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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, Ministry of Posts and Telecommunications of 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°16.9′N	127°48.4′E	15.3°N	196.0°	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

Ionospheic 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 as well as graphically on 35 mm photographic film. The digitally-recorded ionograms are collected from each station by the central computer and reduced to numerical values and Summary Plots by the automatic processing system. The ionograms obtained at Kokubunji are manually scaled as well by experienced specialists to supplement automatically-scaled parameters.

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

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

B Impossible measurement because of absorption in the vicinity of *fmin*.

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 Handbook 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 spread *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 transmisson 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 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.

Z 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 particle *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 normnal *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 measurements, 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 percent.

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 $F_{10.7}$ at Hiraiso

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

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

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

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C2. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

Transmitting Stations

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

HOURLY VALUES OF foF2 AT WAKKANAI

MAR. 1998

LAT. 45.4N LON. 141.7E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	58	56	49	57		36	41	61	72	80	81	94	98	81	77	70	74	68	57	38	38	55	48	44
2	44	58	46	40	37	41			76	70	63	81	81	72	80	74	83	71	57	59	43		46	47
3	48	47	48	48			38	54	67	77	70	86	88	91		65	72	68	64	61	57	57	58	62
4	67	68	56	68	69	58	57	69	68	70	81	87	82	86	78	71								
5												69	59		67	76	68	67	60	56	57		50	
6	56		52	50	51	50	57	70		77	90			83	76	74	71	62	60	41	37		44	44
7	45		56	51	41	47	57	60		72	81	90	82	75	70	72	81	73			38	40		46
8	A	45	46	47	50		48	71	69	77	70	82	71	72	76	71	67	66	72	51	41	41	44	
9	45	39	44	47	47	42	47	63	69	67	76	77	76	81	68	67	71	68	62	69	56	40	41	41
10	47	56	57	57	55		57	68	71	78	78	96	89	67	76	80	71	82	64	70	69	57	57	58
11	56	60	53	59	32	33	38	55	54	68	55	78	86	80	78	71	71	65	50	50	48	40	30	
12	38	26	A	A	A	A	40	58	57	60	76	88	92	83	76	73	72	74	55	56	48	56	41	40
13		38		38	37	38	57	68	70	76	80	86	78	81	80	77	78	71	63	46	38	47	38	
14	40		52	52	56	46	58	61	70	74	71	89	86	88	80	78	68	71	68	59	40	44	47	56
15	47	46		47	56	50	56	57	71	67		92	89	80	80	78	80	80	65	60	59	60	58	58
16	61	56	67	60	55	43	57	83	71		90	88	90	80	83	79	72	78	66	68	57	57	56	46
17	44	43	44	43	42	38	58	63	68	81	81		82	81	68	76	78	71	66	36	44		44	
18	46	40	42	38	38	35	56	59	66	74	88	80	80	76	75	77	78	77	73	60	57	69	56	46
19		47	38	57	40	56	57	58	74	81	79	78	70	81	81	74	76	78	78	61	58	38	38	49
20	57	50	48	50	48	38	60	58	70	80	80	92	84		81	77	71	81	80		69	57	58	57
21	58	57	54	56	52		58	68	68	78	78	72	77	81	80	81	74	77	71	68	57	56	57	
22	57	49	47	47	32	31	57	71	81		88		92	90	81	81	61	71	56	57	57	50	38	46
23	47	47	41	A	38	38	57	69	67	71	78	82		80	80	74	72	72	58	58	58	57	57	57
24	58	56	55	57	54	56	61	69	66	73	87	91	87	87	78	80	65	70	67	58	58	56	58	56
25	52	58	56	51	51	56	58	63	68	81	80		80	77	72	72	68	71	68	62	60	52	46	57
26	49	49	42	41	42	31	42	58	68	61	73	76	78	78	75	68	70	71	60	60	58	57	54	57
27	57		59	36	38	41	58	58	72	71	79	88	78	82	81	76	74	68	56	61	69	57	57	52
28	58	52	38	56		46	60	64	71	87	107	92	91	92	90	81	78	76	61	61	57	69	58	57
29	69	57	48	48	43	37	58	71	81	80	85	101	91	120	90	92	81	72	68	56	57		58	57
30	56	41	46	38	47		57	60	80	78	80	88		88	89	83	78	77	77	76	57	52		40
31	39	38	40		30	42	55	55	62	74	70	87	85	81	77	74	73	73	79	68	57	51	41	40
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	26	27	27	26	24	29	29	28	28	29	27	28	29	30	31	30	30	29	28	30	25	28	24
MED	52	49	48	50	45	42	57	63	70	75	80	87	83	81	78	76	72	71	64	60	57	56	49	50
U Q	58	56	55	57	52	48	58	69	71	79	83	91	89	86	81	79	78	77	69	61	58	57	57	57
L Q	45	43	44	43	38	37	51	58	67	70	74	80	78	79	76	72	71	68	59	56	44	45	42	45

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT WAKKANAI

MAR. 1998

LAT. 45.4N LON. 141.7E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G		G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G			G	G	51	G	G	G	G	G	G	G	G	G	G		G	G
3	G	G	G	G	G	G	G	29	G	G	G	G	G	G		G	G	G	24	G	G	65	26	G
4	30	28	26	32	29	29	26	28	41	40	44	G	41	G	G	G								
5												G	G	G	G	G	G	30	G	G	G		G	
6	G		27	32	29	G	G	G		G	42	G		G	G	36	31	35	G	G	G	24	G	G
7	27	G	27	25	G	G	23	G	36	G	G	G	G	G	G	G	G	G	G	30	G	G		G
8	25	G	G	G	G		G	33	G	G	G	G	G	G	G	38	G		27	G		31	33	
9		28	G	G	25	29	G		G	38	G	G	G	G	G	G	G	G	24	G	G	G	G	G
10	G	G	G	G	G		26		G	G	G	G	G	G	G	G	G	G	27	G	G	G	G	G
11	G	G	G	G	G	G	G	32	38	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
12	G	G	36	34	33	31	24	32	G	G	G	G	54	40	42	36	G	G	G	G	G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	52	G	G	G	G	34	35	27	25	25	G	G	G
14	G	G	G	G	G	G	G	G	N	G	G	G	G	G	G	G	G	G	23	G	G	G	G	G
15	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	28
16	31	31	G	G	G	G	27	G	G	G	39	G	G	G	G	G	G	31	29	23	G	28	26	34
17	G	27	29	28	G	G	G	G	G	G	G		47	55	G	G	G	35	34	27	G	G	G	G
18	G	G	27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	G	G	G	G	G	G
19	G	G	G	G	G	G	G		G	G	40	G	G	G	G	G	G	G	30	G	G	G	G	G
20	G	24	G	G	G	G	G	34	G	G	G	41	G	46	44	37	38	33	G	28	24	30	28	G
21	G	G	G	23	G	27	G	32	44	G	43	43	G	G	G	G	G	34	27	G	G	G	G	
22	21	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	31	G	G	G	G	G	G
23	G	G	G	27	24	G	G	32	G	G	G	G	G	G	G	G	G	35	G	G	G	G	G	G
24	G	G	27	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
25	G	G	G	G	G	G	G	G	G	44	40	G	G	G	G	G	G	G	G	G	G	G	G	G
26	G	29	G	G	G	G	G	G	G	47	G	G	G	G	G	G	G	28	G	G	G	G	G	G
27	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
28	G	26	G	26	31	G	G	33	G	G	G	G	G	G	G	G	33	G	G	G	G	G	G	G
29	G	31	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	25	G		G	G
30	G	G	G	G	G	27	G	G	G	G	G	G		G	G	G	36	28	G	G	25	30	44	32
31	G	G	34		27	G	30	35	37	G	46	G	G	G	G	G	35	30	G	G	G	30	33	33
	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	30	29	29	28	29	25	28	29	29	30	29	31	30	31	30	29	30	30	29	27	29	27
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	25	27	24	12	G	G	32	G	G	39	G	G	G	G	G	G	32	24	G	G	24	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT WAKKANAI

MAR. 1998

LAT. 45.4N LON. 141.7E 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	16	15	15		15	16	22	15	15	16	16	17	16	15	16	15	18	15	16	15	16	15	16
2	15	15	16	15	16	16			15	16	16	16	16	16	16	16	15	16	15	15	15		16	15
3	16	15	15	16	15	15	16	15	16	15	17	16	17	16		16	15	15	15	15	16	15	15	15
4	15	15	15	15	15	15	15	14	15	16	15	16	15	17	16	16								
5												20	50	66	18	15	15	14	16	15	15		16	
6	15		15	15	15	15	15	15		17	16	17		16	16	16	15	15	15	15	15	15	15	15
7	15	15	15	15	15	14	15	15	15	14	15	16	16	15	16	15	15	18	15	15	16	15		15
8	14	14	15	15	15		16	14	16	15	17	18	18	16	16	16	16	14	15	16	16	15	15	
9	14	15	15	15	15	14	16	24	15	15	16	17	16	15	15	16	16	20	15	15	15	15	15	15
10	15	14	15	15	15		16	21	15	17	16	17	16	18	17	16	15	20	15	15	16	15	16	15
11	16	15	15	15	16	16	16	15	15	15	15	16	16	16	16	16	16	17	15	15	15	15	17	15
12	15	17	15	14	15	15	17	14	15	15	16	17	16	16	15	15	15	20	16	16	16	16	15	15
13	15	15	15	15	15	16	17	15	15	16	17	16	16	15	15	15	15	16	16	16	16	15	15	16
14	15	15	14	15	17	15	17	15	16	16	16	17	17	17	16	16	15	21	16	15	15	15	16	15
15	15	15	15	15	15	15	18	15	16	17		17	17	17	16	16	16	21	15	15	15	16	15	15
16	15	15	15	15	14	15	20	15	16	16	20	16	18	17	15	16	16	15	16	15	15	15	16	15
17	15	14	15	15	15	15	18	15	15	16	18		18	17	17	15	16	15	15	15	15	15	16	16
18	15	15	15	15	16	16	20	15	15	16	17	16	17	16	16	16	15	17	15	15	15	15	15	15
19	17	16	15	15	15	16	21	15	16	16	16	17	20	16	16	15	15	15	15	16	16	15	15	15
20	16	16	15	15	15	15	20	15	15	15	16	17	20	16	17	16	16	15	15	16	15	15	15	16
21	15	16	15	16	15	14	18	15	15	16	16	17	16	17	15	16	16	15	15	15	16	15	15	
22	15	15	15	15	15	15	23	15	15		16	16	16	17	16	17	16	15	15	15	15	15	15	15
23	15	15	15	16	15	15	20	15	17	17	17	21		18	18	16	16	18	15	15	15	15	15	16
24	14	15	16	15	15	15	20	15	15	15	16	20	17	20	17	17	15	16	16	15	15	15	15	16
25	15	15	15	15	15	15	20	15	15	16	17	16	16	16	17	16	15	22	16	16	15	15	15	15
26	16	15	16	16	16	17	18	15	15	16	17	16	17	16	15	15	16	21	16	15	15	15	15	15
27	15		15	16	15	15	15	15	16	16	16	16	16	16	17	16	15	21	16	15	16	16	15	16
28	15	15	15	16	15	15	21	15	21	16	16	16	17	16	16	17	15	14	15	15	15	17	16	15
29	15	15	15	15	15	15	21	15	15	16	16	17	16	18	15	16	15	16	16	16	17		16	16
30	15	15	15	15	15	16	21	15	15	15	16	16		16	17	15	16	15	16	15	15	15	15	15
31	15	15	15		17	15	16	16	15	15	16	16	18	18	16	17	15	15	17	15	15	15	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	30	28	30	29	29	28	29	29	29	29	29	30	28	31	30	31	30	30	30	30	30	27	29	27
MED	15	15	15	15	15	15	18	15	15	16	16	16	17	16	16	16	15	16	15	15	15	15	15	15
U Q	15	15	15	15	15	15	20	15	16	16	17	17	17	17	17	16	16	20	16	16	16	15	16	16
L Q	15	15	15	15	15	15	16	15	15	15	16	16	16	16	15	15	15	15	15	15	15	15	15	15

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT KOKUBUNJI

MAR. 1998

LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	58	65	46	47			36	69		85	92	97	122	114	92	76	68	66	51	42	44		42	34
2	46	49	58	38	36	30	37	57	80		82	87	96	94	81	75	71	71	60	47			69	69
3	69		59	47		59	38	55	69	76	98	104	98	96	96	81	71	68	57	60		57		42
4	46	57	57	55	56	47	54	71		76	74	88	96	100	92	77	71	74	57	42	47	47	47	46
5	47	46	46	46	45	45	50	76		82	95	116	105	95	78	86	82	67	57	56	47	56	56	46
6		38			28			70	80		82	97	112	114	84	72	71	71	60	46		56	A	A
7	36			34	28		48	56	71	83	C	C	C	C	C	75	84	67	67	36	32			35
8	A	50	46	47	29		40	67	67	80	77	79	92	92	70	74	77	80	60	A	41	37	40	46
9	40		40	40	38	31	A	57	70	66	70	77	82	78	77	81	75	73	57	46	38	44	46	
10	47	44	46	43	41		69	71	74	68	77	81	105	114	89	71	77	66	69	57	57	57	50	47
11	48	51	47	52	49	49	30	96	69	92	88	92	133	118	117	86	88	96	81	56	60	68	58	45
12	43	49	48	51	47	48	55	73	82	81	81	101	126	114	101	88	84	91	69	A	A	A	59	43
13		60	58	42	38	44	56	70	78	81	86	107	112	104	86	88	76	86	92	47	38		56	
14		42	46	47	43	46	48	74	80	88	104	104	97	100	95	93	86	71	56	38			59	59
15	42	42		24	40		33		70	88	97	102	106	95	98	90	78	78	82	56	47	59	56	58
16	A	50	46	52		29	47	66	96	91	98	105	106	110	88	83	95	96	81	72	60	58	56	59
17	44		46	46	47	41	61	65	70	77	81	106	108	103	92	85	85	91	80	57	58	46		43
18	44			43		34	57	70	71	80	82	98	106	90	73	76	87	94	95	56	50		48	
19	56	62	56		44		57	70	68	91	97	97	115		91	81	88	85	80	48		47		56
20	56	50	48	47		69			78	81	91	94	97	98	97	83	87	94	94	57	57	50		47
21	48	50	50			56	54	72	72	82	98	108	92	91	92	91	93	93	95	73	62	56	63	58
22	67	48	51	57	46	N	48	80	113	115	112	117	120	115	110	91	80	73	74	56	67	68	57	58
23	54	57	57	41	38	37		70	70	91	87	98	111	104	88	78	75	81	83	75				46
24		57		69	37	35	48	68	76	92	101	117	120	111	91	83	84	78	81	63	57		64	43
25	43		46		34	35	57		85	92	95	91	93	92	82	82	80	81	94	73		56	45	56
26	48	44		32	38	38	51	80	84	97	91	113	112	101	93	84	92	81	82	68	57	57		59
27	57	56	57	30	28	31	57	66	73	91	97	101	88	87	92	87	78	83	84	71	57	72	58	56
28	56	56	47	43	42	43	57	68	83	103	100	105	107	106	111	102	81	81	80	67	57	58	57	56
29		57	57	42		59	56	80	87	97	101	108	104	132	136	115	91	82		73	57	57	57	58
30	A	59	48	45	41	38	68	69	70	91	100	104	116	114		110	104	82	82	56	57	57	58	56
31	57	57	57	56	50	50	73		93	93	91	91	100	105	100	81	80	86	83	72	68	57	46	50
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	25	25	27	24	23	27	27	28	29	30	30	30	29	29	31	31	31	30	29	23	22	23	27
MED	48	50	48	46	40	43	54	70	75	88	92	101	106	103	92	83	81	81	80	56	57	57	56	50
U Q	56	57	57	51	45	49	57	73	82	92	98	106	112	114	97	88	87	86	83	69	58	58	58	58
L Q	44	47	46	41	36	35	47	66	70	80	82	92	97	94	85	77	76	71	60	47	47	50	47	45

HOURLY VALUES OF fEs AT KOKUBUNJI

MAR. 1998

LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G	G	29	G	40	G	G	G	G	47	G	G	30	29	G	G		G	G
3	G	G	G	G	G	G	G	30	G	G	45	G	G	G	G	G	G	28	28	32		29	25	G
4	30	31	29	G	G	G	G	G	G	G	G	40	46	G	G	G	46	29	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	G	G	47	G	G	G	G	G	G	29	G	G	G	G	G
6	G	G	G	G	G	G	20	G	G	G	G	G	G	G	G	G	38	G	26	28	25	24	25	34
7	G	G	G	G	G	G	G	G	G	G	C	C	C	C	C	G	36	28	G	G	G		24	G
8		G	G	G	G	G		22	30	G	G	G	G	G	G	G	G	40	30	G	32	G	G	26	G
9	34	67	38	37	47	33	44	32	G	G	50	49	G	G	G	40	G	35		G	G	29	28	G
10	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	45	G	36	34	27	25	29	G	G
11	G	G	G	G	G	G		31	G	45	45	52	G	G	G	G	39	G	G	G	G		G	G
12	G	G	G	G	G	G	G	G	G	G	G	G	G	G	52	G	G	58	62	38	30	25	25	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
14	G	G	G	G	G	G	26	G	G	G	G	G	G	G	G	40	G	G	G	G	G	G	G	G
15	G	G	G	G	G	G			G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	43	G	25	G	G	G	25	G	G	G	G	52	G	G	G	G	G	32	36	G	G	G	G	G
17	G	29	G	G	G	G	25	G	G	G	41	G	51	G	G	G	G	33	G	G	G	G	G	G
18	G	G	G	G		G	G	G	G	38	49	42	G	G	48	46	56	44	50	30	G	34	26	G
19	G	G	G	G	G	G	G	G	G	44	51	G	G	G	G	G	48	34	27	G	32	G	G	G
20	G		24	G	G	G	G	32	G	39	G	56	G	G	G	G	G	85	67	32	32	30	G	G
21	G	G	G	G	G	G		35	G	G	68	42	G	48	54	58	50	46	36	37	28	G	G	G
22	G	24	G	G	G		23	26	32	36	G	G	51	G	G	54	39	G	34	G	G	G	G	G
23	G	G	G	G	G	G	28	G	G	G	G	G	G	G	G	G	G	43	33	25	G	G	B	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		29	G	G	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
26	G	G	G	G	G	G	G	G	G	39	G	G	G	G	G	G	G	G	23	G	G	G	G	G
27	G	G	G	G	G	G	28	32	G	G	46	G	G	G	G	G	G	G	24	G	G	G	G	G
28	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G		29	33	G	G	26	G
29	G	G	G	G	G	G	G	G	G	G	G	49	50	G	47	52	60	36	39	34	G	38	26	G
30	30	G	G	27	G	G	G	G	G	G	G	G	G	G	G	G	G	35	G	23	28	25	G	24
31	28	32	24	G	G	28	29	33	G	G	G	G	G	G	G	G	G	G	G	G	26	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	31	31	30	31	27	30	31	31	30	30	30	30	30	31	31	29	29	31	30	28	30	31
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	26	G	G	G	G	G
U Q	G	G	G	G	G	G	25	30	G	G	41	42	G	G	G	G	38	35	33	30	25	25	25	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT KOKUBUNJI

MAR. 1998

LAT. 35.7N LON. 139.5E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	14	14	15	14	15	14	14	15	14	16	15	14	14	14	21	14	15	15	15	15	15
2	15	15	14	15	14	15	14	15	14	15	16	16		17	14	16	15	16	15	15	15		17	15
3	15	14	15	15	15	15	16	17	14	16		18		16	18	16	14	14	15	14		15	14	15
4	15	14	14	15	15	15	15	16	15	16	23	20	18	22		16	14	15	15	18	15	14	14	14
5	15	15	14	14	14	15	14	14	14	14	18	18		42	18	15	15	15	16	15	14	14	15	15
6	14	16	15	14	14	15	14	14	15	15	16	27	16	18	16	16	14	18	14	15	14	15	15	14
7	15	14	14	15	15	15	16	23	15	14	C	C	C	C	C	15	16	15	15	16	15	15	14	14
8	15	14	15	14	14	16	15	17	15	15	14	15	17	18	16	16	14	14	15	15	14	14	14	15
9	14	15	14	14	15	14	14	14	15	14	16	15	22	18	16	15	15	15	15	15	15	15	15	18
10	15	15	14	16	14	15	14		15	15	15	16	15	18	16	15	14	15	15	15	16	14	15	15
11	15	15	14	14	14	15	15	14	14	14	16	16		43	18	14	15	21	14	15	15	14	15	15
12	15	14	14	15	14	14	15	15	14	15	15	20	18	23	17	17	14	14	14	14	15	15	20	15
13	15	15	15	14	15	15	16	14	15	14	15	18	20	18	18	14	15	22	15	14	14	15	14	21
14	15	14	15	14	15	17	16	26	15	14	15		44	23	17	14	15	16	14	14	15	14	15	14
15	14	14	15	15	14	16	15		15	17	21		17	17	20	18	15	15	14	14	15	15	14	15
16	15	14	14	14	14	14	18	27	16	18	17	16	28	27	17	18	15	15	14	14	15	16	15	14
17	14	15	16	15	15	15	18	15	15	17		24	23	42	43	40	15	15	16	15	15	15	14	14
18	15	14	14	15		15	17	14	15	15			44	45	21	17	16	17	16	14	14	15	14	15
19	15	15	15	15	14	15	20	18	18	16	16	22		20	17	23	14	17	14	15	15	15	17	14
20	15	14	14	15	14	15	18	15	15	18	18	22	44	42	44	23	15	17	14	15	14	15	15	15
21	15	15	14	15	14	14	15	14	17	16	16		47	27	23	17	15	14	14	14	14	14	14	14
22	14	15	15	15	14	15	18	14	15	15	18	20	26	23	16	16		15	17	14	14	14	15	15
23	14	14	14	14	17	15	14	18	15	18	23		76	47	20	16	17	20	14	15	14	15		14
24	14	14	14	15	14	16	22	14	15	15	18	48	15		43	18	15	14	14	14	14	15	15	15
25	16	14	15	14	15	15	20	14	15	18	18	23		20	18	17	18	24	15	14	15	14	14	14
26	15	15	15	15	14	15	20	15	16	16		26		23	17	20	15	24	16	15	14	18	15	15
27	14	15	14	15	15	15	15	15	15	14	22		22		18	22	20	15	17	14	14	14	14	15
28	14	15	14	15	14	15	14	15	40	24	22	21	23		48	21	15	15	14	15	14	21	16	15
29	15	14	14	15	16	16	21	15	16	16	22	18	17	21	30	21	15	15	16	15	15	15	14	14
30	14	15	15	14	14	15	21	14	14	16	26	23		21	14	16	15	15	17	15	14	14	14	14
31	14	14	14	15	14	14	15	15	14	18	22		47	20		42	15	14	14	15	15	14	14	15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	30	31	31	29	31	31	26	23	22	27	28	31	30	31	31	31	30	30	30	31
MED	15	14	14	15	14	15	15	15	15	15	18	20	22	21	18	16	15	15	15	15	15	15	15	15
U Q	15	15	15	15	15	15	18	16	15	17	22	23	44	27	20	20	15	17	16	15	15	15	15	15
L Q	14	14	14	14	14	15	14	14	14	14	16	16	17	18	16	15	14	15	14	14	14	14	14	14

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT YAMAGAWA

MAR. 1998

LAT. 31.2N LON. 130.6E 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	59	47		49	59	69		53	66	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	79	85	91	106	115	101	91	82	84	83	60	64			
3		34			79	29		48	72	83	102	117	104	100	110	105	80	66	86	65	69	64	42	
4		49	58		48	31	37	62	70	71	75	81	100	111	108	93	84	66	63	61	55	44	43	
5	89	36		69	62	59		64	83	75	92	108	108	106	98	95	96	80	72			79	79	
6	59	30			30		69	54	77	81	81	94	110	117	112	98	84	87	80	52	34	37		36
7	34			58	N	69		61	67	79	87	92	102	104	105	98	88	78	66	36		34	79	36
8	38	59	47	54		34	25	46	69	76	87	84	97	104	92	84	82	85	69	44		69		
9	32		49	34		60	30	71	70	68	76	79	80	91	92	86	80	72	64	69		41		
10	46	42	50	58	52	24	32	53	68	70	90	92	101	124	118	99	77	83	74	62	58	60	32	49
11			N	48		48	29	74	98	86	94	88	130	135	116	105	102	106	108	78	32	59		89
12		48	60	48		69	59	60	70	85	92	98	118	132	135	124	102	97	92	66	59			
13	59	55		52	59	59	32	57	76	80	82	101	110	116	107	107	98	91	88	72	79	42	44	43
14		59	44		59		89	52	67	93	107	105	88	96	112	109	104	86	76		45		60	38
15	32	59	35	48	59		35	63	72	108	96	87	101	110	107	104	78	78	92	82	61	55	60	43
16	49		48	35		24	59	62	80	96	97	96	104	107	101	86	96	105	96	85	82	69	79	
17	37			N	46			58	68	82	82	102	110	121	114	100	96	91	93	73	79	25	79	89
18	89	39		60		37	49	56	70	92	85	100	113	104	98	96	96	96	90	74	59	49	42	
19		48		59	59	60		61	72	85	95	100	110	118	110	105	101	100	86	71	69	79	79	34
20	59		70	62	60		32	61	78	97	96	101	114	112	111	100	97	96	98	85	58		53	
21	69	54	54	52	45		69	54	77	93	96	101	105	105	105	93	91	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	91	94	105	108	110	98	97	96	85	91	85	61		79	69
24		60	53				32	60	83	91	102	111	117	112	112	110	111	94	84	77	69	79	52	61
25	59	52	59	54	34	37		61	82	91	90	92	100	105	98	92	94	95	86	84		54	59	
26	53	50	59	79	69	60	59	72	85	92	87	103	122	115	101	92	88	80	87	86	69	79	79	43
27	36	53	59	69	N	26	28	58	76	98	105	100	94	96	98	98	98	100	105	87	73		61	
28	55		56	59	47		59	57	82	107	110	108	108	122	132	125	105	91	97	86	79		53	
29	53	54	61			30		68	84	92	94	110	116	144	162	146	117	104	106	104	83		35	60
30		69	54	58	60	69		69	78	84	100	98	111	128	130	128	124	108	83	83	89	38	53	64
31	55		55	50	38			76	80	91	92	88	110	119	121	110	88	87	94	90			49	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	20	20	18	21	18	19	18	28	28	29	29	29	29	29	29	29	29	28	28	26	22	19	22	14
MED	54	51	54	54	59	48	36	60	76	86	92	100	108	112	108	99	96	89	86	76	66	55	56	46
U Q	59	57	59	59	60	60	59	63	81	92	96	104	112	120	115	108	101	96	93	85	79	69	79	64
L Q	37	44	49	48	46	30	32	55	70	79	86	91	101	104	99	93	84	81	78	65	58	41	44	38

HOURLY VALUES OF fEs AT YAMAGAWA

MAR. 1998

LAT. 31.2N LON. 130.6E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
3	G	26	G	G	G	25	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
4	G	G	G		25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G		G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G		G	G	G
8	24	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G	G	
9	G	G	G	G			G	G	G		G								G	G	G	G	G	
10	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
11	G	G		G	G	G	G	G	G	G	G		G	G	G		G	G	G	G			G	G
12	29	24		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			G	G	G	G
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
15	G	G	G	G	G	B	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
17	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				G	G				G	G		
19	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G				G	G	G	G
20	G	G	G	G	G	G	G		G	G		G	G		G	G	G	G	G	G	G	G	G	G
21	G	G	G	G	G	G	G		G	G		G		G	G	G	G	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C			G	G	G	G	G	G	G				G	G	G
24	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
25	24	25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
26	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G
27	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
28	G	G	G	G	G	G	G	G	G	G			57	53	G	G	G	G				30	29	31
29	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G		
30		G	G		25	G	G		G	G	G	G	G	G	G	G	G			G		28	27	24
31	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	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	27	28	28	27	28	27	28	28	28	29	29	29	28	29	29	29	29	28	28	26	25	28	28	26
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	32	29	24	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT YAMAGAWA

MAR. 1998

LAT. 31.2N LON. 130.6E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	14	14	14	14	14	14	17	26	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
2	C	C	C	C	C	C	C	C	C	29		45	45	44	44	33	20	17	17	14	14	15	14	16
3	14	15	15	14	15	15	14	18	27	32	35	32	36	45	44	39	21	17	15	14	14	14	14	14
4	14	14	14		15	15	15	20	18		39	44	46	47	43	50	17	20	16	14	14	14	15	14
5	14	14	14	14	14	14	15	18	24	32	40	44	44	45	41	40	30	21	16		15	15	15	15
6	15	14	14	14	14	14	15	18	18	20		44	44	45	23	23	21	18	15	14	16	15	14	15
7	14	14	14	14	14	14	14	18	23	20	22		45	23	30	22	21	20	17	15	15	14	14	14
8	15	14	14	14	15	15	15	15	23	32	20	22		45	44	23	21	18	15	15	14	14	14	
9	14	14	15	14	15	15	14	16	15	20		41	38	46		21	20	18	17	14	14	14	15	16
10	14	15	15	14	15	15	15	17	24	17	22		45	23	23	21	20	26	17	14	14	14	15	15
11	14	15	15	14	14	15	15	15	21	18				44	45	32	21	22	16	15	15	15	15	14
12	14	14	14	14	15	14	15	20	26	21	21	23	45	45	45	23	21	23	17	14	15	14	15	15
13	14	14	14	14	14	15	14	16	28		23	45	46	46	45	44	18	17	17	14	15	14	14	14
14	14	15	14	14	14	15	14	16	29	32	42	43	44	45	45	44	21	17	17		15	14	15	15
15	14	14	14	15	14		14	20	30	20	23		45	45	45	43	33	30	18	17	15	14	14	14
16	14	14	15	14	14	16	14	17	29	36	42	46	46	45	46	45	22	26	16	15	15	15	14	14
17	14	14	14	14	15	14	14	22	20	34	23	46	46	46	40	45	23	17	17	17	16	15	14	15
18	14	15	14	14	14	15	14	17	30	35	45	46	46	46	46	44	44	17	16	15	15	14	15	15
19	14	14	14	15	14	15	14	21		21	22	48	45	48	46	44	35	20	17	14	14	14	14	15
20	14	14	14	14	14	15	14	16	17	21	23		48	48	47	46	40	20	18	14	15	14	14	15
21	15	14	14	14	15	14	14	18	21	22	30		38	46	46	45	21	C	C	C	C	C	C	C
22	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
23	C	C	C	C	C	C	C	C	C	40	44	44	59	48	46	44	21	30	17	15	14	15	14	14
24	15	14	14	15	15	15	14	23	20		23	47	46	46	46	44	23	20	16	15	16	15	14	15
25	15	15	14	14	15	14	14	21	29		44	48	46	45	45	44		28	18	15	14	14	14	15
26	14	14	14	15	14	15	14	22	18	21		45	46	34	46	39	22	24	17	15	14	14	14	14
27	14	14	14	14	14	15	14	18	20	24	45	46	45	46	46	44	44	18	20	15	15	15	14	15
28	15	14	14	14	14	14	14	23		46	34	39	44	45	44	45	21	20	16	14	17	15	15	15
29	14	14	14	15	14	15	14	23	18	21		47	47	46	45	42	22	17	20	15	15	15	15	15
30		15	14	15	14	14	14	17	18	20		45	48	23		45	22	17	15	16	14	15	15	15
31	15	14	14	14	14	14	14	24	17	41	45	45	49	46	46	45	23	18	17	15		16	14	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	28	28	27	28	27	28	28	26	25	22	23	27	29	27	29	28	28	28	26	27	28	28	27
MED	14	14	14	14	14	15	14	18	22	22	32	45	45	45	45	44	21	20	17	15	15	14	14	15
U Q	15	14	14	14	15	15	14	21	27	33	42	46	46	46	46	45	23	22	17	15	15	15	15	15
L Q	14	14	14	14	14	14	14	17	18	20	23	43	44	45	44	32	21	17	16	14	14	14	14	14

HOURLY VALUES OF foF2 AT OKINAWA

MAR. 1998

LAT. 26.3N LON. 127.8E 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	56	57	64		59		89	40	66		106	92	123	132	126	110	106	101	74	A	70			79
2	43	53	56	58			69	49	70	74	83	91		118	123	126	124	83			68	68		
3			44						59	82	119	123		105	125	130	134	84	89	A	68	66	58	43
4	44		44	45					60	56	81	86	110	122	121	114	93	83	84	A	54	53	44	
5	44	A	38	41		59	69		83	68	94	114	124	125		124	127	119	120		92	A	89	48
6	32		44	38	44					100	85	102	106	116	131	131	122	126	126		48	A	A	37
7	58	58	A	44	38		89	50	53	66	97	102	99	115	124	114	124	86	77	A	55	55		
8	89	52	57	48	A				56	68	93	95	106	124	120	122	112		86		44		56	A
9	58		57	61	41	43	34		70	94	83	95	99	104	113	102	90	80	74	A	59	A	70	69
10		57		60	A	59		A	52	64	87		121	122	131	132	120	114		A				52
11		46	A		A	38		53		101	96	91	120	142	131	116	122	127	142	A	54	55		
12	A			42	44	38	31	44	69	76	97	106	121	142	162	171	156	135		131	76	58		59
13	38	50	57	48		69		49	54	70	94	115	112	120	133	133	123	118	111	87	68		41	43
14		44	44	45	38			49	70	93		133	94	93	132	132	128	123	114	104	70	58	68	70
15	70		95			35			84	97	114	92	101	131	130	121	122	103	99		70	68		50
16		55	60	68	A	A		54	86	93	122	111	101	103	116	102	112	117	99	104		68	69	
17		43	46	59	59	58			65	83	97	104	116		144	121	112	124	128		82	68	54	42
18		71	69		43				68	98	C	C	116	117	130	130	114		106		93	84	61	A
19	61	68	60	70	60	44		59	72	94	119	117	125	133	134	127	124	134	85	101	84	99		88
20		93	116		61	37		52	78	102	119	121	131	131	128	133	124	122	128		95	82	94	90
21	82	82		93	58	48	39	64	80	108		95	112	123	116	104	91	85	84	A	59	84	62	83
22	59	63	51	49	A			A	116	110	105		164	154	157	153	131	122	132	A	83	83	68	87
23	76	69	69		A	37	A	54	80	93	103	114	116	116	120	132	149	150	127	A	A	A	A	69
24	A	A	49	44	41		N	44	74	94		117	121	127	144	167	164	145	126	126	92		72	80
25	68	74			60	59		51	84	94	91	94	106	117	116	111	114	114	89	A	66	70	68	70
26	54	69	70	57	44	46		61	90	94	115	112	127	146	133	127	131	133	128	A	89	83	A	68
27	53	54		43		N	31	48	67	94	116	94	95	117	116	115	124	143			110	96	89	51
28	57	69	51	38		58		54	76	93	122	110	120	150	150	160	146	N	132		92	81	70	61
29		74	68	57	N		N	55	71	96	95	120	124	168	186	179	159	156	167	169	122	80	83	91
30	58			61	50		58	44	82	90	101	94	116	128	148	150	150	138	122	89	55			
31											C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	21	22	22	15	15		19	28	29	26	27	28	29	29	30	30	27	26		27	20	18	22
MED	58	58	57	48	44	46		51	70	93	97	104	116	123	130	127	124	122	112		70	69	68	68
U Q	68	70	68	60	59	59		54	81	96	115	115	122	132	139	133	131	134	128		92	83	72	80
L Q	44	52	46	44	41	38		48	65	75	93	94	106	116	120	115	114	101	86		59	62	58	50

