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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. 2001

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

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

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

MAR. 2001

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	30	G	36	G	G	G	G	G	G		G	63	G	G	G	G	G		
2	G	34	34	G	G	G		32	G	G	G	G	G	G		40	39	29	G		G	G		G
3	G	G	G		G	G	G		G	G	G	G	G	G		G	G	G	G					G
4	G	G	G	G	G	G	G	G		G	42		G	G	G	G	G	27	G	G	G	G		
5	G	G	G	G	G	G		41	G	G	G	G	G	G	G	G	G		G	G	G			
6	G	G	G	G	G				G	G	G	46	G	G	G	G	G	30	G	G	G			
7	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G		24	G		
8	G	G	G	G	G	G	G	G	G	G	42	G	G		G	G		G	G					
9	38	40	32	G	G	G	30	32	G	40	G	G	G		42	G	G	G	48	G	G			
10	G	G	G	G	G	G	G	48	G	G	G	44		G	G	G	G	G	G	G	G			
11	G	G	G	G	G	G	G	G	G	40		G	G	G	G	38				G	G		G	
12	G	G	G	G	G	G	43	G	G	40	42	G	G	G	G	G	G	28	G	G	G			
13	45	G	G	G	G	G	G		G	42		G		G	G	G	G	30	G		G	G		
14	G	31	G	G	G	G	27	G	G	G	G	G	G	G	G	G	35	G	G	G	G	G		
15	G	G	G	G	G	G	28	33	G	43	44	G	G			G	G	G	G	G	G		G	
16	G	G	G	G	G	G	42	G	G		44	G	G		G	G	G	G	G	G	G		G	
17	G	G	G	G	G	G	36		G		G	G	G	G	G	G	G	G	G	G	G	G		G
18	G	G	G	G	G	G		G	39	G	G	G	G	G	G	G	G	G	26	G	G		G	
19	G	G	G	G	G	G	G		G	42	G		G	G	G	G	36	32	G	G	G			G
20	G	39	24	G	G	G	28		G	G	42	G		G		G	G	G	G	G	G			G
21	G	G		24	G	G	43	G	G	G	G	G		G	G	G	G	G	26	G	G	G	G	
22	G	G	G	G	G	34	48	41	44	47	G	43	G	G	G	G	G	G	G	G	G	G	G	
23	G	G	G	G	G	G	46	G	G	G	G	G	G	G	G	G		30	34	36	G	G		G
24	G		G	G		G	G	G	G	G	G	G	G	G	G	40	G	G	G	G	30	G		
25	G	G	32	29	G	G	G	G	G	41	G	G	G	G		G	G		G	G	G			G
26		G	G	G	G	29	G	G	G	43	G		G	G	G	G	39	G	G	G	G	G		
27	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		36	G	G		G	G	G	G	G	G		G		G		G	
29	G	G	G	G		G	41	G	G	G	G	44	G	G	G		G	G	G	G	G	G	G	G
30		G	G	48	34	30	G	G	G	G	G		50	G	G	G	G	G	31	31	27		G	G
31	29		30	34	30	G	G	G	G	42	43	G	G		G		G	G	G	27	32	G		G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	30	29	30	25	25	30	28	27	26	27	26	25	29	28	26	30	25	29	14	10	10
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	38	32	G	40	42	G	G	G	G	G	G	27	G	G	G	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Wakkanai

MAR. 2001

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	18	20	17	20	18	16	15	15	16	20	18	20	20		17	17	21	16	15	16			
2	17	16	17	18	16	15		17	16	16	20	21	18	18		17	16	21	16		17			
3	21	17	18		17	18	17		15	17	18	20	20	18	17	17	16	21	21			30		
4	17	15	17	20	18	17	17	23	17	18	18		20	20	17	17	16	22	15	15	16			
5	17	17	16	18	17	18		17	15	16	18	20	20	21	16	20	15		15	15	17			
6	15	15	18	17	17			15	15	18	20	20	20	20	18	16	17	15	15	15	16			
7	20	18	17	20	16	16	17	15	16		20	20	20	20	18	17	16	21	15	15	17			
8	16	18	18	18	20	20	18	15	16	17	18	22	22	20	18	17		22	15					
9	15	15	18	17	18	17	18	15	17	20	18	49	22		18	18	16	23	15	14	16			
10	15	18	17	16	15	15	18	15	16	18	18	18		18	17	17	16	22	15	14	17			
11	16	16	16	16	17	15	18	14	15	16		17	18	20	20	20		22		15	16			
12	16	15	15	16	15	16	18	17	15	17	20	18	20	20	20	17	16	23	15	15	16			
13	16	17	18	16	18	17	18		16	18		21		18	17	17	16	15	15		16			
14	18	18	16	15	16	17	20	16	16	17	20	22	20	22	18	17	16	22	16	15	16			
15	17	18	17	17	15	17	21	15	16	16	18	21	20			16	16	21	15	15	17			
16	17	17	17	17	18	17	20	15	17		20	20	20		23	15	15	23	15	15	17			
17	16	16	16	16	17	17	20	16	15		20	20	20	21	16	18	20	23	15	15	16			
18	16	16	17	18	16	17		15	15	17	17	20	23	17	20	17	17	16	15	15	16			
19	17	17	15	18	17	16	21	15	16	16	20		20	26	17	20	16	16	16	15	20			
20	17	16	17	20	18	18	17	15	15	16	21	21		23		22	16	24	16	14	17			
21	16	20			15	18	15	15	20	20	20	20		22	20	20	16	18	18	14	21			
22	17	17	18	18		21	21	18	18	20	22	26	23	22	21	20	20	26	17	14	16			
23	18	16	20	20	18	18	18	16	17	20	26		21	26	23	18		15	15	17	20			
24	16		20	17		17	21	16	17	18	21	24	26	24	23	20	17	24	18	16	17			
25	17	16	16	16	18	18	23	20	20	22	22	23	23	23		21	16	15	20	15	18			
26		18	16	16	16	16	24	15	20	21			48	23	22	22	20	17	20	15	20			
27	15	20	16	20	23	18		18	18	20			48	24	24	20	20		18	15	17			
28	17	17	16	18	20	18		16	22	26		52	33	26	22	17	18		20		17			
29	18	18	18	16		22	24	16	23	22	24	26	55	21	21		18	16	20	15	17			
30		20	16	18	15	17	27	17	20	23	49		33	22	51	26	20	17	15	14	18			
31	18		15	15	16	20	26	17	20	20	27	26	24		22	20	16	15	21	16	18			
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	29	30	29	28	30	25	29	31	28	26	25	27	27	26	30	28	28	30	26	29	1		
MED	17	17	17	17	17	17	18	16	16	18	20	21	20	21	20	18	16	21	16	15	17	30		
U Q	17	18	18	18	18	18	21	17	18	20	21	23	24	23	22	20	17	22	18	15	17	15		
L Q	16	16	16	16	16	17	17	15	15	16	18	20	20	20	17	17	16	16	15	15	16	15		

HOURLY VALUES OF foF2 AT Kokubunji

MAR. 2001

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	47	38	47	57	47	42	48	94	117	115	108	121	124	123			134		86	68		69	60	60
2	57	66	69	57	56	48		81	95	116		148	142	140	142	140	131	118	98	82	93	68	69	63
3	51		56	57	56	46	61		92	112	123	140	140	137	138	131	121	122	104	81	81	68	60	56
4	52	50	57	50	44	44		93	94	114	115	126	132	133	131	121	115	113	103		94	70	64	68
5	68	68	68	70	43	47	56	92	106	124	132	123	123	132	127	114	107	115	93	82	92	63	68	69
6	58	57	56	57	52	44			107	115	125	131	141	130	124	124	123	112	119	80	68	70	63	60
7	68	67	67	59	43	51	64	93	116	106	107	110	115	122	126	122	115	113	104	81	82	70	58	58
8	69	63	57	59	50	50	71	94	116	121	124	134	130	121	122	124	107	122		81			60	57
9	60	67	58	64	50	50	55	100	114	117	117	128	132	132	132	123	114	112	103		94	92	60	69
10	64	60	56	60	57	50	70	82	92	116	122	122	122		122	115	121	122	129	115		68	60	63
11	57	63		57	50	46		95	115	97	120	131	141	150	147	135	130	125	118	94	81		74	
12	70	60	67	60	34	38	69	94	103	95	106	116	130	133	139	127	132	126	107	95	68	60	64	60
13	63	60	68	47	38	44	82	96	134	114	116	133	127	126	131	133	131	120	116	84	86	74	70	70
14	74	68	61	56	54	55	69	82	92	98	128	137	135	132	131	131	131	124	117	92	92	95	73	68
15	70	68	62	60	52	57		92	114	112	115	128	128	131	131	127	118	116	91	80	80	82	92	69
16	70	57	60	60	51	46	64	92	99	108	123	130	136	132	133	123	121	130	114	80	69	69	69	
17	68	60	67	68	56	56		95	116	122	125	128	132	138	137	132	131	123	131	94	94	69	60	74
18	70	63	68	60	55	56		94	114	117	115	118	131	136	132	130	124	A	107					
19															122	116	124	122	129	102	80	68	78	74
20	66	68	94	56	61	57	94	95	94	114	142	137	149	140	152	134	131	126	122	108	101	92	117	100
21		95	81	92	84	85	89		72	68		A		64	64	75	82	85	83	60	63	57	58	58
22	58	56	57	48	44	43	69	82		116	119	138	153	141	137	123	114	114	114	94	76	69	82	63
23	69	70	63	68	57	60	93	94	105	113	116	123	120	124	131	134	125	120	118	115	86	92	93	94
24	A	93	94	60	70	67	94	93	116	126	132	128	126	136	126	117	107	116	130	95	93	94	77	67
25	69	68	68	63	50	58			116	116	132	137	134	133	129	132		130	122	117	93		74	80
26	94	68		68	62	63	96	95	113	116	111	122	130	132	131	127	126	122	119	115	84	94	95	94
27	82		93		55	60	94	113	119	122	118	125	130	131	121	126	127	122	110	100	93	93	93	93
28	94	95	94	73	60	60	99	93	112	135	143	127	130	128	132	125	126	120	118	102	94		94	79
29	76	68	73	74	62	60	93	114	133	136	134	141	142	136	135	132	131		132	117	115	82	94	92
30	94	94	81	76	64	69	94	117	127	130	128	133	133	123	128	128	121	128	132	102	93	93	94	96
31	90	93	94		94	72	98	122	122	129	131	132	134	135	136	109	126	109	122	116	88	94	93	60
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	28	28	30	30	22	26	29	30	28	29	29	29	30	30	30	28	30	28	27	26	30	28
MED	68	67	67	60	54	53	76	94	114	116	122	128	132	132	131	126	124	121	116	94	88	70	72	68
U Q	72	68	77	68	60	60	94	95	116	122	129	135	138	136	136	132	131	123	122	105	93	92	93	79
L Q	59	60	57	57	50	46	64	92	97	112	115	123	127	127	126	122	115	114	104	81	80	68	60	60

HOURLY VALUES OF fEs AT Kokubunji

MAR. 2001

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G		G	G	G	G			G	37	G	G	G	G	G	G
2	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	41	34	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	48	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	32	24	G	G	G	G	32
6	G	G	24	G	G	G			G	G	G	G	G	G	48	G	42	30	31	G	G	G	31	24
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	G	28	29	29	31	G	G
8	G	G	G	G	G	G	G	32	G	G	G	G	G	G	G	G	G	G		G	26	24	G	G
9	G	G	G	G	G	G	G	32	G	G	47	G	G	G	G	G	G	G	G		G	G	G	G
10	G	G	G	G	G	G	G	32	G	G	G	G	G	G	G	G	G	34		47	35	36	G	G
11	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	34	G		G	G
12	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	34	36	35	44	40	G	G
13	G	G	G	29	G	G	25	33	G	G	G	52	49	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	37	32	G	25	28	37	33	40
15	23	G	G	27	G	31	26	G	43	G	47	G	G	G	G	G	40		40	39		G	G	G
16	G	G	G	G	G	G	G	G	G	G	G	G	46	G	48	G	G	G	26	37	32	28	27	29
17	29	38	30	G	G	G	G	G	G	48	G	G	69	58	56	G	G		34	29	24	70	30	G
18	G	G	G	G	G	G	28	G	G	45	G	G	G	G	43	G	G	35	G		G		G	
19	G		G				G	G	G	G	G	G	G		G	G	40	34	54	37	32	28	G	G
20	G	G	G	G	28	G	G	G	44	48	G	75	46	G	G	G	G	G	G	G	G	G	G	G
21		G	G	G	G	G	27	G	G	G		50	G	53	48	G	38	46	64	G	32	G		G
22	G	G	G	G	G	G	G	G	G	62	46	46	G	G	70	59	51	51		71	40		34	G
23	G	G	G	G	G	G	G	G	G	47	G	G	46	G	56	53	43	38	53	44	24	26		34
24	68	54	39	32	26	31	G	G	G	G	G	G	52	G	G	G	G	G	25	28	G	G	G	G
25	G	G	G	G	G	G	G	G	G	G	G	54	G	G	G	G	38	G	32	24	G	G	G	G
26	G	G	G	G	G	G	32	G	G	G	G	G	G	G	G	G	G	G	35	G	G		G	G
27	G	G	G	G	G	G	30	G	G	G	G	G	G	G	G	G	G	G	40	G	G	G	G	G
28		G	G	G	G	G		G	G	G	G	G	G	G	54	42	G	39	31	34	46	24	G	G
29	G	G	28	G	G	G	G	G	G	G	62	G	G	G	52	G	G	G	20	G	G	G	G	G
30	G	G	G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	G	G	32	G	G	G
31	G	G	G	G	G	G	G	G		G	G	G	46	52	G	G	G	G	G	G	26	29	G	25
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	31	30	30	30	26	30	30	30	30	31	31	30	30	30	31	29	28	29	30	27	29	29
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	24	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	48	G	38	34	34	34	32	28	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 Kokubunji

MAR. 2001

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	14	14	15	15	14	15	17	23		42	43			14	15	14	14	15	16	15	15
2	14	14	15	15	14	15		15	15	15	14	18	23	22	18	16	15	15	15	15	14	15	15	15
3	15	15	15	15	14	14	15	14	14	16	20	21		23	20	15	15	15	14	15	15	15	14	15
4	15	15	15	14	15	14	15	17	15	16	17	18	22	16	16	18	15	22	14	15	14	14	15	15
5	15	14	14	14	15	15	16	14	15	16	18	24		32	16	20	14	15	15	14	14	16	15	15
6	15	15	14	14	14	15			16	16	18		46	22	18	16	15	15	14	15	15	15	15	15
7	14	15	15	15	15	14	15	15	15	14	21	22		40	44	18	14	14	15	14	14	14	14	14
8	16	14	14	15	15	15	16	15	15	17	18	21	22		21	16	14	14		16	15	14	15	14
9	15	15	15	14	15	15	18	15	16	17	20		22	20		17	15	15	15		14	15	15	15
10	15	14	15	15	14	15	17	14	16	18	22	20	21		17	14	15	18	16	14	14	14	15	16
11	14	15	15	15	14	15	17	15	15	16	20	27		21		15	15	15	15	14	15		14	14
12	15	14	15	15	14	15	15	16	15	15	18	18		26	16	17	16	14	14	15	14	14	14	14
13	14	14	15	14	15	15	18	15	15	17	17	20	30		20	18	15	15	14	15	15	14	15	15
14	15	14	15	15	14	15	18	14	15	16	18	20	29	20	20	16	16	16	15	14	15	15	14	15
15	15	15	14	15	16	14	17	15	16	17	15	24	30	16	23	17	15	14	14	14	14	15	14	15
16	16	15	15	15	14	15	18	15	16	16	18	23	26	27	18	16	15	14	15	14	14	15	14	15
17	15	14	15	15	14	15	18	15	14	17	18	16	16	20	17	14	16	15	15	14	15	14	14	15
18	14	14	15	14	15	14	17	14	14	16	21	21	23	20	18	14	16	20						
19															41	15	14	15	15	15	14	15	14	14
20	14	15	14	15	15	15	21	14	15	16	17	21		45	23	21	16	15	17	15	14	14	15	15
21		15	14	15	15	15	16	15	18	16		36			22	20	17	14	15	15	14	14	14	15
22	15	14	14	15	16	14	22	18	16	20		36	44	28	21	15	14	14	15	15	15	14	15	17
23	15	15	15	16	14	15	22	15	16	18		48	29	32	26	20	17	15	14	14	15	17	15	14
24	15	14	15	15	15	15	14	15	15	20	22	23	23	22	22	20	15	14	18	14	14	14	15	14
25	14	15	15	15	14	14	17	16	17		30	32	32		27	18	14	14	14	16	16	16	15	15
26	15	14	14	15	15	15	16	16	17	24			50	N	44	18	16	15	15	15	14	15	15	15
27	15	15	15	14	14	15	17	16	17	21		45	62	47	45	21	20	14	15	17	14	15	14	16
28	15	15	15	15	15	14	14	16	14		29			52	27	21	20	15	15	14	14	16	16	21
29	14	15	14	14	14	14	15	16	44		41		74	45	24	32	17	16	20	14	14	16	15	15
30	14	15	15	15	15	15	17	15	22		46	46	54	45		50	16	16	18	14	15	14	15	15
31	14	15	15	15	14	14	24	15	15			45		30	44	21	17	14	18	15	15	14	14	16
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	28	29	30	25	24	24	21	24	27	30	31	31	29	29	30	29	30	30
MED	15	15	15	15	14	15	17	15	15	16	19	22	29	26	21	18	15	15	15	15	14	15	15	15
U Q	15	15	15	15	15	15	18	16	16	17	22	34	45	41	27	20	16	15	15	15	15	15	15	15
L Q	14	14	14	14	14	14	15	14	15	16	18	20	22	20	18	16	15	14	14	14	14	14	14	15

HOURLY VALUES

IONOSPHERIC DATA of Yamagawa is not available due to the ionosonde trouble.

HOURLY VALUES OF foF2 AT Okinawa

MAR. 2001

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	92	82	62	69	70	44	43	54	97	95	116	132		164	168	175	180	182	191		174	141	117	
2	93	70		71	70		26	54	94	115	124	122	134	138	145	154	160	156	146		164	130		
3	94	48	55	60	57	72		54	89	91	120		154	157	168	180	188	184	183		171		154	137
4		124	93	72	73	43		64	107	93	114	119	156	156	166	177	168	183				184	158	133
5	115		96	93		44		54	96	118	124	123	128	138	134	132	128	133	140	142	123	95	92	94
6	80	72	68	70	60	59		59	94	110	126	130	145	151	153	150		156	140		154		158	136
7		96	68	62	60	47			102		102	118	131	N	158	158	172	166	168	A	122		114	93
8	81	82		69	59	42		51	93	110	133	151	172	168	176	171	174	167	166		122	155	136	
9	96	91	94	79	70	46	40	60	100	112	112	120	145	156	161	160	161	144	145	169			111	94
10	96	92	86	94	92	32	N	54	94	122	124	130	137	155	169	171	186	191	168	169	170	120	123	152
11	122	90	82	70	70		69	69	94	105	117	142	163	177	175	168	168	175	167	167			180	
12			113	96		61	38	66	93	99	121	124	145	167	187	185	181		185	183	164	134	116	120
13	116	116	115	70	55	42		82	94	96	122	121	143	134	161	189	183		173		166	177	165	132
14	115	116	92	94		69	60		95	98	132	125	134	161	180	188	184	182	168	170		139		93
15	94	92	92	67	50	59		84	91	112	127	133	148	171	191	193	185	183	183					
16	96	93	96	93	70				96	108	132	120	144	167	170	180	185	180	178	173	162	173		
17		120	116		94	62	49	68	93	124	126	125	139	157	184	188	190	188	184	177			140	156
18			136	133	92	95	95	87	111	120	133	118	139	172	172	161	167	168	168	169	126	140	124	132
19		93	118	116	68	70	54	76	94	102	125	131	143	164	182	184	181	178	173	168	166		136	151
20		121	116		55	56		54	104	124	131	116	119	151	160	172	159	144	143		123		120	113
21	94	94	93	92	85	93			109		93	86	98	118	116	114	119	122	120		94	83	85	84
22	82	72		58	37	59	38		110	118	118	138	165	176	174	176	182		184	167		156		154
23		128	95		76		76	98	94	121	132	117	133	172	188				N					94
24																								
25																								
26																								
27								82	92	94	122			158	155	170	170	164	146	146				93
28	94	96	117	93	60	62	69	90	94	148	132	95	113	147	150			142	147		109		111	96
29	92	94	93	89	74	64	62	87	136	151	122	124	124	154	167	168	180	176	182	167				
30	166	160	156		112		76	91	112	120	125	135	144	152	148	143		150	174	174		174	129	191
31	N	174	152	100	90	81	93	106	121	131		155	146	155	179	169	179	149	170	171			80	77
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	24	24	23	24	22	15	23	28	26	27	26	26	27	28	26	24	24	26	15	16	14	20	21
MED	94	94	94	79	70	59	60	68	94	112	124	124	143	157	168	171	180	168	168	169	158	140	124	120
U Q	115	118	116	94	80	69	76	87	105	121	131	132	146	167	177	180	183	182	182	173	166	173	147	144
L Q	92	86	89	69	59	44	40	54	94	99	118	119	133	151	156	160	167	149	146	167	122	130	112	93

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

MAR. 2001

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

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	37		G	G	27
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	48	G	38	G		G		G	G
4	G	26	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G			33	G	G	G
5	G	G	G	G	25	G	G	G	G	G	G	G	G	G	G	46	48	40	31		G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	G	G	G	56	G	56	48	39	G	36	G		G	G
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	37	35	26		G	G
8	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	65	52	59	55		24	G	26	G
9	G	G	G	G	G	G	G	G	G	G	G	G	G	G	50	G	G	G	G	28		G	G	
10	G	G	G	G	G	G	G	G	G	G	G	G	47	G	G	G	44	G		58	46	28		G
11	G	G	G	G	G	G	G	G	G	G	48	52	G	G	49	G	G	37	G	24	G		G	
12			G	G	G	G	G	G	G	G	G	G	46	G	G	44	G		G	G	G		35	38
13	26	G	G	22	26	G	G		G	G	G	G	G	G	G	G	83		42		29	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	G		G	G	G	G	G	G	G	G	G	G	G	G		46	50	26	
16	23	G	G	G	G	G	G		G	G	G	G	G	G	G	G	44	40	31	24	G	G		
17		G	G	G	G	G		G	G	G	G	G	G	G	G	47	47	48	35	G	26		G	G
18	G		G	G	G	G	G	G	G	G	48	76	G	G	G	G	G	G	34	G	26	30	24	27
19	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	G	28	G		G	G
20		G	G	G	G	G	G	G	G	50	54	65	88	74	G	G	G	G	G	G	G	G	23	40
21	48	38		G	G	G		29	G		G	49	G	61	G	G	G	G	33	30	38	29	59	35
22	G	G	G	G	G	G	G	G	G	G	G	G	G	59	66	G	67		48	40	G	24	G	G
23		G	G	G	G		G	29	G	G	G	G	48	G	G	G		58	38	34	G	G	G	G
24																								
25																								
26																								
27								G	G	G	G	G		G	G	G	G	42	48	28	27	24	G	G
28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G
29	G	G	G	G	G	G	G	G	G	G			G	60	64	G	G	38	39	41	24	G	G	
30	G	G	G	G	G		G	38	G	42	G	G	G	G	G	G	G	G	G	27	G	G	G	G
31	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	64	80	G	G	G	32	G	G	43
	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	26	27	26	25	23	26	28	27	27	27	27	28	28	28	27	25	26	21	26	21	26	23
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	16	28	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	47	39	38	35	27	24	G	27
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

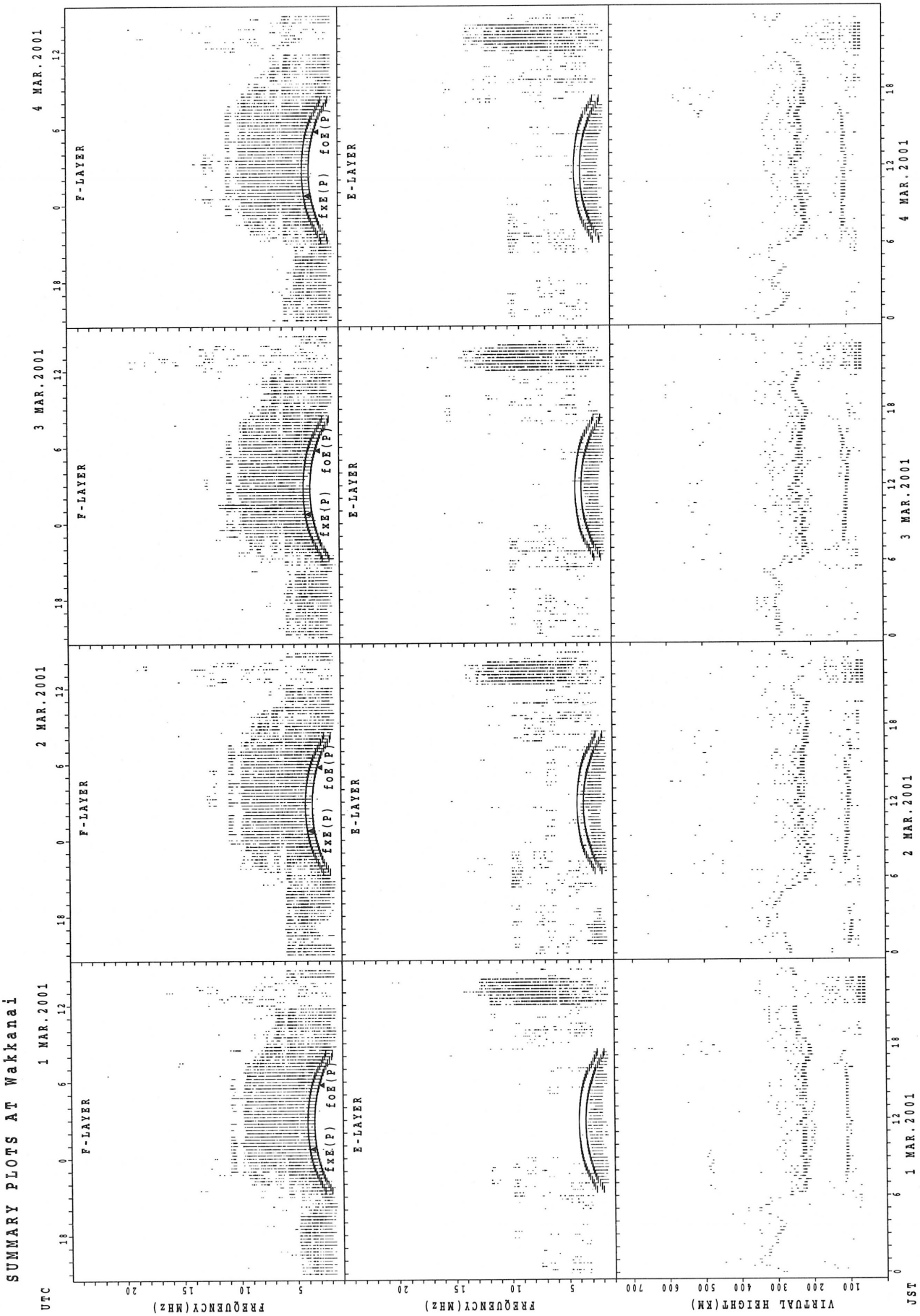
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

