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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

APR. 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	59	65	63	57	69	54	69	97	81	92	92	118	92		94	92	92	94	97	92	83			
2	68	67	68	66	60	59	80	93	115	92	98				102	92	93	115	91	93	93			
3	94	68	70	68	61	68	78	B		79	84	79	87	B		92	108	91	91	92	78			
4	68	78	68	72	67	71	94	99		99	93		84	92	96	94	91	82	92	82	82			
5	94	95	68	57	54		76	81	91	92	90	82		62		94	92	91	91	82	92			
6	69		70	68	63	73	84	99	114	114				92	93	92	94	115	92	92	92			
7	67		71	69	66	70	94	80	96		93	105	84		96	96	100	91	88	84	92	92		99
8	76	71				70	95	94	96	95	103	115	101	93	96		94	97		90	94	90		
9	68	54	68	55	50	56	58	57	67	62	69	74	67	70	86	80	79		91	82	67	62		
10	58	58	58	59	60	68	84	95		92	104	96	90			82	93		86	84	92	94		
11	68		57	65	68	72		92	114		92	89	96	92	96	96	93	94	94	90	83			
12	69	70	45	49	49	59	59		48					67	70	72	80	81	84		73			
13	69	58	70	67	63	71		94	92	91	91	93	96	92	92	92	87	91	82	81	84			
14	55	58	61	52	42	53	54	93	77	77	79	84		84	96	91	87	82	82	84	93		99	
15	58	63	58	57	59	58	53	64	73	72	78	88	79	91	92	83	93	86	84	81	92	79		
16	69	68	67	68	62	69	89	80	84	92	92	95	92	96	96	92	94	95	93	84	92	69	72	66
17	67	69	68	60	57	68	73	74	114	92	91	81	91	92	93	89	96	82	93	79	81	94	75	63
18	70	70	64	61	66	67	95	80	82	93	93	94	92	83		92			117	81	94	66	66	
19	68		68	67	61		93	95	95			94	95			95	114	82	91	82	94	94	82	73
20	57	70	70	74	70		95	82	82	84	92		94	92	96	92	104	90	96	98	94	70	68	92
21		70	70	70	66	76	95	115	96			91	95	92	102	92	115	121	94	114	84		70	
22	79	58	70	70	68		93	94	91		96		95	95	94		92	87	91	91	92	98	95	
23	67	63	39	44		69	40										61	62	58	58	55	53		51
24	52		40	37	36			52	66	81	83	92	81	88	84	85	82	105		91		92	70	69
25	70		69	54	58	71	92	102	92	88	72	72		68		82	81	82	93	81	83	94	95	95
26	95			75	61	64		72	76	81	77	81	81	82	82	86	91		92	90	82	70	72	
27	74	60	68	67	67		82	93	82	82	79	78	81	81	84	84	83	86	86	93	92	95	67	69
28	72	71	68	38	60	60	55	62		65		70	66	72	83	82	74	83	81	93	70	66		70
29	66	40	68	60	41		89			A						58	66	62	70	74	55	58	60	
30	60	42	54	57	59	68	94	85	81	84	82	80	82	82	96	91	93	82	91		92	94	94	94
31																								
	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	23	28	29	28	23	26	26	24	22	23	22	22	22	22	27	29	26	28	28	29	19	14	11
MED	68	67	68	61	61	68	84	92	88	90	91	88	90	90	94	92	92	88	91	84	92	90	72	70
U Q	71	70	69	68	66	71	94	95	96	92	93	94	95	92	96	92	94	94	93	92	92	94	94	94
L Q	63	58	59	56	57	59	69	80	79	81	79	80	81	81	86	83	82	82	85	81	81	66	68	66

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Wakkanai

APR. 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	26		G	G	G	G		40	40	G	G	G	G		G	G	G	G	G	G	G		G	G
2	G	26	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G		G
3	G	G	G	G	G	G	G	B	G	G	G	G	G	B		G	G	G		G	G	G	G	
4	G	G	31	G	G	G	42	G		G	G	G	G	G	G	G	G	G	G	G	G	G		
5	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G	G	G	44	G		G	G	G	G	G	30	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	G	44	G		G	41	G	44	32		G	G		G
8	G	G	G			G	G		G	50	53	G	G	G	G		G	G	G	G	G	G	G	G
9	G	G	G	G	G	G	32	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G
10	G	G	G	G	G	G	G	G		60	G	G	G			G	G	G	G	G	G			G
11	G		G	G	G	G		G	G		G	G	G	G	G	G	G	G	G	G	29	44	G	
12	G	G	24	G	G	G	G	G	G	G	G	G	60	G	G	G	G	50	28		G	G	G	
13	26	G	G	29	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G
14	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	25	29	G		G
15	G	G	G	39	26	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
16	G	G	G	G	G	G	41	G	G	G	46	G	G	G	G	G	G	G	G	G	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	30	G	G	G	
19	39	G	G	G	G	G		G	G			57	G	G	G	G	G	40	33		G	G	G	G
20	G	G	G	G	G	G	34	39	41	G	50	G	G	G	G	G	G		32		G	42	G	G
21		29	34	G	G	G			G	G	G	G	G	G	G	G	G	G	31	G	G	G	G	G
22	G	G	G	G	G	G	G	G	G	G	G		47	74	G	G	G	49	G	G	G	G	G	G
23	G	34	28	33		G	G	G	G	G		G	G	G	G	G	G	42	36	35	30	61		G
24	48	61	45	27	G		G	G	G	G	56	50	G	G	48	G	G				68	G	G	G
25	G		G	G	G	G		G	G	G	G	G		G		G	G	G		27	G	G	G	G
26	G			G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	57	G	G	G	G		G	34		32	33	G	G
28	G	G	G	G	G	G	G	G		G	G	G	G	G	63	G	G	G	G	G	G	G		G
29	G	G	G	G	G		G	G	G	51	G	G	G	47	48	G	G	41	43	39	30		43	58
30	G	G	G	G	G	G	G	46	49	G	57	62	57	62	44	46	45	42	35		G	G	G	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	26	29	29	28	28	23	27	27	28	28	29	27	25	27	29	29	27	27	23	30	27	21	24
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	40	32	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

APR. 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	18	14	16	18	17	20	15	18	20	21	21	22	23		23	20	20	17	18	14	20		24	
2	16	15	18	16	15	20	16	17	24	24		48	49		24	23	18	18	20	17	17		17	
3	17	16	18	18	20	18	28	B		57	53	52	56	B		49	24	28	16	16	18		16	33
4	17	16	17	17	18	20	28	20		48	24		48	30		22	20	16	22	15	17	16	21	
5	18	18	20	18	20		16	18	21	20	26			50	20	21	20	17	22	17	20	16	16	
6	17	18	17	17	20	20	26	20	21	23	24			24	24	20	17	15	18	15	16	18	18	18
7	16	18	17	16	16	20	17	18	20	21	21	23	22		23	18	17	15	15	16	17	17	17	18
8	18	16	16			20	24	17	20	20	21	21	20	22	21		16	15	20	15	17	16	21	17
9	18	18	18	17	17	28	18	18	18	20	20	22			23	17	17	15	21	15	17	17	16	20
10	20	18	17	20	17	20	16	18		21	21	21	21			56	35	27	20	15	18	16	17	16
11	15		18	16	16	20		17	18		20	21	22	22	18	20	17	16	20	15	20	17	16	
12	18	18				20	23	18	20	18	21	20	22	23	20	18	17	15	18		18	17	18	17
13	20	18	17	21	18	21	21	17	18	18	18	21	20	20	20	17	16	26	20	15	18	26	32	20
14	20	17	20	17	20	21	23	16	16	20	21	20		20	18	17	17	16	21	17	15		16	
15	17	17	21	17	18	18	24	17	20	20	20	23	26	21	21	20	21	18	21	15	18	17	17	
16	17	17	15	16	17	20	16	17	20	20	23	22	24	21	21	18	17	17	21	15	17	17	16	17
17	20	18	16	18	17	20	15	16	17	21	21	23	21		21	21	20	15	20	15	17	17	16	17
18	20	20	18	17	16	20	15		18	20	20	20	22	22	21	22	17		21	15	18	17	17	15
19	17	20	17	18	17	21	15	15	17			22	23		18	26	18	15	15	14	17	17	17	16
20	20	17	18	18	17	20	16	16	17	20	21	23	21		21	22	17	17	16	15	17	17	18	17
21		16	15	15	18	21	15	16	18	22	22	21	20	20	30	16	16	17	16	15	18	16	16	16
22	15	18	17	17	15	22	15	16	21	23	21		24	21	20	20	16	15	21	15	16	17	15	16
23	17	16	16	16		29	17	18	18	20	20	22	21	21	22	20	18	16	15	14	17	15		15
24	14	15	15	17	16		18	17	20	20	23	20	30	28	20	21		16		14	14	15	17	16
25	15		17	15	17	22	18	20	22		50	21		26	20	21	17	16	17	16	16	20	16	17
26	18			18	18	23		16	18	20	21		32	21	23	20	20	18	21	17	18	17	17	20
27	16	17	17	20	18	22	16	18	20	28	26	22	22		20	20	20	17	18	15	15	15	16	17
28	20	18	18	20	17	23	18	17		22	22	22	34	23	21	20	20	18	22	15	17	16		18
29	20	18	17	15	23		15	15	18	20	20	22	22	24	20	20	17	15	15	15	16	15	20	15
30	15	20	15	17	20	23	16	16	18	20	21	21	23	18	20	18	16	16	17		20	15	18	16
31																								
	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	27	28	28	27	27	28	28	26	27	28	25	25	20	27	29	29	29	29	28	30	26	28	23
MED	17	18	17	17	17	20	16	17	19	20	21	22	22	22	21	20	17	16	20	15	17	17	17	17
U Q	20	18	18	18	18	22	22	18	20	22	23	22	28	24	23	21	20	17	21	15	18	17	18	18
L Q	16	16	16	16	17	20	15	16	18	20	20	21	21	21	20	18	17	15	16	15	17	16	16	16

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF foF2 AT Kokubunji

APR. 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	64	60	94	A		39	94	112	123	129	127	138	151	143	136	133	126	128		121	93	83	92	92
2	94	95	93	88	64	63	94	116	131	131	132		136	131	128	126	124	122	116	99	92	93	95	97
3		82	93	94	74	72	93	B	120	128	125	133	132	B	131	131	126	121	114	104	93	115	116	103
4	98	94	76		94	93	114	118	127	123	116	120	126	125	130		120	121	118	103	93		101	102
5	93	93	94	66		64	69	108	111	124	131	138	139	138	143	134	131	125	118	113	104	93	93	92
6		94	81	80	66	69	104	116	120	120	128	135	137	134	132	128		118	116	104	97		94	94
7	86	94	94	94	94	95	115	116	116	126	133	133	135	134	131	125	123	122						
8																								
9																								
10																	124	119	124	121	116	93	87	
11	83	94	92	72	73	82	104	114	116	118	125	135	130	129	134	124	128	124	121	116	84	82	84	94
12	94	94	57	49	39	59	57	92	92	76	80	79		122		114	116	111	116			94	80	81
13		94	92	94	82	63	94		93	116	125	133	128	131	123	122	116	112	112	92	82	81	94	94
14	92	70	68		54	57	92		92	116	104	107	122	121	103	108	116	116	114	93		74		72
15	70	67	67	68	57	59	92		96	115	124	121	116	122	124	120	117	124	116	116	95	66	68	69
16	73	68	68	68	64	58	81	97	105	115	118	120	124	129	135	141	137	126		117	93	94		92
17	94	95	69	67	64	73	96	115	94	101	106	109	115	125	131	124	116	118	124	121	93	68	68	68
18	68	68	68	59	54	62	93	98		99	101	112	122	117	130	136	128	126	121	105	85	70	72	92
19	95	70	68	59	61	76	106	116	115	107	112	117	115	123	124	116	118	123	123	121	101	81	92	81
20	94	69	92	92	69	92	101	92	116	114	114	112	126	125	133	135	135	134	114	107	85	68	93	94
21	80	93	94	95		78	94	116	100	108	109	117	132	127	132	138	139	137	129	116	92	86	90	95
22	81	95	81	92	66		115	116	103	106	107	116	120	120	121	129	136	120	122	118	92		94	92
23	93	95	57	69	55	59												66	58	53	59	50	60	63
24	59	57	57	49	47	54	72	94		97	103	114	115	111	117	122	115	115	116	94	68	67	71	68
25	69	68	67	61	53	66	95	116	115	105		93	101	110	112	110	109	104	116	114	93	79	82	94
26		93	70		61	94	93	94	115	104		110	108		120	119	114	110	116	105	83	82	83	94
27	93		93	59	73	84	94	115	103	107	107	110	118	121	121	126	123	123	123	115	95		94	94
28	94	94	94	68		63	77	61	73		92	95	107	110	105	107	104	113	111	94	94	79	77	80
29	74	68	59	66	54	57			48						76	81	73	71	68	62	68	59	59	59
30	57	60	58	51	56		93	94	81	84	92	94	107	117	123	128	124	115	115	114	91	84		100
31																								
	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	26	27	23	23	25	25	21	24	24	23	24	24	23	25	25	26	28	25	26	25	23	24	26
MED	86	93	76	68	64	64	94	114	108	114	114	116	123	125	128	125	123	120	116	110	93	81	88	92
U Q	94	94	93	92	73	80	102	116	116	121	125	133	132	131	132	132	128	124	121	116	94	93	94	94
L Q	70	68	67	59	54	59	92	94	93	104	104	109	115	120	120	117	116	114	114	99	84	68	74	80

HOURLY VALUES OF fEs AT Kokubunji

APR. 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	25	40	31	36	G	G	G	G	G	G	G	56	77	G	G	G	G	G	G	26	G	G		G
2	G	G	G	G	G	G	G	G	G	G	G	G	G	G	56	53	G		G	G	26	G	G	G
3	G	G	G	G	G	G	G	B	G	G	G	G	G	B	G	50	56	48	62	32	28	G	G	G
4	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G
5	G	G	G	G	G	G	G	G	40	G	G	G	G	G	G	G	G	39	32	27	24	G	G	G
6	G	G	G	G	G	G	G	G	G	G	45	G	48	G	G	G	G	33	49	30	34		32	24
7	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	53	G	G						
8																								
9																								
10																	G	41	G	G	G	G	G	G
11	G	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G	G	G	G	28	G	G	G	27
12	30	G	G	G	G	G	G	G	G	54	G	G	G	G	G	G	G	G	29			29	G	24
13	G	38	27	G	G	G	G	G	G	G	G	G	G	55	G	G	G	G	G	G	25	G	G	G
14	G	G	G		G	G	G	G	G	54	55	G	51	47	60	55	G	37	40	44	91	24	26	G
15	G	G	G	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
16	G	G	32	36	29	26	G	G	G	G	G	G	G	55	46	G	G	G	31	26	G	G	G	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	G	G	G	G	G
18	G	G	G	G	G	G	G	G	G	G	50	49	G	G	G	G	G	G	33	40	27	G	G	G
19	G	G	G	G	G	G	G	G	52	55	52	G	G	G	G	G	53	46	43	30	26	G	G	G
20	G	G	G	G	G	G	G	G	49	55	G	G	G	60	G	G	G	G	G	30	26	G	G	G
21	28	24	G	G		G	G	G	G	50	G	G	G	G	G	G	50	74	44	G	35			
22	24	G	G	G	G	G	G	38	55	54	53	G	51	54	54	G	G	45	30	48	28	G	G	G
23	G	G	G	37	G	27			G	G							G	48	37	32	30	29	70	G
24	32	26	23	G	G	G	G	G	G	54	53	G	G	G	G	G	G	47	48	40	48	29	40	44
25	40	G	G	24	G	G	G	G	43	G		53	57	56	G	G	G	54	33	41	27	G	G	G
26		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	41	65	42	57	40	G	34
27	30	G	G	G	G	G	G	G	42	G	53	G	G	56	G	G	G	G	38	60	62		57	51
28		28	31	29	35	G	G	G	G		G	G	G	G	G	G	G	40	G	41	51	39	G	G
29	G	G	G	G	G	G			G	58	52				54	G	57	53	48	36	43	63	70	36
30	32	G	G	G	G	G	G	G	G	52	G	G	G	G	G	50	78	57	G	24	35	62		52
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	27	27	26	26	27	25	24	27	26	24	25	25	24	26	26	28	27	27	26	26	23	24	26
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	37	31	30	27	G	G	G
U Q	26	G	G	G	G	G	G	G	40	54	51	G	G	50	G	G	G	47	43	40	35	29	13	24
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

APR. 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	16	15	15	14			16	16	18	24	45	34	26		42	40	18	15	20	15	15	15	15	15
2	14	15	15	14	14	15	27	23		46	52		45	49	33	34	40	16	21	14	15	15	15	14
3	14	14	14	15	14	15	27	B	78	79	77	77	63	B	79	44	33	20	14	15	14	16	16	15
4	15	15	15	15	15	15	27	21	20	46	45	62	47	49	43	40	17	18	20	14	15		15	15
5	15	14	15	15	15		27	20	15		46	46	77	64	49	43	16	14	14	14	14	14	15	14
6	14	15	15	14	15	15		40	22		44	52	49	54	48	46	18	15	15	15	15		14	14
7	15	15	16	15	15	15	27	20	18	23			47			24	18	15						
8																								
9																								
10																	39	18	22	14	15	15	15	15
11	15	15	14	15	15	15		18		26	45	46	47	27		42	17	17	20	14	14	15	14	15
12	14	15	15			16	24		18	20		17	48	52	47	20	18	14	14			13	13	14
13	13	13	13	13	14	14	22	17	17	21		42	36	35	39	24	14	18	18	13	15	14	17	14
14	14	14	14		13	14	25	17	18	20				46	31	21	17	13	15	13	13	14	13	13
15	13	14	14	13	13	14	25	20	17	18		48	44	18		42	13	13	15	13	14	14	13	14
16	14	14	13	14	13	15	25	34	14	21	24		49	34	22	15	18	14	14	13	13	14	13	13
17	13	14	13	13	13	15		18	18	20		48	47	47	44	18	17	14	14	13	14	14	13	18
18	13	15	13	14	14	15	13		14	18	22		34		47	23	18	14	13	13	14	14	14	13
19	14	14	13	13	14	15	14	17	15		38		47	30	34	18	13	15	14	13	14	14	14	14
20	13	13	14	14	14	15	25	18	15	17		33			24	21	17	18	23	14	13	14	14	17
21	14	14	14	13		17	26	18	20	20		48	47	49	44	22	15	14	14	14	14	14	14	13
22	14	14	14	14	14	18	13	20	23		23		49	40	23	21	17	14	15	13	13	14	14	14
23	14	14	14	13	14	14			20	21							18	13	14	14	13	13	14	13
24	13	14	15	14	14	18		20	21	25	23	37						13	14	18	14	13	14	13
25	14	13	14	14	15	18		21	20	49		39	38	39		51	18	15	15	14	13	14	15	14
26		14	13	15	13	18	22	18	20			65	50	55	46	42	40	15	15	14	13	14	13	14
27	13	14	13	13	14	23	26	34	20		42		52	43	46	24	21	14	15	17	13	14	13	13
28	14	13	14	14	14	18		46	21		47		65	66	53	20	21	15	13	13	13	13	15	13
29	14	13	14	13	13	18			13		39				31	23	15	13	14	13	14	14	13	14
30	13	13	14	14	13	20	17		23		48	49		65		24	15	15	22	14	14	14		14
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	27	27	25	24	25	19	21	25	18	16	16	21	19	20	25	27	28	27	26	26	25	26	27
MED	14	14	14	14	14	15	25	20	18	21	44	47	47	47	44	24	18	15	15	14	14	14	14	14
U Q	14	15	15	14	14	18	27	22	20	26	46	50	49	54	47	42	18	15	20	14	14	14	15	15
L Q	13	14	13	13	13	15	17	18	16	20	31	38	44	35	32	21	16	14	14	13	13	14	13	13

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES

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

HOURLY VALUES OF foF2 AT Okinawa

APR. 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	95	94	94	94			56	86	112		122	142	157	167	160	161	167	167	168	169				158
2		171	151	94	80	76	93	105	127	122		147	150	152	163	166	170	174	171	172		160	163	172
3	173	154	150		110	95	99		117	116	121	136	147	B			148	140	121	125	136			151
4	152	116	117	89	95	79	96	113	120	121	124	123	146			125	119	128	135	155		156	153	164
5	156		120	93	71	94		90	112	129	124	156	157	171	177	165	171	181	182	166		156	160	158
6	162	152	151	116	86	95	93	104	106	118	124		142	148	144	144	146	152	142	129	109	114		121
7		116	116	96	80	92	68	86	111	124	123	115	146	160	160	151		141	147	128	134		90	91
8	114	112	114	96	78	70	71	94	105	116	150	116		168	161	164	162	168	168	164	125	126	151	
9	151	116	93	93	81	63	61	83	110	150	97	118	168	160		152	141	131	136	142		94	80	93
10	114	94	94	81	65	74	80	106	121	116	124	123	142	160	149	150	144	152	156	168		111		
11	97	93	94	80	72	73	84	87	117	122	121	117	121	142	158	159	173	161	167	170	122		94	115
12		96	93	55	49	59	59	95	110	116	81	94	112	154	131	121	131	121	134	142	121	80	93	90
13		115		116	93			82	104	112	116	133	138	172	164	153	160	150	150	148	180	179	123	151
14	141	94	92	81	80	68	94	92		120	114	118	150	156	146	145	157	162	146		115	94	92	78
15	94	81		70	60	61		94	97	115	115	120	129	144	153	172	171	182		165	122	94	89	94
16	95	93	96	82	74	68	61	82	105	113	112	115	131	142	145	173	176	175	164		161	159	151	156
17	150	88	94	75	92	95	94	85	112	116	119	111			153	156	168	186	184	170	121	139	139	151
18	140	128	116	93	74	60	71	93	92	93	93	115	118	121	151	170	171	171	171	142	96			
19	93	81		70	63	67	91	87	112	91	116	115	120	139		153	163	178		172			93	
20	134	117	113	89		67	71	94	94	88	96	115	118	150	170	156	146	156	150		127	110	96	87
21	99	95	94	93		70		100	109		103	123	133	150	171	191	191	190				171	184	
22	190	177	190	153	116	96	92	117	117	116	117	117	130	136	138	150	144	157	175	164		94	94	91
23	96	96	94	73	67	66	64	84	95	69	66		68	73	86	82	105	115	93	88	81			61
24	53	57		52			57	77	96	92	92	115	124	158	172	178	182	180	166	162	132		91	
25	92	96	112	67	71	67	78	105	96	92	88	95	116	124	132	134	145	146	159	130		106	81	
26	95	82	87	92	67		92	107	94	91	94	113	123	147	158	156	159	172	171		172	175	161	
27	172	122	124	103		81	93	105	93	92	102	116	122	130	133	147	147	144		142			132	114
28	114	124	116	93	78	92	94	94	104	121	116	123	140	151	152	153	145	139	144	137				134
29	151	94	94	84		82	87		99	93		120	115	110	126	113	139	118	139	130	132	86		71
30	72	95	94	70	61	69	77	91	97		94	116	124	147	174	184	184	189		173		109	168	
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	26	29	26	29	24	26	26	28	29	27	28	28	28	27	26	29	29	30	25	25	17	20	22	21
MED	114	96	104	89	76	72	82	94	106	116	116	117	130	150	153	153	159	159	156	155	125	112	110	115
U Q	151	119	117	94	83	92	93	104	112	121	121	123	146	160	163	165	171	175	169	168	135	157	153	153
L Q	95	93	94	74	67	67	68	86	96	92	95	115	120	139	144	146	144	141	140	133	118	94	92	90

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fEs AT Okinawa

APR. 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	54	G	G		28	23	G	G	G
2	G	G	29		G	G	G		G	G	G	G	G	G	G	G	G	G	45		G	G	G	G
3	G	G	G	G				G	G	G	G	G	G	B	G	G	G	44	48	39	40	31		24
4	28	25	G	G	G	G	G	G	38	G	46	G	G		61	65	55		32	32	G	G	G	
5	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	33
6	38	G	G	G	G	G	G		G	43	48		G	G	G	G	G	G	40	33	46	26		G
7	G	G	G	G	G	G	25	G	G	G	G	G	G	G	G	G	G	G	G	34	G	G	G	G
8	G	G	G	G	G	G	G	74	46	G	G	G		G	G	G	G	G	G	28	G	G	G	
9	G	G		G	G	24	24	34	G	G	G	G	G	G	G	G	G	44	58	40		40	34	32
10	G	36	25	G	G	G	G	G	G	G	G	46	G	G	G	G	G	G	35	G		G	G	G
11	G	G	27	G	G	G	G	G	G	G	G	G	G	60	48	G	G		48	57	25	G	32	G
12		G	G	G	G	G	G	35	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	26
13	48	G	24	39				G	G	G	G	G	G	47	G	52	G	56	37	38	31	G	32	G
14	G	G	G	G	G	G	G	G	G	G	G	48	G	G	G	G	G	46	38	36	26	52		69
15	46	G	61	G	G	G	G	G	G	G	G	G	G	48	48	50	G	G	38	40	33	G	G	G
16	G	G	G	G	G	G	27	G		G	G	G	G	G	G	45	G	G	G		G	G	70	57
17		28	59	32	49	40	G	G	G	G	63	G	G	G	G	G	G	G	34	39	G	80	67	69
18	G	G	G	G	G	G	G	G	47		G	G	G	G	G	G	G	G	38	38	G	67	73	60
19	60	46	44	24	G	G	G	G	G	G	G	G	G	G	G	47	G	39			26	25	G	26
20		G	27	25		G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G
21	38	G	G	G	G	40	30				76	59	58	57	G	61	G	G		29	G	G	48	34
22	37	27	39	25	33	30	28	35	G	53	57	61	G	G	62	60	46	G	G	G	29	46	29	G
23	G	26	34	G	G	G	G	G	G	G	G		G	G	G	G	G	G	36	53	73	41	80	45
24	G	24	G	G		26	G		43	48	56	G	62	58	60	G	G	50	44	62	94	140	69	
25	30	34	32	31	28	G	G	36	49	G	G	G	G	73	46	60	60	61	56	88	73	94	45	34
26	46		G	G	G	G		G	45	43	G	G	G	G	G	G	G	G	61		40	25	G	G
27	G	G	G	G	G	G	G	G	G	45	G	G	G	G	G	G	G	41	51	54	48	41	G	G
28	G	G	G	G	G	26	G	37	48	57	G	G	G	G	G	G	G	40	62	81			G	G
29	G	G	G	G	G	G	28		52	50	60	60	69	G	58	63	63	57	42	36	71	39	73	44
30	G	24	25	G	G	G	G	G	39	68	75	G	G	68	94	64	79	56		26		25	29	G
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	29	29	26	28	27	25	28	27	30	28	29	28	30	30	29	28	26	26	26	29	27	27
MED	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	36	26	25	G	G
U Q	37	25	28	G	G	G	G	17	41	43	46	G	G	24	46	52	G	44	48	40	40	41	48	34
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	28	G	G	G	G

