

IONOSPHERIC DATA IN JAPAN

FOR FEBRUARY 2003

VOL. 55 NO. 2

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COMMUNICATIONS RESEARCH LABORATORY
 INDEPENDENT ADMINISTRATIVE INSTITUTION
 TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) , solar radio emission (S) and radio propagation (P) obtained at the

following stations under the Communications Research Laboratory, Independent Administrative Institution in Japan.

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

A. IONOSPHERE

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

A1. Automatic Scaling

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

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

a. Characteristics of Ionosphere

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

b. Descriptive Letters

The following descriptive letters are used in the tables.

- A Impossible measurement because of the presence of a lower thin layer, for example Es (for $foF2$).
- C Impossible measurement because of any failure in observation.
- G Impossible automatic scaling because of too small ionization density of the layer (for fEs).
- N Impossible automatic scaling because of complex echoes.
- Blank No digital record because of trouble in the automatic data processing system, but existence of film record.

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

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

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

values.

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

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

d. Reliability of Automatic Scaling

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

e. Summary Plot

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

A2. Manual Scaling

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

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

a. Characteristics of Ionosphere

fxI	Top frequency of 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 transmission by $F2$ and $F1$ layers, respectively
$h'F2$ $h'F$ $h'E$ $h'Es$	Minimum virtual height on the ordinary wave for the $F2$, whole F , E and Es layers, respectively
Types of Es	See below b. (iii)

b. Symbols

(i) Descriptive Letters

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

- A** Measurement influenced by, or impossible because of, the presence of a lower thin layer, for example *Es*.
- B** Measurement influenced by, or impossible because of, absorption in the vicinity of *fmin*.
- C** Measurement influenced by, or impossible because of, any non-ionospheric reason.
- D** Measurement influenced by, or impossible because of, the upper limit of the normal frequency range in use.
- E** Measurement influenced by, or impossible because of, the lower limit of the normal frequency range in use.
- F** Measurement influenced by, or impossible because of, the presence of spread echoes.
- G** Measurement influenced by, or impossible because the ionization density of the layer is too small to enable it to be made accurately.
- H** Measurement influenced by, or impossible because of, the presence of a stratification.
- K** Presence of particle *E* layer.
- L** Measurement influenced or impossible because the trace has no sufficiently definite cusp between layers.
- M** Interpretation of measurement questionable because the ordinary and extraordinary components are not distinguishable.
- N** Conditions are such that the measurement cannot be interpreted.
- O** Measurement refers to the ordinary component.
- P** Man-made perturbations of the observed parameter; or spur type spread *F* present.
- Q** Range spread present.
- R** Measurement influenced by, or impossible because of, attenuation in the vicinity of a critical frequency.
- S** Measurement influenced by, or impossible because of, interference or atmospheric.
- T** Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- V** Forked trace which may influence the measurement.
- W** Measurement influenced or impossible because the echo lies outside the height range recorded.
- X** Measurement refers to the extraordinary component.
- Y** Lacuna phenomena, severe layer tilt.
- Z** Third magneto-electronic component present.

(ii) Qualifying Letters

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

- A** Less than. Used only when *fbEs* is deduced from *foEs* because total blanketing of higher layer is present.
- D** Greater than.
- E** Less than.
- I** Missing value has been replaced by an interpolated value.
- J** Ordinary component characteristic deduced from the

extraordinary component.

- M** Mode interpretation uncertain.
- O** Extraordinary component characteristic deduced from the ordinary component. (Used for x-characteristics only.)
- T** Value determined by a sequence of observations, the actual observation being inconsistent or doubtful.
- U** Uncertain or doubtful numerical value.
- X** Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

- f** An *Es* trace which shows no appreciable increase of height with frequency.
- l** A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the part *E* layer minimum virtual height.
- c** An *Es* trace showing a relatively symmetrical cusp at or below *foE*. (Usually a daytime type.)
- h** An *Es* trace showing a discontinuity in height with the normal *E* layer trace at or above *foE*. The cusp is not symmetrical, the low frequency end of the *Es* trace lying clearly above the high frequency end of the normal *E* trace. (Usually a daytime type.)
- q** An *Es* trace which is diffuse and non-blanketing over a wide frequency range.
- r** An *Es* trace showing an increase in virtual height at the high frequency end similar to group retardation.
- a** An *Es* trace having a well-defined flat or gradually rising lower edge with stratified and diffuse traces present above it.
- s** A diffuse *Es* trace which rises steadily with frequency and usually emerges from another type *Es* trace.
- d** A weak diffuse trace at heights below 95 km associated with high absorption and large *fmin*.
- n** The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.
- k** The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* (particle *E*) the *Es* type precedes k.