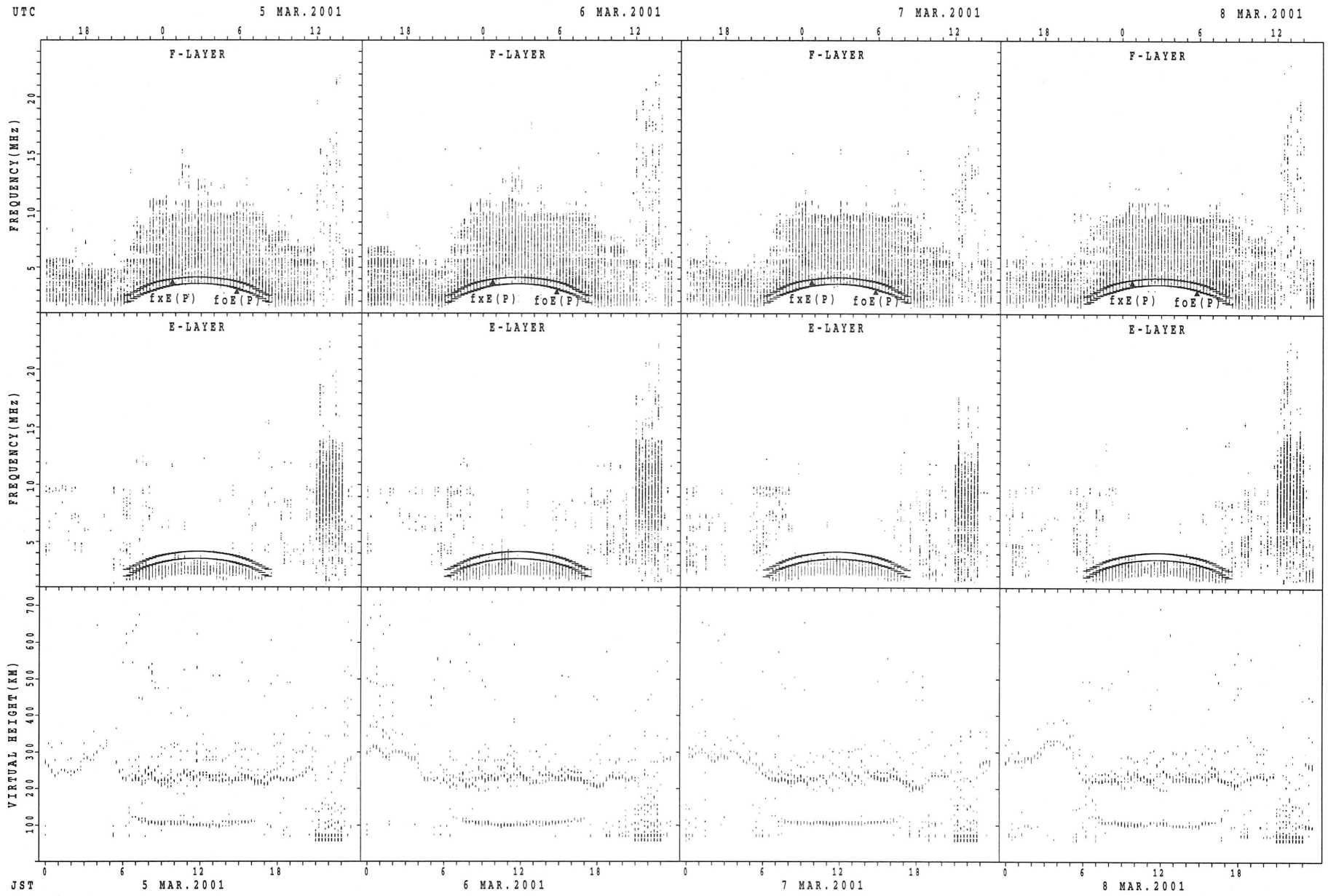
MAR. 2001

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

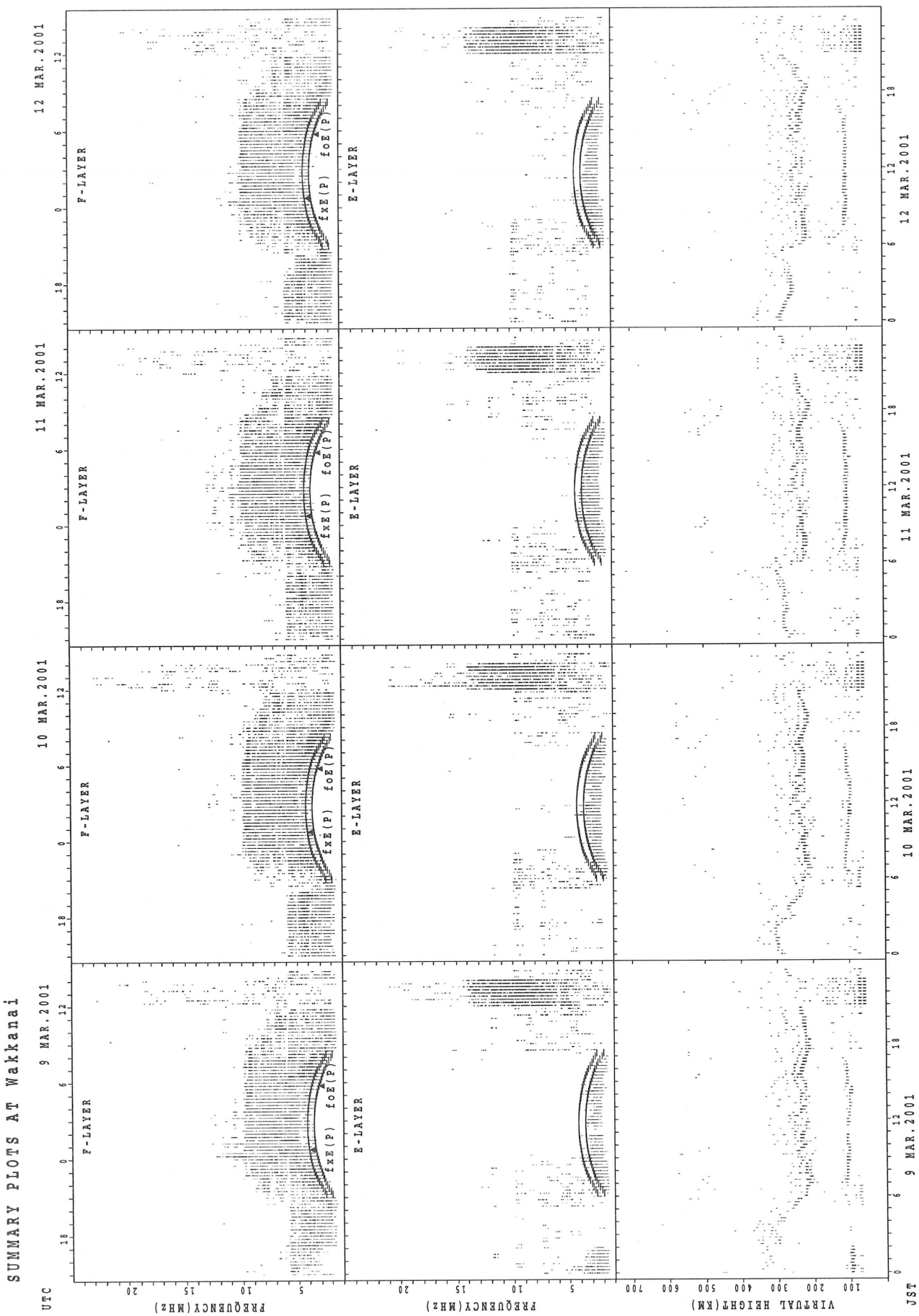
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	15	15	15	14	15	14	18	14	16		40	28		45	22	16	15	14	14	14	17	16	15
2	14	15	14	14	14	14	18	20	16	17		44	48	46	32	29	23	17	21	15	15	15	16	15
3	14	15	15	14	15	14	14	16	28	17		29	30	48	36	38	18	16	14		17		15	14
4	15	15	15	14	14	15		20	15	18		29	29		29	30		14			14	15	14	15
5	15	14	15	14	15	15	16	20	15	17		44	32	37	36	32	20	17	15	14	16	15	15	15
6	14	15	15	15	14	16		20	15	16	28	28	30	30	30	29	16	15	14	15	15		15	16
7	15	14	14	15	15	14	15	21	15	18		47	45	47	48	44	24	17	17	14	15		15	14
8	15	15	15	15	15	15	15	21	14	17	20	28		48	48	28	26	17	15		15	14	15	15
9	15	14	15	14	16	14	14	21	16	18	28	55	33	46	32	28	22	16	15	15		14	15	15
10	15	15	15	14	14	14	18	21	15	23	29	30	29	32		40	24	16	18	14	15	14	14	16
11	15	14	14	15	14	14	18	15	16	20	24	29		34	33	30	20	14	14	14	20		15	
12			15	14	14	14	14	21	15	21	24	30		52	33	30	26		16	14	14	14	14	14
13	14	15	15	14	14	15	15	21	16	26	30	28	30	30	36	29	18		15		15	16	15	14
14	14	14	14	15		15	14	14	15	17		29		50	48	46	27	15	14	14	15	17	15	15
15	15	15	15	15	14	18		21	15	17	28	28	29		47	45	22	17	26	14	15	14	14	
16	14	15	15	15	14	15	17	16	16	18	28		54	50	48	33	28	16	14	15	15	15		
17		15	15	15	14	15	14	21	15	18	22		48	50	49	36	18	17	16	15	15		15	15
18	14		15	14	14	15	15	22	18	20	24	28	29		47	45	37	29	14	15	15	14	16	15
19	15	14	15	15	15	15	15	23	16	17	27		48	48	48	29	26	18	15	15	17		15	15
20		14	15	14	15	15	15	15	15	15	26	40	40	48	46	48	35	16	14	15	15	15	15	14
21	14	15	14	15	14	15		15	16		22	29	54	45	48	46	27	30	14	14	14	14	14	15
22	16	15	15	14	15	18	14	15	16	27	29	49	49	45	39	48	27		15	14	24	16	15	15
23		15	15	15	15		15	16	16	21	28		30	48	53	63			30	15				
24																								
25																								
26																								
27								49	52	53	49	50		49	48	28	29	17	15	14	14	15	15	15
28	14	17	15	15	14	15	15	15	17	29			50	56	64	49	42	20	16		14	17	17	16
29	14	15	17	15	14	14	15	18	38	49	45	44		43	39	29	22	16	14	14	16		16	16
30	15	15	14	15	14		14	16	18	29		48	52	49		64	41	33	18	14	15	16	14	15
31	14	14	15	15	14	15	16	28	17	29	34					33	30	33	17	16	14	16	15	14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	25	27	27	26	25	23	28	28	27	19	22	21	23	25	28	26	24	27	23	26	20	26	24
MED	15	15	15	15	14	15	15	20	16	18	28	30	33	48	46	33	25	17	15	14	15	15	15	15
U Q	15	15	15	15	15	15	16	21	16	26	29	44	48	49	48	45	28	17	17	15	15	16	15	15
L Q	14	14	15	14	14	14	14	16	15	17	24	29	29	43	34	29	20	16	14	14	14	14	15	14


SUMMARY PLOTS AT Wakkanai
1 MAR.2001
2 MAR.2001
3 MAR.2001
4 MAR.2001
UTC
JST
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

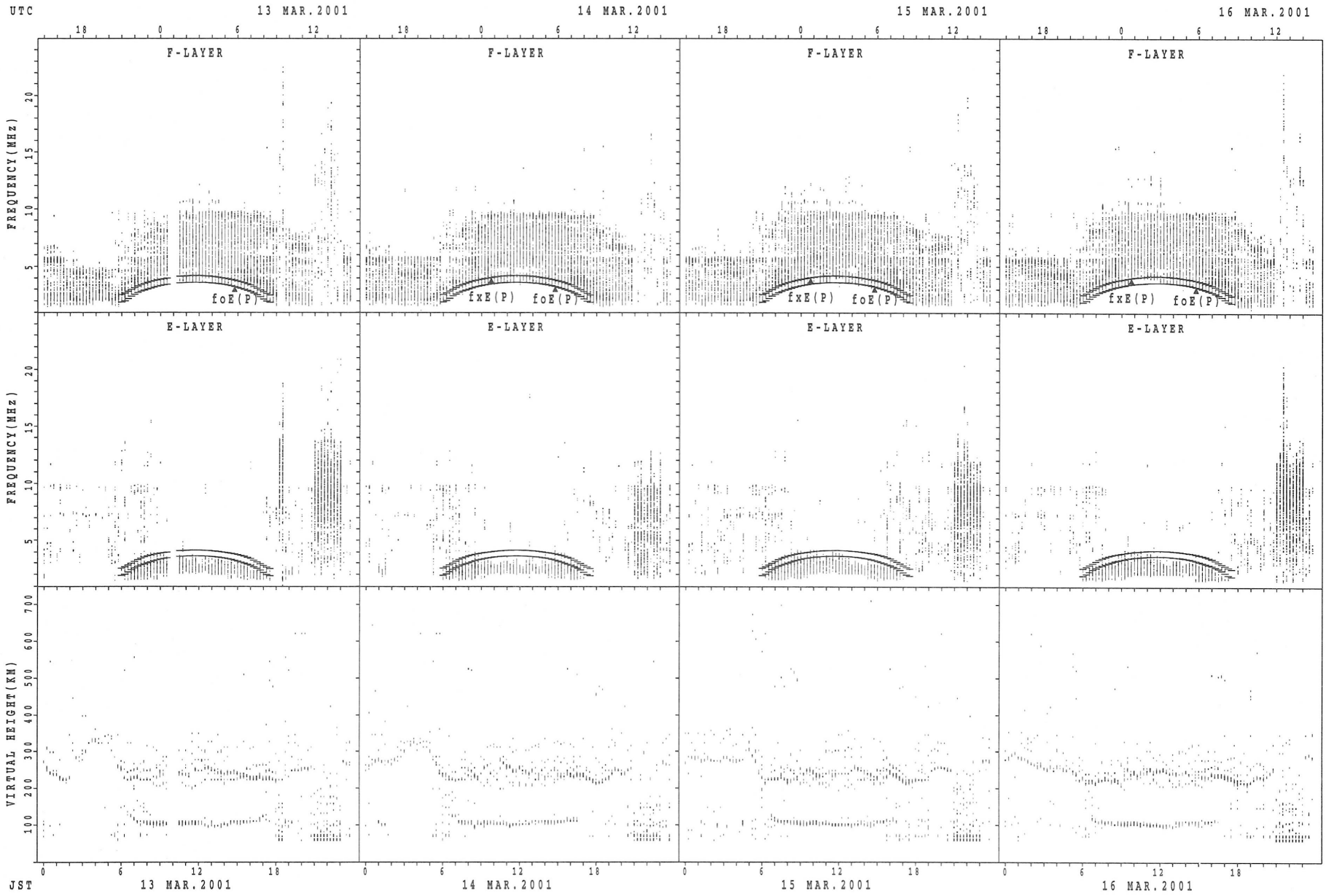
SUMMARY PLOTS AT Wakkanai



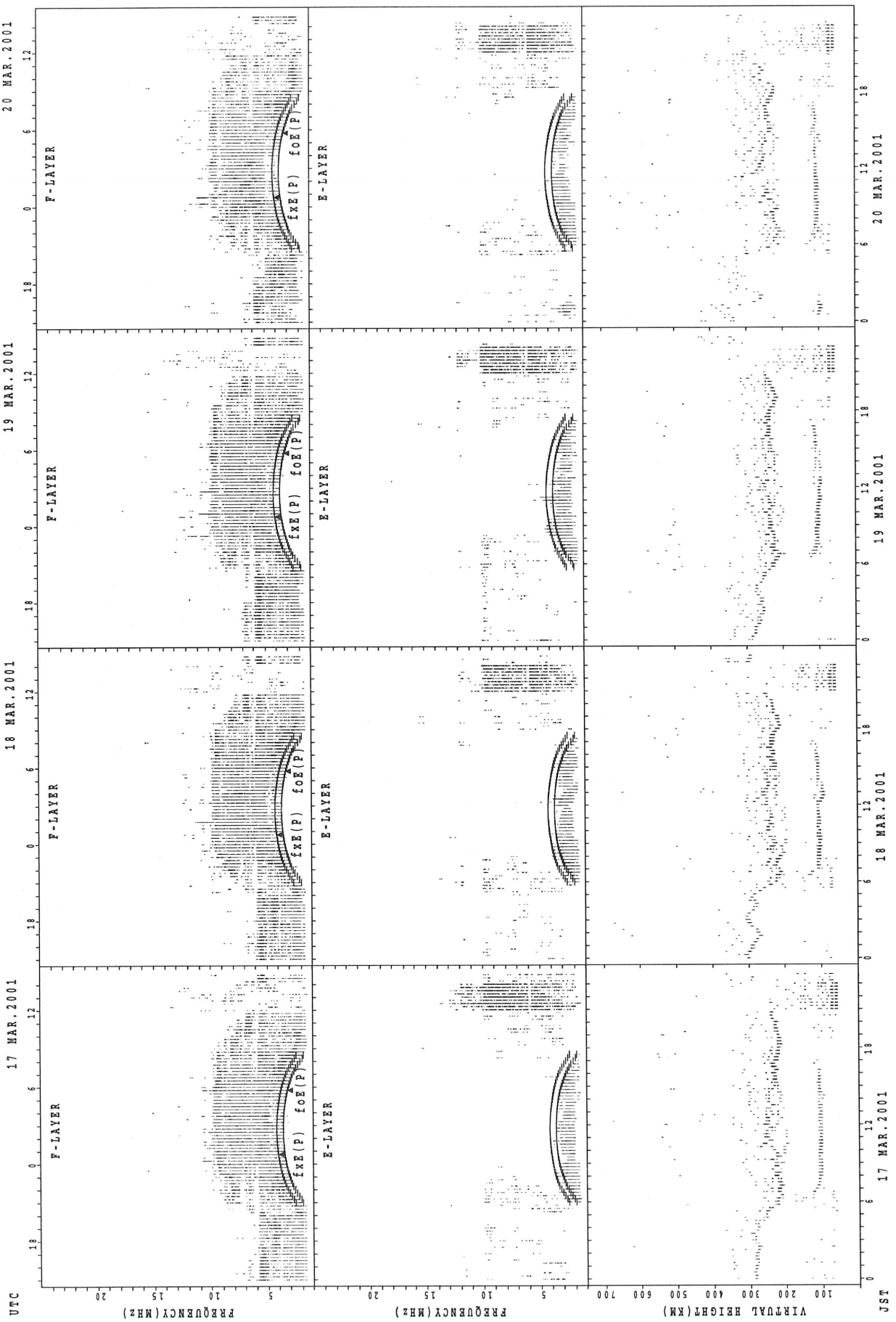
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
9 MAR.2001
10 MAR.2001
11 MAR.2001
12 MAR.2001
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

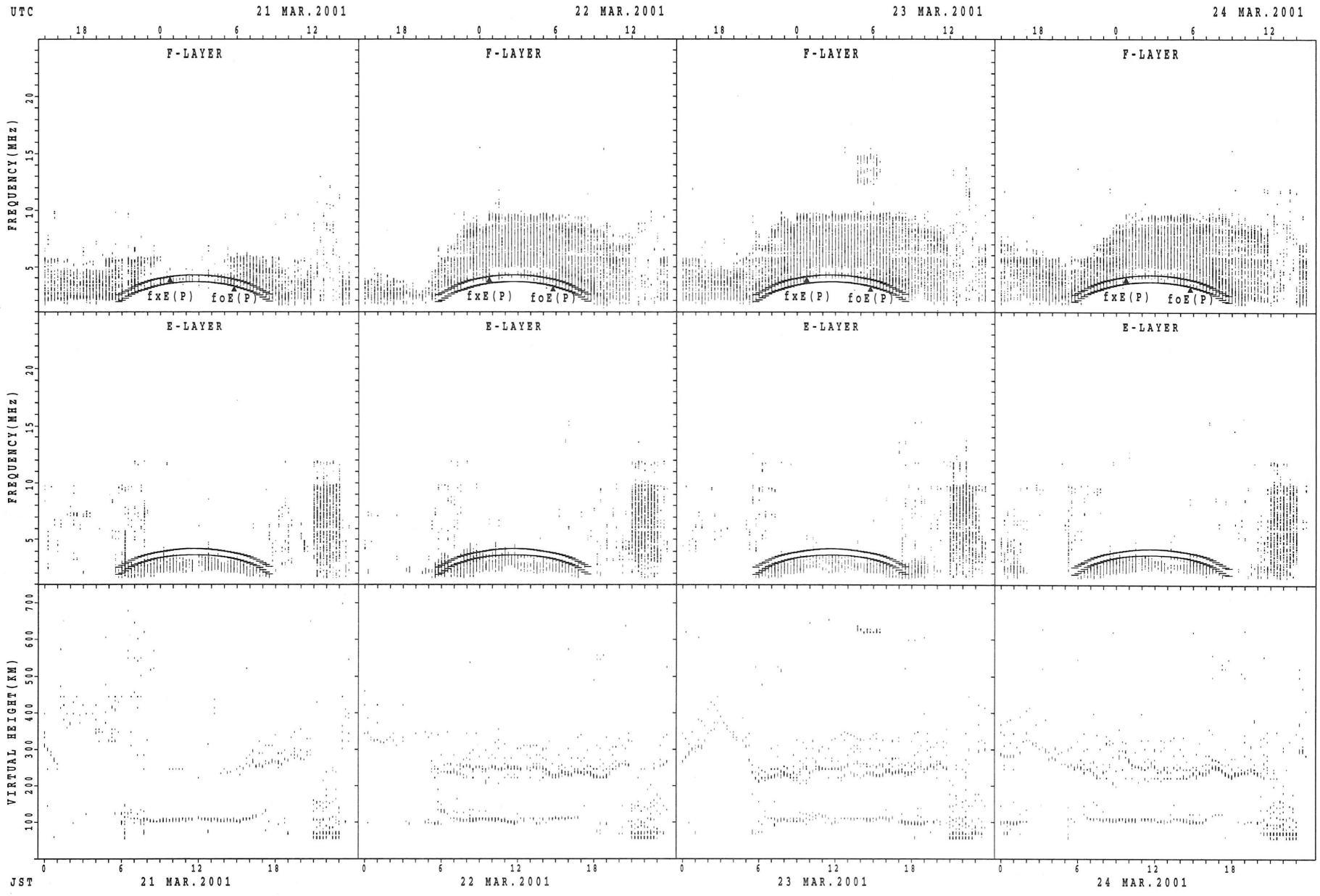
SUMMARY PLOTS AT Wakkanai



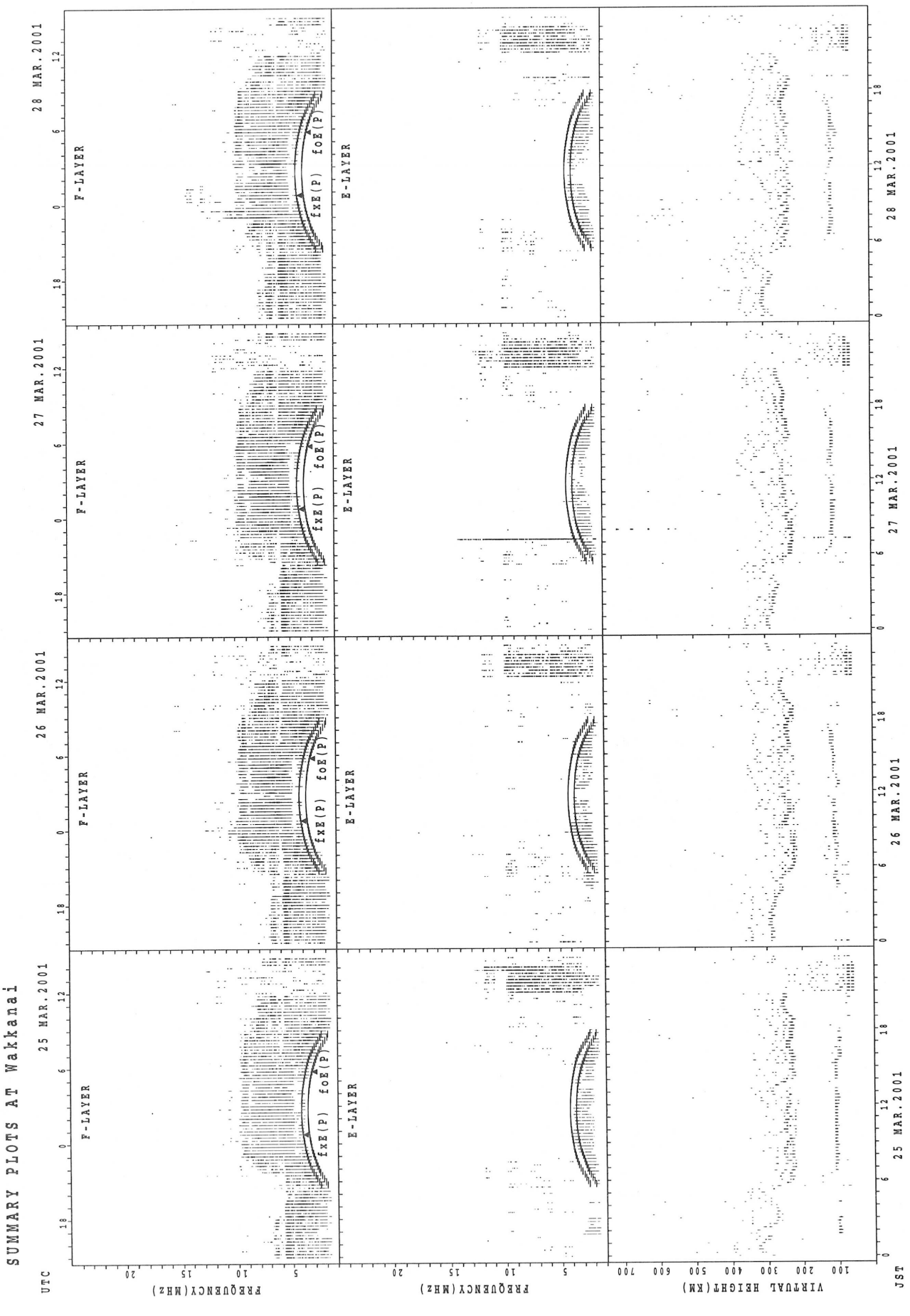
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

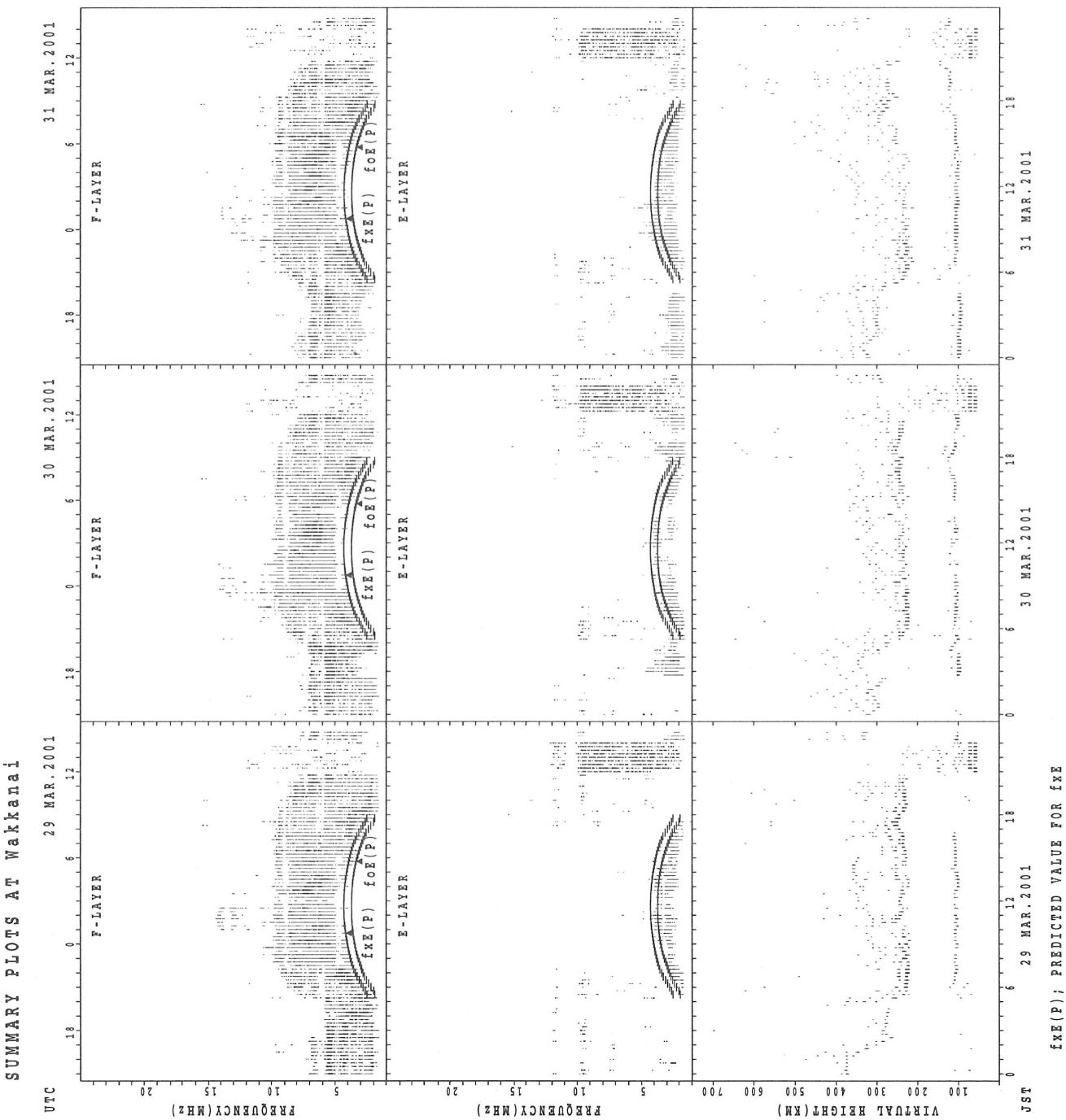

SUMMARY PLOTS AT Wakkanai
UTC
JST
17 MAR.2001
18 MAR.2001
19 MAR.2001
20 MAR.2001
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

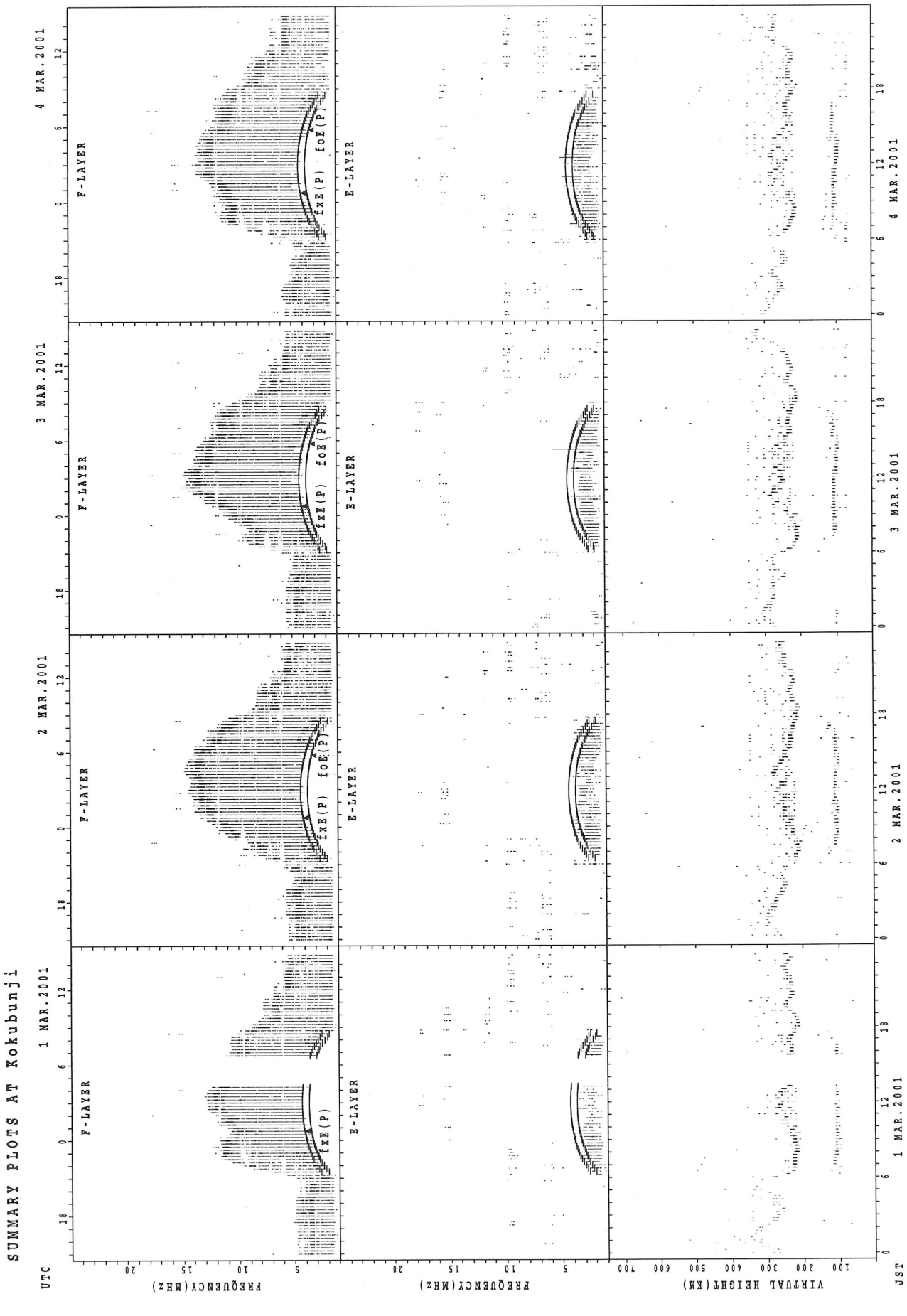
SUMMARY PLOTS AT Wakkanai



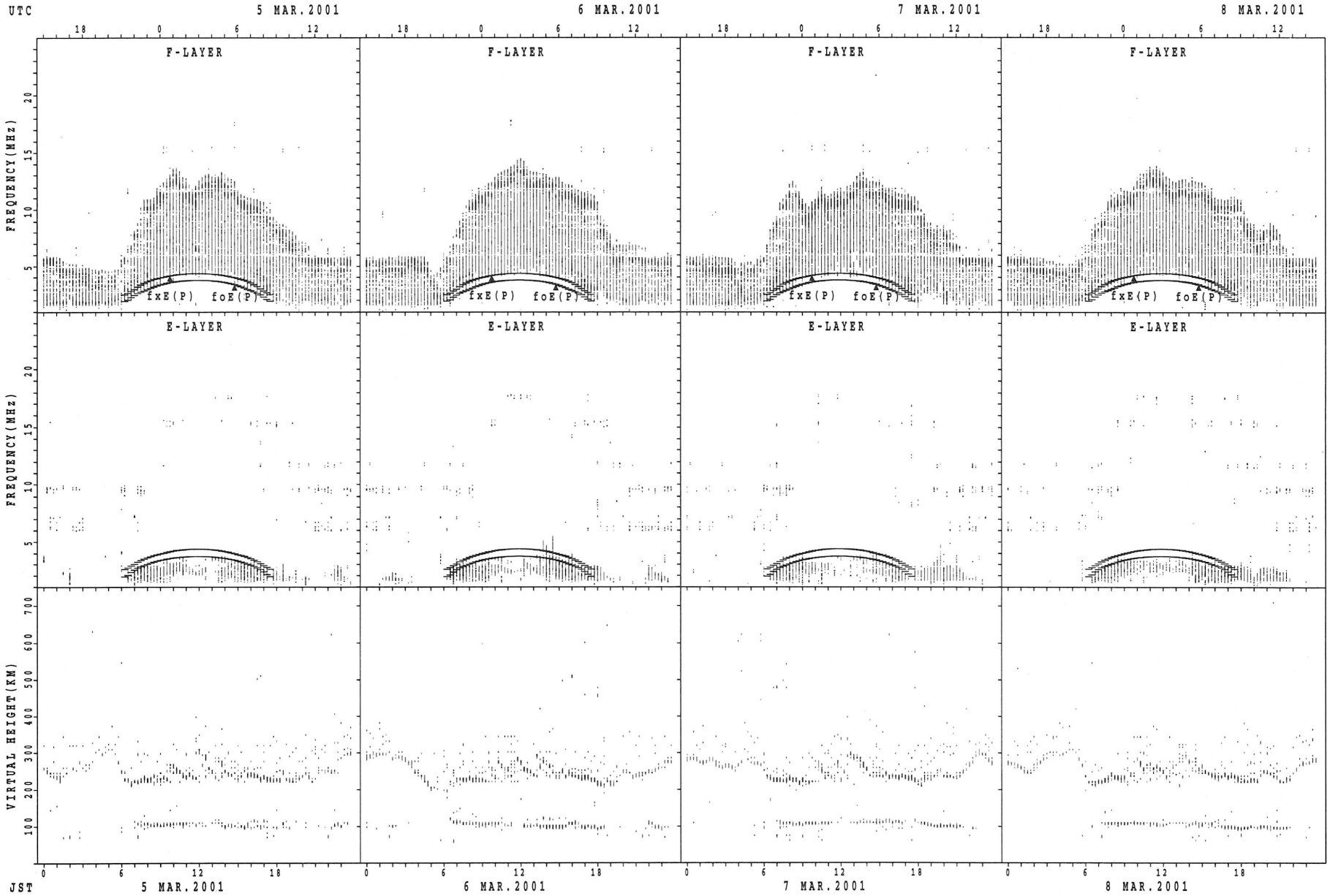
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
25 MAR.2001
26 MAR.2001
27 MAR.2001
28 MAR.2001
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
UTC
JST
29 MAR.2001
30 MAR.2001
31 MAR.2001
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P): PREDICTED VALUE FOR fxE
foE(P): PREDICTED VALUE FOR foE