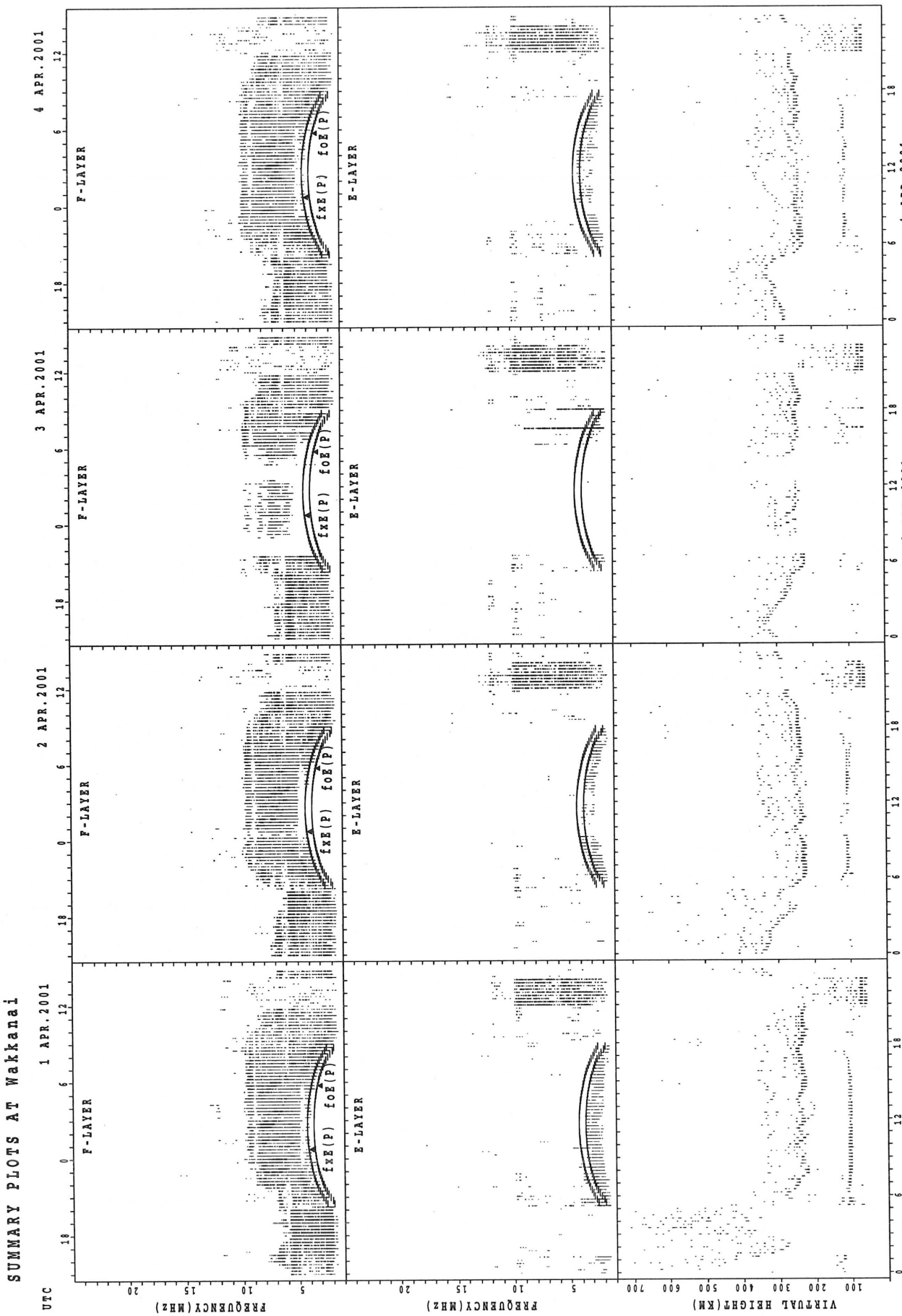
COMMUNICATIONS RESEARCH LABORATORY, JAPAN

HOURLY VALUES OF fmin AT Okinawa

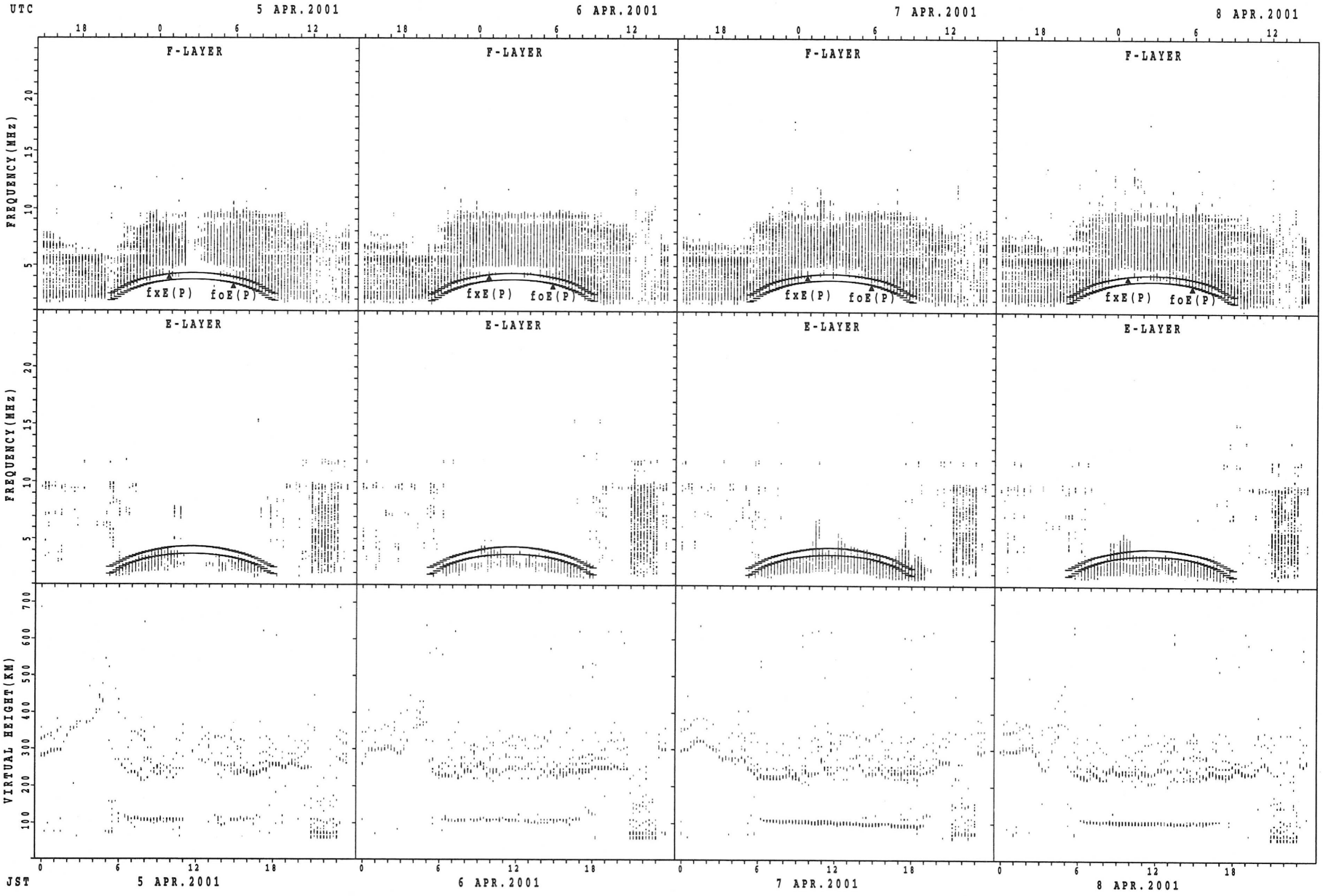
APR. 2001

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

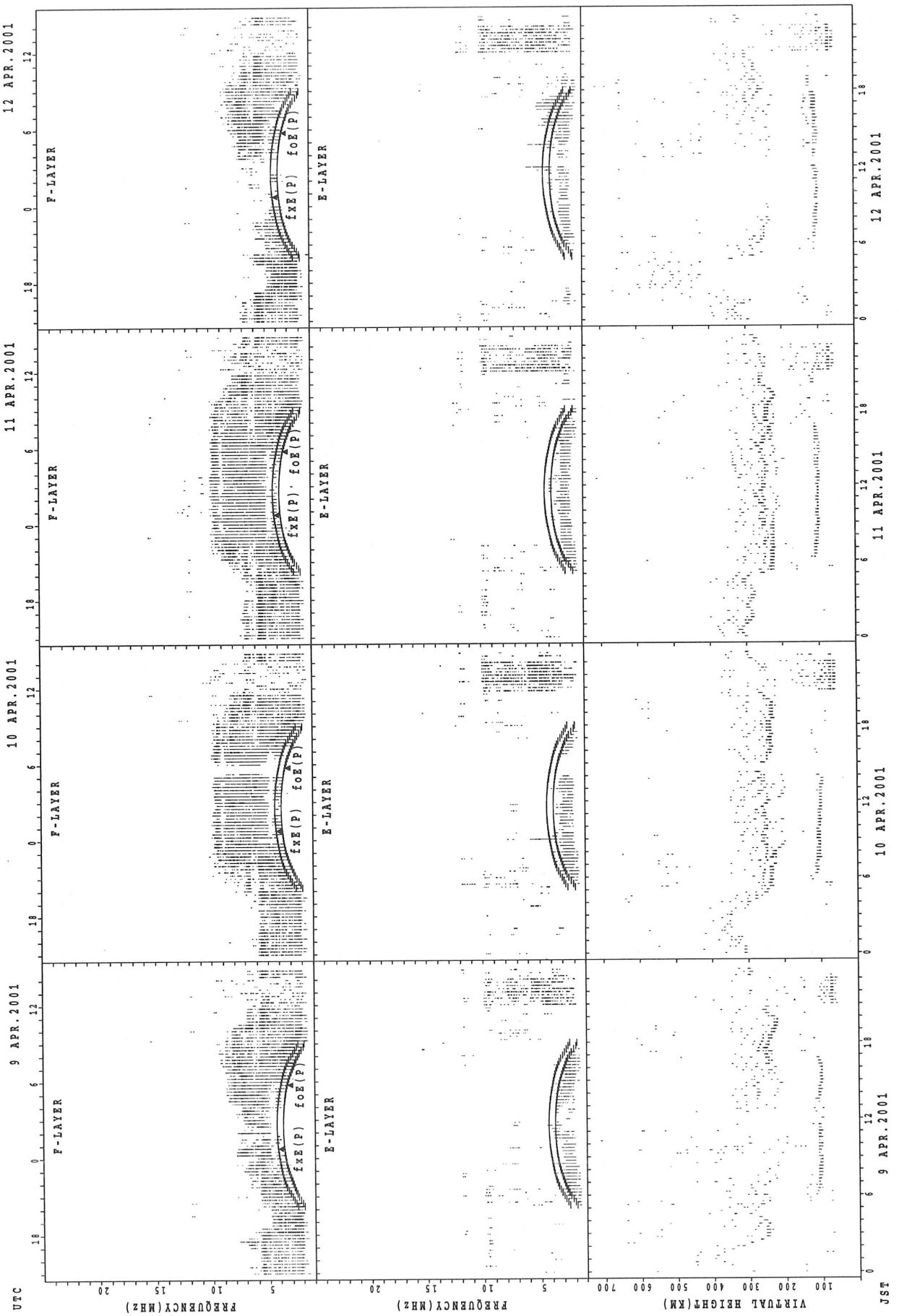
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	14	15	15			16		18		44	34	60	63	32	28	20		15	14	16	18	15	15
2	17	15	15	15	14	15	14	18		46	50	49	52	50	59	55	46	18	14	14	16	15	14	15
3	14	15	15	14	15	15	15	66	58	60	60	63	62	B		72	58	34	16	14	14	14		15
4	14	15	15	14	15	15	15	28	32	49	48	54	50		44	33	22	20	15	14	15	14	15	14
5	16		15	15	15	15	15	15	17		48	50	62	61	54	49	48	20		17	15	14	14	14
6	15	15	14	14	15	15	16		21		48		50	52	49	48	40	36	14	14	14	14		15
7	15	15	15	15	14	14	15	18		40	48	50	54	53	48	28	36	18	14	14	15	15	15	14
8	14	15	15	14	15	15	15	18	17	24	33			48	46	46	36	15		14	14	14	14	
9	15	14	15	14	14	14	16	18	16	28	28	48	56	53	50	46	40	18	15	14		14	14	14
10	14	15	15	17	15	14	15	27	17	27		32	33		48	63	48	33	17	14		14	15	14
11	15	15	14	15	15	15	15	15		38	44	47	48	42	46	46	34	30	15	14	16	14	15	16
12		17	15			15	16	18	17	26		47	53	59	52	46	34	15	15	16	14	14	15	14
13	14	14	15	14	14			27	20		44	49	49	49	48	40	35	21	14	14	14	15	14	15
14	15	15	15	15	14	14	15	15	18	20		39	48	48	47	46	21	18	16	14	15	14	15	14
15	14	16	15	14	15	15	15	15	16	20	29		44	38	30	28	23	20	15	14	14	16	15	15
16	15	15	14	14	15	14	14	15	17		27	30	49	49	40		40	18	16		15	17	14	14
17	15	14	15	15	14	15	16	15	16	18	38	48	49	59	50	49	39	15	15	14	15	15	15	14
18	15	15	15	14	14	14	17	18	15	18	28	30	53	52	49	45	36	16	15	14	15	14	14	14
19	15	14	15	15	15	14	17	15	16			47	48	46	48	33				14	15	15	15	17
20	15	15	14	14	14	15	17	18	18	17	28		52	49	52	50	27	17	17	16	15	15	15	14
21	15	15	15	15	15	14	14	16	23		27	35	28	49				33		15	15	14	14	14
22	14	15	14	14	14	14	14	15	17		29	46	54	48	43	40	35	32	18	16	15	14	14	15
23	15	15	14	15	15	15	18	28	17	28	33				58	54	36	17	16	14	15	15	14	15
24	15	15	17	18		17	15	15	18	27	29	33	36	39	33	30	59	18	15	14	14	14	14	
25	15	14	15	14	14	16	20	16			48	51	33	33	33	30	39	30	16	15	14	14	14	14
26	15	15	15	15	14	15	20	18	18	29	33		59	58	55	30	28		15		15	18	15	15
27	15	14	14	15	15	15	18	16	23	32		50	52	58	57	50	43	21	16	14	15	15	15	
28	15	16	15	15	14	14	20	15	22	36	32	32		57	33	32		18	16	14			15	15
29	16	15	15	15	15	15	15		21	30	40	43	44	54	33	35	35	28	16	14	15	14	14	14
30	15	16	15	17	18	16	23	29	23	29	30	55	63	44	42	35	29	17		14		15	14	
31																								
	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	27	28	29	27	26	21	25	24	27	26	28	28	27	27	25	28	26	29	28	26
MED	15	15	15	15	15	15	15	18	18	28	33	47	50	50	48	46	36	18	15	14	15	14	14	14
U Q	15	15	15	15	15	15	17	18	21	37	48	50	54	57	51	49	40	30	16	14	15	15	15	15
L Q	14	14	15	14	14	14	15	15	17	22	29	34	48	48	41	32	29	17	15	14	14	14	14	14


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

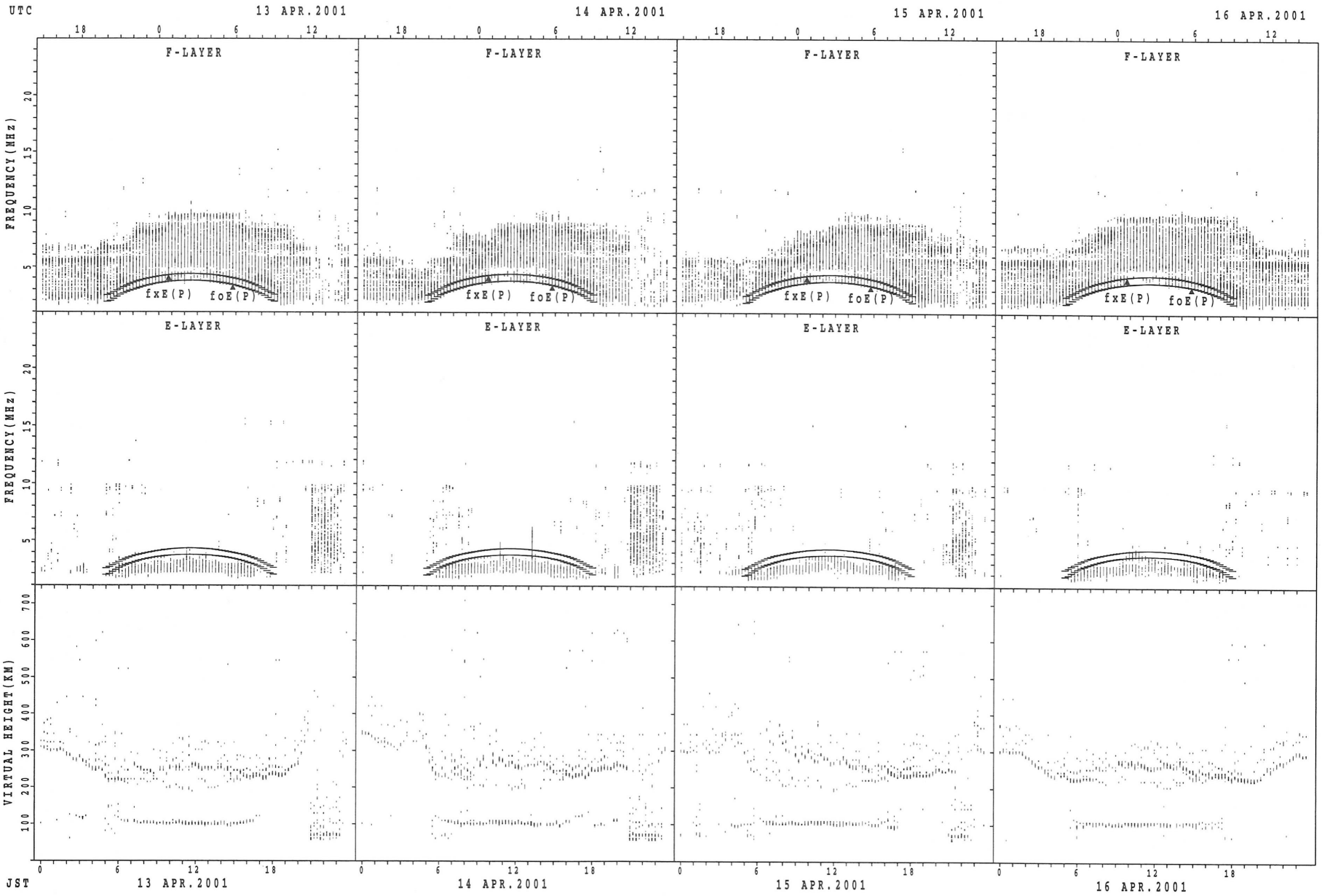
SUMMARY PLOTS AT Wakkanai



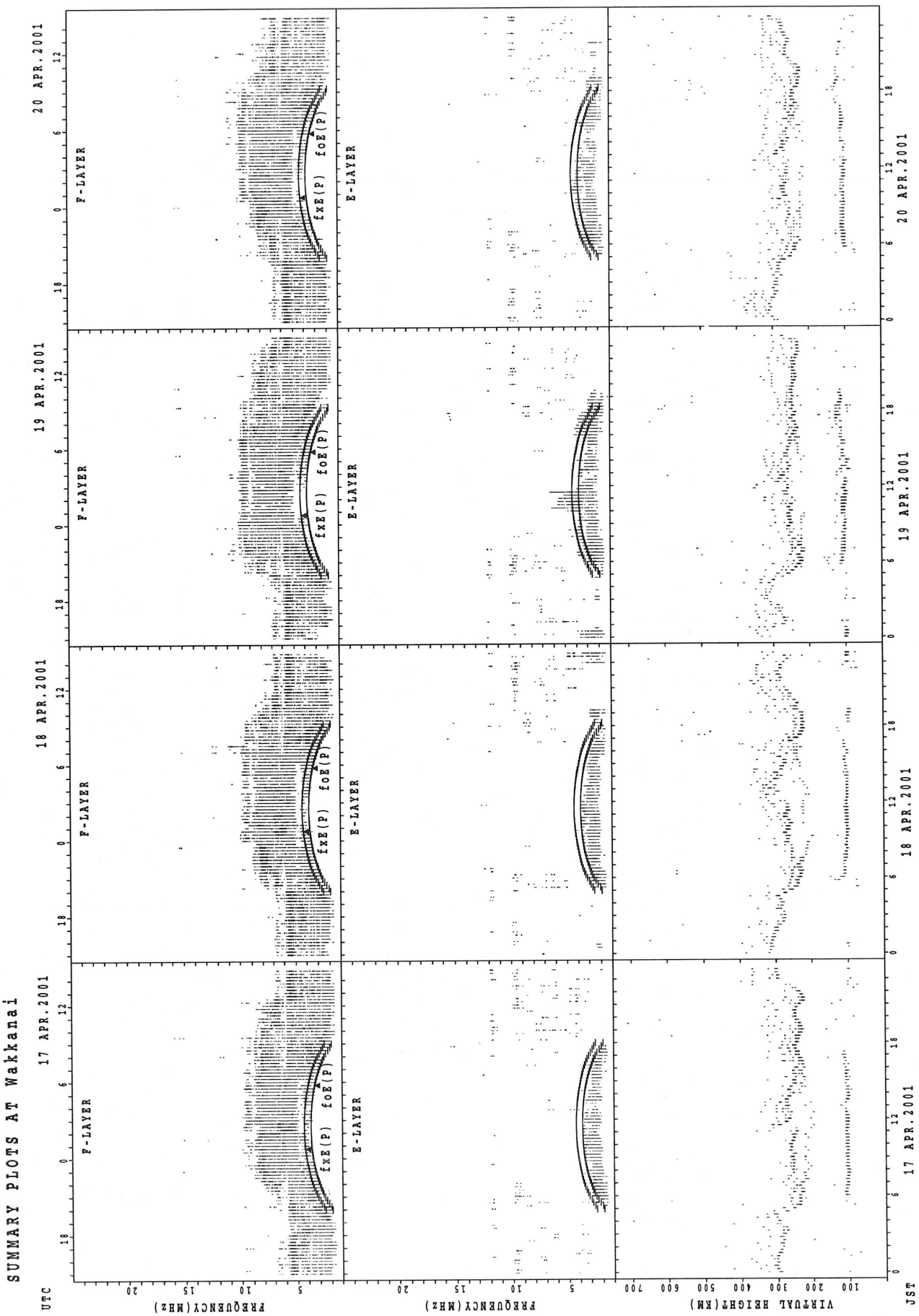
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

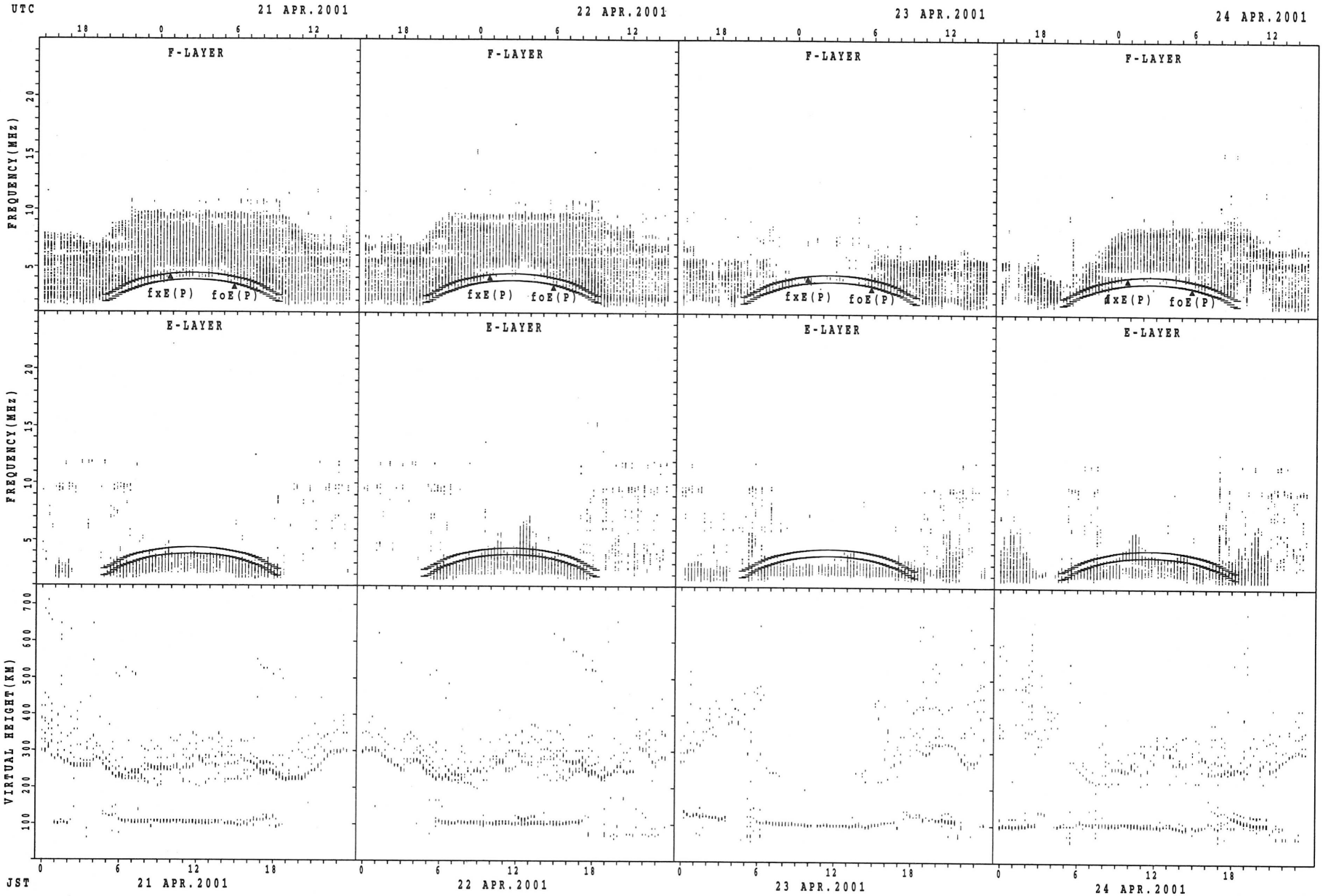
SUMMARY PLOTS AT Wakkanai



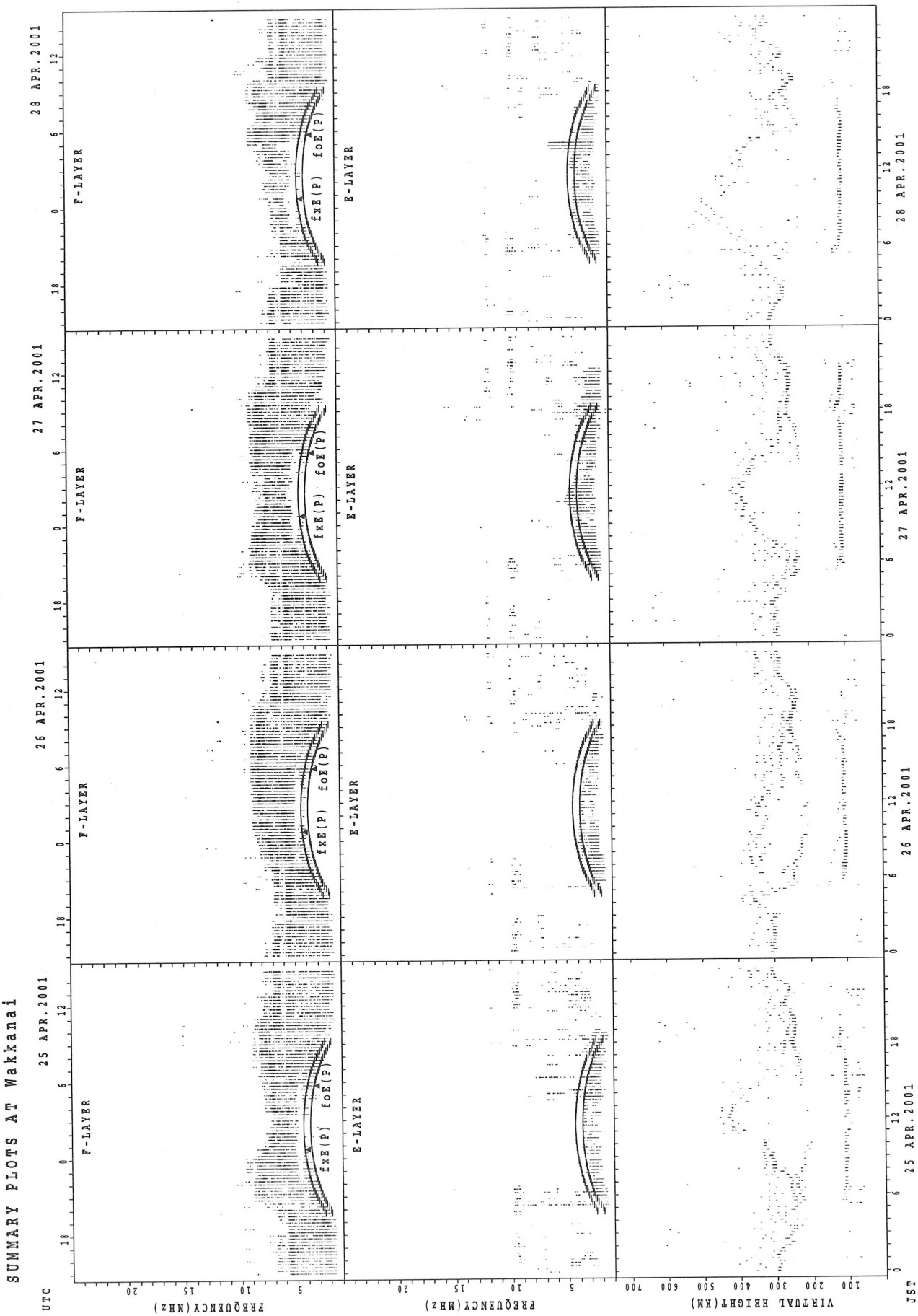
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
17 APR.2001
18 APR.2001
19 APR.2001
20 APR.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

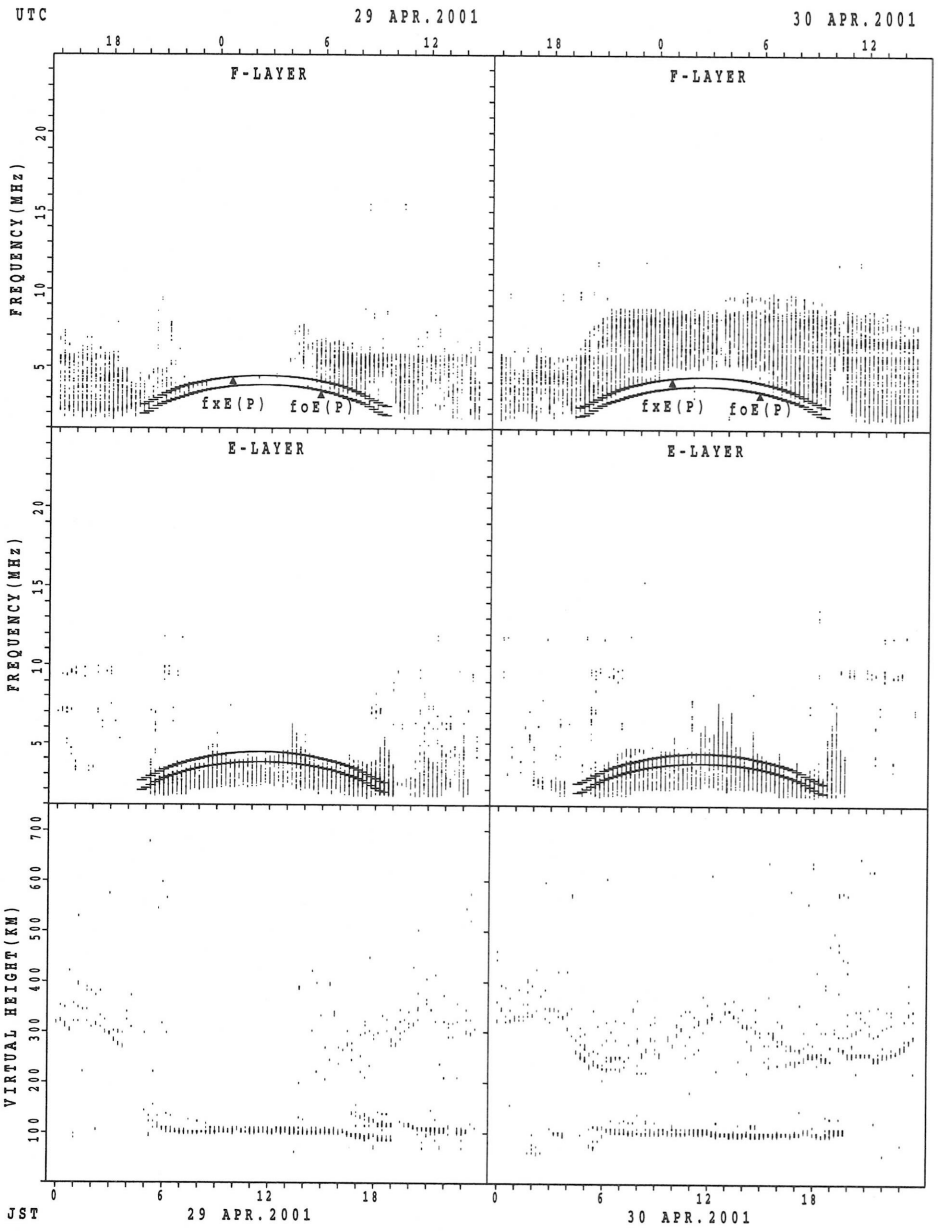
SUMMARY PLOTS AT Wakkanai



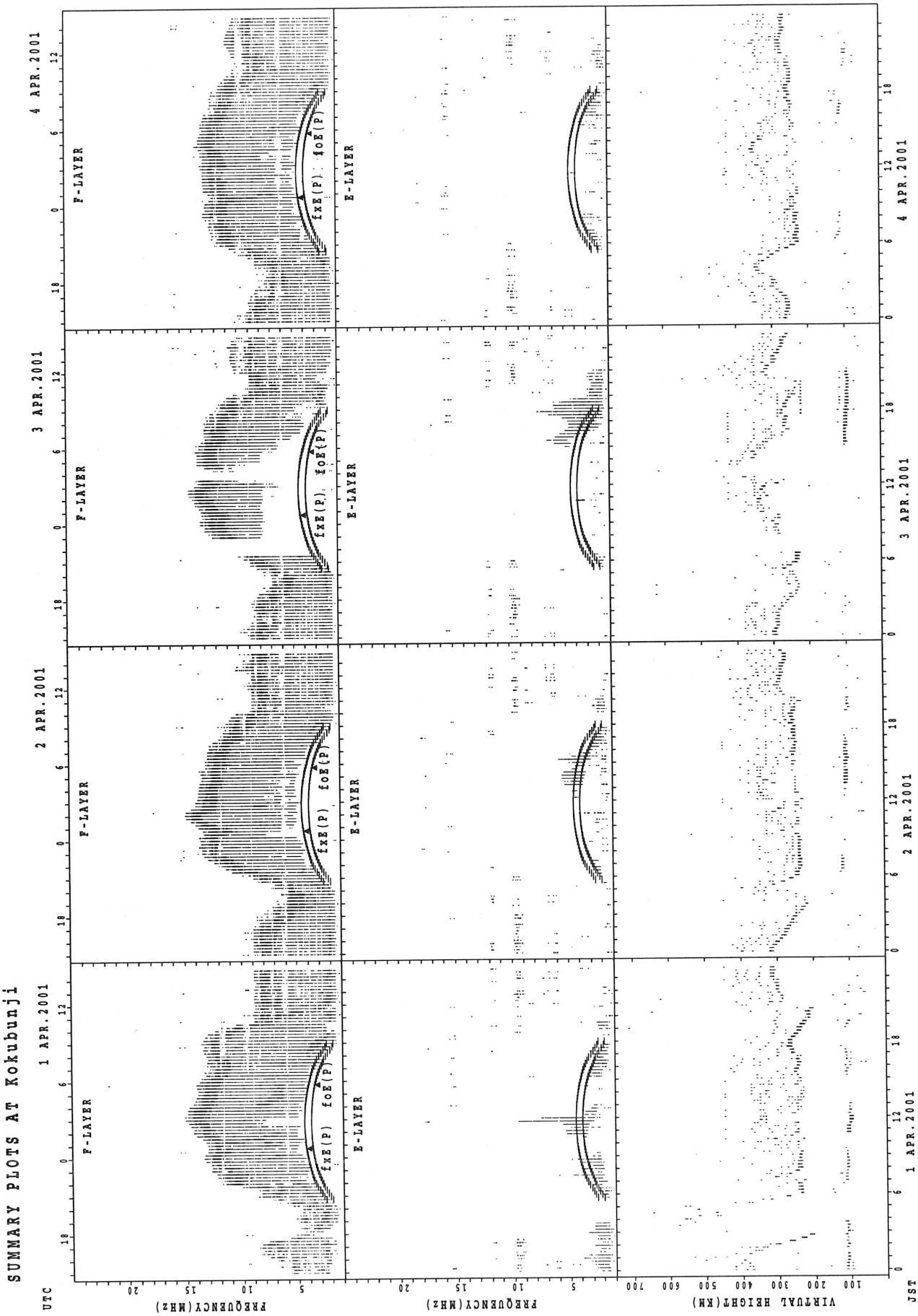
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