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

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

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

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

B. SOLAR RADIO EMISSION

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

B1. Daily Data at Hiraiso

The three-hourly mean and daily mean values of the solar radio emission intensities are tabulated for 500 MHz measurements. The intensities are expressed by the flux

density in $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$ 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} $\text{Wm}^{-2} \text{Hz}^{-1}$ 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

SGD Code	Letter Symbol	Morphological Classification
43	NS	Onset of Noise Storm
44	NS	Noise Storm in progress
45	C	Complex
46	C	Complex F
47	GB	Great Burst
48	C	Major
49	GB	Major+

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

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

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

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

B3. Summary Plots of F10.7 at Hiraiso

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

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

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

C. RADIO PROPAGATION

C1. Phase Variation in OMEGA Radio Waves at Inubo

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

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

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

C2. Sudden Phase Anomaly (SPA) at Inubo

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

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

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

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

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

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

HOURLY VALUES OF foF2 AT Wakkanai

FEB. 2003

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

$\frac{H}{D}$	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	44	42	40	36	40	35	34	54	80	87	94	91	97	94	92	93	77	54		34	23	32	32	37	
2	37	34	37	38	34	36		52	78	84	93	94			99	92	87	82	77	68	60	61	52	65	
3	54	54	47	44	43	46	44	54	82			93	92		92	81	80	72	60	45	42	46	47	52	
4	48	45	43	50	45	36	40	49	66	91	81	90	93	91	94	93	83	77	48	48	41		52		
5	29	32	29	32	40		35		80	89	93	94	104	93	90	88	74	66	50	46	46	38	38	36	
6	43	40	40	41	40	40	32	61	85	88	104		102	94	93	84	80	66	58	54	38	37	40	38	
7	38	34	38	40	32	36	31	66	91	104	94	116	94	102	94	88	85	72	49	35		A			
8		46	44	44	44	41	36	65	85	104		94	94	102	106	93	88	76	58	43	44	52	53	54	
9	44	43	44	48	39	40		66	77	94	94	106		103	91	84	83	70	60	58	50	48	45	41	
10	40	40	41	42	41	37	38	60	82	81	91	93		104	94	92	92	81	70	62	61	58	61	58	
11	54	61	54	54	46	40	46	71	84	111	96	125	130		92	94	94	78	66	60	53				
12	53	53	45	54	51	47	53	73	77	84	118	109	103	92	92	93	90	84	64	53	46	44	42	42	
13	44	42	44	48	53	45	51	72	72	92		94		92	102	93	92	81	72	62	53	43	42		
14	43	43	50	47	46	46	48	80	84	90	92			92	92	81	90	84	82	62	53	48	48	47	
15	43	42	44	49	44	43	44	66	80							92	92	83	67	49	46	44	43	42	
16	42	41	36	36	38	40	44	72	88	92		107		94	92	92		82	64	58	50	44	44	32	
17	34	36	43	46	44	41	43	66	84	92	93	92	94	94	93	81	82	72	58	57	50	42	43	42	
18	43	43	42	44	39	41	47	76		C	90	94	93	89	94	93	90	82	77	63	54	53	53	54	47
19	54	48	50	51	40	41	45	66	82	87	92	94	94	91	80	80	84	72	64	53	46	45	44	44	
20	43	38	41	44	43	43	43	64	82	83	82	94	93	100	82	92	84	83	66	47	43	37	42	A	
21	33	42	41	40			40	66	81	93		93		92	92	93	93		51	44	42	41			
22	45	43	40	41	41	41	45	57	82	80	93		94	90	81	84	81	70	51	51	54	45	45	43	
23	42	43	43	42	45	40	40	51	76	102	100	102	92	90	84	82	90	82	52	45	45	37	44		
24	45	45	47	45	38		40	66	80	84	94	94	90	93	81	84	84	71	54	45	42	41	40	40	
25	36		44	41	40	32	41	66	85	93	92	93	85	85	85	82	84	78	51	46	41	40	40	38	
26	40	40	40	32	40	41	47	72	77	82	85	84	94	79	85	82	78	75	62	67	51	45	45	48	
27	51	47	47	46	46	45	45		82	82	93	94		93		84	85	72	54	53	54	53	47	38	
28	38	42	45	40	34	29	48	66	82	91	92			94	91	84	85	83	71	61	53	58	54	53	
29																									
30																									
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	28	28	27	25	26	26	27	26	22	23	18	24	26	28	27	27	27	28	27	25	25	21	
MED	43	42	43	44	41	41	44	66	82	90	93	94	94	93	92	88	84	77	60	53	46	44	44	42	
U Q	45	45	45	47	45	43	46	71	84	93	94	102	97	94	93	92	90	82	66	59	53	50	50	50	
L Q	38	40	40	40	39	36	40	60	78	84	92	93	92	91	85	83	82	72	52	45	42	40	42	38	