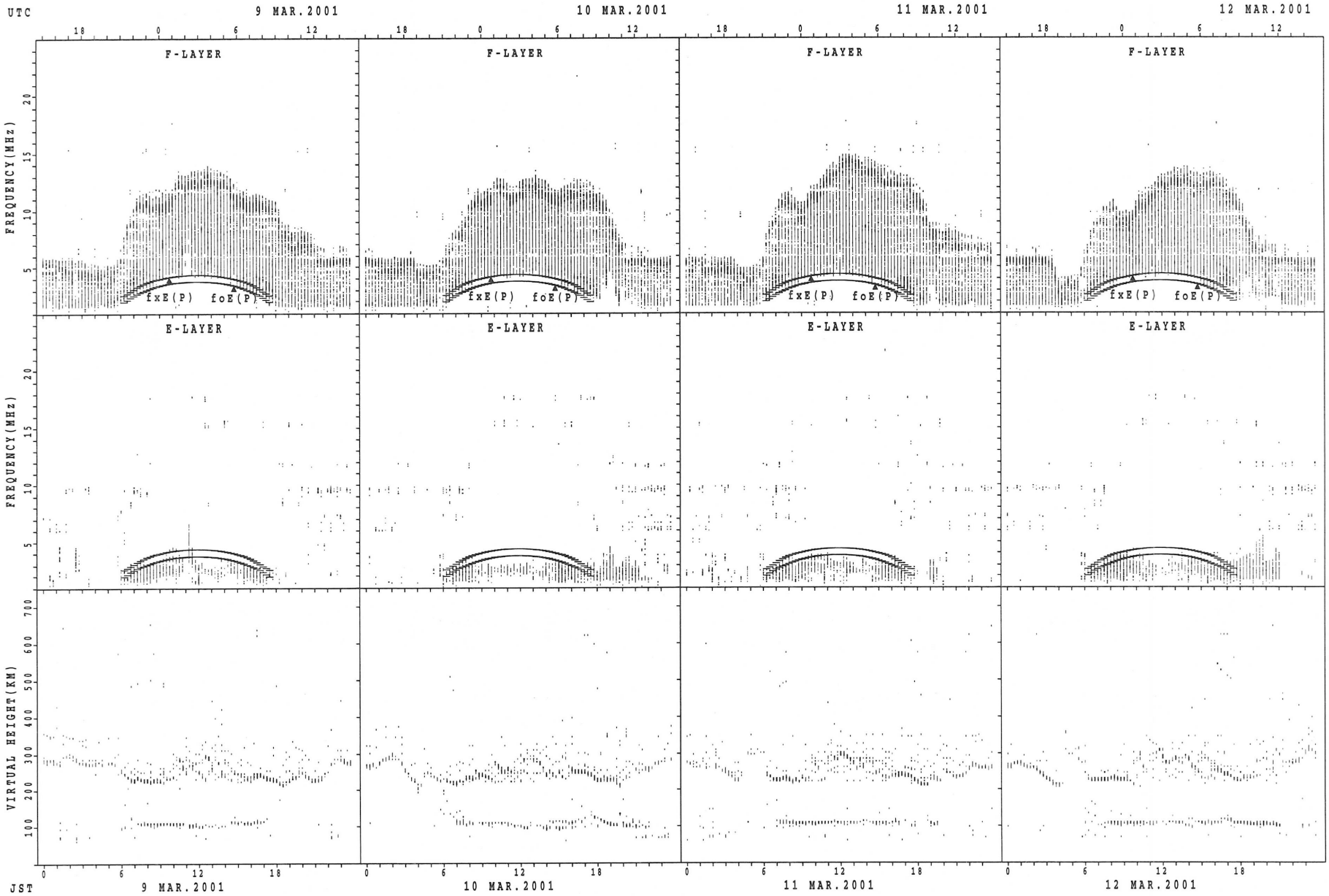

SUMMARY PLOTS AT Kokubunji
UTC
JST
1 MAR.2001
2 MAR.2001
3 MAR.2001
4 MAR.2001
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



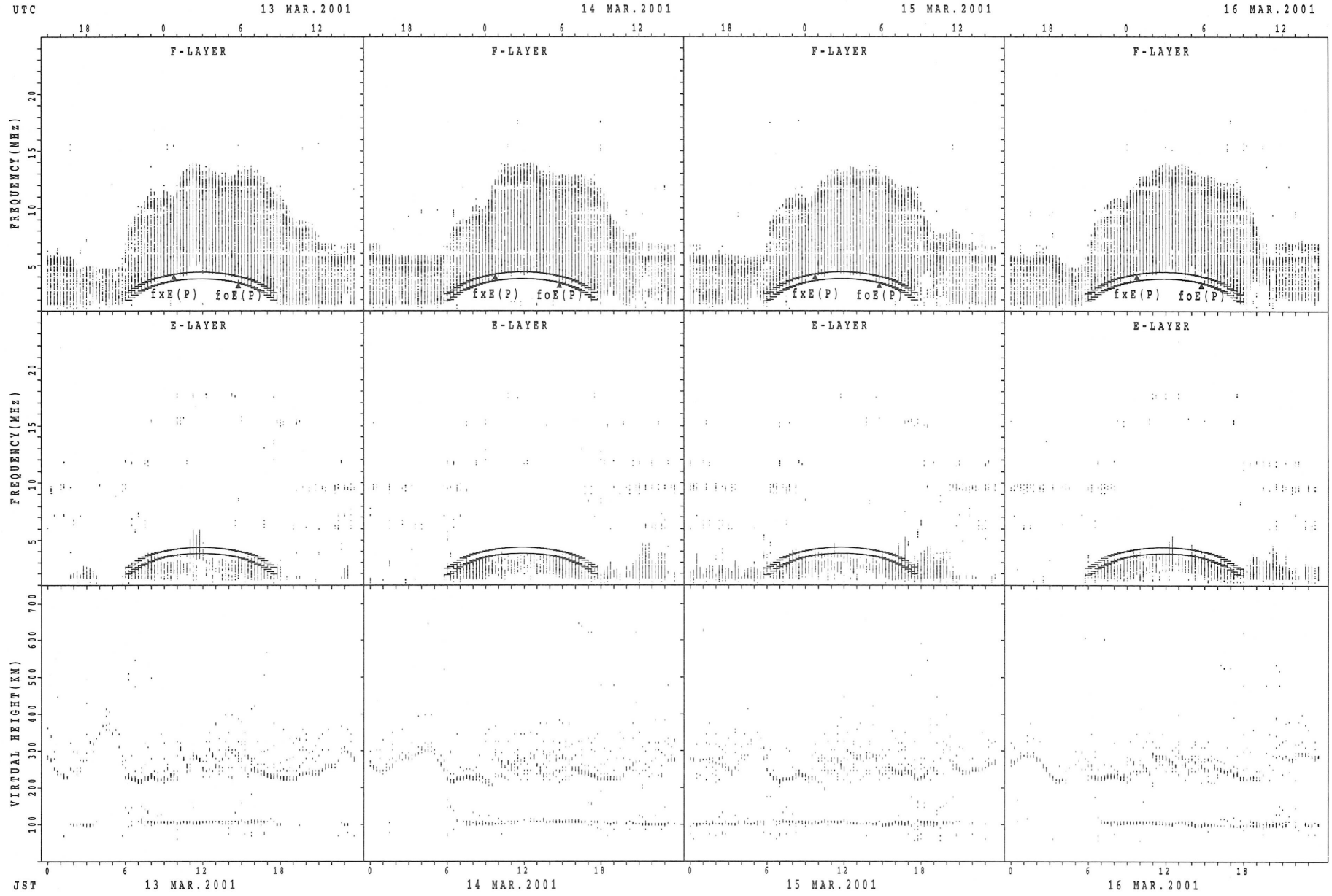
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji

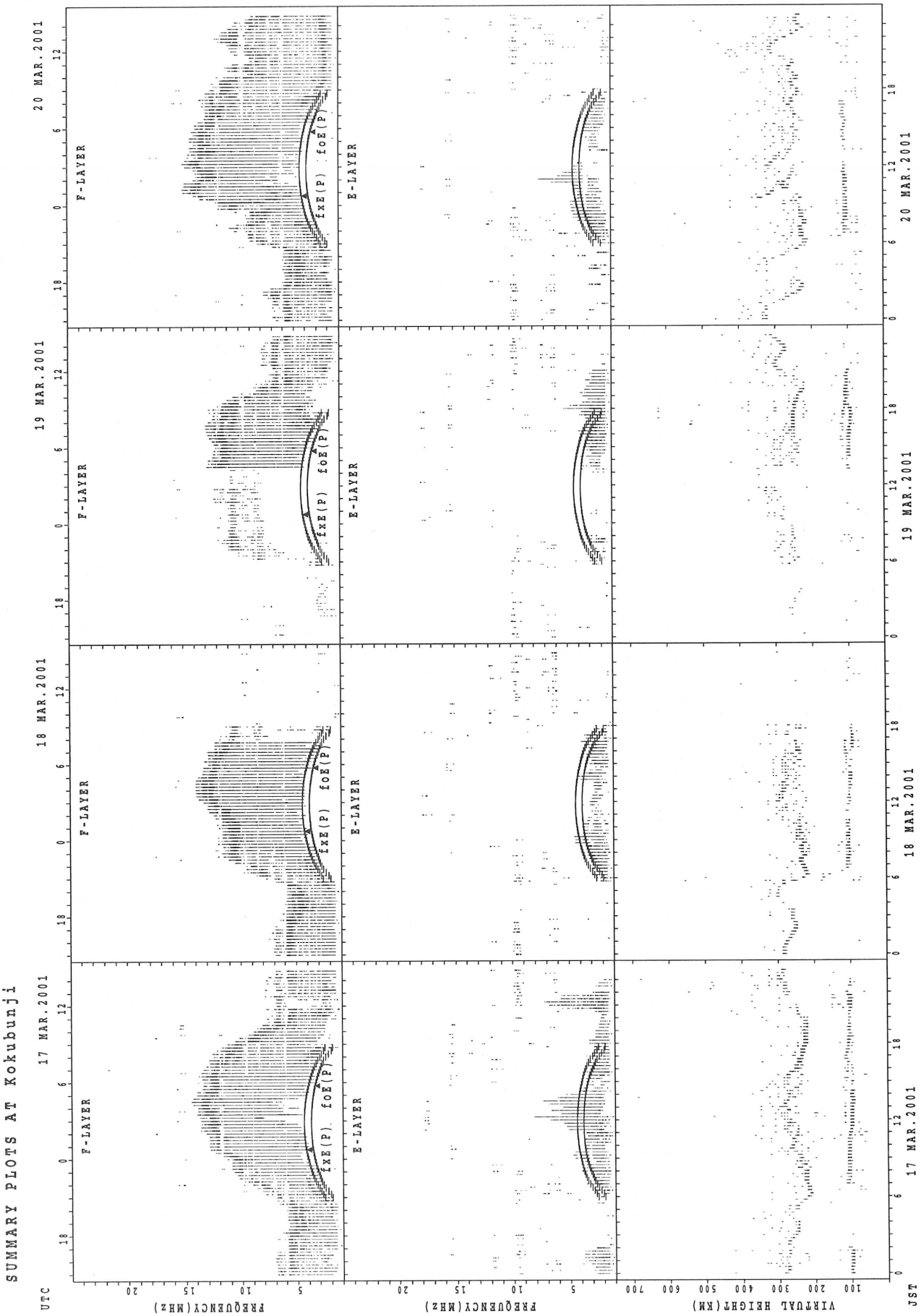


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

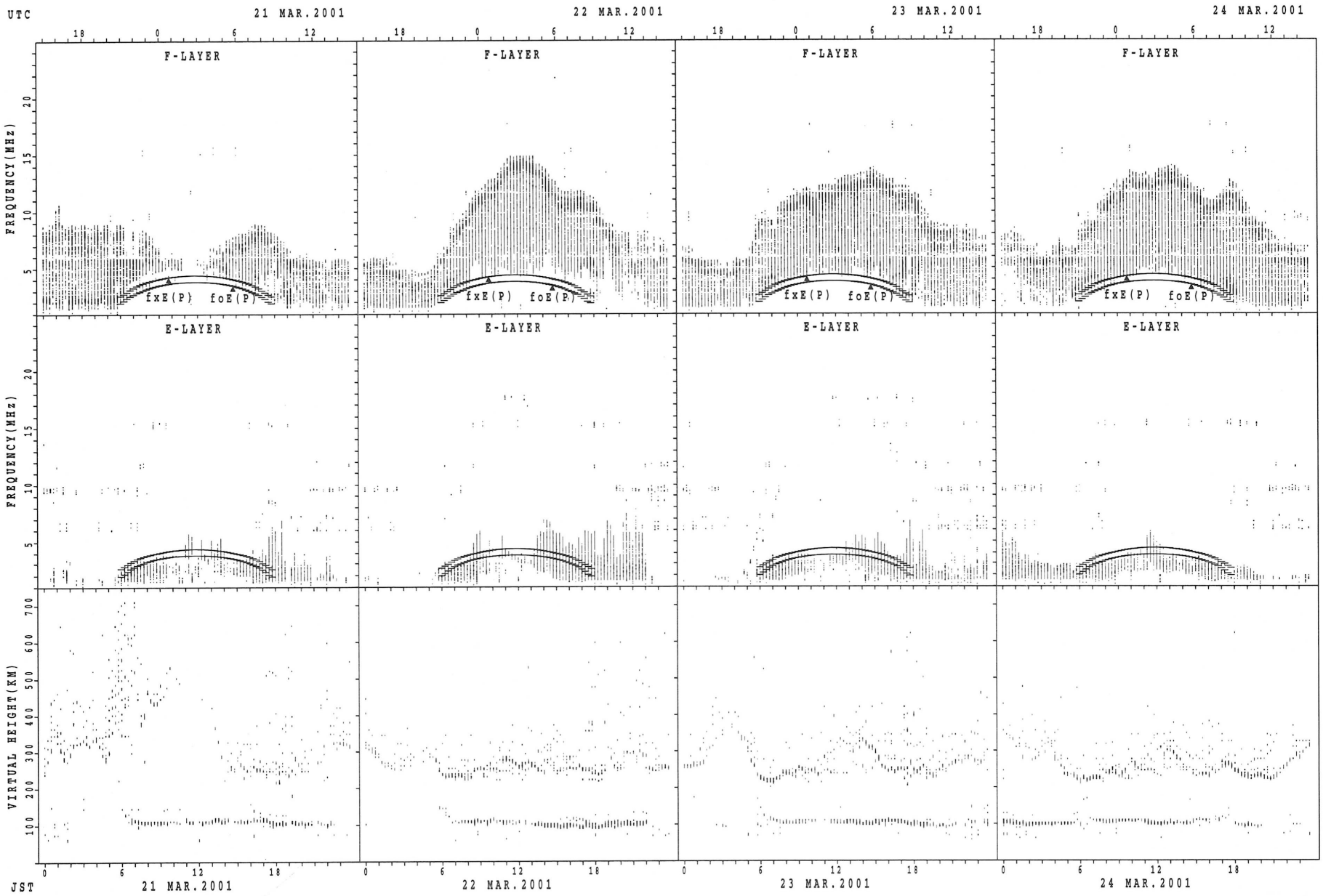
SUMMARY PLOTS AT Kokubunji



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

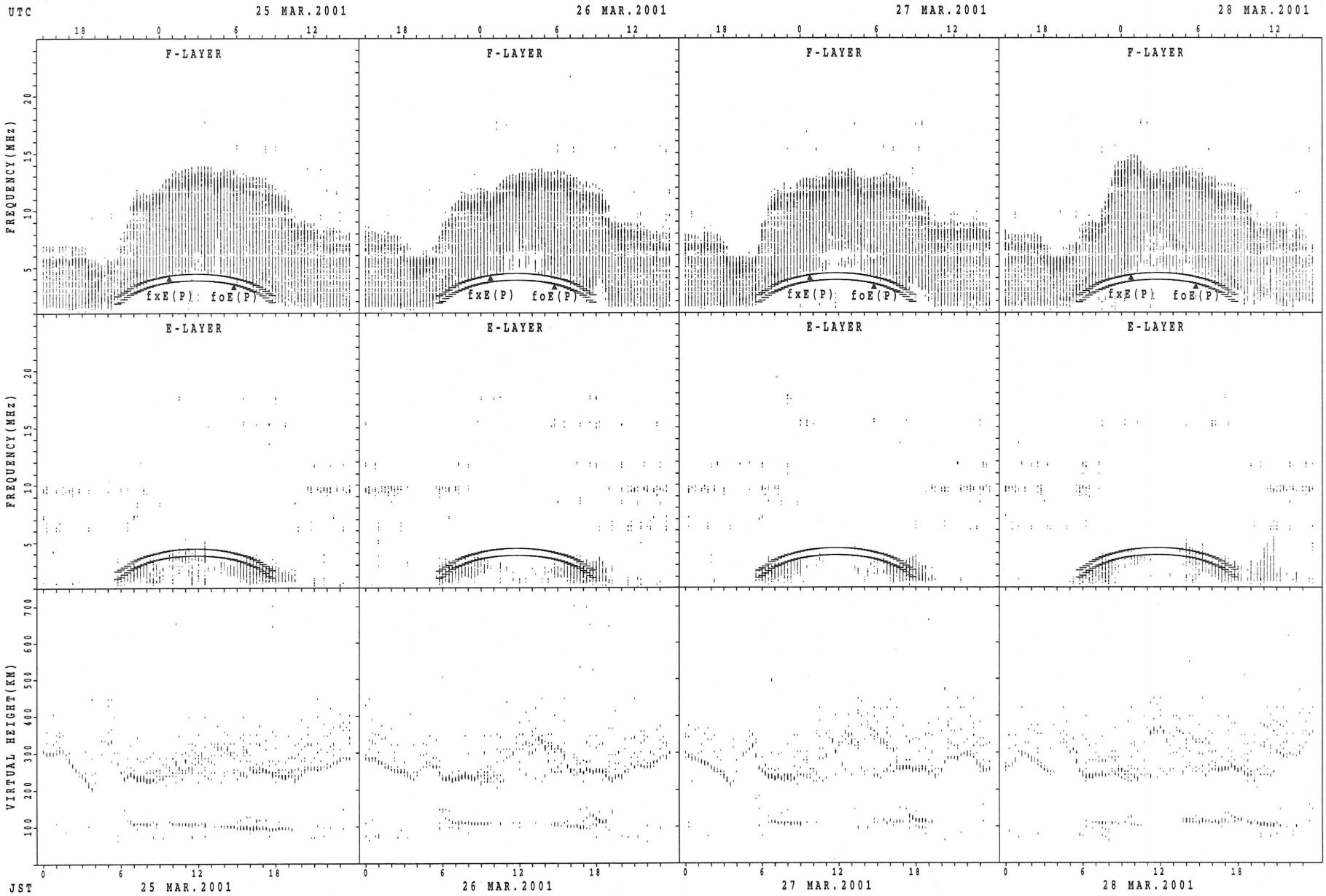

SUMMARY PLOTS AT Kokubunji
UTC
JST
17 MAR.2001
18 MAR.2001
19 MAR.2001
20 MAR.2001
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



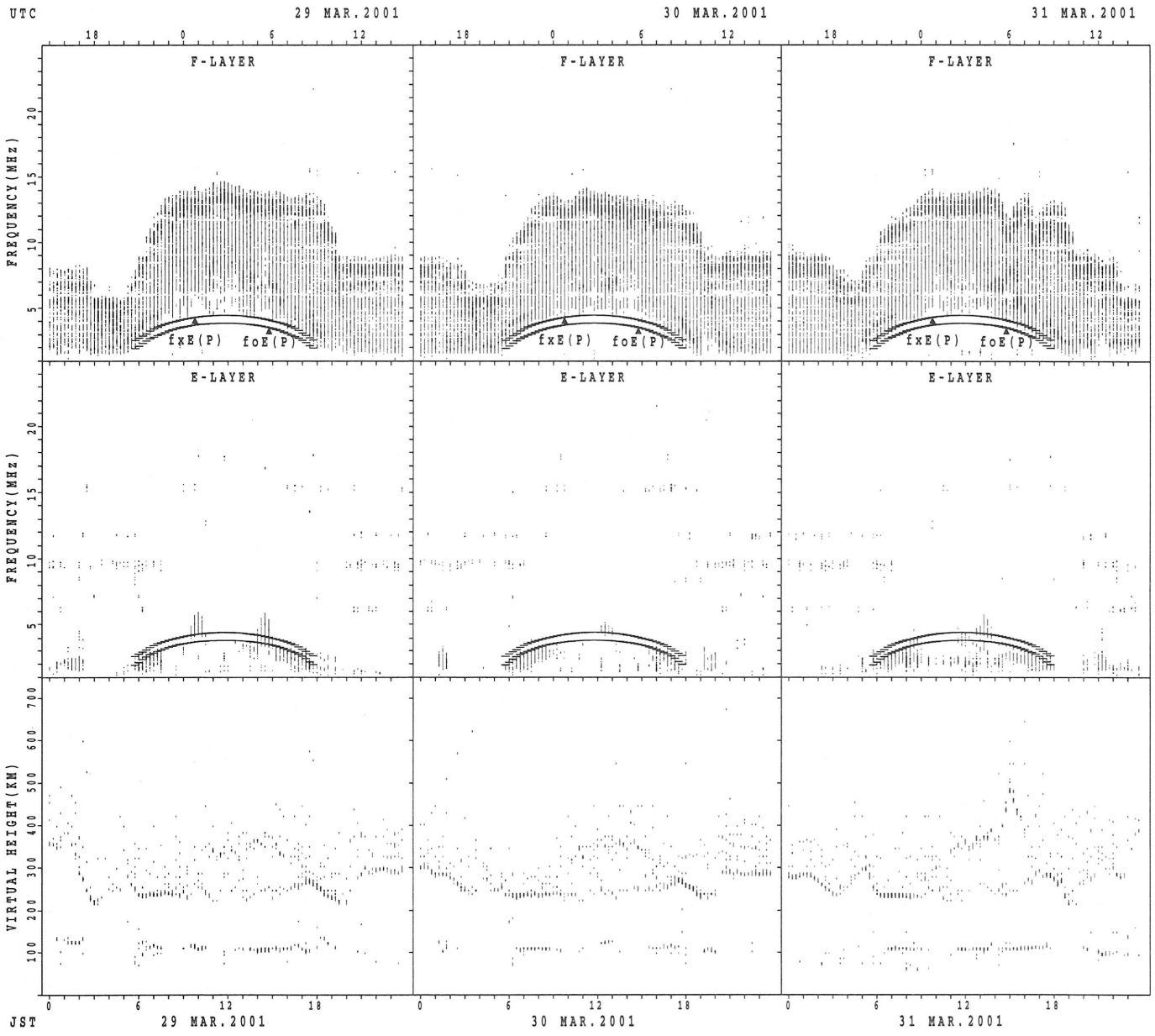
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

SUMMARY PLOTS AT Kokubunji

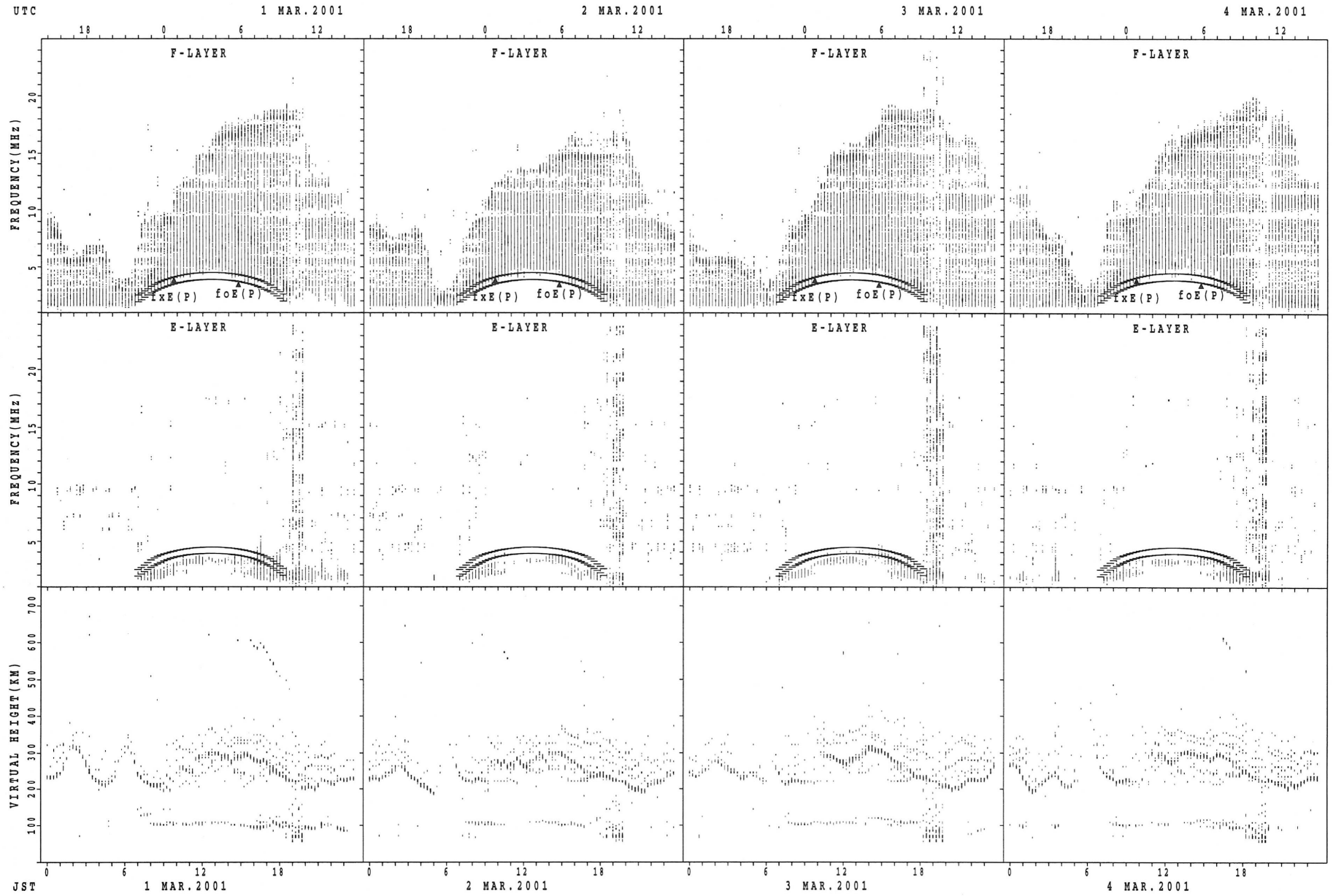


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

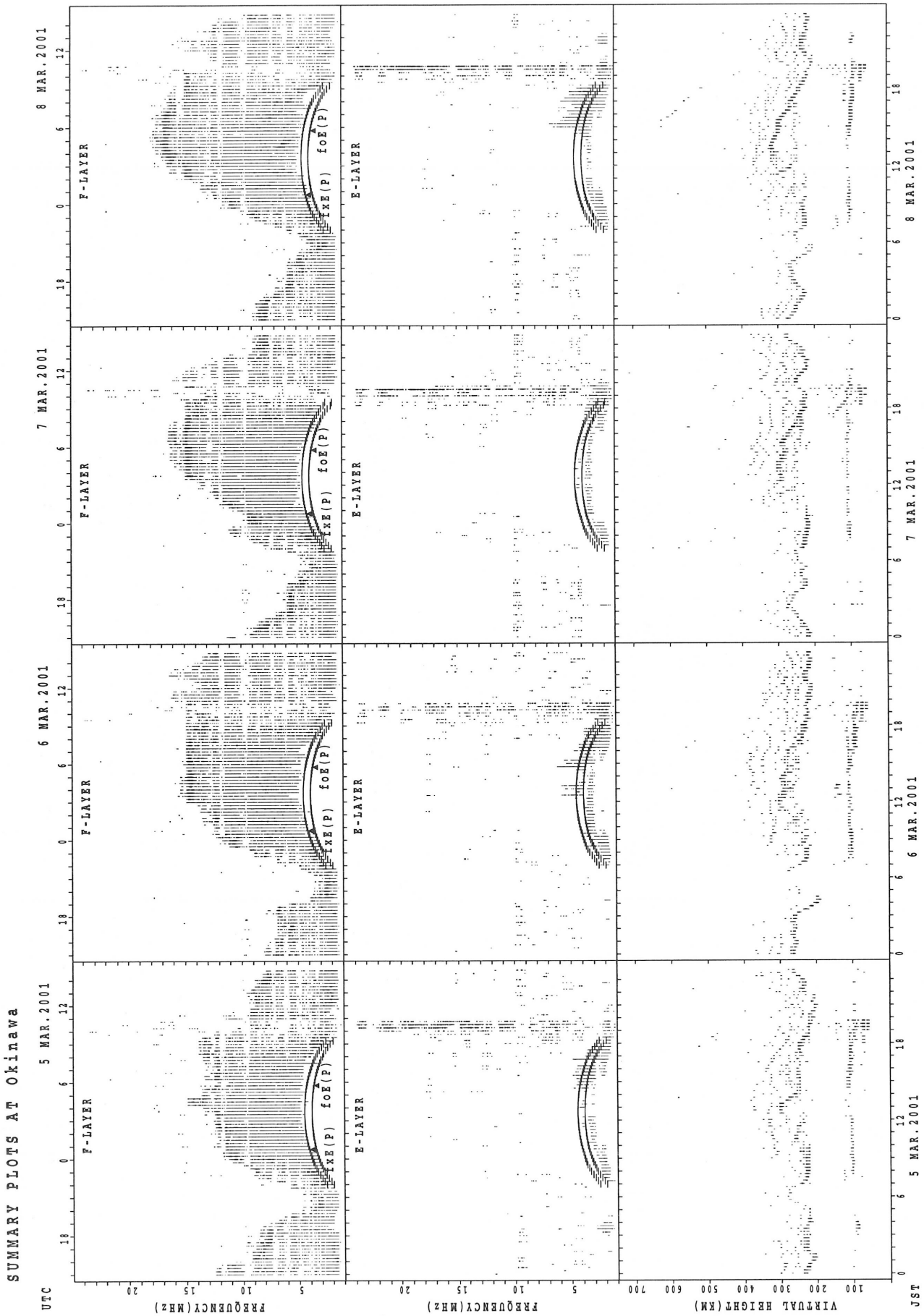
SUMMARY PLOTS

IONOSPHERIC DATA of Yamagawa is not available due to the ionosonde trouble.

