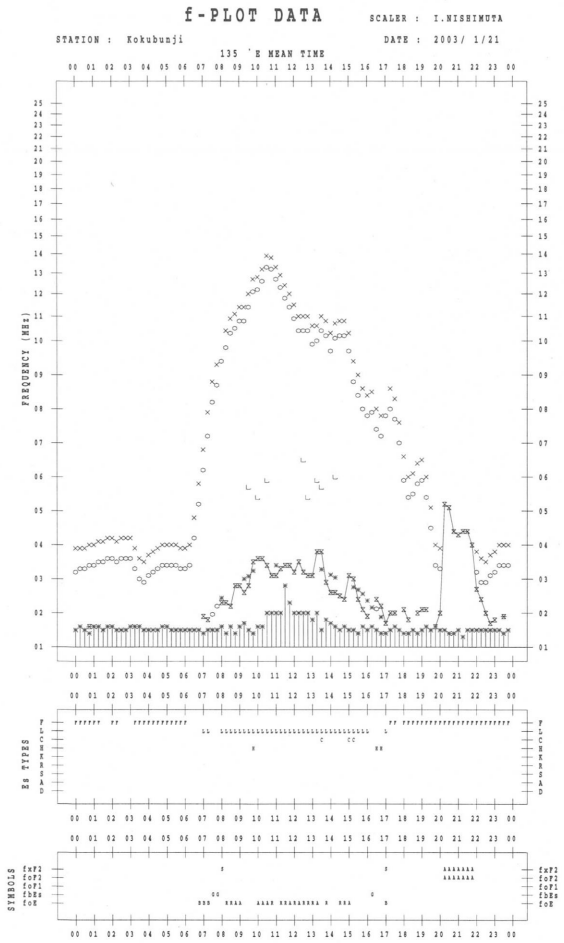
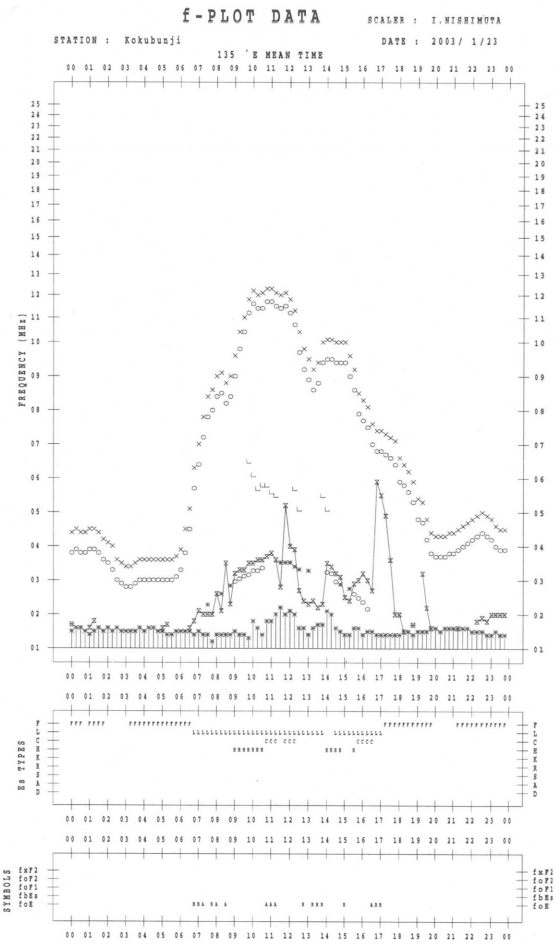
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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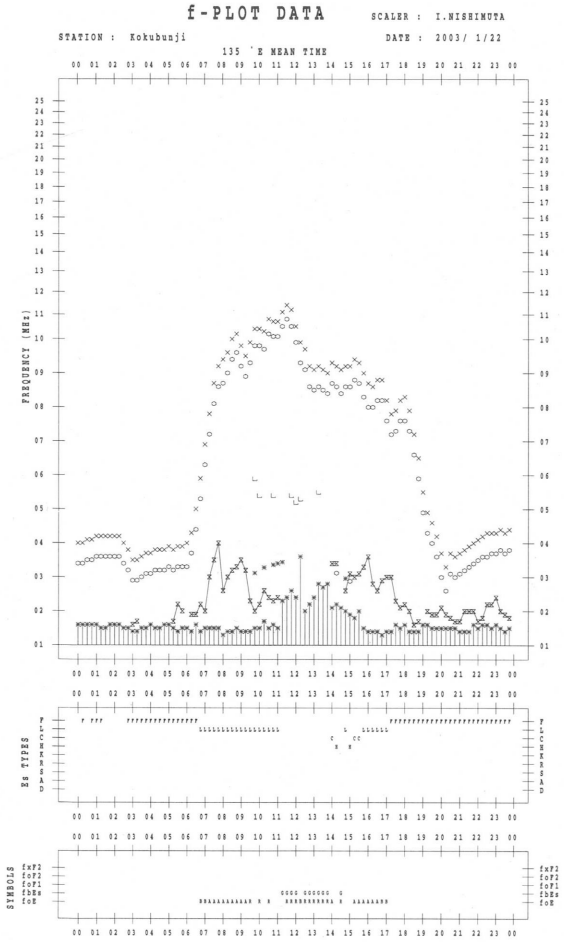
STATION : Kokubunji
DATE : 2003/ 1/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