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT OKINAWA

MAR. 1998

LAT. 26.3N LON. 127.8E 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	46	32	36	G	G	G	G		G	41	G	54	42	G	G	G	38	36	G	26	G	G	27	
2	G	G	G	G	G	G	G		33	G	43	G	G	G	G	G	G	G	G	G	G	G	G	G
3	G		G	G	B		G		G	G	G	G	G	50	G	G	40	35	28		G	G	G	G
4	G	G	G	G	G			48	G	G	G	G	50	G		40	49	34	40	50	30	G	G	G
5	G	54	G	G	G	G	G		G	G	G	G	G	50	G	G	40	38	G	G	30	38	G	
6	G	G	G	27	G	G	G			G	G	G	G	G	42	G	39	36	46		G	25	49	G
7	30	G		G	G	G	G	42	G	G	G	G	G	G	G	42	41	34	34		G	G	G	G
8	G				29	G		40	35	G	G	G	G	50	49	50	42	39	32	38			G	30
9	31		G	G	37	25	25		G	G	G	G	55	57	60	53		38	31	24	29	33	27	
10	G	G	G	G	44	32		40	G	G	G	G	G	60	42	G		42		25	G	G	G	
11			73	24	29	24	G			G	G		G	57		G	G	40	33	36	24		48	
12	27		40		G	G	G		G	58	G	43	G	G	G	G	38	G	G			G	G	G
13	G	G	G	G	G	G	G		G	G	G	G	52	G	42	G	G	G	G	G	G	G	G	G
14	G	G	42	G	G	G		42	G	N	G	G	G	50	G	G	42	36	29	G	G	G	G	G
15	G		G			G			G	G	G	G	G	G	G	G	G	36	G		G	G	G	G
16	G	24	28	39	32	25	G	G	G	G	G	G	G	G	G	G	G	40	30	29	G	G	G	G
17	G	G	G	G	G	30			G		G	G	43	G	G	G	G	39	37	49	39	24	G	G
18	G	G	G		26	26			G	G	C	C	G	45	76	62	G		G	48	G	29	G	58
19	48	29	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G			G	G	34	42	46	43	G	46	67	G	G	G	G	28		G			
21		G	G	G	G	G	G	48	35	39		43	G	65	76	G	G	G	G	58	G	G	44	48
22	G	36	28	39	58	26	27	47	G	39	G		G	G	G	G	G	50		43	28	G	G	G
23	G	49	40		34	34	40	43	G	G	G	G	G	G	G	G	38	43	44	39	48	46	41	44
24	44		G	41	G	G	G	44	G	38	G	G	G	G	G	48	44	38	38	48	48		49	40
25		25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29		G	G	G	G
26	G	G	G	G	G	G	G	42	34	G	G	G	G		74	G	G	37	32		28	45	49	G
27	G	G	G			G	G	40	G	G	G	G	G	G	G	G	49	52	50		60	50	G	G
28	G	G	G	G	G	G		31	G	G	G	G	G	G	G	G	G	40	33	G	G	G	G	G
29		58	G	G	G		G	48	G	G	G	G	G	G	G	G	G	G	47	48	21	G	23	G
30	G	25	G	G	G		34	41	G	G	G	G	G	G	G	G	G	G	33	G	G			G
31								G	G		C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	23	28	23	26	26	22	19	29	28	28	27	30	29	28	30	28	29	28	21	28	25	28	24
MED	G	G	G	G	G	G	G	41	G	G	G	G	G	G	G	G	G	36	30	29	G	G	G	G
U Q	G	29	14	G	29	25	G	44	G	G	G	G	G	50	42	G	40	39	35	48	28	27	27	G
L Q	G	G	G	G	G	G	G	31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

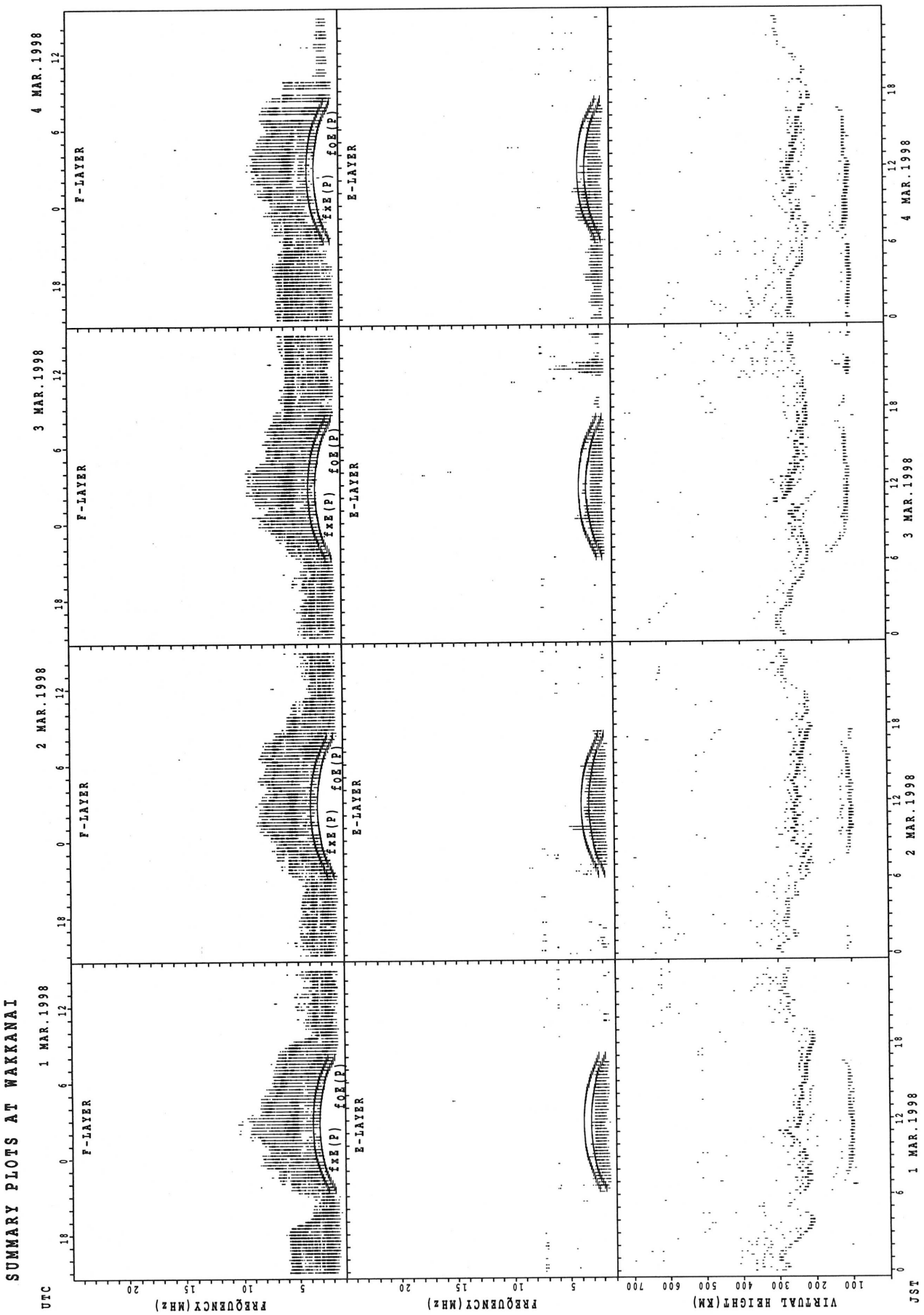
HOURLY VALUES OF fmin AT OKINAWA

MAR. 1998

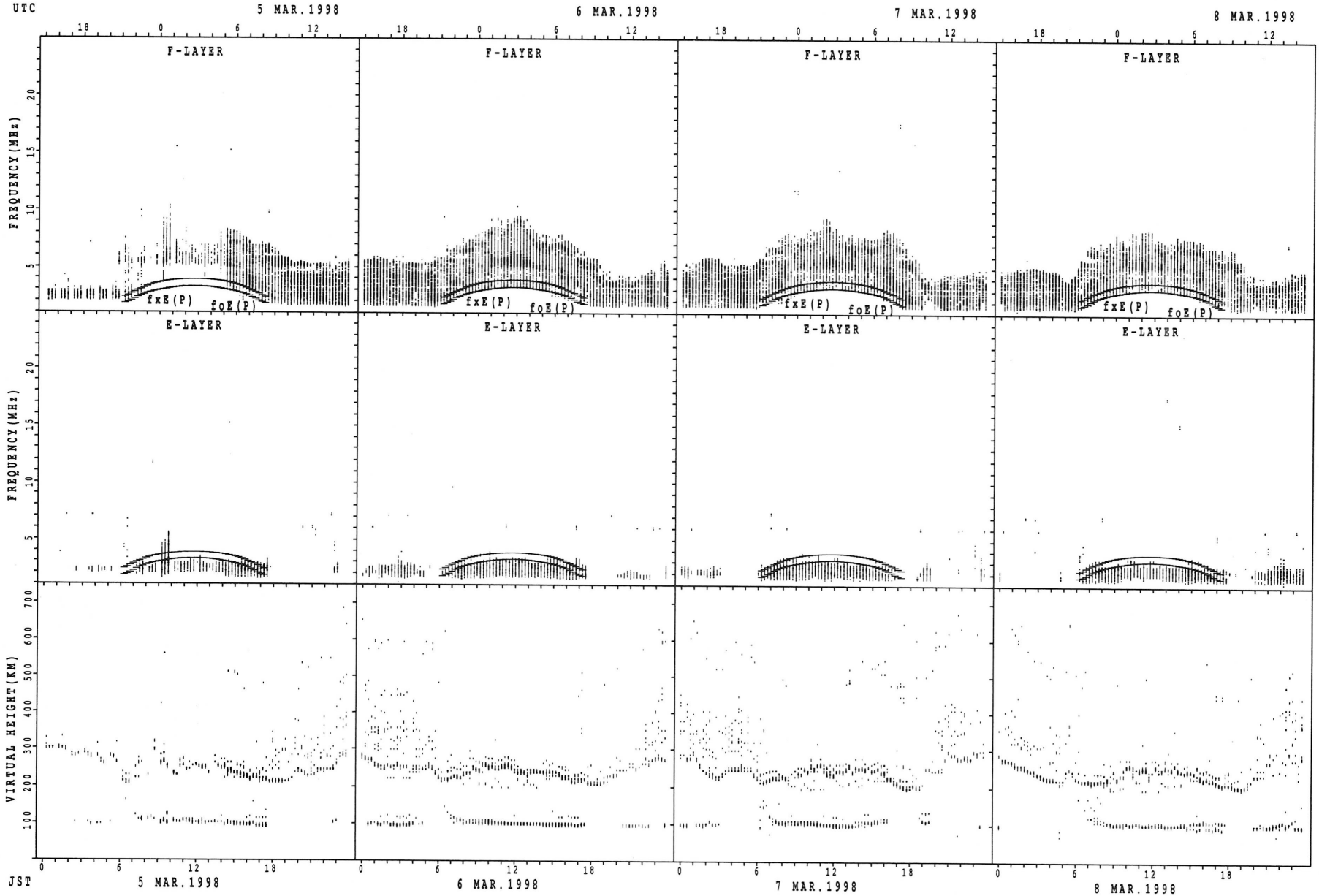
LAT. 26.3N LON. 127.8E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	14	15	15	15	14	16	14	15	17	22	20	18	20	18	16	14	14	14	14	14	15	15
2	15	15	15	14	15	16	14	14	14	15	16	17	20			18	16	14	17	15	14	15	14	
3	15		14	14			17		14	14	18	20	27	26	30	17	17	14	14	14	14	15	15	14
4	14	15	15	15	14			16	14	15	17		21	30	23	23	15	15	15	14	14	16	14	15
5	15	15	15	14	14	14	14	16	14	15	16	21	24		24	17	15	14	16	14	14	14	15	14
6	15	15	14	15	14	15	16	16		15	16	22		21	18	18	15	14	14		15	15	15	15
7	14	15	18	14	15	15	15	18	14	15	16	17	23	20	28	20	16	15	14	14	15	15	15	15
8	15	14	14	14	15	14		14	14	14	15	17	20	20	20	17	17	15	15	15	16		14	15
9	14		14	15	14	15	15		14	15	17	21	24	24	24	20	15	15	14	14	14	14	15	14
10	15	15	14	14	14	15		14	15	14	15	18	27	21	18	18	16	14		15	17	22		15
11	14	15	15	15	15	14	15	14		15	16	17	29	32	28	18	18	15	15	15	15	14	14	
12	15		14	14	14	14	14	14	14	15	20	18	17	23	21	20	18	15	18	14	14	15	15	15
13	15	15	14	14	14	14	18	14	16	16		23	16		47	21	14	15	22	15	15	14	14	15
14	15	15	14	15	15	15		14	14	15	17	20			45	17	18	16	14	14	15	15	14	15
15	14		15			14			14	16	17	22		46	45	16	20	14	14	14	15	14	15	15
16	15	16	14	14	15	15	20	15	15	15	17	21	46	48	44	45	23	16	15	14	15	14	15	14
17	15	15	14	14	15	14			18	16	24	28	27	47	48	42	18	17	14	14	16	16	15	15
18	15	15	14		14	14			14	18	C	C	46	48	36	22	21		14	15	14	15	16	14
19	14	14	15	14	15	15	14	14	15	16	20	45	47	48	47	50	17	15	14	14	14	17	14	15
20	14	14	14		15	14	15	15	15	18	20	46	48	39	48	20	18	15	14	14	14	14	15	15
21	14	14	14	14	14	15	14	16	15	16		30	28	42	43	45	20	16	23	14	15	14	15	14
22	15	15	14	15	15	14	14	15	14	17	21		27		48	44	43	14	14	14	14	15	15	14
23	14	14	14		14	14	14	22	15	18	27		59	49	29	22	20	17	17	14	14	15	15	15
24	15	15	14	15	15	16	18	16	15	17		47	29	46	47	29	27	16	14	14	14		14	15
25	14	14	15	15	14	15	15	17	16	17		45	28		45	45	17	15	15	15	15	14	15	15
26	15	14	16	14	15	14	15	22	15	17	22		48	44	27	22	21	14	14	14	14	14	14	14
27	14	15	14	15		14	15	14	14	18	28	29		45	46	44	18	16	16		14	15	14	15
28	15	16	14	15	15	15		15	33	24	24	28		29		42	18	16	15	14	15	15	15	14
29		14	14	14	15		15	15	15	16	20	28		48	22		17	16	14	14	14	14	15	14
30	16	15	14	14	15		14	15	14	16	22	24		48	47	43	18	17	14	15	15			
31											C	C	C	C	C	C	C	C	C	C	C	C	C	C
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	26	30	26	27	26	22	25	28	30	25	25	23	24	28	29	30	29	29	28	30	27	28	27
MED	15	15	14	14	15	14	15	15	14	16	17	22	27	40	33	21	18	15	14	14	14	15	15	15
U Q	15	15	15	15	15	15	15	16	15	17	21	28	46	47	46	42	20	16	15	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	15	16	19	21	23	23	18	16	14	14	14	14	14	14	14

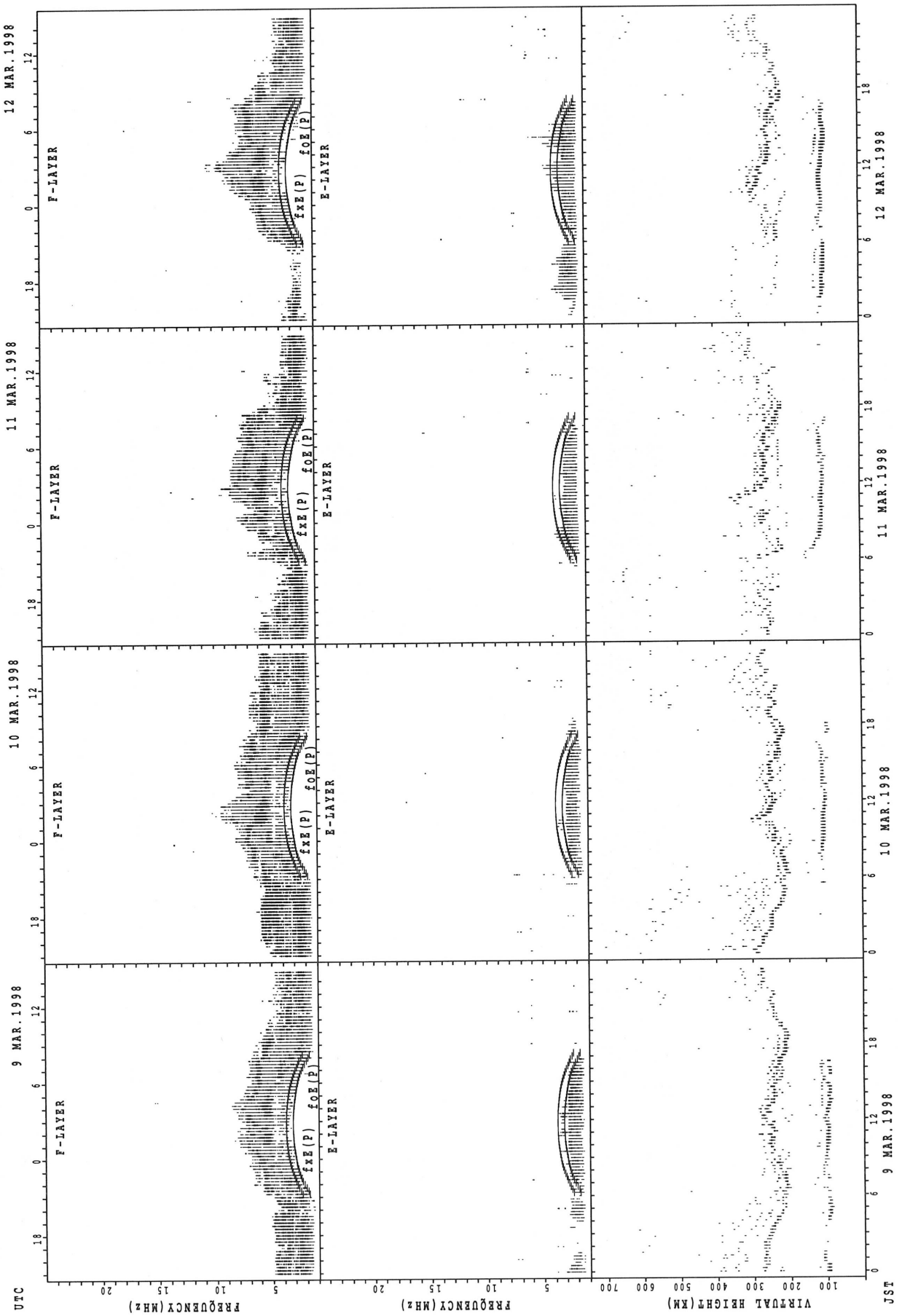
COMMUNICATIONS RESEARCH LABORATORY, JAPAN


SUMMARY PLOTS AT WAKKANAI
1 MAR.1998
2 MAR.1998
3 MAR.1998
4 MAR.1998
UTC
JST
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

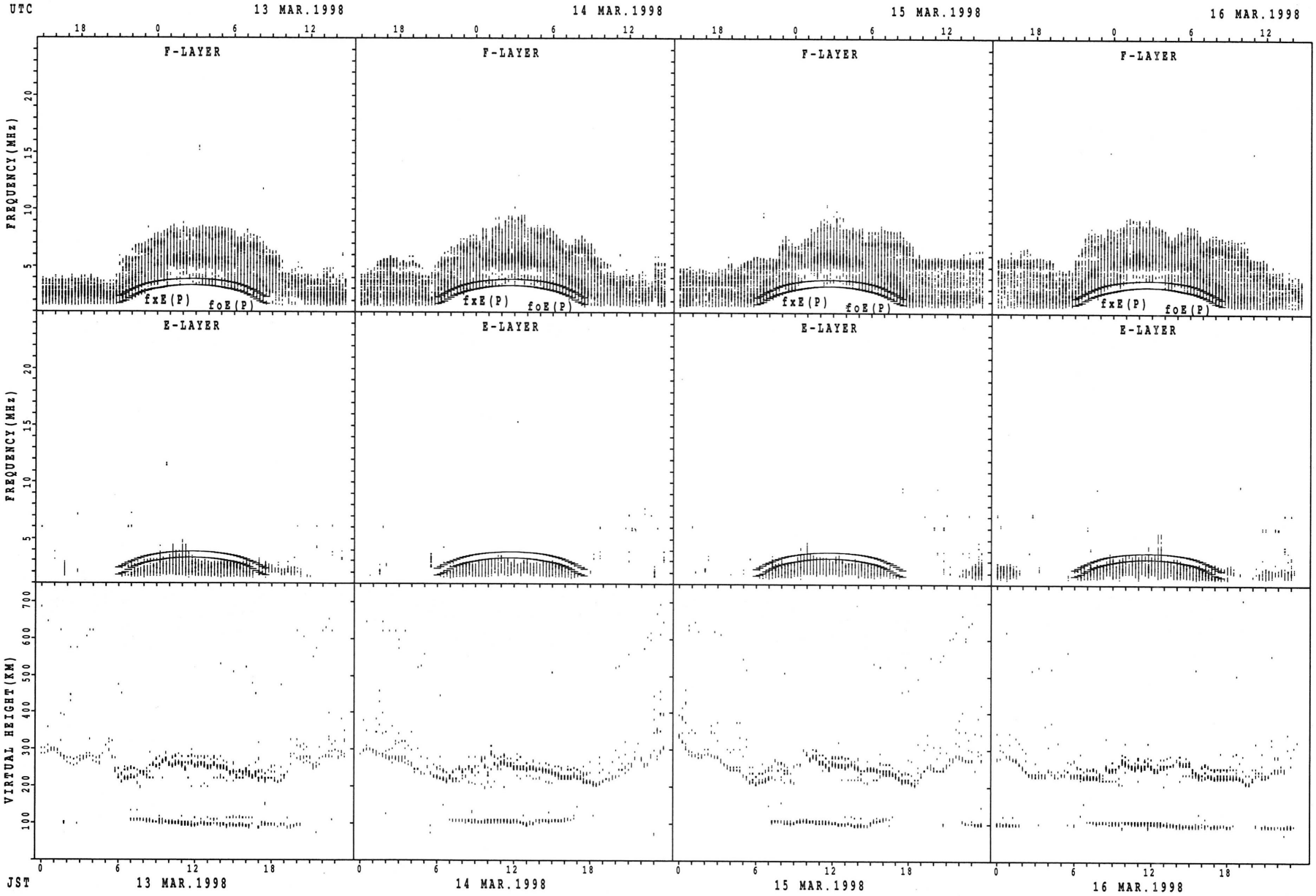
SUMMARY PLOTS AT WAKKANAI



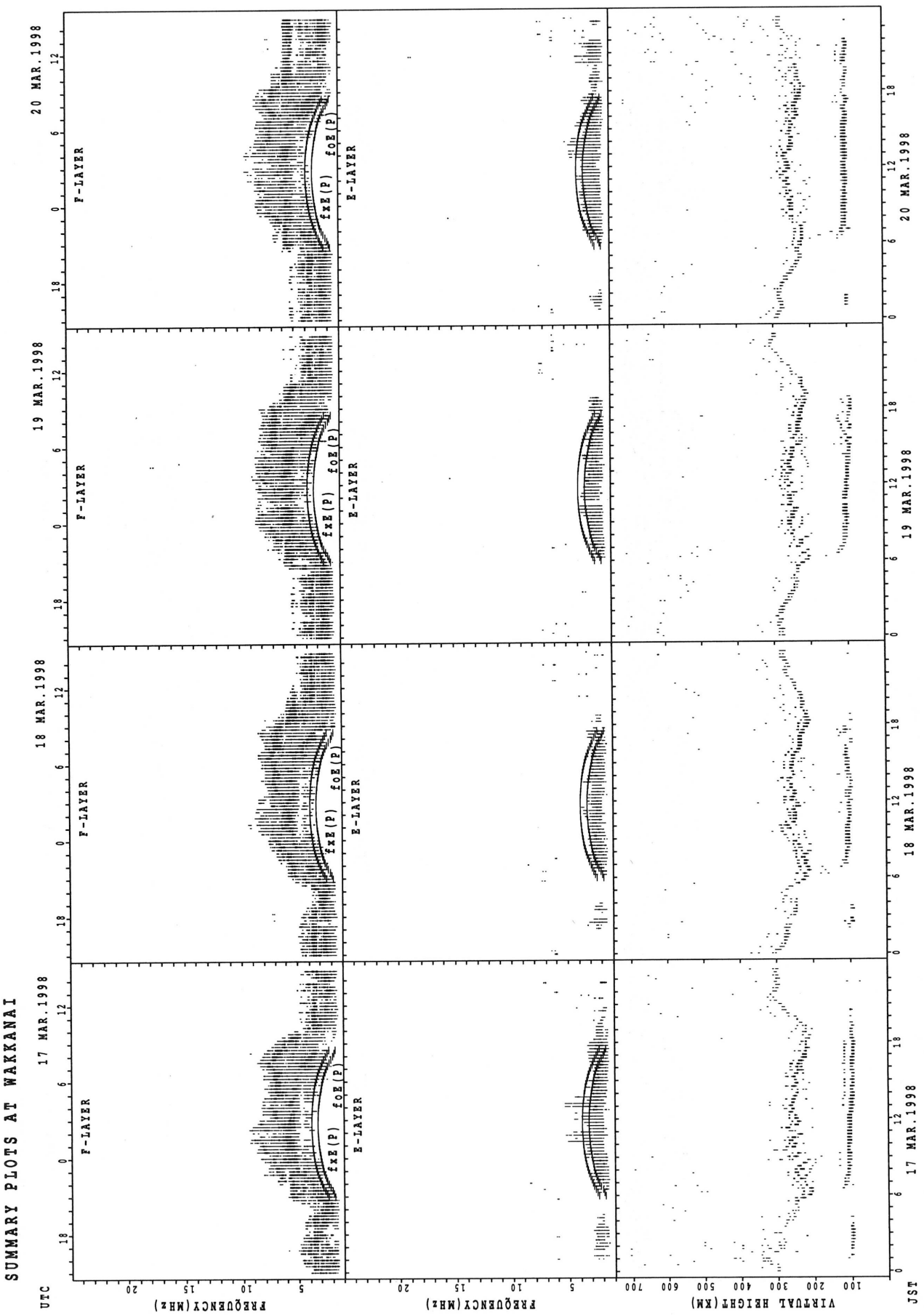
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT WAKKANAI
UTC
JST
9 MAR.1998
10 MAR.1998
11 MAR.1998
12 MAR.1998
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

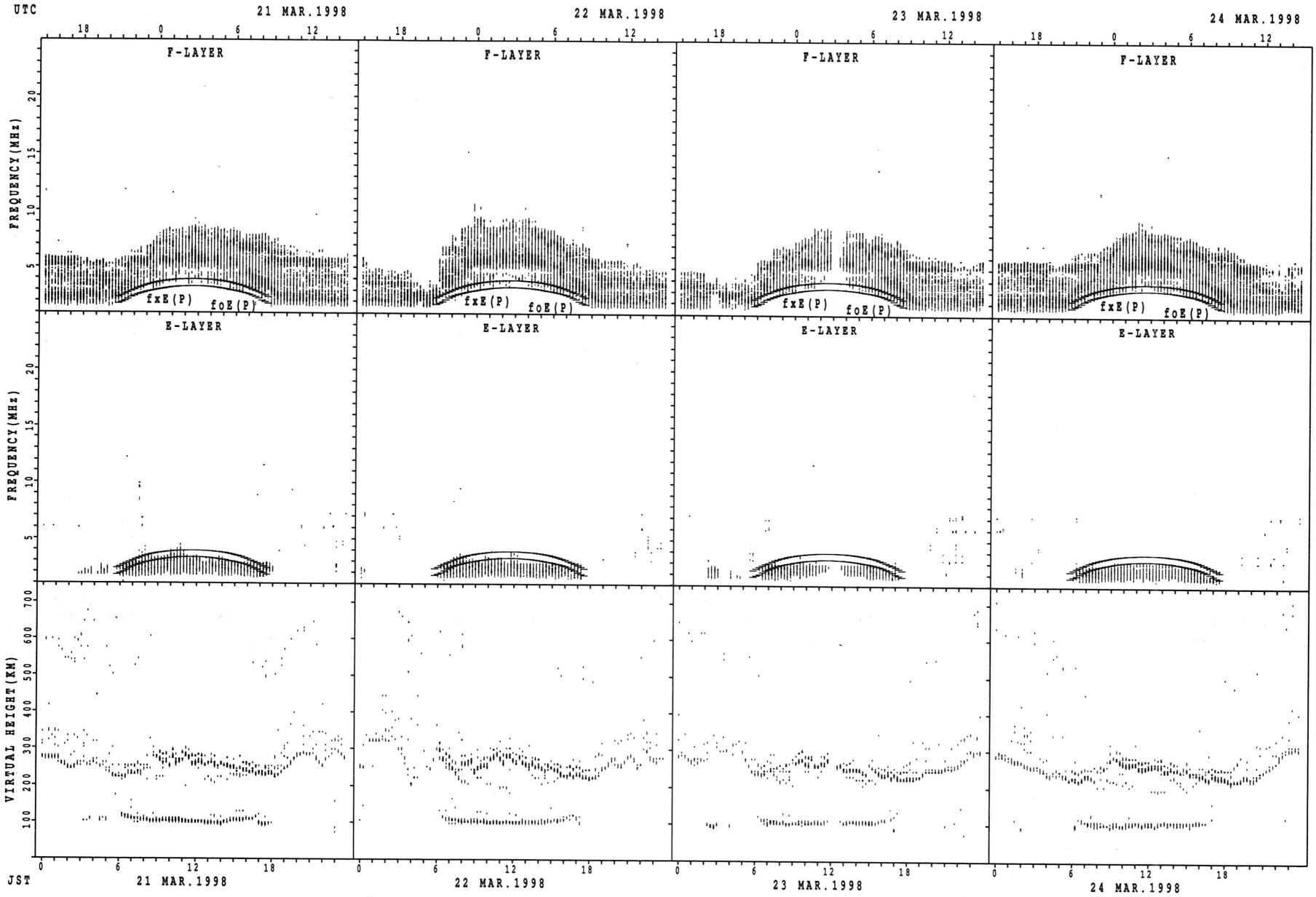
SUMMARY PLOTS AT WAKKANAI



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

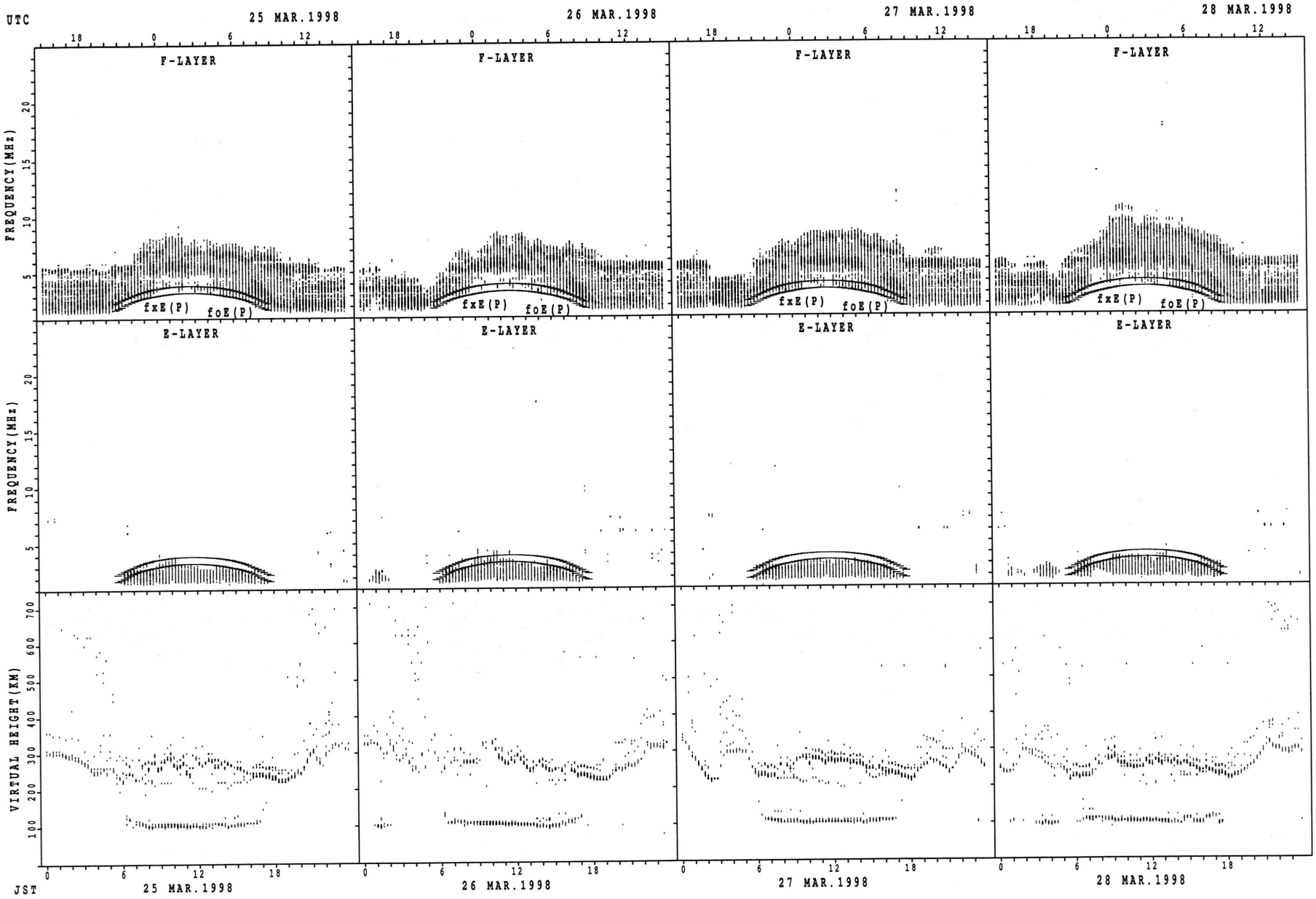

SUMMARY PLOTS AT WAKKANAI
UTC
JST
17 MAR.1998
18 MAR.1998
19 MAR.1998
20 MAR.1998
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