SUMMARY PLOTS AT Wakkanai
UTC
JST
25 APR.2001
26 APR.2001
27 APR.2001
28 APR.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

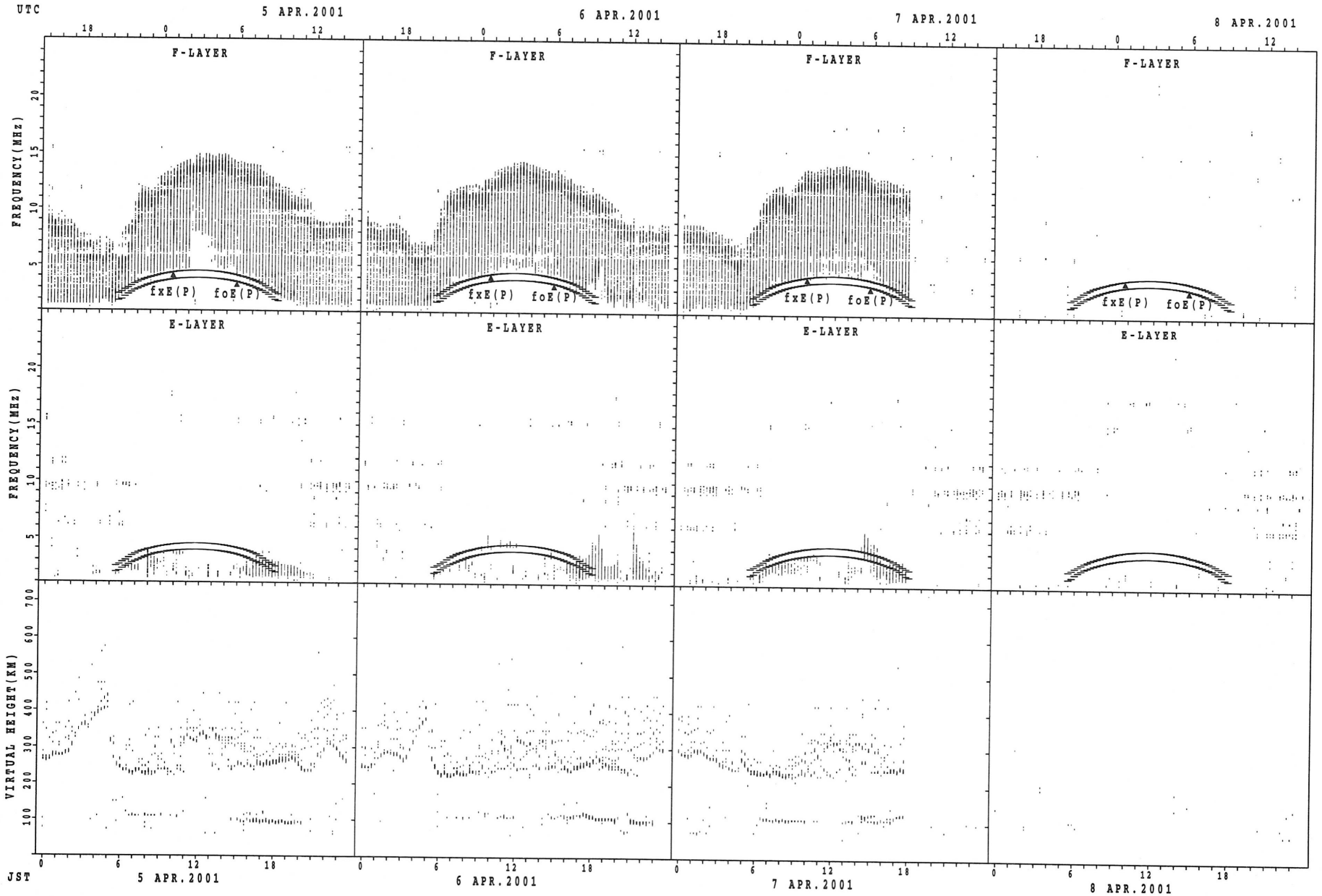
SUMMARY PLOTS AT Wakkanai



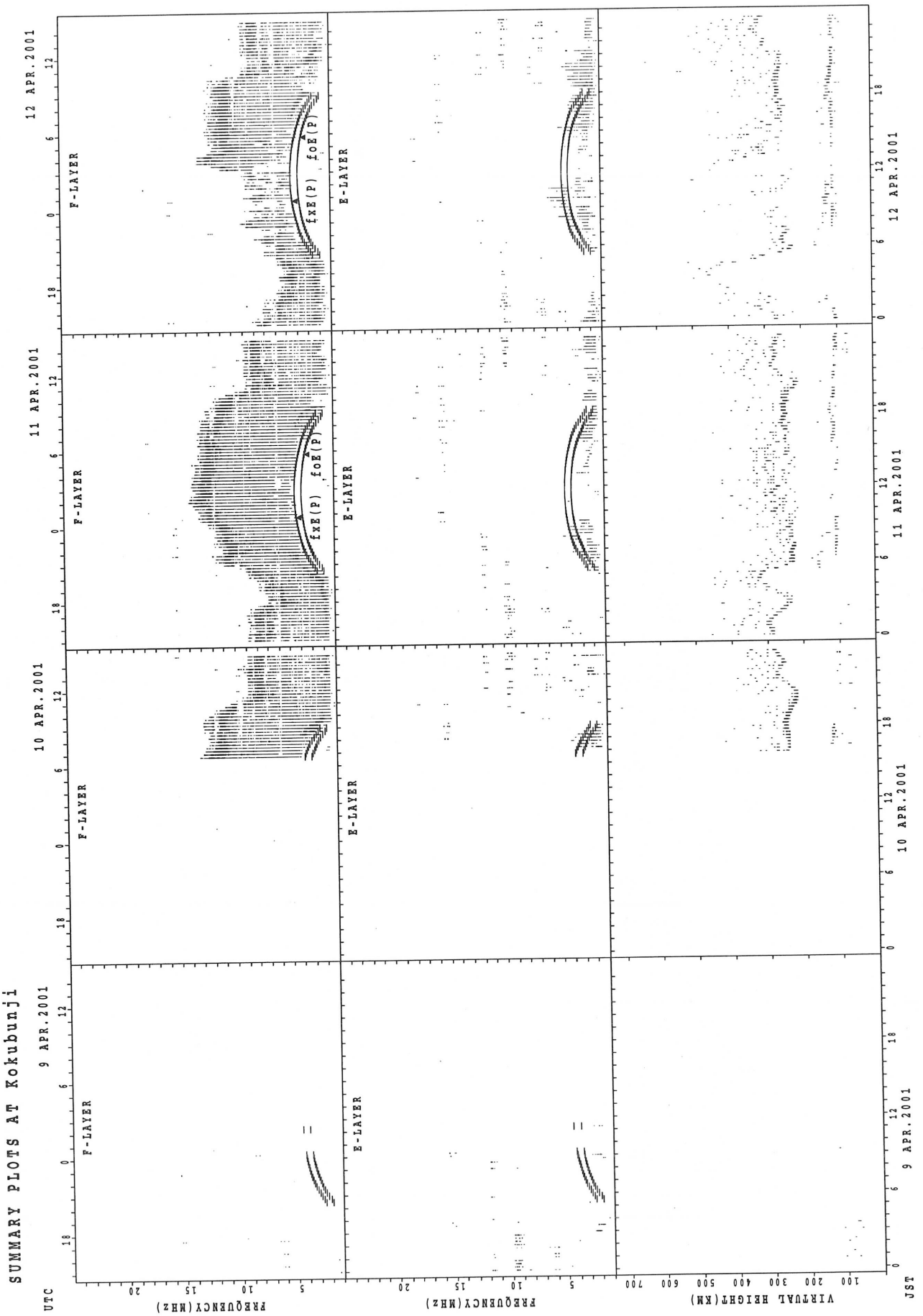
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

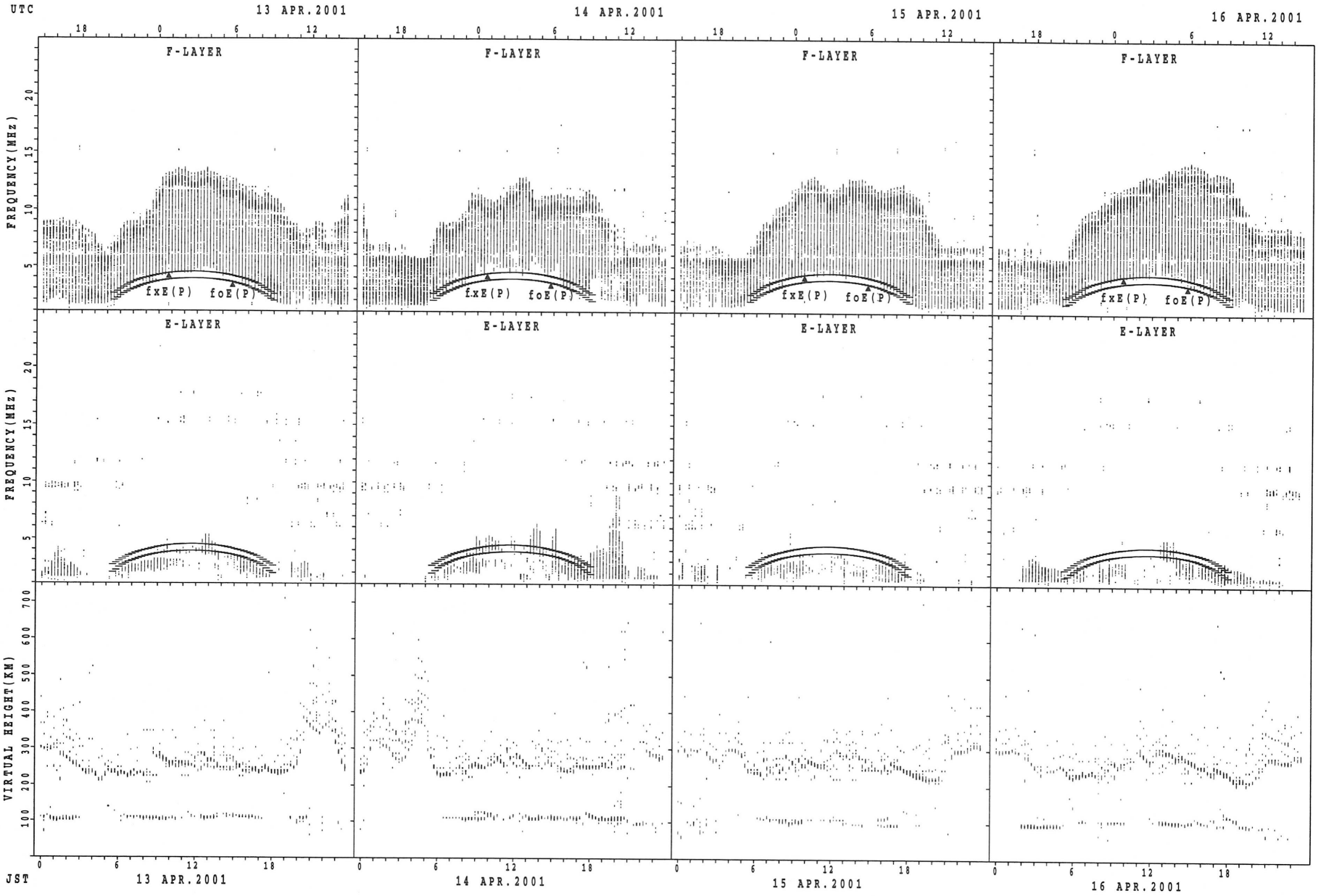
SUMMARY PLOTS AT Kokubunji



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

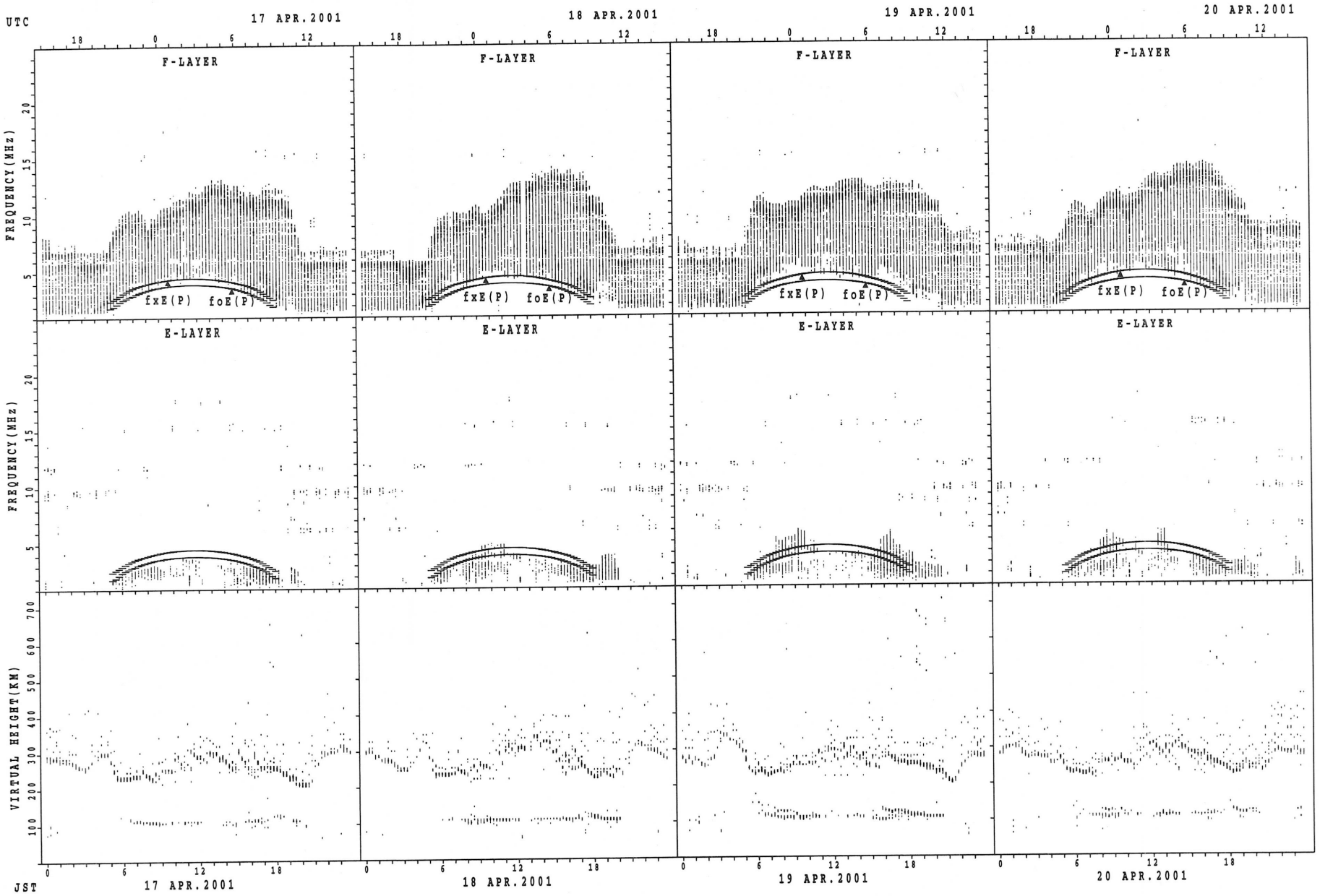

SUMMARY PLOTS AT Kokubunji
UTC
JST
9 APR.2001
10 APR.2001
11 APR.2001
12 APR.2001
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P) foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



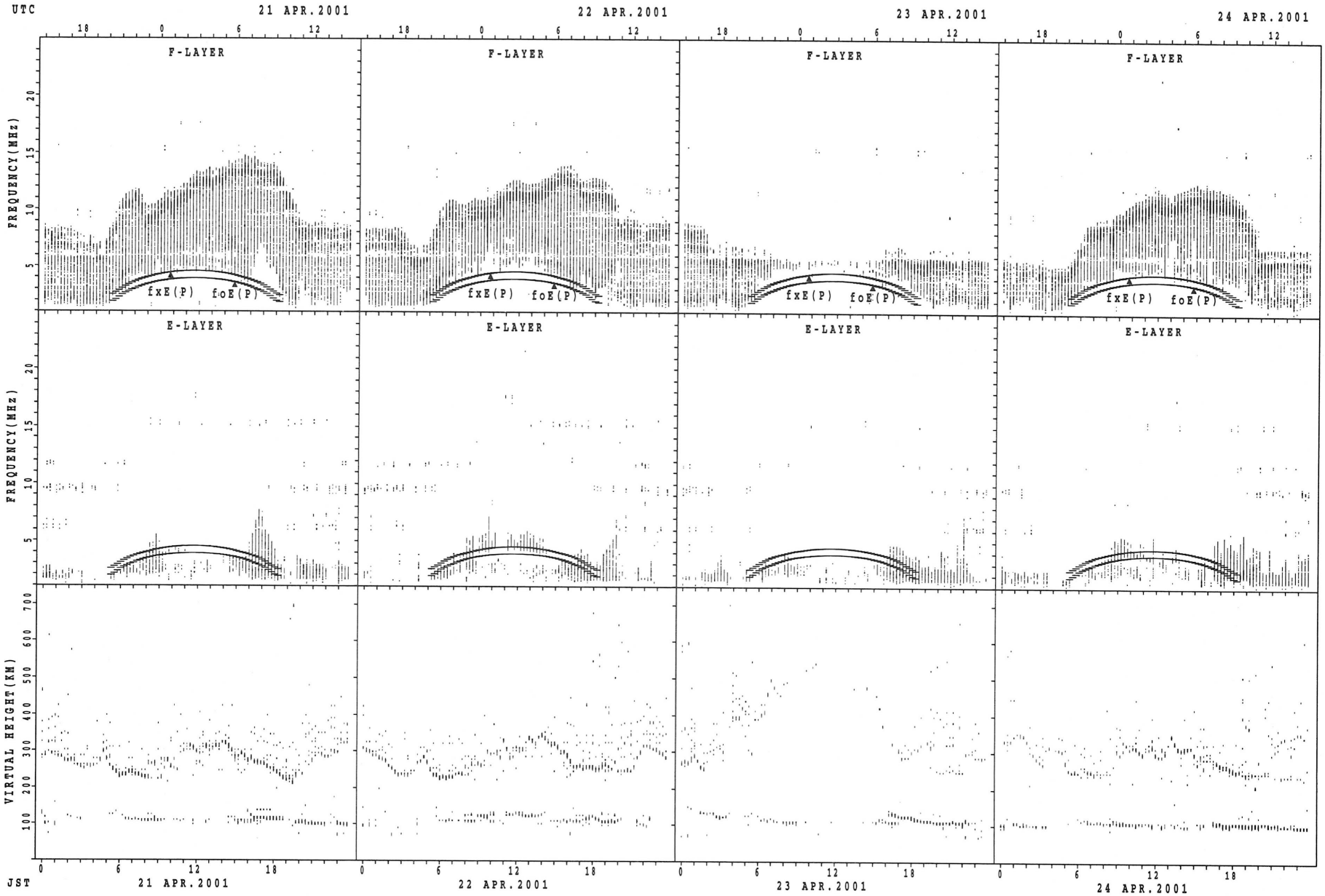
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



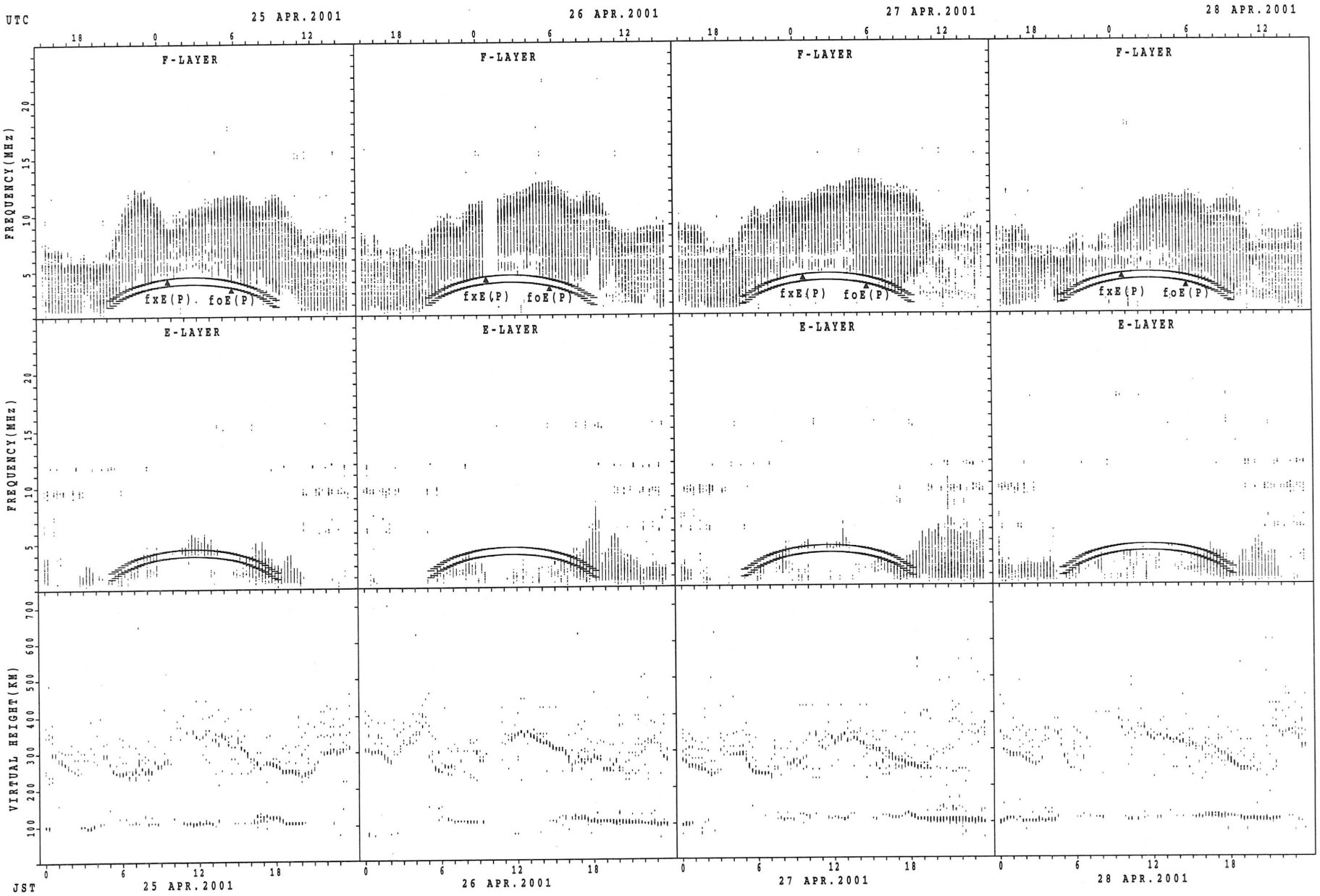
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



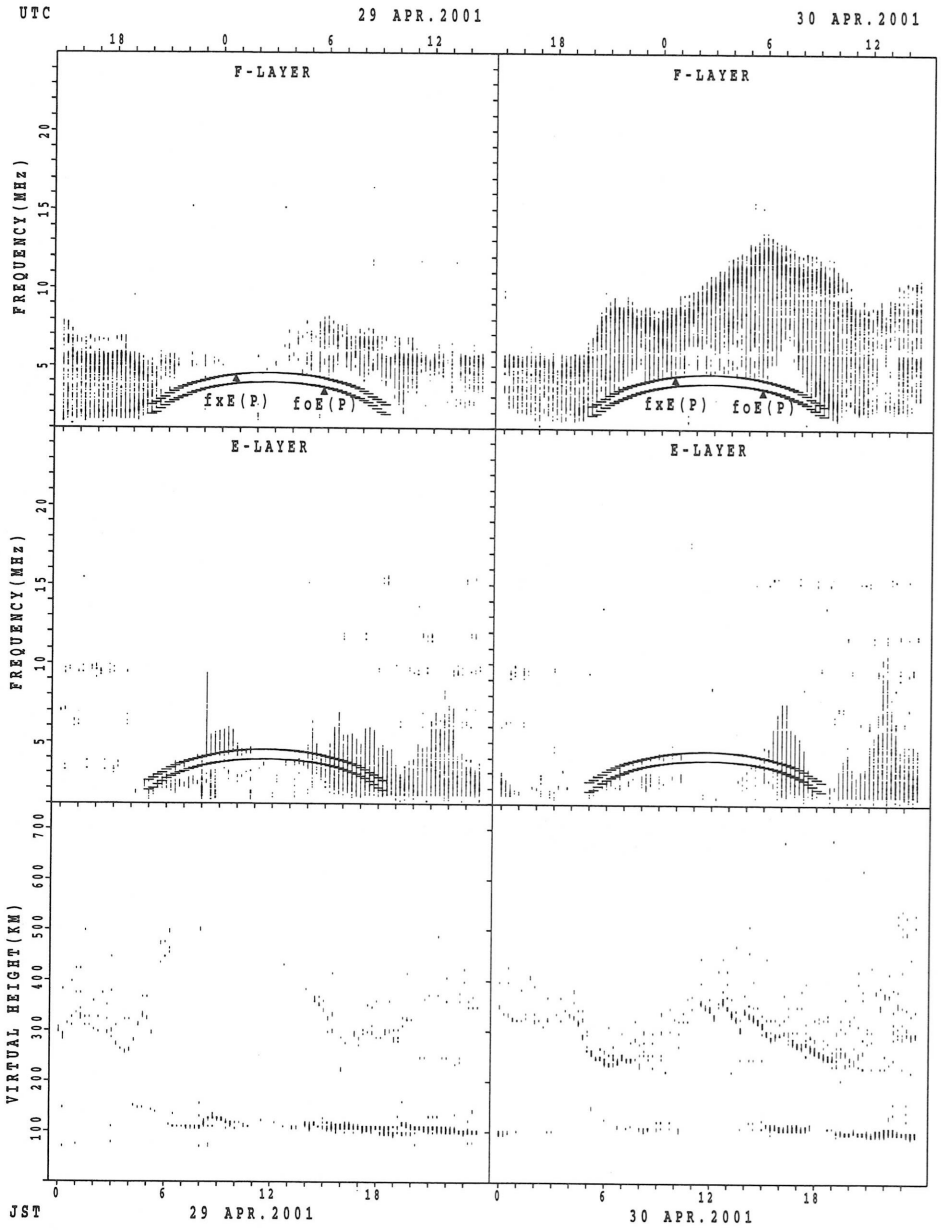
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