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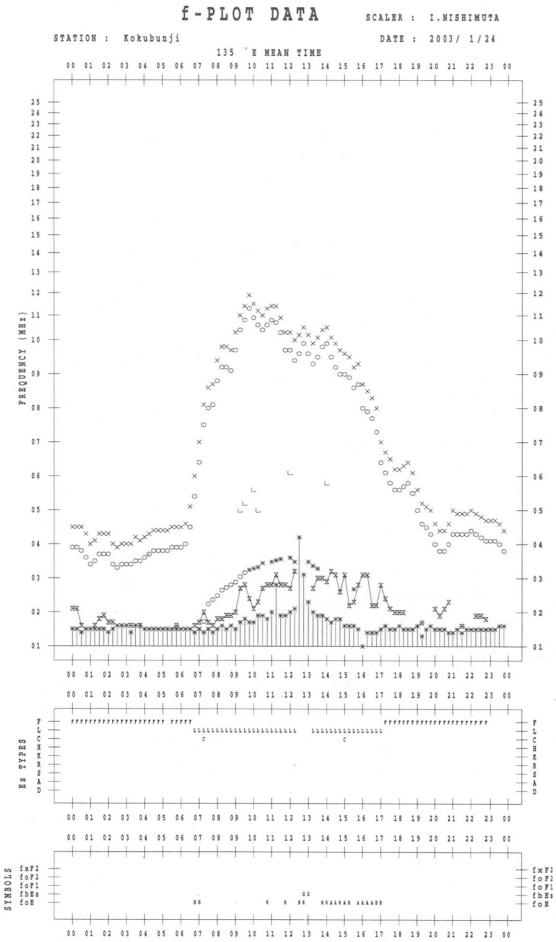
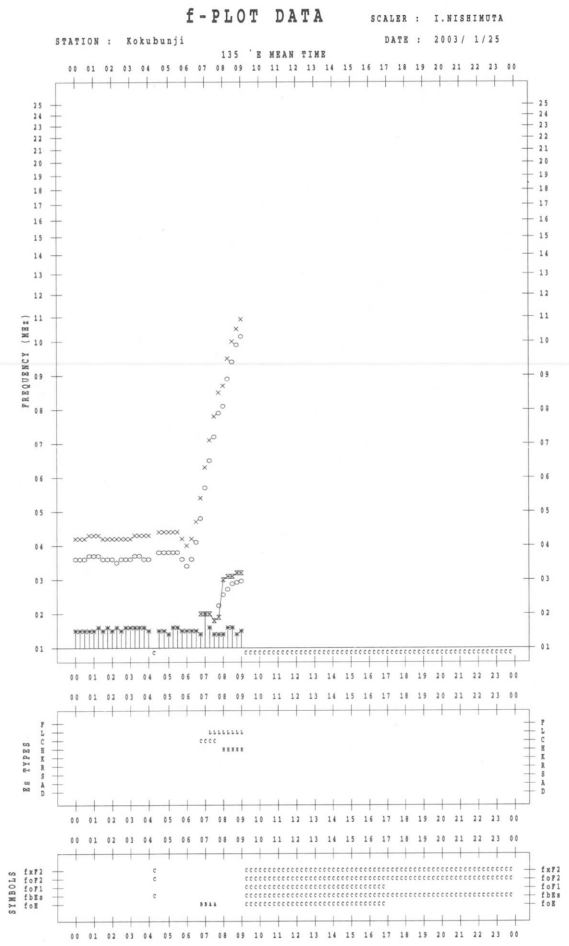
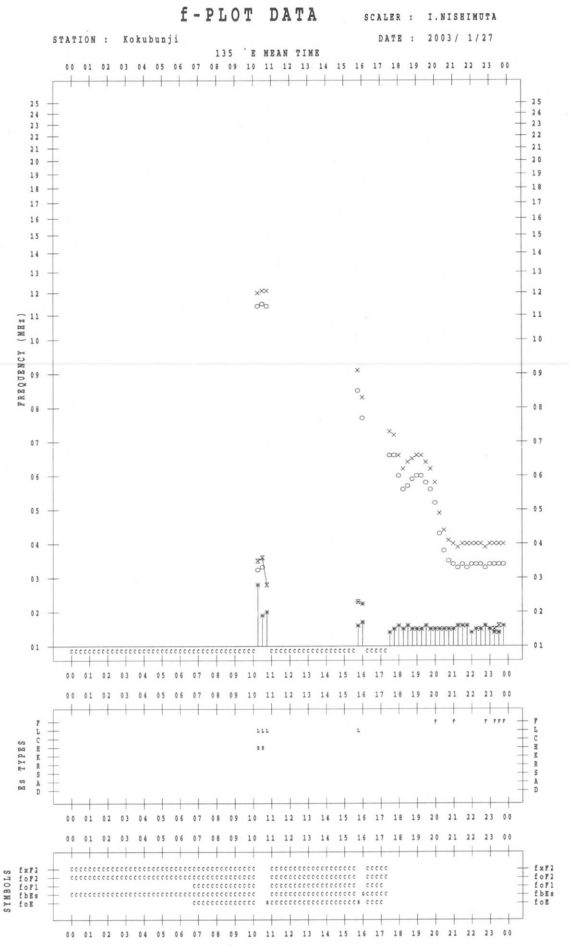
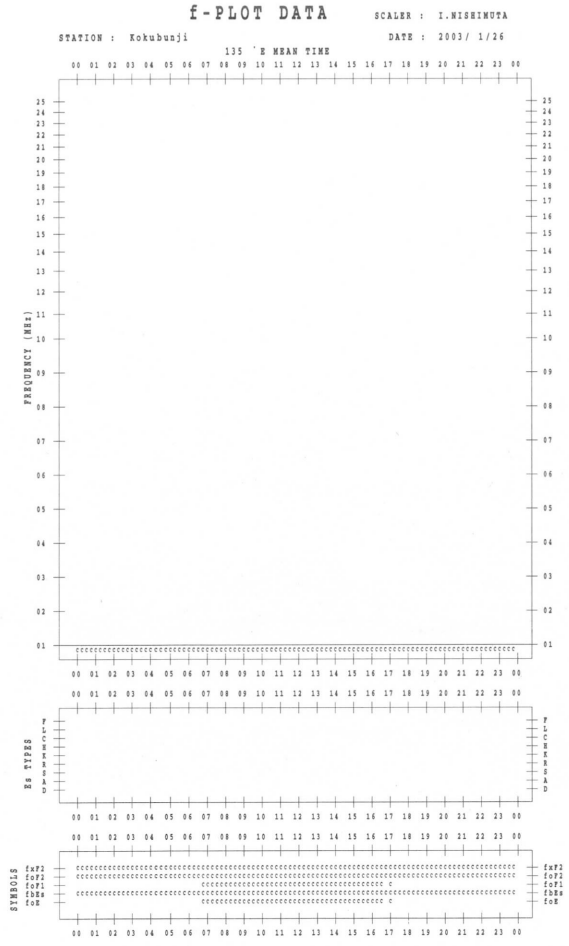
STATION : Kokubunji
DATE : 2003/ 1/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
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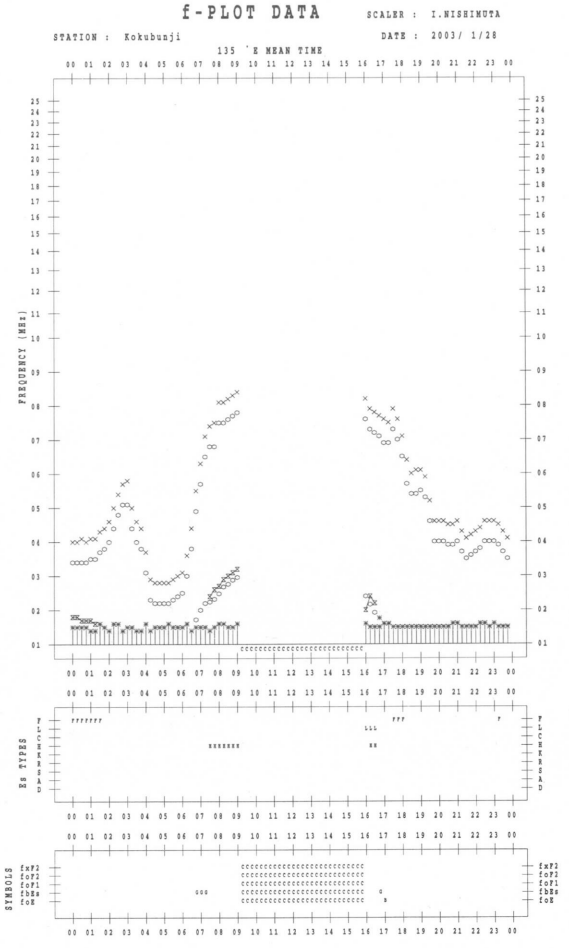