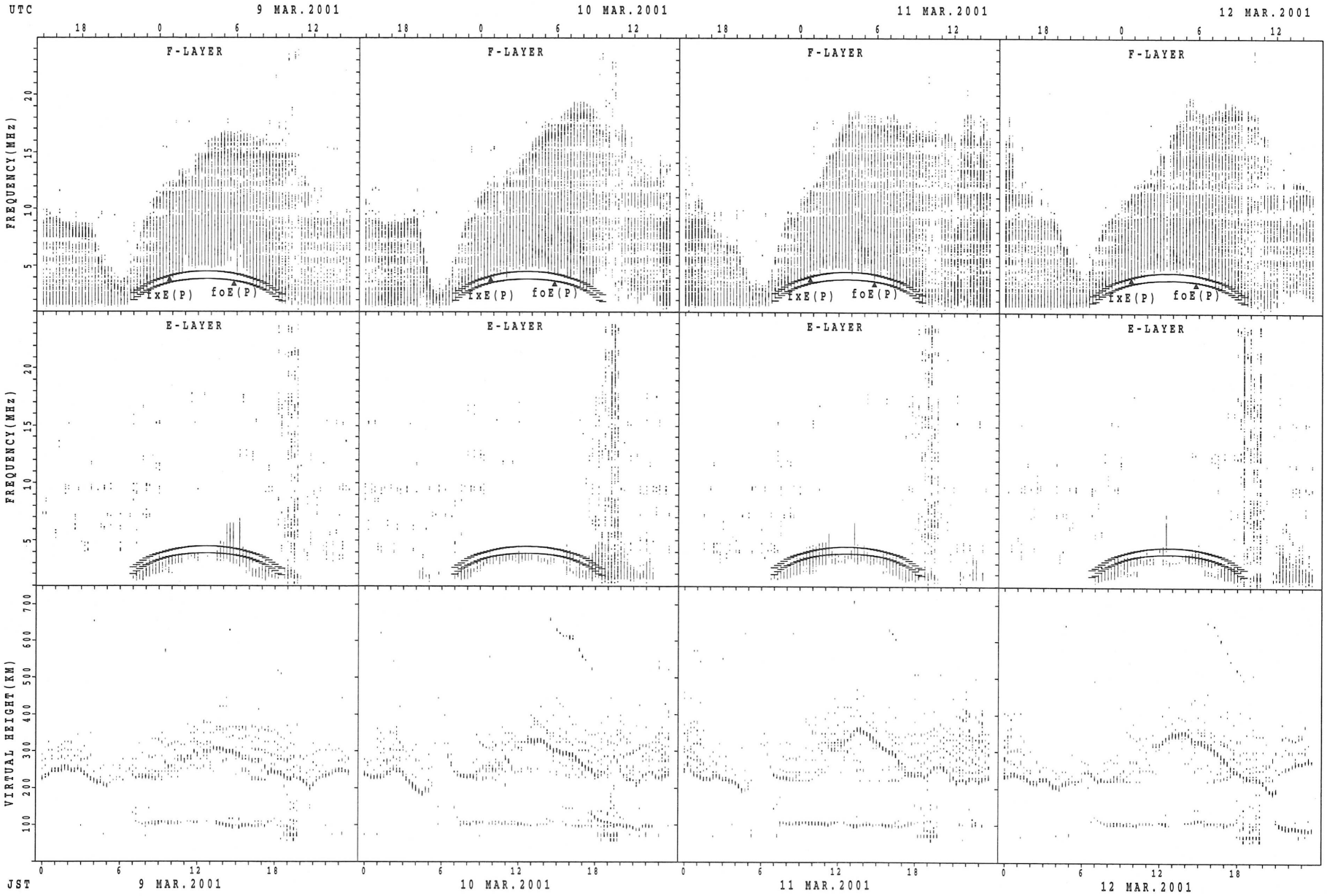
SUMMARY PLOTS AT Okinawa



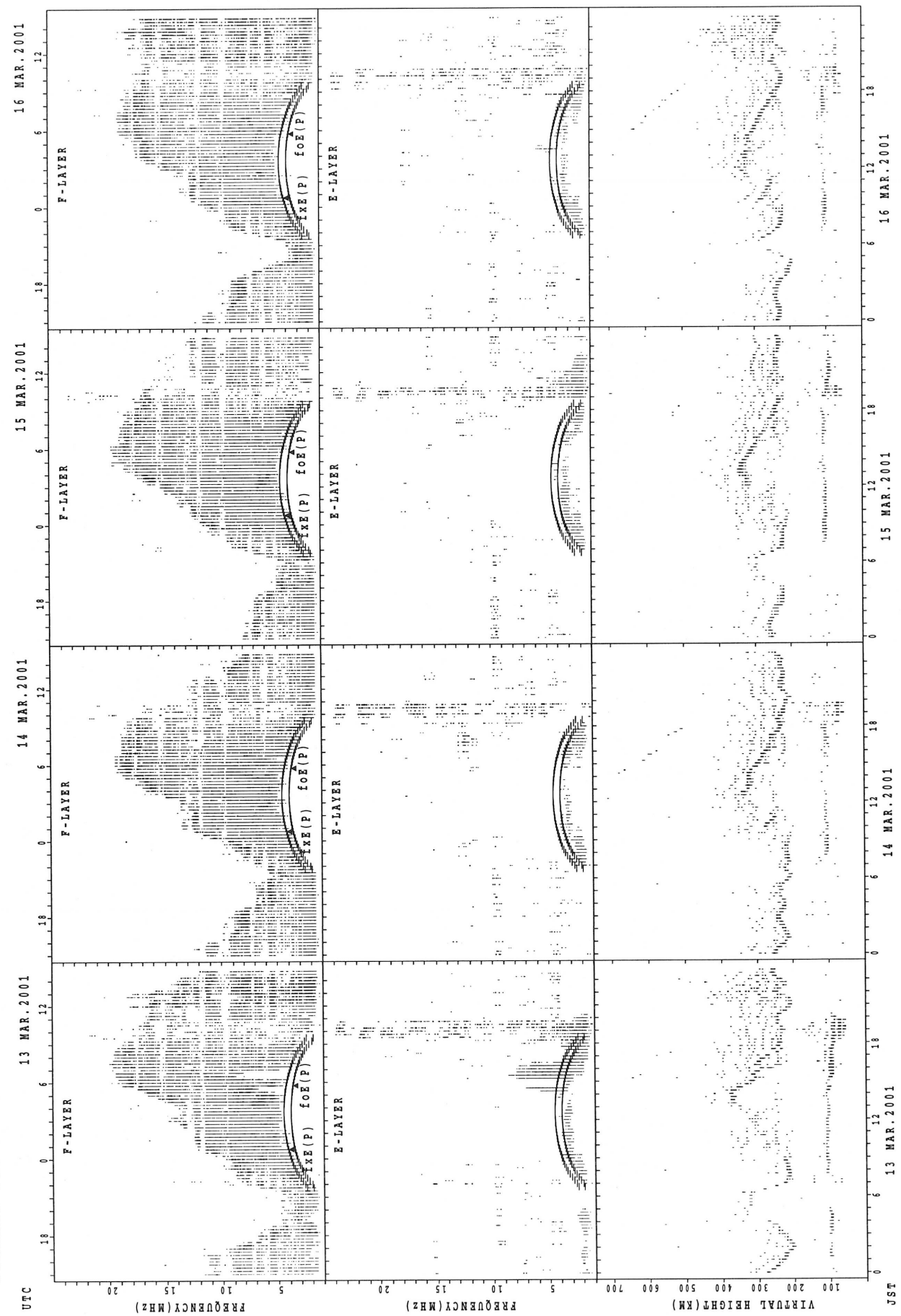
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Okinawa
UTC
JST
5 MAR.2001
6 MAR.2001
7 MAR.2001
8 MAR.2001
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

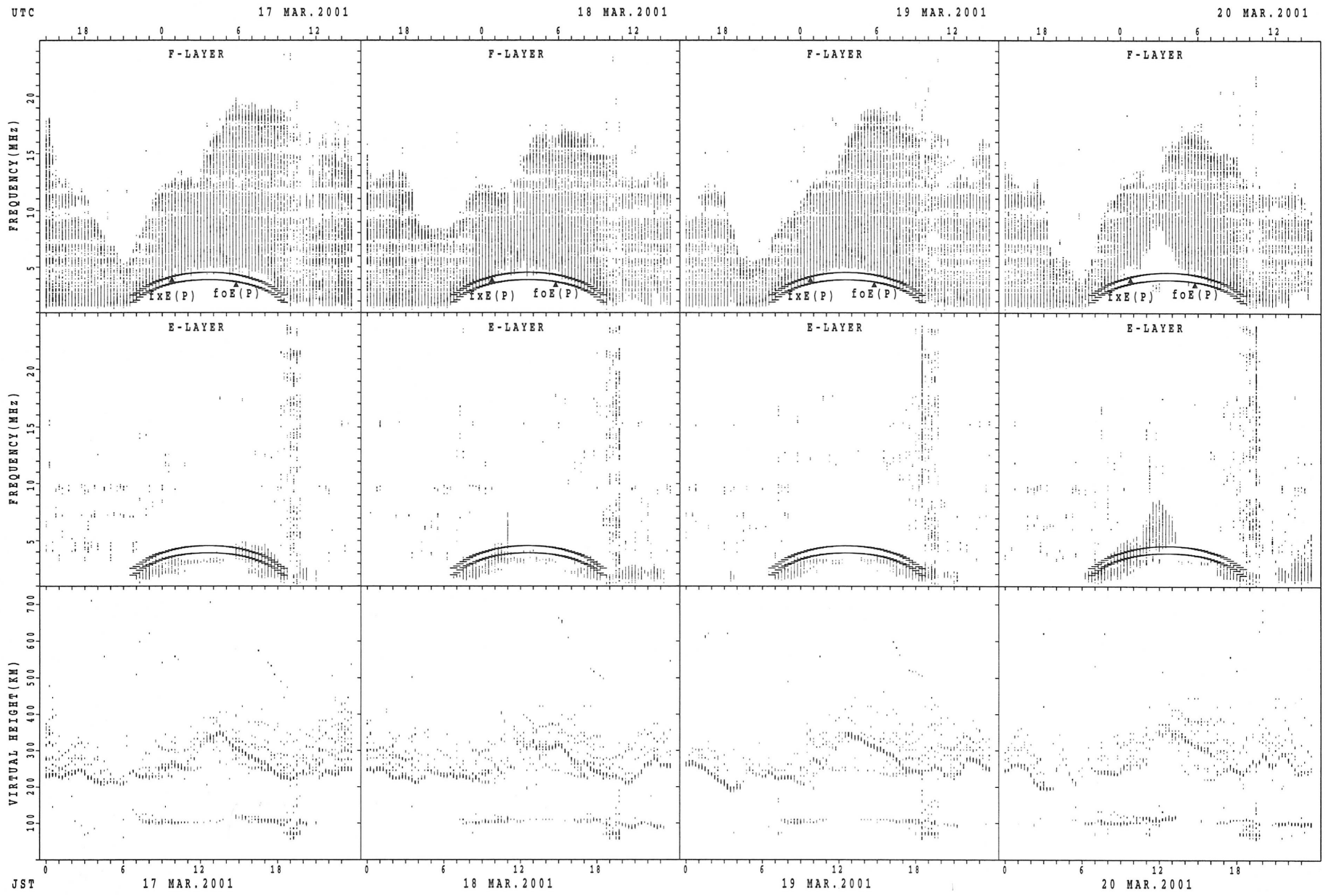
SUMMARY PLOTS AT Okinawa



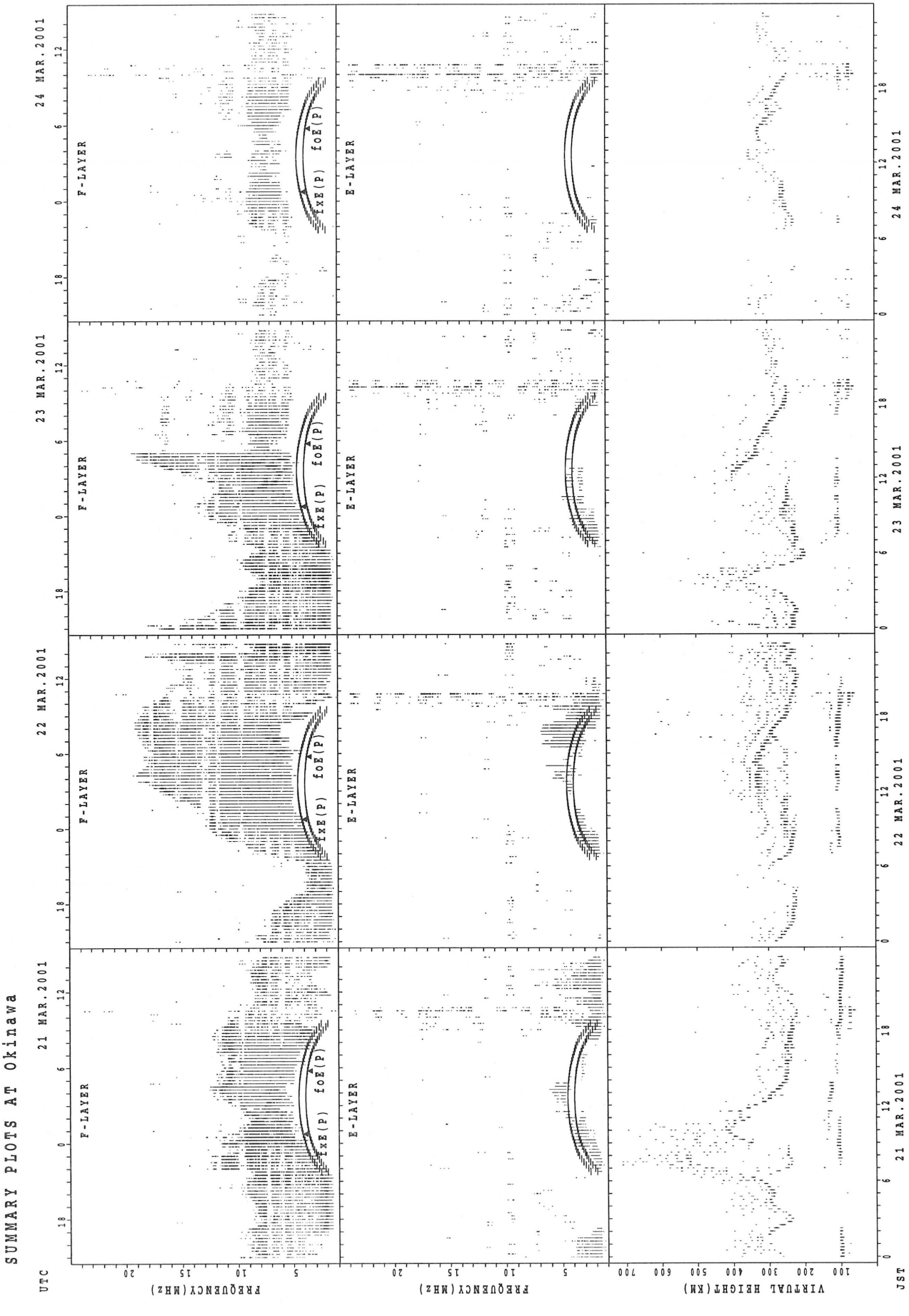
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Okinawa
UTC
JST
13 MAR.2001
14 MAR.2001
15 MAR.2001
16 MAR.2001
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

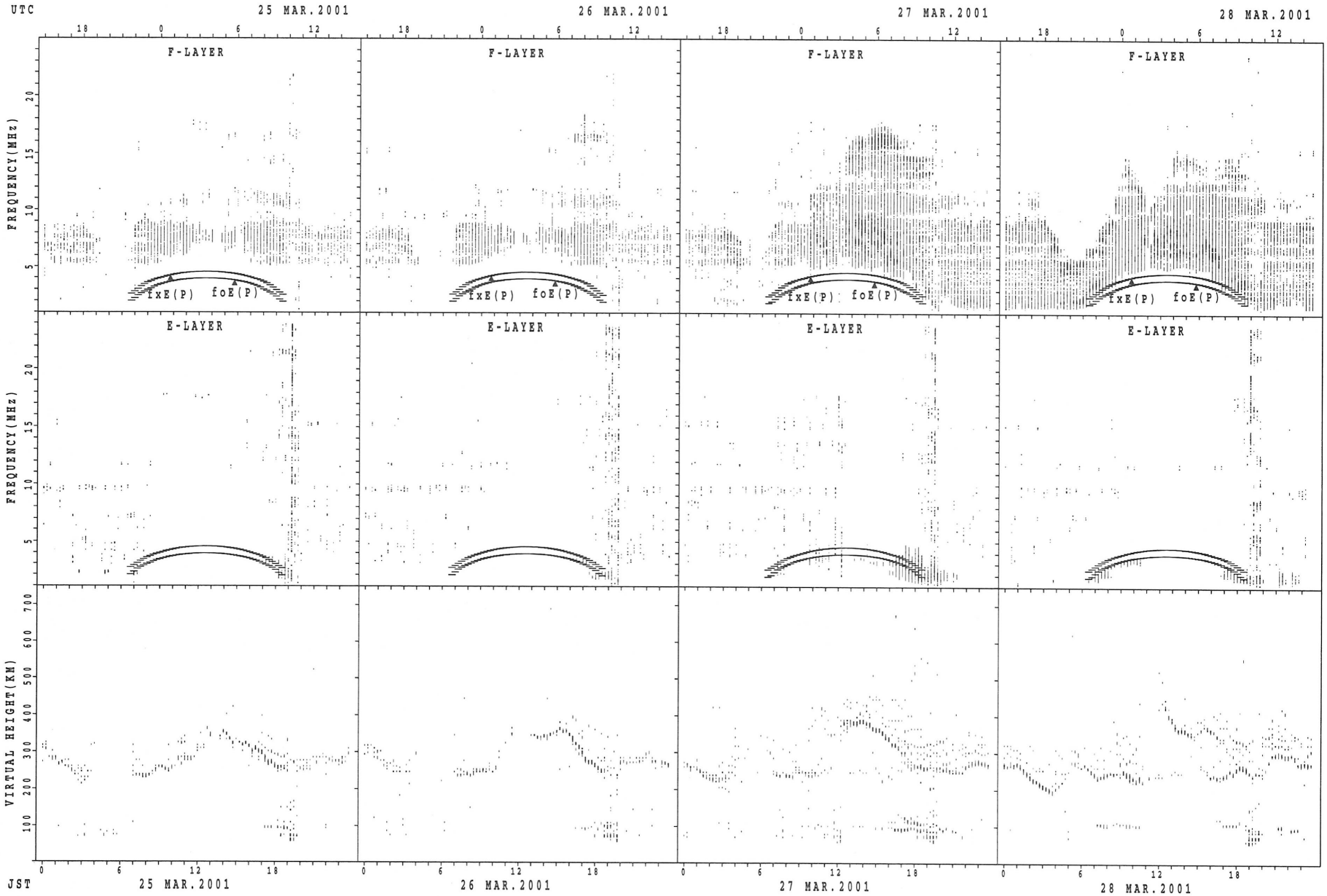
SUMMARY PLOTS AT Okinawa



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

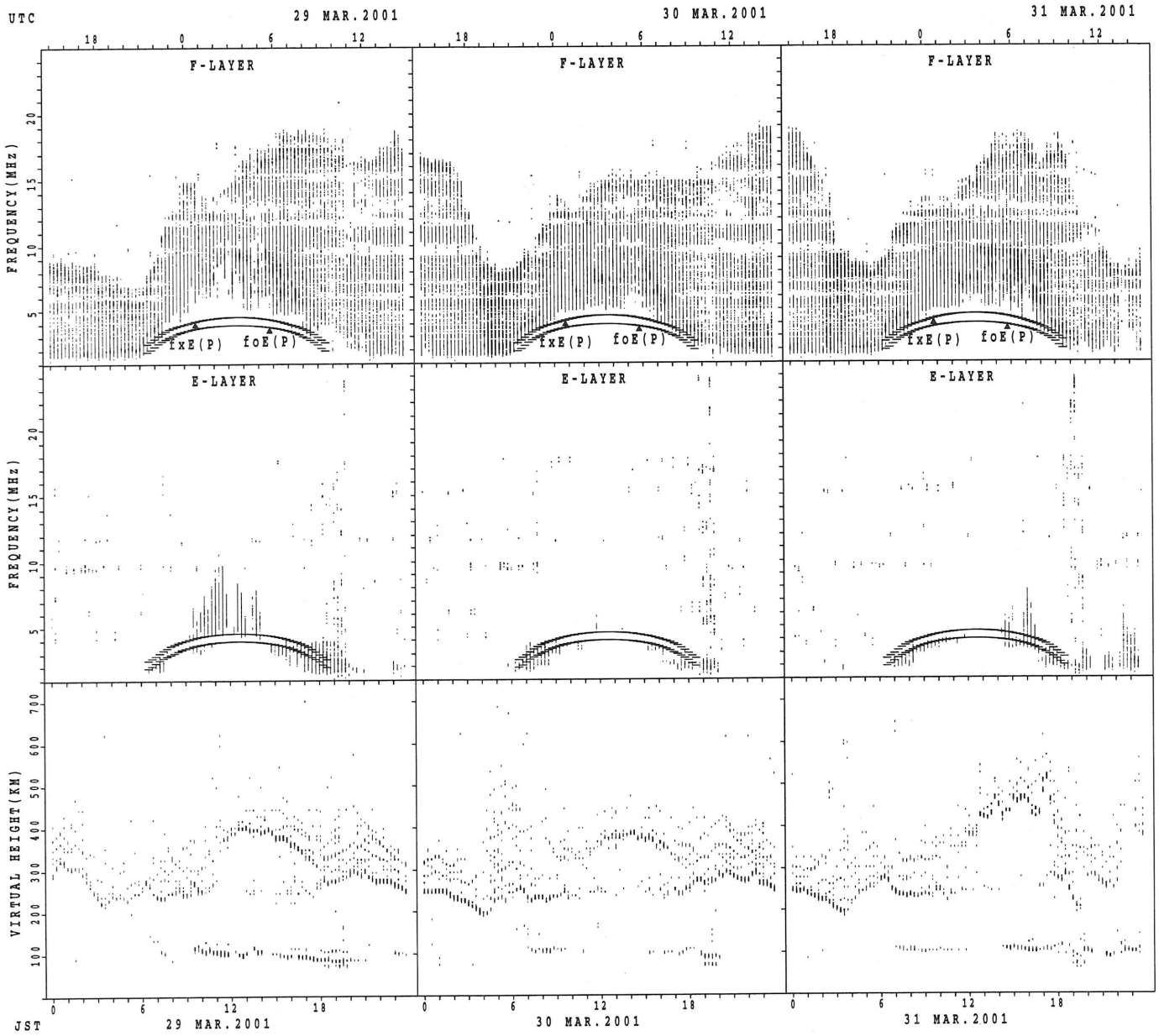

SUMMARY PLOTS AT Okinawa
UTC
JST
21 MAR.2001
22 MAR.2001
23 MAR.2001
24 MAR.2001
F-LAYER
E-LAYER
fxE(P)
foE(P)
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

MAR. 2001 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°23.5'N LON. 141°41.2'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	2	5	4	2		1	16	27	29	18	4				12	28	27	27	28	21	18	2	1	
MED	342	362	361	329		334	259	234	236	232	228				243	255	256	252	253	274	297	338	218	
U Q	344	401	394	336		167	277	256	256	248	234				257	266	272	266	268	304	320	338	109	
L Q	340	327	339	322		167	248	230	230	230	226				239	246	240	234	246	264	284	338	109	

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	4	5	4	2	4	11	12	3	10	7	4	1	1	2	4	5	9	5	4	4	16	19	20
MED	101	97	97	100	99	111	137	118	119	108	107	104	115	171	135	113	113	123	113	105	109	103	107	119
U Q	107	103	101	128	101	140	167	121	151	113	107	108	57	85	171	117	114	132	129	120	118	133	143	137
L Q	87	97	96	92	97	108	95	108	113	105	107	101	57	85	99	108	89	110	101	94	105	89	89	101

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	8	9	5	1	2	16	29	30	21					3	29	30	29	30	27	24	15	17	11
MED	342	334	370	336	364	405	263	240	240	242					270	274	265	256	253	272	325	340	346	344
U Q	374	363	390	344	182	420	290	248	250	252					272	290	292	264	264	290	343	370	371	366
L Q	319	329	325	307	182	390	243	232	232	237					262	256	256	246	238	260	293	314	327	320

h'Es

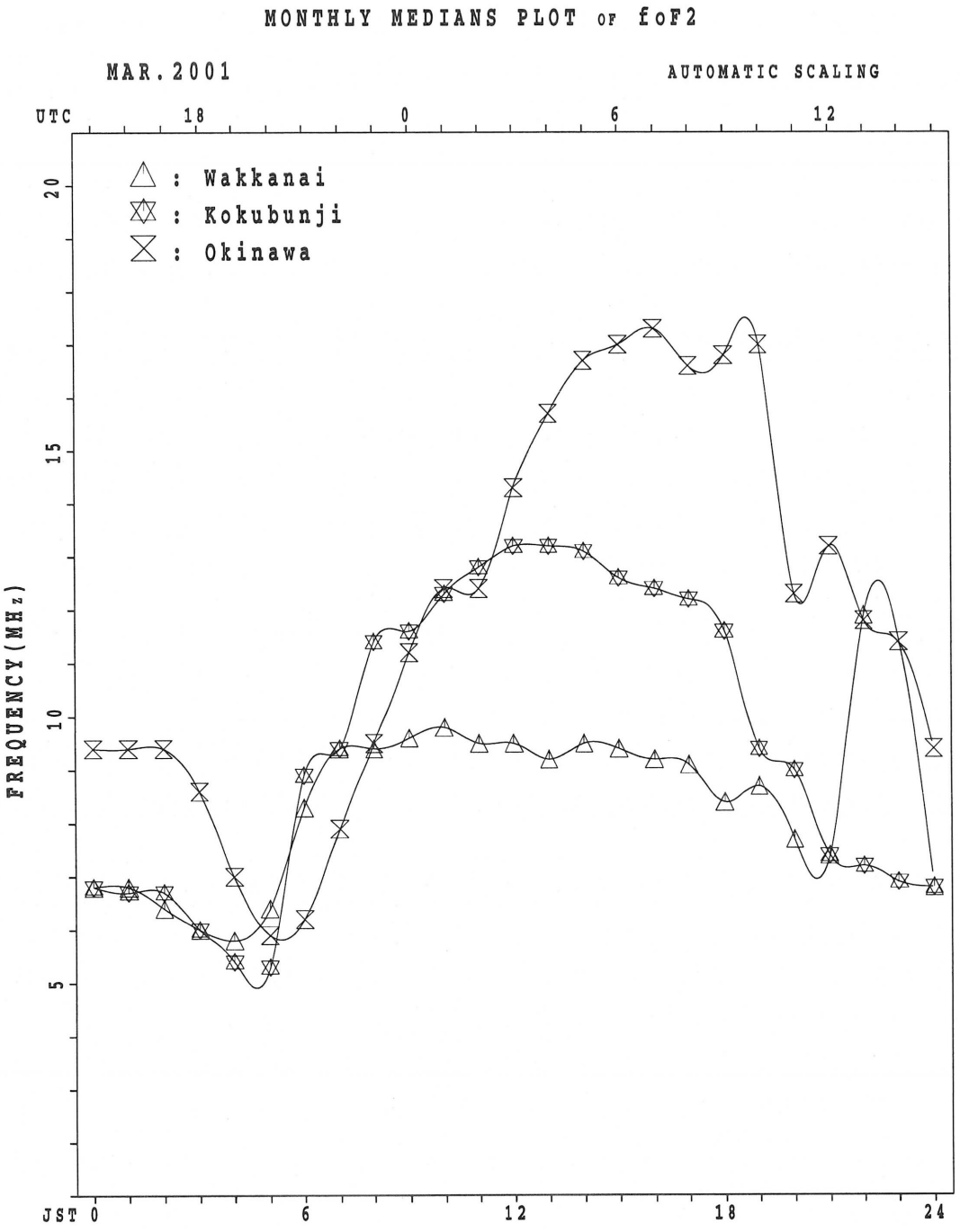
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	4	2	5	3	2	2	9	4	3	5	4	6	7	4	9	3	10	15	18	14	15	13	7	7
MED	102	101	107	103	89	101	143	131	111	111	111	110	105	111	103	107	111	115	107	105	105	103	107	103
U Q	109	103	146	105	103	103	157	143	119	114	115	111	113	121	110	115	111	125	113	109	107	107	111	105
L Q	100	99	101	99	75	99	126	119	97	108	110	107	103	103	99	103	107	101	101	99	99	96	103	101

h'F STATION Okinawa LAT. 26°16.9'N LON. 127°48.4'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	23	22	24	21	17	4	4	16	31	28	15					8	29	28	30	22	28	21	26	25
MED	280	273	264	266	254	333	296	267	246	255	272					293	286	268	248	242	265	278	277	280
U Q	296	288	288	280	296	382	388	294	262	260	276					299	307	296	264	274	286	307	306	291
L Q	262	248	243	237	244	314	252	250	238	248	262					280	276	258	240	234	246	261	256	265