HOURLY VALUES OF fEs AT Wakkanai
 FEB. 2003
 LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	G	G	G	G	26	G	G	G	G	G	42	G	G	41	G	48	41	33	39	40	33	G	11	G		
2	G	G	G	G	27	G		33	G	G	G	G	G		46	46	40	36	51	32	32	26	27	G		
3	G	G	G	G	G	G	G	G	G			G	G	G	G	G	G	G	37	39	40	G	G	G		
4	G	G	G	G	G	G	G		G	G	G	G	G	G	G		G	G	G	G	G	29	33	69		
5	G	G	G	G	G		34	26	33	37	G	G	G	G	G	G	39	G	G	G	G	G	G	G		
6	G		G	G	G	G	G	G		34	36	G		G	G	G	G	G	G	G	G	G	G	G		
7	G	G	G	G	G	G	G	G	G		47	41		G	G	G	G	36	54		71	50	70	55	38	
8	46	32	33	27	G	G	G	G		37	43	50	96	45		40	49		46		G	G	11	32	43	
9	G		G	G	G	G		G	G	G	G	G	G	G	G	G	40	43	32	G	G	G	G	G		
10	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	39	G	G	G	G		G	G		
11	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G		34	26	35	39	59	44	28	
12	31		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	27	
13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		31	33	32	G	G	G	G	
14	G	G		G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	
15	29	G	G	G	G	G	G	G	G	G	G		G	G		G	G	G	G	G	G	29	36	32	G	
16	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G	G	G	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	G	
18	G		G	G	G	G	G	G	C	G	G	G	G	G	G	G		35	29		G	G	G	G	G	
19	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
20	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		26	G	G	G	G	29	
21	30	27	G		27	36	37		G	G		35	69	100	61		G	G	G	G	G	G	G	G	35	49
22	29	28	G	G	G	G	G		G	G	G	G		G	G	G	40		39	31	G	G	G	G	G	
23	G	G	G	G	G	G	G		G	G		51		G	G		42	41	46	44	G	G	G	G	22	31
24	33	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G		28	31	G	G	G	G	G	
25	G	G	G	G	G	G	G			41		G	40		G	G	G	G	G	G	G	G	G	G	G	
26	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		30	G	G	G	G	G	
27	G		G	G	G	G	G		38	G	G	G	G	G		G		38	30	29	G	G	G	G	G	
28	G	G	G		23	G	G	G		31	40	85		G	G	G	G	G		28	G	G	G	G	G	
29																										
30																										
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	28	28	28	28	28	28	26	26	26	26	27	25	27	27	26	27	27	27	27	28	28	28	28	28	28	
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	G	
U Q	G	13	G	G	G	G	G	G	G	G	G	G	G	G	G	G	38	33	31	G	G	6	24	27		
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	