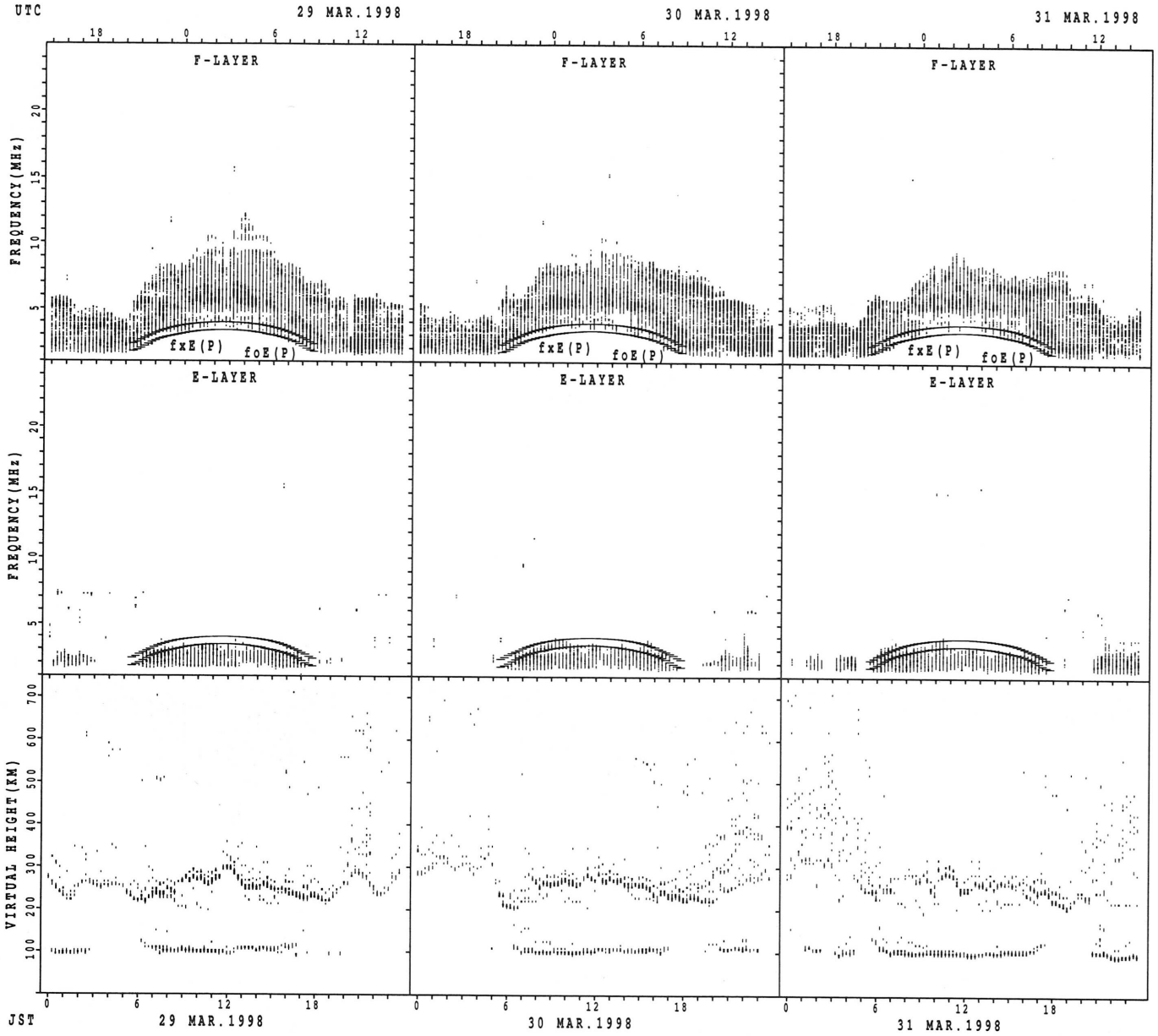
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



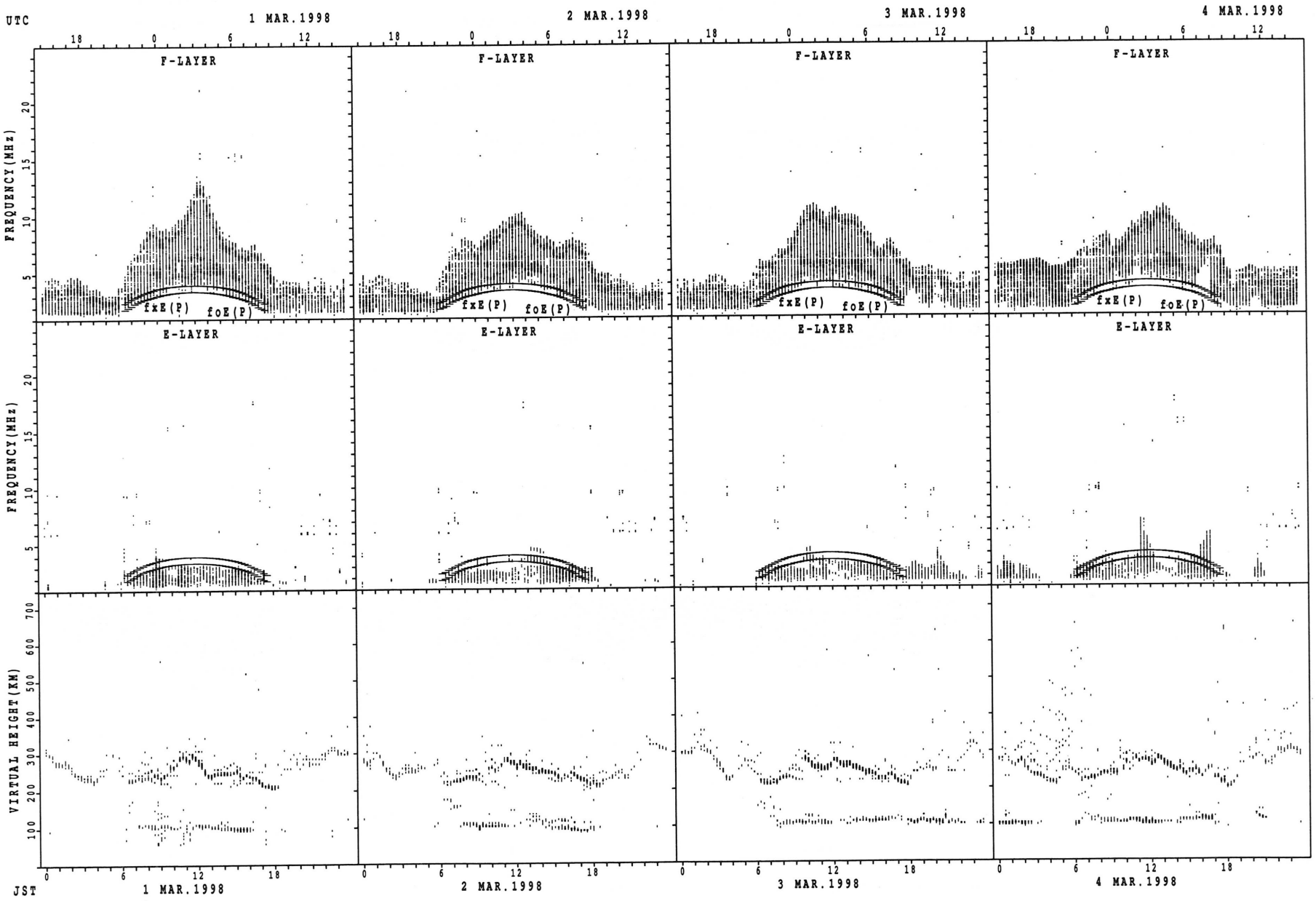
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT WAKKANAI



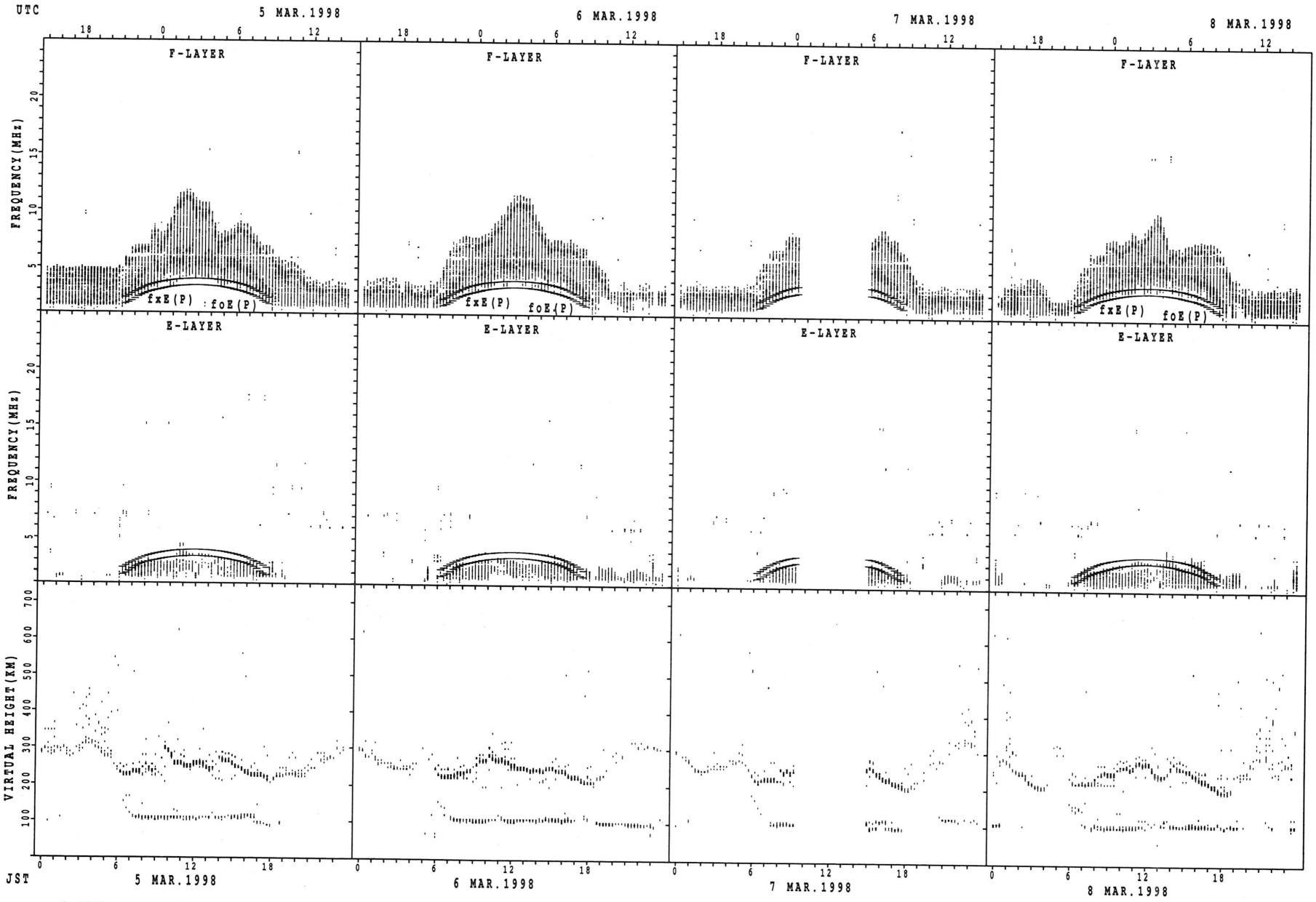
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO

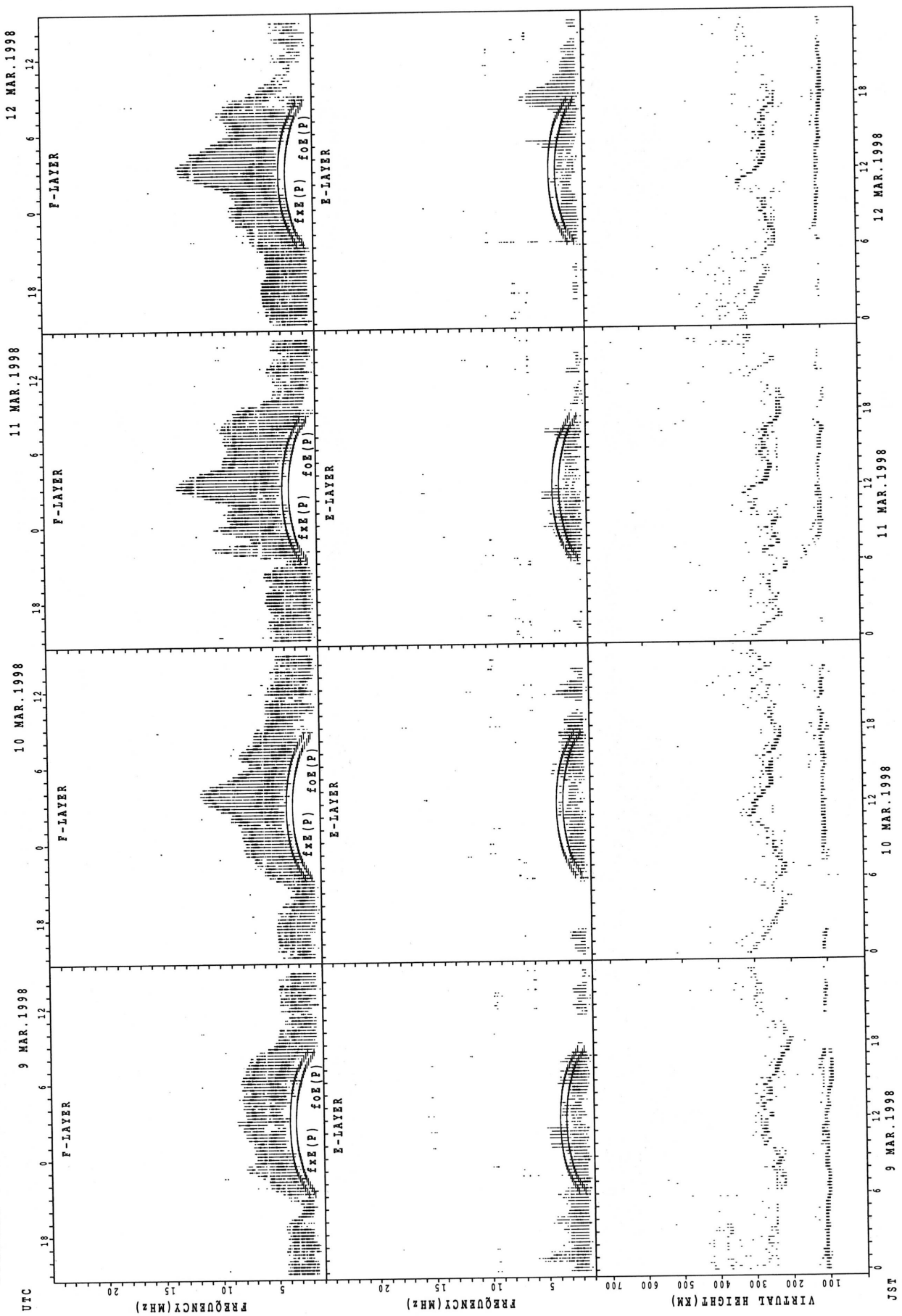


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

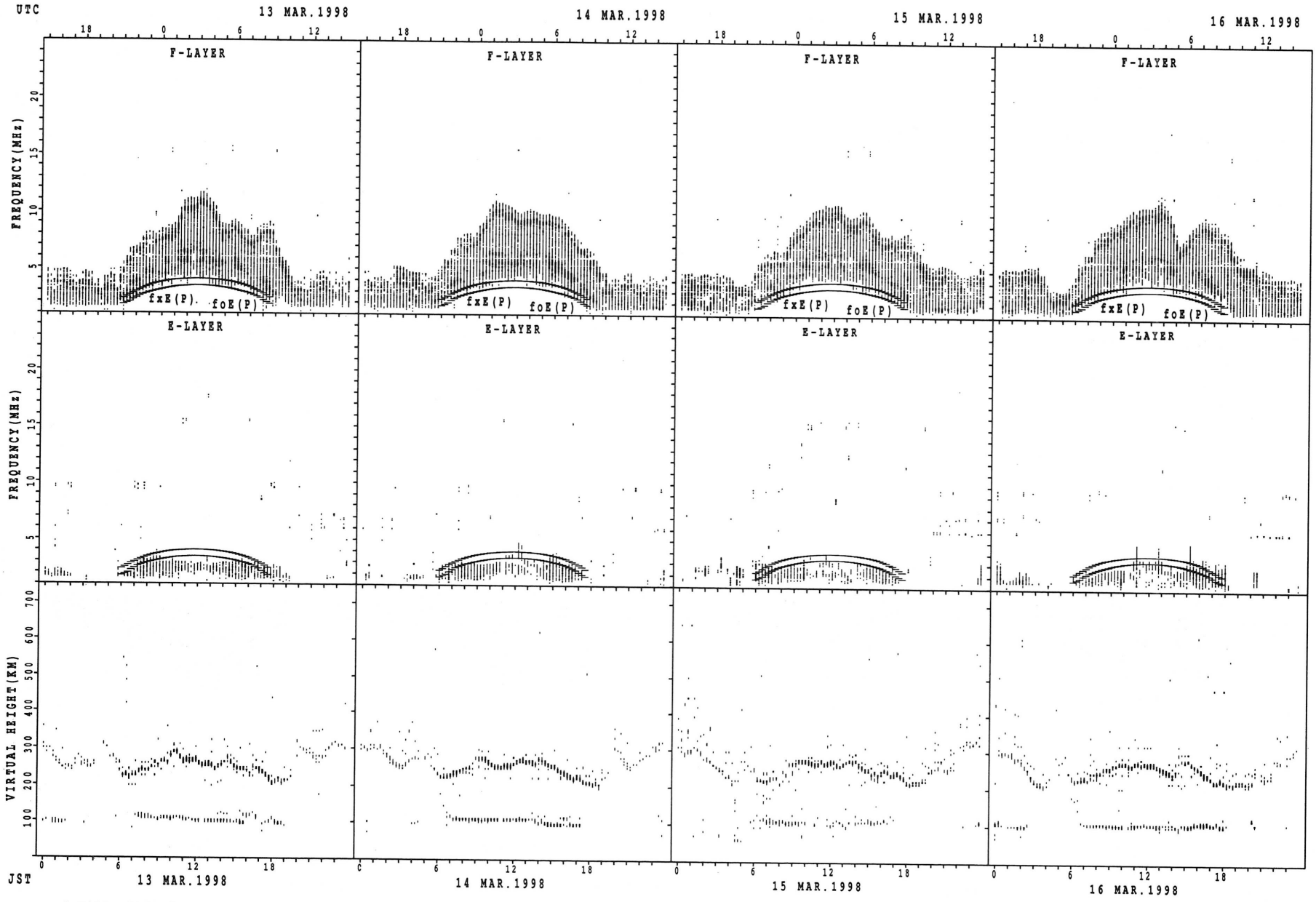
SUMMARY PLOTS AT KOKUBUNJI TOKYO



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

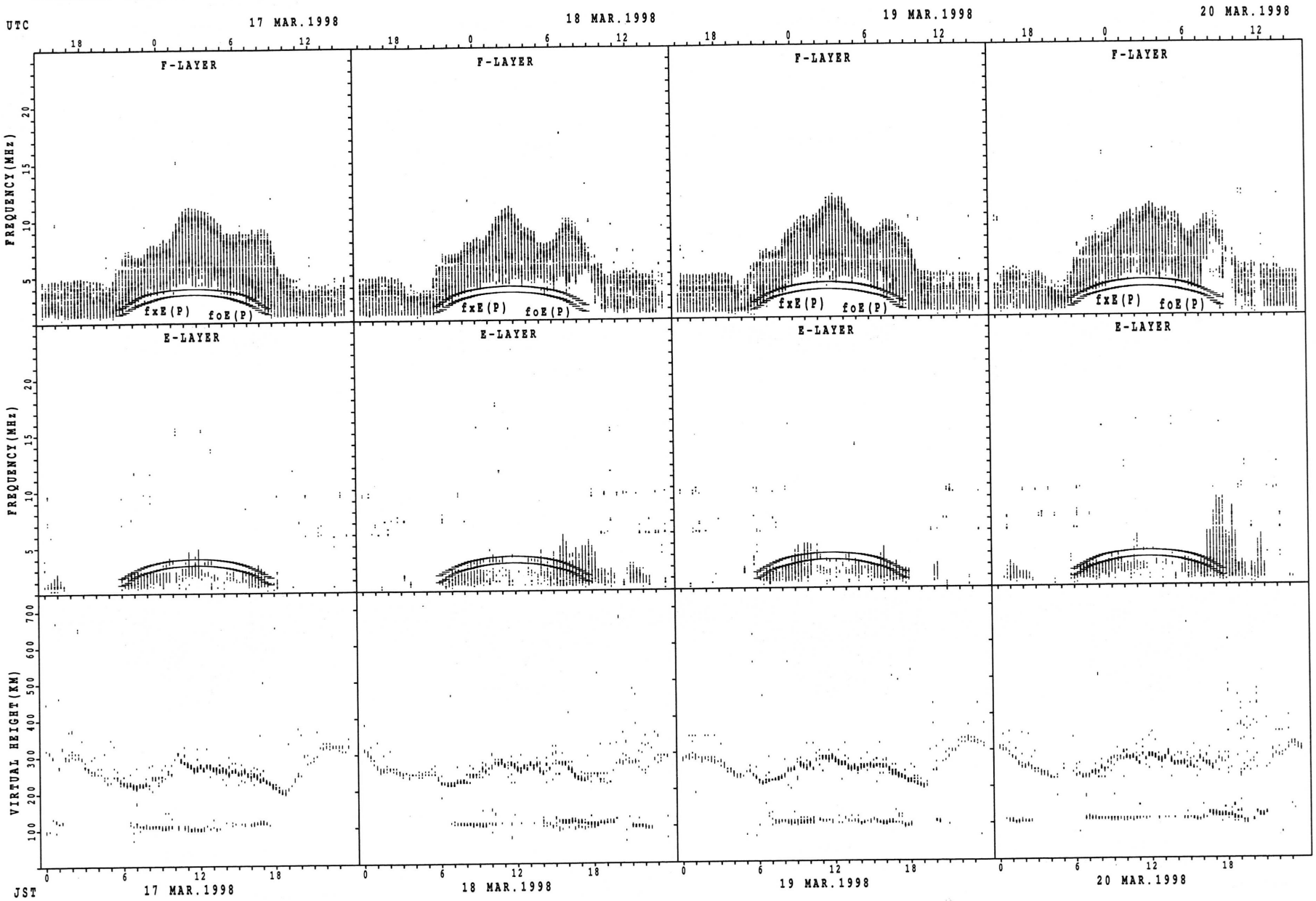

SUMMARY PLOTS AT KOKUBUNJI TOKYO
UTC
JST
9 MAR.1998
10 MAR.1998
11 MAR.1998
12 MAR.1998
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) ; PREDICTED VALUE FOR fxE
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



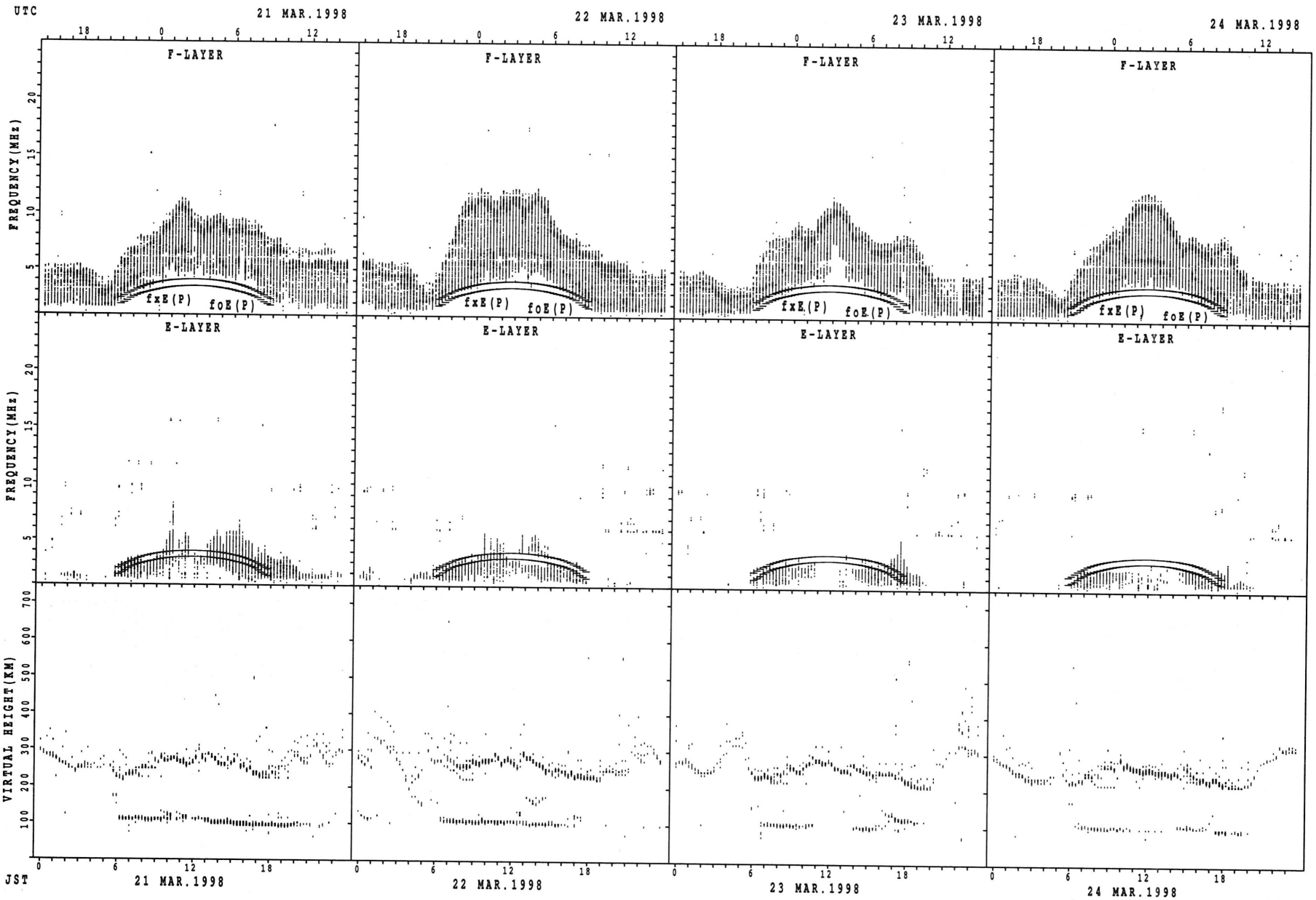
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



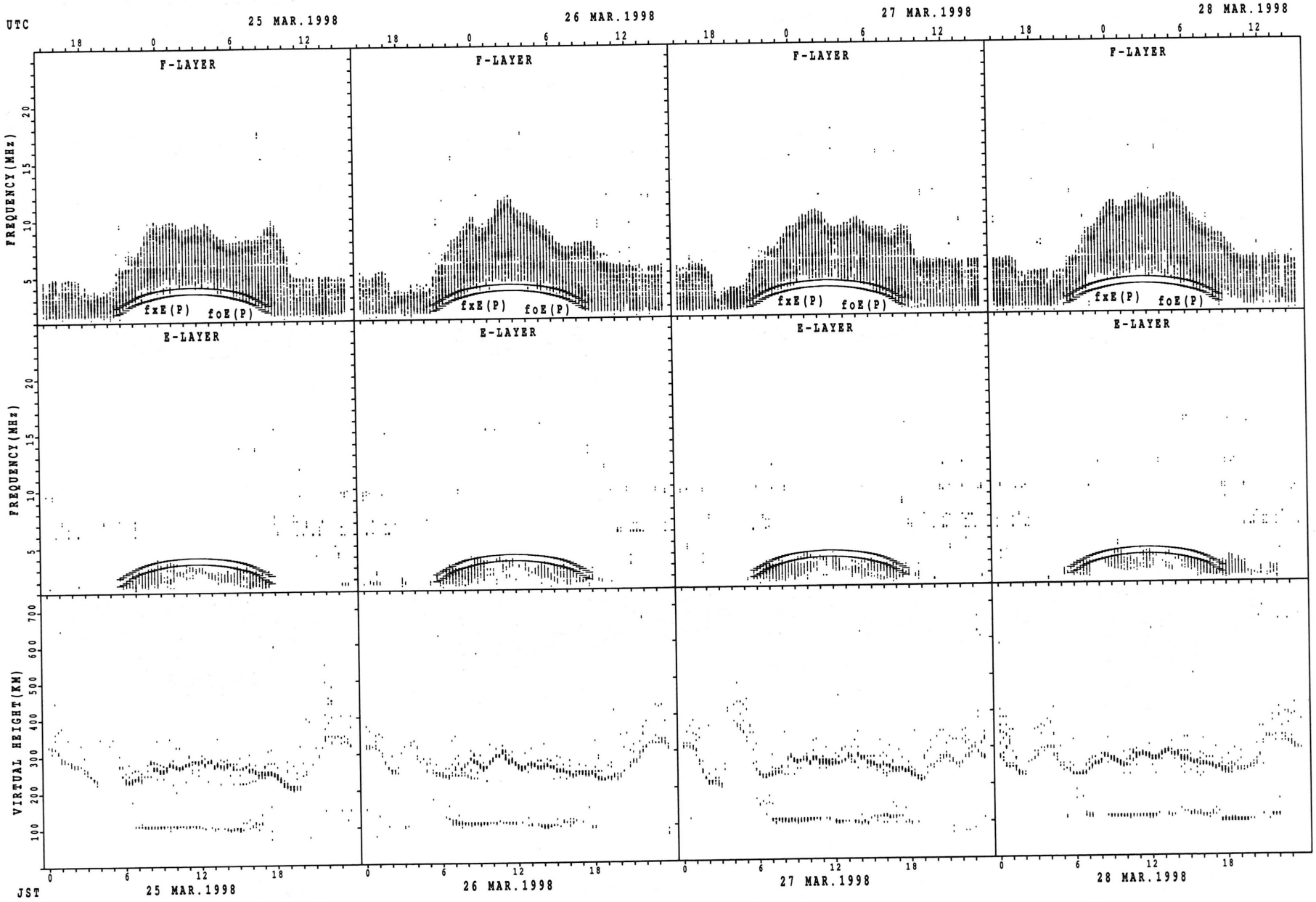
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



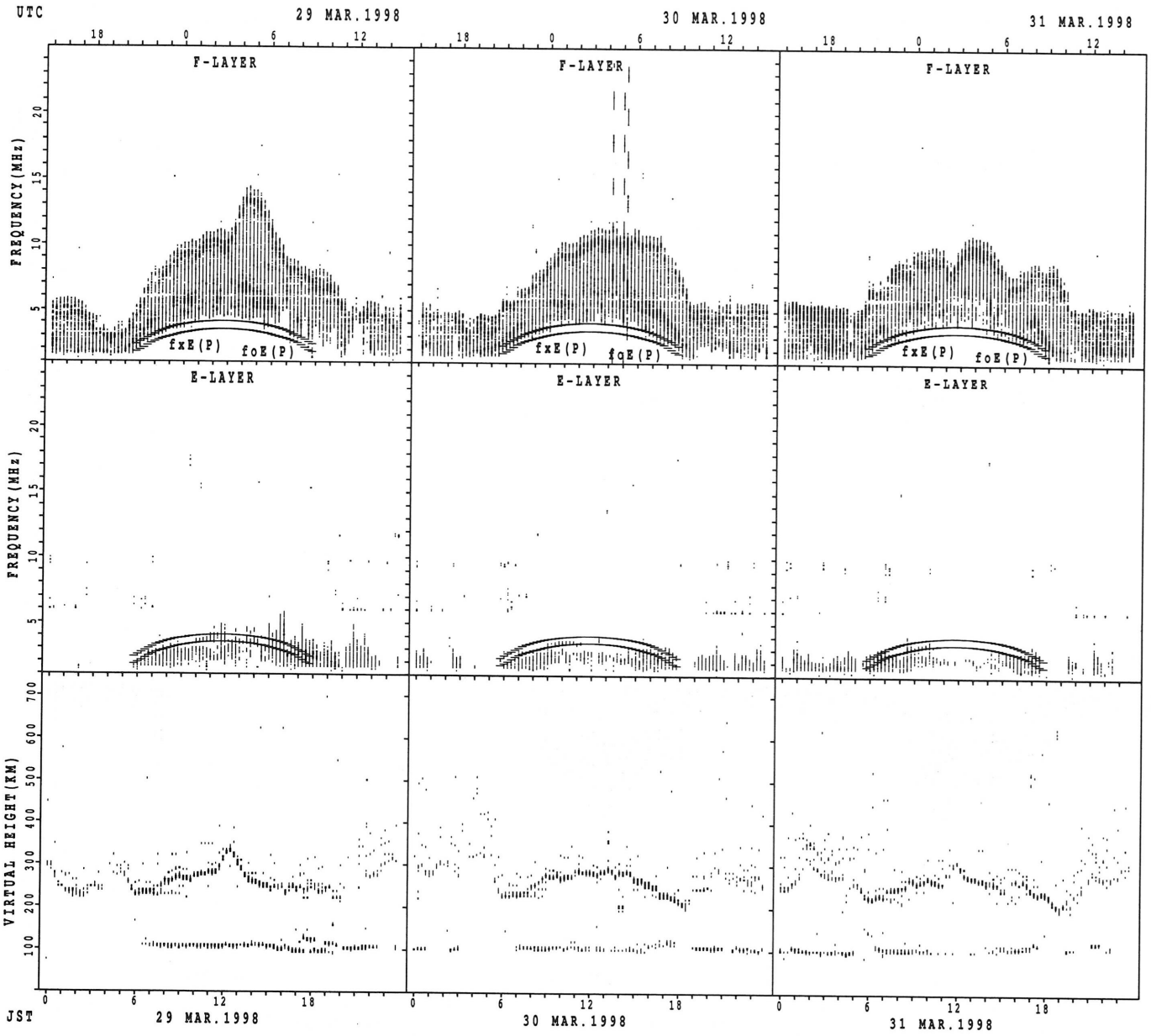
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



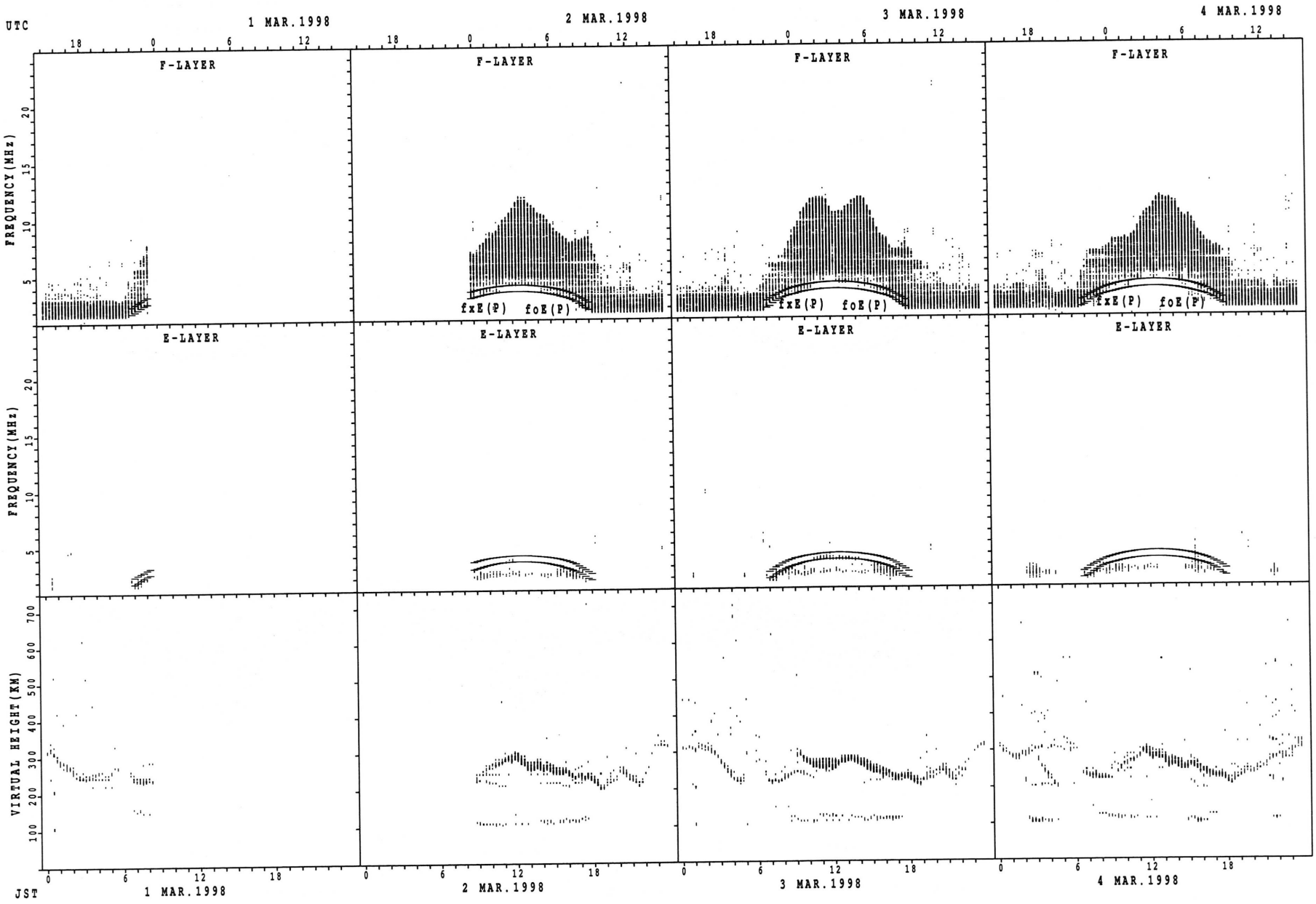
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT KOKUBUNJI TOKYO