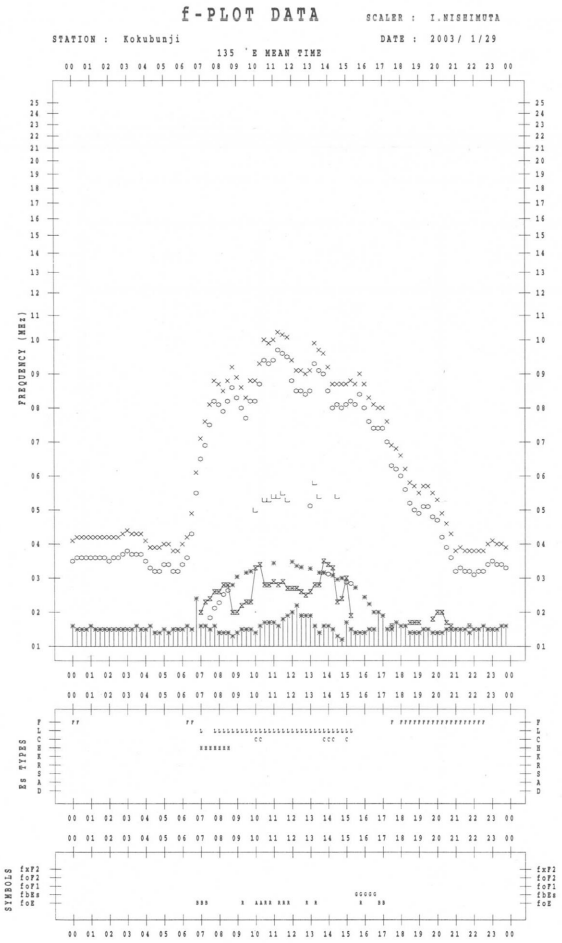
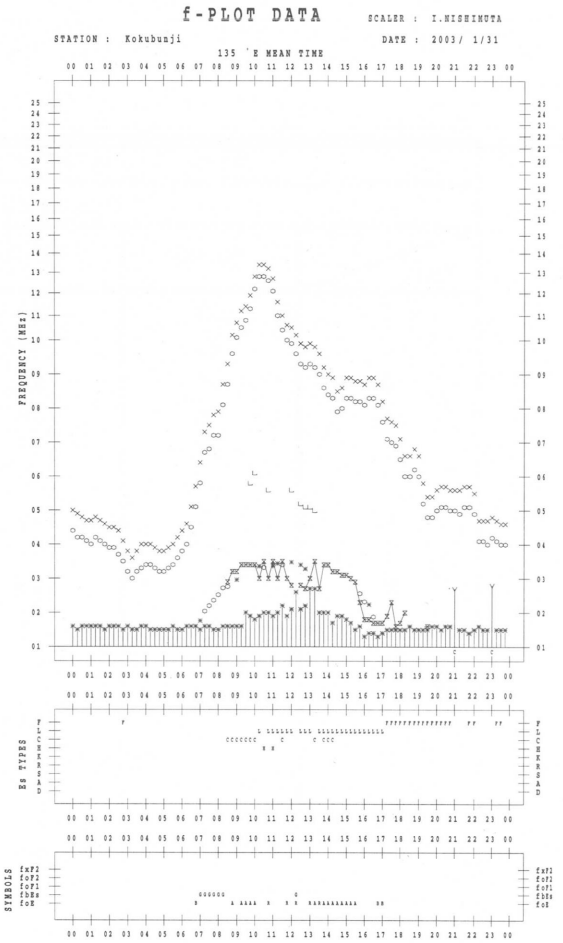
STATION : Kokubunji
DATE : 2003/ 1/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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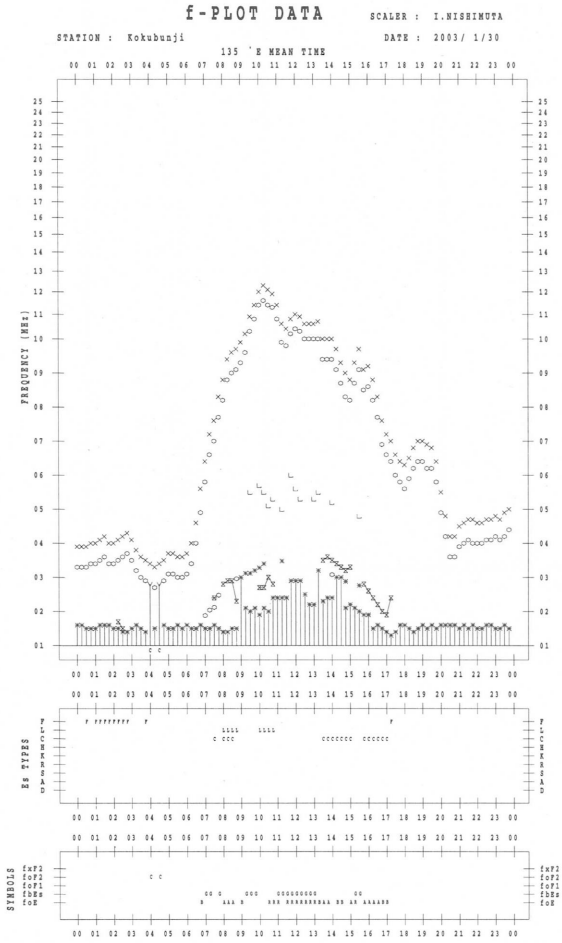
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2003/ 1/30
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 January 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	42	41	39	42	41
2	42	41	42	44	42
3	44	41	40	46	43
4	43	39	38	45	41
5	42	42	46	47	43
6	45	41	41	53	45
7	49	44	44	53	48
8	47	43	42	53	47
9	48	44	42	51	47
10	47	43	40	52	46
11	47	43	41	51	46
12	46	41	40	50	45
13	46	41	39	51	44
14	46	40	39	47	43
15	45	43	43	49	45
16	45	43	44	49	45
17	44	39	39	43	41
18	42	40	39	41	41
19	41	39	39	42	40
20	39	36	36	42	38
21	39	38	38	43	39
22	40	37	36	39	38
23	39	36	33	45	39
24	43	42	43	43	43
25	40	38	38	43	40
26	39	37	37	36	37
27	35	34	34	40	36
28	37	34	34	40	36
29	39	35	35	41	38
30	38	36	36	41	38
31	38	35	36	40	37