HOURLY VALUES OF fmin AT Wakkanai

FEB. 2003

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

$\frac{H}{D}$	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	15	14	14	14	14	20	17	23	29	21	34		34		21	16	14	15	15	17	15	20	15
2	15	15	17	14	16	15		14	14	20	16	20	18		20	16	15	14	14	14	14	18	16	14
3	14	15	15	15	15	15	15	18	20				52	47	35	29	18	14	14	15	14	14	15	15
4	14	14	14	14	14	14	16	14	14	16	14	20	21	20	18	16	21	14	14	14	15	18	15	16
5	20	16	17	15	14	14	18	16	14	14	16	17	21	22	18	14	15	18	14	17	15	21	20	20
6	17	15	18	15	16	15	15	20	15	15	18		18	35	18	15	21	17	14	15	14	17	15	17
7	15	16	15	16	16	16	20	20	20	16	18	18	20	17	18	17	16	14	15	14	14	15	14	15
8	14	14	14	16	15	15	15	18	15	18	20	21	21	21	20	20	17	14	15	15	14	15	15	15
9	16	15	15	15	14	15		20	28	18	20	22	23	21	20	27	20	14	14	18	14	15	14	15
10	14	17	14	14	15	16	14	18	20	32	38	23	36	34	22	16	17	15	16	16	15	15	14	14
11	14	14	14	14	14	15	15	20	24	23	20	24	22	20	21	18	17	17	17	15	15	14	16	14
12	15	15	15	15	18	15	14	20	26	29	20	22	20	20	17	16	22	17	17	15	14	20	14	14
13	14	14	14	15	15	15	14	18	22	21	21	22	22	22	21	17	23	14	15	14	14	18	17	18
14	14	15	15	16	15	16	16	20	26	30	21	23		23	23	34	23	16	17	14	15	18	15	17
15	15	15	15	14	14	15	14	20	26	34	34		39			33	23	20	15	16	14	15	16	17
16	18	15	15	14	15	14	15	21	17	21	22	24	23	21	20	16		18	15	15	14	16	16	15
17	20	16	16	16	14	14	15	18	14	18	21	20	20	18	15	16	15	16	21	18	15	15	15	17
18	15	17	18	15	18	15	15	18	^C	29	21	20	22	21	21	14	18	16	15	14	14	14	15	15
19	15	14	15	17	14	16	16	18	15	28	21	20	22	21	18	15	22	16	15	15	14	16	16	15
20	15	16	14	15	20	16	16	20	17	20	21	20	22	21	21	18	22	18	15	15	15	17	17	16
21	14	15	15	16	14	14	15	18	14	14	17	16	15	17	18	14	14		14	15	18	16	15	16
22	16	14	14	18	15	15	15	14	14	15	17	20	16	14	14	14	14	20	21	15	15	15	15	15
23	15	15	15	14	14	15	15	16	14	15	18	17	21	20	17	16	15	14	14	14	14	15	15	15
24	15	14	14	15	14	14	15	21	14	15	14	20	18	15	17	15	14	17	15	14	15	15	15	15
25	15	14	14	16	14	14	15	16	15	14	15	16	17	17	18	15	15	18	15	15	14	16	18	15
26	14	15	14	18	14	14	14	20	15	16	15	20	20	20	15	14	16	20	14	17	17	16	15	15
27	15	15	15	15	16	14	15	16	14	16	18	20	20	21		14	14	15	17	18	14	15	15	17
28	14	15	15	14	15	21	14	16	15	18	18	20	20	20	18	15	14	20	15	16	16	15	15	15
29																								
30																								
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	28	28	28	28	28	28	26	28	27	27	27	25	26	26	25	28	27	27	28	28	28	28	28	28
MED	15	15	15	15	15	15	15	18	15	18	20	20	21	21	18	16	17	16	15	15	14	15	15	15
U Q	15	15	15	16	15	15	16	20	22	28	21	22	22	22	21	18	21	18	15	16	15	17	16	16
L Q	14	14	14	14	14	14	15	16	14	15	17	20	20	20	17	15	15	14	14	14	14	15	15	15