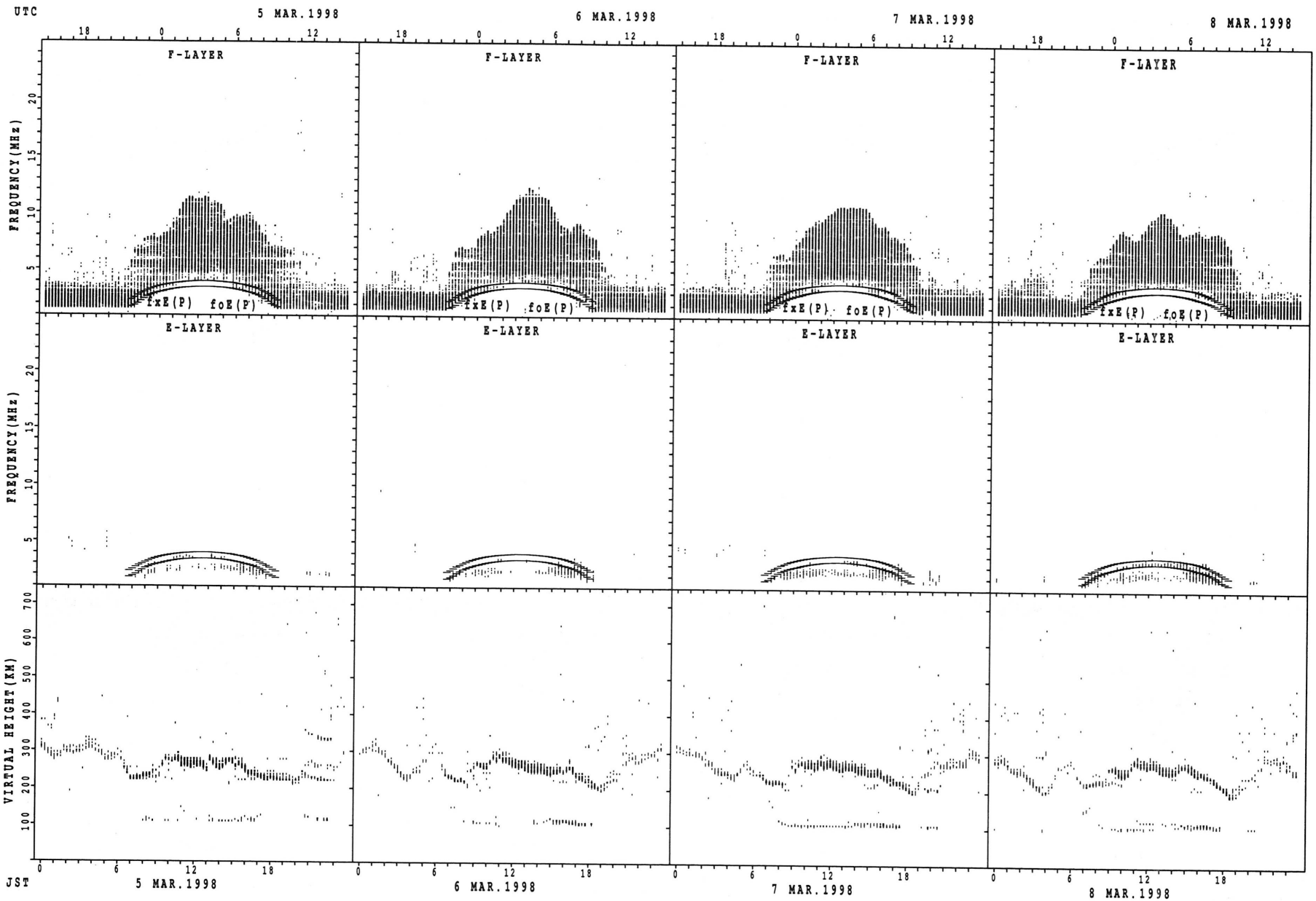
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



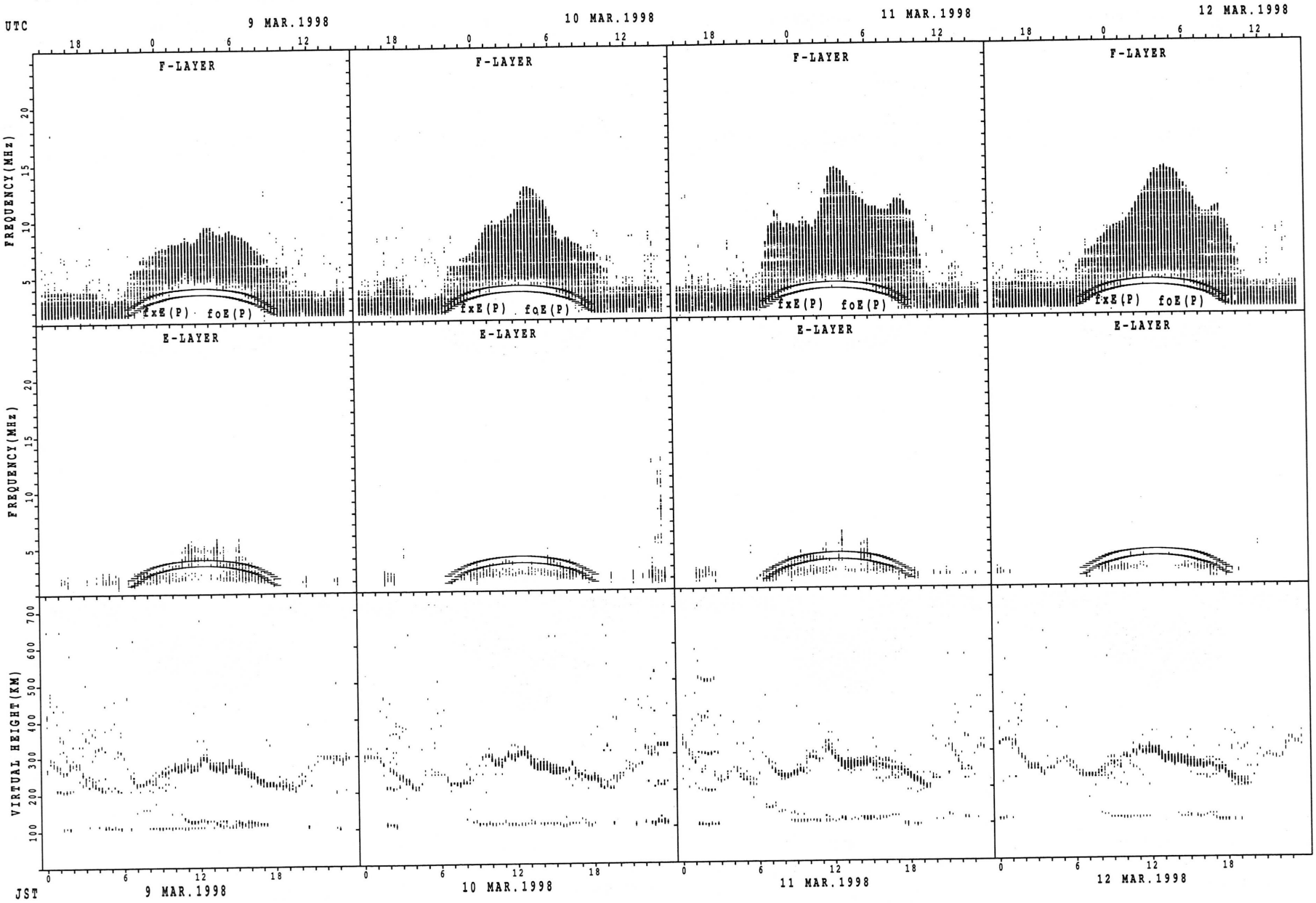
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



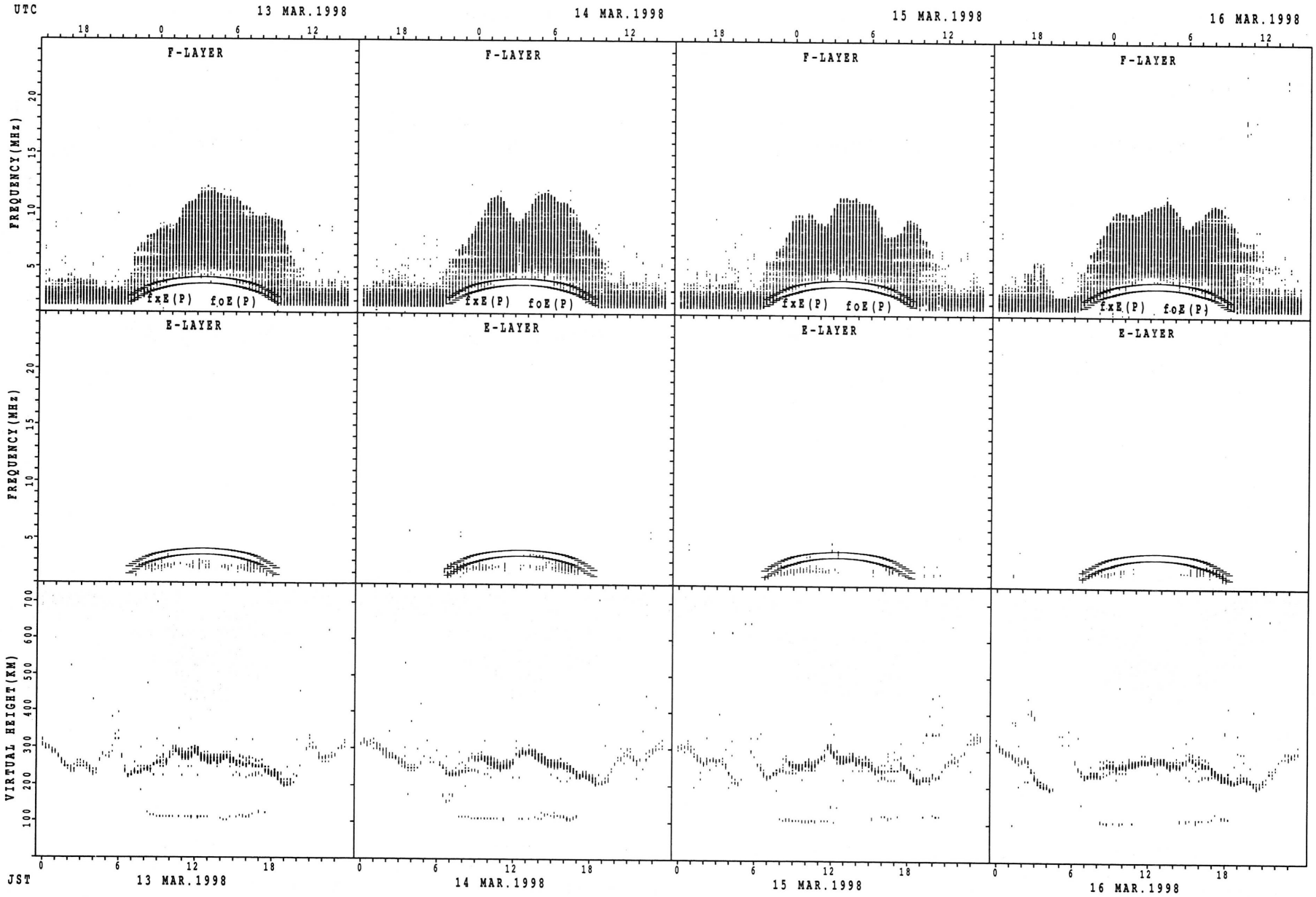
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



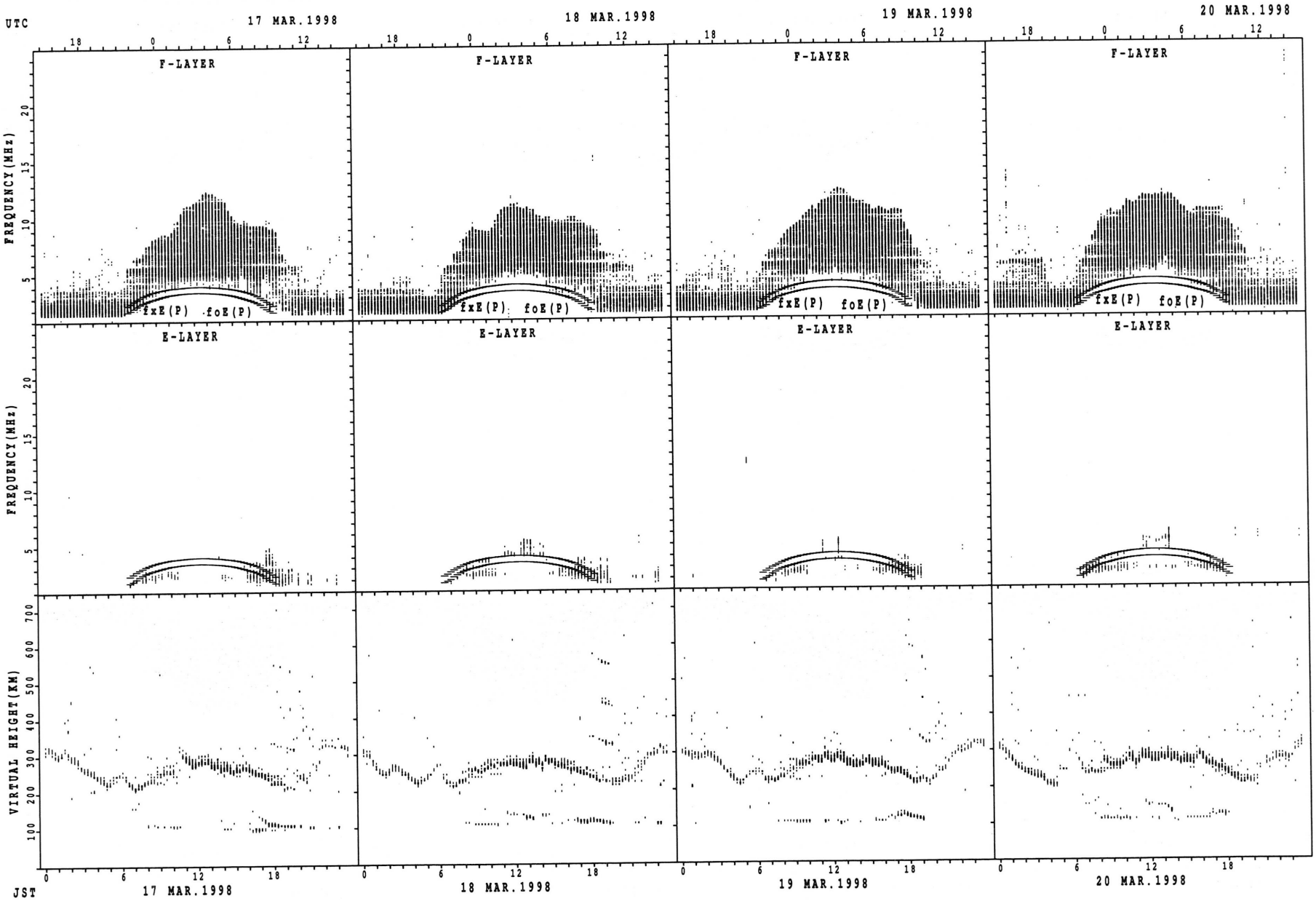
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



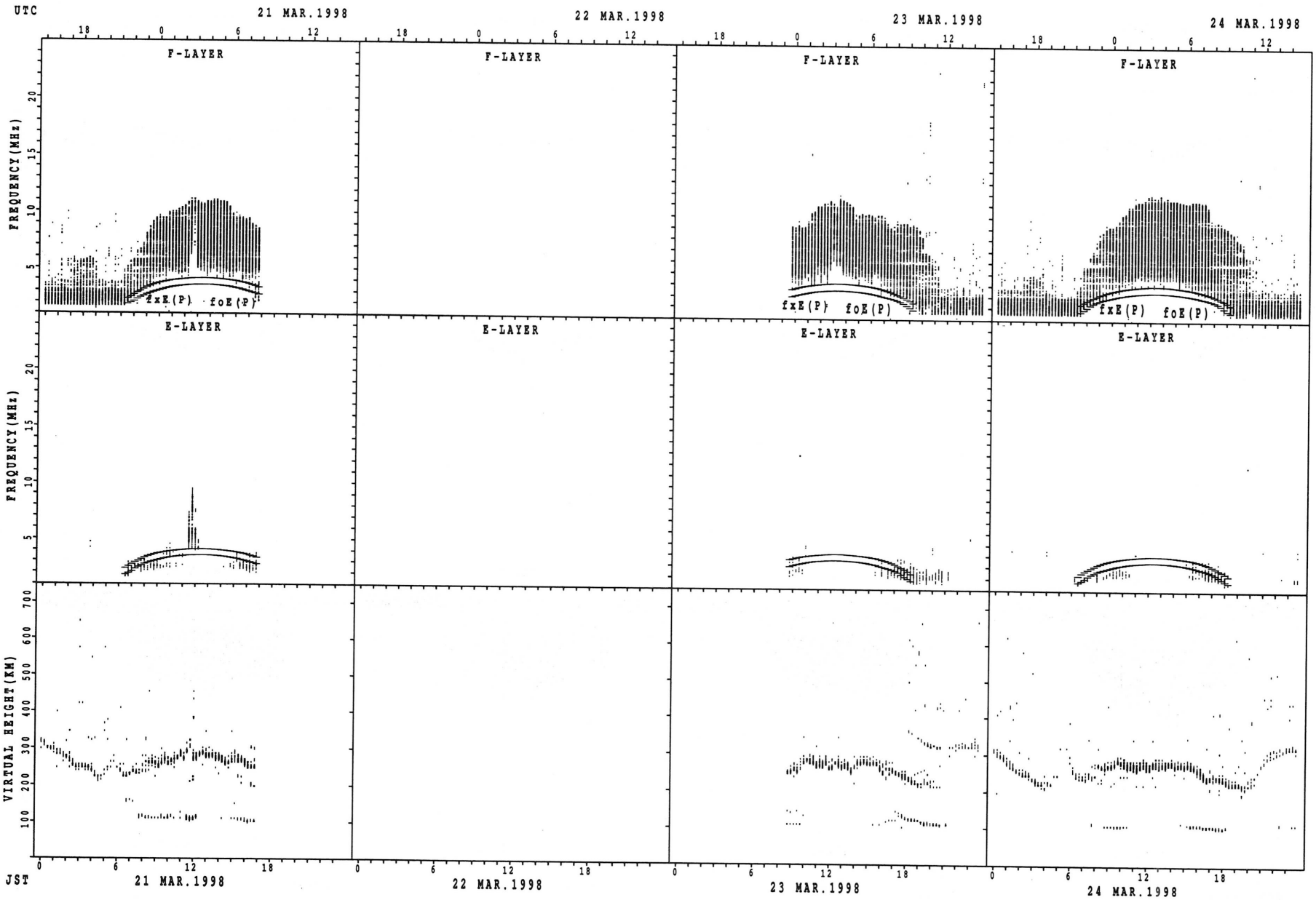
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



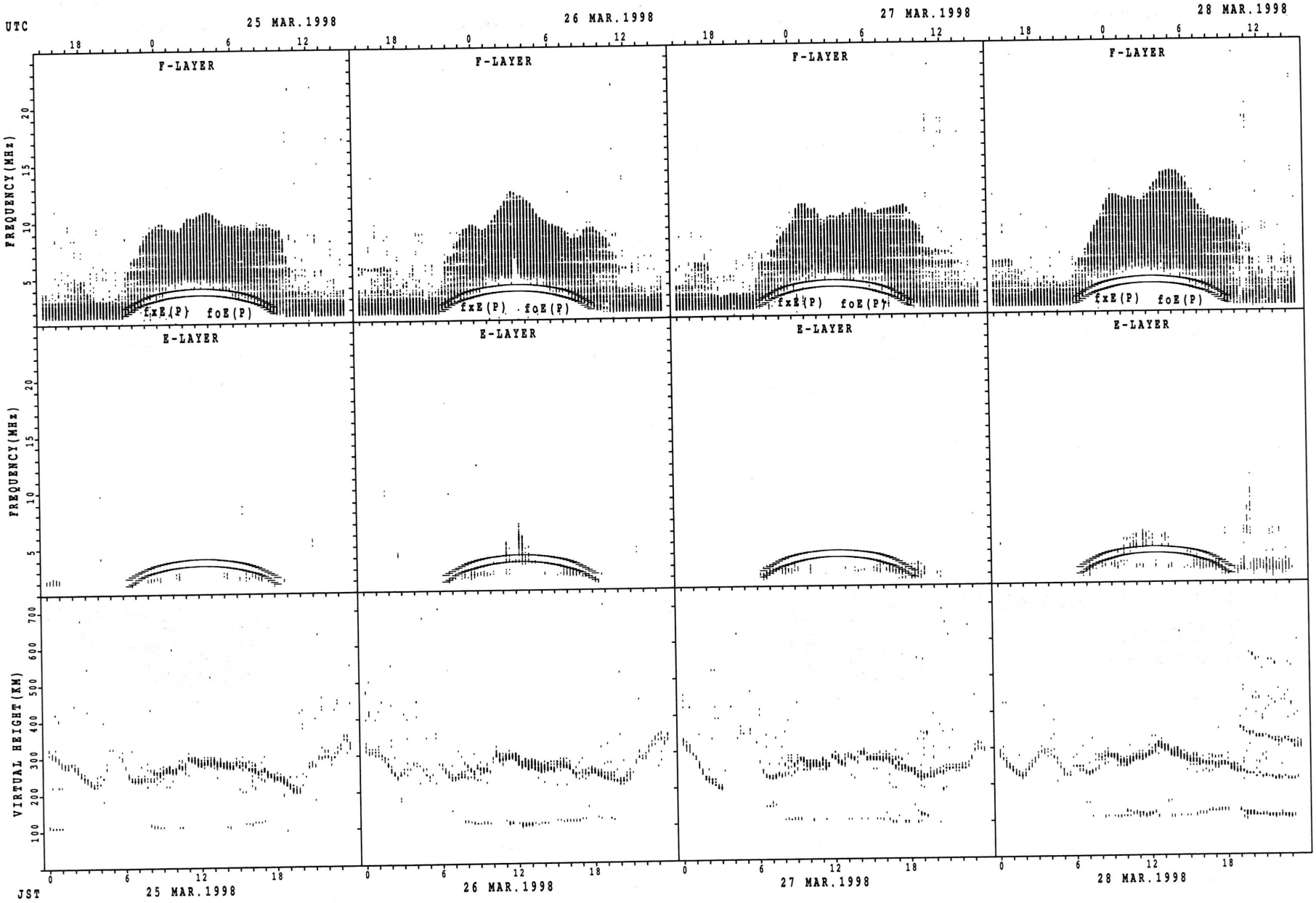
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



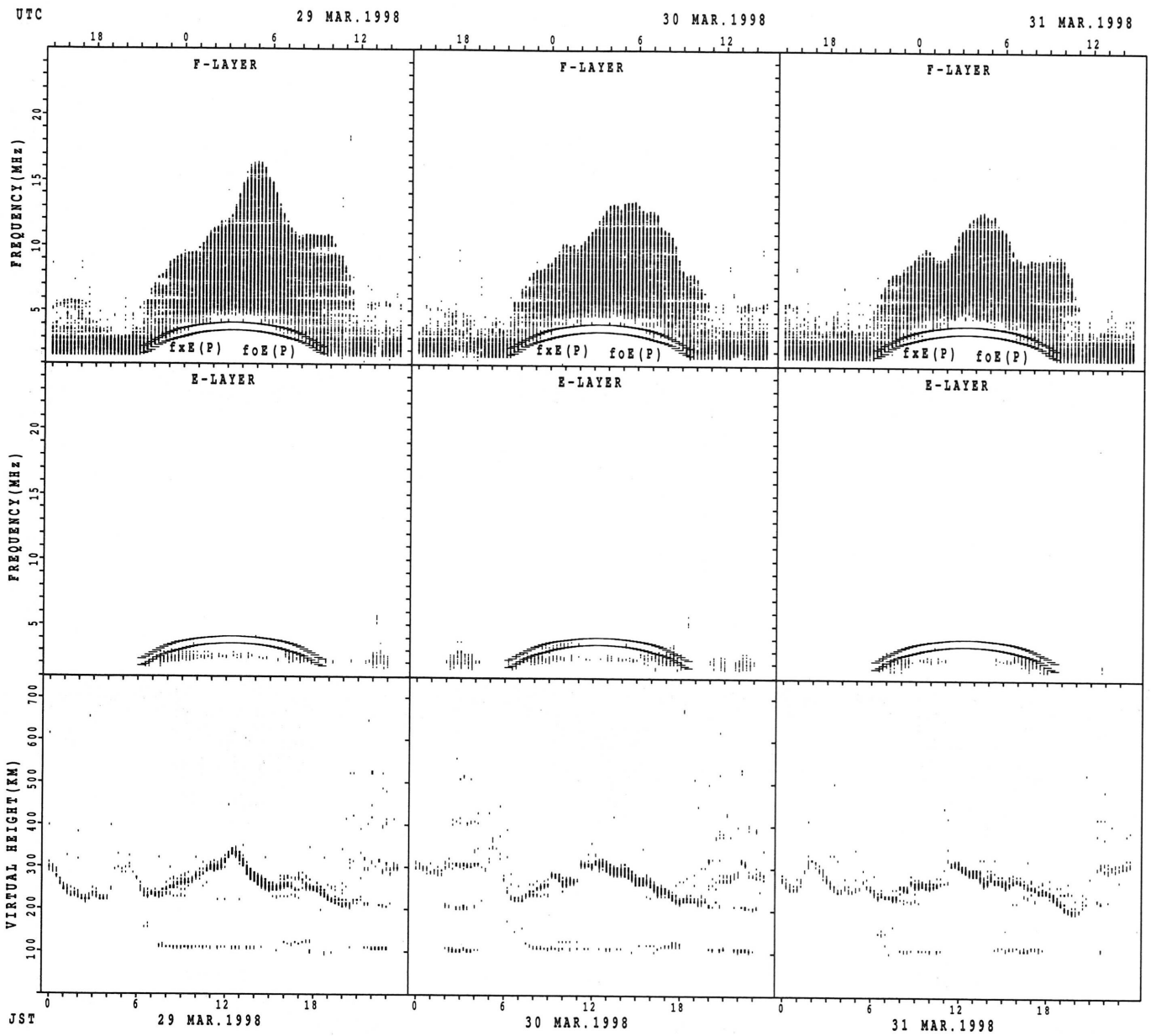
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



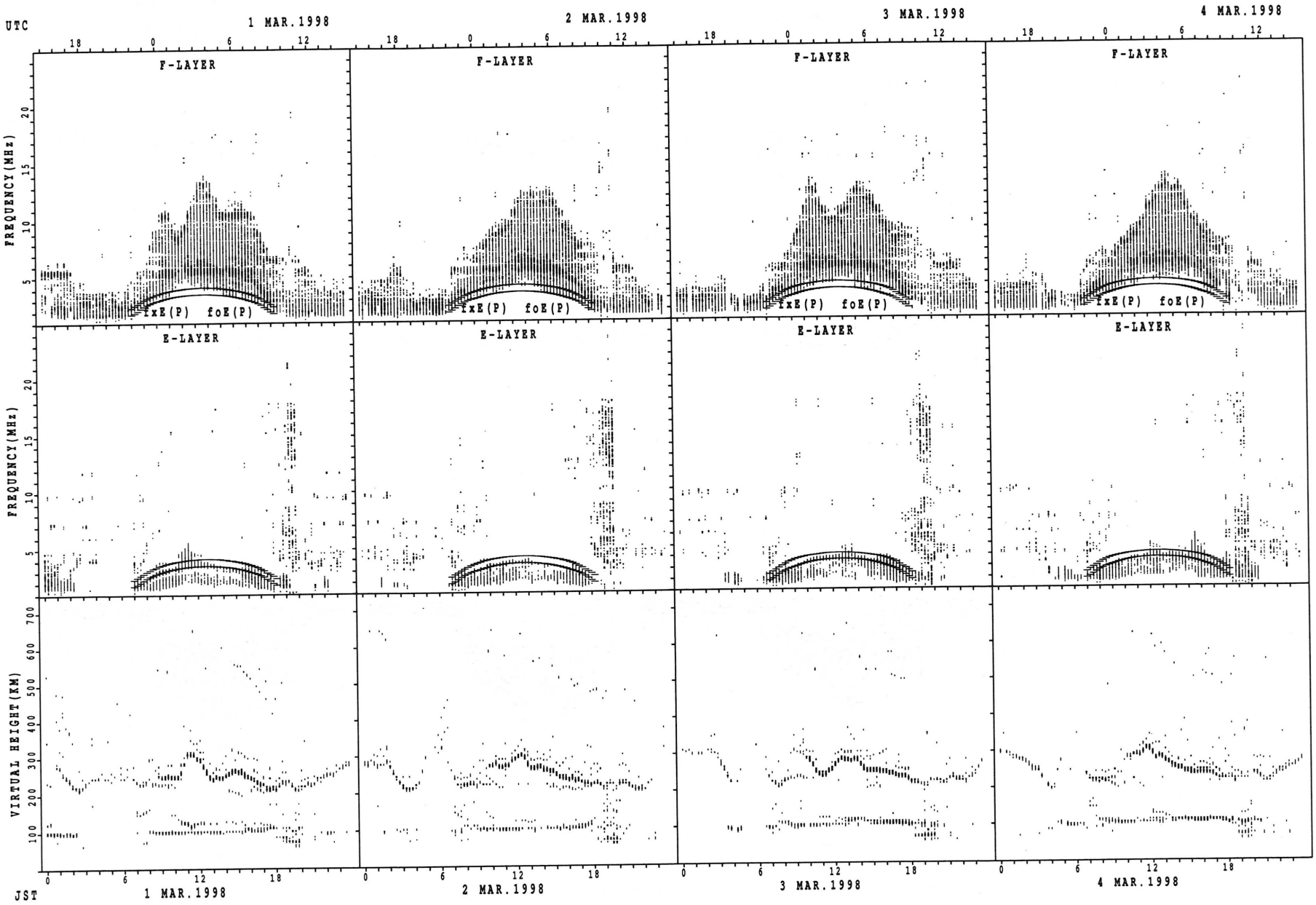
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT YAMAGAWA



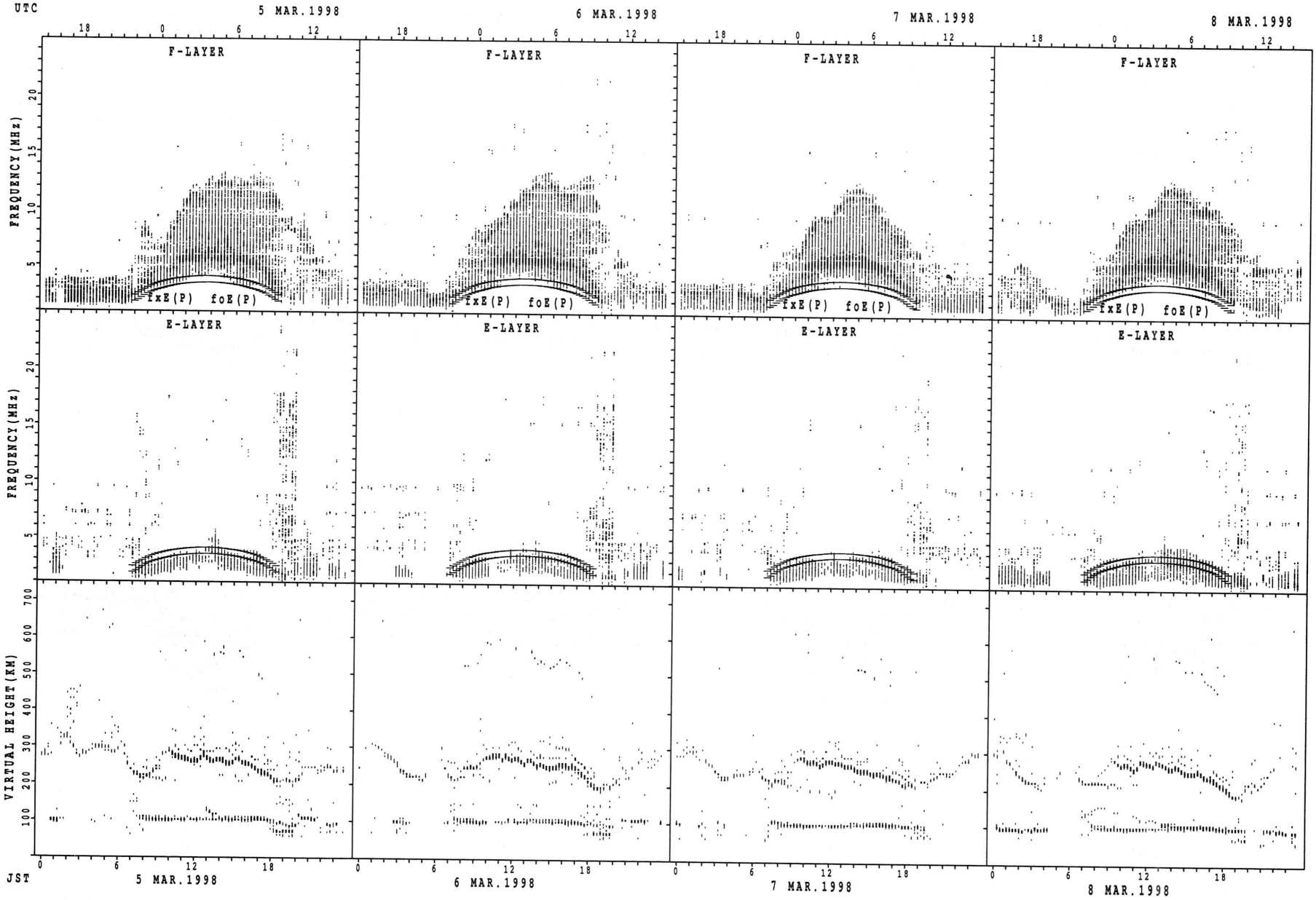
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