SUMMARY PLOTS AT Kokubunji

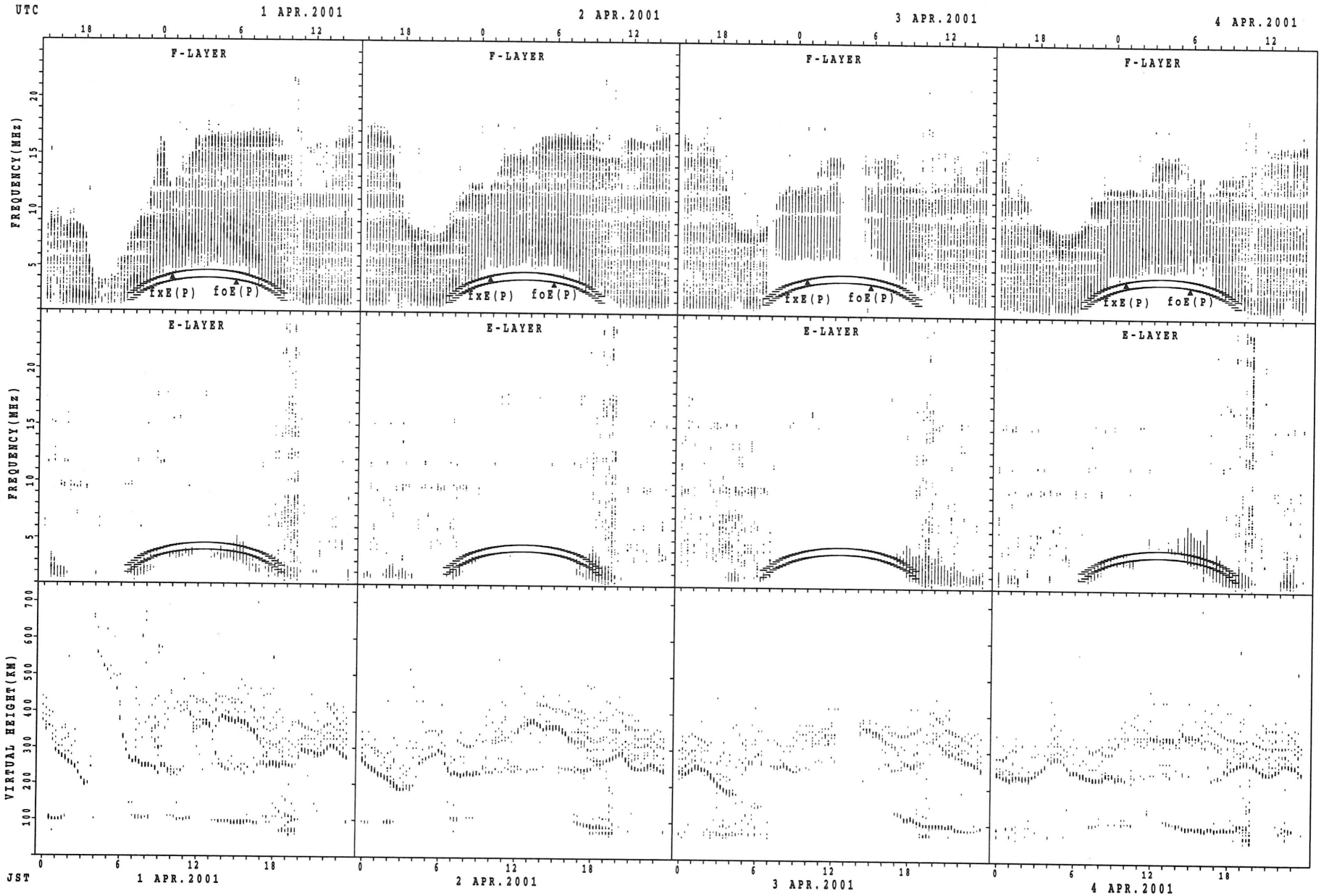


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

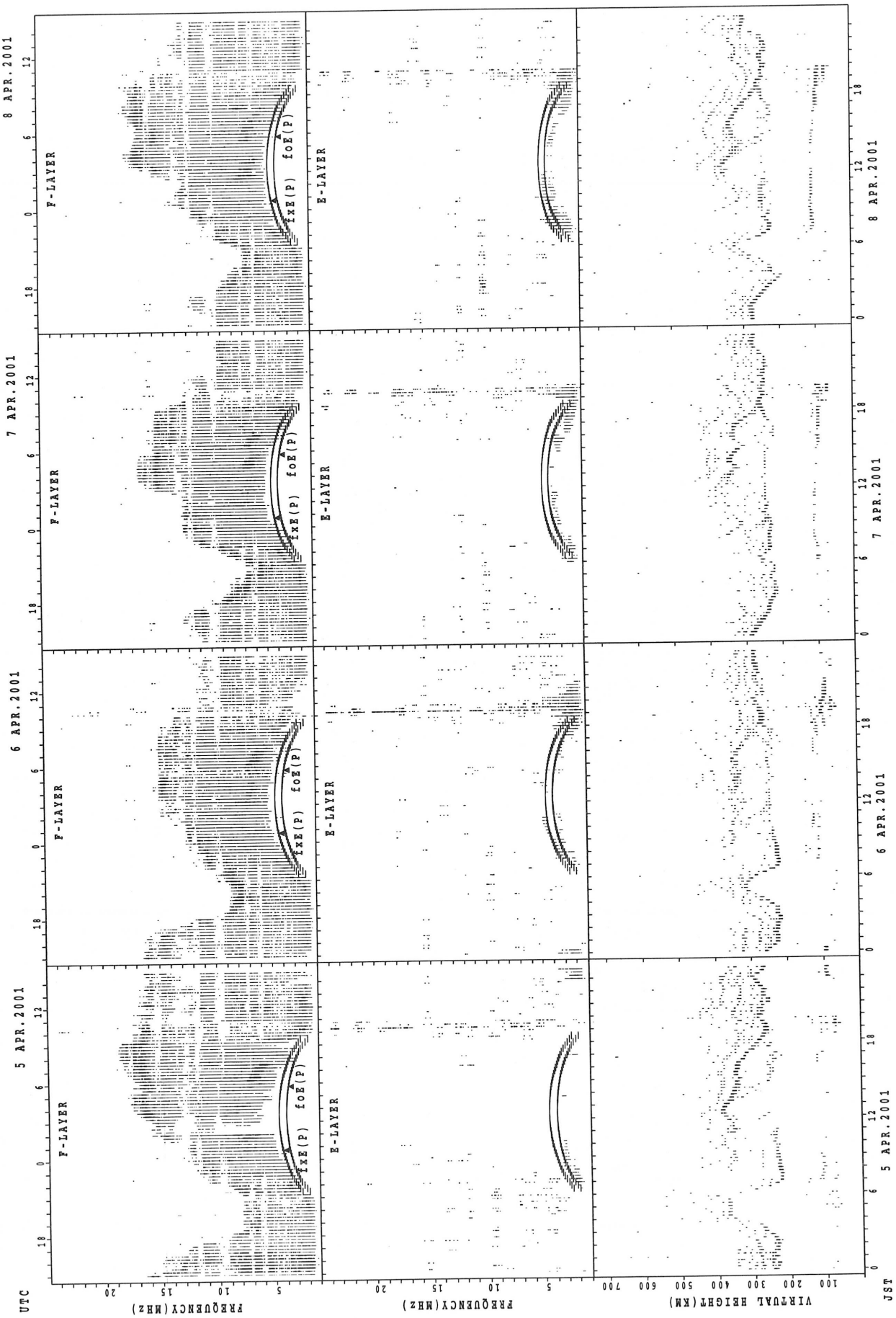
SUMMARY PLOTS

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

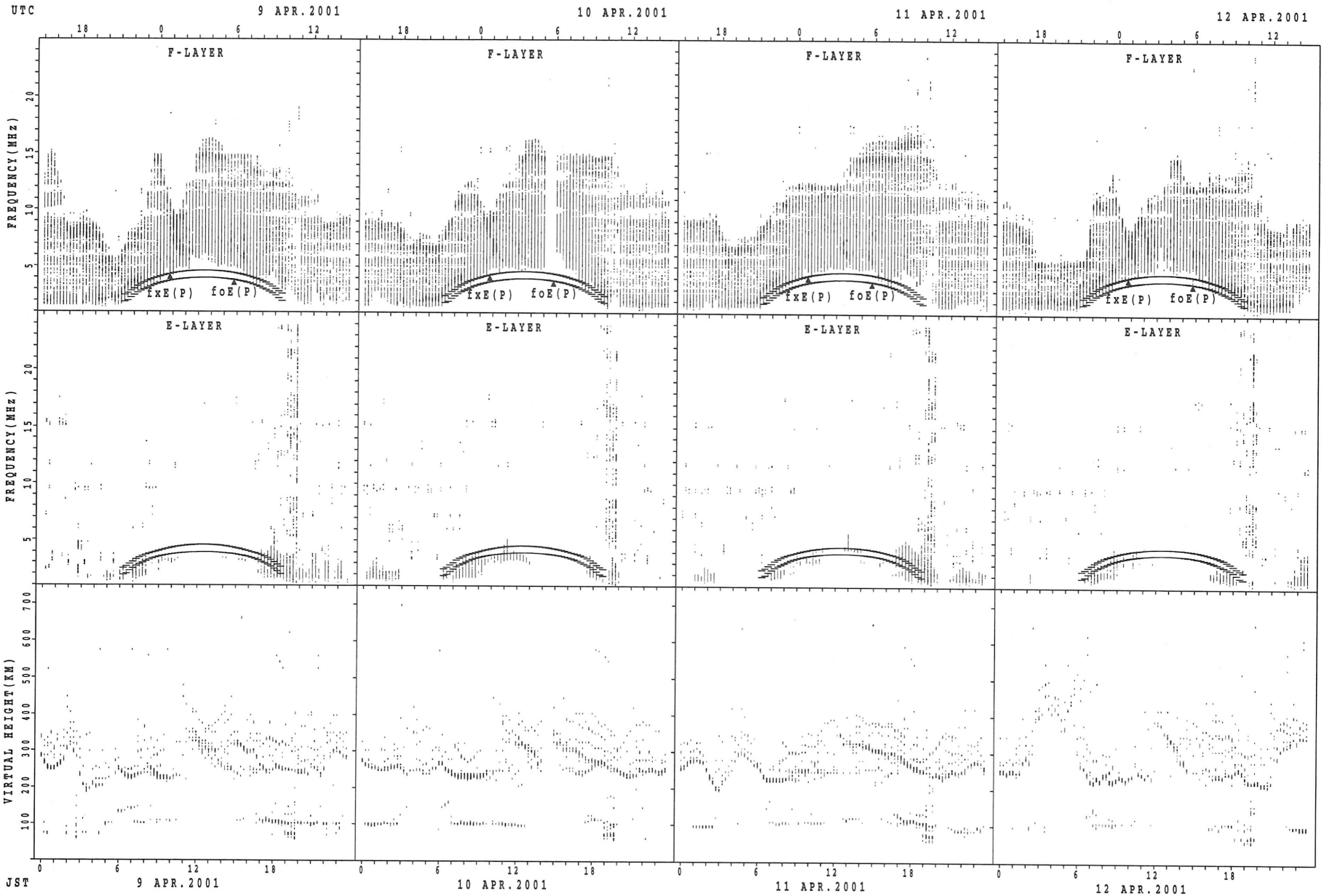
SUMMARY PLOTS AT Okinawa



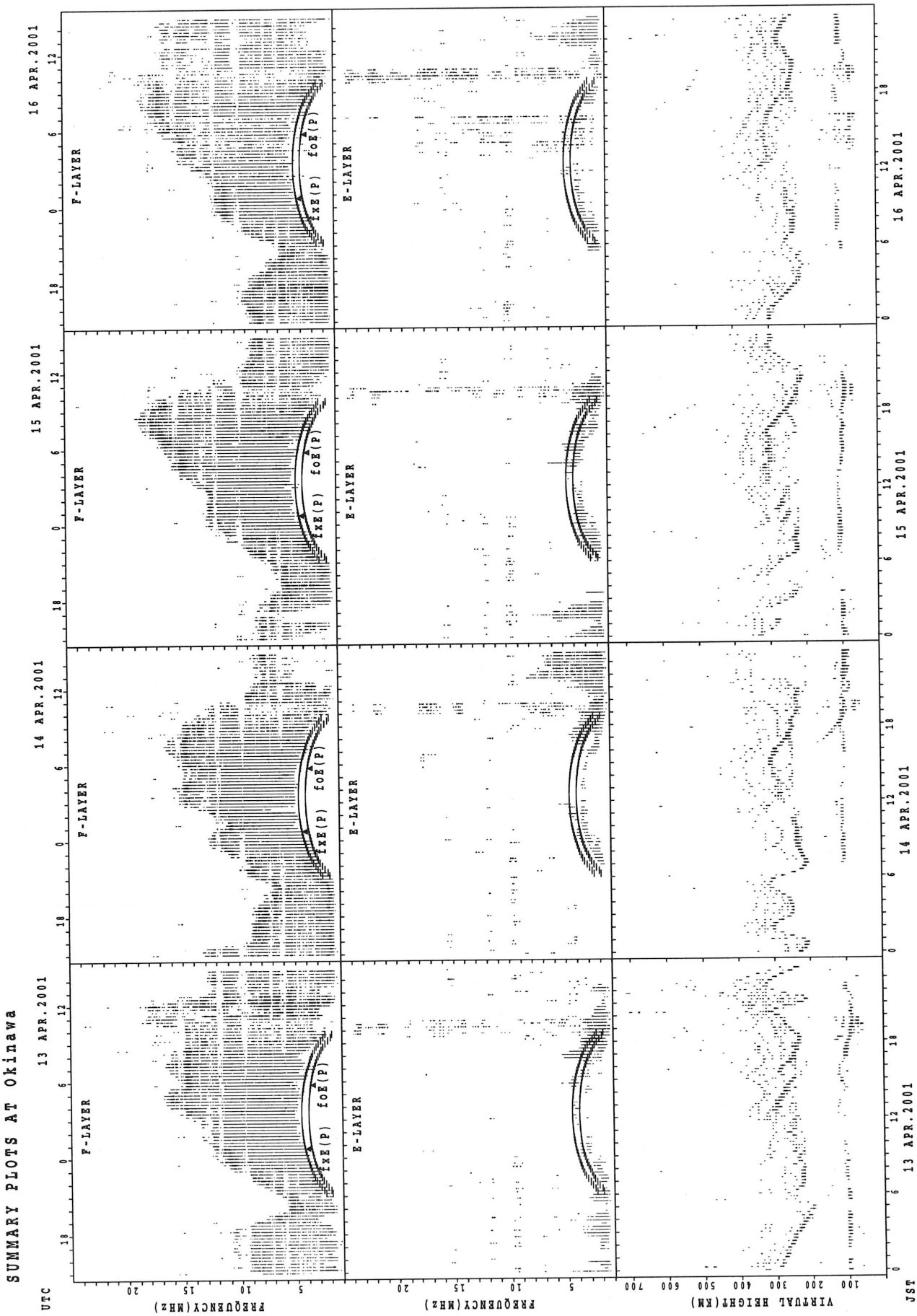
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE


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

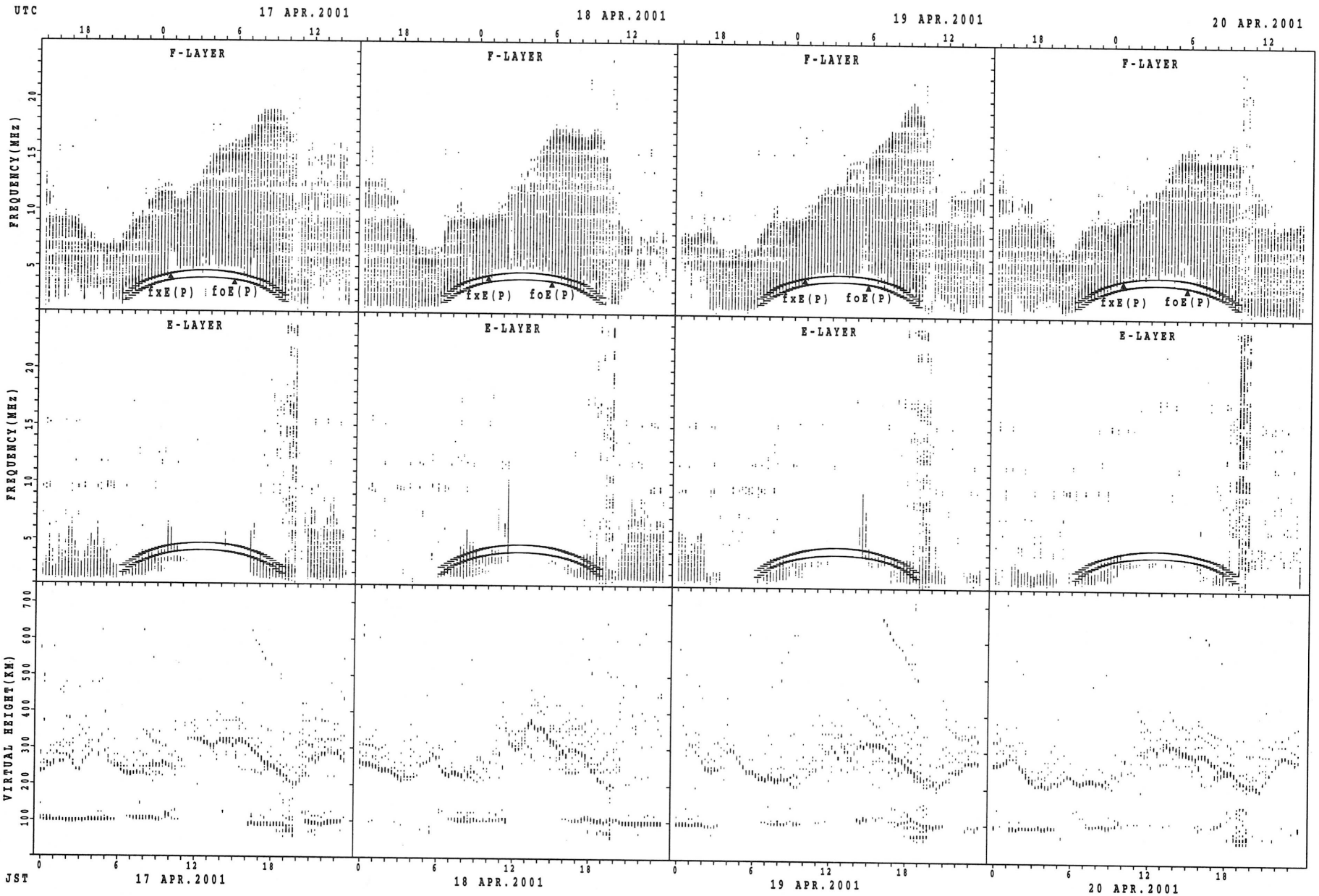
SUMMARY PLOTS AT Okinawa



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

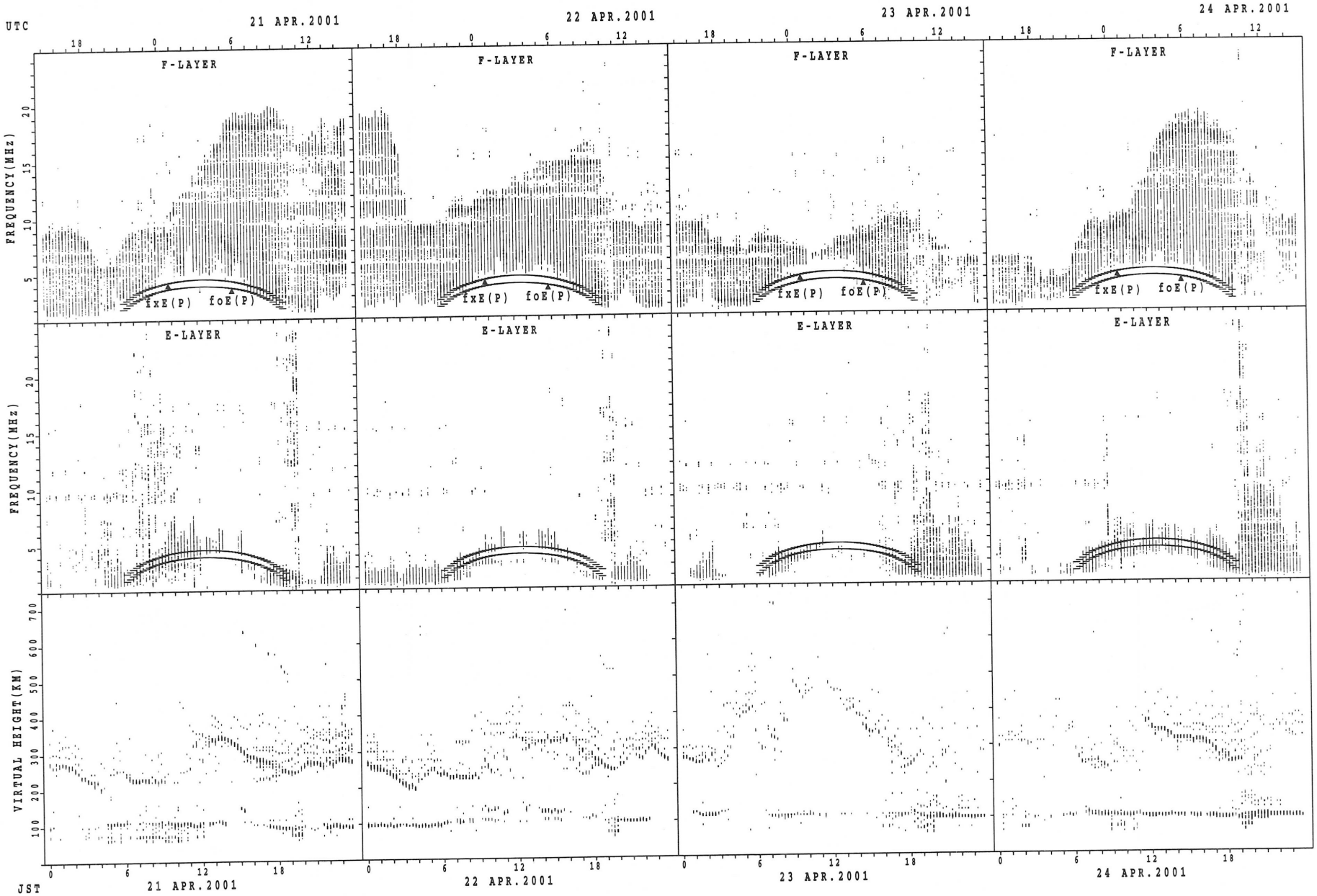

SUMMARY PLOTS AT Okinawa
UTC
JST
13 APR.2001
14 APR.2001
15 APR.2001
16 APR.2001
F-LAYER
E-LAYER
FREQUENCY(MHz)
VIRTUAL HEIGHT(KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



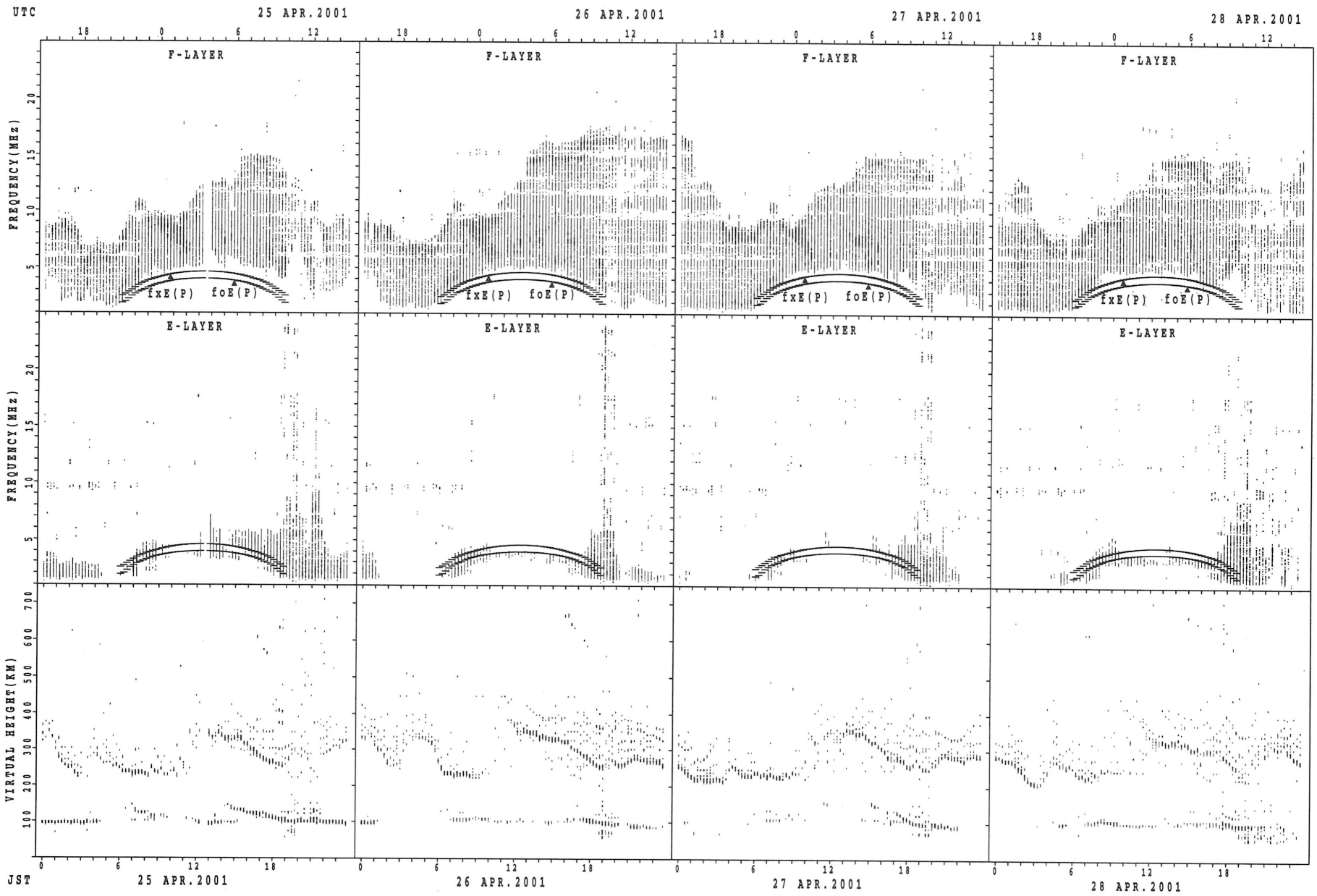
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



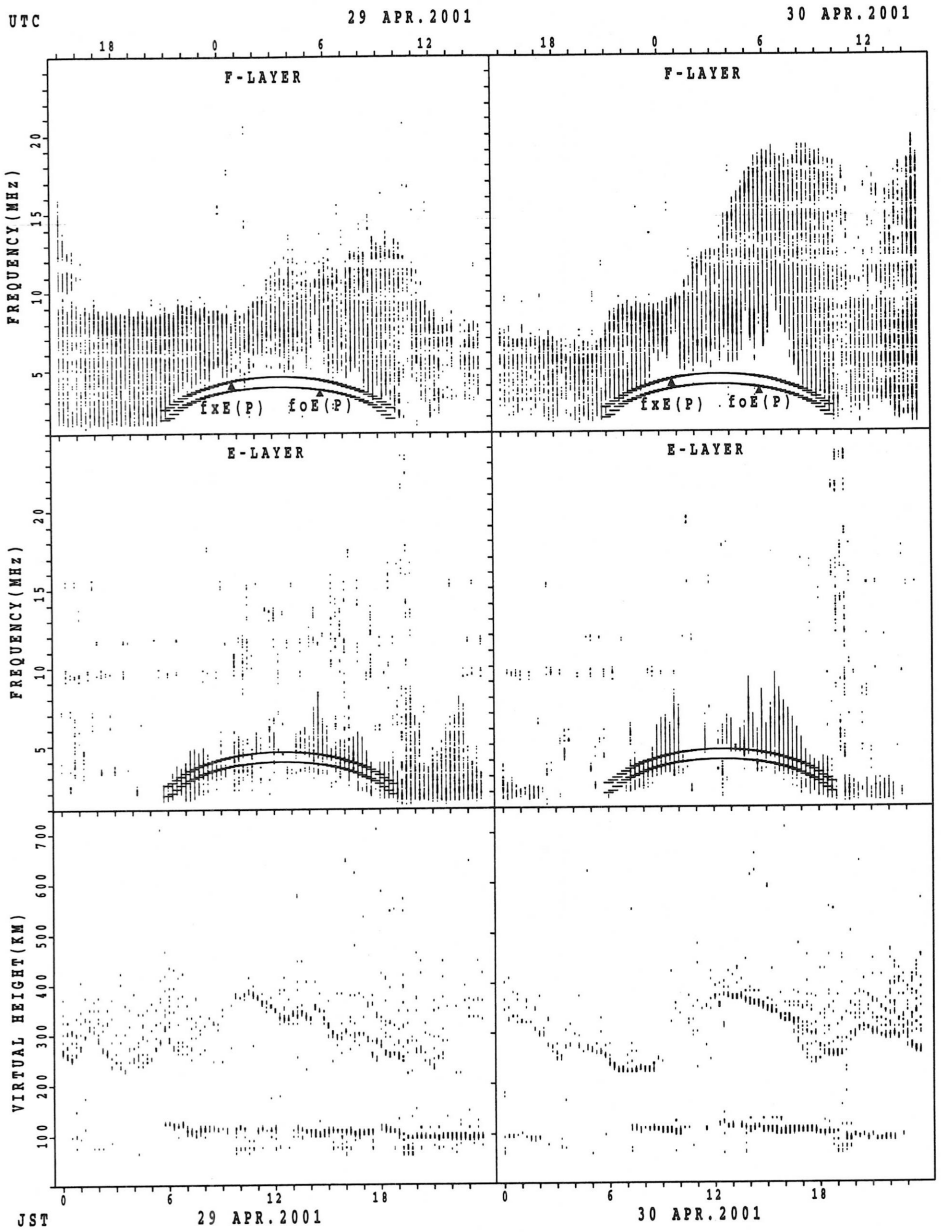
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

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

APR.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	7	6	4	3		11	17	22	12							11	26	26	27	25	20	14	9	6
MED	348	372	339	354		296	258	262	259							266	268	266	272	270	300	320	342	358
U Q	364	412	377	466		368	277	288	306							300	290	290	288	282	314	340	385	378
L Q	342	360	306	328		286	246	248	248							260	254	256	262	264	286	288	314	334

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	4	5	4	1	1	4	3	3	3	6	5	3	3	4	2	1	7	10	5	7	4	1	1
MED	104	104	107	120	103	107	116	111	121	111	111	103	113	107	101	99	101	111	121	119	117	113	107	103
U Q	118	118	142	131	51	53	137	119	125	111	115	110	113	119	105	99	50	121	129	121	119	118	53	51
L Q	101	101	103	104	51	53	105	103	107	107	109	99	107	103	98	99	50	97	113	99	111	108	53	51