HOURLY VALUES OF foF2 AT Kokubunji

FEB. 2003

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	34	37	34	37	28	35	31	61	86	100	118	125	120	127	114	100	79	67	57	47	36	34		36
2		36	34	37	34	34		49	86	107	82	98	117	107	114	98	86	88	84	74	54	64	54	54
3	54	52	54	48	43	45	45	73	86	106	125	122	122	118	116	104	82	84	66	61	44	47		45
4			42	44	38	36	27	66	79	86	111	128	107	84	84	92	82	77	59	53	52	54	48	42
5		38	32	42	34	32	34	67	84	86	104	112	101	106	95	92	84	68	54	48	46	49	46	39
6	39	42	43	39	36	37	37	61	89	103	117	118	115	117	95	90	85	69	64		52	43	36	35
7	36	39	38	41	36	34	39	64	96	113	132	130	127	124	107	98	85	83	73	58	50	46	41	
8		43		43	43	41	42	72	85	96	110	104	122	135	116	107	91	78	66	53	49	53	47	38
9	43	39	44	47	46	34	38	76	95	96	112	110	132	111	115	110	97	85	62	64	62	54	36	39
10	38		32	41		32	39	65	81	113	108	107	112	122	115	101	95	81	72	66	66	54	48	49
11	52	54	51	51	36	34	38	69	96	114	124	125	147	138	118	115	107	92	74	62	53	49	52	49
12	47	48	49	47	38	36	42	77	98	105	98	110	121	114	115	106	101	87	71		58	44	36	37
13		39	34	36	36	36	43	73	97	92	108	124	108	101	98	104	85	84	77	74	57	49	46	44
14	49	49	42	39	37	36	36	78	95	106	108	114	115	105	92	94	94	96	86	63	49	48	48	48
15	47	53	47	46	36	41	42	69	102	118	127	121	125	131	125	108	104	106	101	73	54	53		79
16		52	32	32	42	51	47	76	98	116	118	126	114	105	101	104	100	80	72	58	54	51	46	44
17	44	43	47	46	41	36	43	72	104	110	108	120	118	115	114	106	104	91	64	54	54	43	43	43
18	42	43	36	34	30		34	75	115	99	101	105	113	104	97	95	87	80	78	59	53	51	51	48
19	53	54	49	36	41	32	36	76	88	101	105	107	121	111	96	87	84	75	66	58	52	47	43	43
20	48	42	43	42	41	42	42	69	90	101	105	115	123	120	122	115	101	80	83	54	49	42	36	42
21	43	43	46	48	34	34	34	79	84	84	98	107	116	116	110	97	91	69	50	47	52	48	32	36
22	43	42	41	44	45	34	38	64	81	104	108	114	122	121	104	80	76	71	51	54	51	52	48	34
23	32	36	36	39	32	30	37	63	72	91	104	98	97	101	101	92	88	84	63	48	51	44	43	43
24	43	36	46	46	32	32	38	66	85	97	91	101	101	88	101	96	81	75	63	42	48	43	42	39
25	42	33	39	37	37	36	38	66	81	98	96	96	101	98	101	91	76	74	77	51	44	36	36	38
26	36	38	38	37	35	36	42	72	83	82	86	98	94	97	88	91	86	74	59	51	54	38	38	34
27	44	45	46	46	45	45	51	69	96	93	94	106	130	112	112	111	90	77	69	54	52	54	48	
28	48	49	51	48		28	43	77	96	93	118	117	112	112	107	96	87	84	80	54		51	53	49
29																								
30																								
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	22	26	27	28	26	27	27	28	28	28	28	28	28	28	28	28	28	28	28	26	27	28	25	26
MED	43	42	42	42	36	36	38	69	88	100	108	113	116	112	107	98	87	80	68	54	52	48	46	42
U Q	48	49	47	46	41	37	42	75	96	106	117	121	122	120	115	106	96	84	77	62	54	52	48	48
L Q	39	38	36	37	34	34	36	65	84	93	99	105	110	104	97	92	84	74	62	51	49	43	37	38