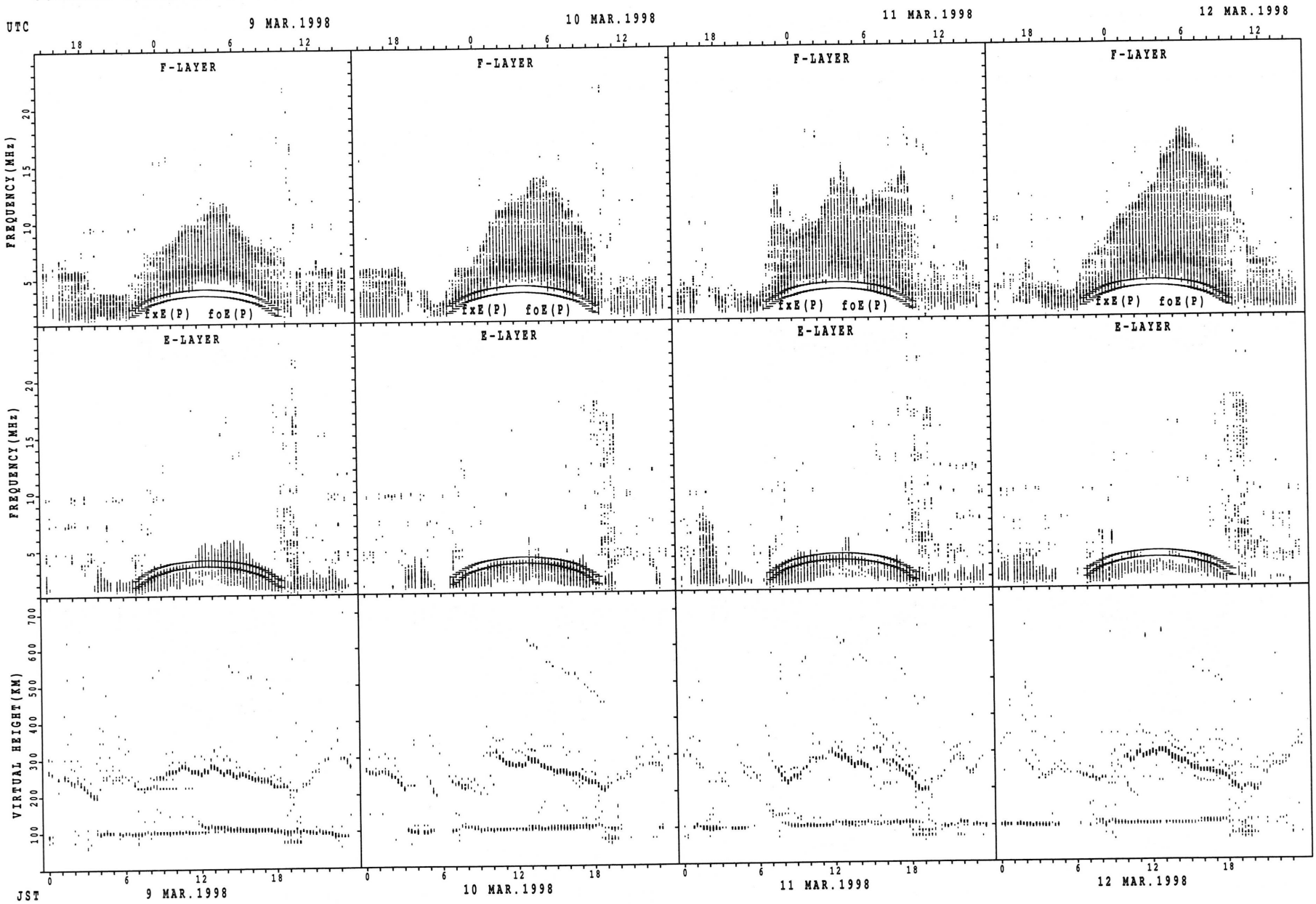
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA



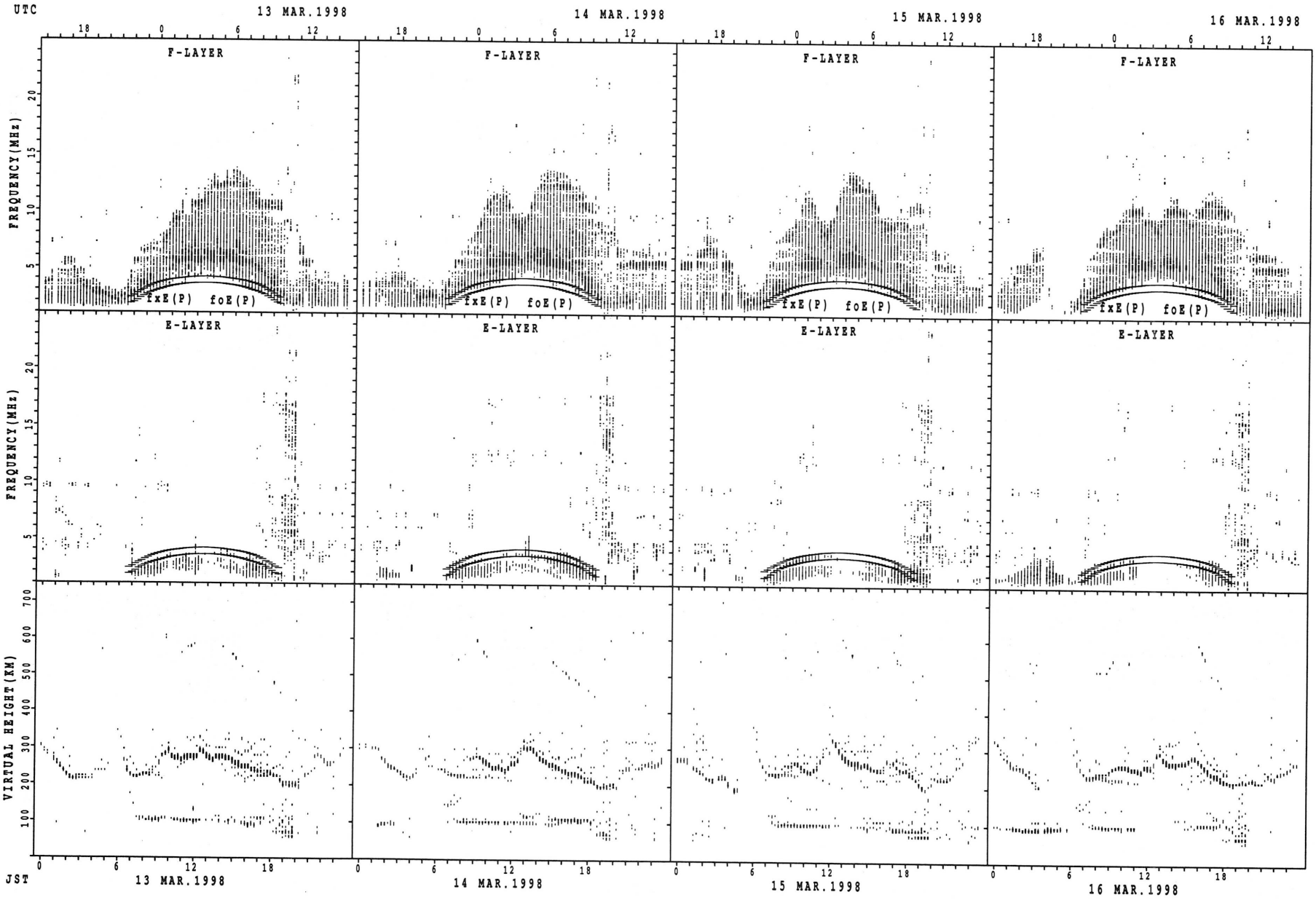
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT OKINAWA

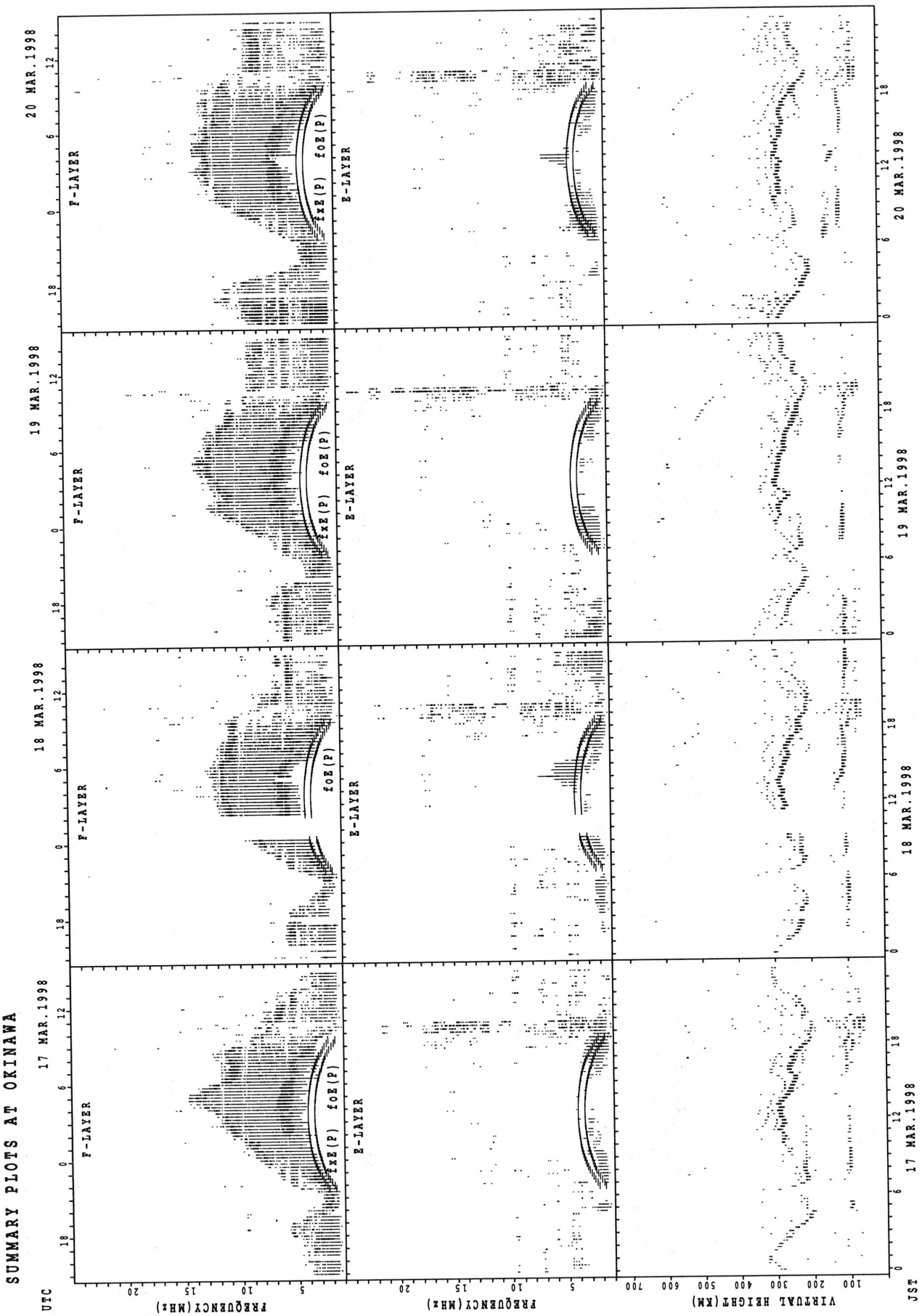


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

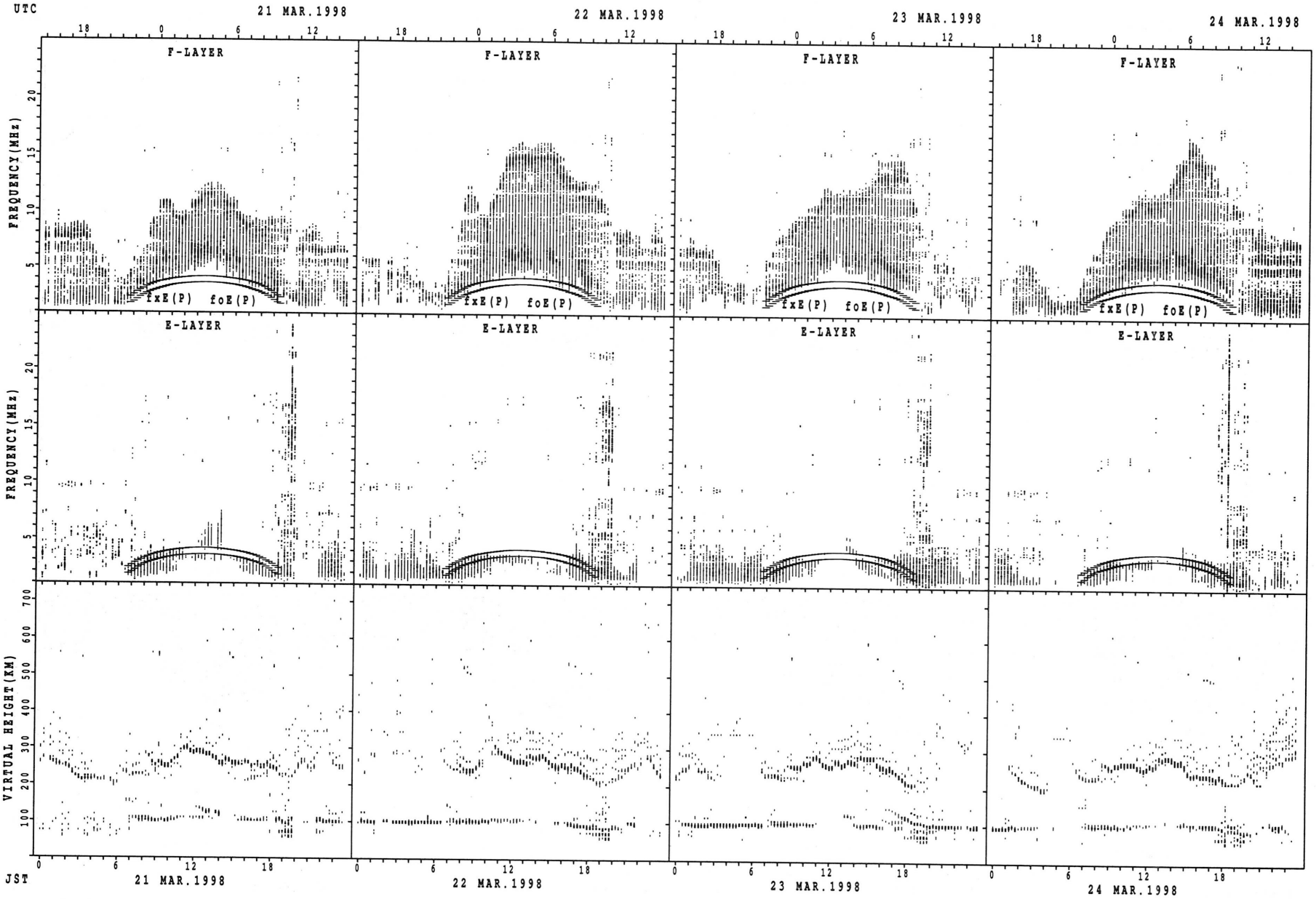
SUMMARY PLOTS AT OKINAWA



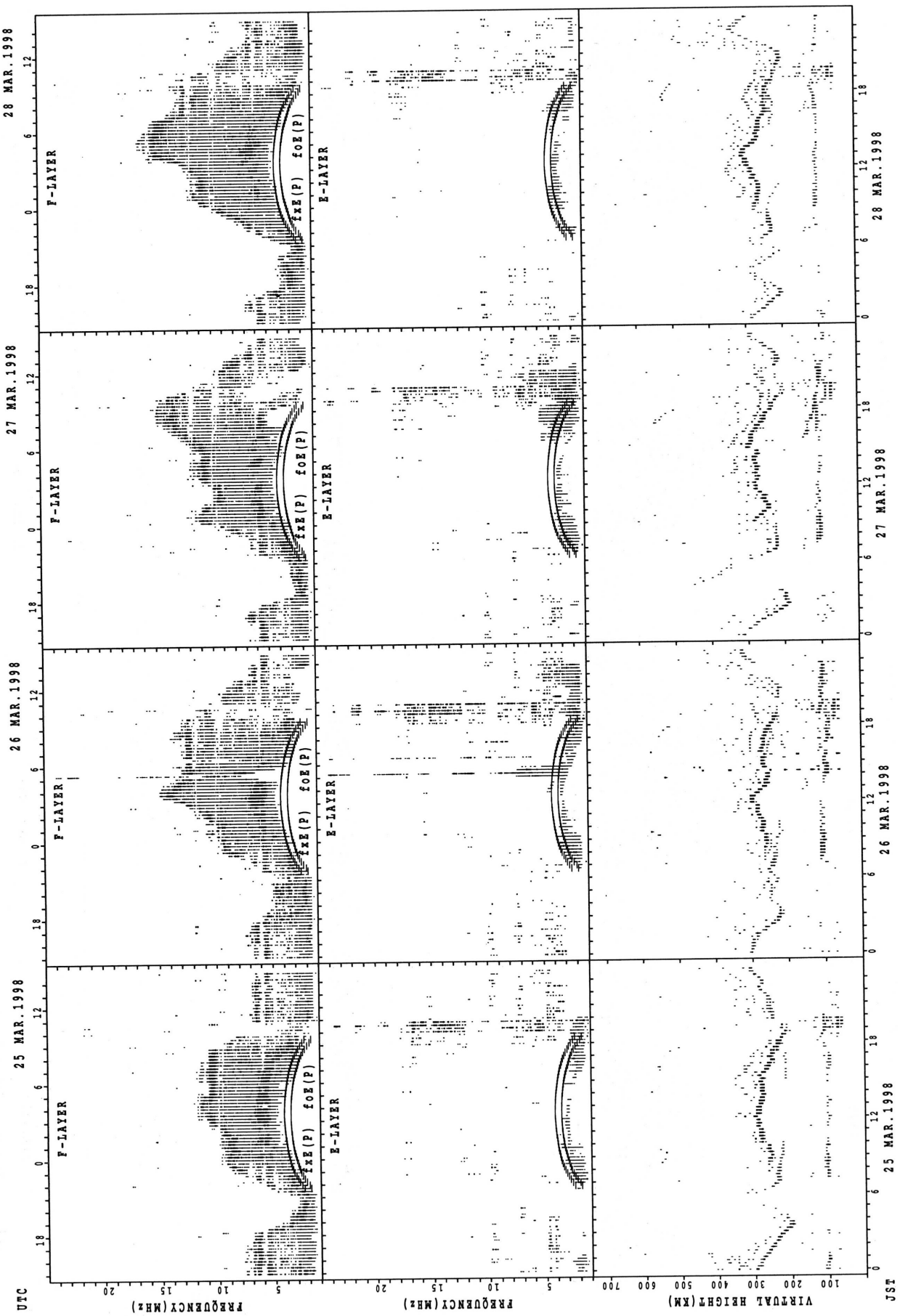
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT OKINAWA
UTC
JST
17 MAR.1998
18 MAR.1998
19 MAR.1998
20 MAR.1998
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

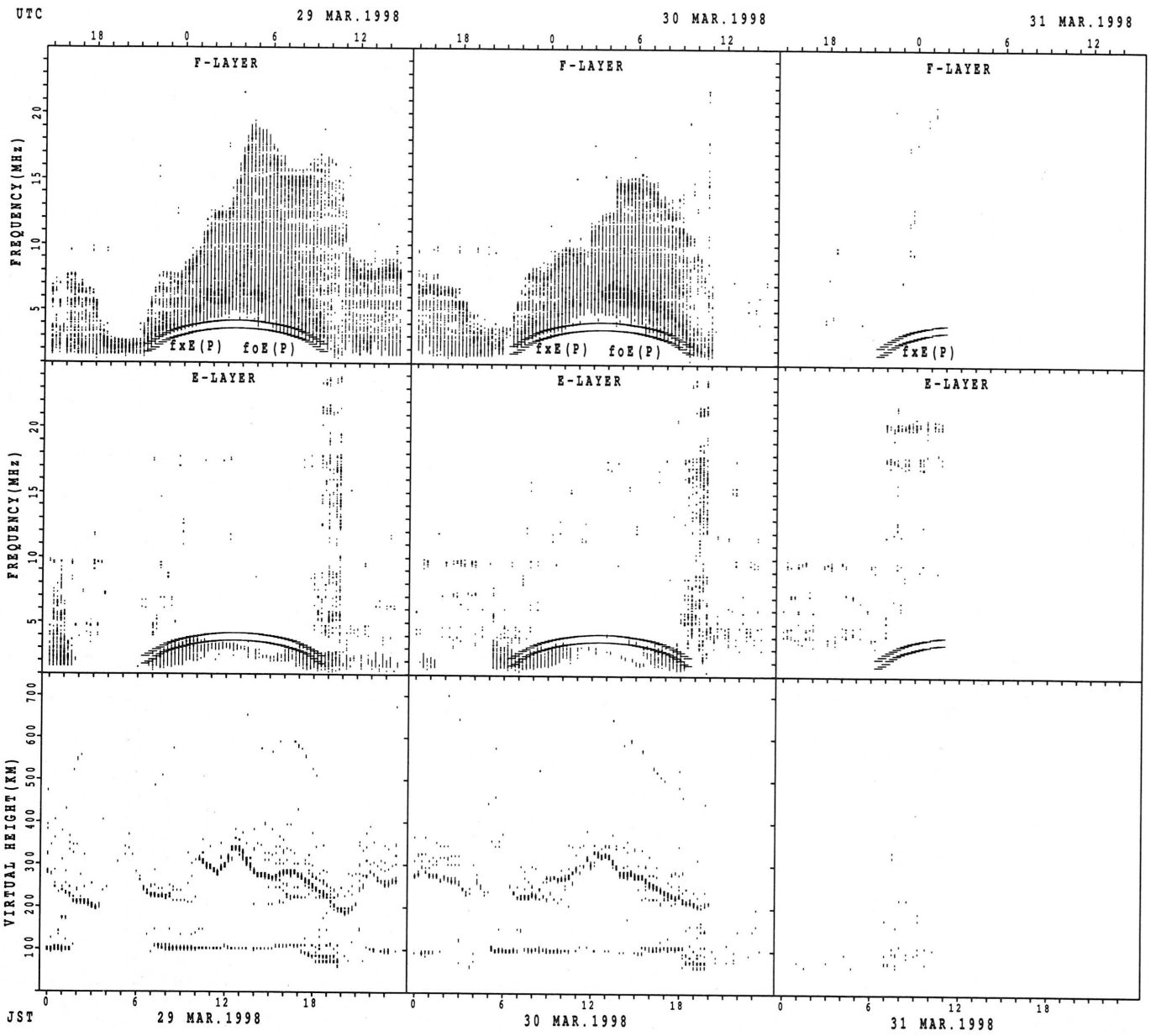
SUMMARY PLOTS AT OKINAWA



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


SUMMARY PLOTS AT OKINAWA
UTC
JST
25 MAR.1998
26 MAR.1998
27 MAR.1998
28 MAR.1998
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

MONTHLY MEDIANS OF h'F AND h'Es

MAR.1998 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

STATION WAKKANAI LAT. 45.4N LON. 141.7E

h'F

	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	20							30	29	25	12					
MED								244	256							256	254	248	257					
U Q								256	267							274	262	258	297					
L Q								238	247							250	248	244	246					

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								10										13	10					
MED								111										101	99					
U Q								125										116	101					
L Q								107										96	97					

STATION KOKUBUNJI LAT. 35.7N LON. 139.5E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								21	27	10						24	30	28	16					
MED								256	260	252						262	257	244	252					
U Q								274	268	274						274	264	261	274					
L Q								250	254	238						253	252	236	245					

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							10	10				10						18	17	12				
MED							164	111				115						115	101	111				
U Q							177	143				119						121	113	115				
L Q							151	109				111						99	96	99				

STATION YAMAGAWA LAT. 31.2N LON. 130.6E

h'F

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									22	28							29	27	25	14				
MED									264	263							260	254	246	261				
U Q									272	271							263	264	254	268				
L Q									250	262							248	248	237	244				

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																								
MED																								
U Q																								
L Q																								

MONTHLY MEDIANS OF h'F AND h'Es

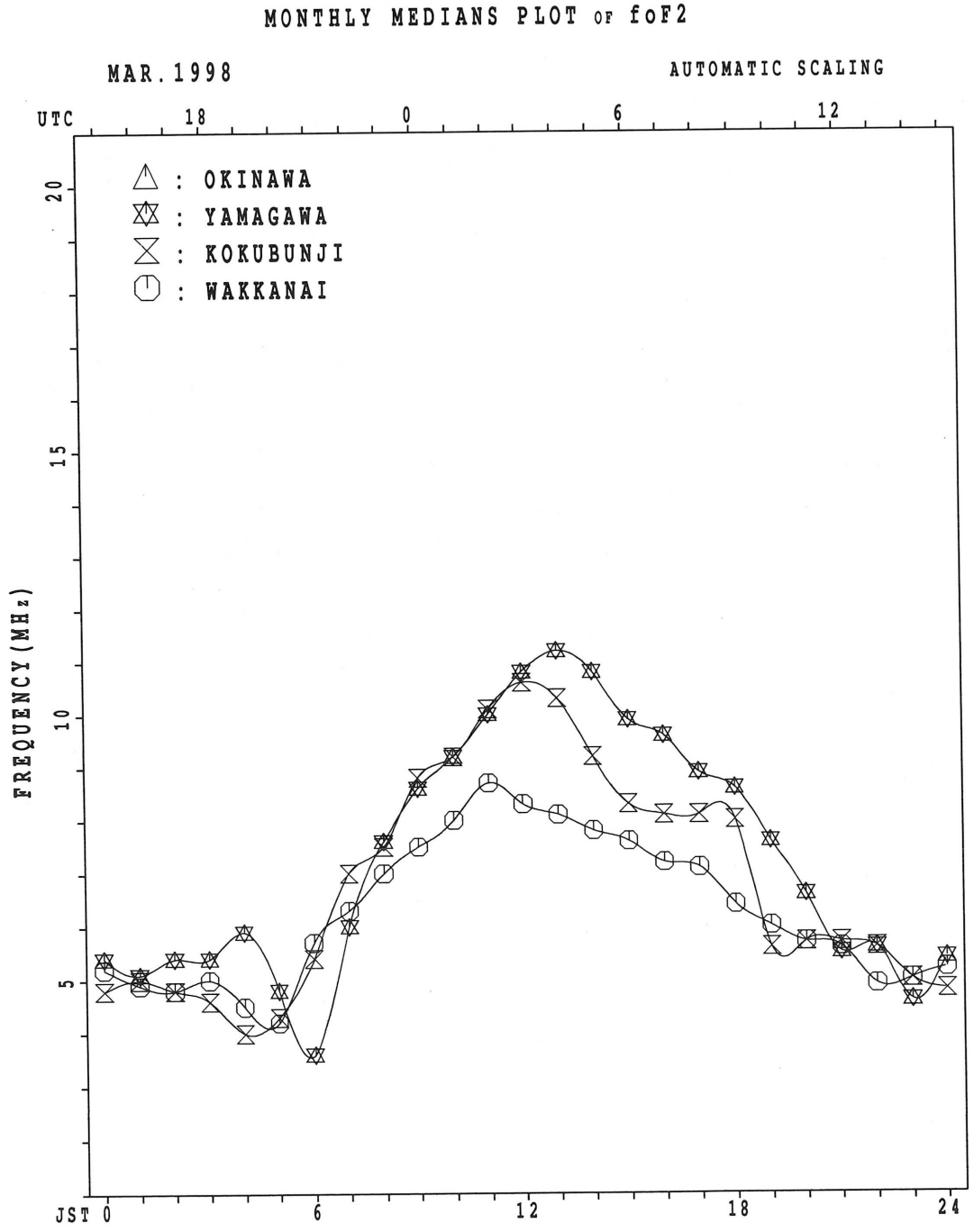
MAR.1998 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION OKINAWA LAT. 26.3N LON. 127.8E

	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						15	27							30	29	28	15	14			
MED			288						254	268							254	244	233	250	262			
U Q			302						264	278							268	255	247	286	290			
L Q			240						242	254							246	235	229	234	246			

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								15						10			12	20	19	14	11			
MED								137						117			110	109	107	94	91			
U Q								155						127			111	116	119	99	95			
L Q								107						113			107	106	103	87	87			


MONTHLY MEDIANS PLOT OF foF2
MAR. 1998
AUTOMATIC SCALING
UTC
18
0
6
12
: OKINAWA
: YAMAGAWA
: KOKUBUNJI
: WAKKANAI
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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 45	X 50	X 48	X 48	X 40	X 36													X 58	X 47	X 47	X 46	X 46	X 46
2	X 47	X 45	X 50	X 44	X 42	X 38													X 70	X 52	X 47	X 44	X 38	X 42
3	X 46	X 43	X 45	X 48	X 42	X 40													X 61	X 53	X 56	X 51	X 47	X 47
4	X 51	X 58	X 61	61	58	54													X 62	X 48	X 52	X 51	X 51	X 49
5	X 51	52	X 51	52	52	51													X 64	X 58	X 52	X 44	X 43	X 43
6	X 44	X 43	X 44	X 43	X 39	X 38													X 64	X 50	X 41	X 39	X 42	O X 42
7	X 40	X 42	X 41	X 40	X 40	X 39					C	C	C	C	C				X 60	X 44	X 38	X 40	X 40	X 41
8	X 42	45	X 48	X 48	X 35	X 28													X 64	X 49	X 42	X 40	44	44
9	44	X 44	45	45	43	X 35													X 58	X 50	X 46	X 49	X 49	X 47
10	X 46	X 49	X 50	X 50	X 46	X 39													X 67	X 60	X 61	X 57	X 56	X 51
11	X 52	X 56	X 50	58	X 57	X 60													X 86	X 58	X 49	X 55	X 48	51
12	X 50	X 54	56	57	53	54													X 74	X 55	X 43	X 47	X 46	X 48
13	X 49	X 51	X 47	X 49	X 46	X 46													X 77	X 54	X 45	X 48	X 50	X 48
14	X 49	X 47	X 49	X 53	X 47	X 47													X 68	X 49	X 46	X 49	X 45	X 45
15	47	50	X 48	X 47	45	39													X 82	X 66	X 58	X 58	X 52	X 55
16	X 57	X 55	X 55	X 57	X 39	X 37														X 70	X 65	X 57	X 50	X 49
17	X 48	X 50	X 50	X 51	X 50	X 45														X 54	X 48	X 48	X 48	X 49
18	X 49	X 52	X 50	X 48	X 43	X 40														X 60	X 55	X 57	X 55	X 53
19	X 49	X 51	X 49	X 50	X 50	X 46														X 55	X 50	X 50	X 49	X 51
20	X 50	X 55	X 54	X 51	X 46	X 38														X 67	X 54	X 56	X 54	X 53
21	X 54	X 56	X 55	X 53	X 48	X 44														X 75	X 72	X 68	X 73	X 66
22	X 69	X 60	X 59	X 58	X 52	X 34														X 66	X 64	X 56	X 56	X 51
23	X 56	X 53	X 52	X 46	X 44	X 43														X 71	X 49	X 51	X 44	51
24	X 53	X 53	X 54	X 51	X 44	X 37														X 67	X 55	X 50	X 50	X 49
25	X 48	X 50	X 49	X 47	X 40	X 42														X 78	X 53	X 51	52	X 51
26	X 52	X 50	X 52	X 43	X 46	X 44														X 70	X 60	X 59	X 59	X 57
27	X 58	X 59	X 58	X 35	X 38	38														X 68	X 64	X 66	X 64	X 62
28	62	X 63	X 51	X 48	X 49	X 48														X 69	X 62	X 59	X 60	60
29	X 57	X 61	X 57	X 47	X 42	X 43														X 79	X 60	X 58	X 60	X 56
30	X 56	X 56	X 53	X 50	48	47														X 62	X 59	X 60	X 61	X 61
31	X 62	63	59	58	60	X 54														X 78	X 57	58	X 56	56
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31													15	31	31	31	31	31
MED	X 50	X 52	X 50	X 49	X 46	X 42													X 64	X 60	X 53	X 51	X 50	X 51
U Q	X 56	X 56	X 55	53	50	47													X 74	X 69	X 60	X 58	X 56	X 55
L Q	X 47	X 49	X 48	X 47	X 42	X 38													X 61	X 52	X 47	X 48	X 46	X 47

MAR. 1998 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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	39	44	42	42	34	30	35	60	80	89	88	96	120	114	89	76	68	68	52	41	41	40	40	40
2	41	39	44	38	36	32	R 36	59	76	70	81	88	94	94	80	74	70	74	64	46	41	38	32	36
3	40	37	39	42	36	34	42	57	65	76	98	104	98	96	94	80	65	69	55	47	50	45	41	41
4	45	52	55	F 53	F 48	F 45	F 50	64	70	74	73	88	95	100	91	77	71	71	56	42	46	45	45	43
5	45	44	45	44	F 44	F 43	48	66	74	76	100	116	105	94	78	86	81	66	58	52	46	38	37	37
6	38	37	38	37	33	32	41	66	76	74	82	97	112	108	83	72	71	67	58	44	35	33	36	S 36
7	34	36	35	34	34	33	42	R 65	70	78	C	C	C	C	C	74	83	74	54	38	32	34	34	35
8	36	F 37	41	42	29	22	37	60	68	78	76	79	93	90	69	74	76	75	58	42	36	34	F 38	F 36
9	F 36	38	F 38	F 38	F 37	29	S 41	57	72	65	70	76	81	78	76	81	75	70	52	44	40	43	43	41
10	40	43	44	44	40	33	44	60	72	73	77	87	105	113	89	69	77	66	61	54	55	51	50	45
11	47	50	44	F 50	51	54	33	93	66	90	89	94	130	117	89	86	87	92	80	52	43	49	42	F 42
12	44	48	F 50	F 51	F 46	F 47	F 55	66	76	80	78	101	126	117	99	82	83	90	68	49	37	41	40	42
13	43	45	41	43	40	40	52	69	77	79	86	106	112	103	85	87	76	85	71	48	39	42	43	42
14	43	41	R 43	47	41	41	48	70	77	84	103	103	96	97	94	92	85	71	62	43	40	43	39	39
15	F 38	F 39	42	41	F 39	F 30	51	63	64	84	95	102	104	94	97	89	78	76	76	60	52	52	46	49
16	51	49	49	51	33	31	45	66	83	90	97	104	106	108	82	84	94	92	82	64	59	51	44	43
17	42	44	44	R 45	44	39	55	70	71	76	82	105	107	102	91	84	84	91	78	48	42	42	42	43
18	43	45	44	42	37	34	R 51	R 64	69	78	82	98	105	89	75	75	92	90	72	54	49	51	49	47
19	U R 43	45	43	44	44	40	57	66	72	86	96	96	114	111	91	80	89	90	79	49	44	44	U R 43	45
20	U R 44	49	48	45	40	32	46	68	R 76	79	94	R 93	102	98	96	82	86	91	80	61	48	50	48	47
21	48	50	49	47	42	38	58	70	75	81	98	107	92	90	92	89	88	84	74	69	66	62	67	60
22	63	54	53	52	46	28	46	77	108	116	112	116	118	114	115	90	79	73	68	60	58	50	50	R 45
23	50	47	46	40	38	37	54	R 74	77	90	87	98	111	104	88	R 77	75	80	82	65	43	45	U R 38	F 42
24	47	47	48	45	38	31	49	67	76	86	100	117	118	110	89	83	77	78	80	61	49	44	44	43
25	42	44	43	41	34	36	55	66	86	92	94	88	92	91	81	77	80	82	92	72	47	45	F 44	45
26	46	44	46	37	40	37	50	73	85	96	92	109	111	100	92	82	71	74	76	64	54	53	53	51
27	52	53	53	29	32	F 29	52	66	72	86	94	100	87	86	92	86	83	81	86	62	58	60	58	56
28	F 53	57	R 45	42	43	42	55	S 73	84	102	100	104	107	106	111	103	87	80	74	63	56	53	54	F 54
29	50	55	51	41	36	37	57	76	87	97	100	108	106	132	137	114	91	82	78	73	54	52	54	50
30	50	50	47	44	F 41	F 41	60	66	R 75	89	99	103	110	108	107	109	104	90	74	56	53	54	55	55
31	56	F 53	F 52	F 52	F 50	48	F 66	74	85	94	96	90	98	104	98	80	77	86	83	72	51	F 50	50	F 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	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	31	31	31	31
MED	44	45	44	43	40	36	50	66	76	84	94	100	106	102	91	82	80	80	74	54	47	45	44	43
U Q	50	50	49	47	44	41	55	70	80	90	98	105	112	110	96	87	87	90	80	63	54	51	50	48
L Q	40	41	42	41	36	31	42	64	71	76	82	93	96	94	83	77	75	71	58	46	41	42	40	41