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	20	17	16	5	2	6	22	21	24							10	27	26	25	24	21	14	15	20
MED	333	354	346	354	350	351	257	254	259							303	286	272	272	272	288	348	350	351
U Q	347	366	362	369	398	368	280	269	272							322	290	286	281	277	312	370	384	369
L Q	293	334	332	321	302	338	246	245	248							294	274	266	261	258	273	318	328	323

h'Es

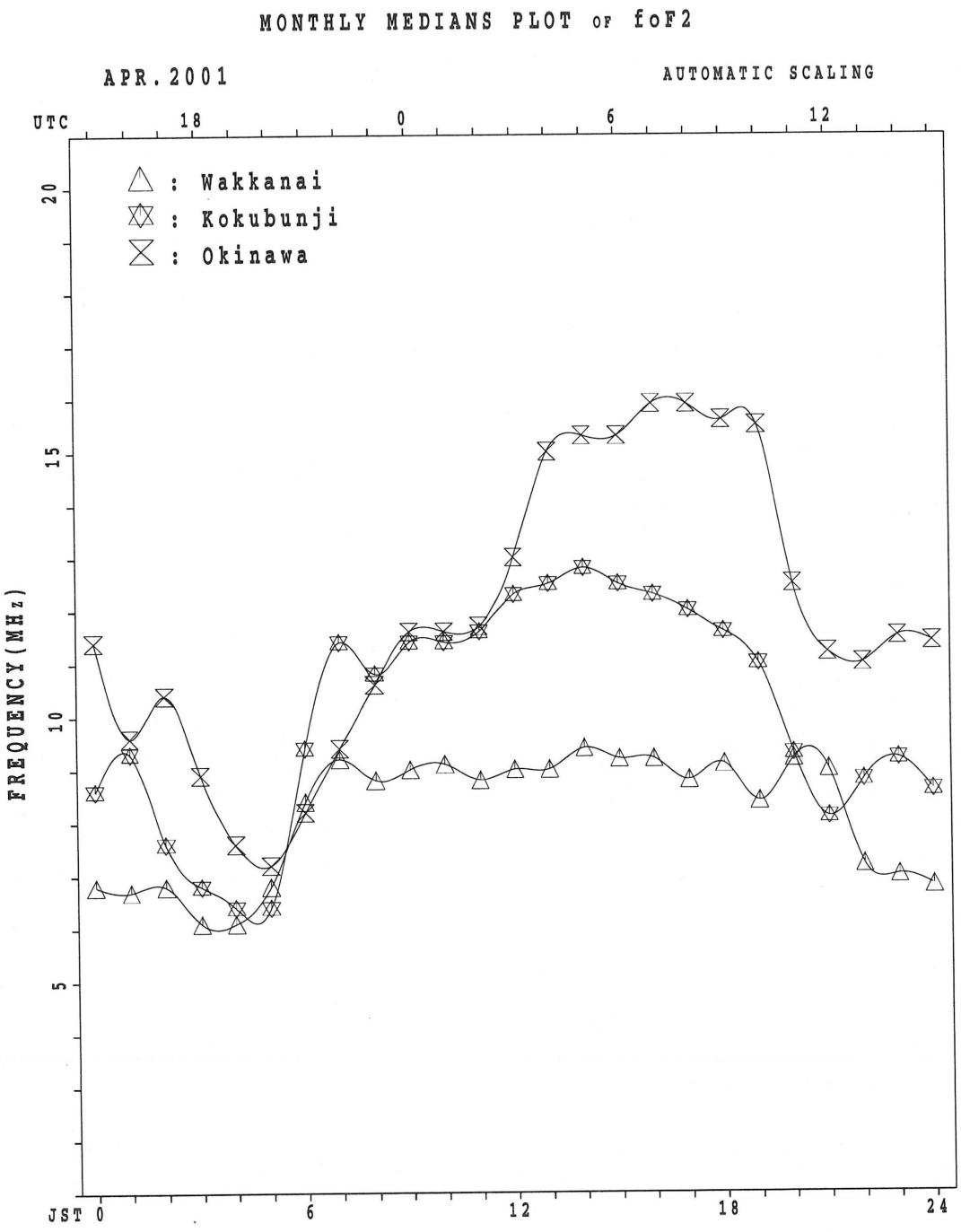
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	8	5	5	6	2	2		1	7	9	8	3	5	7	5	5	5	15	17	19	19	8	6	8
MED	102	111	107	109	102	115		125	123	123	118	111	117	111	111	113	113	119	115	111	107	108	106	103
U Q	106	112	108	113	105	129		62	127	128	123	113	127	119	122	123	132	127	122	113	111	111	107	105
L Q	99	98	103	105	99	101		62	111	115	114	105	108	111	107	107	107	111	111	103	103	105	103	99

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	26	27	26	21	13	7	19	27	29	27							30	30	27	27	25	25	21	23
MED	301	288	276	252	330	324	306	248	246	250							312	296	272	264	280	286	304	312
U Q	338	312	288	302	370	354	332	258	258	260							342	316	282	272	304	302	332	328
L Q	270	270	254	240	256	276	266	234	234	238							296	278	262	250	254	275	287	286

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	9	9	12	6	3	6	6	5	9	8	8	5	3	7	8	11	5	11	19	21	15	15	13	13
MED	95	99	99	97	99	102	110	131	113	112	118	111	107	115	108	113	103	119	113	103	103	101	103	101
U Q	99	104	104	101	103	105	121	144	115	118	133	120	113	117	114	127	128	137	117	107	109	103	105	105
L Q	90	96	97	95	95	101	103	122	111	108	109	105	99	101	101	101	96	105	105	92	97	95	96	94


MONTHLY MEDIANS PLOT OF foF2
APR. 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

APR. 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

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 84	X 77	X 88	X 58	O X 52	X 49														X 128	O X 98	X 91	X 93	X 92
2	X 92	X 94	X 91	X 82	X 74	X 72														X 105	X 96	X 100	X 101	X 102
3	X 97	X 93	X 90	X 88	X 79	X 78														X 110	O X 97	X 104	X 108	X 109
4	X 103	X 95	X 88	X 82	X 82	X 91														X 112	X 103	X 106	X 111	X 108
5	X 104	X 96	X 89	X 79	X 77	X 78														X 116	X 113	O X 99	X 97	X 98
6	X 101	X 87	X 90	X 85	X 74	X 78														X 112	X 102	X 97	X 92	X 89
7	X 92	X 92	X 88	X 82	X 77	X 80													C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C				X 127	X 108	X 96	X 99	O X 98
11	X 90	X 87	X 91	X 78	X 79	X 86														X 118	X 91	X 90	X 94	X 94
12	X 88	X 77	O X 65	X 56	X 57	X 64														X 117	X 94	X 88	X 92	O X 95
13	X 95	X 96	O X 95	X 92	X 82	X 72														X 98	X 86	O X 94	X 86	X 98
14	X 106	X 76	X 74	X 72	60	64														X 99	X 87	X 80	O X 79	X 81
15	X 76	X 76	X 75	X 69	X 66	X 66														X 109	X 87	X 76	O X 79	O X 76
16	X 78	O X 73	X 74	X 74	X 65	X 66														X 114	X 96	X 90	X 92	X 86
17	X 84	X 79	X 78	X 74	X 72	X 78														X 119	X 86	X 72	X 74	X 74
18	X 74	X 75	X 72	X 66	X 62	X 68														X 110	X 82	X 75	X 80	X 81
19	X 81	X 78	X 73	X 71	X 72	X 81														X 126	X 114	O X 92	X 83	X 86
20	X 82	X 81	X 81	X 78	X 75	X 82														X 112	X 98	X 90	X 96	O X 94
21	X 89	X 85	X 84	X 80	X 77	X 84														X 122	X 97	X 93	X 92	X 88
22	X 88	X 89	X 88	X 81	X 71	X 79														X 125	X 102	X 100	X 92	O X 99
23	X 92	X 88	X 77	X 76	X 71	X 70														X 64	X 68	X 68	O X 66	X 67
24	X 61	X 59	X 60	X 58	X 54	X 58														X 102	X 78	X 75	X 78	X 76
25	X 77	X 78	X 72	X 68	X 64	X 70														X 113	X 93	X 88	X 91	X 89
26	X 88	X 86	X 79	X 77	X 75															X 112	X 89	X 87	X 90	X 95
27	X 98	X 95	X 86	X 76	X 80															X 109	X 88	X 88	X 90	X 88
28	X 88	X 88	X 88	X 76	X 73															X 106	X 81	X 85	X 85	X 86
29	X 85	X 73	X 70	X 73	X 63															X 73	X 68	X 68	X 68	X 68
30	X 66	X 65	X 62	X 63	X 63															X 116	X 102	O X 98	X 103	X 106
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	22														27	27	27	27	27
MED	X 88	X 85	X 81	X 76	X 72	X 75														X 112	X 94	X 90	X 92	X 89
U Q	X 95	X 92	X 88	X 81	X 77	X 80														X 118	X 102	X 97	X 96	X 98
L Q	X 81	X 76	X 73	X 69	X 63	X 66														X 106	X 86	X 80	X 80	X 81

IONOSPHERIC DATA STATION Kokubunji

APR. 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

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	R 78	71	82	52	46	43	82	112	124	132	128	140	148	143	137	134	128	129	132	R 122	92	85	87	86
2	86	88	85	75	68	66	88	114	131	132	133	146	136	132	130	128	124	118	110	99	90	94	95	S 96
3	91	87	84	82	73	72	90	B	120	130	130	138	137	B	133	132	127	124	R 118	104	91	S 98	S 102	103
4	97	89	82	75	R 76	85	110	118	123	123	121	126	128	126	131	128	124	119	116	106	R 96	R 99	105	102
5	R 98	90	83	72	71	72	80	110	116	126	134	142	144	144	144	138	134	128	118	110	107	93	91	R 92
6	95	81	84	78	68	72	104	116	119	120	131	138	138	138	132	132	124	118	116	106	R 96	91	86	83
7	86	86	82	R 75	71	74	R 101	117	117	127	133	137	138	138	135	130	126	122	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	124	122	123	121	102	90	93	S 92
11	84	81	85	72	73	80	104	107	114	118	127	135	132	131	130	127	128	124	120	112	85	84	88	88
12	82	71	59	50	51	58	60	R 69	87	79	85	84	91	R 125	112	117	116	117	115	111	88	82	86	89
13	89	R 90	R 89	86	76	R 66	R 78	87	93	116	129	132	126	130	122	122	112	107	105	92	80	R 88	80	92
14	R 100	70	68	66	F 52	F	88	86	96	111	104	106	121	120	106	110	108	108	109	93	81	R 74	73	75
15	70	70	68	R 63	60	60	76	92	R 101	R 112	124	120	116	121	123	119	116	119	114	103	81	70	R 73	R 70
16	R 72	R 67	68	68	59	60	82	97	105	115	118	123	128	132	137	R 140	136	131	128	108	90	84	86	80
17	78	73	72	68	66	72	R 96	100	95	100	106	112	117	125	130	123	115	116	R 120	113	80	66	68	68
18	68	68	66	R 60	56	62	91	98	96	104	101	112	124	125	133	139	133	129	R 121	104	76	69	74	75
19	75	R 72	67	R 65	66	R 75	105	105	103	107	114	116	117	122	126	118	118	121	121	S 120	108	86	R 77	80
20	76	75	74	72	69	76	100	98	101	111	R 109	R 111	127	128	133	136	137	134	118	106	92	84	90	R 88
21	83	79	78	74	71	78	105	116	100	108	112	120	129	130	136	140	141	136	134	116	91	87	86	82
22	82	83	82	75	65	73	R 99	104	102	105	109	119	122	120	124	133	135	124	125	R 118	R 96	94	86	93
23	86	82	71	70	65	R 64	66	62	R 62	57	59	R 60	R 62	R 60	R 59	60	64	64	58	58	62	R 62	U R 60	61
24	55	53	54	52	48	52	73	88	92	97	103	110	117	110	116	121	117	116	111	95	72	69	R 72	70
25	S 73	72	66	62	58	R 64	94	U R 113	120	106	R 97	R 99	108	R 111	113	115	112	107	114	107	87	82	85	83
26	R 82	80	R 73	71	69	R 78	95	94	97	107	B	110	113	119	123	122	114	108	115	106	83	81	84	89
27	92	89	80	70	74	84	100	97	106	109	108	115	120	121	125	126	121	119	117	103	82	82	84	82
28	82	82	81	70	67	66	76	R 70	74	R 77	91	100	106	109	108	109	104	101	108	100	75	78	79	80
29	79	67	64	67	57	52	57	53	60	R 58	R 69	R 63	R	68	75	79	72	70	68	67	R 62	S 62	62	S 62
30	60	59	56	57	57	69	90	92	84	84	92	96	108	117	123	131	124	118	118	R 110	S 96	R 92	S 97	R 100
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	26	27	26	27	27	26	27	26	26	27	27	28	28	27	27	27	27	27	27
MED	82	79	74	70	66	70	90	98	101	109	110	116	123	125	126	127	124	119	117	106	88	84	86	83
U Q	89	86	82	75	71	75	100	112	117	120	128	135	132	131	133	133	128	124	121	112	96	91	90	92
L Q	75	70	67	63	57	62	78	88	93	100	101	106	116	119	116	118	114	112	111	100	80	74	74	75

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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	L	L	L	A	L	L	L								
2											L	L	L	L	L	L								
3								B	B			E B		B	B	L	L							
4											L	L	L	L	L	L								
5										L	L	L	B	L	L	L								
6											L	L	L	L	L	L								
7										L	L	L	L		L	L	L		C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C								
11											L	L		L	L	L	L							
12									L	U L 584	L	U L 648	U L 656	L	L	L								
13										L	L	L		L		L								
14										L		L		L	L									
15								L		L			L	L	L		L							
16									L	L	L	L	U L 600	L	L	L								
17										L	L	U L 540	U L 588	L		L								
18									L	L	L	L	U L 580	U L 584	L	L								
19									L	L	L	L	U L 552	L	L	L	L							
20									L	L	L	L	U L 576	L	L	L	L							
21										L	L	L	L	L	L	L	L							
22									L	L	L	L	L	L	L	L	L							
23							L	U L 448	U L 468	R	U L 484	U L 500	U L 508	U L 516	U L 536	U L 516	U L 504	A						
24								L	L	L	L	L	L		L	L	L							
25								L	L	L	L	L	L	L	L	L	L							
26						L		L	L	L	B	L	L	U L 596	L	L	L	L						
27								L	L		L	L	U L 596	L	L	L	L							
28							L	L	U L 556	L	L	L	U L 608	L	L	L	L	L						
29							U L 412	U L 432	U L 468	A	A	U L 540	D R 544	U L 536	U L 560	L	A	A	A					
30									L		L	L	L	U L 608	L	L	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	2	3	1	1	4	10	5	2	1	1							
MED							U L 412	U L 440	U L 468	U L 584	U L 484	U L 540	U L 584	U L 584	U L 548	516	U L 504							
U Q									U L 556			U L 594	U L 600	U L 602										
L Q									U L 468			U L 520	U L 552	526										

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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							188	U R 292	R	R	B	A	A	R	R	R	U R 316	260	B					
2							216	304	R	R	B	B	B	A	A	A	R	U A 236	B					
3							196	B	B	B	B	B	B	B	B	B	A	A	A					
4							220	R	R	B	B	B	B	B	B	R	U R 324	U R 252	156					
5							U R 204	R	R	R	R	B	B	B	B	R	U R 308	260	B					
6							U R 200	B	R	R	R	B	B	B	B	R	328	260	B					
7							228	U R 300	U R 348	R	R	R	B	R	R	352	320	256	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	260	B					
11							220	U R 288	U R 340	R	B	R	R	R	R	R	R	256	B					
12							192	U R 284	324	R	R	R	R	B	B	348	300	U R 236	B					
13							220	276	312	R	R	R	R	B	R	R	304	U R 236	B					
14							U R 208	R	R	R	R	R	R	R	R	R	A	A	B					
15							U R 232	284	U R 320	R	R	R	R	R	R	R	U R 300	A	U A 176					
16							U R 216	292	R	U R 356	R	R	R	A	A	U R 340	R	U R 256	B					
17							216	288	R	R	R	R	R	B	R	R	R	U R 252	U R 168					
18							228	R	U R 356	A	A	A	A	R	R	R	R	252	B					
19							220	292	R	360	R	R	R	R	R	R	316	256	B					
20							U R 216	292	R	U R 364	R	R	R	A	R	R	R	R	B					
21							256	R	348	368	U A 372	A	R	R	R	R	R	264	160					
22							U R 248	U A 312	U R 352	R	R	R	R	R	R	R	U R 316	264	U R 156					
23							U R 244	U R 296	U R 340	R	R	B	B	B	B	R	R	256	164					
24							U R 268	R	U R 352	U A 368	R	A	B	R	R	R	B	A	B					
25							248	308	U R 352	B	R	R	A	A	B	U R 368	332	272	U R 184					
26						B 176	244	U R 304	R	R	B	B	B	R	R	R 340	R	268	B					
27						B	U R 256	324	352	R	R	B	B	B	R	R	U R 332	288	B					
28						B	R	R	R	R	R	R	R	B	B	R	A	260	B					
29						B	252	A	U R 344	R	R	R	R	R	A	A	U A 316	260	B					
30						B	260	R	U R 352	R	R	B	B	B	R	R	332	260	B					
31																								
	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	26	16	14	5	1					5	14	23	7					
MED						B 176	220	292	U R 348	U 364	U A 372					R 348	316	260	U 164					
U Q							248	304	U R 352	368						360	328	260	U 176					
L Q							216	288	340	358						R 340	308	U R 252	156					

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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	J A 19	J A 34	J A 24	34	E B E B 16 17		24	32	38	G 33	E B 45	J A 49	76	G 30	G 30	G	G	29	E B 18	J A 19	20	E B 16	20	E B 15
2	E B E B 16 16	18	E B 14	E B E B 14 15			G	G	G	43	E B 50	E B 48	E B 45	48	J A 50	J A 46	G 32	27	E B 18	J A 18	J A 20	18	E B 16	E B 14
3	E B E B E B 14 16 16	20	E B E B 14 16		G	B	E B 78	E B 66	E B 72	E B 77	E B 56		B	E B 78	50	J A 49	J A 42	J A 55	J A 25	J A 21	19	21	E B 16	
4	E B E B E B 12 16 14	E B 15	E B E B 16 14		G	G	G	E B 47	E B 45	E B 47	42	E B 46	E B 44	G 32	G	G 23	18	E B 16	20	J A 18	E B 17	E B 16		
5	E B E B E B 15 16 15	E B 16	21	E B 15	G	G	38	G 32	G	E B 45	E B 67	E B 53	E B 44	G	G 24	32	J A 25	J A 22	J A 17	E B 14	E B 16	E B 15		
6	E B E B E B E B 16 16 16 15		E B E B 16 16		E B 16 14		27	E B 35	G 31	G	44	46	47	E B 48	E B 48	G	G	32	J A 46	J A 23	J A 27	E B 14	J A 26	J A 18
7	E B E B E B E B 16 15 16 16				E B E B 16 16		G	34	37	G 36	G 38	G	E B 46	G	G	J A 48	G	30	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B 40	34	20	E B 15	E B 16	E B 16	E B 16	E B 14
11	E B E B E B E B 16 15 14 16				E B E B 16 16		26	32	41	38	42	45	G 32	G 34	G 28	G 26	G	G	20	J A 23	E B 16	21	20	J A 22
12	J A E B 24 15	21	E B 15		E B E B 16 15		24	34	38	48	44	G	G	E B 41	E B 40	41	G 27	32	22	J A 34	45	J A 22	22	J A 18
13	20	J A 32	J A 20	21	E B E B 12 16		G	G	G 28	37	43	43	42	J A 49	G	36	G 29	G E 22	B E 19	B E 16	J A 19	E B 15	E B 20	E B 16
14	E B E B E B E B 16 16 14 15				E B E B 15 15		24	G 24	G 29	48	J A 49	42	50	46	J A 57	J A 48	32	J A 32	J A 34	J A 38	J A 86	J A J A 22	23	19
15	E B E B E B E B 15 14 16 13				E B E B 16 13		G	G	G 31	G 32	G 37	G 37	G 36	G 34	36	G	G 19	31	23	J A 19	E B 16	E B 16	E B 16	E B 15
16	E B E B J A 14 16 25			J A J A 33	J A J A 22 20		26	G	36	38	G 34	G	41	J A 51	46	G 31	G 26	G 22	24	J A 22	19	21	18	E B 15
17	E B E B E B E B 13 12 16 12				E B E B 14 15		27	32	G 31	38	G	G 38	G E 36	B 44	G 30	G	G 22	G 23	23	E B 14	E B 15	E B 16	E B 16	E B 18
18	E B E B E B 15 16 12	20			E B E B 14 16		25	G 30	G 28	40	43	44	40	G 35	G 33	G 27	G	28	26	39	J A 21	18	E B 16	E B 14
19	E B 15	18	E B 15	E B E B 15 15	E B E B 12 15		29	38	46	48	J A 46	G 31	G	G 37	41	G 28	J A 46	J A 40	J A 36	J A 25	J A 21	21	E B 15	E B 15
20	E B E B E B E B 15 13 16 16				E B E B 16 16		28	36	41	J A 48	45	40	G J 36	A 55	G 33	G	G 26	G	23	J A 25	J A 20	E B 15	E B 16	J A 20
21	21	23	J A 18	J A E B 17 16	E B 16		G	G	39	44	42	43	G	G 31	G 33	G 25	J A 43	J A 67	J A E B 37 16		J A 30	J A 28	J A 22	J A 31
22	J A E B 21 15		E B 16	E B E B 12 16	E B 16		30	37	J A 48	47	53	46	50	54	46	G 28	G 26	38	23	J A 42	28	E B 15	19	E B 16
23	20	18	J A 18	J A E B 31 16	J A 21		28	32	39	G 32	G 32	E B 46	E B E B 42	45	E B 44	G 24	36	40	J A 33	J A 25	J A 24	J A 22	J A 64	19
24	J A J A 25 21	22	E B 13	E B E B 15 20			G	G	38	48	46	44	E B 42	G	G 27	G	E B 45	J A 44	J A 42	J A 34	J A 41	J A 24	J A 34	J A 40
25	J A E B 37 16	E B 15	E B J A 19	A E B 16	19		29	36	43	E B 46	45	J A 49	J A 52	J A 50	E B 43	39	38	J A 47	26	J A 35	J A 22	E B 16	E B 15	E B 15
26	E B E B E B E B 16 16 16 15				E B 16	18	30	G 33	40	G 32	B	E B 47	E B 50	G 35	G 30	G 26	G	36	J A 62	J A 36	J A 52	J A 33	J A 21	J A 27
27	J A E B 26 15	J A 22	E B 15		E B 14	19	G	35	42	44	52	E B 43	44	J A 51	G	G	G 29	G 24	J A 32	J A 54	J A 59	J A 102	J A 50	J A 48
28	J A J A 48 22	J A 24	J A 23		J A 29	E B 18	G 21	G	38	G 32	G 38	G 34	G E 35	B 52	E B 45	G 28	36	34	22	J A 33	J A 44	J A 31	E B 16	E B 15
29	E B E B E B E B 16 16 16 15				E B 15	20	29	36	39	J A 54	53	G	G 36	G 30	48	42	J A 52	J A 47	J A 42	J A 34	J A 38	J A 54	J A 63	J A 30
30	J A 26	22	J A 17	E B 13	E B 14	19	G 20	37	42	45	44	45	E B 47	E B 48	G 37	43	J A 71	J A 51	19	J A 19	J A 32	J A 46	J A 124	J A 47
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	26	27	27	26	27	27	26	27	27	28	28	27	27	27	27	27	27
MED	E B 16	E B 16	E B 16	E B 15	E B E B 16 16		24	G	38	U 40	43	E G 44	E G 42	E G 46	U 36	G	G	32	24	J A 25	J A 21	19	20	E B 16
U Q	J A 21	J A 18	J A 20	20	E B 16	19	28	35	41	48	46	E B 46	50	J A 50	46	41	J A 39	J A 40	J A 36	J A 34	J A 38	J A 24	J A 23	J A 22
L Q	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	G	33	G	G 36	G	G	G	G 35	G 33	G 28	G 28	G	20	E B 19	E B 19	E B 16	E B 16	E B 15

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

IONOSPHERIC DATA STATION Kokubunji

APR.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	16	29	22	32	E B 16	E B 17	23	U Y 32	U Y 38	G 33	E B 45	48	U Y 76	U Y 30	G 30	G	G	27	E B 18	16	E B 16	E B 16	E B 15	E B 15
2	E B 16	E B 16	16	E B 14	E B 14	E B 15	G	G	G	U Y 43	E B 50	E B 48	E B 45	48	47	44	U Y 32	27	E B 18	16	E B 16	E B 15	E B 16	E B 14
3	E B 14	E B 16	E B 16	E B 16	E B 14	E B 16	G	B	E B 78	E B 66	E B 72	E B 77	E B 56	B	E B 78	U Y 50	48	39	44	19	17	17	E B 15	E B 16
4	E B 12	E B 16	E B 14	E B 15	E B 16	E B 14	G	G	G	E B 47	E B 45	E B 47	U Y 42	E B 46	E B 44	U Y 32	G	G 21	18	E B 16	E B 14	16	E B 17	E B 16
5	E B 15	E B 16	E B 15	E B 16	E B 15	E B 15	G	G	36	U Y 32	G	E B 45	E B 67	E B 53	E B 44	G	G 24	30	23	18	15	E B 14	E B 16	E B 15
6	E B 16	E B 16	E B 16	E B 15	E B 16	E B 14	25	E B 35	U Y 31	G	43	46	47	E B 48	E B 48	G	G	30	31	19	23	E B 14	17	E B 14
7	E B 16	E B 15	E B 16	E B 16	E B 16	E B 16	G	34	35	G 36	G 38	G	E B 46	G	G	44	G	29	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	E B 40	34	U Y 20	E B 15	E B 16	E B 16	E B 16	E B 14
11	E B 16	E B 15	E B 14	E B 16	E B 16	E B 16	26	32	41	U Y 38	42	44	U Y 32	G 34	U Y 28	U Y 26	G	G	20	18	E B 16	E B 16	E B 12	18
12	19	E B 15	E B 14	E B 15	E B 16	E B 15	24	33	37	46	44	G	G	E B 41	E B 40	U Y 41	G 27	31	20	23	39	17	E B 16	E B 16
13	16	30	E B 14	E B 16	E B 12	E B 16	G	G	G 28	37	42	43	U Y 42	46	G	35	G 29	G 21	E B 19	E B 16	16	E B 15	E B 20	E B 16
14	E B 16	E B 16	E B 14	E B 15	E B 15	E B 15	22	G 24	G 27	47	46	42	46	45	49	44	31	27	28	36	46	E B 15	18	17
15	E B 15	E B 14	E B 16	E B 13	E B 16	E B 13	G	G	G 31	G U Y 32	U Y 37	U Y 37	G U Y 36	G U Y 34	36	G	U Y 19	30	22	E B 15	E B 16	E B 16	E B 16	E B 15
16	E B 14	E B 16	16	19	19	17	26	G	35	36	G 34	G	U Y 41	44	44	G 31	G 25	G 21	23	16	16	E B 16	E B 16	E B 15
17	E B 13	E B 12	E B 16	E B 12	E B 14	E B 15	26	32	G 29	37	G	U Y 38	U Y 36	E B 44	G 29	G	G 20	G 21	22	E B 14	E B 15	E B 16	E B 16	E B 18
18	E B 15	E B 16	E B 12	E B 15	E B 14	E B 16	24	U Y 30	G 28	39	42	43	40	G 35	G U Y 33	27	G	26	24	36	18	E B 16	E B 16	E B 14
19	E B 15	12	E B 15	E B 15	E B 12	E B 15	27	34	44	46	44	G 31	G	G U Y 37	39	G 27	40	34	34	22	17	E B 15	E B 15	E B 15
20	E B 15	E B 13	E B 16	E B 16	E B 16	E B 16	26	34	40	45	45	U Y 39	G 36	46	G 33	G	G 26	G	21	20	E B 15	E B 15	E B 16	18
21	E B 12	16	E B 16	E B 15	E B 16	E B 16	G	G	38	41	42	U Y 43	G	G U Y 31	33	G 25	41	65	35	E B 16	23	E B 16	17	E B 16
22	E B 14	E B 15	E B 16	E B 12	E B 16	E B 16	28	34	45	46	52	U Y 46	49	52	46	G 28	G 26	32	21	37	20	E B 15	E B 16	E B 16
23	E B 16	E B 16	E B 16	25	E B 16	18	U Y 28	U Y 32	U Y 39	U Y 32	U Y 32	E B 46	E B 42	E B 45	E B 44	G 24	36	39	31	23	20	21	39	E B 16
24	22	E B 15	16	E B 13	E B 15	19	G	G	36	46	46	U Y 44	E B 42	G	G 27	G	E B 45	34	37	26	29	18	28	27
25	30	E B 16	E B 15	E B 16	E B 16	18	27	34	42	E B 46	U Y 45	46	48	48	E B 43	38	36	43	25	32	17	E B 16	E B 15	E B 15
26	E B 16	E B 16	E B 16	E B 15	E B 16	U Y 18	28	G 32	39	U Y 32	B	E B 47	E B 50	G 35	U Y 30	U Y 26	G	33	57	34	38	31	18	E B 16
27	20	E B 15	G 15	E B 15	E B 14	18	G	34	40	U Y 44	50	E B 43	44	48	G	G	G 29	G 24	31	50	41	30	24	41
28	22	16	19	18	25	E B 18	G 20	G	38	U Y 32	U Y 38	U Y 34	U Y E 35	B 52	E B 45	G 28	35	32	U Y 22	30	41	28	E B 16	E B 15
29	E B 16	E B 16	E B 16	E B 15	E B 15	18	28	36	38	50	U Y 53	G	U Y 36	U Y 30	46	42	49	40	41	23	32	41	26	23
30	18	E B 14	E B 15	E B 13	E B 14	U Y 19	G 20	37	41	44	U Y 44	45	E B 47	E B 48	G 36	42	68	45	19	16	22	29	44	23
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	26	27	27	26	27	27	26	27	27	28	28	27	27	27	27	27	27
MED	E B 16	E B 16	E B 16	E B 15	E B 16	E B 16	23	E G 32	38	39	43	U 40	U 39	E G 44	U 36	G	G	30	23	19	17	E B 16	E B 16	E B 16
U Q	16	16	16	16	E B 16	18	26	34	40	46	46	E B 46	47	48	45	41	38	34	31	30	29	18	18	18
L Q	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	G	G	G	U Y 36	G 38	G 37	G	G 35	G 33	G 28	G 28	G	20	E B 16	E B 16	E B 15	E B 16	E B 15