HOURLY VALUES of fEs AT Kokubunji

FEB. 2003

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

D ^H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	G	G	G	26	29	28	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	29	48	33
2	55	30	G	G	G	G	G	29	G	42	G	G	G	G	G	G	55	59	26	11	G	G	G	G
3	G	G	G	G	G	G	G	G	34	51	55	83	74	G	47	G	36	29	34	29	32	29	34	32
4	41	60	29	G	G	G	G	47	G	G	43	G	G	45	G	43	34	G	G	G	G	G	G	G
5	G	G	G	G	G	G	G	G	G	50	47	G	G	G	41	37	34	48	G	G	G	G	G	G
6	G	G	G	G	G	G	G	42	34	37	G	G	G	G	G	G	G	G	G	G	G	G	G	G
7	G	G	G	G	G	G	G	G	G	G	49	57	50	69	G	G	39	35	32	32	34	24	G	54
8	35	33	56	G	29	G	G	G	34	60	46	51	G	G	G	G	G	G	30	29	G	29	26	G
9	G	G	37	52	G	G	G	G	35	G	G	51	45	59	G	G	G	28	33	26	G	G	G	G
10	G	G	G	G	G	G	G	G	G	G	G	G	49	57	46	43	G	G	G	G	G	G	G	G
11	30	28	G	G	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G	G	G	G	31	26
12	G	G	33	27	27	27	23	28	G	G	G	G	G	G	G	G	G	G	G	G	G	11	G	46
13	44	G	G	G	23	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
14	23	G	G	G	G	G	G	G	G	G	G	G	G	45	G	G	G	G	26	G	G	G	G	G
15	G	25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	30	30	26	G	G
16	28	29	G	G	G	G	G	G	G	G	46	G	59	48	45	G	G	28	29	60	31	27	32	G
17	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	11	G	G	G	G	G
18	G	G	G	G	G	G	G	G	48	G	G	G	G	G	G	G	40	G	G	G	G	G	G	G
19	25	G	G	G	G	G	G	G	G	G	50	G	G	G	G	G	38	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	23	G
21	G	G	G	G	G	G	G	47	G	G	G	G	G	G	G	43	G	G	G	G	G	G	G	G
22	G	23	G	G	G	G	G	G	G	G	G	G	G	G	45	42	36	G	G	G	G	23	G	G
23	G	G	G	G	G	G	G	47	G	G	G	45	G	G	49	52	41	32	G	G	G	G	24	29
24	29	30	G	G	26	G	G	G	G	41	G	G	G	G	G	G	36	G	G	G	G	G	G	G
25	G	G	G	G	G	G	G	32	G	42	G	G	G	G	G	G	40	G	G	60	G	28	G	G
26	G	G	G	G	G	G	G	31	G	G	G	G	G	46	G	G	G	32	G	G	G	G	G	G
27	G	G	G	G	G	G	G	G	G	G	G	G	52	46	41	G	36	G	24	31	G	29	23	33
28	34	31	29	29	28	G	G	32	G	G	G	53	47	58	61	G	G	34	34	33	48	G	G	G
29																								
30																								
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	28	27	28	28	27	27	28	25	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
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
UQ	28	28	G	G	G	G	G	31	G	19	22	23	23	45	41	G	36	28	26	29	G	25	23	13
LQ	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Kokubunji

FEB. 2003

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

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	17	13	13	13	14	18	17	25	34		40	40	35	20	17	17	14	14	13	13	15	13
2	13	13	17	14	13	15	14	14	13	17	21	21	22	23	18	17	13	14	15	13	15	17	13	15
3	14	14	14	14	14	14	13	20	13	18	18	23	28	22	23	23	15	13	13	13	13	13	26	13
4	13	14	13	13	14	15	18	14	13	13	26	17	17	18	20	21	14	20	14	13	14	14	15	15
5	13	17	14	14	13	13	14	21	15	17	17	21	20	20	20	15	14	13	14	14	15	15	15	14
6	13	13	13	13	13	15	13	14	13	18	18	21	22	44	21	20	14	20	14	14	13	13	20	13
7	17	14	14	15	13	15	14	14	13	15	15	18	20	20	24	15	14	13	13	13	13	15	14	14
8	13	13	13	17	13	14	14	13	14	14	18	18	21	18	18	20	14	21	13	14	14	15	13	18
9	14	18	13	14	13	14	14	14	13	20	15	21	21	25	21	20	17	14	14	15	13	14	17	14
10	14		15	13		15	14	25	29		34		23	33	26	23	14	21	17	14	13	14	14	13
11	14	14	17	13	13	14	13	14	26	31	21	23	26	30	26	20	17	20	14	14	13	14	14	17
12	14	13	13	14	13	14	13	14	17	18	21	39	25	22	21	18	17	22	14	15	14	14	14	14
13	13	17	14	13	14	13	17	22	14	17	22	21	23	21	15	21	15	21	13	15	13	14	14	14
14	13	14	15	14	13	14	15	22	20	20	21	21	25	24	24	17	13	21	14	13	14	14	14	13
15	14	14	13	13	14	15	14	15	15	18	40	39	42		23	18	18	21	13	13	14	14	15	14
16	14	13	14	14	14	13	14	21	17	17	23	39	29	25	21	18	13	15	13	13	13	14	13	14
17	13	14	14	14	17	18	14	20	13	17	20	26	20	22	15	17	15	21	14	18	14	14	13	14
18	14	15	14	13	13		14	15	18	14		24	22	15	13	17	13	22	13	14	14	13	13	20
19	13	15	14	14	13	17	14	21	13	23	20	21	23	22	18	18	13	20	25	14	17	14	13	18
20	18	13	13	14	13	14	14	22	14	13	18	38		22	14	13	15	20	13	13	14	14	17	13
21	13	14	13	14	13	15	13	22	14	17	34			21	20	17	15	22	14	14	14	14	15	14
22	13	13	14	13	13	13	14	23	14	15	20	20	29	35	20	13	15	20	14	14	13	14	14	14
23	13	13	15	14	13	15	14	23	13	14	18	29	22	21	21	17	13	13	14	14	13	14	13	13
24	13	13	14	13	13	17	14	20	14	13		21	20		15	14	13	18	14	15	13	14	14	15
25	14	14	14	14	25	14	13	15	13	29	13	23		21	20	17	18	20	15	14	14	13	13	14
26	14	13	13	14	13	14	14	14	13	14	15	21			20	28	14	14	14	14	25	14	14	15
27	13	13	15	13	14	14	13	22	14	21	15		24	25	26	17	13	13	14	13	14	14	14	14
28	13	15	13	13	13	18	14	14	14	21	17	21	28	31	21	18	13	13	13	13	15	13	14	15
29																								
30																								
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	28	27	28	28	27	27	28	28	28	27	26	24	24	25	28	28	28	28	28	28	28	28	28	28
MED	13	14	14	14	13	14	14	19	14	17	20	21	23	22	20	18	14	20	14	14	14	14	14	14
U Q	14	14	14	14	14	15	14	22	16	20	22	25	27	27	23	20	15	21	14	14	14	14	15	15
L Q	13	13	13	13	13	14	13	14	13	14	17	21	21	21	18	17	13	14	13	13	13	14	13	13