MAR. 1998 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR.1998 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 U L 448	U L 484	L 484	H 500	472	L 452	U L 444	L							
2										L L	U L 488	L 496	U L 488	U L 476	U L 456	L 432	L 340							
3										L	U L 500	L 500	L 500	L 480	L 476	U L 448	L							
4										L L	L 456	U L 480	L 476	L 480	464	L								
5										L L	448	U L 484	L 480	U L 480	U L 488	L 440	L							
6										L L	L 464	480	L 476	L 476	L 460	L	U L 380							
7										L L 452	C	C	C	C	C	L 440	U L 412	L						
8										L L 448	L 460	L 468	488	460	L 460	U L 444	U L 416							
9										L U L 436	L 480	472	476	L 464	L 452	L 440	L	L						
10									U L 428	L 456	L 460	L 468	492	L 476	U L 460	U L 456	U L 384							
11								L		U L 444	L 532	U L 544	U L 488	U L 480	L 476	L	U L 424							
12										L L	L 492	L 508	L 496	L 484	L 464	U L 456	L							
13								296		L L	L 492	U L 500	L 500	L 488	U L 456	U L 464	L	L 240						
14										L L	L 508	L 488	U L 484	L 492	U L 532	L 452	L	U L 304						
15										L U L 504	U L 496	U L 484	U L 492	U L 504	L 476	L	L							
16										L L	U L 508	U L 504	U L 524	U L 492	L 444	U L 476	U L 464	L						
17										L	L	U L 524	U L 512	L 500	L 496	L 440	L	L						
18										L		L	456	U L 504	U L 476	U L 492	A							
19									U L 408	L	L	L 532	L 508	508	U L 464	U L 448	L							
20									U L 432	U L 520	L 500	A	L 524	L 496	L 464	L 452	U L 444	A						
21								L	U L 468		A	U L 524	L 500	L 496	U L 492	U L 492	A	L						
22								L	L	L 492	U L 516	U L 544	L 528	524	U A 460		L							
23									L	U L 512	L	480	B	L 504	U L 508	L								
24									L	U L 492	496	504	L 504	L 500	L 488	U L 508	L							
25									L 484	U L 472	L 480	U L 504	508	L 500	L 476	U L 464	L	L						
26								L	L	L 484	U L 504	L 500	L 492	U L 512	U L 488	U L 448	L							
27									L	L 484	472	U L 504	488	L 516	L 488	L	L	L						
28								L	L	L 492	L 492	U L 536	L 504	U L 528	U L 520	U L 460	L 368	L						
29									U L 464	L 496	U L 492	L 500	L 512	L 540	L 496	L	A							
30								288		L U L 516	480	U L 528	508	U L 508	L 496	U L 480	U L 448	U L 348						
31									U L 456	L 476	L 480	L 488	U L 540	U L 504	L 476	U L 440	U L 432	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	7	18	25	28	29	30	30	23	11	3						
MED								292	U L 456	L 484	L 492	L 500	L 500	L 496	L 476	U L 452	U L 416	U L 304						
U Q									L 468	U L 496	U L 500	U L 516	L 508	L 504	U L 488	U L 464	U L 444	U L 348						
L Q									U L 428	U L 452	L 476	L 484	488	L 480	L 460	L 440	L 380	L 240						

MAR.1998 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B 200		272	316	U A 320	344	348	332	320	292	240	184						
2							B	A 248		A	320	U R 332	U R 348	336	324	300	256	B						
3							B 212		260	304	324	A	348	332	316	300	260	A						
4							B	A	276	304	U R 332	A	A	340	332	304	260	A						
5							B 212		256	300	R 324	U A 340	A	U R 336	316	300	276	192						
6							B 220		A	296	U A 308	352	348	336	316	A	A	168						
7							B 200		268	R 304	C	C	C	C	C	304	U A 264	A						
8							B 240		B 276	R 316	332	344	344	328	320	308	A	A						
9							B	A	268	U R 308	320	336	A	328	316	A	268	A						
10							B	H 224	272	312	R 336	R	R 352	U R 336	336	300	268	208						
11							164	228	272	308	A 312	A 336	A	R	324	300	A 272	188						
12							B	220	276	308	R 336	344	A	R 332	A	A	272	A						
13							B	216	284	320	R 340	352	U R 352	U R 332	320	304	260	192						
14							B	240	284	312	R 332	R	A	A	332	A	264	196						
15							B	228	284	R 328	R	356	368	352	324	304	276	208						
16							B	220	U R 284	R	340	A	A	A	328	A	A	A	B					
17							B	236	284	R 324	348	A 352	A	R 344	332	308	284	U A 216	B					
18							B	224	284	R 328	R 348	360	U B 364	R 352	A 340	316	U A 292	U A 216	B					
19							B	248	292	A	A	A	R	R 352	R	U R 328	A	A	B					
20							168	244	304	R 332	U R 360	376	B	U R 364	U R 344	332	292	228	B					
21							188	252	A	340	A 352	A	392	A	A	A	A	A	B					
22							176	248	A 292	332	A 360	A	R	R	A 360	R 344	284	228	B					
23							164	240	296	R	U R 352	R	B	B	R 348	R 332	300	H 244	B					
24							156	252	292	R 316	R 340	B	U R 364	U R 356	B	328	296	224	B					
25							168	260	296	A 324	A	A	R	R	R	320	276	216	B					
26							156	264	304	A 324	U A 344	352	R	R	A	316	284	212	B					
27							A	248	A	320	A	A	A	R	340	324	288	224	B					
28							192	260	B	R	368	A	A	R	R 344	328	292	236	B					
29							192	248	296	344	U A 352	A	A	A	A	A	A	A 244	B					
30							192	H 256	292	328	348	A 356	R	R	U R 344	R 316	284	220	B					
31							192	252	296	A 328	U A 340	R	B	R	348	U R 328	288	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								12	28	27	26	26	15	11	17	23	24	25	21					
MED								172	240	284	318	340	352	352	R 336	332	312	276	216					
U Q								192	250	292	328	348	356	364	R 352	R 344	R 328	288	228					
L Q								164	220	272	308	324	340	348	332	320	302	264	194					

MAR. 1998 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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 15	E B 15	E B 15	E B 14	E B 16	E B 15	J A 14	23	G 22	35	34	G 28	G 30	G	G 21	G 24	G 24	G	E B 14	18	E B 14	E B 15	E B 15	E B 14
2	18	E B 15	E B 14	E B 14	E B 14	E B 14	E B 15	24	28	J A 34	36	G 26	G	39	39	G 20	G 24	J A 23	J A 23	E B 15	E B 14	E B 13	E B 14	E B 14
3	E B 14	E B 14	E B 15	E B 14	E B 13	E B 15	E B 15	24	G 21	32	38	37	G 25	G 22	34	G	G 24	J A 22	J A 22	J A 25	J A 26	28	23	E B 15
4	J A 24	J A 27	J A 22	20	E B 15	E B 15	22	25	G 24	34	36	40	J A 40	G 27	37	33	J A 39	22	20	E B 15	E B 15	21	E B 14	E B 15
5	E B 16	18	E B 15	E B 14	E B 14	18	J A 15	G	31	32	G	39	36	36	34	G 29	G	23	J A 22	18	E B 14	E B 15	E B 15	E B 15
6	E B 15	E B 15	E B 14	E B 14	E B 15	E B 14	20	G 20	32	33	33	G 34	G	G 31	G 29	34	J A 31	19	J A 22	J A 22	24	23	24	24
7	22	24	E B 14	E B 16	E B 15	E B 14	E B 14	G	G 22	G 26	C	C	C	C	C	G 28	30	J A 22	22	E B 14	E B 14	24	23	18
8	J A 25	E B 15	E B 15	E B 14	18	E B 14	18	26	31	G 30	35	37	38	37	38	33	J A 33	J A 23	J A 28	J A 27	E B 15	18	25	E B 13
9	J A 28	J A 61	J A 30	J A 34	J A 42	J A 26	J A 33	J A 26	J A 29	34	J A 44	J A 42	38	37	G 24	39	34	J A 29	J A 18	E B 14	22	28	J A 24	E B 15
10	18	21	J A 22	E B 16	E B 16	E B 13	E B 13	G	30	33	G 31	G 33	G 30	G 28	37	37	32	J A 29	J A 28	J A 21	J A 23	28	20	E B 15
11	E B 14	20	E B 15	E B 16	E B 16	E B 15	G	27	31	J A 39	38	J A 46	39	G 30	G 28	G 28	J A 32	G	J A 19	20	E B 15	E B J A 23	18	E B 15
12	E B E B 16	14	18	20	19	E B 14	E B 15	G	G	G	G	36	36	G J A 31	46	31	G J A 23	52	J A 56	36	30	25	24	E B 15
13	22	22	19	E B 15	E B 13	E B 14	20	G	32	35	G 28	G 28	G 28	G 27	G 30	G 21	G 19	G	J A 21	20	E B 14	E B 14	E B 16	E B 16
14	E B 16	E B 16	E B 14	E B 15	20	18	20	G 22	32	34	G	G	37	36	G 28	39	G 26	22	E B 15	E B 15	E B 15	E B 15	E B 16	E B 14
15	E B 16	E B 14	E B 15	E B 14	E B 14	E B 17	E B 17	27	G 26	G 28	G	39	41	39	G	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
16	J A 38	18	24	17	E B 15	E B 15	J A 19	G	G 26	G 29	G J A 30	46	39	J A 40	G 28	34	32	J A 26	J A E B 29	14	E B 14	E B 14	E B 15	E B 14
17	18	27	E B 14	E B 15	E B 15	E B 14	E B 17	28	G 25	36	40	40	50	39	G 22	G	30	26	E B 14	E B 14	E B 14	E B 15	E B 16	E B 14
18	E B 15	E B 14	E B 15	E B 15	E B 14	E B 15	E B 16	G 21	33	38	42	42	39	40	40	39	55	J A 37	50	J A 23	E B 15	J A 30	24	E B 14
19	E B 14	E B 14	E B 16	E B 15	E B 16	E B 16	E B 18	G 22	G J A 24	41	J A 45	39	G 26	39	G 34	G	47	30	26	E B 15	J A E B 25	16	E B 16	E B 14
20	E B 15	J A 28	24	E B 16	E B 16	E B 15	G	29	33	38	G 29	49	42	40	40	G	33	J A 70	J A 60	J A 28	J A 25	29	E B 16	19
21	17	E B 14	19	18	E B 16	E B 14	G J A 30		31	38	J A 60	44	G 38	J A 41	J A 48	J A 51	49	J A 41	36	J A 31	27	20	20	E B 15
22	18	24	19	E B 16	18	J A 16	G	26	33	36	41	J A 45	G 34	G 30	47	39	G 24	27	E B 15	E B 14	E B 15	E B 16	E B 14	E B 16
23	E B 14	E B 16	E B 15	E B 15	E B 14	E B 14	22	27	32	G 31	38	G 32	E B E B 77	39	G 30	38	33	J A J A 36	J A 26	J A E B 18	14	E B 15	E B 15	E B 14
24	E B 14	E B 15	E B 14	E B 14	E B 13	E B 14	G	G 23	G	G	G	E B 43	40	G E B 42	G 29	G 23	G	J A 24	J A 20	19	E B 15	E B 16	E B 16
25	E B 15	E B 15	E B 16	E B 15	E B 14	E B 15	20	G 23	32	37	38	36	G 32	G 28	G 26	G 30	G 20	24	E B 14	14	E B 15	E B 15	E B 15	E B 15
26	18	19	E B 14	21	E B 14	E B 16	20	G 26	G 25	40	38	36	G 34	G 30	34	G 22	G 20	G	22	18	E B 15	E B 15	E B 14	E B 14
27	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14	22	30	34	36	40	J A 38	41	G 26	G 26	35	G 19	23	23	20	E B 15	E B 15	E B 16	E B 15
28	E B 16	E B 16	E B 14	E B 14	E B 13	E B 14	G	G E B 40	G 33	G	38	40	G 36	G	35	G	G	J A 23	J A 26	19	23	26	E B 15
29	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	G	28	33	G	38	43	J A 44	38	41	J A 45	J A 54	36	J A 31	J A 28	E B 14	J A 32	24	E B 15
30	29	21	E B 14	J A 22	18	E B 15	G	G	32	36	38	37	G 35	G 27	G 25	G 24	32	27	J A 18	22	J A 21	24	22	22
31	J A 22	J A 25	23	21	24	J A 22	25	29	32	37	39	G 28	E B 42	G 26	G	G	31	28	E B 16	E B 16	J A 20	E B 14	E B 15	J A 20
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	31	31	31	31
MED	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	16	G	31	34	37	38	G	G	G	G	30	23	J A 22	18	E B 15	E B 16	E B 16	E B 15
U Q	J A 22	22	19	17	16	16	20	27	32	37	39	42	40	39	39	37	33	J A 29	J A 28	J A 23	22	24	23	16
L Q	E B 15	E B 14	E B 14	E B 14	E B 14	E B 14	G	G 24	G 26	G 33	G	G	G 34	G 28	G 28	G 29	G 24	G 19	E B 18	E B 15	E B 14	E B 15	E B 15	E B 14

MAR. 1998 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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 15	E B 15	E B 15	E B 14	E B 16	E B 15	E B 13	22	G 20	32	U Y 34	G 24	G 28	G	G 20	G 20	G 22	G	E B 14	E B 15	E B 14	E B 15	E B 15	E B 14
2	17	E B 15	E B 14	E B 14	E B 14	E B 14	E B 15	22	27	32	36	G 25	G	38	38	G 19	G 16	21	E B 16	E B 15	E B 14	E B 13	E B 14	E B 14
3	E B 14	E B 14	E B 15	E B 14	E B 13	E B 15	E B 15	23	G 19	31	37	36	G 24	G 22	34	G	G 22	20	18	E B 15	21	19	16	E B 15
4	18	17	17	E B 15	E B 15	E B 15	E B 14	23	G 21	34	35	38	36	G U Y 26	37	32	34	22	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15
5	E B 16	E B 15	E B 15	E B 14	E B 14	E B 15	E B 13	G	28	31	G	38	36	36	34	G 26	G	G 18	18	16	E B 14	E B 15	E B 15	E B 15
6	E B 15	E B 15	E B 14	E B 14	E B 15	E B 14	E B 15	G 18	28	32	32	G 28	G	G 28	G 27	31	27	G 17	E B 16	16	17	17	18	17
7	17	E B 15	E B 14	E B 16	E B 15	E B 14	E B 14	G	G 20	G 24	C	C	C	C	C	G 28	29	21	16	E B 14	E B 14	E B 15	E B 15	E B 14
8	18	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	26	30	G 27	35	37	37	36	36	33	29	19	16	16	E B 15	16	17	E B 13
9	18	17	17	19	25	17	24	21	G 22	33	41	41	36	37	G 22	37	32	26	E B 16	E B 14	E B 14	18	17	E B 15
10	17	E B 15	E B 14	E B 16	E B 16	E B 13	E B 13	G	30	32	G 27	G 31	G 29	G 27	37	36	30	23	17	16	E B 15	E B 14	E B 14	E B 15
11	E B 14	E B 15	E B 15	E B 16	E B 16	E B 15	G	25	30	36	36	41	U Y 39	U G 30	G 26	G 24	G 23	G	E B 16	E B 15	E B 15	19	16	E B 15
12	E B 16	E B 14	E B 14	E B 14	E B 15	E B 14	E B 15	G	G	G	G	G 36	36	G 29	35	U Y 31	G 21	37	46	30	23	19	18	E B 15
13	E B 14	E B 14	E B 14	E B 15	E B 13	E B 14	E B 16	G	31	34	G 26	G 26	G 26	G 26	G 27	G 20	G 18	G	E B 15	16	E B 14	E B 14	E B 16	E B 16
14	E B 16	E B 16	E B 14	E B 15	E B 14	16	18	G 18	30	34	G	G	U Y 37	36	G 26	31	G 23	22	E B 15	E B 15	E B 15	E B 15	E B 16	E B 14
15	E B 16	E B 14	E B 15	E B 14	E B 14	E B 14	E B 17	26	G 22	G 27	G	38	40	38	G	G	G	G	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
16	25	E B 16	E B 15	E B 15	E B 15	E B 15	E B 17	G	G U G 22	28	G 29	41	38	35	G 25	33	28	22	22	E B 14	E B 14	E B 14	E B 15	E B 14
17	E B 13	17	E B 14	E B 15	E B 15	E B 14	E B 17	27	G 23	34	38	U Y 38	42	39	G 21	G	30	24	E B 14	E B 14	E B 14	E B 15	E B 16	E B 14
18	E B 15	E B 14	E B 15	E B 15	E B 14	E B 15	E B 16	G 19	31	36	41	42	39	38	38	38	50	33	43	21	E B 15	18	E B 15	E B 14
19	E B 14	E B 14	E B 16	E B 15	E B 16	E B 16	E B 18	G 18	G 24	36	43	39	U G 25	U Y 39	U G 34	G	44	27	18	E B 15	17	E B 16	E B 16	E B 14
20	E B 15	18	E B 15	E B 16	E B 16	E B 15	G	28	31	38	G 29	49	41	40	U Y 40	G	32	67	51	16	21	18	E B 16	E B 14
21	E B 14	E B 14	E B 14	E B 14	E B 16	E B 14	G	G 21	31	U Y 38	46	41	G 36	40	42	36	46	23	20	20	17	E B 15	E B 15	E B 15
22	E B 13	E B 15	E B 14	E B 16	E B 15	E B 15	G	26	32	35	39	41	U G 34	G 30	46	38	G 22	24	E B 15	E B 14	E B 15	E B 16	E B 14	E B 16
23	E B 14	E B 16	E B 15	E B 15	E B 14	E B 14	19	26	32	U G 31	U Y 38	U G 32	E B 77	E B 39	B 29	G 37	33	33	20	18	E B 14	E B 15	E B 15	E B 14
24	E B 14	E B 15	E B 14	E B 14	E B 13	E B 14	G	G 21	G	G	G	E B 43	U Y 39	G	E B 42	G 28	G 21	G	18	19	E B 16	E B 15	E B 16	E B 16
25	E B 15	E B 15	E B 16	E B 15	E B 14	E B 15	20	G U Y 22	32	35	38	U Y 36	U G 32	U G 28	U G 25	G 28	G 20	23	E B 14	E B 14	E B 15	E B 15	E B 15	E B 15
26	E B 14	E B 13	E B 14	17	E B 14	E B 16	20	G 22	G 23	38	38	G 30	U G 34	G 30	34	G 21	G 19	G	18	E B 14	E B 15	E B 15	E B 14	E B 14
27	E B 14	E B 14	E B 15	E B 14	E B 15	E B 14	20	28	30	34	40	U Y 38	41	U G 26	G 24	34	G 18	G 18	E B 15	E B 13	E B 15	E B 15	E B 16	E B 15
28	E B 16	E B 16	E B 14	E B 14	E B 13	E B 14	G	G	E B 40	U G 33	G	U Y 38	40	U G 36	G	35	G	G	18	20	E B 14	E B 14	E B 14	E B 15
29	E B 14	E B 14	E B 14	E B 15	E B 14	E B 14	G	28	33	G	38	41	42	38	38	43	49	G 24	25	20	E B 14	30	17	E B 15
30	24	E B 14	E B 14	E B 15	E B 15	E B 15	G	G	31	35	37	U Y 36	U G 35	U G 27	G 24	G 22	31	26	E B 16	17	15	22	17	E B 15
31	17	17	E B 15	E B 15	E B 15	E B 15	22	28	32	36	38	G 27	E B 42	U G 26	G	G	30	26	E B 16	E B 16	E B 15	E B 14	E B 15	E B 15
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	31	31	31	31
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 18	G	29	33	36	38	36	G	G	G	27	G	16	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	17	16	E B 15	E B 15	E B 15	E B 15	G	26	31	35	38	41	40	38	37	35	32	26	18	17	15	18	16	E B 15
L Q	E B 14	E B 14	E B 14	E B 14	E B 14	E B 14	E B 15	G 22	G 23	G 32	G	G 32	G 34	G 28	G 26	G 28	G 22	22	E B 15	E B 14	E B 14	E B 15	E B 15	E B 14

MAR. 1998 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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	15	15	15	14	16	15	13	14	15	16	16	16	17	15	16	15	16	16	14	15	14	15	15	14
2	13	15	14	14	14	14	15	15	14	15	14	16	16	18	16	14	14	16	16	15	14	13	14	14
3	14	14	15	14	13	15	15	15	14	16	17	17	18	15	19	17	16	14	16	15	13	15	13	15
4	15	14	14	15	15	15	14	15	15	16	16	17	19	22	16	18	14	14	15	15	15	14	14	15
5	16	15	15	14	14	15	13	14	14	15	16	19	18	21	15	15	15	16	14	14	14	15	15	15
6	15	15	14	14	15	14	15	14	15	14	15	19	17	18	15	16	14	16	16	15	14	15	15	16
7	14	15	14	16	15	14	14	15	15	14	C	C	C	C	C	16	16	14	14	14	14	15	15	14
8	14	15	15	14	14	14	15	16	16	14	15	16	16	18	16	16	16	14	15	15	15	15	15	13
9	16	15	13	14	15	15	17	14	15	16	15	18	19	18	16	16	14	14	16	14	14	14	15	15
10	15	15	14	16	16	13	13	15	15	16	16	17	16	18	15	15	15	15	16	15	15	14	14	15
11	14	15	15	16	16	15	13	14	15	15	16	15	15	16	17	15	15	15	16	15	15	16	15	15
12	16	14	14	14	15	14	15	16	15	15	16	20	17	16	17	18	14	14	16	14	14	15	15	15
13	14	14	14	15	13	14	16	14	14	15	17	20	20	19	19	16	14	15	15	14	14	14	16	16
14	16	16	14	15	14	14	15	15	15	15	16	19	22	20	16	16	14	16	15	15	15	15	16	14
15	16	14	15	14	14	17	17	14	15	16	22	26	20	16	19	19	16	15	15	15	15	15	15	14
16	16	16	15	15	15	15	17	16	16	19	18	17	26	25	16	14	16	15	15	14	14	14	15	14
17	13	14	14	15	15	14	17	15	14	17	25	18	21	23	18	17	16	15	14	14	14	15	16	14
18	15	14	15	15	14	15	16	16	15	15	16	19	36	23	22	14	18	15	16	15	15	15	15	14
19	14	14	16	15	16	16	18	16	15	16	18	21	19	20	19	22	14	14	15	15	14	16	16	14
20	15	15	15	16	16	15	14	16	16	18	20	20	39	22	24	20	17	15	15	14	14	14	16	14
21	14	14	14	14	16	14	15	15	16	17	17	21	22	26	22	17	15	15	16	15	14	15	15	15
22	13	15	14	16	15	15	16	16	14	16	18	20	24	19	18	18	17	14	15	14	15	16	14	16
23	14	16	15	15	14	14	14	15	16	20	21	21	77	39	18	17	15	16	15	14	14	15	15	14
24	14	15	14	14	13	14	13	15	15	15	18	43	23	22	42	20	15	16	16	15	16	15	16	16
25	15	15	16	15	14	15	13	15	15	18	21	22	19	21	20	18	16	15	14	14	15	15	15	15
26	14	13	14	14	14	16	13	15	18	16	20	23	28	19	18	17	15	15	15	14	15	15	14	14
27	14	14	15	14	15	14	14	13	15	15	21	22	24	23	18	16	14	16	15	13	15	15	16	15
28	16	16	14	14	13	14	13	15	40	22	18	19	21	27	18	19	16	15	15	14	14	14	14	15
29	14	14	14	15	14	14	14	16	15	15	18	16	20	18	26	19	16	14	14	14	14	19	14	15
30	14	14	14	15	15	15	14	15	15	16	19	18	22	21	20	18	16	14	16	15	14	14	15	15
31	14	14	15	15	15	15	16	14	16	18	18	21	42	19	19	17	16	16	16	16	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	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	31	31	31	31
MED	14	15	14	15	15	15	15	15	15	16	18	19	20	20	18	17	15	15	15	15	14	15	15	15
U Q	15	15	15	15	15	15	16	16	16	17	19	21	24	22	19	18	16	16	16	15	15	15	15	15
L Q	14	14	14	14	14	14	13	14	15	15	16	17	18	18	16	16	14	14	15	14	14	14	14	14

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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	294	291	308	324	311	305	327	333	331	349	329	306	316	335	332	344	342	355	331	302	302	305	301	301
2	297	302	319	320	315	314	R 315	342	346	344	328	310	328	338	352	354	335	348	348	304	316	332	295	287
3	291	284	291	310	323	325	334	371	341	315	323	331	316	325	346	356	352	366	332	302	307	325	294	280
4	305	301	312	F 332	F 332	F 311	F 304	352	344	361	324	326	330	326	352	345	357	355	356	286	293	301	293	290
5	294	296	292	290	F 292	F 297	325	353	318	319	303	333	327	350	324	337	360	352	331	312	334	318	315	304
6	288	300	314	316	336	306	327	357	358	336	316	318	333	342	341	338	349	351	346	345	302	304	292	S 298
7	309	309	329	316	308	309	343	R 344	338	351	C	C	C	C	C	338	356	366	366	317	300	289	283	280
8	301	F 306	325	351	363	301	334	360	351	344	334	326	322	356	337	332	351	355	354	314	302	301	F 298	F 311
9	F 318	322	F 313	F 321	F 346	320	S 333	355	339	348	335	328	344	328	339	337	344	377	337	325	301	296	289	288
10	285	301	316	327	345	305	349	353	359	329	313	307	316	333	339	342	348	353	337	290	298	306	283	289
11	294	306	301	F 335	311	339	370	347	331	353	316	273	322	338	317	323	329	340	338	335	284	296	310	F 285
12	271	290	F 298	F 300	F 283	F 302	F 328	350	339	332	304	293	326	325	324	321	325	358	348	325	301	287	292	289
13	295	309	314	305	297	292	326	353	347	336	310	327	326	334	328	338	335	335	362	342	276	278	288	281
14	287	292	R 312	319	287	292	325	347	347	317	330	337	326	327	326	338	357	361	349	311	296	313	300	290
15	F 300	F 306	305	314	F 327	F 306	343	345	332	327	323	319	321	325	319	340	332	329	336	319	288	299	283	283
16	280	283	306	345	346	299	334	338	337	330	323	308	317	330	337	307	329	340	346	316	321	314	284	292
17	283	293	288	R 311	296	311	351	370	324	338	302	317	321	321	338	330	338	347	365	317	285	287	276	277
18	281	307	313	322	328	317	R 348	R 350	340	335	308	317	339	328	333	317	329	337	325	312	283	292	294	299
19	U R 305	294	304	311	314	316	350	362	326	320	333	308	325	338	328	329	329	353	349	340	305	285	U R 276	278
20	U R 286	302	314	319	347	297	321	339	R 340	330	323	R 321	312	312	320	332	323	339	346	332	305	288	290	280
21	280	290	312	319	306	287	347	346	340	309	308	335	316	318	328	320	333	344	312	310	282	291	274	280
22	293	271	270	282	312	292	295	306	317	319	317	312	310	303	322	326	340	342	322	308	303	302	288	R 271
23	302	298	316	302	275	276	327	R 344	342	337	316	311	320	326	336	R 336	337	335	339	342	332	290	U R 310	F 282
24	289	299	321	337	326	294	338	338	320	317	311	319	322	329	335	325	336	329	338	334	306	288	279	273
25	277	298	300	311	284	287	337	336	320	329	319	312	318	325	324	325	324	328	335	358	281	285	F 263	269
26	282	277	316	282	282	308	322	328	312	336	299	314	332	327	327	334	337	328	329	315	291	292	276	273
27	270	277	340	344	256	F 295	341	343	321	332	329	331	329	321	322	327	324	330	336	305	280	296	290	281
28	F 295	323	R 320	289	283	327	336	S 331	320	331	316	312	319	305	314	323	335	338	330	311	294	274	274	F 283
29	284	316	334	311	299	304	334	344	335	324	310	302	279	298	315	324	323	323	312	326	324	280	292	269
30	294	291	285	285	F 273	F 257	324	341	R 330	319	321	297	308	303	308	323	336	353	349	299	286	284	290	293
31	314	F 289	F 276	F 277	F 303	294	F 346	325	331	320	316	304	295	313	332	320	322	327	326	331	312	F 297	291	F 293
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	30	30	30	30	30	31	31	31	31	31	31	31	31	31
MED	293	298	312	316	311	304	334	345	337	331	316	316	322	326	328	332	336	344	338	316	301	296	290	283
U Q	300	306	316	324	328	311	343	353	342	338	324	326	327	334	337	338	348	355	349	332	306	304	294	292
L Q	283	290	300	302	287	294	325	338	324	320	310	308	316	321	322	323	329	335	331	308	286	287	283	280

MAR. 1998 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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	U L 368	U L 360	L 350	H 335	363	L 367	U L 351	L							
2									L	L	U L 344	L 349	U L 348	U L 356	A 372	L 369	L 411							
3										L	U L 344	L 351	L 347	L 349	L 341	U L 357	L							
4									L	L	L 374	U L 366	L 358	L 355	396	L								
5									L	L	374	U L 338	L 363	U L 359	U L 353	L 342	L							
6									L	L	L 359	360	L 356	L 363		L	U L 364							
7									L	L 364	C	C	C	C	C	L 359	L	L						
8									L	L 362	L 364	L 368	361	356	L 368	U L 361	L							
9									L	U L 386	L 365	387	375	L 386	376	L 365	L	L						
10									U L 369	L 372	L 390	H 392	363	L 364	U L 365	L	U L 364							
11								L		U L 375	L 338	U L 330	U L 357	U L 363	L 370	L	L							
12									L	L	L 365	L 352	L 360	L 361	L 365	L	L							
13								404	L	L	L 358	H 357	L 351	L 359	U L 380	L	L	L 398						
14									L	L	L 337	L 364	U L 372	L 348	U L 336	L 351	L	L						
15									L	U L 352	U L 351	U L 364	U L 356	U L 344	L 361	L	L							
16									L	L	U L 358	U L 356	U L 350	U L 354	L 381	U L 351	L	L						
17										L	L	U L 344	U L 361	L 350	L 348	L 372	L	L						
18										L		L	404	U L 362	U L 382	U L 372	A							
19									U L 404	L	L	L 363	L 365	348	U L 376	U L 373	L							
20									U L 378	U L 358	L 357	A	L 347	L 359	Y 395	L 370	U L 365	A						
21								L	L		A	U L 357	L 367	L 372	A	U L 350	A	L						
22								L	L	L 361	U L 359	U L 339	L 355	358	A		L							
23									L	U L 360	L	400	B	L 362	U L 369	L								
24									L	U L 360	376	369	L 358	L 366	L 372	U L 328	L							
25									L 363	U L 371	L 378	U L 360	367	L 352	L 358	U L 362	L	L						
26								L	L	L 360	U L 364	L 344	L 355	U L 360	U L 365	U L 356	L							
27									L	L 350	382	U L 359	371	L 361	L 354	L	L	L						
28								L	L	L 353	L 376	U L 350	L 362	U L 346	U L 341	U L 370	L 393	L						
29									U L 368	L 353	U L 365	L 365	L 351	L 323	L 343	L	A							
30								411	L	U L 354	371	U L 348	360	Y	L 343	U L 346	U L 363	L						
31									U L 368	L 366	L 367	L 381	U L 333	Y 355	L 361	U L 375	U L 352	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								2	6	18	25	28	29	29	27	20	7	1						
MED								408	U L 368	L 360	L 364	L 358	L 358	L 359	L 365	U L 360	U L 364	L 398						
U Q									U L 378	U L 368	L 374	366	364	L 362	L 376	U L 370	L 393							
L Q									L 368	L 354	L 358	U L 350	L 351	L 351	L 353	U L 351	U L 363							

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MAR. 1998 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									262	240	274	292	284	246	254	260	246							
2									248	248	272	290	266	266	256	250	242							
3										272	280	260	284	270	258	244	232							
4									244	244	272	276	268	270	252	252								
5									250	246	298	260	258	250	276	262	238							
6									240	266	280	276	260	254	252	258	248							
7									246	246	C	C	C	C	C	254	240	222						
8									248	252	274	270	282	248	272	268	252							
9									262	248	278	282	266	286	268	272	244	230						
10									250	266	276	310	296	264	258	258	246							
11								248		232	298	334	266	250	264	272	260							
12									248	260	296	324	274	250	254	258	260							
13								230	246	266	284	268	270	260	262	256	246	248						
14									248	284	272	256	266	270	278	258	240	228						
15									254	276	280	270	274	268	282	250	248							
16									258	266	278	278	276	266	246	290	268	244						
17										252	282	286	278	270	262	258	252	242						
18										260		278	266	280	252	290	268							
19									240	278	268	288	278	258	260	266	264							
20									252	280	284	268	288	278	266	260	270	266						
21								236	254		270	270	270	278	268	272	264	242						
22								288	264	276	276	286	278	298	270		250							
23									250	270	266	286	282	260	274	256								
24									264	280	298	274	266	262	258	280	254							
25									288	262	276	282	290	272	278	268	266	256						
26								262	274	268	288	294	262	274	270	256	250							
27									L 274	272	270	266	264	282	278	264	262	250						
28								262	266	266	252	278	270	286	280	258	254	242						
29									266	274	276	286	318	306	266	254	A 252							
30								238	260	284	274	300	290	292	292	272	260	234						
31									258	274	276	268	316	282	270	258	276	254						
	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	27	30	29	30	30	30	30	30	29	13						
MED								248	254	266	276	278	274	270	266	258	252	242						
U Q								262	264	274	283	288	284	280	274	268	263	252						
L Q								236	248	252	272	270	266	260	258	256	246	232						