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

IONOSPHERIC DATA STATION Kokubunji

APR. 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	14	16	14	15	16	17	14	16	17	23	45	34	26	22	24	20	22	15	18	13	16	16	15	15
2	16	16	14	14	14	15	18	20	28	34	50	48	45	33	33	32	22	16	18	12	16	15	16	14
3	14	16	16	16	14	16	16	B	78	66	72	77	56	B	78	42	28	21	14	15	13	16	15	16
4	12	16	14	15	16	14	18	20	17	47	45	47	38	46	44	24	18	14	13	16	14	12	17	16
5	15	16	15	16	15	15	16	19	18	22	34	45	67	53	44	26	16	14	14	16	12	14	16	15
6	16	16	16	15	16	14	13	35	23	30	18	41	42	48	48	24	19	16	14	14	15	14	14	14
7	16	15	16	16	16	16	17	20	20	22	23	31	46	29	22	14	18	15	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	40	15	14	15	16	16	16	14
11	16	15	14	16	16	16	14	16	18	17	38	29	22	21	22	19	17	14	14	15	16	16	12	14
12	14	15	14	15	16	15	15	16	15	23	26	28	27	41	40	21	15	14	14	14	15	12	16	16
13	13	15	14	16	12	16	15	15	18	21	22	17	24	36	30	22	14	14	19	16	15	15	20	16
14	16	16	14	15	15	15	15	15	17	17	23	24	20	29	22	17	16	14	13	14	16	15	16	14
15	15	14	16	13	16	13	17	19	15	14	22	18	18	28	19	23	15	14	13	15	16	16	16	15
16	14	16	12	15	16	12	16	16	19	20	18	28	23	27	22	17	17	15	14	12	15	16	16	15
17	13	12	16	12	14	15	14	16	17	18	23	19	24	44	19	22	15	15	13	14	15	16	16	18
18	15	16	12	15	14	16	14	21	16	18	23	23	27	22	27	16	16	16	15	16	16	16	16	14
19	15	10	15	15	12	15	14	16	16	18	19	22	22	27	23	15	14	18	15	14	14	15	15	15
20	15	13	16	16	16	16	14	16	16	17	13	29	20	20	14	22	16	15	15	16	15	15	16	16
21	12	16	16	15	16	16	16	19	19	18	25	26	36	24	29	18	16	16	13	16	14	16	15	16
22	14	15	16	12	16	16	16	18	24	18	21	20	27	28	16	18	16	14	13	16	15	15	16	16
23	16	16	16	12	16	14	20	22	21	20	26	46	42	45	44	15	19	15	14	15	15	15	16	16
24	15	15	12	13	15	16	18	18	18	21	22	31	42	28	19	20	45	15	16	19	16	16	16	16
25	15	16	15	16	16	15	13	18	18	46	23	27	37	21	43	19	17	18	15	13	13	16	15	15
26	16	16	16	15	16	14	17	18	21	21	B	47	50	26	28	20	22	18	16	15	15	14	15	16
27	14	15	15	15	14	16	16	20	20	22	22	43	40	39	28	24	22	15	17	19	12	15	14	13
28	13	12	12	12	14	18	14	21	17	28	22	30	21	52	45	21	19	16	14	15	14	15	16	15
29	16	16	16	15	15	14	16	20	22	24	23	28	28	24	26	24	16	14	15	15	15	15	14	15
30	16	14	14	13	14	15	16	20	22	21	22	41	47	48	24	24	16	16	16	12	15	16	16	16
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	28	28	27	27	27	27	27	27
MED	15	16	15	15	16	15	16	19	18	21	23	29	28	29	27	21	17	15	14	15	15	15	16	15
U Q	16	16	16	16	16	16	17	20	21	24	34	43	42	45	43	24	20	16	16	16	16	16	16	16
L Q	14	15	14	13	14	14	14	16	17	18	22	24	23	24	22	18	16	14	14	14	14	15	15	14

APR. 2001 fmin (0.1MHz) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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	R 242	228	270	239	218	219	315	268	288	271	265	261	265	266	262	264	262	272	285	R 301	278	256	259	260
2	255	271	276	279	256	250	278	299	299	287	267	279	267	262	263	266	269	277	281	276	251	261	268	S 279
3	272	269	266	277	272	267	309	B	288	285	271	271	272	B	262	266	269	282	R 291	282	251	S 257	S 268	273
4	286	297	271	266	R 251	272	308	307	297	289	273	266	272	259	267	265	272	276	287	278	R 267	R 265	274	R 279
5	R 282	276	264	236	233	230	225	288	300	285	276	273	271	262	270	271	273	282	285	287	276	263	251	R 272
6	294	270	271	280	247	244	309	303	297	287	279	280	272	272	270	278	282	283	290	286	R 289	270	270	261
7	269	272	270	R 276	269	272	S 298	314	310	282	287	274	274	274	271	271	280	281	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	289	289	299	R 307	R 312	273	275	S 287
11	276	267	292	266	262	264	311	318	308	296	298	294	286	282	284	286	290	297	299	301	287	267	277	291
12	294	260	258	221	224	262	316	R 318	312	266	302	251	249	R 279	266	269	268	275	276	287	278	245	253	252
13	261	R 273	R 282	291	300	R 285	R 318	320	311	300	305	307	299	309	302	309	309	308	313	314	282	R 242	240	266
14	R 317	250	269	275	F	F	322	315	313	327	312	304	292	310	287	295	298	301	312	305	293	R 273	257	276
15	268	276	266	R 285	265	274	295	306	R 306	R 307	304	306	296	293	294	294	296	302	310	318	300	268	R 266	R 266
16	R 269	R 270	267	293	291	284	312	322	301	301	296	284	287	285	290	R 299	300	303	315	308	289	272	283	280
17	277	280	283	277	269	283	R 328	332	338	308	297	286	297	291	299	292	289	299	R 310	329	334	266	267	267
18	269	283	286	R 305	269	279	329	330	319	319	287	289	290	270	275	283	275	284	R 292	310	290	255	259	272
19	282	R 282	277	R 267	268	R 295	330	335	319	313	290	296	290	287	291	291	292	303	308	S 310	314	327	R 275	280
20	277	267	285	286	283	293	337	343	312	312	R 308	R 286	289	288	285	292	294	307	310	294	303	270	281	R 272
21	277	272	284	285	285	277	322	336	305	290	282	279	284	282	278	292	296	297	312	313	288	266	271	265
22	274	281	295	295	277	287	R 328	323	313	307	285	285	284	273	271	277	290	287	289	R 300	R 290	281	253	265
23	281	276	256	270	233	R 241	251	245	R 242	230	243	R 242	R 239	R 259	R 242	253	273	303	281	254	251	R 259	R 268	274
24	261	254	262	276	259	277	310	317	312	290	281	282	286	272	283	288	285	294	301	310	279	250	R 267	261
25	S 261	280	281	270	269	R 280	295	U R 307	309	288	R 258	R 262	262	R 264	266	270	286	279	304	304	293	261	265	264
26	R 263	268	R 270	253	247	R 261	296	294	282	285	B	266	267	271	280	284	289	283	300	305	290	259	258	268
27	291	297	299	262	268	290	325	305	291	282	263	270	272	271	276	282	287	294	305	304	281	270	R 269	267
28	266	270	286	280	257	R 267	286	R 291	273	R 269	277	272	285	282	285	286	282	279	295	298	258	253	251	253
29	267	241	251	265	274	253	249	224	246	R 246	R 242	R 251	R	265	277	294	302	299	290	284	R 274	S 267	259	S 262
30	262	257	263	259	260	289	330	333	311	293	290	274	273	272	271	283	286	283	295	R 293	S 280	R 270	S 261	S 275
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	26	26	27	26	27	27	26	27	26	26	27	27	28	28	27	27	27	27	27	27
MED	272	271	271	276	266	273	311	314	306	289	284	279	279	272	276	283	286	288	299	301	287	266	267	268
U Q	282	280	284	285	272	284	325	323	312	307	297	286	289	285	285	292	293	300	310	310	293	270	271	276
L Q	263	267	266	265	251	261	295	299	291	282	271	266	271	266	267	270	274	282	289	287	276	257	258	264

APR. 2001 M(3000)F2 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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	L	L	L	A	L	L	L								
2											L	L	L	L	L	L								
3								B	B			E B		B	B	L	L							
4											L	L	L	L	L	L								
5										L	L	L	B	L	L	L								
6											L	L	L	L	L	L								
7										L	L	L	L		L	L	L		C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C								
11											L	L		L	L	L	L							
12									L	U L 323	L	U L 310	U L 298	L	L	L								
13										L	L	L		L		L								
14										L		L		L	L									
15								L		L			L	L	L		L							
16									L	L	L	L	U L 322	L	L	L								
17										L	L	U L 367	U L 331	L		L								
18									L	L	L	L	U L 337	U L 320	L	L								
19									L	L	L	L	U L 350	L	L	L	L							
20									L	L	L	L	U L 362	L	L	L	L							
21										L	L	L	L	L	L	L	L							
22									L	L	L	L	L	L	L	L	L							
23							L	R 307	U L 331	R	U L 359	U L 353	U L 358	353	U L 328	338	U L 318	A						
24								L	L	L	L	L	L		L	L	L							
25								L	L	L	L	L	L	L	L	L	L							
26						L		L	L	L	B	L	L	U L 333	L	L	L	L						
27								L	L		L	L	U L 341	L	L	L	L							
28							L	L	U L 330	L	L	L	U L 341	L	L	L	L	L						
29							U L 296	U L 347	U L 352	A	A	U L 357	D R 363	U L 355	U L 327	L	A	A	A					
30									L		L	L	L	U L 333	L	L	A							
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							1	2	3	1	1	4	10	5	2	1	1							
MED							U L 296	327	U L 331	U L 323	U L 359	U L 355	U L 341	U L 333	U L 328	338	U L 318							
U Q									U L 352			U L 362	U L 358	354										
L Q									U L 330			U L 332	U L 331	U L 326										

APR. 2001 M(3000)F1 (0.01) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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								340	308	344	358	346	338	340	342	344								
2											344	324	334	350	352	354								
3								B	E B 280			316		B	358	340	334							
4											344	310	342	360	340	340								
5										298	324	330	308	350	316	322								
6											314	324	350	324	348	330								
7										322	298	310	340		332	312	304		C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C								
11											280	306		324	310	300	294							
12									292	392	326	438	420	300	300	326								
13										288	268	270		276		280								
14										262		268		262	322									
15								278		270			292	286	296		292							
16									286	280	280	308	284	314	300	286								
17										288	298	284	294	308		312								
18									282	268	320	310	316	326	330	312								
19									276	282	276	284	294	298	284	290	300							
20									278	268	260	316	312	306	316	298	286							
21										306	266	320	310	310	330	302	282							
22									286	282	314	334	318	340	348	328	298							
23							396	498	488	U R 578	526	538	532	474	R 510	510	384	310						
24								266	282	316	314	306	312		316	310	302							
25								268	268	276	362	360	358	356	348	342	296							
26						362		292	312	292	B	350	354	352	328	312	294	298						
27								288	302		348	318	324	330	326	312	304							
28							304	310	380	390	344	342	328	334	322	316	316	300						
29							450	610	502	536	522	512	R	440	390	344	284	272	280					
30									282		332	360	350	350	346	318	296							
31																								
	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	3	9	16	20	23	26	22	24	25	25	16	4	1					
MED						362	396	292	286	290	320	319	326	328	330	316	297	299	280					
U Q							450	419	310	333	344	346	350	350	348	340	304	305						
L Q							304	273	281	278	280	308	310	307	316	306	293	285						

APR. 2001 h'F2 (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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	E A 364	E A 408	304	242	E B 466	E B 470	240	232	238	244	246	242	A	230	230	244	244	260	268	238	214	282	300	310
2	316	288	266	242	206	280	246	238	238	240	242	242	230	246	244	248	250	246	258	254	252	294	286	272
3	292	288	286	252	232	248	236	B	B	E B 298	E B 308	B	290	B	B	U R 288	E A 270	268	266	244	236	316	294	274
4	260	258	272	294	340	300	230	232	238	234	228	224	234	246	238	246	252	250	262	248	258	276	274	270
5	264	276	288	350	E B 378	362	248	228	228	240	236	226	B	276	234	236	252	256	262	266	254	240	292	298
6	248	258	288	274	316	366	236	226	232	232	222	220	248	244	248	256	252	250	258	256	256	228	274	292
7	294	290	292	270	252	276	244	244	240	228	210	234	234	236	240	236	242	254	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	246	248	256	242	226	246	276	256
11	284	292	258	238	306	312	234	226	234	230	212	224	240	230	222	242	234	254	252	240	218	268	266	270
12	266	314	308	E B 436	E B 442	304	244	236	236	E A 262	266	232	238	E B 236	244	248	244	260	258	254	254	284	292	316
13	300	304	270	244	232	228	228	222	224	220	226	226	248	236	224	222	H 228	236	234	236	262	360	354	316
14	236	318	302	266	Q 308	Q 332	234	232	216	E A 242	242	234	258	230	258	254	242	248	252	258	276	248	308	282
15	286	286	290	242	292	286	240	214	H 214	224	246	H 220	228	216	216	232	244	254	244	228	222	248	294	306
16	298	298	298	258	244	260	232	238	228	204	226	228	210	236	E A 248	230	240	240	246	222	218	268	276	272
17	292	282	272	250	290	280	232	236	234	218	214	214	216	E B 244	252	228	236	260	256	228	210	262	294	318
18	298	286	264	246	278	284	236	240	232	224	220	226	212	228	238	252	240	262	226	234	234	292	308	294
19	272	264	248	310	316	272	238	232	234	244	E A 248	230	218	222	228	240	256	256	258	246	234	210	240	280
20	284	302	278	276	258	258	236	230	224	E A 242	E A 242	222	206	240	238	E B 268	226	256	236	236	234	252	284	292
21	280	280	272	258	258	280	234	236	224	222	218	222	266	224	238	236	E A 254	266	250	220	224	272	288	296
22	304	288	262	234	244	272	228	230	236	238	262	238	248	E A 268	250	246	230	264	258	268	244	248	312	306
23	270	290	262	E A 310	E B 390	340	282	286	278	R	258	E B 274	224	226	246	H 200	252	A	E A 298	E A 326	E A 330	E A 324	E A 378	284
24	E A 308	E A 324	320	272	280	272	246	232	228	234	232	240	206	U R 294	E A 266	248	222	260	258	244	254	E A 298	E A 332	E A 342
25	E A 330	280	254	260	266	276	246	236	E A 234	E B 244	U R 270	238	248	252	238	230	252	252	270	246	234	254	302	300
26	306	294	274	316	330	290	248	222	230	230	B	236	E B 278	262	U R 254	E Y 250	236	248	282	250	256	E A 292	304	302
27	276	252	236	244	286	276	238	228	228	238	240	220	222	248	230	230	230	252	262	258	272	294	320	E A 330
28	310	284	272	260	E A 334	280	228	240	232	254	256	236	216	E B 286	240	230	232	E A 266	264	242	E A 320	E A 338	334	332
29	300	330	300	292	256	322	282	272	254	A	A	260	216	252	242	238	A	A	A	284	E A 320	E A 368	E A 332	E A 336
30	324	306	316	312	332	266	242	244	238	232	238	212	232	252	230	240	A	272	264	250	242	278	E A 334	294
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	27	27	27	27	27	27	27	26	26	25	25	26	25	26	26	27	26	26	26	27	27	27	27	27
MED	288	288	274	259	U 274	280	238	232	232	232	236	228	231	239	238	239	242	254	258	245	239	U 265	293	294
U Q	306	304	298	294	E B 332	312	246	238	238	E 243	252	238	248	252	248	248	252	260	264	256	258	E A 294	E A 320	316
L Q	272	280	264	244	256	272	234	228	228	226	224	222	216	230	230	230	234	250	252	236	226	248	284	280

APR. 2001 h'F (KM) COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

APR. 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							E B 138	116	116	122	B	A	A	A	120	120	120	118	B					
2							130	120	120	118	B	B	B	A	A	A	A	122	B					
3							122	B	B	B	B	B	B	B	B	B	A	A	A					
4							120	118	118	B	B	B	B	B	B	130	120	126	E B 140					
5							E B 136	118	128	122	114	B	B	B	B	120	120	122	B					
6							122	B	A 122	122		B	B	B	B	118	118	118	B					
7							122	118	118	E A 138	124	120	B	118	120	118	120	124	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	118	B					
11							120	118	124	122	B	120	A	124	118	122	118	120	B					
12							124	126	138	118	120	120	120	B	B	128	124	A	B					
13							124	118	122	120	120	A	116	B	120	118	126	120	B					
14							118	124	122	A	R	116	A	122	118	120	A	A	B					
15							118	120	126	124	122	118	A	118	122	120	118	120	E B 138					
16							120	118	118	124	A	118	116	118	A	124	122	126	B					
17							120	118	128	120	116	A	A	B	122	122	116	126	124					
18							128	A	120	118	120	A	A	120	120	122	116	124	B					
19							118	118	122	118	116	118	116	A	A	122	120	120	B					
20							118	122	124	122	122	A	A	A	128	122	124	118	B					
21							124	118	128	122	118	116	120	120	120	120	120	118	124					
22							126	A	124	122	118	120	120	R	116	122	124	122	126					
23							126	118	124	126	R	B	B	B	B	118	124	124	130					
24							120	120	120	124	118	A	B	116	120	118	B	A	B					
25							124	118	122	B	120	118	A	A	B	122	122	122	132					
26						B 132	118	124	122	122	B	B	B	122	R	A 124	120	118	B					
27						B	120	122	122	118	120	B	B	B	118	118	128	126	B					
28						B	126	118	R	126	A	120	120	B	B	120	124	120	B					
29						B	118	A	A	120	120	122	126	118	A	120	120	114	B					
30						B	128	118	116	124	118	B	B	B	130	126	120	120	B					
31																								
	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	27	22	23	23	17	12	8	10	14	25	23	24	7					
MED						B 132	121	118	122	122	120	119	120	119	120	120	120	120	127					
U Q							126	120	124	124	121	120	120	122	122	122	124	124	E B 138					
L Q							120	118	120	120	118	118	116	118	118	119	120	118	124					

IONOSPHERIC DATA STATION Kokubunji

APR. 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	118	112	112	114	B	B	152	144	130	112	B	106	102	104	104	G	G	148	B	116	116	B	118	B
2	B	B	102	B	B	B	G	G	G	124	B	B	B	110	108	108	108	134	B	108	102	108	B	B
3	B	B	B	104	B	B	G	B	B	B	B	B	B	B	B	108	104	100	98	96	94	98	98	B
4	B	B	B	B	B	B	G	G	G	B	B	B	118	B	B	114	G	108	140	B	102	100	B	B
5	B	B	B	B	114	B	G	G	132	110	G	B	B	B	B	G	100	128	100	96	96	B	B	B
6	B	B	B	B	B	B	166	B	112	G	124	118	116	B	B	G	G	134	116	110	108	B	104	102
7	B	B	B	B	B	B	G	152	150	114	110	G	B	G	G	124	G	138	C	C	C	C	C	C
8	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
9	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
10	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	B	126	116	B	B	B	B	B
11	B	B	B	B	B	B	168	152	134	140	128	120	112	108	104	106	G	G	124	114	B	118	112	106
12	108	B	136	B	B	B	160	142	136	128	128	G	G	B	B	140	110	124	124	116	114	114	116	112
13	114	110	108	110	B	B	G	G	108	140	120	120	116	112	G	118	112	108	B	B	120	B	B	B
14	B	B	B	B	B	B	148	114	112	122	120	124	120	116	114	118	110	114	120	116	112	112	100	98
15	B	B	B	B	B	B	G	G	106	104	114	124	110	108	126	G	104	158	136	110	B	B	B	B
16	B	B	102	100	100	100	168	G	160	148	110	G	122	114	108	112	110	114	122	106	106	102	100	B
17	B	B	B	B	B	B	164	146	108	132	G	114	110	B	108	G	106	114	128	B	B	B	B	B
18	B	B	B	110	B	B	156	114	106	122	116	110	108	108	108	112	G	136	116	112	112	120	B	B
19	B	106	B	B	B	B	150	134	122	116	114	108	G	108	110	102	128	128	116	114	112	110	B	B
20	B	B	B	B	B	B	162	142	126	118	122	110	106	110	110	G	110	G	138	118	120	B	B	130
21	102	98	120	116	B	B	G	G	126	124	122	118	G	112	108	106	140	118	116	B	108	102	104	106
22	102	B	B	B	B	B	154	140	124	124	132	146	134	124	128	110	110	130	122	112	118	B	106	B
23	158	156	138	122	B	132	134	140	124	110	114	B	B	B	B	108	162	126	122	118	112	112	110	114
24	108	110	108	B	B	134	G	G	134	114	114	110	B	G	102	G	B	110	108	108	106	108	106	104
25	104	B	B	104	B	144	150	142	130	B	122	112	112	110	B	166	150	128	124	112	112	B	B	B
26	B	B	B	B	B	170	150	154	130	108	B	B	B	112	110	110	G	126	112	112	112	108	108	102
27	100	B	104	B	B	166	G	136	128	126	118	B	116	118	G	G	110	112	118	110	108	108	106	106
28	102	112	106	108	106	B	114	G	134	112	104	108	110	B	B	106	132	114	116	108	106	106	B	B
29	B	B	B	B	B	138	144	138	140	126	122	G	110	110	114	130	114	114	110	112	114	110	106	104
30	102	106	110	B	B	160	118	144	134	126	120	118	B	B	108	128	112	114	116	112	104	102	102	102
31																								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	8	11	9	3	8	17	16	24	23	20	16	16	16	16	19	19	26	24	22	23	17	15	12
MED	104	110	108	110	106	141	152	142	129	122	120	116	112	110	108	112	110	125	117	112	112	108	106	105
U Q	114	112	120	115	114	163	163	145	134	126	122	120	117	113	112	124	128	130	124	114	114	112	110	109
L Q	102	106	104	104	100	133	146	137	117	112	114	110	110	108	108	108	108	114	116	108	106	102	102	102

IONOSPHERIC DATA STATION Kokubunji

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

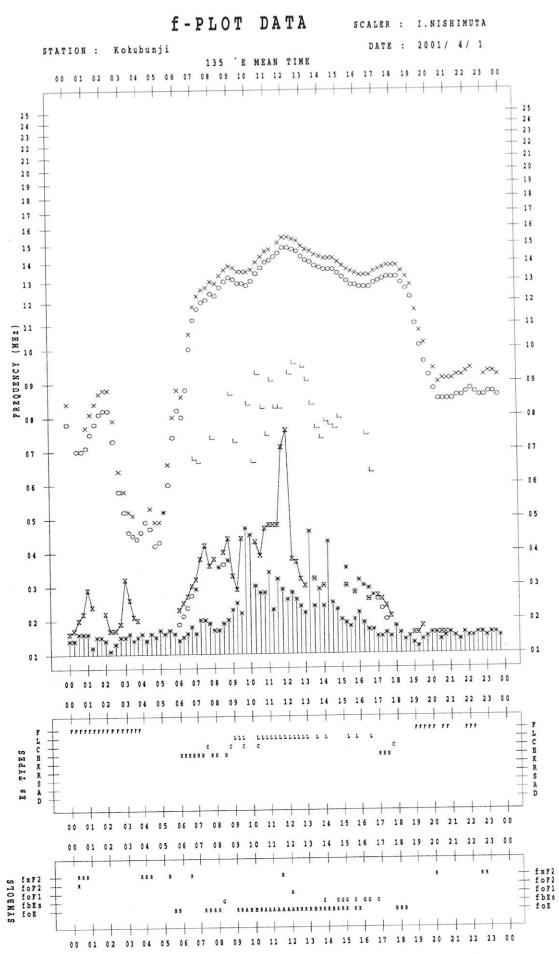
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

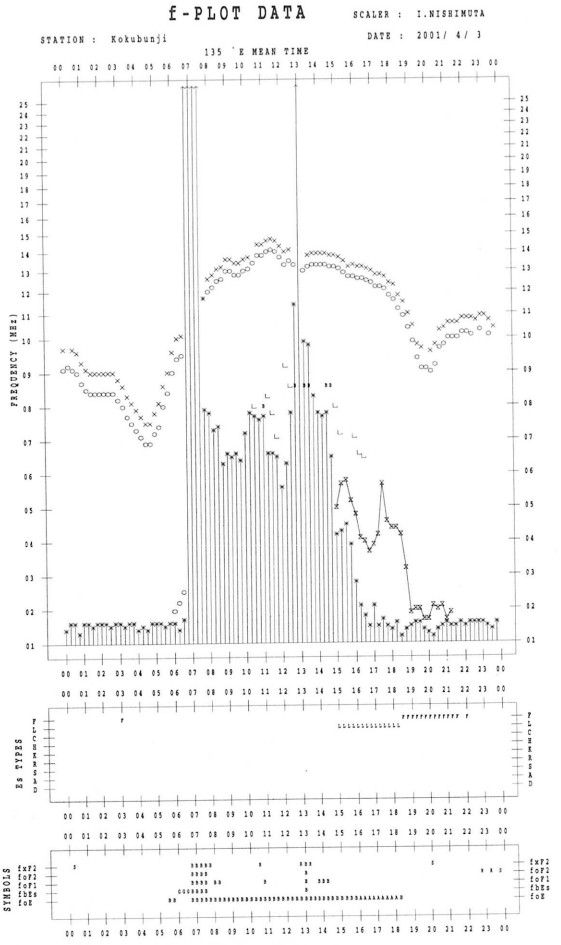
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	FF 21	F 4	F 2	F 4			H 1	H 1	H 1	L 1		L 1	L 2	L 1	L 1			H 1		F 1	F 1		F 1	
2			F 1							C 1				L 1	L 1	L 1	L 1	CL 11		F 1	F 1	F 1		
3				F 1												L 1	L 1	L 2	L 3	F 4	F 3	F 1	F 1	
4													C 1			L 1		L 1	H 1		F 1	F 2		
5					F 1				CL 11	L 1							L 1	CL 12	L 2	F 2	F 2			
6							H 1		L 1		CL 11	C 1	C 1					H 1	C 2	F 4	F 4		F 2	F 1
7								H 1	H 1	L 1	L 1					C 1		HL 11						
8																								
9																								
10																		CL 11	C 1					
11							H 1	H 1	HL 11	CL 11	C 1	C 1	L 1	L 1	L 1	L 1			C 1	F 2		F 1	F 1	F 2
12	F 2		F 1				H 1	HL 11	HL 11	CL 11	C 1					HL 11	L 1	CL 21	C 2	F 4	F 6	F 2	F 2	F 2
13	F 2	F 4	F 3	F 1					L 1	HL 11	CL 11	CL 11	CL 11	C 1		C 1	L 1	L 1			F 2			
14							H 1	L 1	L 1	CL 11	CL 11	CL 11	CL 11	C 1	C 2	C 1	L 1	L 2	C 2	F 5	F 3	F 2	F 1	F 2
15									L 1	L 1	L 1	CL 11	L 1	L 1	CL 11		L 1	HL 12	H 1	F 1				
16			F 2	F 2	F 3	F 2	H 1		H 1	H 1	L 1		C 1	C 2	L 1	L 1	L 1	L 1	C 2	F 1	F 1	F 2	F 2	
17							H 1	H 1	L 1	HL 11		L 1	L 1		L 1		L 1	L 1	C 1					
18				F 1			HL 11	L 1	L 1	CL 11	CL 11	L 1	L 1	L 1	L 1	L 1		HL 11	C 3	F 6	F 3	F 1		
19		F 1					H 1	H 1	C 1	CL 21	CL 11	L 1		L 1	L 1	L 1	CL 11	CL 21	CL 31	F 3	F 2	F 1		
20							H 1	HL 11	CL 11	CL 11	CL 11	L 1	L 1	L 1	L 1		L 1		C 1	F 2	F 1			F 2
21	FF 11	FF 21	F 1	F 1					CL 11	CL 11	CL 11	C 1		L 1	L 1	L 1	HL 11	C 4	C 3		F 3	F 1	F 1	F 2
22	F 1						HL 11	HL 11	CL 11	CL 11	CL 11	HL 11	CL 11	CL 11	CL 11	L 1	L 1	HL 11	C 2	F 5	F 3		F 1	
23	F 1	F 1	F 2	F 5		F 2	C 1	H 1	CL 11	L 1	L 1					L 1	HL 11	CL 21	C 3	F 4	F 6	F 5	F 5	F 1
24	F 4	F 2	F 2			F 1			CL 11	CL 11	CL 11	L 1			L 1			L 2	L 2	F 3	F 5	F 5	F 5	F 6
25	F 5			F 1		F 1	H 1	H 1	CL 11		C 1	C 1	L 1	L 1		HL 11	HL 11	H 2	H 2	F 4	F 2			
26						H 1	H 1	H 1	HL 11	L 1				L 1	L 1	L 1		C 1	C 3	F 4	FF 52	F 5	F 2	F 2
27	F 3		F 1			H 1		H 1	CL 11	CL 11	CL 11		C 1	C 1			L 1	L 1	C 2	F 5	F 3	F 3	F 2	F 3
28	F 2	F 1	F 2	F 3	F 3		L 1		CL 11	L 1	L 1	L 1	L 1			L 1	CL 11	CL 21	C 1	F 3	F 4	F 4		
29						H 2	H 2	HL 11	HL 11	CL 21	CL 11		L 1	L 1	L 1	CL 11	CL 21	C 3	L 3	FF 32	FF 21	F 4	F 3	F 3
30	F 2	F 1	F 2			H 1	L 1	H 1	H 1	CL 11	CL 11	C 1			L 1	CL 11	CL 31	C 3	L 2	F 1	F 3	F 3	F 4	F 3
31																								
	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																								