HOURLY VALUES OF foF2 AT Yamagawa

FEB. 2003

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1MHz TO 25MHz AUTOMATIC 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	34	34		32	29	28	28	22	80	92	113	128	115	130	128	108	87	84	58	51		34	32	34
2	32	37	32		32	30		37	77	112	72	80	107	103	110	85	81	88	86	84	54	65	57	53
3	53	52		54	51	50	54	52	77	98	128	111	138	128	127	111	90	99	81	78	64	49	44	42
4		38		37				50	72	84	106	113	88	78	80	84	80	78	76	52	54	66	34	34
5	37	36	34	40	41	28	32	51	78	84		111	111	110	109	^C	85	78	77	54	49	42	48	32
6	36	32		41	32	29	39	49	85	100	114	111	107	113	111	111	112	109	78	80	78	73	48	36
7	32	36	34	34	36	36	36	51	86	104	^C	146	147	146	147		114	114	110		77	51	50	34
8	37	^A		37	42	30	36	51	82	82	88	111	122	143	114	124	108	103	80	66	66	66	51	36
9	36	34	36	44	36		32	52	101	86	114	117	127	123	130	128	111	111	110		76	71	52	37
10	36	36	34	36		29	29	51	83	84	100	111	108	123	130	113	104	88		78	77	74	52	49
11	42	34	51	45	32	29	31	52	86	102	114	130	136	141	128	116	120	110	111	85	78	72	67	52
12	53	54	51	53	46	34	35	52	89	113	106	85	111	115	129	121	115	110	88	77	78	78	52	43
13	36	54	36	32	37	35		47	81	84	111	114		103	111	111		87	86	82	80	77	73	36
14	51	52	61	53	43	37	26	54	82	102	111		110	90	86	88	110	89	86	78	72	52	53	
15	53	42	43	44	32	34	34	52	84	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C
16	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C
17	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C	^C
18	^C	^C	^C	^C	^C	^C	^C	^C	87	87	86	109	115	114	105		102	87	84	78	54	54	54	49
19	55	51	51	36	36	34	34	52	94	98	87	111	130	123	114	86	87	81	78	78	61	52	37	42
20	45	42	42	41	43	36	34	54	84	88	100	86	115	127	143	142	114	87	86	77	74	54	53	36
21	42	42	47	43	34	32		53	75	81	88	111	112	133	131	112	87		74	64	52	53	36	
22	34	36	36	30	40	29		48	66		113	106	125	130	130	111	92	86	78	74	73	54	54	36
23	36	36	34	36	43	26	28	47	76	78		106	88	90	107	108	89	82	82	73	48	36	43	42
24	37	37	43	38	29	30	28	52	76	84	86	84	99	86	108	105	86	82	80	72	54	53	42	42
25	42	42	42	32	34	34	32	54	76	82	86	88	110	111	127	111	81	82	80	78	51	34	34	36
26	34	32	36	38	36	30	31	52	73	81	86	81	81	106		88	99	86	80	62	54	46	43	43
27	36	43	34	46	47	42	37	54	84	93	107	112	115	124	114	112		85	78	66	53	52	52	36
28		43	50	47	37	34	29	54	80	105	111	111	115	128	132	111	86	102	84	66	54	52	52	53
29																								
30																								
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	24	20	24	23	23	20	25	26	24	22	24	24	25	24	22	23	24	24	23	24	25	25	23
MED	37	38	39	39	36	32	32	52	82	88	106	111	114	123	120	111	92	87	80	77	62	53	51	37
U Q	45	43	48	44	43	35	35	52	85	101	113	112	123	129	130	113	111	102	86	78	76	68	53	43
L Q	36	36	34	36	32	29	29	49	76	84	87	97	107	104	109	105	86	83	78	66	54	50	42	36