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	2	1	1	2		1	5		2	4	5	4	5	4	8	9	12	14	18	13	7	7	8
MED	95	100	153	103	96		89	145		131	111	111	108	115	104	114	111	108	107	98	97	95	95	98
U Q	99	101	76	51	99		44	156		149	116	126	112	136	107	121	115	109	113	101	104	103	107	105
L Q	93	99	76	51	93		44	128		113	108	106	104	106	103	107	101	102	103	91	94	93	91	93


MONTHLY MEDIANS PLOT OF foF2
MAR. 2001
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
⛛ : Kokubunji
⧖ : Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 52	X 48	X 52	X 52	X 53	X 49	X 53										X 110		X 96	X 80	X 80	X 74	X 66	X 63
2	X 56	X 56	X 58	X 58	X 58	X 54													X 103	X 86	X 86	O X 74	X 67	X 62
3	X 57	X 57	X 58	X 58	X 57	X 54													X 108	X 83	X 80	X 73	O X 65	X 57
4	X 58	X 58	X 62	X 54	X 54	X 49													X 109	X 96	X 90	X 75	X 71	X 69
5	X 68	X 64	X 56	X 54	X 50	X 48													X 95	X 85	X 76	X 68	X 69	X 62
6	X 64	X 63	X 63	X 64	X 64	X 50													X 108	X 82	X 74	X 74	O X 65	X 64
7	X 62	X 62	X 62	X 59	X 54	X 56													X 109	X 91	X 88	X 79	O X 70	X 68
8	X 67	X 66	X 62	X 58	X 56	X 56													X 108	X 90	X 89	X 80	X 64	X 62
9	X 62	X 60	X 59	X 59	X 55	X 55													X 109	X 90	X 87	X 79	X 68	X 70
10	X 70	X 64	X 62	X 66	X 58	X 55													X 124	X 104	X 78	X 69	X 66	X 65
11	X 65	X O 64	X O 62	X O 63	X 55	X 53													X 124	X 99	X 89	X 88	X 80	X 77
12	X 70	X 66	X 69	X 66	X 41	X 45													X 112	X 84	O X 76	X 69	X 70	X 64
13	X 65	X 66	X 57	X 52	X 50	X 49													X 113	X 96	X 91	X 80	X 75	X 72
14	X 74	X 68	X 66	X 66	X 63	X 63													X 119	X 95	X 81	X 76	X 74	X 72
15	X 72	X 68	X 68	O X 66	X 62	X 61													X 107	X 82	X 81	X 82	X 75	X 70
16	X 68	X 64	X 66	X 68	X 56	X 51													X 116	X 87	O X 72	X 75	X 76	X 78
17	X 77	X 72	X 68	X 68	X 61	X 62													X 115	X 94	X 78	X 80	R 60	X 79
18	X 76	X 72	X 72	X 66	X 61	X 62													X 120	R 32	C	C	C	C
19	C	C	C	C	C	C													X 125	X 107	X 84	O X 75	X 82	X 80
20	X 73	X 74	X 80	X 63	X 63	X 62													X 128	X 112	X 106	X 107	X 123	X 107
21	X 93	X 105	O X 92	X 93	X 91	X 93													X 84	X 72	X 65	X 62	X 61	X 62
22	X 63	X 63	X 58	X 55	X 50	X 49													X 115	O X 96	X 84	R 70	X 86	X 78
23	X 74	X 68	X 63	X 57	X 59	X 67													X 123	X 104	X 91	X 90	X 89	X 86
24	X 82	X 83	X O 77	X 70	X 76	X 73													X 128	X 109	X 98	X 83	X 78	X 77
25	X 76	X 73	X 74	X 73	X 60	X 58													X 124	X 111	X 94	X 93	X 87	X 85
26	X 84	X 84	X 80	X 76	X 67	X 67													X 124	X 106	X 93	X 92	X 88	X 84
27	X 82	X 82	X 82	X 76	X 63	X 63													X 119	X 106	X 93	X 95	X 94	X 95
28	X 86	X 81	X 81	X 78	X 68	X 72													X 123	X 108	X 96	X 95	X 88	X 86
29	X 86	X 80	X 84	X 73	X 68	O X 67													X 138	X 118	X 96	O X 94	X 93	X 96
30		X 91	X 89	X 81	X 75	O X 76													X 129	X 112	X 98	X 101	X 102	X 101
31	X 100	X 98	X 98	X 86	X 79	X 82													X 134	X 120	X 102	X 95	X 92	X 73
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	1										1		31	31	30	30	30	30
MED	X 70	X 67	X 66	X 66	X 60	X 57	X 53										X 110		X 116	X 96	X 88	X 80	X 75	X 72
U Q	X 80	X 80	X 80	X 73	X 64	X 67													X 124	X 107	X 93	X 92	X 88	X 84
L Q	X 64	X 63	X 62	X 58	X 55	X 51													X 108	X 85	X 80	X 74	X 67	X 64

MAR. 2001 fxI (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR.2001 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	46	R 42	46	46	47	43	47	92	116	114	108	117	124	123	C	C	104	103	90	R 74	74	68	R 60	57
2	R 51	50	52	52	52	48	57	80	R 100	116	131	136	R 140	140	142	136	126	117	R 97	80	80	68	R 61	56
3	51	51	52	52	51	48	59	90	91	107	122	139	140	137	132	126	120	115	102	77	R 74	R 67	R 59	51
4	R 52	52	56	48	48	43	52	97	111	112	116	126	130	132	128	119	114	110	102	90	84	R 69	R 65	R 63
5	R 62	58	50	48	44	42	53	82	104	118	133	122	122	127	126	114	106	102	89	79	70	R 62	R 63	56
6	58	57	57	58	58	44	52	80	106	116	124	131	141	129	126	122	118	112	102	76	68	68	R 59	58
7	56	56	56	53	48	50	R 62	R 94	118	106	107	109	113	120	124	120	113	111	103	85	82	73	R 64	62
8	61	60	55	52	50	50	65	88	109	114	121	134	128	121	121	120	107	106	102	84	R 83	74	58	56
9	56	54	53	53	49	49	R 64	R 99	112	110	116	127	131	134	130	116	111	109	103	84	81	R 73	R 62	R 64
10	64	58	56	60	52	49	58	81	101	113	122	121	122	126	122	115	120	122	118	R 98	72	R 63	R 60	58
11	59	58	56	57	49	47	R 62	R 98	113	103	119	131	144	148	R 144	137	131	127	R 118	R 93	83	R 82	R 74	R 71
12	R 64	60	R 63	60	35	39	58	92	102	94	104	114	128	132	133	128	130	122	106	U R 78	70	R 64	64	58
13	59	60	51	46	44	44	66	R 96	110	112	117	134	129	128	126	128	129	118	107	90	85	74	69	66
14	68	62	60	60	57	57	R 72	84	R 97	R 97	128	132	134	132	127	126	125	122	113	89	R 75	70	68	66
15	R 66	62	62	60	56	55	71	R 96	106	106	116	128	128	131	129	126	119	116	101	R 76	R 75	76	69	64
16	R 62	58	60	62	50	45	R 62	92	104	108	123	129	136	133	129	123	120	119	110	80	66	V 70	70	72
17	71	66	62	62	55	57		88	103	110	124	127	133	138	137	131	130	120	109	88	72	R 74	R	73
18	70	66	66	60	55	56	R 76	R 92	113	111	114	120	129	135	132	128	124	R 116	U R 114	R	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	122	118	123	122	R 119	101	77	R 69	76	R 74
20	68	68	74	57	57	56	80	100	92	114	144	137	143	140	139	135	128	129	122	106	R 99	R 101	117	R 103
21	87	R 99	86	87	86	87	89	F	79	70	62	R 59	62	R 65	70	74	80	85	78	66	59	56	55	56
22	57	57	53	48	44	43	61	81	97	115	124	138	148	147	136	122	113	114	109	90	78	R	80	R 72
23	69	62	57	51	53	61	93	95	104	112	116	120	120	128	130	133	127	120	116	98	85	84	83	80
24	R 76	77	R 71	R 64	70	67	77	90	108	123	132	128	130	137	129	119	106	112	122	103	92	77	72	71
25	70	R 67	68	67	54	52	73	108	112	117	130	133	135	133	132	127	127	125	R 118	105	88	87	81	79
26	78	78	74	69	61	61	84	102	112	114	115	126	129	129	131	131	126	122	R 118	R 100	87	86	82	78
27	76	R 76	76	70	57	57	83	110	116	122	122	125	130	131	123	126	127	122	113	100	87	89	88	89
28	80	75	75	72	R 62	66	84	92	117	139	144	133	132	131	134	128	125	118	117	101	90	89	82	80
29	80	74	78	67	61	61	86	115	131	137	137	141	143	138	137	136	132	133	132	111	90	88	87	90
30		85	83	75	69	70	92	112	127	134	130	138	135	132	130	130	127	126	123	106	92	95	96	R 95
31	94	92	92	80	72	76	98	116	122	132	R 137	134	136	137	138	114	133	118	128	114	R 96	89	86	R 66
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	31	31	31	30	30	29	29	30
MED	64	61	60	60	54	51	66	92	108	114	122	128	130	132	130	126	124	118	110	90	82	74	69	66
U Q	74	74	74	67	58	61	84	100	113	117	130	134	136	137	134	130	127	122	118	101	87	86	82	78
L Q	58	57	55	52	49	45	58	88	102	108	116	122	128	128	126	119	113	112	102	80	74	68	R 62	58

MAR.2001 foF2 (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L		L		C	C								
2									L	L		L	L	L	L									
3											L	L	L	L	L									
4											L	L		L	L									
5											L		L											
6													L		L									
7										L	L		L	L	L									
8											L	L			L	L								
9										L	L			L	L									
10										L	L	L	L	L	L									
11											L	L	L	L	L									
12											L	L	U L 564	L	L	L	L							
13										L	L		L		L	L								
14											L	L	L		L	L								
15											L	L		L	L	L								
16										L		L	L	L	L									
17											L	L		L	L	L								
18												L	L	L	L	L								
19							C	C	C	C	C	C	C	C	L	L	L							
20										L	U L 560		L	L	L		L							
21							L	U L 396	U L 436	472	U L 488	U L 488	R	U L 556	U L 532	L								
22											L	L	L	L	L		L							
23										L		L	L	L	L	L								
24									L	L	L		L	L			L							
25											L	L	L	L	L	L								
26												L	L	L	U L 592	L								
27												L	L	L 648	L	L								
28										L	L	L	L	L	L	L	L							
29												L	L	L	L 720	L	L							
30											L	L		L	L	L	L							
31										L		L	L	L	L	L 624	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	1	2	1	1	2	3	1								
MED								U L 396	U L 436	472	U L 524	U L 488	U L 564	L 602	U L 592	L 624								
U Q															L 720									
L Q															U L 532									

MAR. 2001 foF1 (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 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								228	R	R	R	R	R	R	C	C		B						
2							B	220	292	328	UR 360	R	UR 372	R	UR 356	R	276	204						
3							B	UR 228	292	R	R	R	R	R	R	R	UR 276	UR 208						
4							B	236	UR 292	R	R	A	UR 380	R	356	320	272	196						
5							B	232	R	R	UR 356	R	R	A	A	R	UA 276	B						
6							B	A	UR 300	A	R	R	R	R	A	A	A	R						
7							B	236	A	UR 324	R	R	A	R	R	A	A	208						
8							B	244	UR 296	R	R	R	R	R	R	UR 324	UR 288	UR						
9							B	244	296	R	R	B	R	R	R	UR 332	284	208						
10							B	260	UR 308	R	R	R	R	R	A	R	UR 292	232						
11							B	244	316	R	R	A	UR 384	R	R	UR 332	UR 288	240						
12							B	UA 236	UR 316	R	R	UR 376	R	UR 368	UR 356	UR 332	UR 280	220						
13							B	264	304	R	UR 348	A	A	R	R	UR 336	UR 292	UR 224						
14							B	244	304	340	UR 356	UR 372	UR 396	R	UR 372	UR 348	R	UR 224						
15							B	UR 244	296	UR 328	R	A	UR 396	UR 372	R	A	A	B						
16							B	248	R	R 340	R	R	A	R	A	R	UR 296	UR 216						
17								244	R	R	A	UR 376	A	A	A	R	300	244						
18							B	UR 252	304	R	R	R	R	R	A	R	R	A						
19							C	C	C	C	C	C	C	C	R	UR 340	UR 308	UR 248						
20							B	260	304	332	A	R	R	B	UR 356	R	292	UR 228						
21							B	UR 256	UR 308	344	R	R	R	R	A	UR 340	296	232						
22							B	UR 272	UR 312	R	A	A	A	R	A	A	A	A						
23							168	UR 260	UR 324	R	R	R	A	A	A	A	A	A						
24							B	264	R	R	A	A	A	A	R	R	304	240						
25							B	UR 292	340	R	A	A	UR 388	R	R	UR 368	UR 324	A						
26							180	284	UR 348	UR 372	R	R	B	R	R	R	UR 312	252						
27							B	280	R	R	R	R	B	B	B	R	R	268						
28							196	292	R	R	A	B	R	B	A	A	UR 332	268						
29							UR 180	304	B	R	R	B	B	R	A	A	UR 324	UR 288						
30							184	UR 288	UR 336	R	R	R	B	R	B	B	UR 340	UR 280						
31							196	UR 288	UR 356	A	B	B	A	R	B	R	R	240						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	29	21	8	4	3	6	2	5	10	21	22						
MED							182	252	UR 304	336	UR 356	UR 376	UR 386	UR 370	UR 356	UR 334	UR 292	232						
U Q							196	276	UR 320	R 342	UR 358	UR 376	UR 396		UR 364	UR 340	UR 310	248						
L Q							180	240	296	UR 328	UR 352	UR 372	UR 380		356	UR 332	282	216						

MAR. 2001 foE (0.01MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR.2001 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 16	E B 15	E B 16	E B 15	E B 14	20	G	G 27	G 29	G 32	G 26	G 26	G 30	C	C	J A 29	22	E B 15	E B 15	E B 16	E B 15	E B 15	E B 16
2	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15	E B 16	G	G 25	G 28	G 22	G 23	G 31	G 30	G 27	G 20	33	26	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16
3	E B 15	22	E B 15	E B 14	E B 15	E B 16	E B 16	G 20	32	G 30	G 29	G 34	G 32	G 31	J G 30	G 23	33	G	E B 14	E B 16	19	E B 16	E B 16	E B 16
4	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	E B 17	G	G 25	G 28	35	40	J A 38	G 30	G 23	G	G	G	E B 12	E B 16	E B 17	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 14	E B 16	E B 16	G	G 26	G 28	G 31	G 36	G 28	39	38	G 20	32	J A 25	23	20	19	E B 16	E B 15	J A 26
6	E B 15	E B 16	24	19	E B 14	E B 13	E B 16	33	G 26	36	37	G 29	G	G 28	J A 42	39	35	J G 24	J A 25	19	E B 16	E B 15	J A 27	22
7	E B 15	E B 15	E B 16	E B 15	E B 16	E B 15	E B 16	26	34	G 30	G 33	G 32	38	G 36	36	35	32	G	J A 22	J A 23	J A 22	J A 24	20	19
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	23	G 20	32	G 34	G 28	G 32	G 29	G 31	G 28	G 28	G 19	G 23	J A 27	J A 18	J A 23	J A 18	E B 16	E B 15
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	J A 25	27	34	G 31	38	E B 48	G 32	G 29	G 25	G	G	G	E B 16	E B 15	E B 15	E B 16	E B 16	E B 16
10	E B 16	E B 15	E B 16	E B 12	E B 12	E B 15	E B 18	J A 26	J G 26	G 32	G 28	G 29	G 28	G 26	39	J G 27	G 23	26	20	46	J A 28	J A 30	18	E B 16
11	E B 15	E B 16	E B 22	E B 16	E B 15	E B 14	E B 17	G	G 30	G 31	40	38	G 34	G 34	G 34	G 32	G 22	G	E B 16	J A 30	E B 16	E B 16	E B 16	E B 14
12	E B 16	E B 16	E B 16	E B 15	E B 13	E B 16	20	27	J G 30	38	38	G 29	G 30	G 33	G 25	G 28	G 22	28	J A 30	J A 30	J A 31	J A 34	E B 15	E B 16
13	E B 14	E B 15	22	J A 24	20	E B 13	18	30	36	G 30	39	J A 46	J A 45	G 32	G 31	G 28	G 21	G 20	J A 22	20	E B 16	E B 16	E B 16	J A 20
14	E B 14	E B 15	E B 15	E B 14	E B 16	E B 15	E B 17	28	G 23	G 28	G 27	G 27	G	G	G 32	G 28	G 28	24	22	24	J A 22	J A 32	J A 27	J A 33
15	22	20	21	J A 21	18	J A 22	E B 17	G 21	36	35	41	39	G 38	G 32	G 29	39	34	J A 26	J A 34	J A 33	J A 27	20	20	E B 16
16	18	E B 16	E B 16	E B 14	E B 16	E B 16	19	G 22	G 27	G 32	G 32	G 36	40	G 38	39	J A 35	G 22	G 19	22	J A 31	J A 25	29	J A 22	J A 22
17	J A 23	J A 33	J A 25	20	E B 16	E B 16		G 22	G 28	41	37	G 36	J A 62	J A 52	J A 50	37	G 19	G	J A 27	J A 22	23	J A 66	J A 24	21
18	E B 15	E B 16	E B 16	E B 15	E B 14	E B 16	20	G 22	32	38	38	G 28	G 31	G 27	G 43	G 20	G	33	J A 19	E B 26	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G 24	J G 27	J A 33	J A 28	J A 49	J A 31	J A 25	J A 21	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 12	E B 13	E B 16	E B 16	G 22	38	40	44	J A 68	J A 46	E B 42	G 30	G 28	G	G	E B 16	E B 16	19	19	E B 16	21
21	E B 16	E B 16	E B 16	17	E B 16	E B 12	E B 15	30	G 28	38	40	J A 44	43	J A 47	J A 43	G 29	37	J A 40	J A 57	E B 16	J A 26	E B 14	38	E B 16
22	22	E B 15	E B 16	E B 14	E B 14	E B 16	E B 15	G	34	J A 55	J A 47	45	40	G 34	J A 64	J A 52	J A 45	J A 45	J A 54	69	J A 35	J A 48	J A 26	E B 15
23	E B 16	E B 16	E B 16	19	E B 16	E B 16	22	30	36	40	39	G 33	46	43	J A 52	J A 47	36	J A 32	J A 48	J A 44	23	J A 20	18	J A 20
24	J A 55	J A 54	J A 34	J A 26	J A 20	J A 26	26	G 23	G 28	G 34	41	39	J A 47	37	G 35	G 29	G 26	G	J A 21	J A 22	19	18	E B 16	E B 16
25	E B 16	E B 14	E B 16	E B 16	E B 14	E B 16	E B 22	32	G 32	G 33	41	J A 48	G 36	G 32	G 33	G 26	J G 30	32	J A 27	23	E B 16	E B 15	E B 15	E B 16
26	E B 14	E B 15	E B 16	E B 15	E B 14	E B 16	24	32	G	G 33	G 33	G 30	E B 48	G 28	G 29	G 26	G 22	29	J A 28	20	J A 17	E B 16	E B 15	E B 16
27	E B 16	E B 14	E B 15	E B 15	E B 14	E B 14	29	32	G 31	G 34	G	G 33	E B 48	E B 49	E B 42	G 29	G 28	32	J A 34	20	E B 14	E B 14	E B 16	E B 12
28	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	23	G 26	G 31	44	44	E B 53	G 32	E B 50	47	42	G 31	32	24	J A 28	45	24	E B 16	E B 18
29	19	E B 15	J A 22	E B 14	E B 15	E B 16	G	G	E B 41	G	J A 59	E B 45	E B 64	G 36	53	J A 40	G 30	G 26	J A 24	18	E B 15	E B 15	E B 15	E B 12
30		E B 16	E B 15	E B 14	E B 13	E B 16	G	G 28	G 28	G 34	G 31	G 30	E B 49	48	E B 46	E B 40	G	G	E B 18	E B 15	J A 25	E B 15	E B 16	E B 12
31	E B 14	E B 16	18	18	E B 14	J A 19	24	G 27	G	41	E B 50	39	45	50	E B 43	G 30	33	G 22	19	E B 15	J A 20	J A 24	24	24
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	31	31	31	31	30	30	30	30
MED	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G	G	G 30	G 34	38	G 34	G	G 33	34	29	G	G	J A 22	20	20	17	E B 16	E B 16
U Q	16	16	18	17	E B 16	E B 16	22	28	34	38	41	44	46	42	43	37	33	29	J A 28	J A 30	J A 25	J A 24	J A 20	20
L Q	E B 15	E B 15	E B 16	E B 14	E B 14	E B 15	E B 16	G 23	G 27	G 30	G 32	G 30	G 32	G 30	G 29	G 27	G 23	G 25	E B 18	E B 16	E B 16	E B 15	E B 16	E B 16

MAR.2001 foEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 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

H / D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 16	E B 15	E B 16	E B 15	E B 14	E B 15	G	G 27	G 28	U Y 32	G 26	G 25	G 27	C	C	27	22	E B 15	E B 15	E B 16	E B 15	E B 15	E B 16
2	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15	E B 16	G	G 23	G 27	G 21	G 23	G 30	G 30	G 26	G 20	32	26	E B 16	E B 16	E B 15	E B 15	E B 16	E B 16
3	E B 15	18	E B 15	E B 14	E B 15	E B 16	E B 16	G 18	31	G 30	G 29	G 34	G 32	G 30	G 28	G 22	32	G	E B 14	E B 16	16	E B 16	E B 16	E B 16
4	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	E B 17	G	G 24	G 28	U Y 35	U Y 40	G 33	G 30	G 22	G	G	G	E B 12	E B 16	E B 17	E B 16	E B 16	E B 16
5	E B 16	E B 16	E B 16	E B 16	E B 14	E B 16	E B 16	G	G 25	G 27	G 30	U Y 36	G U Y 27	G U Y 39	U Y 38	G 20	30	23	E B 16	E B 15	E B 14	E B 16	E B 15	19
6	E B 15	E B 16	16	E B 16	E B 14	E B 13	E B 16	20	G 24	36	36	G 29	G U Y	28	41	37	34	G 22	E B 16	E B 16	E B 16	E B 15	E B 16	E B 15
7	E B 15	E B 15	E B 16	E B 15	E B 16	E B 15	E B 16	25	31	G 29	G U Y 33	U Y 32	U Y 38	U Y 36	U Y 36	34	30	G	16	18	16	16	E B 16	E B 15
8	E B 16	E B 16	E B 16	E B 16	E B 16	E B 15	E B 16	G 20	30	G 30	G 28	G 32	G 29	G 30	G 28	G 28	G 18	G 22	E B 16	16	17	17	E B 16	E B 15
9	E B 16	E B 16	E B 16	E B 16	E B 16	E B 16	16	26	31	G 30	U Y 38	E B 48	G 30	G 29	G 25	G	G	G	E B 16	E B 15	E B 15	E B 16	E B 16	E B 16
10	E B 16	E B 15	E B 16	E B 12	E B 12	E B 15	E B 18	G 23	G 24	G 31	G 28	G 29	G 28	G 26	U Y 39	G 23	G 23	26	16	43	16	20	16	E B 16
11	E B 15	E B 16	E B 22	E B 16	E B 15	E B 14	E B 17	G	G 28	G 31	39	U Y 38	G 34	G 34	G 33	G 31	G 22	G	E B 16	27	E B 16	E B 16	E B 16	E B 14
12	E B 16	E B 16	E B 16	E B 15	E B 13	E B 16	18	27	G 26	36	38	G 27	G U Y 30	33	G 25	G 28	G 21	27	28	26	19	29	E B 15	E B 16
13	E B 14	E B 15	E B 16	E B 15	E B 15	E B 13	16	27	34	G 30	U Y 39	44	41	G 32	G 31	G 27	G 21	G 20	16	E B 14	E B 16	E B 16	E B 16	17
14	E B 14	E B 15	E B 15	E B 14	E B 16	E B 15	E B 17	26	G 23	G 28	U Y 27	G 27	G	G	G 31	G 28	G 28	24	E B 16	23	E B 16	24	24	23
15	E B 16	16	16	17	E B 15	E B 16	E B 17	G 21	34	35	41	U Y 39	G 37	G 30	G 29	37	31	24	32	29	21	E B 16	E B 15	E B 16
16	E B 16	E B 16	E B 16	E B 14	E B 16	E B 16	19	G 21	G 27	G 32	G 32	U Y 36	U Y 40	G U Y 34	39	29	G 22	G 18	E B 16	25	21	22	E B 16	20
17	19	23	E B 16	E B 16	E B 16	E B 16		G 21	G 27	39	36	G 36	61	48	42	36	G 19	G	22	19	16	32	E B 16	E B 16
18	E B 15	E B 16	E B 16	E B 15	E B 14	E B 16	19	G 21	31	U Y 38	38	U Y 28	G 31	G 27	41	G 20	G	U Y 33	E B 16	E B 26	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	G 24	G 21	G 26	G 21	35	28	22	19	E B 16	E B 16
20	E B 16	E B 16	E B 16	E B 12	E B 13	E B 16	E B 16	G 21	36	39	42	64	44	E B 42	G 30	G 28	G	G	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16
21	E B 16	E B 16	E B 16	16	E B 16	E B 12	E B 15	28	G 28	U Y 38	U Y 40	42	40	44	40	G 29	34	35	54	E B 16	24	E B 14	32	E B 16
22	E B 14	E B 15	E B 16	E B 14	E B 14	E B 16	E B 15	G	34	53	42	U Y 45	U Y 40	U Y 34	G 51	44	42	41	43	66	25	35	15	E B 15
23	E B 16	E B 16	E B 16	E B 14	E B 16	E B 16	21	29	35	38	U Y 39	G 33	45	43	48	45	35	28	18	E B 16	E B 16	18	E B 15	E B 15
24	44	34	25	E B 15	E B 16	19	22	G 23	G 28	U Y 34	37	U Y 39	43	U Y 37	G 32	G 29	G 26	G	E B 16	17	16	E B 16	E B 16	E B 16
25	E B 16	E B 14	E B 16	E B 16	E B 14	E B 16	E B 22	31	G 28	U Y 33	41	46	G U Y 35	U Y 32	U Y 33	G 26	G 27	28	19	E B 15	E B 16	E B 15	E B 15	E B 16
26	E B 14	E B 15	E B 16	E B 15	E B 14	E B 16	24	31	G	G 32	G U Y 33	30	E B 48	G U Y 28	29	G 26	G 22	27	26	15	E B 16	E B 16	E B 15	E B 16
27	E B 16	E B 14	E B 15	E B 15	E B 14	E B 14	24	31	G 31	G 34	G U Y 33		E B 48	E B 49	E B 42	U Y 29	G 28	30	25	18	E B 14	E B 14	E B 16	E B 12
28	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	23	G 25	G 30	41	44	E B 53	G E B 32	50	45	U Y 42	G 30	30	21	25	40	17	E B 16	E B 18
29	E B 15	E B 15	E B 16	E B 14	E B 15	E B 16	G	G E B 41	G	57	E B 45	E B U Y 64	36	53	36	G 27	G 25	18	E B 14	E B 15	E B 15	E B 15	E B 12
30	E B 16	E B 15	E B 14	E B 13	E B 16	G	G 28	G 28	G 34	G U Y 31	U Y 30	E B 49	45	E B 46	E B 40	G	G	E B 18	E B 15	21	E B 15	E B 16	E B 12
31	E B 14	E B 16	16	E B 12	E B 14	E B 16	24	G 26	G	40	E B 50	U Y 39	U Y 45	49	E B 43	G 30	32	G 22	18	E B 15	17	18	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	29	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	31	31	31	31	30	30	30	30
MED	E B 15	E B 16	E B 16	E B 15	E B 15	E B 16	E B 17	G 26	G 28	G 34	36	34	G	33	33	29	G 30	G	16	E B 16	16	E B 16	E B 16	E B 16
U Q	E B 16	16	16	E B 16	E B 16	E B 16	20	G	31	38	40	42	44	42	42	36	31	27	22	25	19	18	E B 16	16
L Q	E B 15	E B 15	E B 16	E B 14	E B 14	E B 15	E B 16	G 21	G 27	G 30	G 32	G 30	G 31	G 30	G 29	G 26	G 23	G 23	E B 16	E B 15	E B 16	E B 15	E B 15	E B 15