MAR. 1998 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 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	310	278	266	240	236	256	248	236	242	224	244Y	216	218H	232	216	222	224	224	214	254	264	274	292	310
2	288	294	256	250	260	260	250	228	220H	232	220	212	240	228	256EA	220	212	236	218	234	242	240	298	318
3	300	304	310	268	228	266	238	220	232	232	242	234	220	216	218	230	222	226	218	240	256	250	276	310
4	278	276	270	236	220	250	248	226	196H	238	224	214	218	234	232	220	232	228	206	246	278	272	290	308
5	294	296	290	292	316	286	248	232	232	222	206	248	236	240	218	214	238	232	222	228	230	236	270	276
6	298	286	260	252	240	284	252	232	232	216	200	206	200	216	212	224	228A	228	218	224	272	276	298	302
7	298	272	248	260	262	280	244	232	226	218	C	C	C	C	C	218	236	232	208	210H	272	272	314	332
8	312A	288	252	224	212	300	242	230	234	224	216	214	206	216	220	238	226	232	206	218	250	286	286	278
9	296	268	274	262	248	260	258A	224	236	224	238A	222	190	212	212	230	244A	A	210	224	264	286	292	298
10	312	280	262	246	226	246	238	218	224	216	200	188H	198H	180	228	242	224	230	226	242	268	258	296	264
11	290	260	222	236	252	236	212	240	232	230	216	242	254Y	214	224	226	232	230	222	212	258	286	236	320
12	308	302	278	264	250	266	234	230	200H	204	204	190H	190	226	218	226	220	230	240A	250	296A	276	288	310
13	302	272	248	262	260	292	246	196	218	212H	222	204H	218	212	212	234	218	230	210	212	284	292	276	310
14	302	308	284	264	276	268	242	232	224H	224	206	224Y	222Y	214	226	210	236	228	218	222	274	262	274	294
15	314	300	294	266	240	266	238	226	196H	196H	240	218	240	230	220	234	232	244	222	220	256	262	266	320
16	328A	298	282	230	216	254	244	238	222	232	212	242A	214	198	228	220	242	250	230	224	222	240	264	286
17	308	290	306	284	258	238	230	220	218	212H	224	236	254A	228	222	220	244	244	222	216	254	286	326	324
18	306	272	262	248	240	248	232	222	226	230	266	240A	212	242	234	232	A	236	242A	226	278	284	254	274
19	286	292	286	274	246	250	226	226	212	224	244	208H	222	216	230	218	252A	240	222	208	250	284	320	326
20	312	286	258	246	222	246	240	230	226	226	234Y	A	226	226	244Y	220	230	A	250A	222	262	268	286	310
21	300	282	260	248	256	260	234	234	226	252H	A	234	222	232A	A	226	A	236	226	250	282	272	298	264
22	282	300	318	286	220H	256	276	258	236	220	242	236	216	218	A	248	238	232	236	230	252	244	294	312
23	272	276	248	256	306	324	252	246	230	230	238	216	B	222	198H	252	248	252	238	224	218	272	296	320
24	300	280	256	238	236	272	240	240	236	220	220	240	242	214	242B	214	240	240	234	228	232	288	308	326
25	314	298	278	262	262	304	240	242	248	236	206	266EA	208	256	212	230	230	244	240	214	222	288	352	338
26	314	320	256	296	296	260	242	244	240	234	216	262Y	268EY	216	210	202	232	248	242	232	238	272	316	320
27	314	298	216	206	370	324	240	236	232	230	228	250Y	212	238	196	242	232	236	236	218	260	272	264	300
28	280	250	232	278	298	238	230	238	254B	232	222	202	240	244	220	234	218A	240	232	234	244	308	324	310
29	304	248	236	246	252	276	234	240	230	232	222	238	236	218	252A	A	A	242	250	238	224	322A	276	302
30	318	284	306	288	322	342	238	234	234	226	214	226	206	Y	226	194H	228	238	224	232	246	292	270	266
31	260	266	316	288	286	266	236	236	224	222	210	202	246B	248Y	198H	226	226	254	244	212	226	272	278	286
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	31	31	31	31	31	29	29	29	29	28	30	28	29	31	31	31	31	31	31
MED	302	286	262	260	252	266	240	232	230	224	222	223	219	222	220	226	232	236	224	224	256	272	290	310
U Q	312	298	286	274	276	284	248	238	234	232	238	240	240	233	229	234	238	243	238	234	272	286	298	320
L Q	290	272	252	246	236	250	234	226	222	220	211	210	210	215	212	220	225	230	218	218	238	262	274	286

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 h'E (KM) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							B	150	132	A 134	136	120	A 130	114	120	A 120	A 136	136						
2							B	A 150	E A	A	132	A 122	120	124	120	120	120	B						
3							B	144	120	126	A 132	A	128	120	120	120	128	A						
4							B	A	132	130	A	A	A	126	122	118	122	A						
5							B	134	130	A 136	116	116	118	120	114	A 136	120	E A 146						
6							B	A 144	A	130	116	130	114	A 126	128	A	A	A 134						
7							B	126	124	118	C	C	C	C	C	A 128	122	A						
8							B	140	132	130	126	122	120	118	116	116	A	A						
9							B	A	A	A 140	116	116	116	A 130	126	A	A 126	A						
10							B	134	124	126	A 128	A 126	122	128	124	124	A 130	A 138						
11							164	A 148	A 136	A 134	132	120	116	A	A 126	A 128	A	132						
12							B	126	120	116	112	112	A	A 126	A	A	126	A						
13							B	126	122	118	122	118	124	120	A 126	120	120	122						
14							B	E A 162	A	A 130	114	114	116	A	A 126	A	A 136	128						
15							B	E A 162	128	130	118	124	122	116	118	118	118	124						
16							B	122	A 130	A	126	116	A	A	A 124	A	A	A	B					
17							B	146	A 138	A	114	A	A	124	116	118	116	122	B					
18							B	A 132	130	118	118	118	B	122	120	118	120	124	B					
19							B	A 140	128	A	122	A	A	126	A	126	A	124	B					
20							B 158	A 150	A 142	A	124	126	B	A	128	122	126	122	B					
21							156	A 152	A	130	A	A	A 132	A	A	A	A	A	B					
22							142	A	A	116	116	A	A	120	A	120	122	126	B					
23							150	118	A	A	A	A	B	B	124	128	128	A 150	B					
24							162	A 138	116	110	112	B	A	118	B	A 130	122	122	B					
25							166	A 138	126	116	116	A	A	A	A	A 126	118	118	B					
26							150	A 138	A 126	120	122	130	A	A 126	A	126	124	120	B					
27							A	A	A	A 130	118	A	A	A	126	128	122	A 144	B					
28							162	120	B	A	116	114	A	A	118	A 134	122	120	B					
29							162	120	114	112	114	114	A	A	A	A	A	A	B					
30							152	122	120	114	114	118	A	A	122	126	122	118	B					
31							136	E A 152	A 122	118	118	124	B	A	114	122	126	A 134	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								12	26	23	24	27	20	13	18	22	24	24	21					
MED								157	136	127	126	118	119	120	123	122	123	122	124					
U Q								162	A 148	A 132	A 130	126	124	126	A 126	126	A 128	A 126	A 135					
L Q								150	126	122	117	116	116	116	120	118	120	120	122					

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MAR. 1998 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	B	B	B	B	B	162	172	110	138	130	110	112	G	108	106	114	G	B	102	B	B	B	B
2	126	B	B	B	B	B	B	160	164	104	146	112	G	140	132	106	102	96	98	B	B	B	B	B
3	B	B	B	B	B	B	B	178	110	162	128	124	110	110	130	G	116	122	116	128	112	110	110	B
4	110	106	106	108	B	B	104	170	114	164	170	110	106	106	192	146	124	124	100	B	B	118	B	B
5	B	114	B	B	B	114	B	G	150	168	G	124	124	124	124	116	G	102	96	100	B	B	B	B
6	B	B	B	B	B	B	164	120	112	124	124	118	G	112	112	120	112	116	120	110	106	108	102	100
7	118	120	B	B	B	B	B	G	108	108	C	C	C	C	C	112	120	98	98	B	B	126	124	170
8	114	B	B	B	114	B	124	172	174	110	146	134	134	132	126	126	118	116	114	110	B	122	116	B
9	110	120	114	114	114	112	108	108	108	188	122	124	124	128	108	100	126	118	166	B	116	112	112	B
10	120	112	120	B	B	B	B	G	E G 198	142	110	108	112	110	154	142	138	132	120	116	120	112	114	B
11	B	108	B	B	B	B	G	154	144	128	124	122	120	116	114	112	108	G	112	102	B	118	118	B
12	B	B	114	110	110	B	B	G	G	G	G	122	116	116	108	106	106	100	98	98	98	104	106	B
13	108	104	102	B	B	B	120	G	182	166	108	108	108	108	106	106	104	G	112	100	B	B	B	B
14	B	B	B	B	104	114	170	118	196	192	G	G	124	118	108	102	120	162	B	B	B	B	B	B
15	B	B	B	B	B	B	B	178	112	110	G	168	158	176	G	G	G	G	B	B	B	B	B	B
16	114	110	108	110	B	B	180	G	114	112	108	114	114	112	108	112	116	116	112	B	B	B	B	B
17	100	126	B	B	B	B	B	180	114	166	136	136	102	128	108	G	152	128	B	B	B	B	B	B
18	B	B	B	B	B	B	B	114	188	154	144	144	142	134	124	124	118	116	112	116	B	106	106	B
19	B	B	B	B	B	B	B	114	112	116	118	116	108	130	108	G	104	130	100	B	112	B	B	B
20	B	110	110	B	B	B	G	172	186	174	110	152	156	156	154	G	150	124	120	130	108	128	B	146
21	144	B	130	132	B	B	G	116	116	146	128	130	118	114	106	108	104	106	102	102	104	102	100	B
22	138	120	122	B	124	158	G	188	138	144	122	112	114	110	164	180	106	128	B	B	B	B	B	B
23	B	B	B	B	B	B	158	184	166	110	E G 198	110	B	B	104	182	168	142	132	122	B	B	B	B
24	B	B	B	B	B	B	G	116	G	G	G	B	196	G	B	114	112	G	106	106	102	B	B	B
25	B	B	B	B	B	B	176	118	126	118	120	118	106	108	104	104	98	164	B	B	B	B	B	B
26	154	136	B	106	B	B	158	118	112	118	122	118	114	108	102	108	106	G	102	102	B	B	B	B
27	B	B	B	B	B	B	152	152	110	134	116	110	110	106	102	130	102	118	102	108	B	B	B	B
28	B	B	B	B	B	B	G	G	B	112	G	122	110	118	G	172	G	G	104	100	102	120	114	B
29	B	B	B	B	B	B	G	174	160	G	124	120	114	114	114	114	104	102	128	124	B	108	112	B
30	108	112	B	108	116	B	G	G	162	134	128	124	110	110	110	110	136	132	122	118	114	114	116	112
31	108	114	110	106	108	108	150	156	144	126	122	108	B	108	G	G	168	136	B	B	120	B	B	118
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	14	14	10	8	7	5	13	23	28	28	24	28	26	27	26	25	28	24	24	19	12	15	13	5
MED	114	113	112	109	114	114	158	156	126	134	124	119	114	114	109	112	115	120	112	108	110	112	112	118
U Q	126	120	120	112	116	136	167	174	165	163	133	124	124	128	126	128	125	131	120	118	115	120	116	158
L Q	108	110	108	107	108	110	122	118	112	114	119	111	110	110	108	106	105	111	101	102	103	108	106	106

IONOSPHERIC DATA STATION Kokubunji

MAR. 1998 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

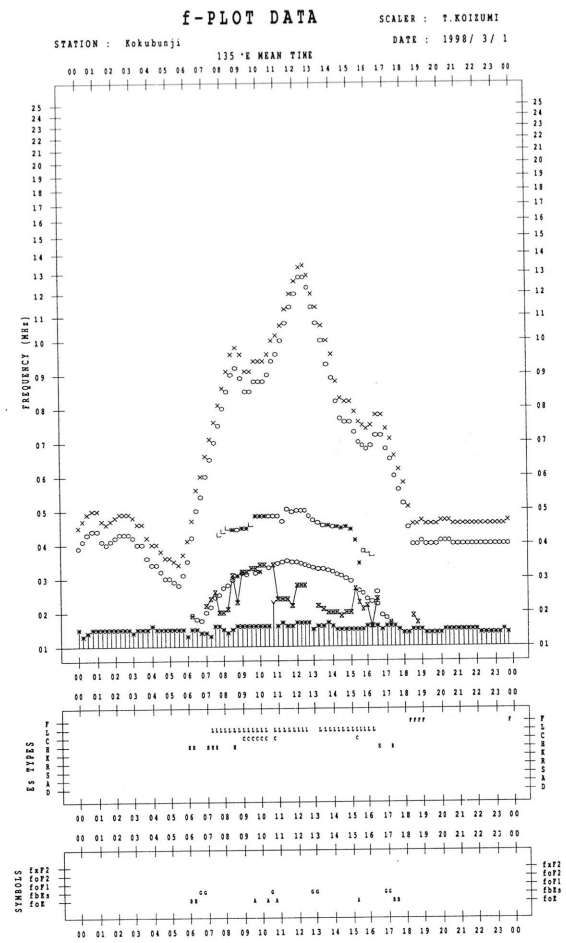
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

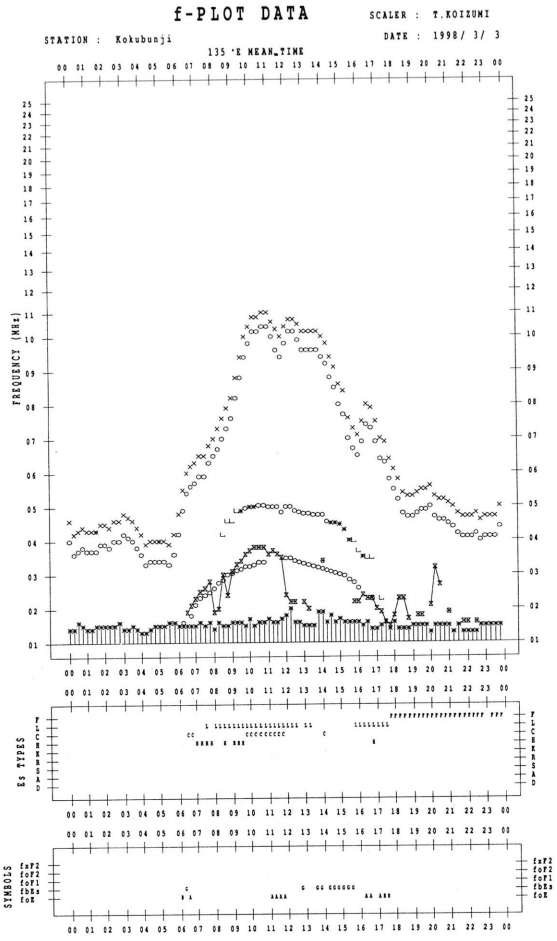
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							H 1	H 1	L 1	CL 11	CL 11	L 1	L 1		L 1	L 2	LL 11			F 1				
2	F 1							C 1	HL 12	L 1	HL 11	L 1		CL 11	CL 11	L 1	L 2	L 2	F 2					
3								H 1	L 1	HL 11	CL 11	CL 11	L 1	L 1	C 1		L 1	L 1	F 2	FF 11	F 3	F 2	F 2	
4	F 2	F 2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