Note: No data is available during the following periods.

A superscript * stands for being superposed on a burst.

B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso January 2003

Single-frequency observations
Normal observing period: 2145 - 0745 U.T. (sunrise to sunset)

JAN. 2002	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
2	200	8 S	23130	23130	1.0	125	-	0
3	500	8 S	01520	01520	1.0	50	-	0
3	500	8 S	05150	05150	1.0	10	-	0
3	200	8 S	05150	05150	1.0	50	-	0
3	200	8 S	06370	06370	1.0	40	-	WR
4	500	8 S	01420	01420	1.0	20	-	0
4	200	8 S	01420	01430	1.0	205	-	0
5	200	8 S	01300	01310	1.0	85	-	0
5	2800	3 S	05550	06090	22.0	40	-	0
5	500	8 S	06020	06030	3.0	15	-	0
5	200	8 S	07230	07230	1.0	25	-	0
5	200	8 S	07270	07270	1.0	30	-	0
6	200	8 S	02430	02430	1.0	50	-	0
6	200	8 S	04100	04100	1.0	50	-	0
6	500	8 S	23480	23480	1.0	250	-	0
7	2800	4 S/F	23280	23320	11.0	100	-	0
8	500	8 S	05500	05500	1.0	45	-	0
8	200	8 S	06580	06580	1.0	25	-	WL
9	2800	1 S	01290	01330	5.0	30	-	0
9	2800	1 S	05330	05350	5.0	35	-	
11	200	8 S	04510	04510	1.0	25	-	0
11	200	8 S	05310	05310	1.0	15	-	SR
12	200	8 S	00490	00490	1.0	25	-	WR
12	200	8 S	01340	01340	1.0	155	-	WR
12	200	7 C	04110	04160	7.0	65	-	0
12	200	8 S	06160	06160	1.0	100	-	0
12	500	8 S	23070	23070	1.0	30	-	0
12	500	8 S	23580	23580	1.0	25	-	0
12	200	8 S	23590	23590	1.0	75	-	0
13	200	8 S	00020	00020	1.0	20	-	0
13	200	8 S	05580	05580	1.0	25	-	0
13	200	8 S	06050	06050	1.0	15	-	0
14	200	8 S	22300	22300	1.0	15	-	0
15	200	8 S	01400	01400	1.0	75	-	0
16	2800	8 S	01050	01070	7.0	30	-	0
16	500	8 S	01070	01070	3.0	50	-	0
16	200	8 S	01070	01070	1.0	80	-	0
19	200	8 S	04150	04150	1.0	320	-	0
20	500	8 S	07050	07050	1.0	45	-	0
20	200	8 S	07090	07090	1.0	65	-	0
20	500	8 S	23250	23250	1.0	10	-	0
20	200	8 S	23250	23250	1.0	55	-	0
21	2800	3 S	02250	02260	5.0	65	-	0
21	500	4 S/F	02250	02260	3.0	20	-	0
21	200	7 C	02250	02250	3.0	110	-	0
21	2800	7 C	05520	05530	3.0	215	-	MR
21	500	8 S	05520	05540	3.0	40	-	0