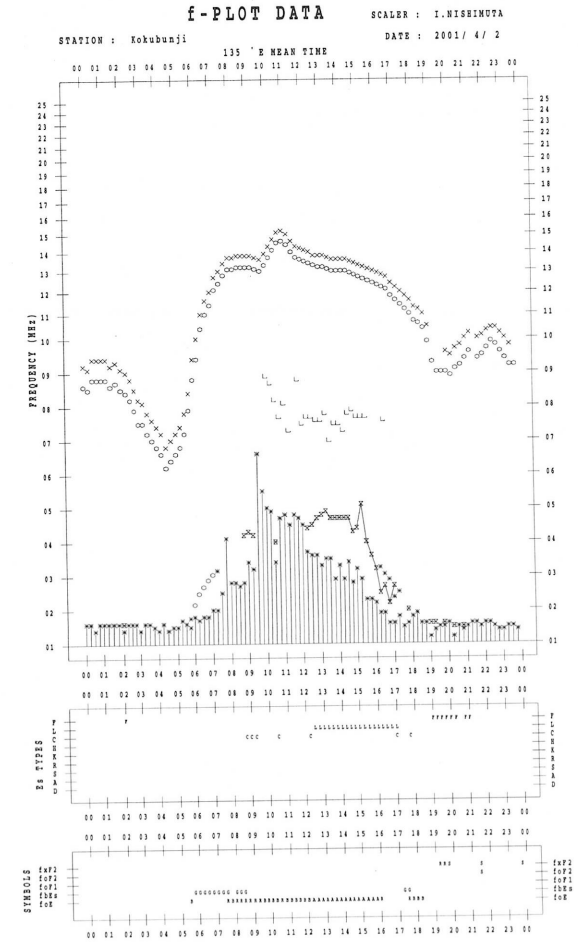
APR. 2001 TYPES OF Es COMMUNICATIONS RESEARCH LABORATORY, JAPAN

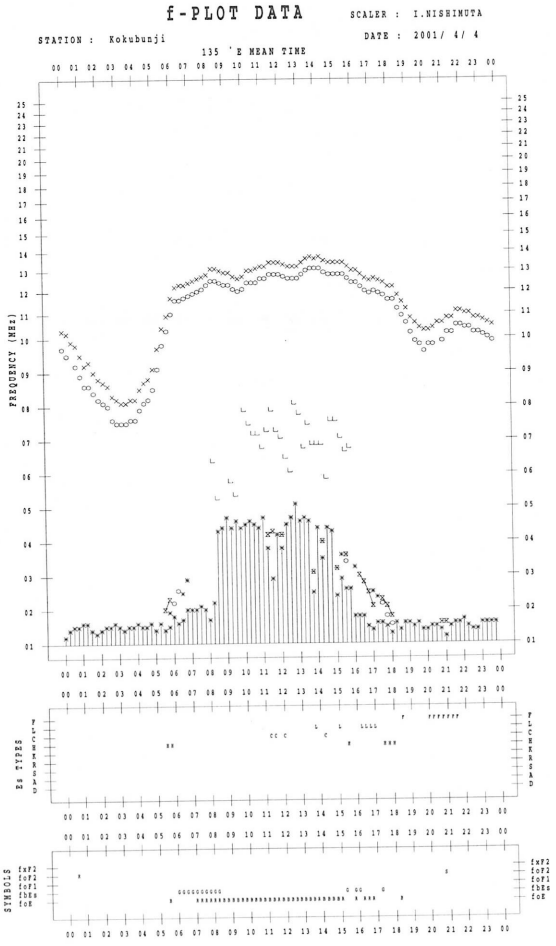
f-PLOTS OF IONOSPHERIC DATA

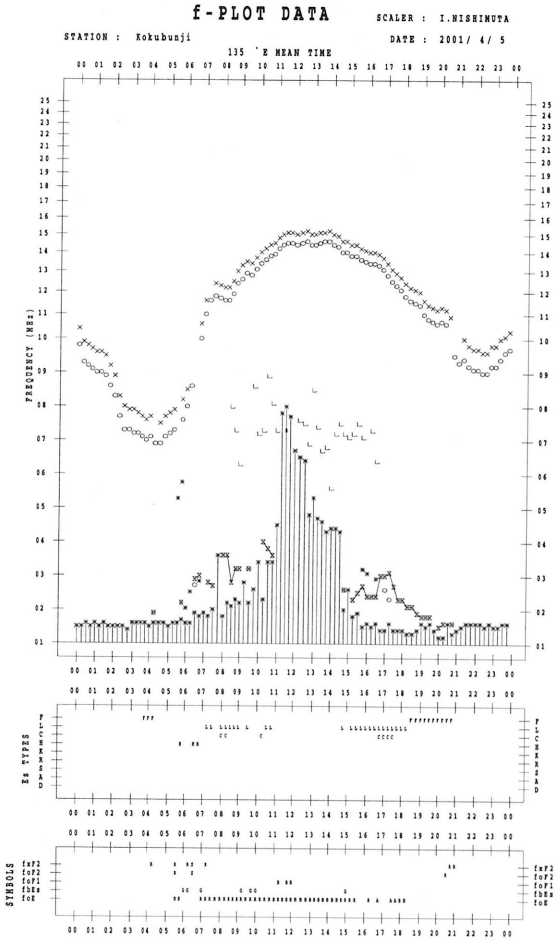
KEY OF f-PLOT	
	SPREAD
	foF2,foF1,foE
	fxF2
	DOUBTFUL foF2,foF1,foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN

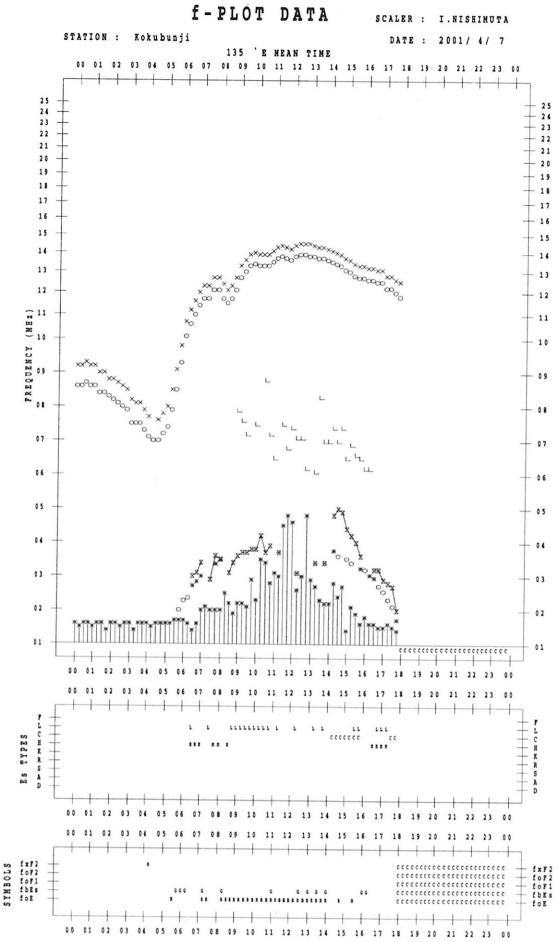

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

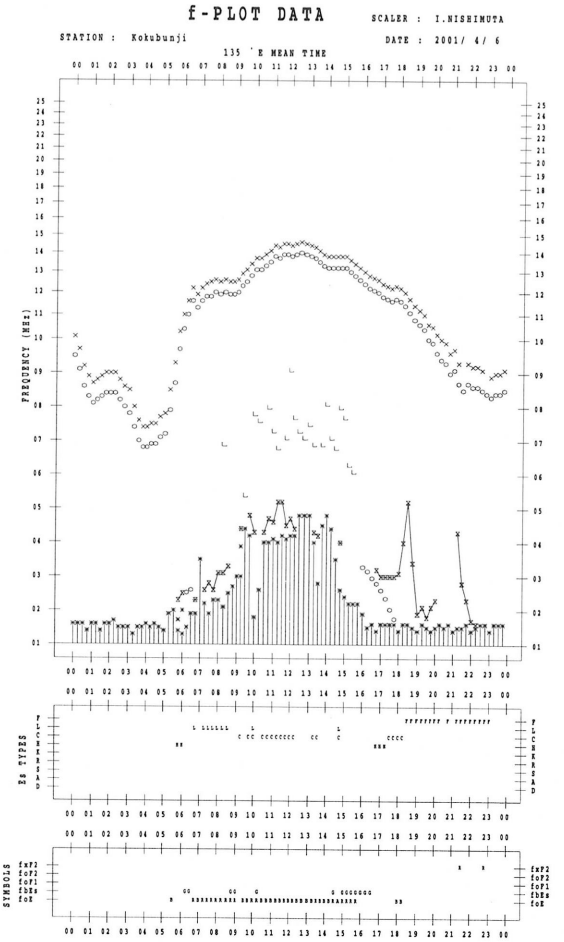

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 3
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

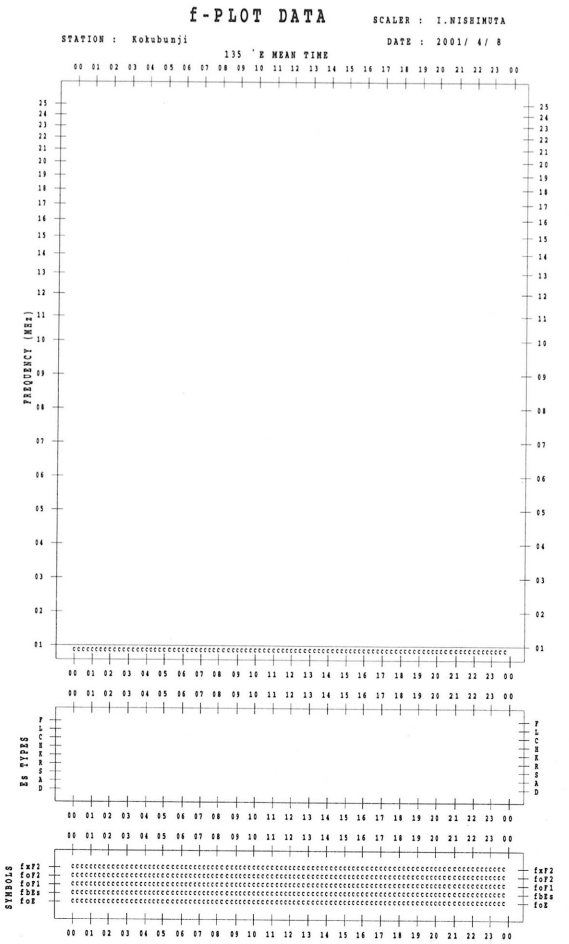

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 2
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

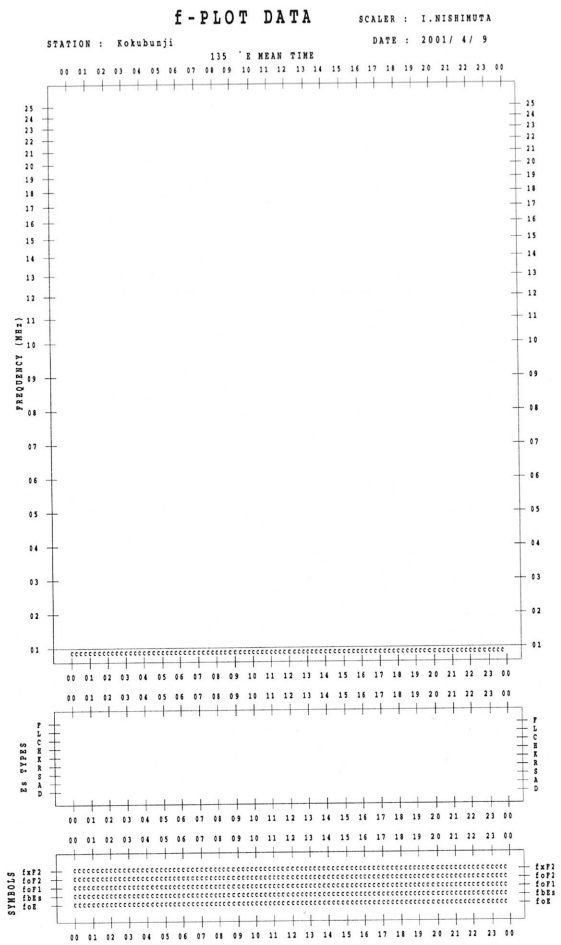

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 4
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

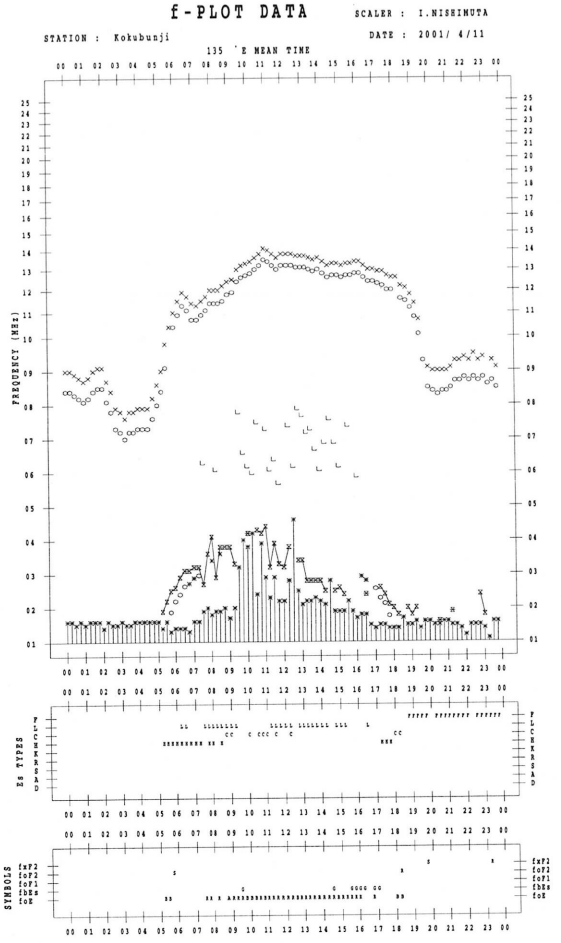

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 5
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

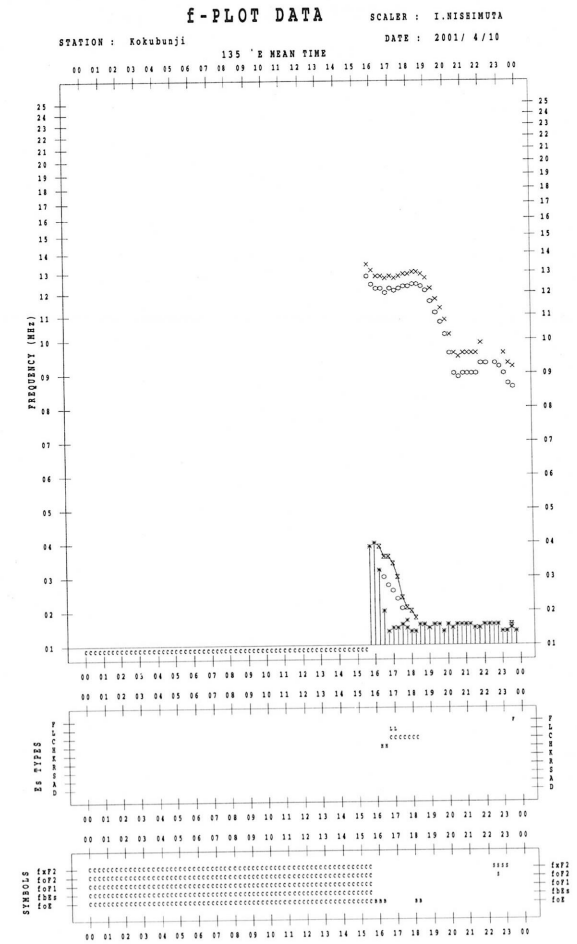

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 7
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

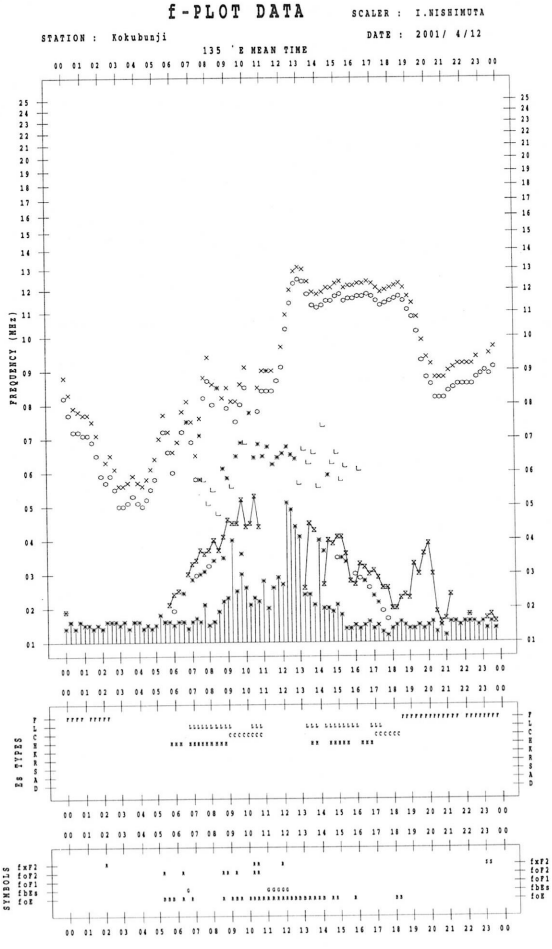

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 6
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

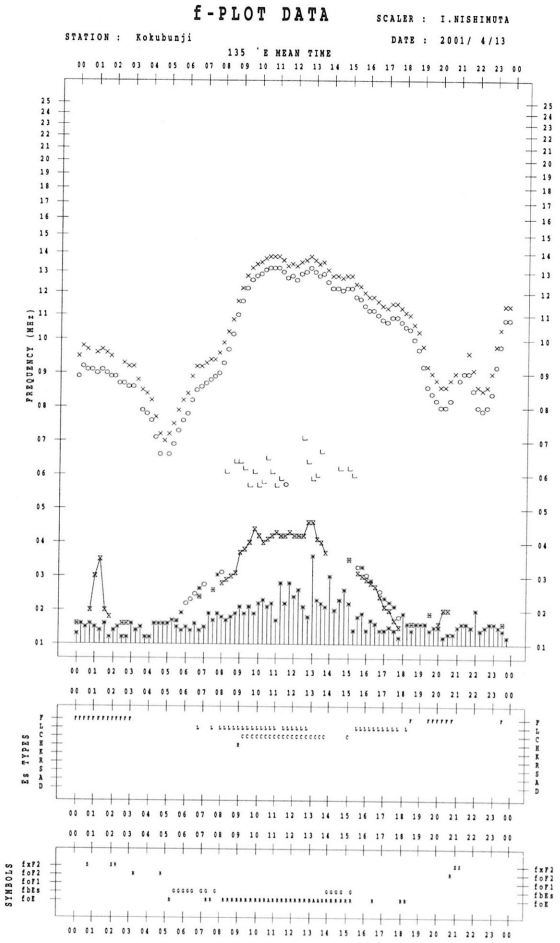

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 8
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

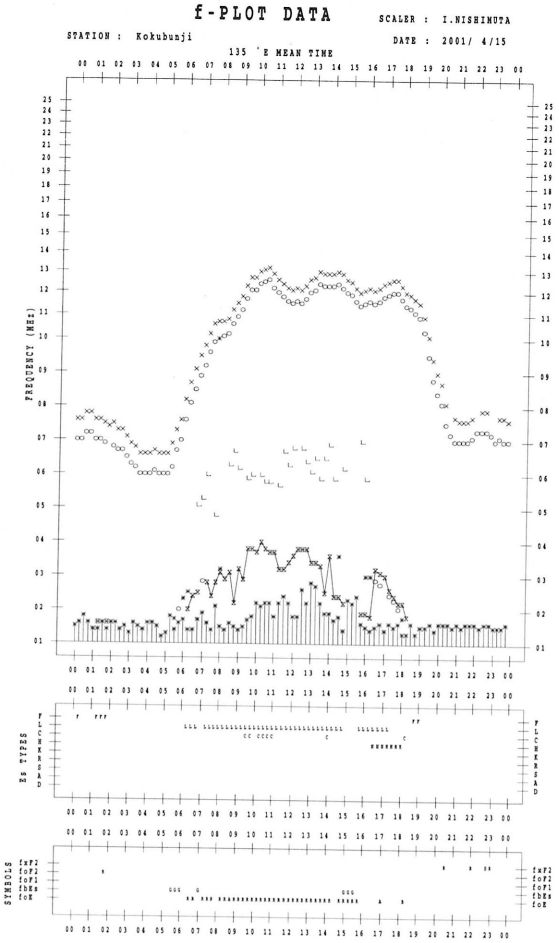

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/ 9
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

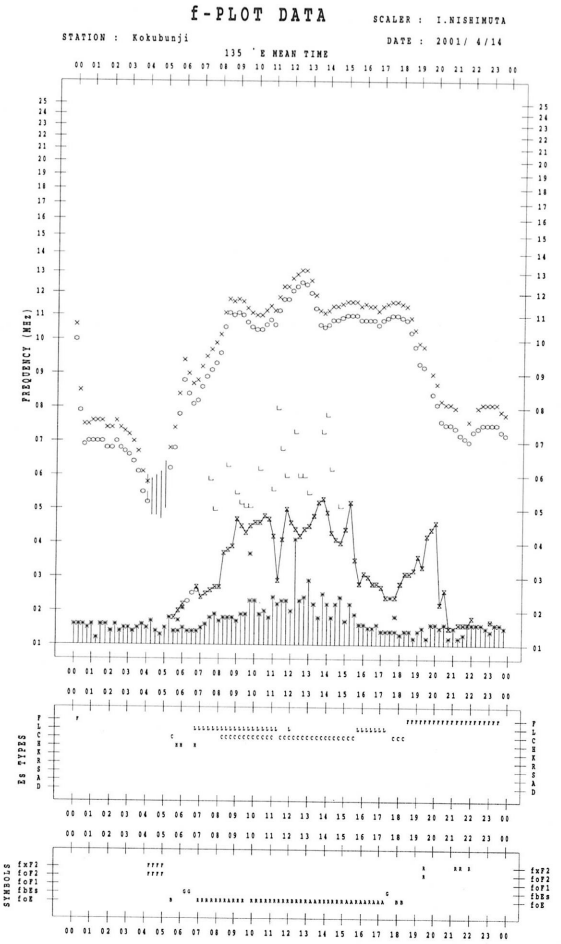

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/11
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

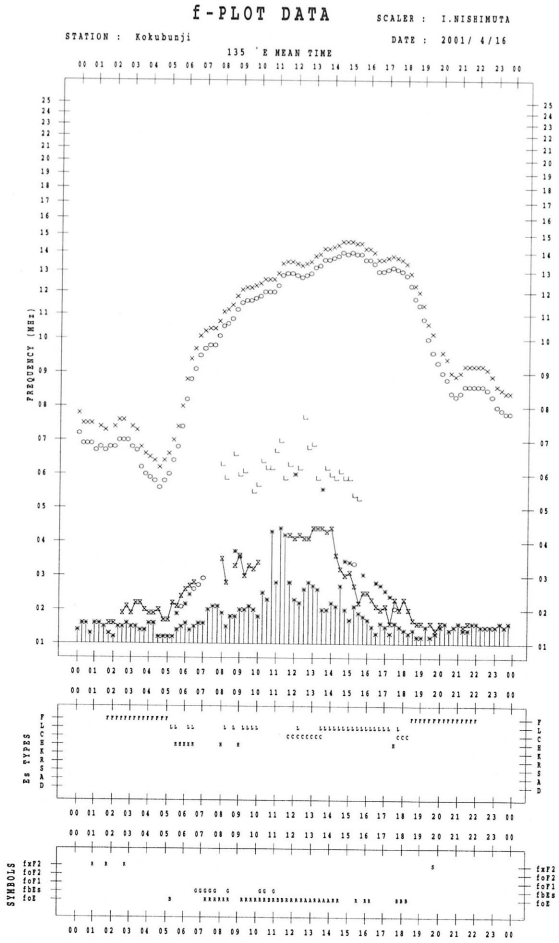

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/10
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

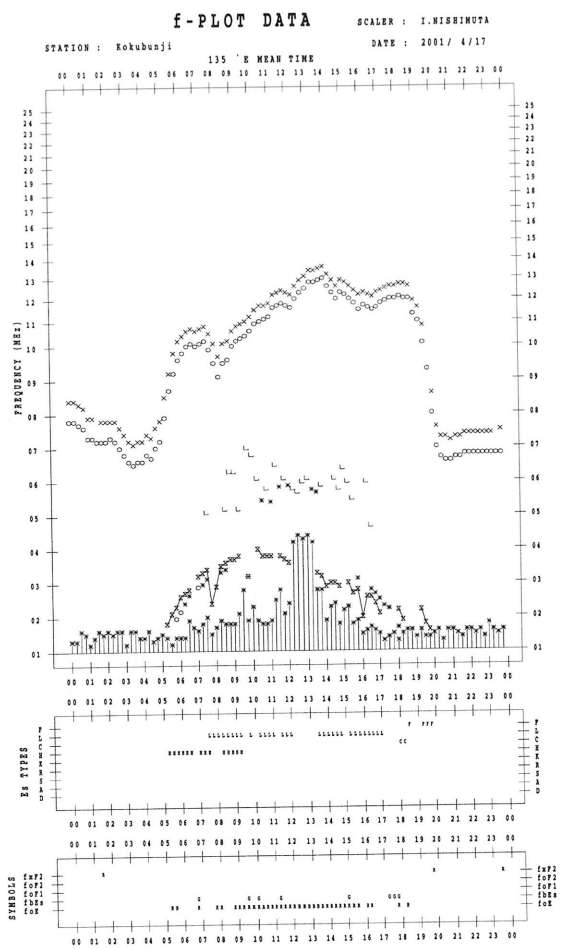

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/12
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE

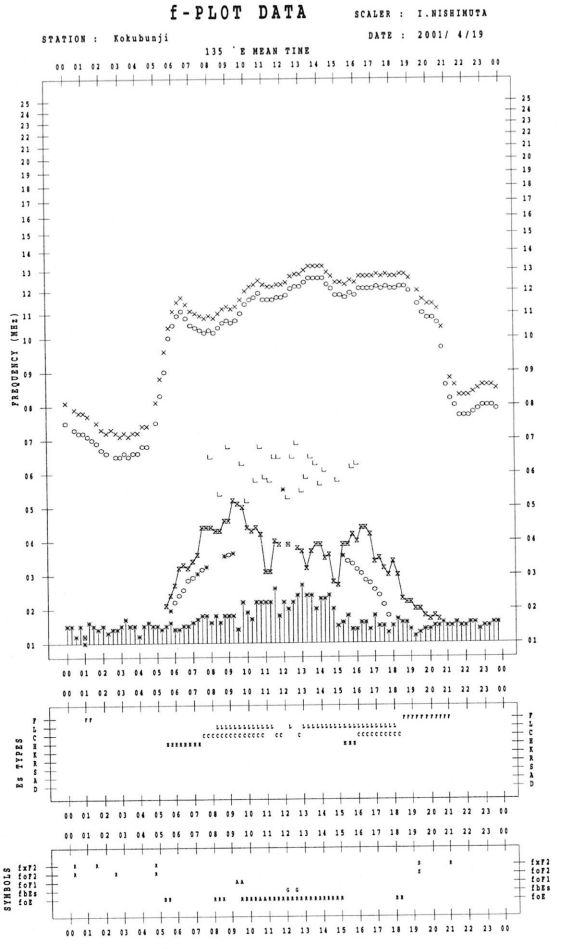

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/13
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

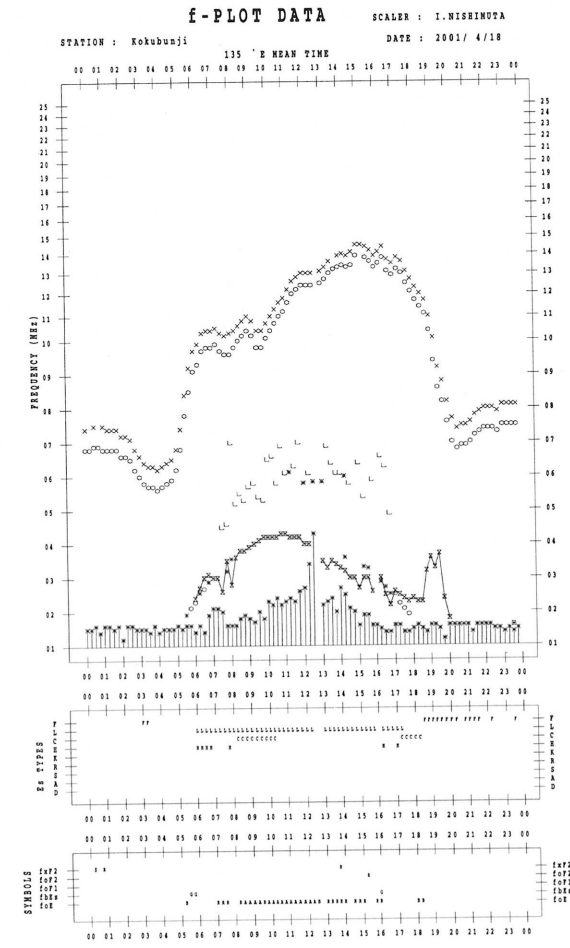

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/15
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