MAR. 1998 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 : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/ 1
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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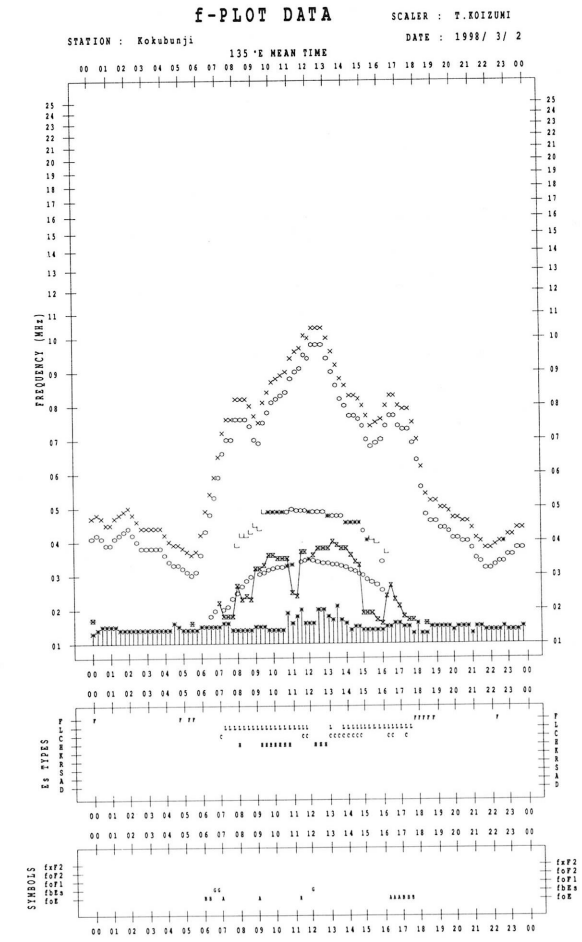
STATION : Kokubunji
DATE : 1998/ 3/ 3
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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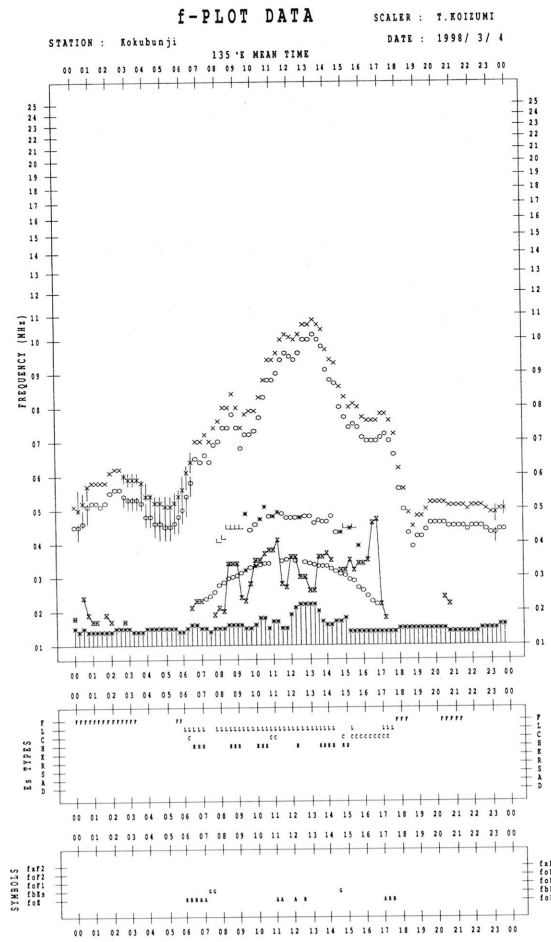
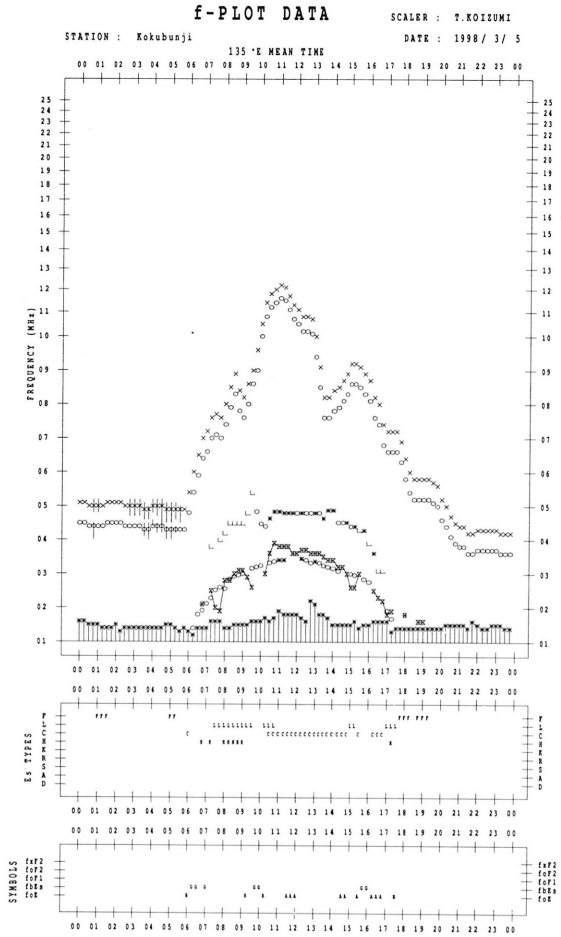
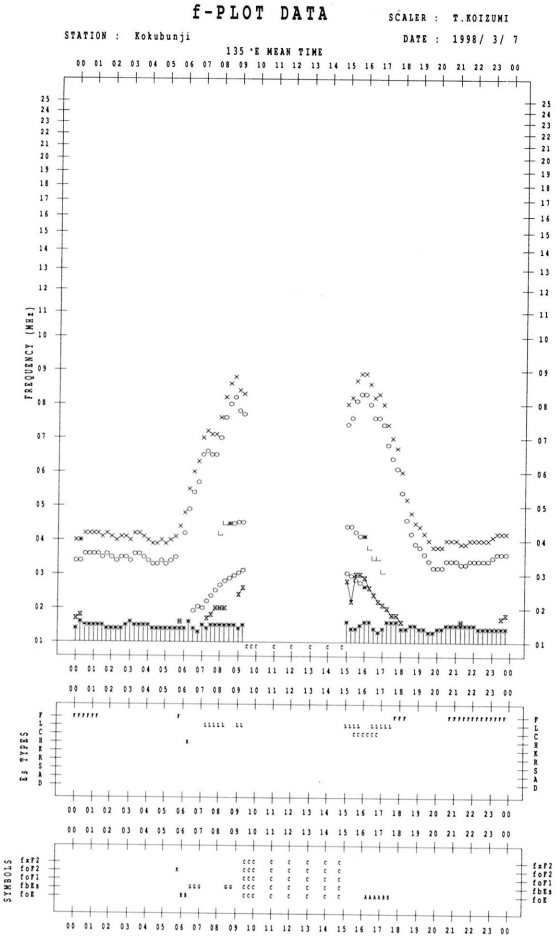
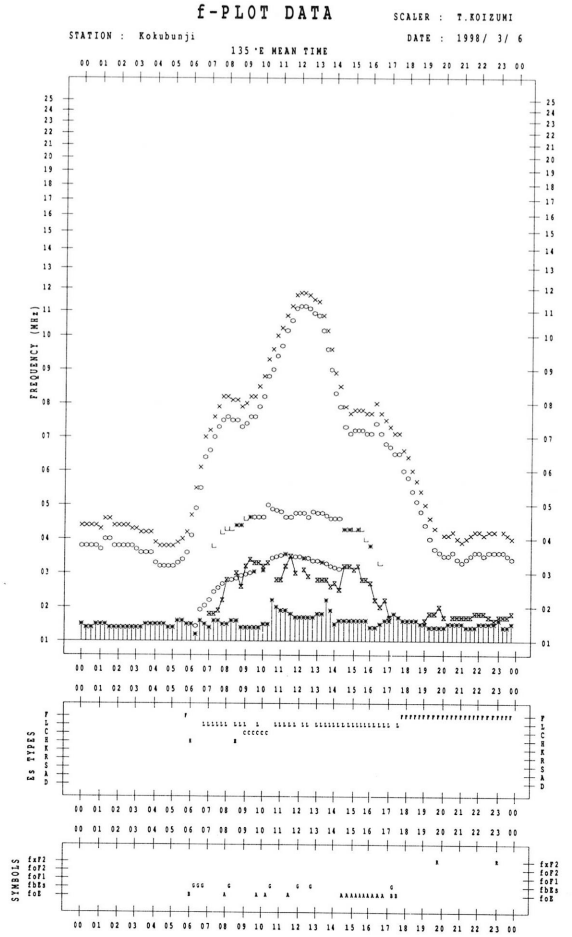
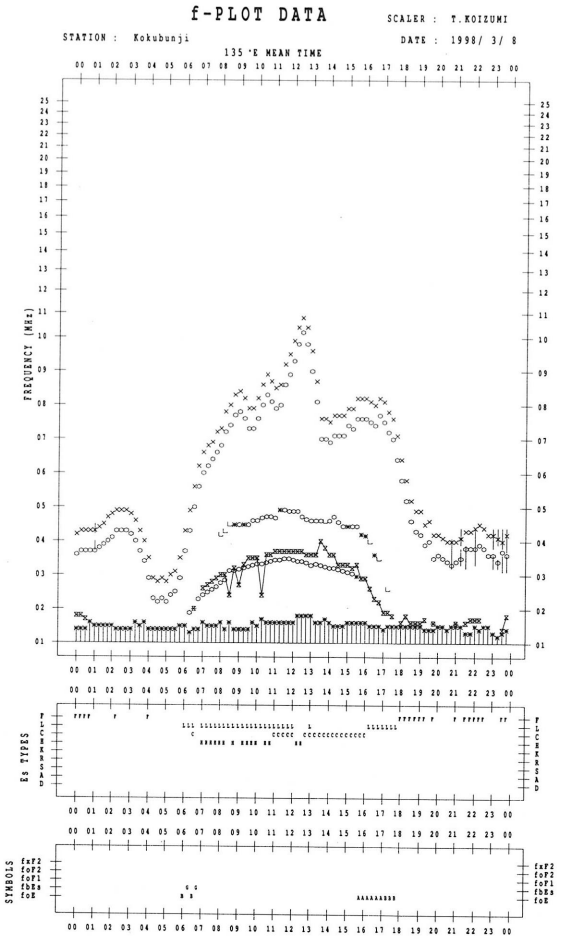
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/ 2
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/ 4
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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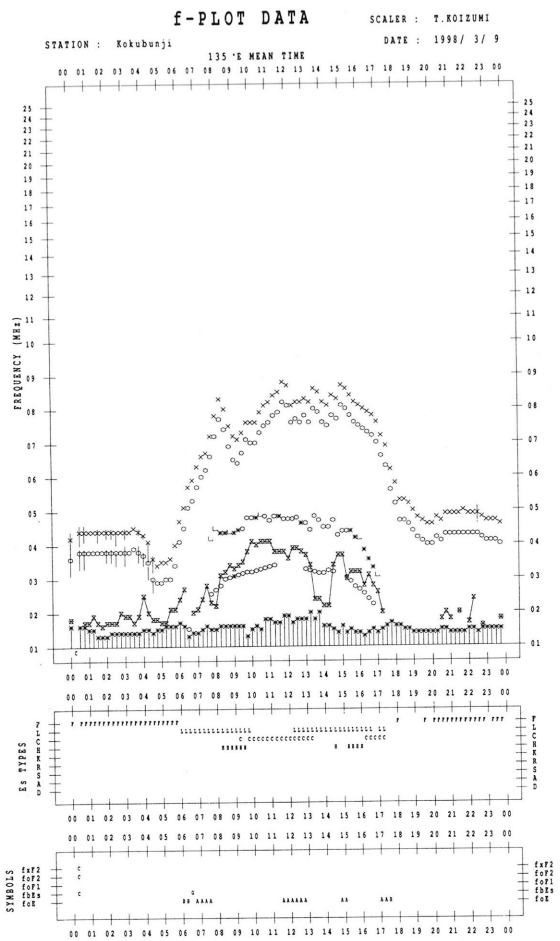
STATION : Kokubunji
DATE : 1998/ 3/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
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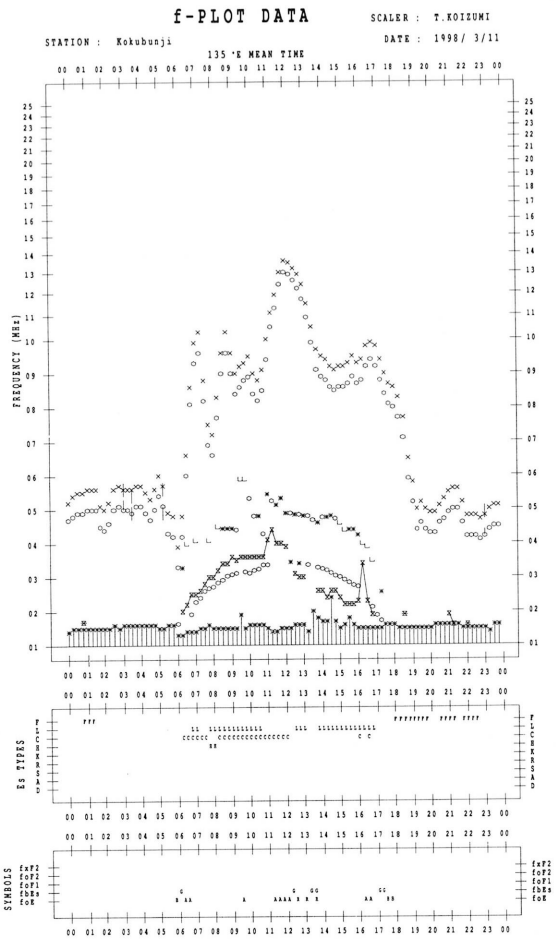
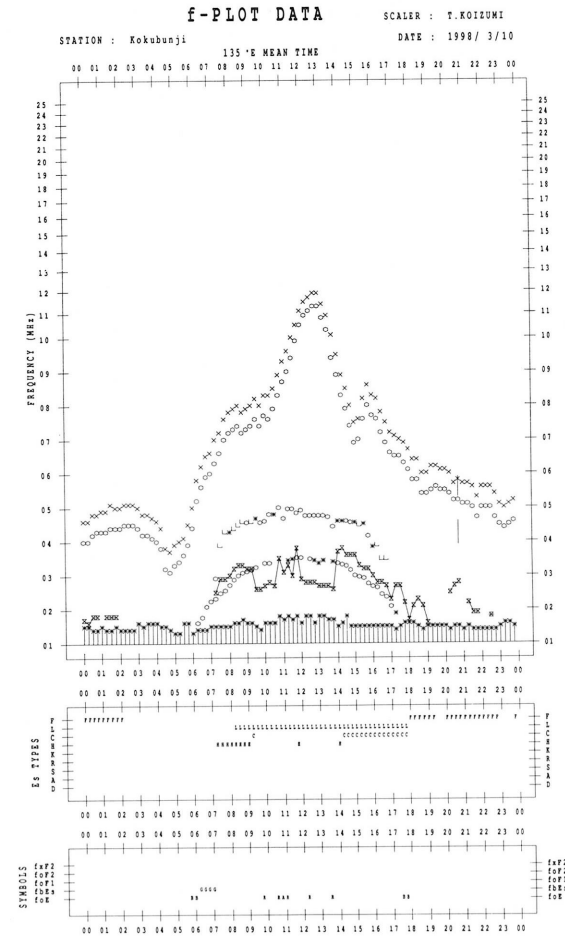
STATION : Kokubunji
DATE : 1998/ 3/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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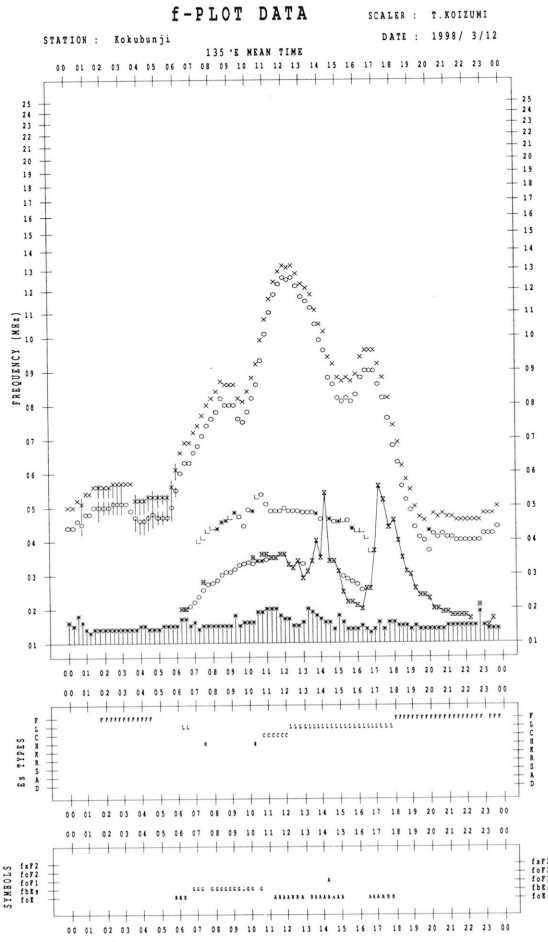
STATION : Kokubunji
DATE : 1998/ 3/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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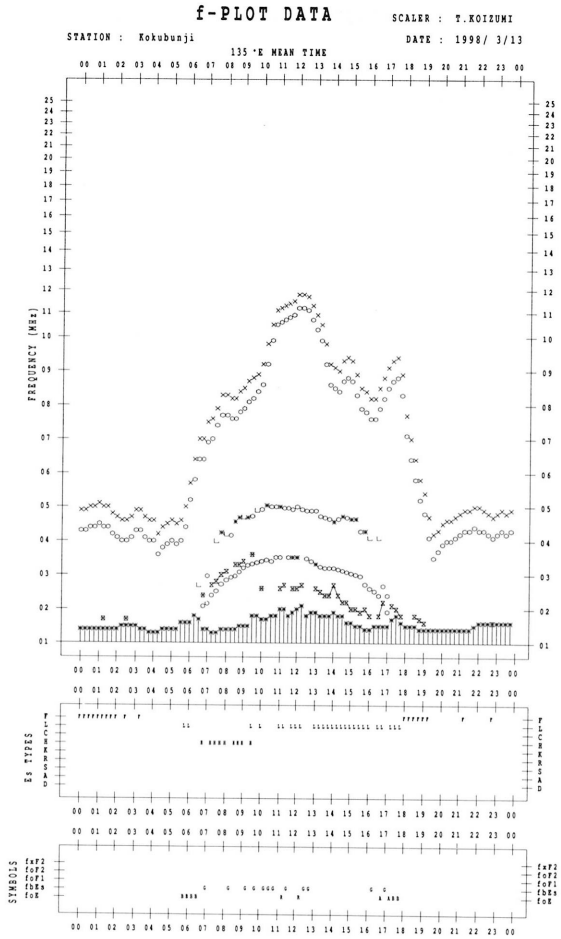
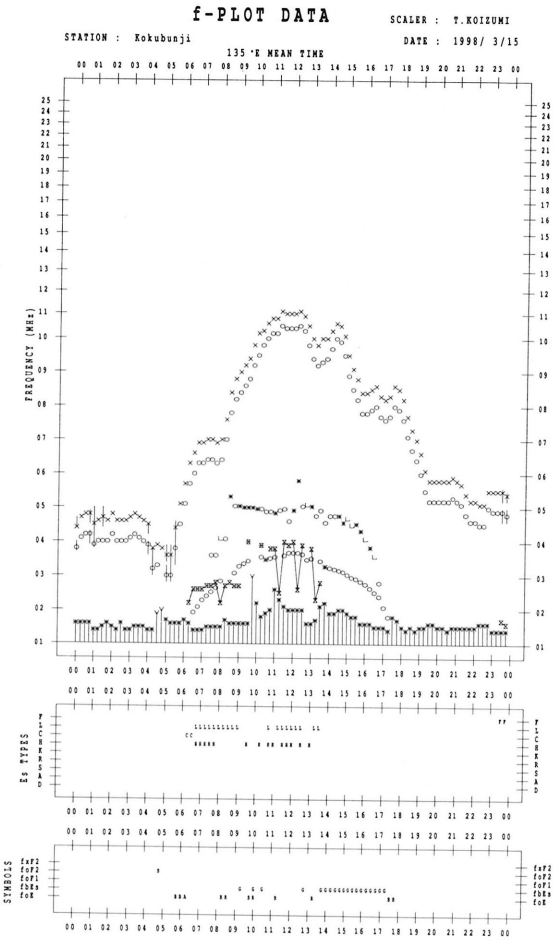
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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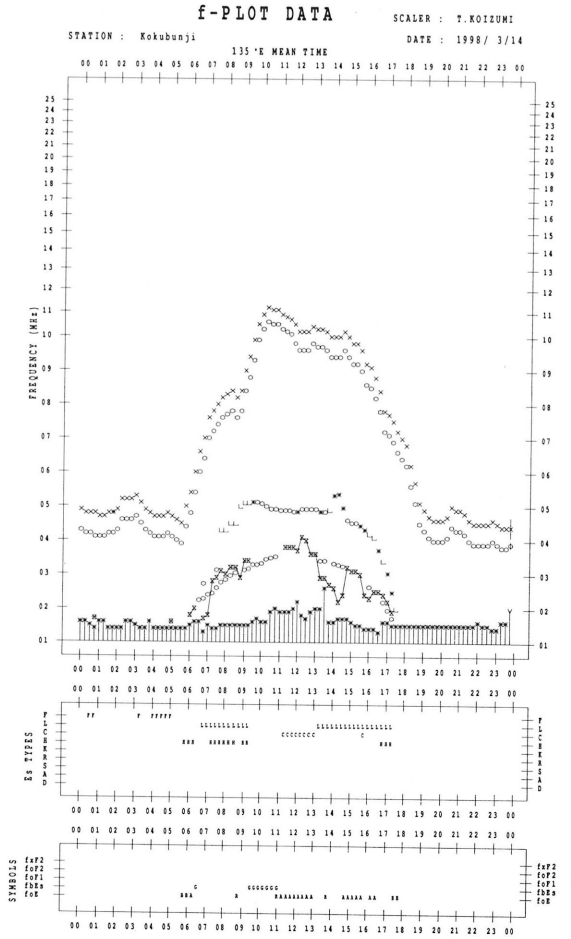
STATION : Kokubunji
DATE : 1998/ 3/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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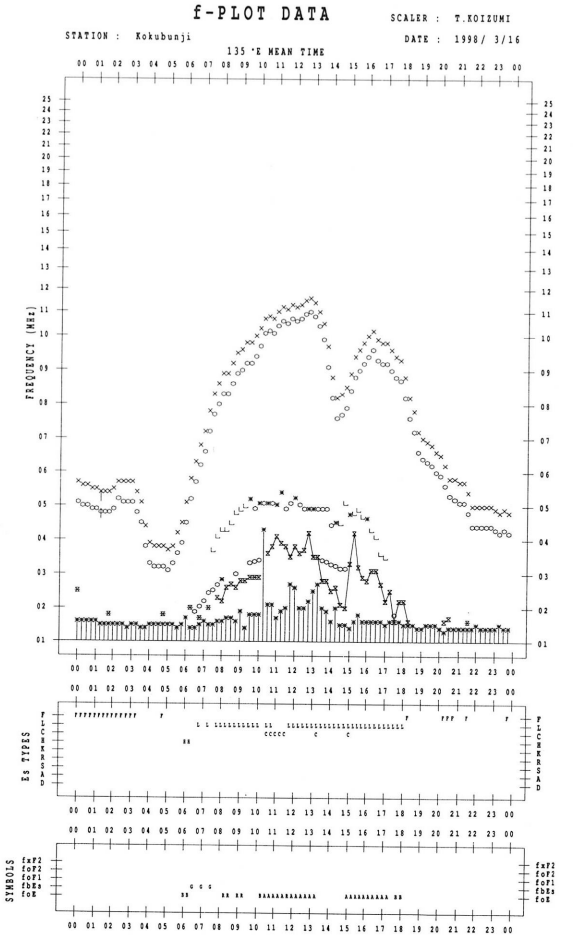
STATION : Kokubunji
DATE : 1998/ 3/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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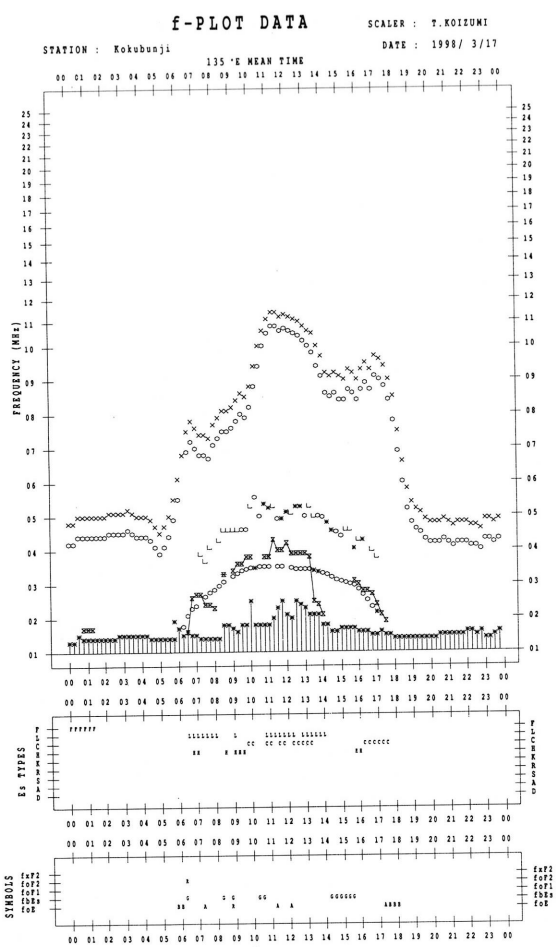
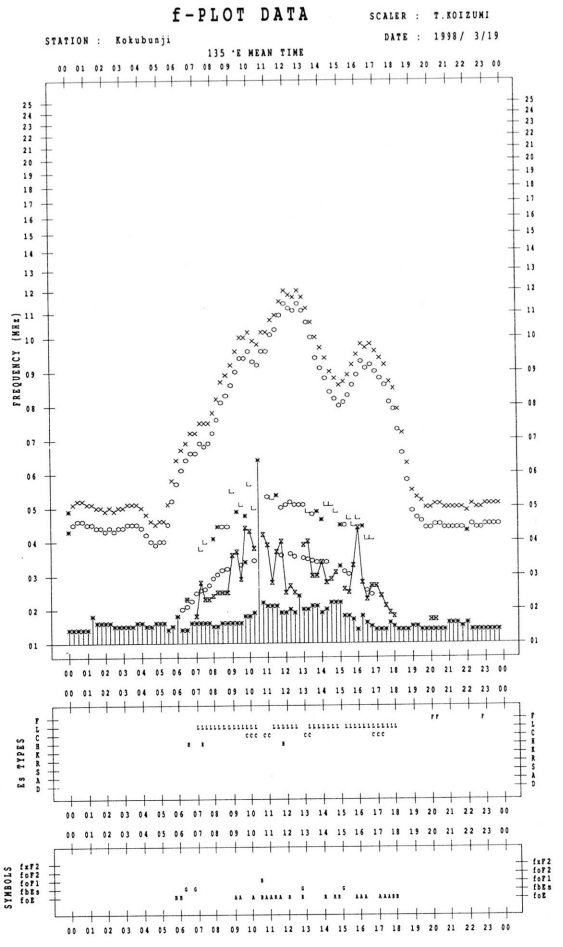
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
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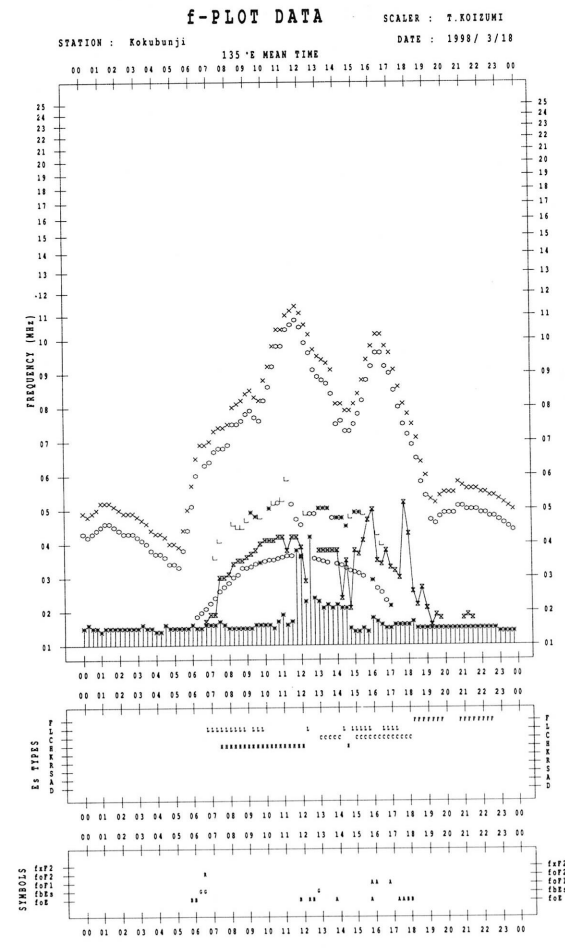
STATION : Kokubunji
DATE : 1998/ 3/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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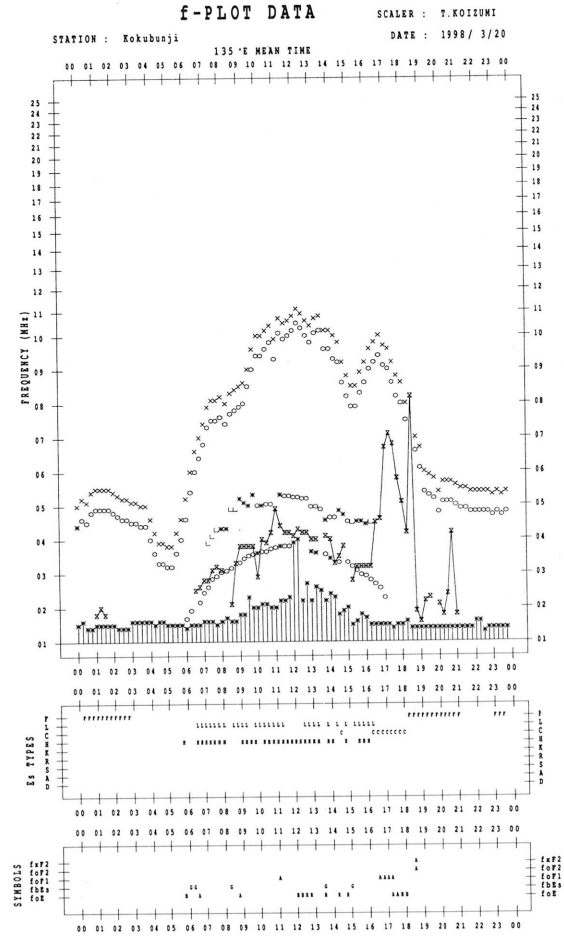
STATION : Kokubunji
DATE : 1998/ 3/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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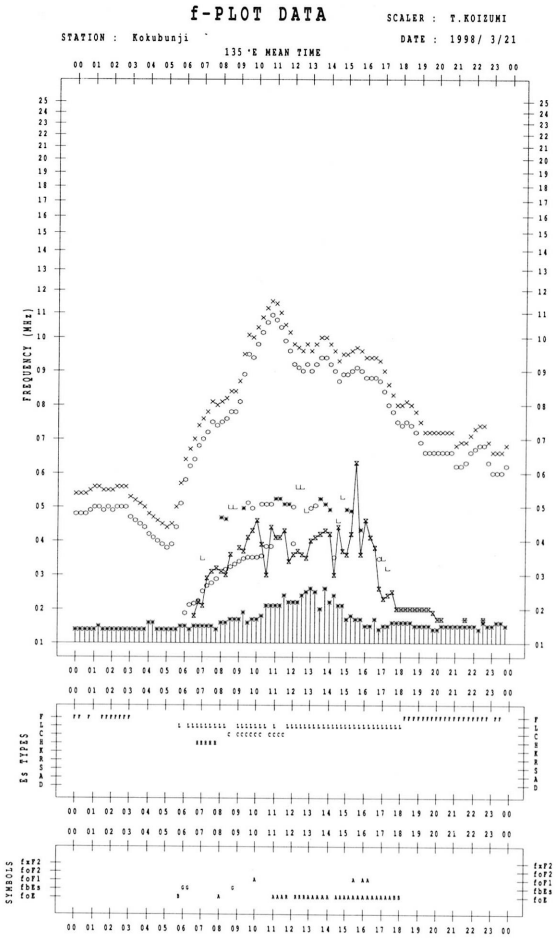
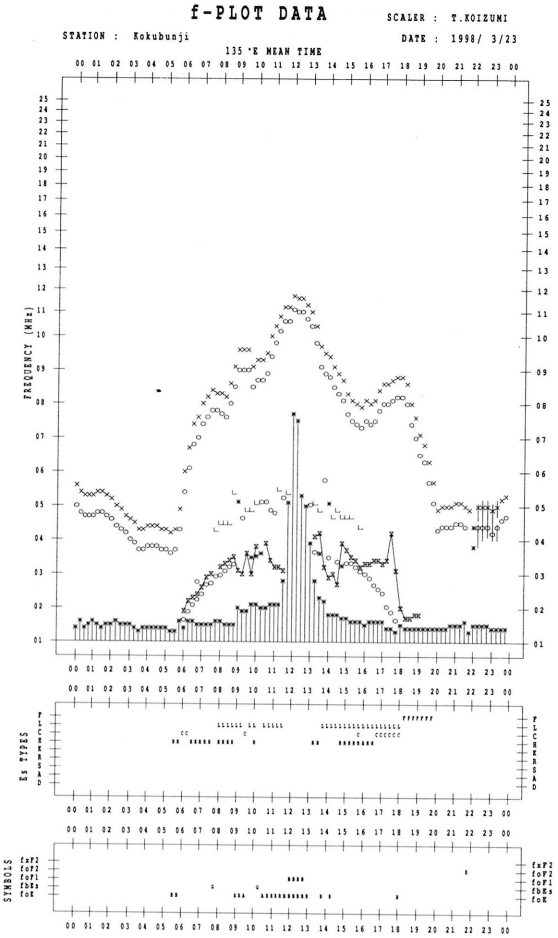
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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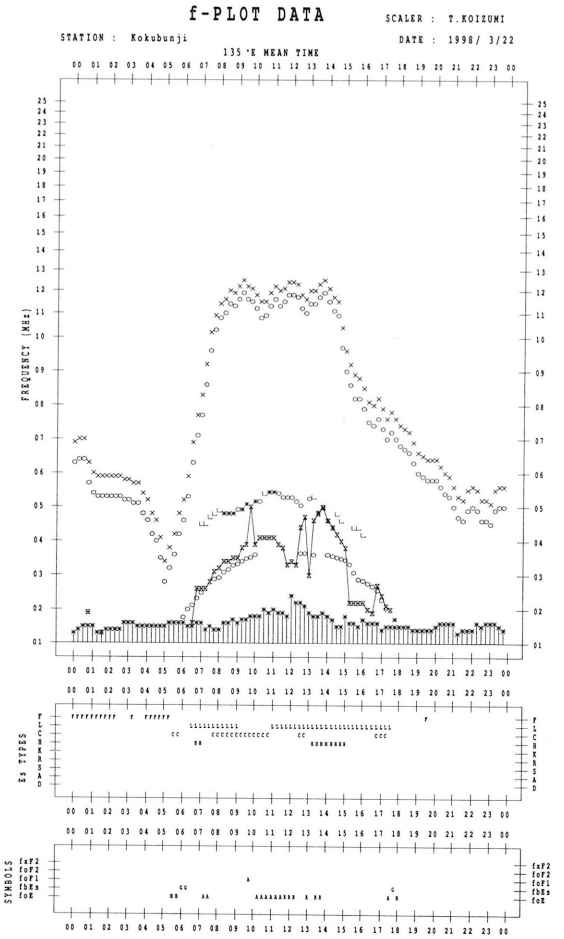
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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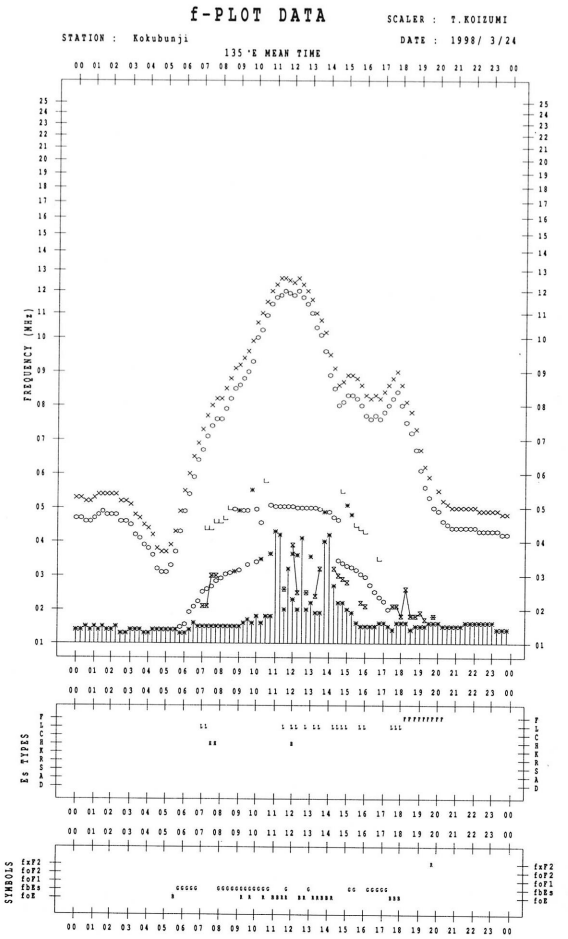
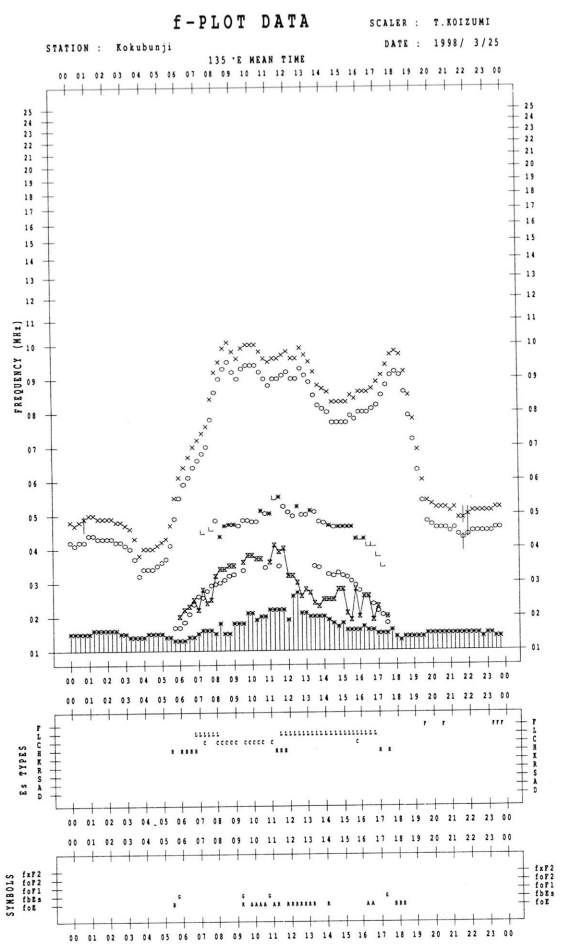
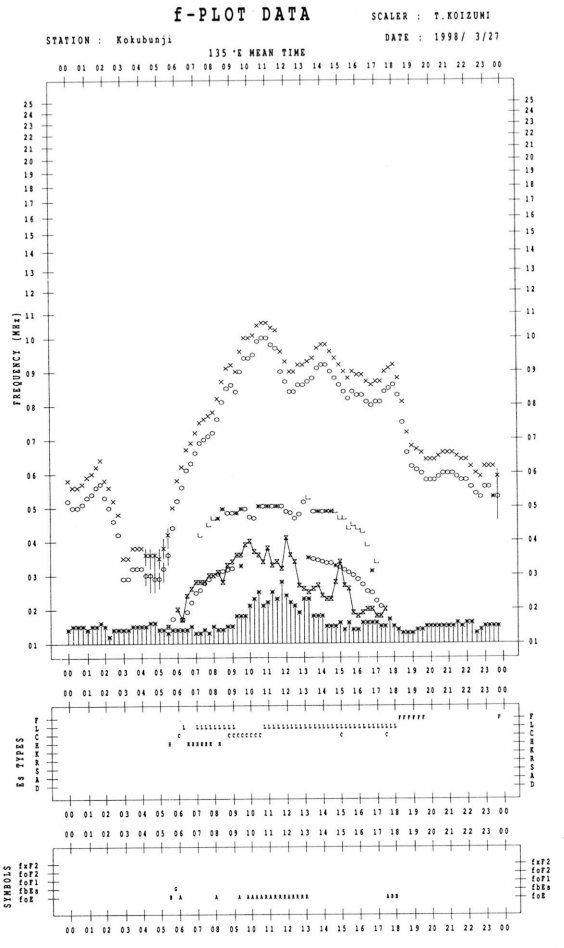
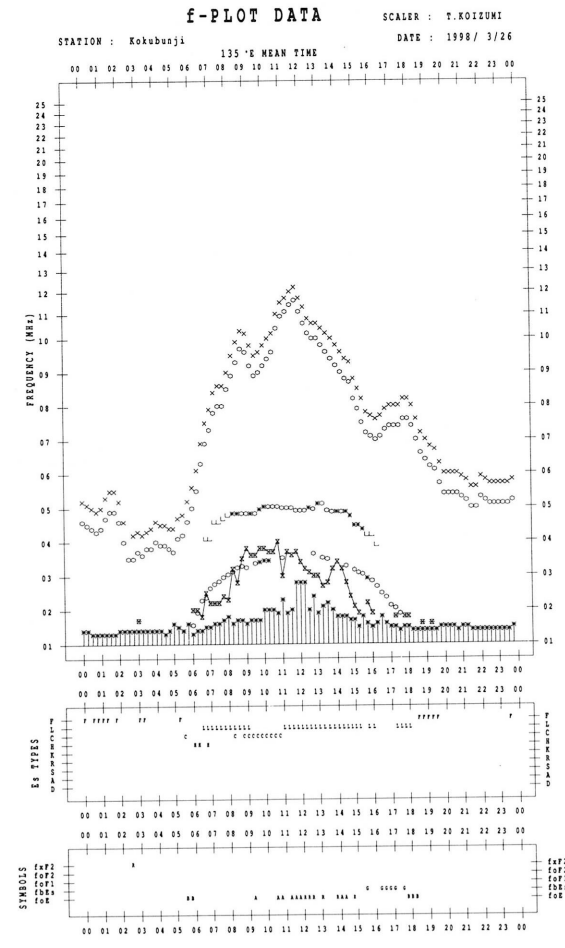
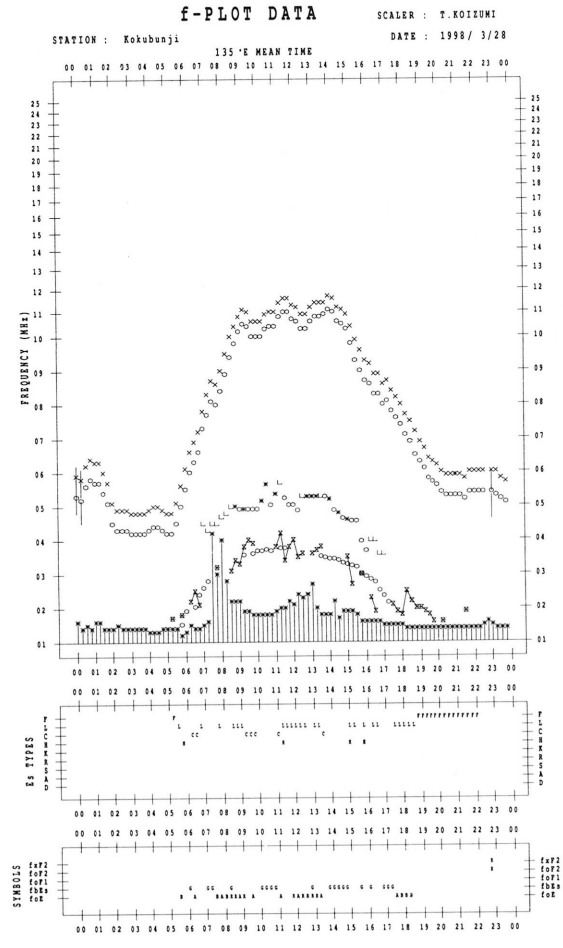
STATION : Kokubunji
DATE : 1998/ 3/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

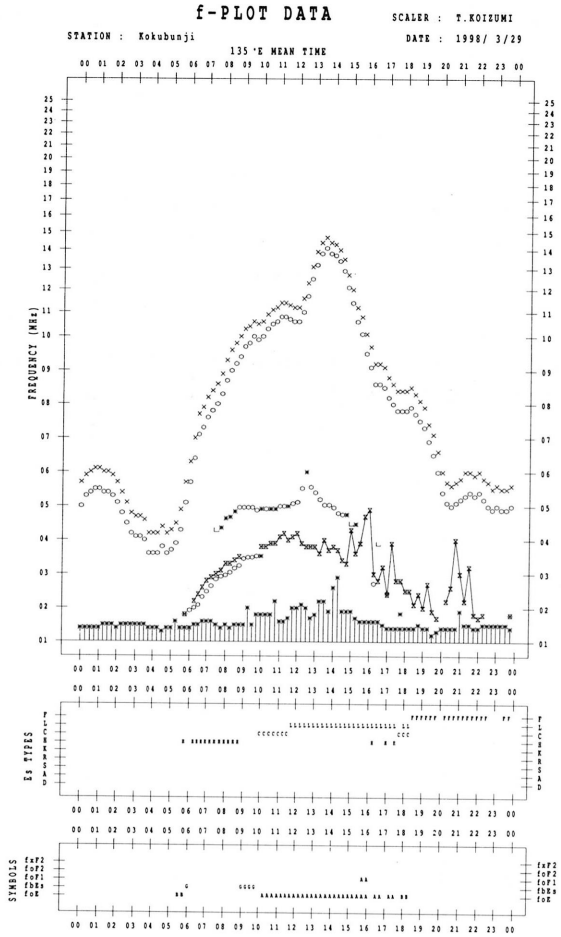

f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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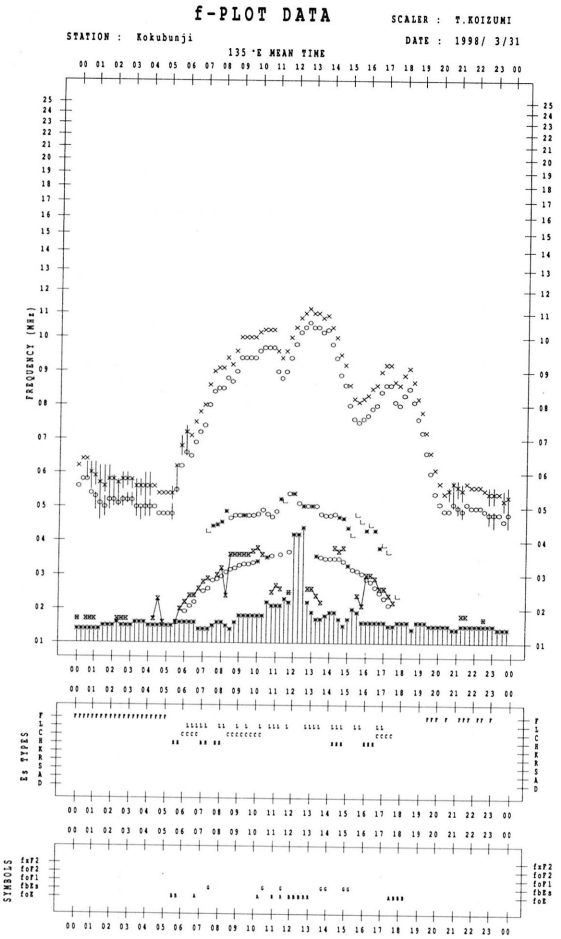
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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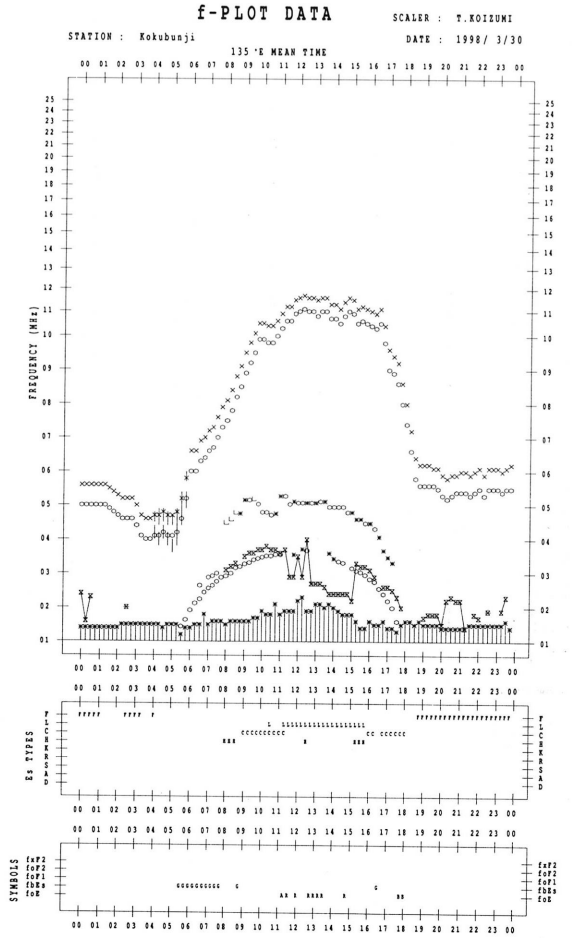
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : T.KOIZUMI
STATION : Kokubunji
DATE : 1998/ 3/30
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

B. Solar Radio Emission

B1. Daily Data at Hiraiso

500 MHz

Hiraiso March 1998

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

Note: No observations during the following periods.
2nd 0600 - 2nd 0700

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso

March 1998

Single-frequency observations

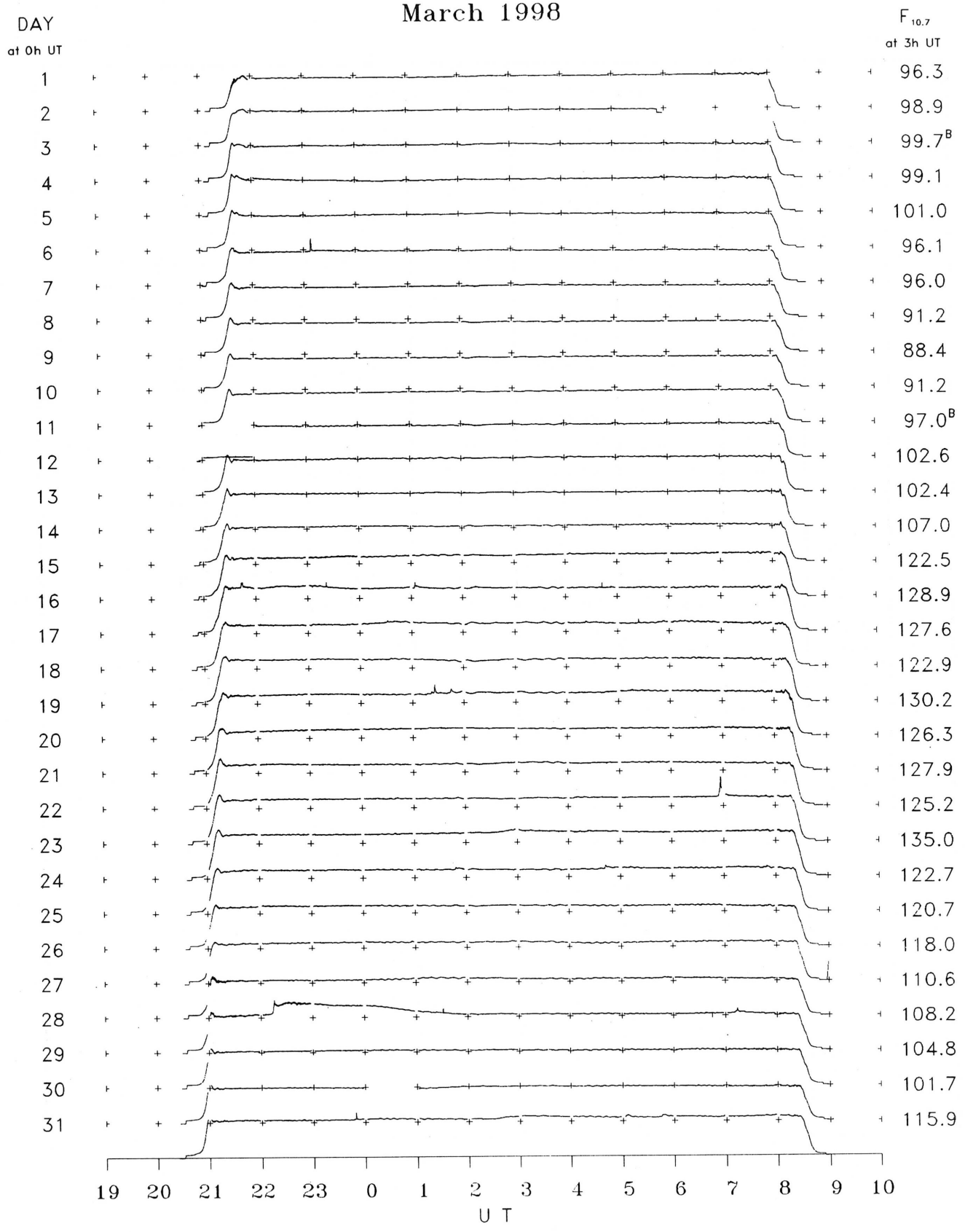
Normal observing period: 2050 - 0850 U.T. (sunrise to sunset)

MAR. 1998	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} Wm^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
5	500	42 SER	2307.9	2308.1	0.7	3	-	0
	2800	46 C	2307.9	2308.2	2.0	27	9	0
11	500	42 SER	0307.1	0308.9	2.0	15	-	0
	200	8 S	0307.4	0307.6	0.5	15	-	0
14	200	8 S	0628.5	0628.7	0.5	20	-	0
17	500	42 SER	0524.5	0524.9	0.6	12	-	0
	2800	8 S	0524.9	0525.0	0.2	7	-	WL
18	500	8 S	0211.0	0211.1	0.2	30	-	WL
	500	8 S	0235.5	0235.6	0.2	30	-	WL
19	500	46 C	0125.5	0126.0	3.2	15	2	0
	2800	3 S	0126.1	0126.5	2.0	17	6	0
22	500	46 C	0654.7	0656.0	3.0	22	3	0
	2800	3 S	0655.0	0657.0	4.2	40	12	0
	200	46 C	0656.5	0657.5	2.5	45	5	0
26	500	27 RF	2305.0	0000.0	150.0	20	6	WL
27	500	42 SER	0042.6	0043.9	1.5	25	-	0
	2800	21 GRF	2214.0	2216.0	166.0	30	8	0
28	500	42 SER	0130.7	0131.6	1.0	80	-	0
	2800	42 SER	0131.2	0131.7	0.6	8	-	WL
	2800	3 S	0712.2	0714.2	5.5	5	2	0
29	500	29 PBI	0243.0	0243.6	7.5	8	2	0
30	2800	1 S	2348.5	2349.0	0.7	13	3	WL
	500	8 S	2348.7	2348.9	0.5	160	-	0
31	200	8 S	0500.0	0500.3	0.6	670	-	0
	500	3 S	0500.0	0505.0	15.0	10	3	0
	2800	20 GRF	0502.7	0505.0	7.5	6	2	0
	500	46 C	0544.5	0545.7	5.0	13	3	0
	2800	20 GRF	0545.0	0546.7	7.5	6	2	0
	200	42 SER	0656.2	0657.5	1.5	13	-	0
	500	42 SER	0656.2	0658.7	2.7	3	-	0
	500	42 SER	0817.0	0817.7	0.9	7	-	0

B. Solar Radio Emission

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

March 1998



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

IONOSPHERIC DATA IN JAPAN FOR MARCH 1998
F-591 Vol.50 No.3 (Not for Sale)

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☎ (042) (327) ７４７８(直通)

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