MAR. 2001 fbEs (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 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	16	15	16	15	14	15	14	14	15	15	21	15	23	C	C	14	16	15	15	16	15	15	16
2	15	15	15	16	16	15	16	15	15	15	15	18	17	23	20	16	15	15	16	16	15	15	16	16
3	15	16	15	14	15	16	16	14	16	16	19	18	18	25	19	16	15	16	14	16	14	16	16	16
4	15	16	16	15	15	15	17	16	14	15	18	18	22	17	15	17	16	16	12	16	17	16	16	16
5	16	16	16	16	14	16	16	16	16	15	14	19	20	23	17	15	12	17	16	15	14	16	15	16
6	15	16	15	16	14	13	16	16	15	16	18	19	26	15	20	15	16	16	16	16	16	15	16	15
7	15	15	16	15	16	15	16	14	16	18	18	19	20	23	22	20	15	13	12	12	13	14	16	15
8	16	16	16	16	16	15	16	16	15	15	18	23	20	22	22	16	14	16	16	14	15	14	16	15
9	16	16	16	16	16	16	12	16	16	16	20	48	24	21	14	18	16	16	16	15	15	16	16	16
10	16	15	16	12	12	15	18	12	16	19	19	20	22	20	16	15	16	16	14	15	13	16	13	16
11	15	16	22	16	15	14	17	13	15	15	22	22	25	22	21	15	15	13	16	15	16	16	16	14
12	16	16	16	15	13	16	16	15	14	16	14	20	26	22	20	16	15	14	16	16	16	16	15	16
13	14	15	16	15	15	13	13	16	14	14	18	22	29	17	21	20	14	14	12	14	16	16	16	16
14	14	15	15	14	16	15	17	12	16	14	17	20	28	23	19	15	16	16	16	15	16	16	16	16
15	16	14	13	15	15	16	17	16	15	16	15	24	26	19	23	18	16	16	16	15	16	16	15	16
16	16	16	16	14	16	16	16	16	18	15	20	17	17	24	16	15	15	13	16	16	15	15	16	16
17	16	15	16	16	16	16		16	16	16	19	17	21	21	19	15	16	16	12	15	13	15	16	16
18	15	16	16	15	14	16	15	13	15	17	18	19	25	16	18	14	17	22	16	26	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	17	15	14	15	15	16	15	11	16	16
20	16	16	16	12	13	16	16	12	15	15	16	20	22	42	22	19	15	14	16	16	16	15	16	16
21	16	16	16	12	16	12	15	16	17	15	17	27	27	23	18	20	15	14	18	16	12	14	16	16
22	14	15	16	14	14	16	15	16	14	19	22	35	28	24	22	16	15	16	16	14	16	14	14	15
23	16	16	16	14	16	16	14	15	14	20	22	25	25	29	26	22	18	16	13	16	16	16	15	15
24	15	16	15	15	16	14	13	16	16	19	20	22	24	21	24	17	15	15	16	15	15	16	16	16
25	16	14	16	16	14	16	22	15	18	22	23	28	24	24	29	18	15	16	13	15	16	15	15	16
26	14	15	16	15	14	16	16	15	18	24	27	24	48	26	22	18	15	16	14	15	16	16	15	16
27	16	14	15	15	14	14	16	17	18	20	25	24	48	49	42	21	21	14	16	14	14	14	16	12
28	15	16	16	15	15	15	13	16	18	23	20	53	27	50	27	20	19	16	14	15	16	15	16	18
29	15	15	16	14	15	16	13	17	41	26	26	45	64	25	25	23	18	16	17	14	15	15	15	12
30		16	15	14	13	16	16	15	21	26	27	26	49	28	46	40	21	16	18	15	12	15	16	12
31	14	16	13	12	14	16	16	14	21	20	50	36	32	28	43	18	18	14	15	15	15	16	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	29	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	31	31	31	31	30	30	30	30
MED	15	16	16	15	15	16	16	16	16	16	19	22	25	23	21	17	15	16	16	15	15	15	16	16
U Q	16	16	16	16	16	16	16	16	18	20	22	26	28	25	24	20	16	16	16	16	16	16	16	16
L Q	15	15	15	14	14	15	15	14	15	15	17	19	21	21	18	15	15	14	14	15	14	15	15	15

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 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	284	R 262	276	286	289	260	279	343	349	335	308	298	303	309	C	C	308	321	315	R 298	311	312	R 312	311
2	R 294	284	286	295	306	288	323	353	R 324	319	316	315	R 312	299	305	305	311	318	R 329	299	315	310	R 303	296
3	289	277	284	291	298	283	312	360	331	315	305	306	301	307	300	307	305	314	318	306	R 313	R 312	R 308	258
4	R 270	278	306	293	297	278	289	330	333	320	298	300	299	301	301	303	302	313	314	306	311	R 307	R 284	R 288
5	R 294	308	290	298	282	275	307	333	334	313	310	302	291	292	303	306	314	318	313	304	297	R 283	R 298	277
6	280	273	283	283	309	331	303	324	328	316	296	302	308	294	297	306	312	310	331	315	292	298	R 316	287
7	285	289	285	292	284	286	R 316	R 337	338	337	307	305	302	298	307	305	308	313	317	308	306	299	R 281	280
8	293	296	295	282	271	269	320	346	339	315	302	311	307	292	297	309	310	306	320	315	R 311	328	288	282
9	284	287	278	286	284	280	R 305	R 331	334	315	297	300	293	294	295	298	302	315	313	305	298	R 310	R 288	R 288
10	293	279	274	297	325	310	329	344	323	326	310	313	292	293	292	286	296	309	319	R 333	309	R 292	R 293	287
11	286	295	293	307	310	274	R 307	R 334	340	311	304	294	290	292	R 290	290	297	300	R 315	R 315	283	R 283	R 281	R 298
12	R 293	291	R 300	327	328	287	313	339	341	324	296	295	299	296	299	284	303	312	308	R 297	292	R 294	287	265
13	284	307	317	283	253	259	311	R 352	340	308	280	292	288	287	282	287	298	307	302	301	299	295	290	272
14	289	292	277	282	266	275	R 331	338	R 332	R 300	301	303	295	298	290	292	301	308	313	308	R 286	286	288	283
15	R 283	282	279	294	269	262	315	R 335	332	329	302	301	289	295	289	296	302	313	313	R 298	R 285	R 306	300	290
16	R 293	283	290	321	302	275	R 319	338	325	308	303	299	298	294	294	294	301	315	328	327	265	R 282	279	286
17	291	288	287	303	273	290		326	323	306	313	300	296	294	297	294	308	316	326	315	293	R 280	R	R 275
18	291	286	301	293	271	277	R 318	R 332	335	327	307	291	289	293	292	293	300	R 306	R 319	R	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	285	288	299	312	R 312	324	289	R 279	280	R 282
20	256	260	303	294	257	275	303	322	310	287	297	303	277	282	278	281	278	286	290	297	R 285	R 255	286	R 287
21	250	R 259	238	246	247	248	239	F	231	245	241	R 263	262	R 281	302	305	304	325	315	305	284	271	265	261
22	263	280	286	274	276	270	328	326	318	313	307	297	299	301	295	293	298	312	318	311	287	R	292	R 293
23	292	290	266	252	251	279	336	338	321	311	305	295	273	276	269	288	289	296	307	300	283	274	267	277
24	R 268	274	R 280	R 272	271	299	314	324	318	314	302	293	280	288	289	291	292	293	311	305	301	290	277	276
25	267	R 265	284	303	254	259	318	327	320	308	298	297	286	285	276	280	288	300	R 299	305	288	283	273	272
26	273	281	300	310	276	288	325	323	323	301	272	277	274	272	274	272	278	289	R 299	R 294	273	275	279	271
27	269	R 277	292	314	266	265	314	320	320	300	282	269	263	269	257	261	275	283	288	280	261	265	263	289
28	279	267	277	290	R 256	260	308	294	255	284	279	259	260	255	263	264	271	275	289	287	255	258	255	251
29	236	234	269	292	267	259	293	288	301	285	280	268	263	258	256	257	260	271	288	294	262	254	260	269
30		274	266	281	255	267	300	295	291	290	267	269	264	258	257	258	265	275	289	284	248	263	266	R 272
31	279	273	287	283	270	264	297	306	293	284	R 277	261	255	252	254	225	240	233	248	257	R 240	252	260	R 236
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	29	30	30	30	30	30	30	30	30	31	31	31	30	30	29	29	30
MED	284	280	286	292	272	275	313	332	324	312	302	298	290	292	291	292	300	309	313	305	288	283	284	281
U Q	292	289	293	298	297	286	320	338	334	319	307	302	299	296	297	303	305	314	318	311	301	302	R 292	288
L Q	270	273	277	283	266	264	303	324	318	300	282	291	274	281	276	281	288	293	299	297	283	272	270	272

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IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1											L		L		C	C								
2									L	L		L	L	L	L									
3											L	L	L	L	L									
4											L	L		L	L									
5											L		L											
6													L		L									
7										L	L		L	L	L									
8											L	L			L	L								
9										L	L			L	L									
10										L	L	L	L	L	L									
11											L	L	L	L	L									
12											L	L	U L 337	L	L	L	L							
13										L	L		L		L	L								
14											L	L	L		L	L								
15											L	L		L	L	L								
16										L		L	L	L	L									
17											L	L		L	L	L								
18												L	L	L	L	L								
19							C	C	C	C	C	C	C	C	L	L	L							
20										L	U L 346		L	L	L		L							
21							L	U L 304	U L 333	307	U L 343	U L 343	R	U L 325	U L 345	L								
22											L	L	L	L	L		L							
23										L		L	L	L	L	L								
24									L	L	L		L	L			L							
25											L	L	L	L	L	L								
26												L	L	L	U L 345	L								
27												L	L	L 335	L	L								
28										L	L	L	L	L	L	L	L							
29												L	L	L	L 324	L	L							
30											L	L		L	L	L	L							
31										L		L	L	L	L	L 307	L	L						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	1	2	1	1	2	3	1								
MED								U L 304	U L 333	307	U L 344	U L 343	U L 337	L 330	U L 345	L 307								
U Q															U L 345									
L Q															L 324									

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IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 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											272		280		C	C								
2									256	260		274	274	290	268									
3											276	290	282	266	292									
4											284	288		284	280									
5											280		316											
6													286		284									
7										230	286		286	294	266									
8											290	284			290	274								
9										266	290			284	304									
10										252	286	268	304	294	308									
11											282	296	302	286	294									
12											302	292	296	300	292	308	286							
13										278	342		278		318	296								
14											282	274	282		292	286								
15											286	280		284	306	288								
16										286		298	288	302	290									
17											268	282		298	282	286								
18												296	304	294	276	290								
19							C	C	C	C	C	C	C	C	306	312	280							
20										294	310		326	288	328		316							
21							Q 416	504	466	448	514	466	472	408	318	334								
22											272	294	268	272	300		292							
23										264		294	338	324	340	308								
24									276	276	288		322	312			308							
25											292	286	320	316	332	306								
26												318	348	332	318	324								
27												316	318	332	356	354								
28										262	316	362	372	390	338	342	322							
29												348	368	374	370	356	344							
30											346	328		370	350	350	338							
31										304		348	368	370	378	486	398	412						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	1	3	12	21	22	24	24	28	17	9	1						
MED							Q 416	504	276	271	286	294	304	299	305	308	316	412						
U Q									466	290	306	318	332	332	330	346	341							
L Q									256	261	281	284	284	287	290	289	289							

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MAR. 2001 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	260	E B 324	308	266	264	E B 314	282	228	220	212	H 196	220	232	H 220	C	C	238	244	216	226	244	232	240	248
2	254	284	290	272	254	258	222	212	H 198	198	230	230	220	240	222	244	232	226	216	226	236	228	250	258
3	264	300	280	276	248	274	248	214	206	216	230	234	232	230	226	246	232	232	214	216	236	230	240	E B 308
4	306	276	254	268	248	248	284	234	218	H 202	220	248	228	224	H 218	224	232	236	216	234	226	234	278	272
5	260	230	252	260	276	304	252	226	228	218	202	234	222	252	234	228	238	238	230	226	236	230	258	284
6	288	292	282	282	240	204	248	224	234	230	232	240	224	242	244	234	240	234	216	212	248	236	250	260
7	282	274	278	262	256	272	260	230	H 212	H 194	218	230	228	218	224	238	236	236	218	224	238	230	268	292
8	272	258	254	284	290	302	240	226	230	228	222	230	228	226	H 206	242	236	238	224	228	248	222	244	272
9	276	276	292	274	270	276	258	230	228	226	240	248	H 222	230	244	228	226	238	226	222	244	228	250	282
10	268	272	284	250	206	238	228	216	H 212	228	220	212	228	222	242	244	256	250	228	228	214	250	258	280
11	272	262	270	252	228	284	256	230	228	H 216	216	224	218	228	226	H 222	242	242	218	226	232	234	254	258
12	262	268	260	230	206	296	248	228	230	224	H 196	212	210	232	224	234	230	242	218	224	256	288	274	300
13	280	234	240	272	344	344	232	220	232	220	212	240	226	250	236	218	244	234	228	222	240	242	256	296
14	260	238	264	276	296	286	226	226	226	216	200	206	216	244	222	224	236	242	222	224	248	254	272	282
15	274	272	266	246	264	318	252	220	226	224	214	228	224	218	230	234	240	244	226	242	284	248	244	254
16	264	278	276	236	222	258	238	230	234	210	H 204	212	242	240	230	H 212	238	250	228	224	262	282	276	290
17	280	284	264	252	242	250		224	224	232	220	224	268	246	E A 238	226	246	238	222	222	222	E A 302	276	292
18	282	272	246	256	276	296	234	232	218	H 222	H 200	H 194	214	H 214	222	H 224	242	U R 248	236	222	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	230	238	238	252	248	234	208	288	288	278
20	324	312	244	230	316	278	218	232	228	224	224	262	224	226	228	248	246	254	240	242	250	312	276	234
21	244	332	292	330	334	296	Q 334	276	268	E A 316	278	266	U R 232	E A 248	226	224	236	246	270	238	266	262	E A 348	320
22	308	282	256	252	260	292	240	234	228	256	222	238	232	222	246	242	254	250	240	E A 284	258	288	258	250
23	258	262	302	344	360	298	226	218	240	224	H 220	208	232	236	256	E A 268	246	254	246	226	246	264	284	270
24	E A 334	E A 304	296	290	278	224	216	226	H 216	230	204	244	226	226	236	232	236	258	246	230	232	224	258	286
25	304	300	278	236	220	326	248	238	230	230	226	226	222	234	242	230	256	254	240	238	244	258	260	278
26	286	276	256	244	236	266	232	230	236	218	216	222	244	256	238	244	250	246	246	228	238	262	262	286
27	288	280	258	234	240	308	248	230	232	226	224	232	E B 238	240	244	238	244	258	250	244	250	284	296	262
28	258	288	284	254	270	302	240	240	240	232	216	240	234	256	242	250	250	256	250	238	E A 312	306	292	310
29	358	362	290	218	248	242	238	240	242	244	E A 256	222	284	234	264	230	246	264	256	232	220	284	290	290
30		284	276	248	256	244	238	240	234	240	234	224	252	240	240	236	256	266	262	232	232	292	284	282
31	282	286	268	236	256	300	244	234	234	228	254	224	238	260	240	242	268	294	274	218	264	308	300	298
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	30	30	30	30	30	29	30	30	30	30	30	30	30	30	30	31	31	31	31	30	30	30	30
MED	275	278	273	255	256	283	240	230	228	224	220	229	228	234	234	234	240	246	228	226	243	254	263	282
U Q	288	292	284	274	276	302	252	234	234	230	230	240	234	244	242	242	246	254	246	234	250	288	284	292
L Q	261	272	256	244	240	258	232	224	220	216	212	222	222	226	226	226	236	238	218	224	232	232	254	262

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MAR. 2001 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								120	E A 132	126	A	120	122	122	C	C		B						
2							B 122	122	122	124	122	122	120	122	120	120	124	122						
3							B 126	120	120	118	A	122	A	120	118	118	120							
4							B 136	130	128	120	A	130	118	118	118	118	120							
5							B 118	E A 130	120	122	120	118	118	118	118	118	B							
6							BE A 132	128	124	122	120	120	118	A	124	A	118							
7							B 124	A	122	A	A	116	128	A	116	A	118							
8							BE A 136	128	124	120	118	118	122	118	120	120	118							
9							B 122	124	128	118	B	124	124	120	118	118	122							
10							B 120	124	126	120	122	118	120	A	118	120	126							
11							B 118	128	126	122	A	124	128	130	130	118	120							
12							B 120	A	120	A	122	120	126	120	120	118	118							
13							B 118	E A 132	124	126	118	A	128	120	124	118	126							
14							B 126	120	120	120	122	120	118	126	122	122	122							
15							B 124	124	120	120	A	126	122	120	A	A	B							
16							B 122	124	124	120	A	A	128	A	E A 130	120	118							
17							124	126	124	A	120	A	A	A	120	118	120							
18							BE A 136	118	120	122	122	124	120	A	118	120	A							
19							C	C	C	C	C	C	C	C	122	120	122	120						
20							B 126	120	120	126	120	116	B	124	124	118	120							
21							B 118	124	124	118	A	130	120	A	124	124	126							
22							B 120	124	118	A	A	A	118	A	A	A	A							
23							128	120	122	122	A	126	A	A	A	A	A							
24							B 122	122	A	E A 130	A	A	A	120	124	124	120							
25							B 122	124	124	118	A	124	124	R	118	126	118							
26							E B 148	132	116	122	A	R	B	118	124	120	120	120						
27							B 130	122	122	118	124	B	B	B	122	124	130							
28							120	128	124	118	A	B	122	B	124	124	126	E A 130						
29							124	120	B	116	118	B	B	A	A	A	126	122						
30							124	120	116	122	118	116	B	118	B	B	122	120						
31							120	126	116	120	B	B	A	118	B	122	A	128						
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							6	30	27	29	21	15	19	22	16	25	24	25						
MED							123	122	123	122	120	120	122	121	120	120	120	120						
U Q							128	126	128	124	122	122	124	124	124	124	124	124						
L Q							120	120	120	120	118	120	118	118	120	118	118	119						

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MAR. 2001 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	132	G	110	106	108	110	108	108	C	C	112	144	B	B	B	B	B	B
2	B	B	B	B	B	B	B	G	106	106	104	106	110	108	106	106	144	122	B	B	B	B	B	B
3	B	106	B	B	B	B	B	110	148	108	108	108	110	104	104	100	126	G	B	B	104	B	B	B
4	B	B	B	B	B	B	B	G	110	106	116	104	100	98	102	G	G	G	B	B	B	B	B	B
5	B	B	B	B	B	B	B	G	110	108	110	108	106	114	114	102	122	116	98	98	116	B	B	104
6	B	B	104	116	B	B	B	112	110	120	116	108	G	106	100	124	108	98	100	100	B	B	110	96
7	B	B	B	B	B	B	B	170	142	110	110	110	122	112	116	118	110	G	114	108	104	102	104	98
8	B	B	B	B	B	B	130	110	154	110	110	106	106	110	104	106	104	102	100	106	98	98	B	B
9	B	B	B	B	B	B	100	166	122	108	112	B	102	106	102	G	G	G	B	B	B	B	B	B
10	B	B	B	B	B	B	B	114	112	110	114	108	102	108	96	98	112	158	126	110	110	100	96	B
11	B	B	B	B	B	B	B	G	110	108	124	110	112	106	116	108	108	G	B	108	B	B	B	B
12	B	B	B	B	B	B	138	130	108	118	120	110	112	110	102	110	110	124	110	108	110	104	B	B
13	B	B	104	100	108	B	138	142	134	110	124	112	110	108	108	112	106	110	106	106	B	B	B	104
14	B	B	B	B	B	B	B	132	110	104	106	108	G	G	110	108	108	164	116	110	108	108	104	104
15	100	106	108	104	108	108	B	108	126	134	116	110	112	104	110	100	108	106	112	112	108	110	108	B
16	104	B	B	B	B	B	156	110	108	106	110	108	106	112	106	106	100	100	98	114	102	126	106	100
17	102	100	106	104	B	B		108	108	118	108	106	102	100	100	126	100	G	110	108	110	104	114	110
18	B	B	B	B	B	B	E B 150	108	130	120	112	110	104	104	102	102	G	96	98	B	C	C	C	C
19	C	C	C	C	C	C	C	C	C	C	C	C	C	C	104	100	98	98	112	110	108	104	B	B
20	B	B	B	B	B	B	B	108	120	120	122	108	112	B	110	114	G	G	B	B	118	126	B	164
21	B	B	B	108	B	B	B	122	112	148	144	118	134	114	108	112	160	118	106	B	112	B	102	B
22	106	B	B	B	B	B	B	G	140	112	114	108	108	106	100	100	116	112	108	108	108	106	112	B
23	B	B	B	96	B	B	156	128	140	120	120	112	106	108	104	108	110	108	104	100	96	98	98	100
24	110	106	102	104	104	102	170	110	108	108	114	110	104	106	106	112	102	G	122	100	98	96	B	B
25	B	B	B	B	B	B	B	148	110	116	112	110	110	108	104	100	98	124	98	98	B	B	B	B
26	B	B	B	B	B	B	140	152	G	112	112	108	B	108	108	106	102	150	122	98	108	B	B	B
27	B	B	B	B	B	B	176	168	110	108	G	112	B	B	B	110	114	140	120	116	B	B	B	B
28	B	B	B	B	B	B	168	112	110	130	124	B	112	B	116	124	114	134	118	110	110	112	B	B
29	114	B	128	B	B	B	G	G	B	G	112	B	B	110	106	112	108	108	116	120	B	B	B	B
30		B	B	B	B	B	G	110	108	110	104	106	B	128	B	B	G	G	B	B	106	B	B	B
31	B	B	104	94	B	136	160	110	G	120	B	126	108	114	B	110	110	114	136	B	114	104	118	140
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	6	4	7	8	3	3	13	23	27	29	28	27	24	26	27	27	26	22	23	21	20	15	11	10
MED	105	106	104	104	108	108	150	112	110	110	112	108	108	108	106	108	109	115	110	108	108	104	106	104
U Q	110	106	108	106	108	136	164	142	130	120	118	110	112	110	110	112	114	134	118	110	110	110	112	110
L Q	102	103	104	98	104	102	135	110	110	108	110	108	105	106	102	102	104	106	100	100	104	100	102	100

MAR. 2001 h'Es (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

MAR. 2001 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

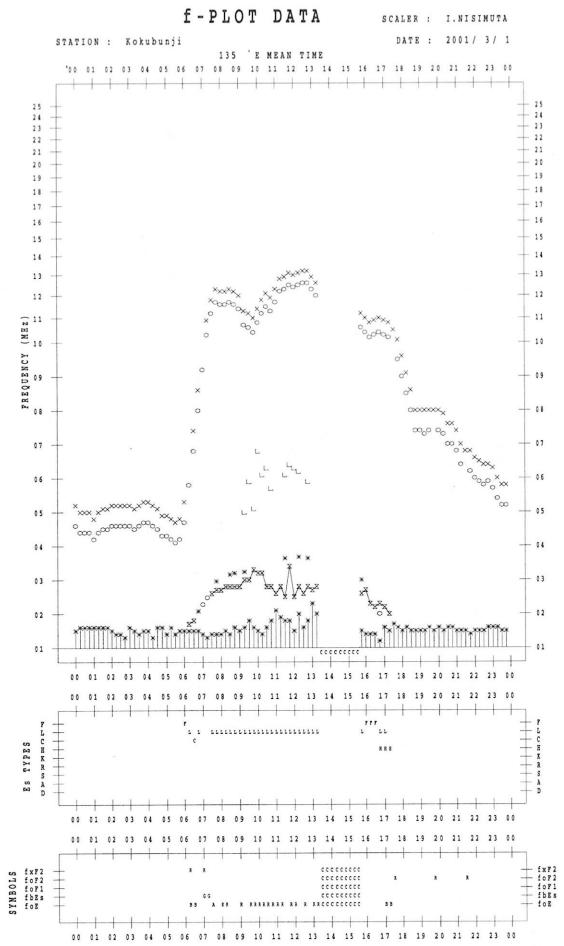
LAT.35°42.4'N LON.139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

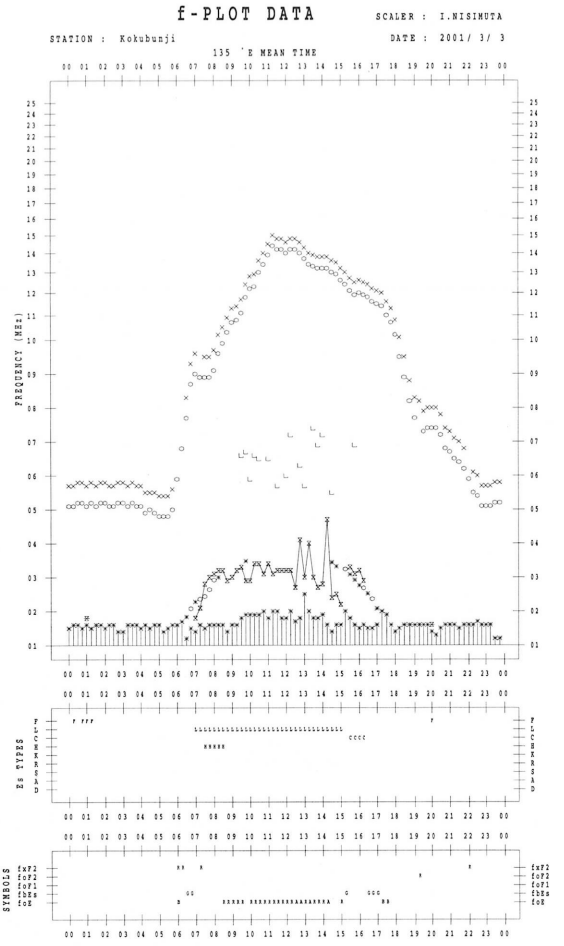
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1							F 1		L 1	L 1	L 1	L 1	L 1	L 1			F 1	HL 11						
2									L 2	L 1	L 1	L 1	L 1	L 1	L 1	L 1	HL 11	C 2						
3		F 1						L 1	HL 11	L 1	L 1	L 1	L 1	L 1	L 1	L 1	C 1				F 1			
4									L 2	L 1	CL 11	L 2	L 2	L 1	L 2									
5									L 1	L 1	L 1	L 1	L 1	C 1	CL 11	L 1	CL 11	C 2	F 2	F 1	F 1			F 2
6			F 2	F 1				L 2	L 1	CL 11	CL 11	L 1		L 1	L 2	CL 12	L 2	L 1	F 3	F 1			F 1	F 2
7								H 1	HL 12	L 1	L 1	L 1	C 1	L 1	L 1	C 2	L 2		F 2	F 3	F 3	F 2	F 1	F 1
8							H 1	L 1	HL 11	L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 2	F 3	F 1	F 2	F 2		
9							L 2	HL 11	CL 11	L 1	CL 11		L 1	L 1	L 1									
10								L 1	L 1	L 1	L 1	L 1	L 1	L 1	L 2	L 2	L 1	H 1	F 2	F 3	F 1	F 2	F 1	
11									L 2	L 1	CL 11	L 1	L 1	L 1	L 1	L 1	L 1			F 5				
12							H 1	H 1	L 2	CL 11	CL 11	L 1	L 1	L 1	L 1	L 1	L 1	C 4	F 5	F 4	F 4	F 4		
13			F 1	F 3	F 1		H 1	H 1	HL 11	L 1	CL 11	C 1	L 1	L 1	L 1	L 1	L 1	L 1	F 1	F 1				F 2
14								C 1	L 1	L 1	L 1	L 1			L 1	L 1	L 1	HL 12	L 1	F 2	F 1	F 4	F 6	F 4
15	F 1	F 2	F 2	F 2	F 1	F 1		L 2	CL 11	CL 11	CL 11	L 1	L 1	L 1	L 1	L 1	L 2	L 2	F 5	FF 31	F 3	F 1	F 2	
16	F 1						H 1	L 1	L 2	L 1	L 1	L 1	L 1	L 1	L 2	L 2	L 2	L 2	F 1	F 3	F 3	FF 21	FF 11	F 3
17	F 2	F 3	F 1	F 1				L 2	L 1	CL 11	L 1	L 1	L 3	L 2	L 2	CL 11	L 1		F 3	F 4	F 1	F 3	F 1	F 1
18							H 1	L 2	CL 11	CL 21	CL 11	L 1	L 1	L 1	L 2	L 1		L 2	F 2					
19															L 1	L 1	L 2	L 3	FF 32	FF 32	F 2	F 4		
20								L 2	CL 22	CL 21	CL 11	CL 21	C 1		L 1	L 1					F 1	F 1		F 1
21				F 1				C 2	L 1	HL 11	HL 11	CL 11	CL 11	L 1	L 1	L 1	HL 11	CL 21	F 4		F 2		F 4	
22	F 1								HL 11	CL 31	L 1	L 1	L 1	L 1	L 2	L 2	CL 22	CL 23	FF 34	FF 31	FF 21	F 3	F 1	
23				F 1			H 2	C 1	HL 11	CL 11	CL 11	L 1	L 1	L 1	L 2	L 2	L 2	L 2	F 3	F 3	F 2	F 2	F 2	F 1
24	FF 33	FF 41	F 3	F 2	F 2	F 2	HL 11	L 1	L 1	L 1	CL 11	L 1	L 1	L 1	L 1	L 1	L 1		FF 11	F 2	F 1	F 1		
25								HL 11	L 1	L 1	C 1	L 1	L 1	L 1	L 1	L 1	L 3	CL 11	F 2	F 1				
26							HL 31	HL 11		L 1	L 1	L 1		L 1	L 1	L 1	L 1	HL 11	F 5	F 1	F 1			
27							H 2	HL 11	L 1	L 1		L 1				L 1	L 1	HL 11	F 3	FF 21				
28							H 1	L 1	L 2	C 1	CL 11		L 1		C 1	CL 11	L 1	HL 11	F 2	F 3	F 4	F 2		
29	F 1		F 4								C 2			L 1	L 1	L 1	L 1	L 1	F 2	F 1				
30								L 1	L 1	L 1	L 1	L 1		C 1							F 1			
31			F 2	F 1		F 1	H 2	L 1		CL 11		C 1	L 1	CL 11		L 1	L 1	L 1	F 1		F 2	F 2	FF 21	FF 11
	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																								