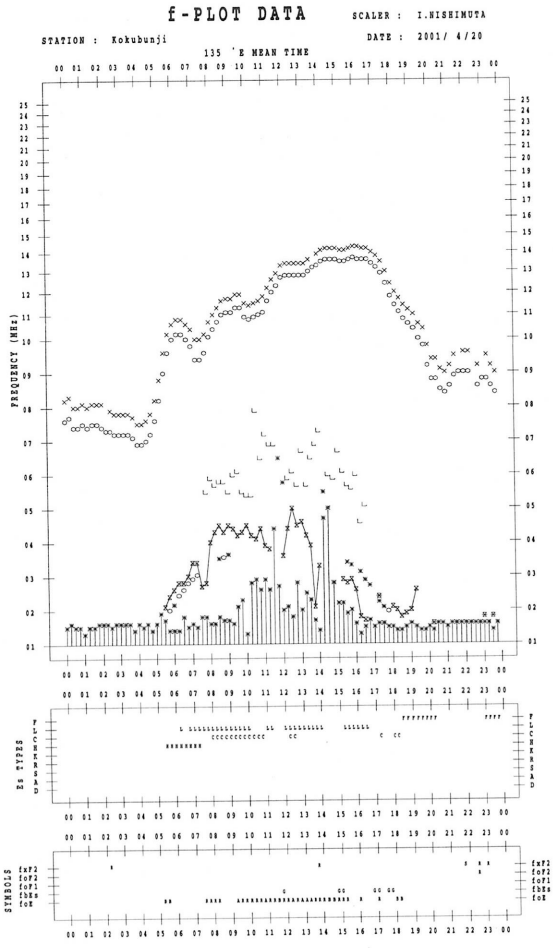

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

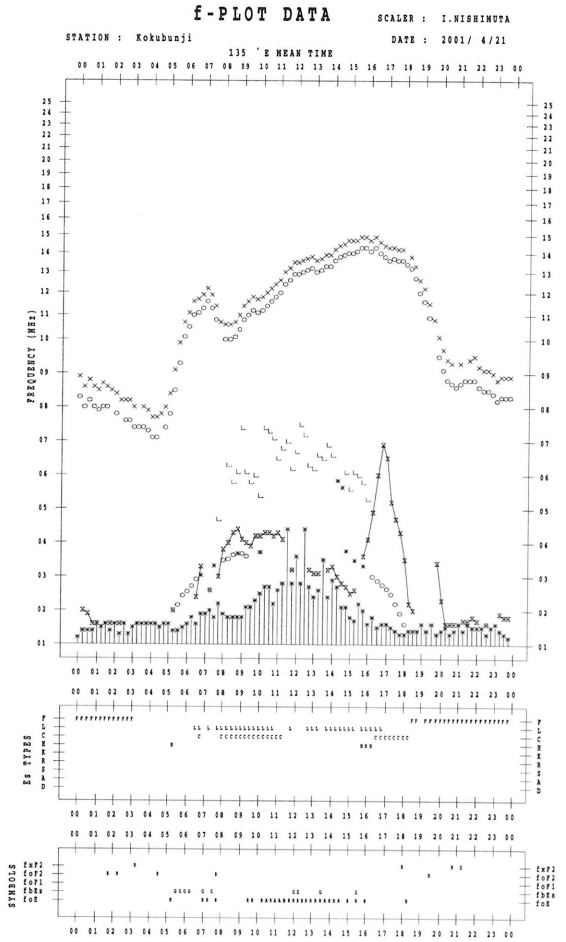

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
foE

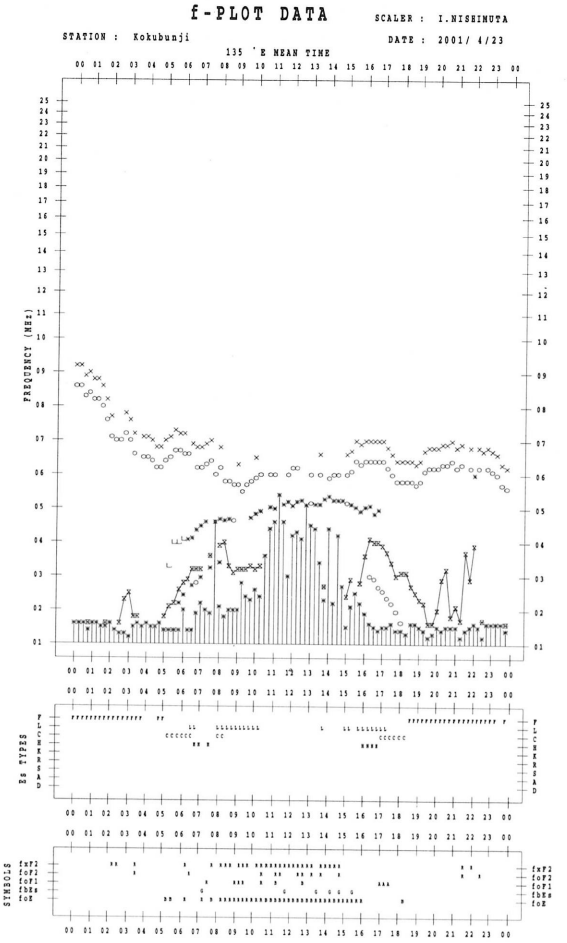

f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/18
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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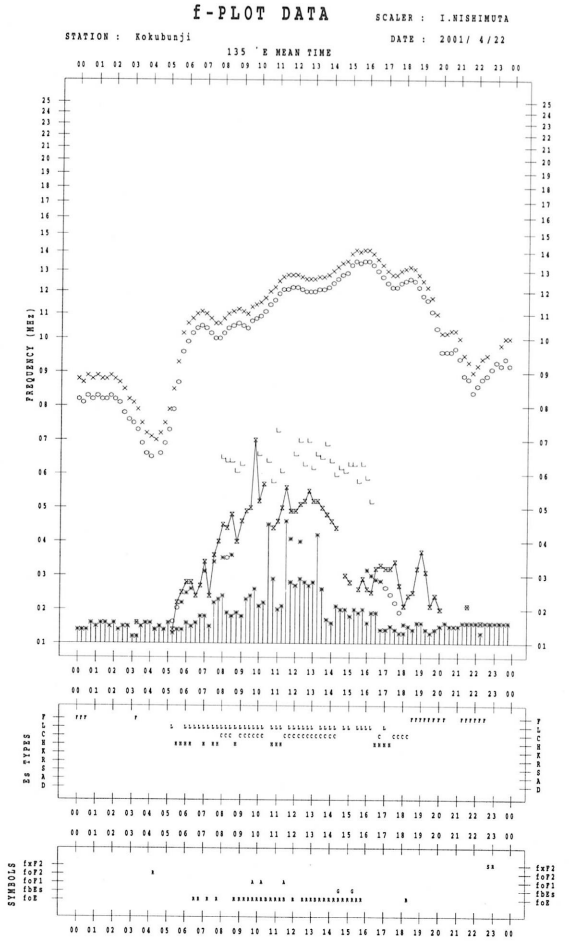
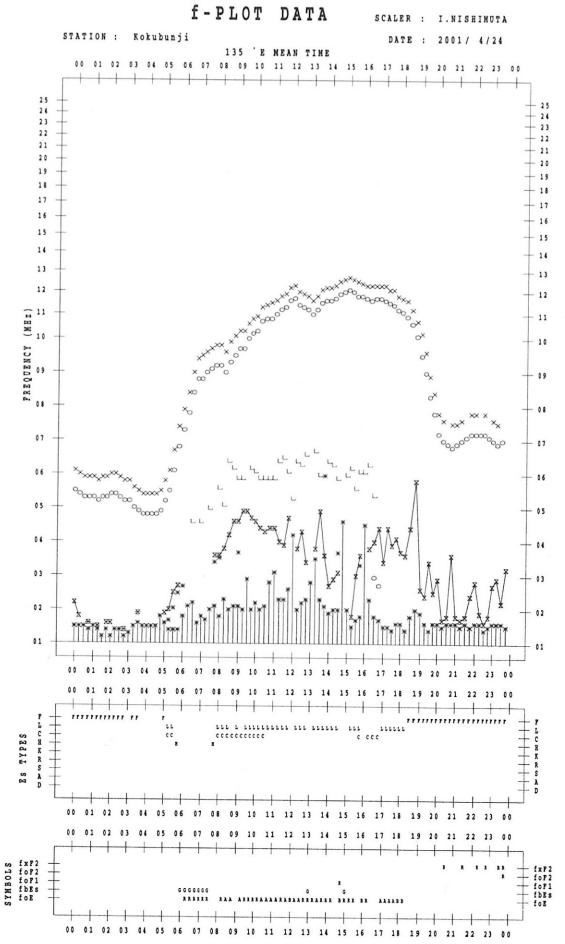
STATION : Kokubunji
DATE : 2001/ 4/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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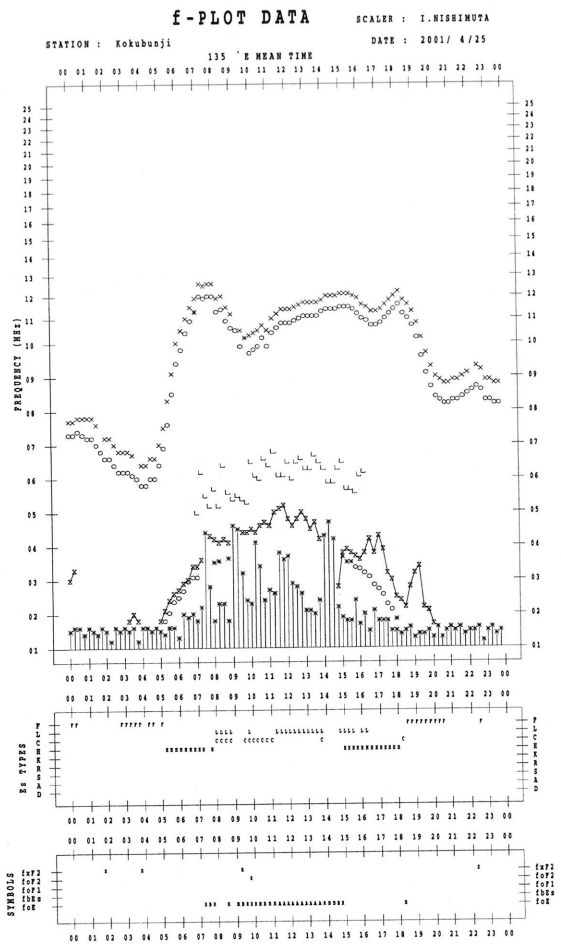
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/24
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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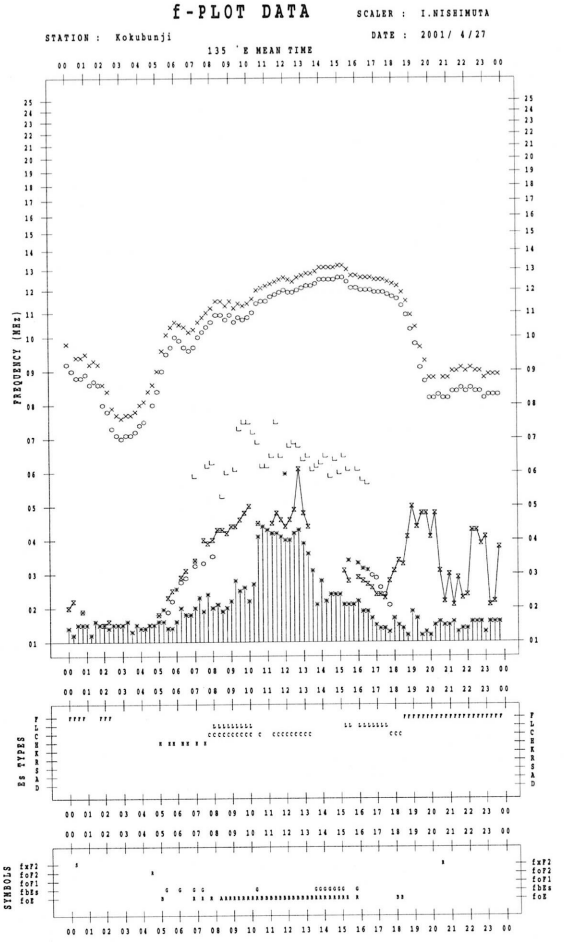
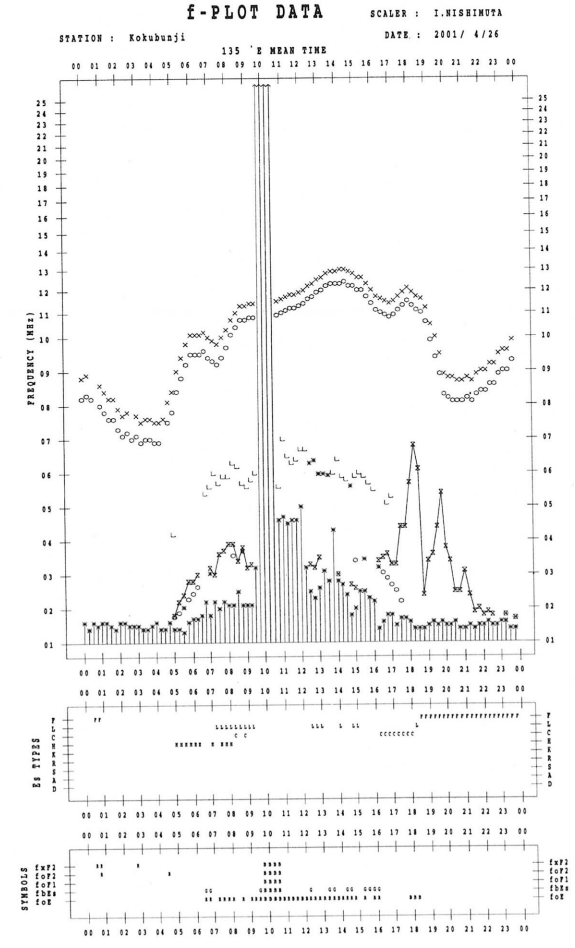
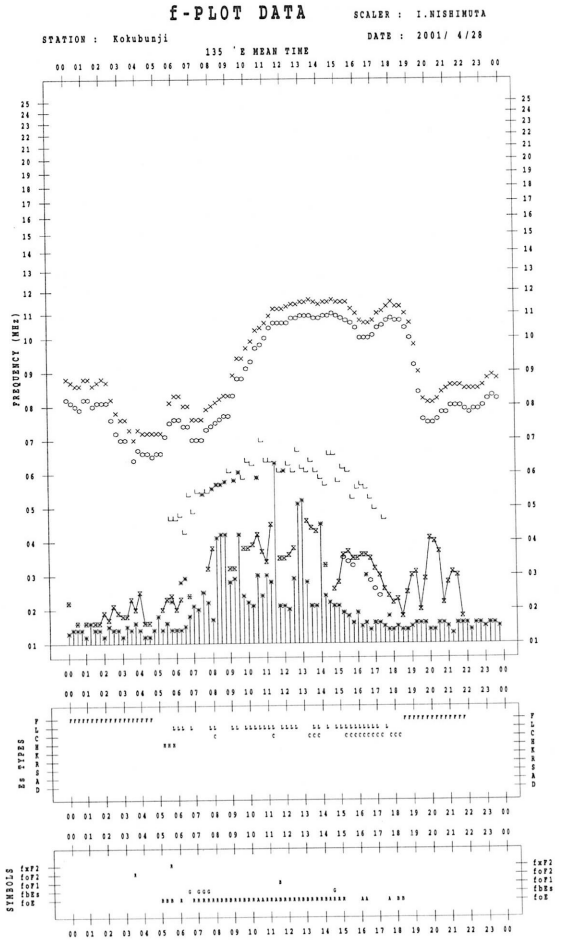
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/25
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/27
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/26
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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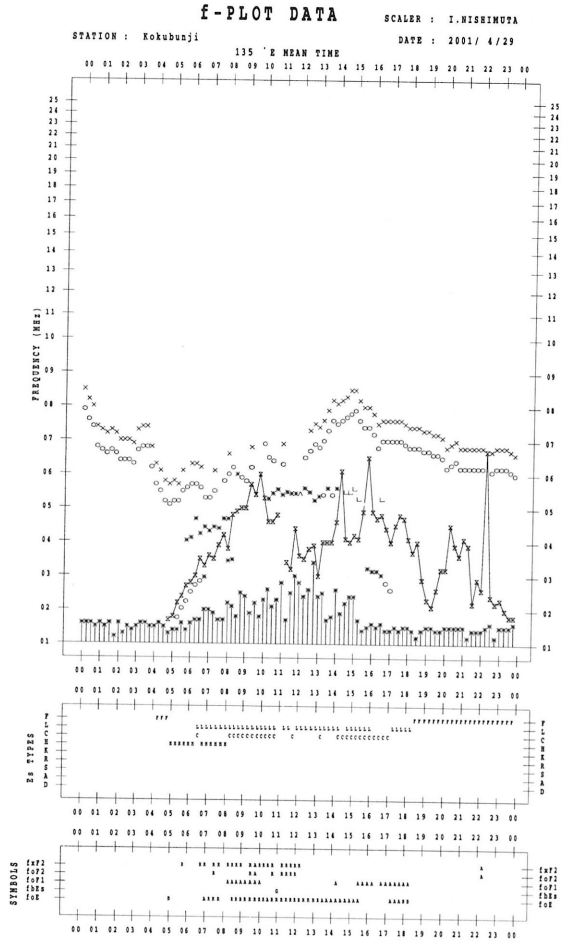
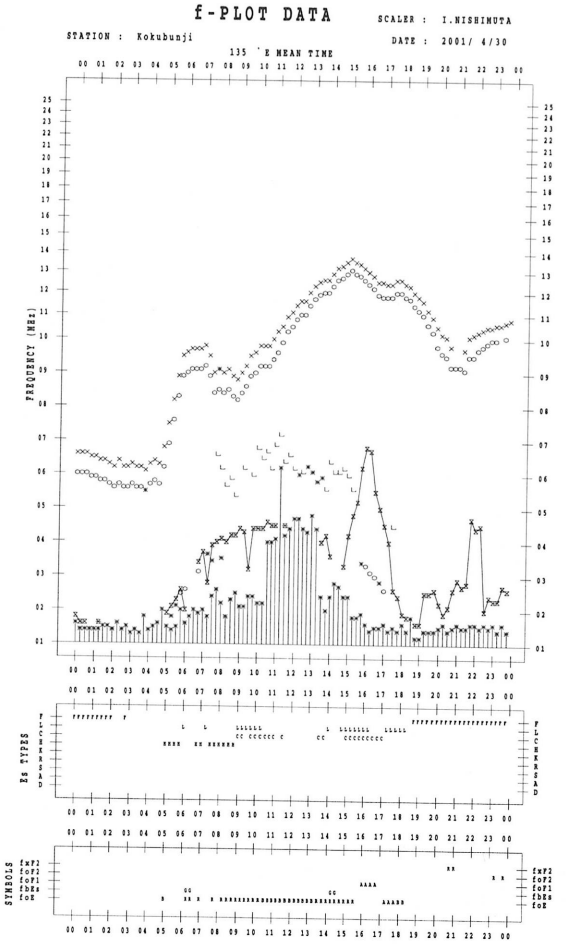
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/28
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/29
135 °E MEAN TIME
FREQUENCY [MHz]
Es TYPES
SYMBOLS


f-PLOT DATA
SCALER : I.NISHIMUTA
STATION : Kokubunji
DATE : 2001/ 4/30
135 °E MEAN TIME
FREQUENCY [MHz]
Es TYPES
SYMBOLS

B. Solar Radio Emission
B1. Daily Data at Hiraiso
500 MHz

Hiraiso April 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	50	48	48	57	51
2	47	43	42	55	51
3	50	51	51	53	51
4	51	50	47	51	50
5	45	42	42	49	44
6	44	43	43	54	45
7	46	43	41	44	44
8	43	42	42	22	37
9	290*	23	20	44	29
10	43	41	85*	45	43
11	42	39	40	39	40
12	38	37	35	40	37
13	37	35	35	38	36
14	36	34	34	38	36
15	36	36	36	41	37
16	38	35	35	41	37
17	36	34	35	38	36
18	36	35	34	37	36
19	38	37	37	42	38
20	39	37	37	42	37
21	42	43	42	44	43
22	45	43	43	51	46
23	47	45	44	47	46
24	44	42	43	41	42
25	42	44	43	47	44
26	44	43	42	47	44
27	43	40	40	44	42
28	43	40	38	43	41
29	41	39	39	40	40
30	42	43	45	39	42
31					

A superscript * stands for being superposed on a burst.

B. Solar Radio Emission

B2. Outstanding Occurrences at Hiraiso

Hiraiso

April 2001

Single-frequency observations

Normal observing period: 2000 - 0920 U.T. (sunrise to sunset)

APR. 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
1	2800	3 S	0523.0	0525.0	8.0	50	-	0
1	500	7 C	0523.0	0523.0	4.0	20	-	0
1	200	8 S	0524.0	0524.0	1.0	50	-	0
1	500	8 S	0633.0	0633.0	1.0	20	-	0
1	200	8 S	0633.0	0633.0	1.0	50	-	MR
2	2800	3 S	0016.0	0019.0	8.0	185	-	0
2	500	8 S	0018.0	0018.0	2.0	105	-	0
2	200	8 S	0130.0	0130.0	1.0	20	-	WL
2	200	8 S	0741.0	0742.0	1.0	30	-	WR
2	500	47 GB	2146.0	2150.0	17.0	510	-	0
2	200	47 GB	2149.0	2152.0	18.0	4460	-	0
2	500	47 GB	2205.0	2205.0	1.0	985	-	0
3	500	46 C	0316.0	0340.0	43.0	255	-	0
3	200	46 C	0317.0	0321.0	31.0	170	-	0
4	500	8 S	0523.0	0527.0	4.0	90	-	WL
4	200	8 S	0523.0	0523.0	3.0	80	-	0
5	500	8 S	0456.0	0457.0	2.0	10	-	0
5	500	8 S	0732.0	0733.0	2.0	20	-	0
5	200	8 S	2316.0	2316.0	1.0	25	-	0
7	200	8 S	0304.0	0304.0	1.0	30	-	0
8	200	8 S	0128.0	0128.0	1.0	10	-	0
8	200	8 S	0247.0	0248.0	2.0	20	-	0
9	500	47 GB	0109.0	0246.0	113.0	1200	-	0
9	2800	46 C	0129.0	0219.0	131.0	285	-	0
9	2800	8 S	0148.0	0149.0	1.0	305	-	SR
9	200	46 C	0113.0	0213.0	150.0	85	-	WL
10	200	8 S	0136.0	0136.0	1.0	15	-	0
10	500	47 GB	0504.0	0539.0	116.0	2850	-	0
10	200	47 GB	0504.0	0526.0		460	-	ML
10	2800	47 GB	0508.0	0526.0	58.0	3310	-	0
11	200	8 S	0026.0	0027.0	1.0	30	-	0
13	200	8 S	0130.0	0131.0	1.0	20	-	ML
13	200	8 S	0727.0	0728.0	1.0	10	-	WR
14	200	8 S	0053.0	0054.0	2.0	45	-	0
14	200	7 C	0157.0	0157.0	2.0	105	-	WR
14	200	7 C	2322.0	2325.0	4.0	45	-	0
15	200	8 S	0431.0	0431.0	1.0	35	-	0
15	200	8 S	0759.0	0800.0	1.0	10	-	0
15	200	8 S	0816.0	0817.0	1.0	75	-	0
15	200	8 S	2206.0	2206.0	1.0	15	-	WR
16	500	8 S	2105.0	2105.0	1.0	65	-	0
16	200	8 S	2105.0	2105.0	1.0	55	-	0
16	200	8 S	2223.0	2223.0	1.0	30	-	WR
17	200	8 S	0616.0	0616.0	1.0	30	-	0
17	200	8 S	0735.0	0736.0	1.0	85	-	WL
18	2800	3 S	2112.0	2118.0	14.0	495	-	0
18	500	8 S	2114.0	2115.0	1.0	170	-	0

B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso — April 2001

Single-frequency observations
Normal observing period: 2000 - 0920 U.T. (sunrise to sunset)

APR. 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 MEAN	POLARIZATION REMARKS
18	200	47 GB	2114.0	2115.0	16.0	550	-	WL
18	500	7 C	2115.0	2118.0	14.0	90	-	0
19	200	8 S	0440.0	0442.0	2.0	25	-	0
20	500	8 S	0057.0	0057.0	1.0	10	-	0
20	200	8 S	0057.0	0057.0	1.0	15	-	0
20	200	8 S	0705.0	0706.0	1.0	15	-	WL
20	2800	4 S/F	2129.0	2132.0	5.0	80	-	0
20	500	47 GB	2129.0	2129.0	6.0	830	-	WL
20	200	7 C	2130.0	2132.0	7.0	140	-	WL
21	200	8 S	0537.0	0537.0	1.0	25	-	WL
21	200	8 S	0903.0	0903.0	1.0	40	-	WL
21	500	42 SER	2349.0	2354.0	5.0	15	-	WL
21	200	42 SER	2350.0	2354.0	4.0	30	-	0
22	200	8 S	0042.0	0042.0	1.0	20	-	0
22	500	42 SER	0121.0	0147.0	28.0	55	-	WL
22	200	42 SER	0134.0	0148.0	16.0	390	-	WR
22	2800	8 S	0146.0	0147.0	1.0	30	-	WL
22	500	8 S	0405.0	0405.0	1.0	15	-	0
22	200	8 S	0407.0	0408.0	2.0	20	-	0
22	200	8 S	0620.0	0620.0	1.0	10	-	0
22	2800	3 S	-	.2041.0		170	-	0
22	500	7 C	2039.0	2041.0	7.0	285	-	WL
22	200	47 GB	2039.0	2045.0	8.0	1825	-	WL
22	500	7 C	2155.0	2158.0	5.0	20	-	WL
22	200	8 S	2157.0	2159.0	2.0	75	-	0
23	2800	3 S	0121.0	0123.0	8.0	80	-	0
23	200	8 S	0124.0	0125.0	3.0	460	-	MR
23	500	8 S	0125.0	0125.0	2.0	200	-	0
24	2800	3 S	0019.0	0019.0	3.0	55	-	0
24	500	8 S	0218.0	0218.0	1.0	90	-	0
24	2800	4 S/F	0535.0	0541.0	13.0	90	-	0
24	500	7 C	0535.0	0536.0	10.0	300	-	0
24	200	47 GB	0536.0	0540.0	10.0	1220	-	SR
24	2800	3 S	0656.0	0658.0	10.0	110	-	0
24	2800	3 S	2220.0	2222.0	8.0	120	-	0
24	500	8 S	2220.0	2222.0	7.0	350	-	0
24	200	7 C	2220.0	2225.0	3.0	340	-	MR
24	2800	4 S/F	2242.0	2246.0	7.0	65	-	0
24	500	4 S/F	2244.0	2246.0	3.0	10	-	0
25	200	8 S	0124.0	0124.0	1.0	175	-	MR
25	200	8 S	0533.0	0533.0	1.0	50	-	WR
25	500	8 S	0619.0	0619.0	1.0	20	-	0
26	500	8 S	0043.0	0043.0	1.0	15	-	0
26	200	7 C	0430.0	0434.0	7.0	285	-	WR
27	500	8 S	0655.0	0656.0	1.0	10	-	0
27	200	47 GB	0656.0	0656.0	1.0	1615	-	WR
27	200	8 S	0822.0	0822.0	1.0	25	-	0

B. Solar Radio Emission

B2.Outstanding Occurrences at Hiraiso

Hiraiso April 2001

Single-frequency observations

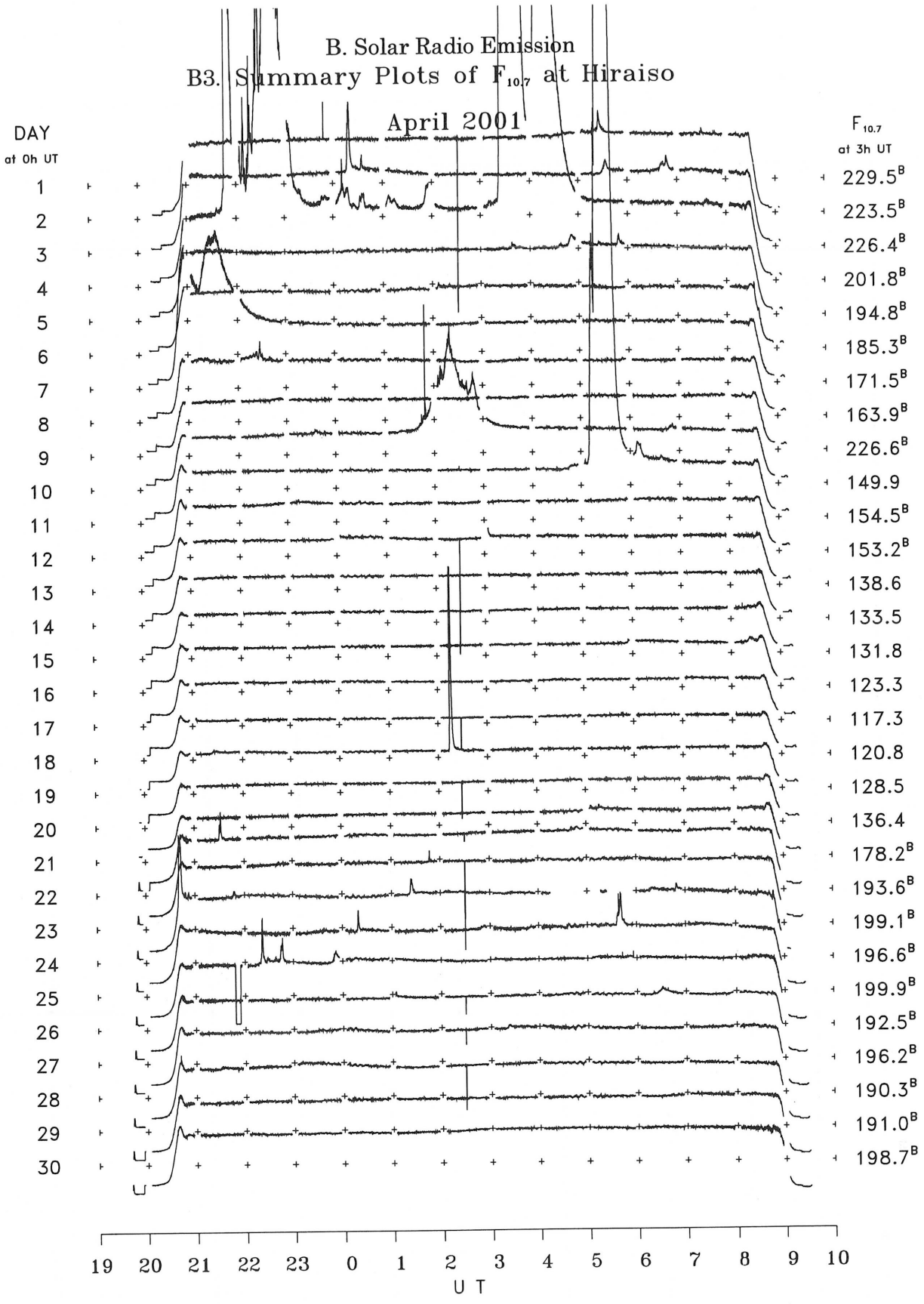
Normal observing period: 2000 - 0920 U.T. (sunrise to sunset)

APR. 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
27	200	8 S	0859.0	0859.0	1.0	40	-	WR
27	200	8 S	2001.0	2002.0	2.0	435	-	WR
27	500	8 S	2117.0	2118.0	1.0	15	-	0
27	200	8 S	2315.0	2316.0	1.0	20	-	0
28	500	8 S	0310.0	0310.0	1.0	50	-	0
28	200	8 S	0310.0	0310.0	1.0	10	-	0
29	200	8 S	0029.0	0029.0	1.0	100	-	0
29	200	8 S	0259.0	0259.0	1.0	10	-	0
29	200	8 S	0519.0	0519.0	1.0	15	-	
29	200	8 S	0650.0	0650.0	1.0	5	-	
29	200	8 S	2054.0	2055.0	1.0	5	-	0
29	200	8 S	2101.0	2101.0	1.0	20	-	0
30	500	8 S	2111.0	2111.0	1.0	25	-	0
30	200	8 S	2111.0	2112.0	1.0	95	-	0

B. Solar Radio Emission

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

April 2001



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

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