B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso January 2003

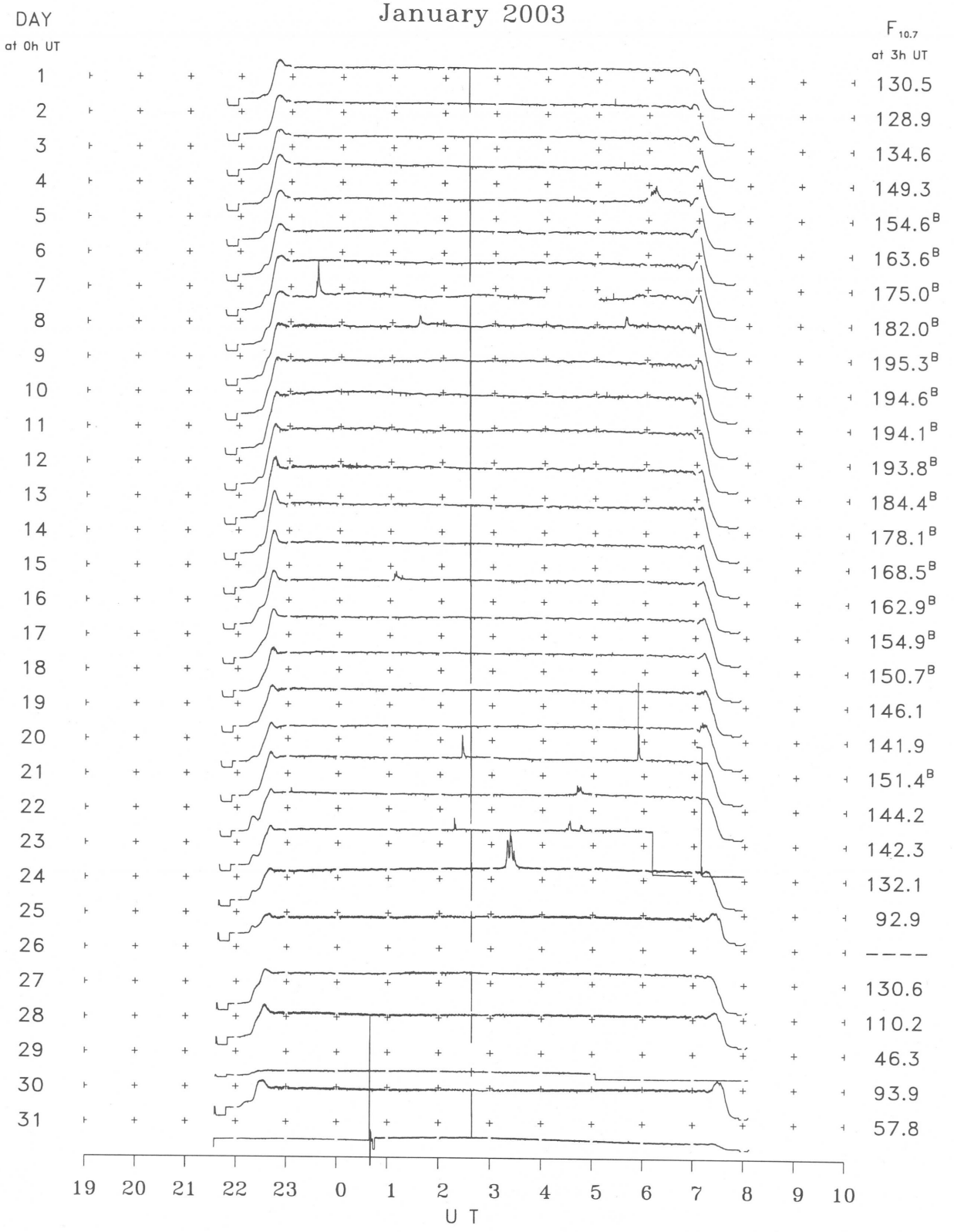
Single-frequency observations
Normal observing period: 2145 - 0745 U.T. (sunrise to sunset)

JAN. 2002	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	MEAN	POLARIZATION REMARKS
21	200	4 S/F	05520	05530	3.0	115	-	0
21	200	8 S	23040	23050	1.0	20	-	0
22	200	8 S	03000	03000	1.0	20	-	0
22	500	7 C	04390	04410	3.0	20	-	0
22	2800	4 S/F	04400	04410	8.0	25	-	0
22	200	7 C	04410	04480	7.0	220	-	0
22	200	8 S	07150	07150	1.0	30	-	0
22	200	8 S	23100	23100	1.0	30	-	0
22	200	8 S	23160	23160	1.0	30	-	0
23	200	8 S	01230	01230	1.0	40	-	0
23	500	7 C	04270	04320	7.0	75	-	0
23	200	7 C	04270	04310	7.0	20	-	0
23	200	7 C	04430	04460	5.0	130	-	0
23	500	7 C	04440	04460	4.0	300	-	0
23	200	8 S	07060	07060	1.0	40	-	0
23	2800	4 S/F	02170	02170	2.0	35	-	0
23	500	8 S	02170	02170	1.0	15	-	0
23	2800	3 S	04270	04330	7.0	30	-	0
23	2800	3 S	04440	04460	5.0	20	-	0
24	2800	7 C	03170	03220	14.0	100	-	0
24	500	47 GB	03170	03230	17.0	3070	-	0
24	200	47 GB	03190	03210	22.0	1230	-	0
24	500	7 C	03420	03440	5.0	45	-	0
24	200	8 S	23010	23010	1.0	20	-	0
25	500	8 S	05140	05140	1.0	15	-	
27	200	8 S	03390	03390	1.0	25	-	0
29	200	47 GB	06250	06250	1.0	1310	-	0

B. Solar Radio Emission

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

January 2003



Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range ≧ 6°.
The datas since 25, Jan., 2003 have been incorrect values due to troubles.

IONOSPHERIC DATA IN JAPAN FOR JANUARY 2003
F-649 Vol.55 No.1 (Not for Sale)

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☎ (042) (327) ７４７８(直通)

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