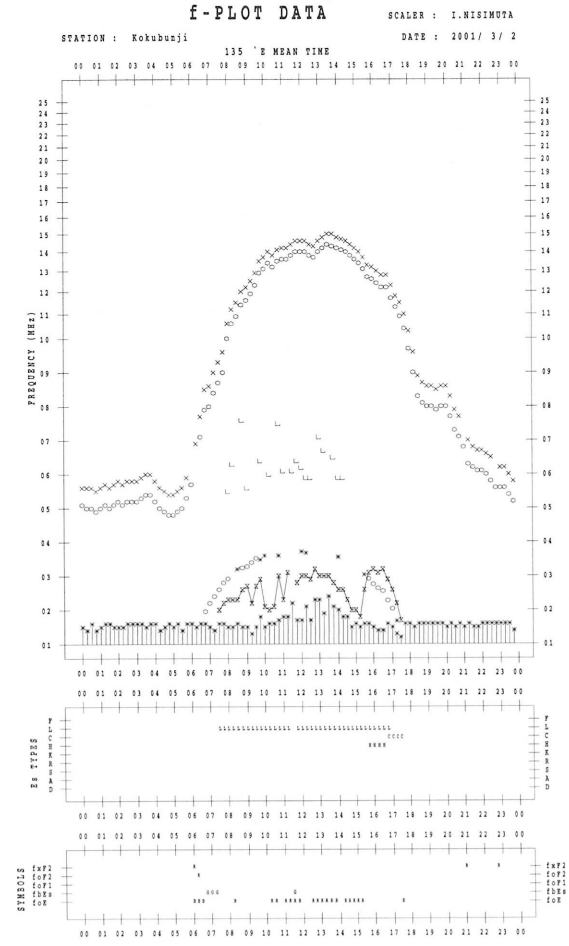
MAR. 2001 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

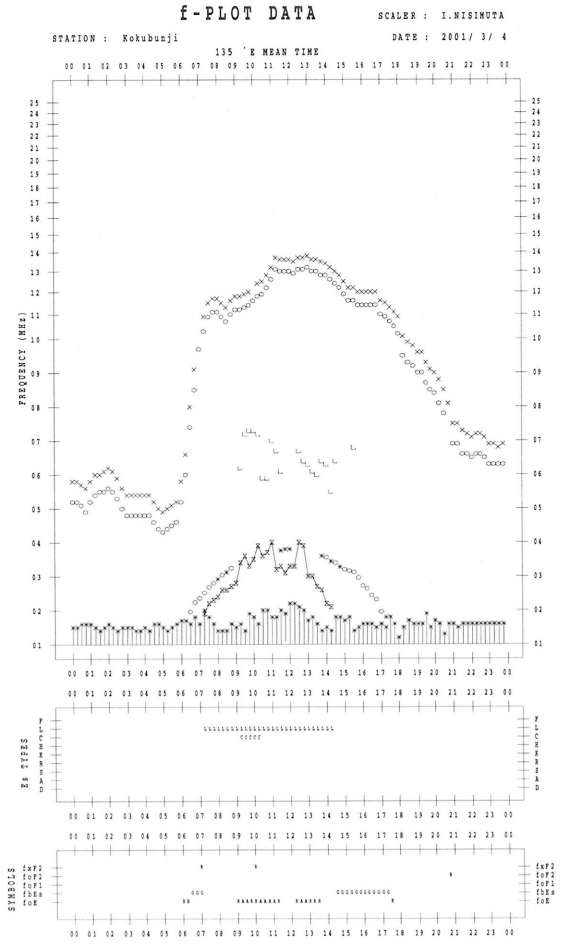
f-PLOTS OF IONOSPHERIC DATA

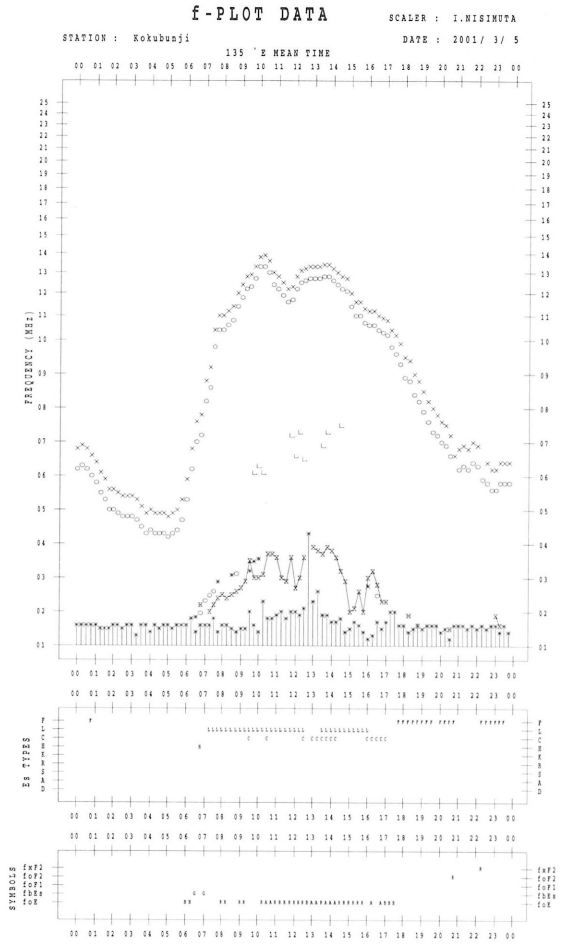
KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

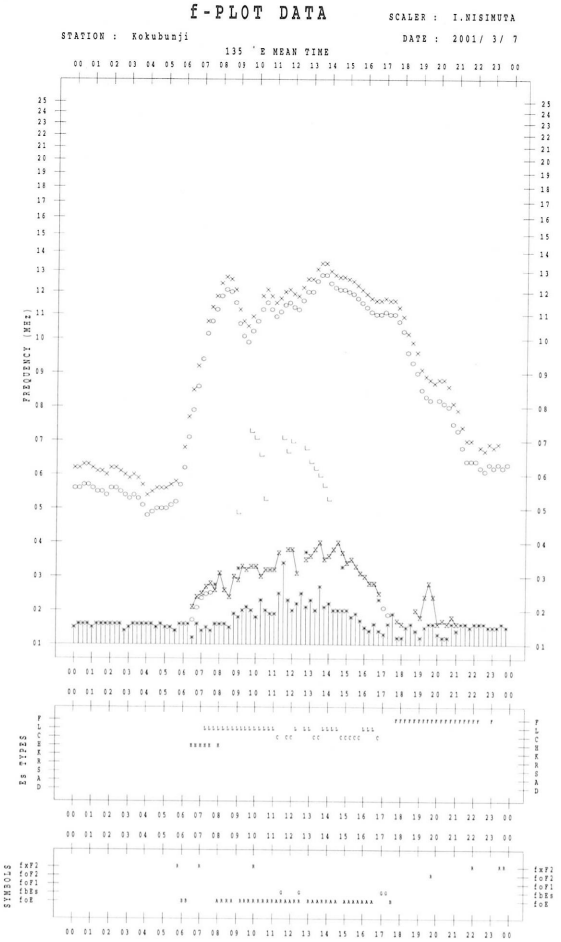

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

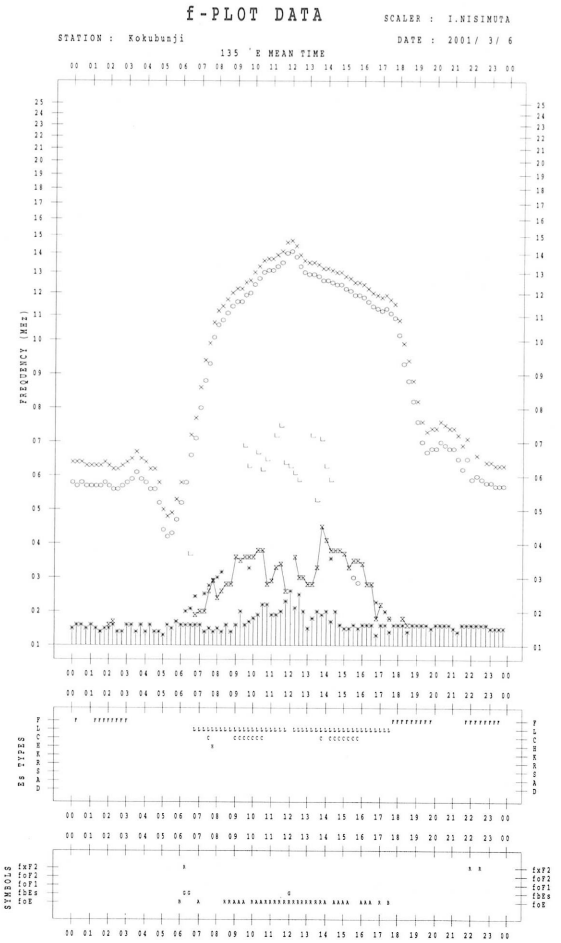

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

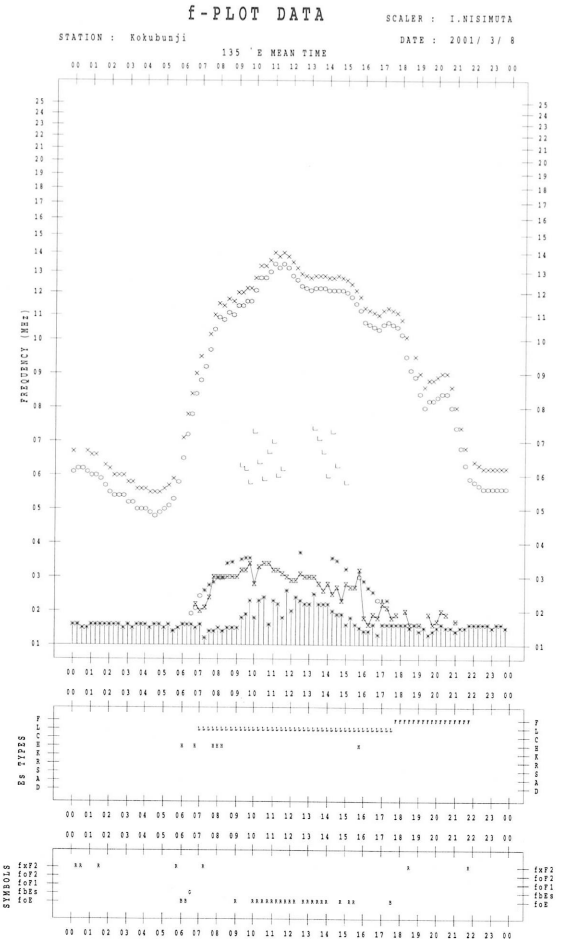

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

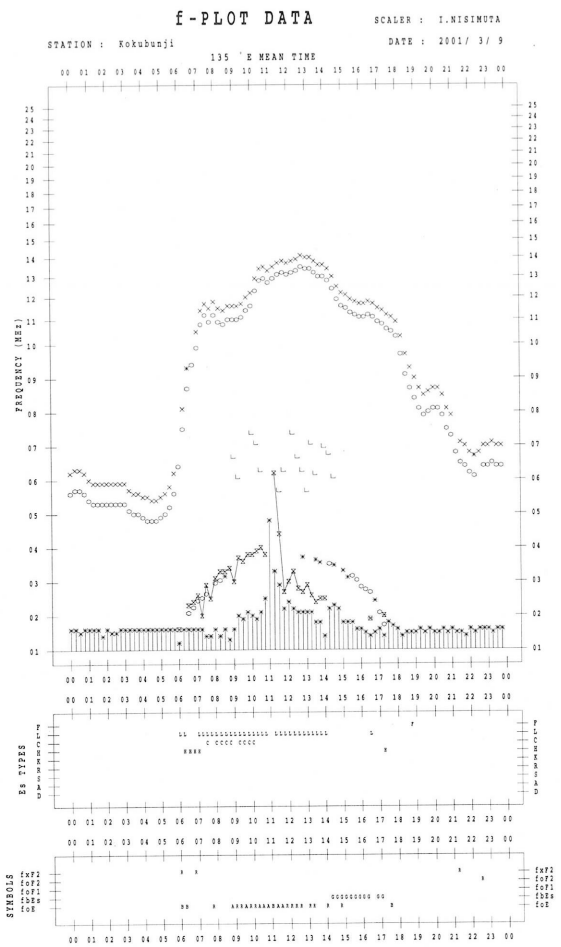

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

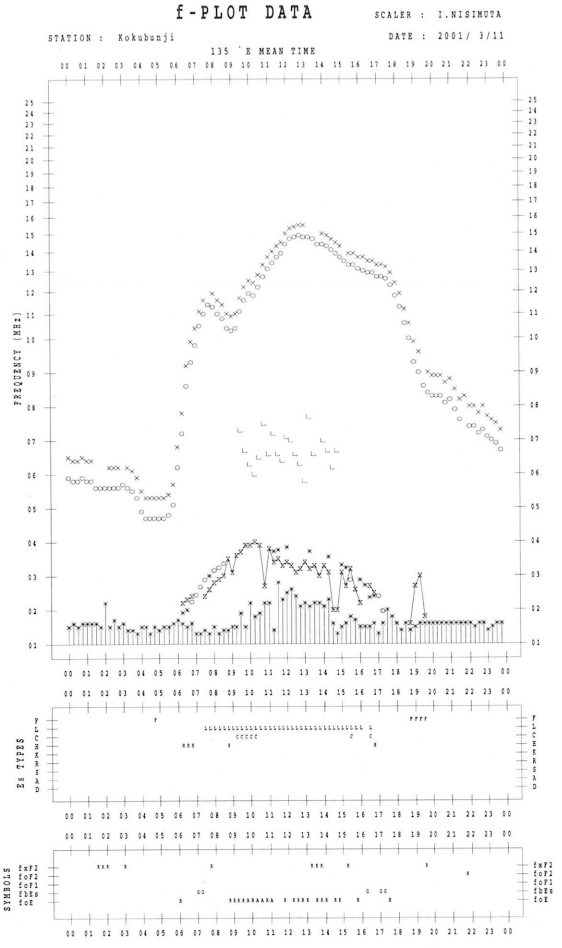

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

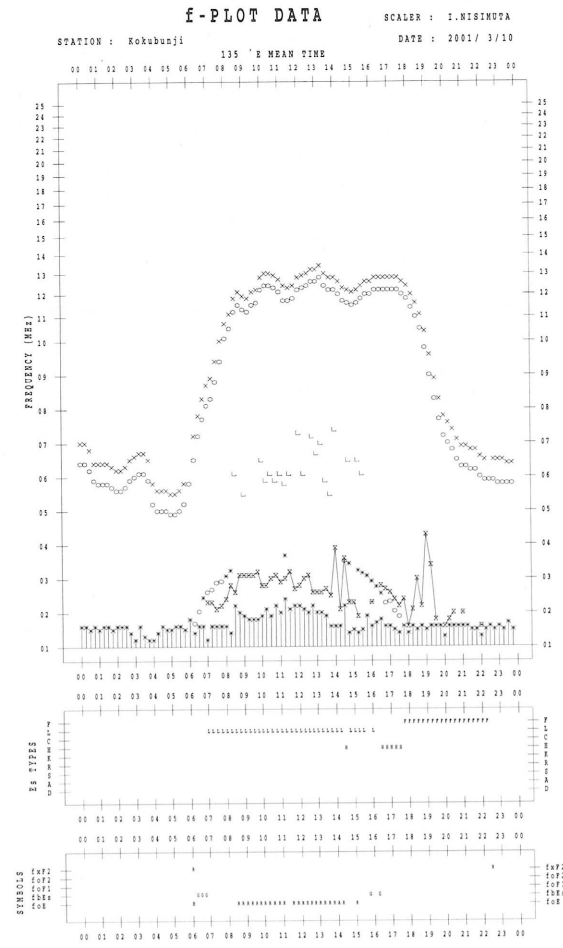

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

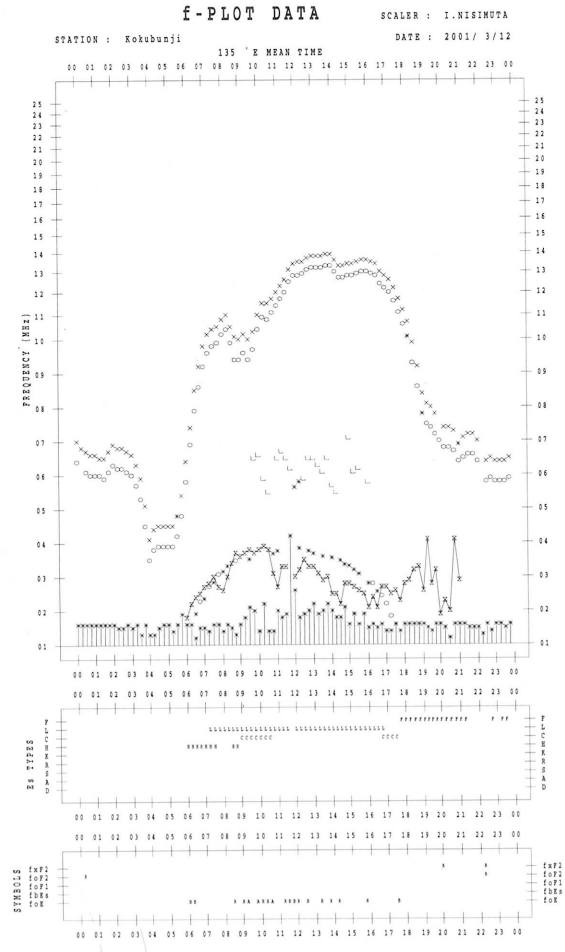

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

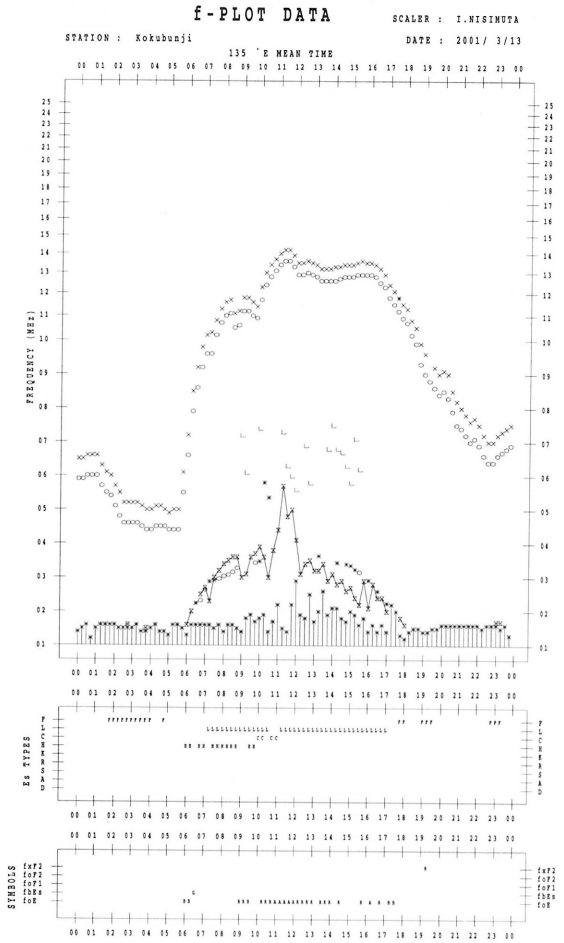

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

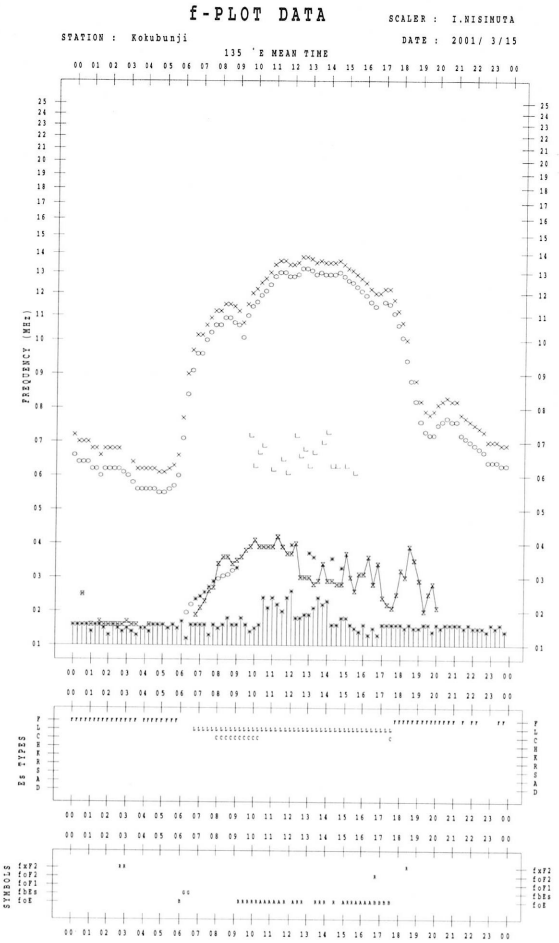

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/ 9
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

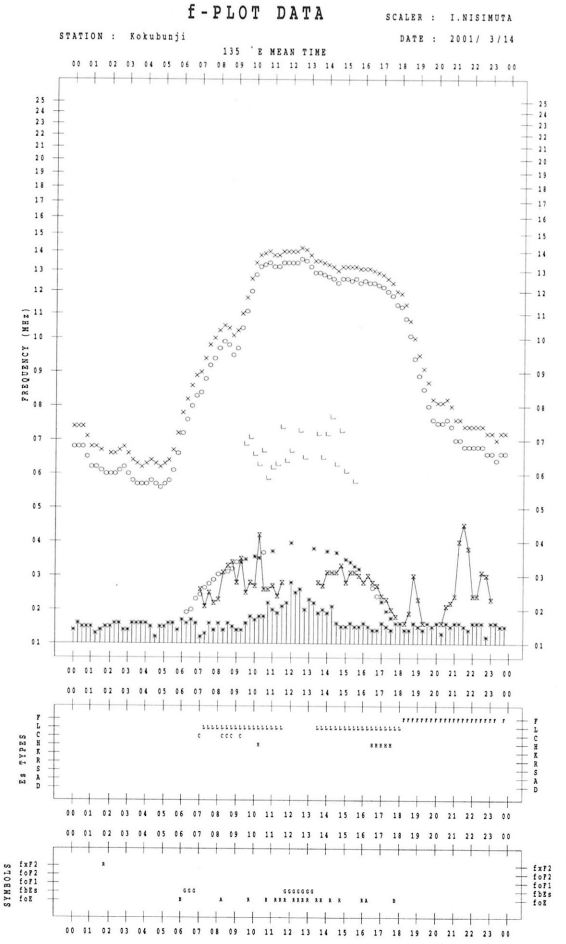

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/11
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

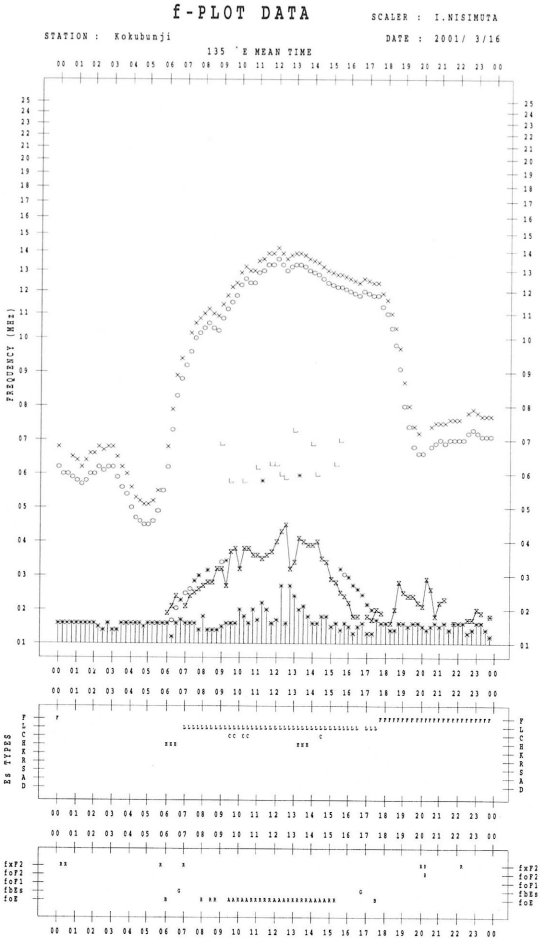

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/10
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

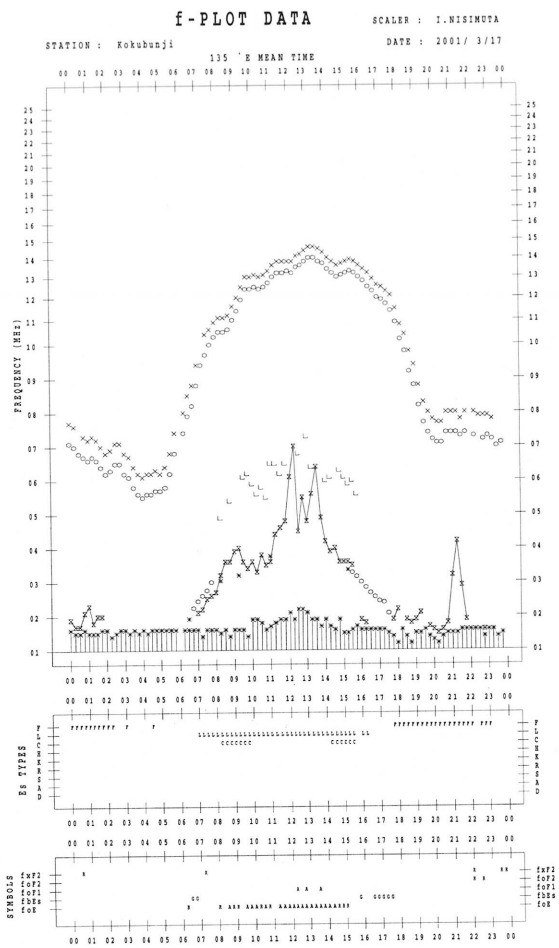

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

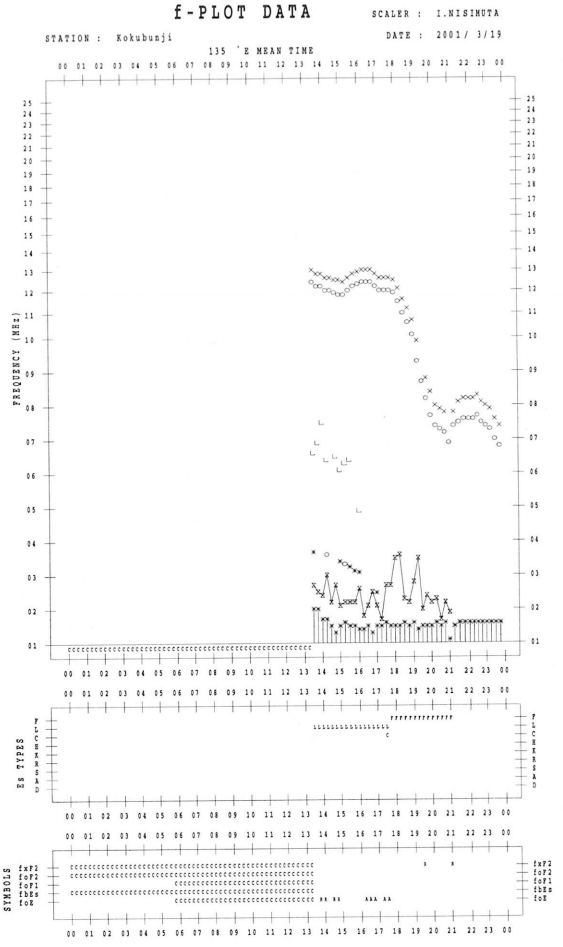

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/13
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

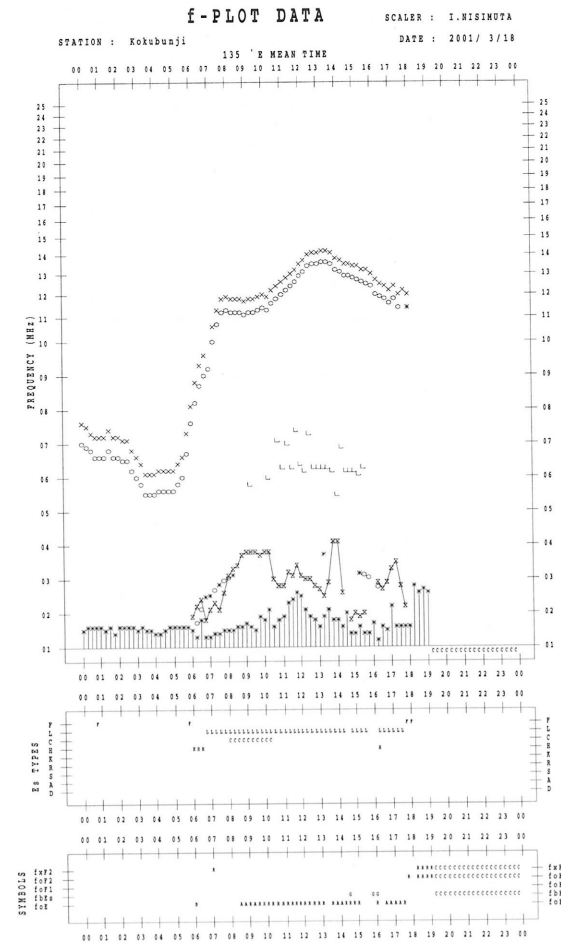

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/15
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/14
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/16
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/17
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/19
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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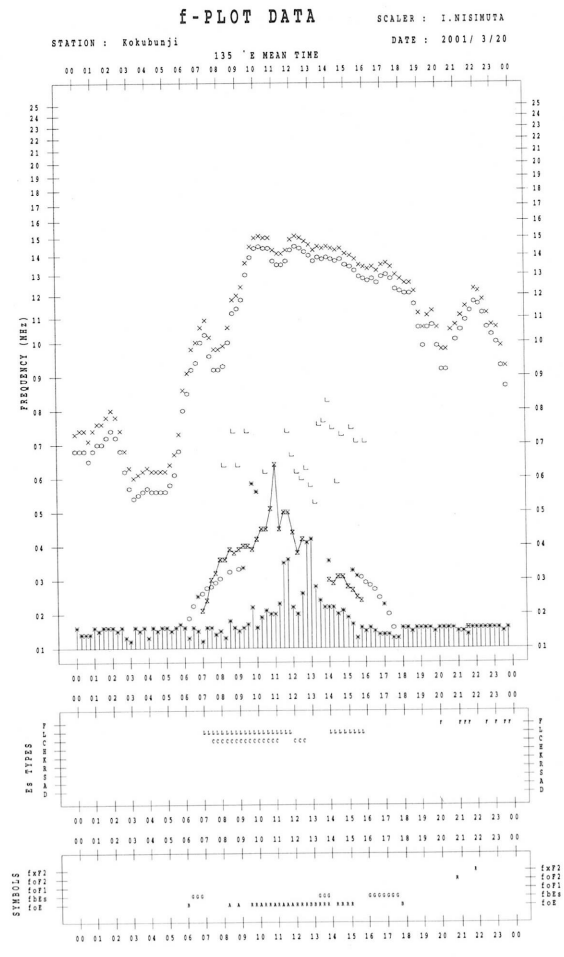
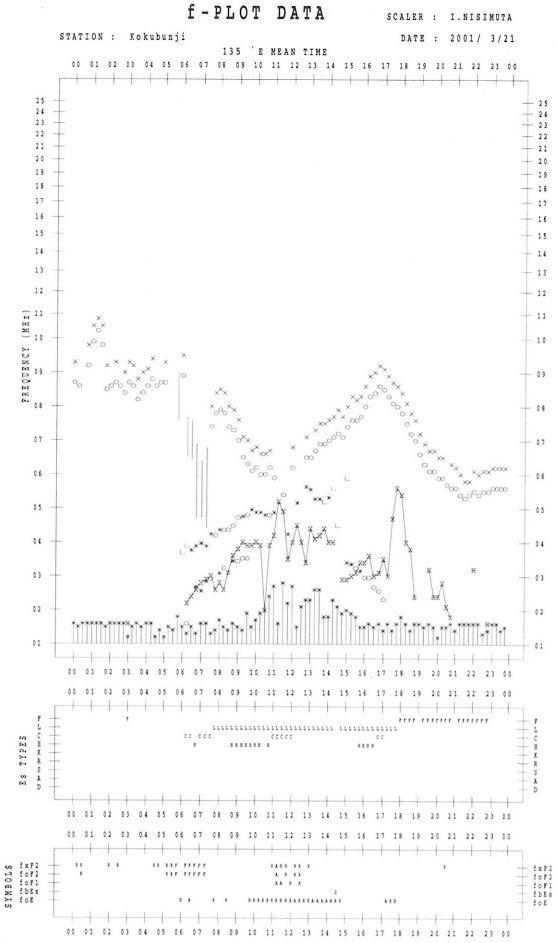
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/18
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/20
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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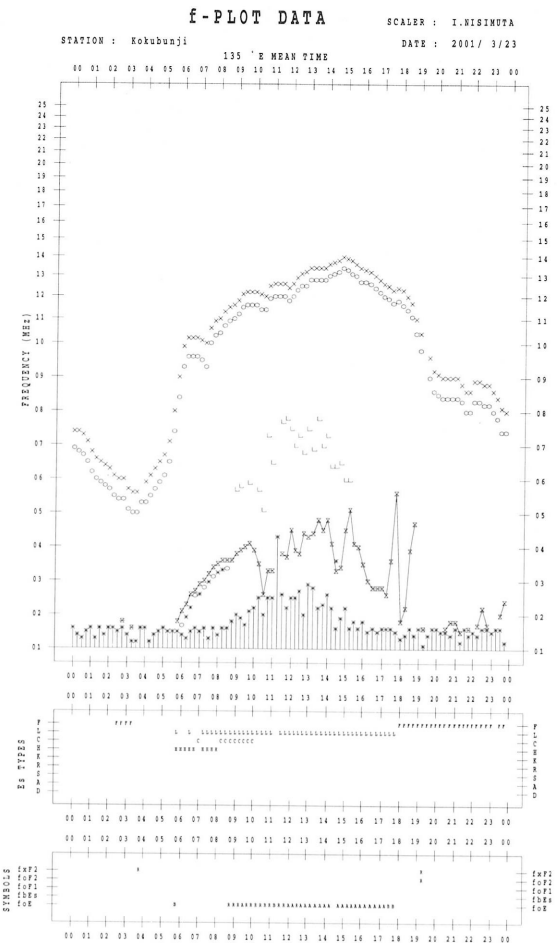
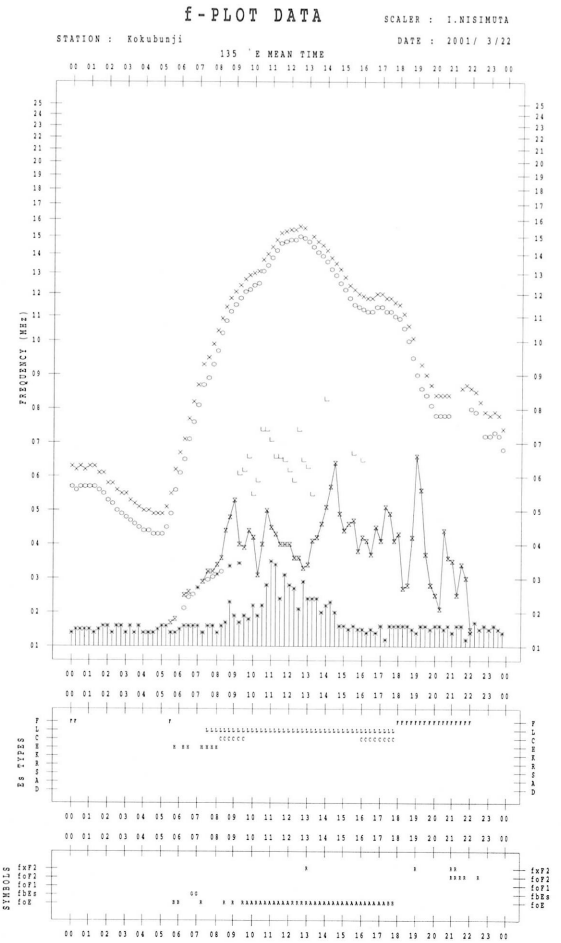
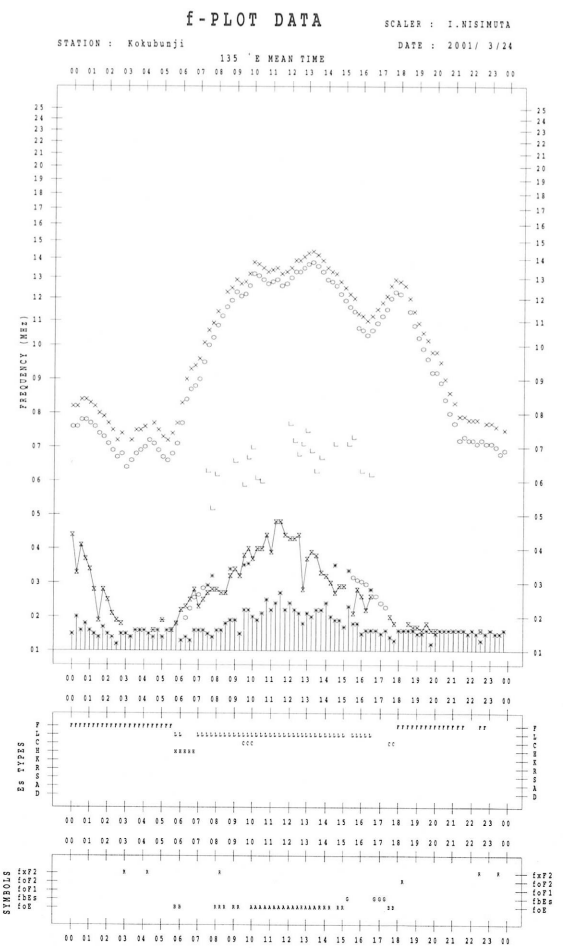
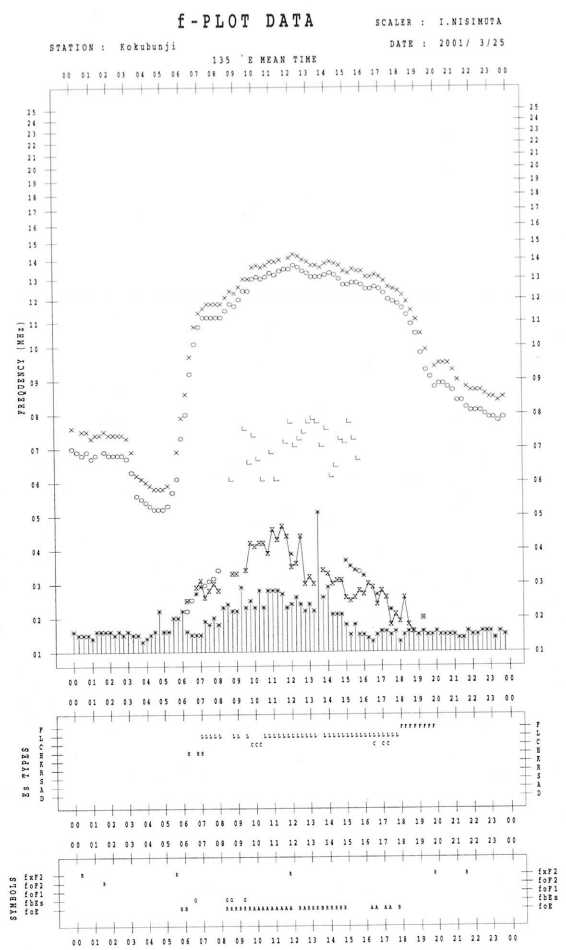
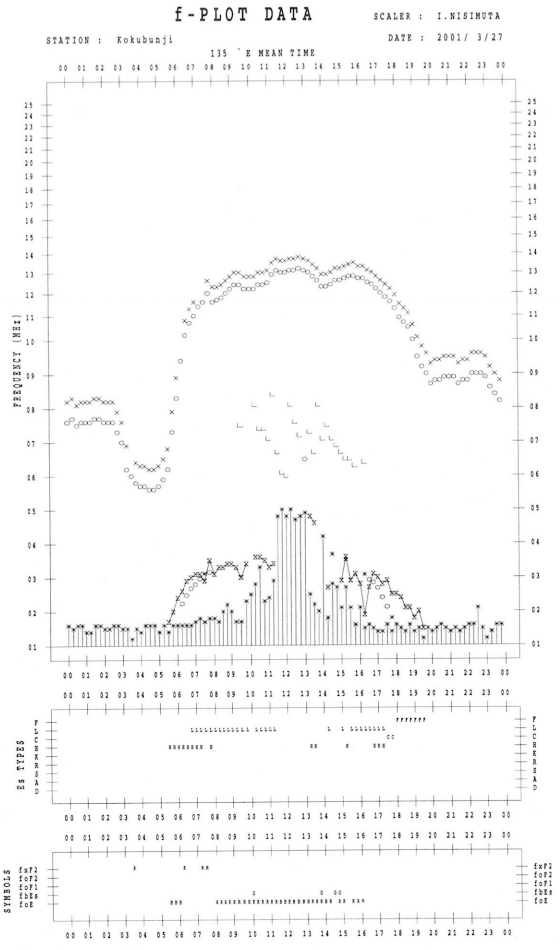
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

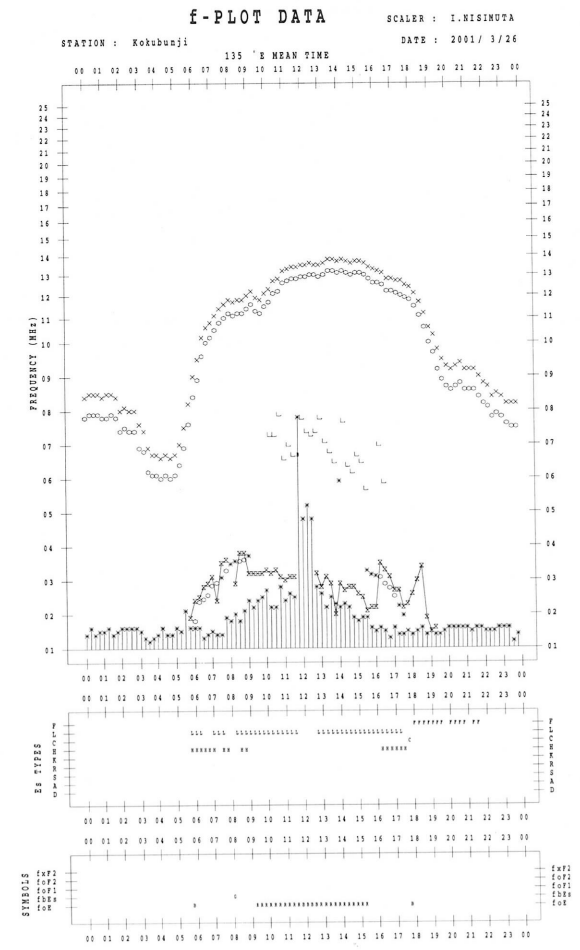

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

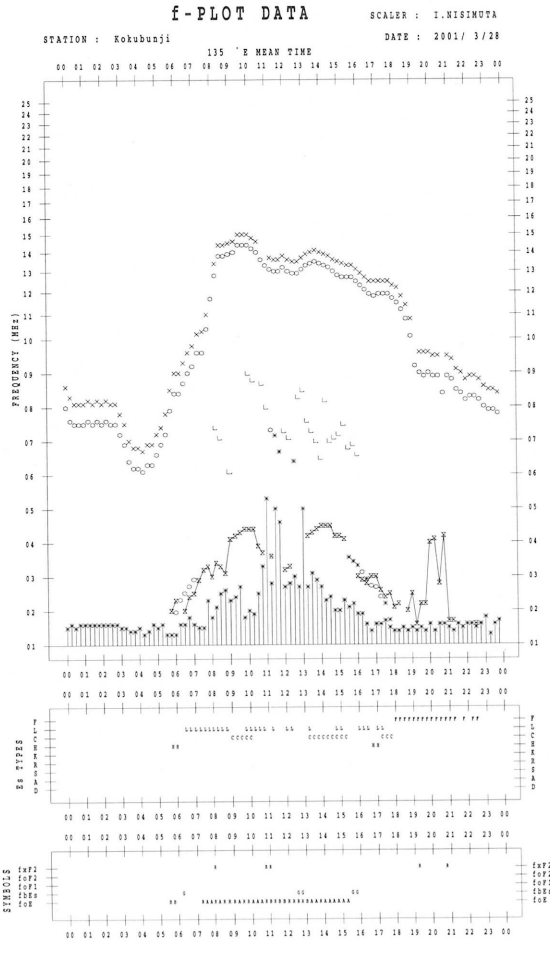

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

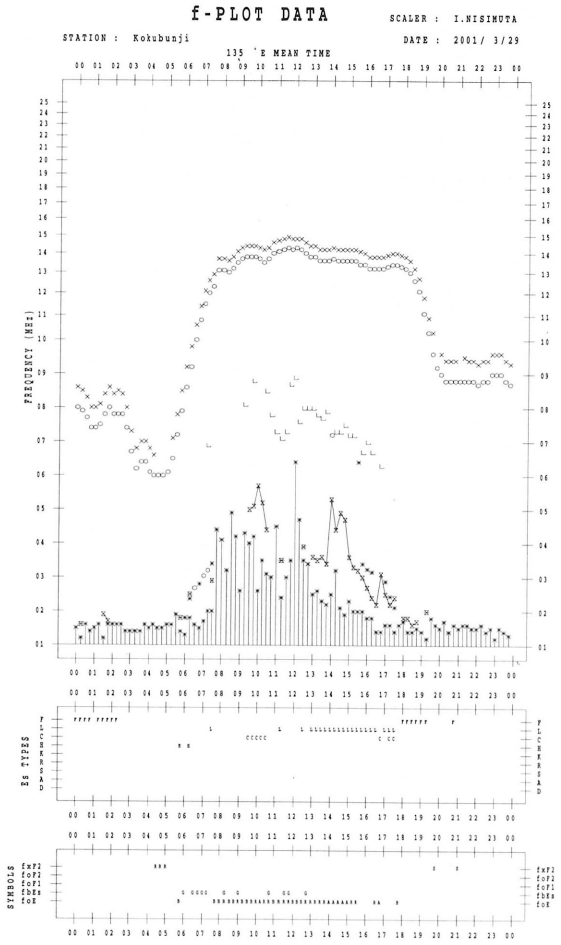

f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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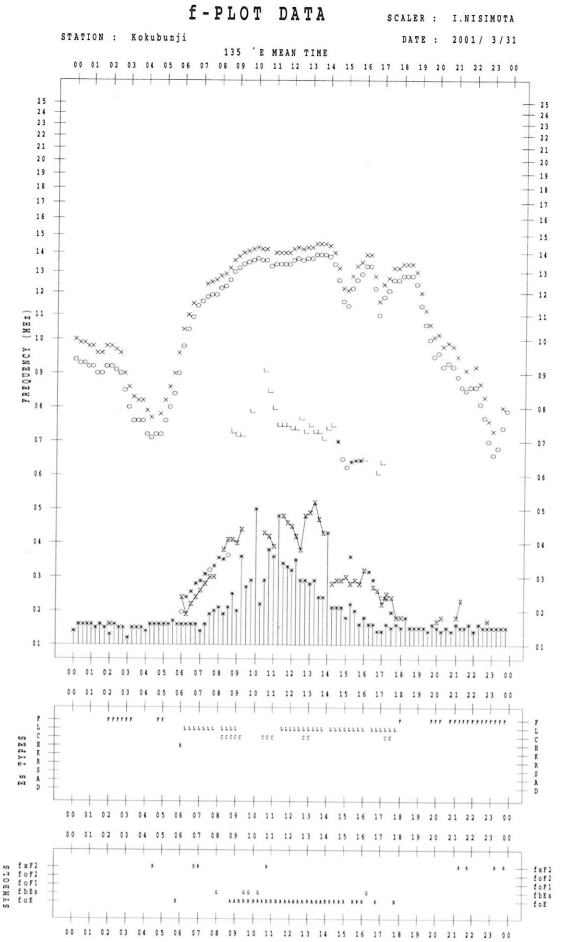
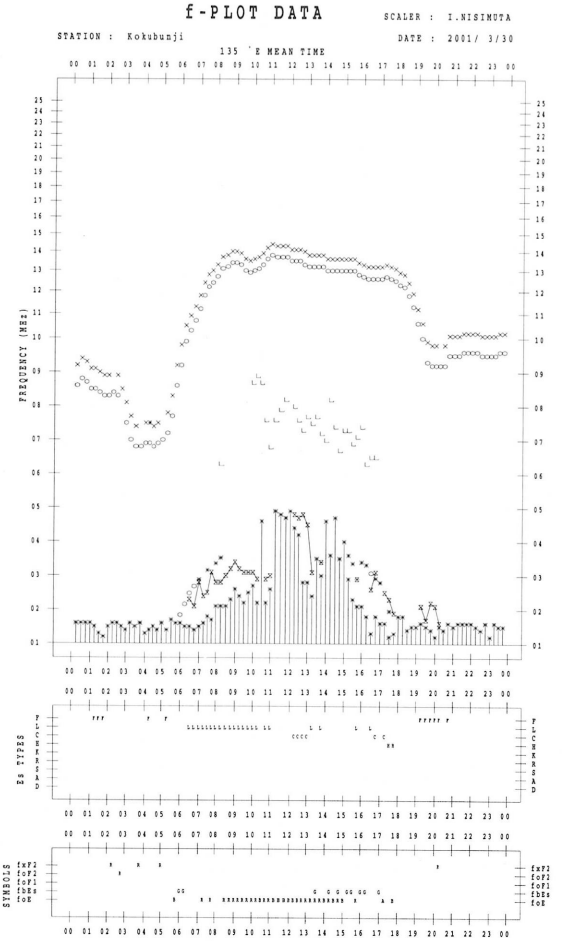
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/29
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 3/31
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISIMUTA
STATION : Kokubunji
DATE : 2001/ 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 2001

Single-frequency total flux observations at 500 MHz					
Flux density: 10^{-22} W m^{-2} Hz^{-1}					
Date \ UT	00-03	03-06	06-09	21-24	Day
1	41	41	40	46	42
2	43	40	39	44	41
3	41	40	41	40	40
4	39	39	40	43	40
5	42	40	40	45	42
6	42	42	41	–	41
7	45	46	47	54	47
8	49	48	49	53	49
9	48	47	44	48	47
10	43	40	40	45	42
11	42	40	40	44	42
12	43	41	39	45	42
13	42	40	39	46	42
14	41	38	37	47	41
15	40	38	–	–	40
16	–	–	–	–	–
17	–	–	–	–	–
18	–	–	–	–	–
19	41	39	40	45	42
20	41	40	40	–	40
21	–	–	–	46	46
22	43	41	40	45	42
23	43	42	44	49	45
24	43	40	42	50	43
25	51	54	47	46	50
26	49	62	61	62	58
27	56	62	66	61	61
28	60	57	55	62	59
29	64	57	58	59	61
30	56	55	272*	69	61
31	64	55	51	52	56

Note: No data is available during the following periods.
6th 2100 - 6th 2400 15th 0600 - 18th 2400 20th 2100 - 21th 0900
A superscript * stands for being superposed on a burst.

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 2001

Single-frequency observations

Normal observing period: 2040 – 0850 U.T. (sunrise to sunset)

MAR. 2001	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
3	200	8 S	0107.0	0108.0	1.0	320	–	0
4	200	8 S	0426.0	0426.0	1.0	140	–	0
4	200	8 S	0513.0	0514.0	2.0	100	–	0
4	200	8 S	0705.0	0705.0	1.0	75	–	0
7	2800	7 C	0009.0	0012.0	8.0	25	–	0
7	500	8 S	0012.0	0014.0	5.0	75	–	0
8	200	8 S	0110.0	0111.0	1.0	60	–	0
8	200	8 S	0159.0	0200.0	1.0	25	–	0
9	2800	3 S	0155.0	0156.0	5.0	115	–	0
9	500	4 S/F	0233.0	0242.0	17.0	40	–	0
10	200	8 S	0110.0	0110.0	1.0	70	–	0
10	2800	3 S	0403.0	0404.0	7.0	105	–	0
10	500	4 S/F	0403.0	0404.0	7.0	115	–	0
10	200	47 GB	0403.0	0404.0	7.0	5050	–	0
10	500	8 S	0740.0	0741.0	1.0	45	–	0
10	200	8 S	0740.0	0741.0	1.0	215	–	0
12	200	8 S	2118.0	2118.0	1.0	15	–	0
12	200	8 S	2216.0	2216.0	2.0	20	–	0
13	200	8 S	0014.0	0014.0	3.0	35	–	0
13	200	8 S	0103.0	0103.0	1.0	15	–	0
13	200	8 S	2222.0	2222.0	1.0	25	–	WR
13	200	8 S	2337.0	2339.0	2.0	40	–	WR
13	500	8 S	2338.0	2339.0	1.0	25	–	0
14	200	8 S	0055.0	0055.0	1.0	25	–	0
14	200	8 S	0336.0	0337.0	2.0	30	–	MR
14	200	8 S	0649.0	0650.0	2.0	25	–	WR
14	200	8 S	2304.0	2304.0	1.0	15	–	0
15	200	8 S	0003.0	0003.0	1.0	15	–	0
15	200	7 C	0011.0	0011.0	8.0	185	–	WR
15	500	8 S	0253.0	0253.0	1.0	10	–	0
15	200	8 S	0253.0	0253.0	1.0	25	–	WR
17	200	8 S	0610.0	0610.0	1.0	25	–	WR
18	200	8 S	0522.0	0523.0	1.0	25	–	0
18	200	8 S	2201.0	2202.0	1.0	30	–	0
18	200	8 S	2326.0	2326.0	1.0	50	–	WL
18	200	7 C	2341.0	2342.0	1.0	230	–	WL
19	200	8 S	0039.0	0039.0	1.0	15	–	ML
19	500	8 S	0050.0	0052.0	3.0	20	–	WL
19	200	7 C	0050.0	0050.0	3.0	215	–	WL
19	200	8 S	0056.0	0056.0	1.0	15	–	0
19	500	8 S	0116.0	0117.0	1.0	70	–	ML
19	200	8 S	0117.0	0117.0	1.0	10	–	0
19	200	8 S	0149.0	0149.0	1.0	15	–	0
19	200	7 C	0153.0	0155.0	2.0	40	–	ML
19	500	8 S	0154.0	0155.0	1.0	10	–	WL
19	200	7 C	0227.0	0227.0	1.0	60	–	ML
19	200	42 SER	0237.0	0238.0	12.0	110	–	ML

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso March 2001

Single-frequency observations

Normal observing period: 2040 - 0850 U.T. (sunrise to sunset)

MAR. 2001	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
19	200	8 S	0244.0	0244.0	1.0	20	-	WL
19	200	8 S	0425.0	0426.0	1.0	15	-	0
19	2800	3 S	2317.0	2318.0	4.0	55	-	0
19	500	8 S	2318.0	2318.0	1.0	40	-	0
20	500	8 S	0332.0	0332.0	1.0	240	-	0
21	200	8 S	2331.0	2332.0	1.0	15	-	0
22	200	8 S	0001.0	0001.0	1.0	30	-	0
22	200	8 S	0139.0	0139.0	1.0	15	-	0
22	200	8 S	0817.0	0818.0	2.0	70	-	0
22	200	47 GB	0821.0	0823.0	3.0	680	-	WR
23	500	8 S	0038.0	0040.0	3.0	95	-	0
23	500	7 C	0538.0	0543.0	7.0	80	-	0
23	200	8 S	2137.0	2138.0	1.0	40	-	0
24	200	42 SER	0134.0	0150.0	17.0	50	-	0
24	2800	8 S	0135.0	0136.0	3.0	110	-	0
24	200	8 S	0743.0	0743.0	1.0	50	-	0
24	500	47 GB	2047.0	2104.0	64.0	1970	-	SL
25	500	8 S	0014.0	0014.0	1.0	45	-	0
25	2800	3 S	0414.0	0418.0	12.0	140	-	0
27	2800	7 C	0224.0	0233.0	13.0	55	-	0
27	200	47 GB	0224.0	0225.0	3.0	1130	-	WR
27	500	7 C	0225.0	0230.0	15.0	25	-	0
27	500	7 C	0544.0	0548.0	7.0	75	-	ML
27	500	42 SER	2108.0	2114.0	18.0	70	-	WL
27	200	42 SER	2109.0	2111.0	9.0	370	-	0
27	200	47 GB	2301.0	2301.0	1.0	785	-	SR
28	500	3 S	0026.0	0028.0	3.0	85	-	MR
28	500	8 S	0049.0	0049.0	1.0	45	-	WL
28	200	47 GB	0049.0	0049.0	1.0	990	-	SR
28	500	3 S	0156.0	0200.0	7.0	110	-	WR
28	200	7 C	0156.0	0159.0	3.0	250	-	WR
28	200	47 GB	2227.0	2236.0	13.0	635	-	SL
28	500	42 SER	2228.0	2233.0	14.0	90	-	ML
29	500	8 S	0613.0	0613.0	1.0	30	-	WL
29	200	8 S	0650.0	0651.0	1.0	50	-	0
29	500	8 S	0652.0	0652.0	1.0	85	-	WL
30	200	20 GRF	0410.0	0556.0	255.0	460	-	ML
30	500	20 GRF	0420.0	0556.0	254.0	460	-	ML
30	500	8 S	0420.0	0422.0	3.0	320	-	WL
30	2800	3 S	0422.0	0428.0	18.0	80	-	0
30	200	8 S	0422.0	0424.0	4.0	220	-	0
30	500	4 S/F	0429.0	0436.0	7.0	490	-	ML
30	500	4 S/F	0442.0	0444.0	5.0	275	-	ML
30	2800	3 S	0513.0	0515.0	7.0	80	-	0
31	500	8 S	0345.0	0346.0	1.0	30	-	WL
31	200	8 S	0345.0	0345.0	1.0	170	-	0
31	200	8 S	0527.0	0527.0	1.0	165	-	SR

B. Solar Radio Emission
B2. Outstanding Occurrences at Hiraiso

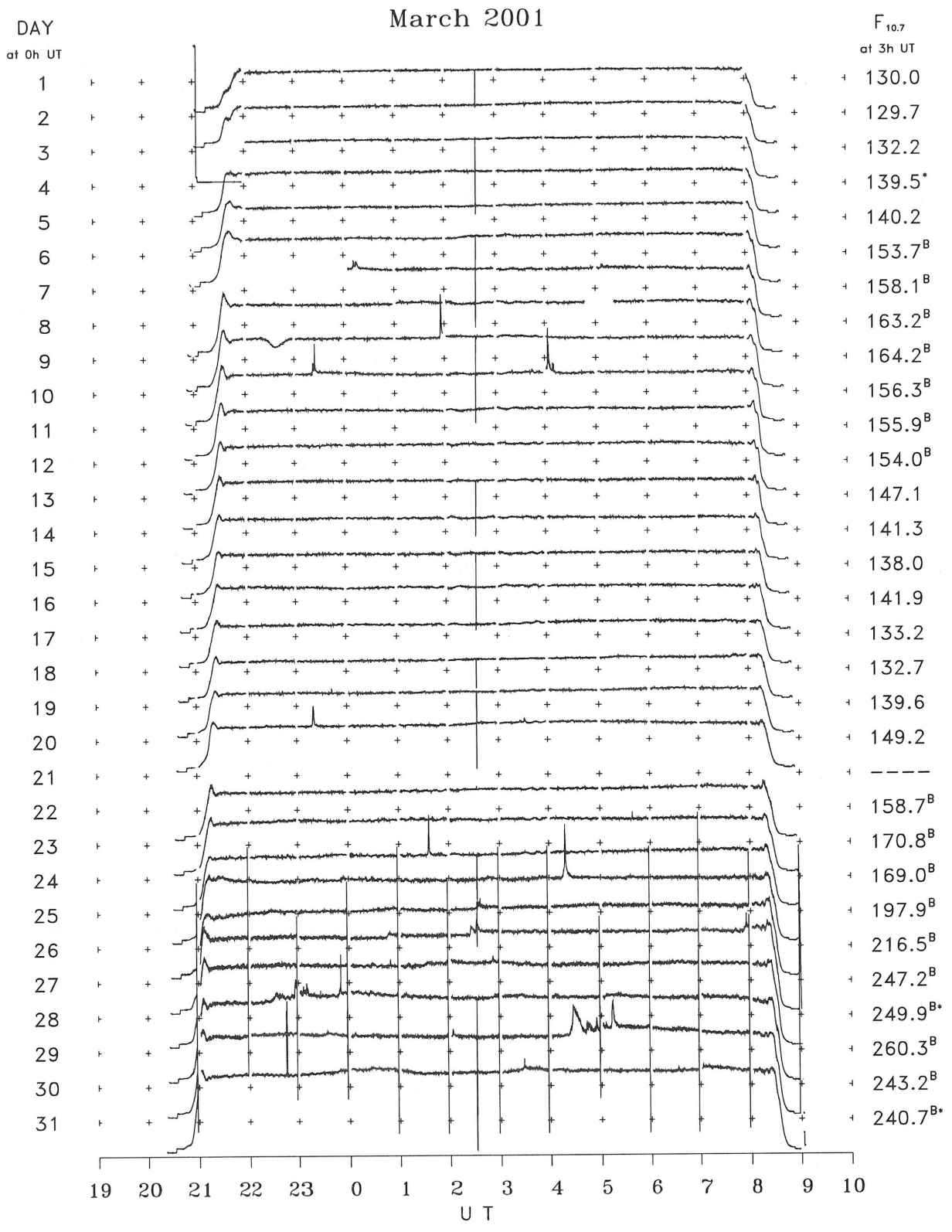
Hiraiso March 2001

Single-frequency observations
Normal observing period: 2040 - 0850 U.T. (sunrise to sunset)

MAR. 2001	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS
31	200	8 S	0846.0	0846.0	1.0	445	-	0
31	200	8 S	2049.0	2049.0	1.0	105	-	MR

B. Solar Radio Emission

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



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

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