HOURLY VALUES OF fEs AT Yamagawa
 FEB. 2003
 LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1MHz TO 25MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	G	G	G	G	G	G	G	30	38	40	G	48	54	G	G	G	G	G	25	30	27	25	G	G			
2	G	38	G	30	24	G	G	11		G	41	46	48	G	G	45	46	40	28	33	32	G	G	G			
3	G	G		G	G	G	G	G	G	G	G	G	G	45		G	G	40	G		24	24	G	G	26		
4	60	33		24	28	G		G	G	G	G	G	G	G	50	G	G		34	25	G	G	G	11	G		
5	G	G	G	G	G	G	G	G	G	G		G	44	48	G	C	40	G	25	G	G	G	G	G	G		
6	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		
7	G	G	G	G	G	G	G	G	G	G	C		52	57	49	61		39	51	50	G	G	G	G	G		
8	G	72	40	G	27	28		G	G	G	G	50	61	54	50		47	G	61	35	36	G	27	31	G		
9	G	G	G	G	24	32	24		G	G	G	G	48	59	46	G	48	G	G	G	G	G	G	G	G		
10	G	G	G	G	26	G	G		G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G		
11	G	G		G	G	G	G	G	N	G	G	G	G		G	G	G	G		G		26	25	G	G		
12	30	23		G	G	G	G	G	G	G	G	G	G	47		G	G	G	G		54	36	51	G	G		
13	G	G	G	G	G	G			G	G	G	G		43		G	G		42	28	G	G	G	G	G		
14	G	G	G	G	G	G	G	G	G	G	G		G	G		70	44	45	33		G	G	G	G	G		
15	G	G	G	G	G	G	G	G	G	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C		
18	C	C	C	C	C	C	C	C	G	G	G		G	G	G		53	60	27		G		22	24	32	24	
19	25		G	G	G	G	G	G		G	G	G	G		G	G		G	G	G	G	G	G	G	G		
20	G	G	G	G	G	G	G	G	G	G	G	52		G	G	G	G			35	27		G	G	G	G	
21	G	G	G		24	23	G	G	G	G	G	G	G	G		48	46	G	G	G	G	G	G	G	G		
22	G	G	G	G	G	G		24	26		G		G	G	G	G		47	45	39	G	G	G	G	G	G	
23	G	G	G	G	G	G	G	G	G	G		48	55	58	48	45	39	33	G	G	G	G	G	G	G		
24	G	G	G	G	G	G	G		G	G	G	G		51	52	48	44	40	35	29	G	G		25	23	27	
25	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		26		G	G		24	G	G
26	G	G	G	G	G	G	G		G	G	G	G		55	49		G	44	66	38	46	G	G	G	G	G	
27	G	G	G	G	G	G	G	G	G	G	G	G	G	G		56	44	G	G		32	31	G	G	G	G	
28		28	23	G	G		26	23	35		G	G	46	51	56	50	48	50	45	37		G	G	G	G	G	
29																											
30																											
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	24	25	23	25	25	25	24	22	24	24	22	24	24	24	24	22	24	25	25	25	25	25	25	25	24		
MED	G	G	G	G	G	G	G	G	G	G	G	G	22	G	G	21	G	33	25	G	G	G	G	G	G		
U Q	G	G	G	G	23	G	G	11	G	G	G	48	54	49	48	45	42	40	28	27	11	12	6	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	G	G	

HOURLY VALUES of fmin AT Yamagawa

FEB. 2003

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1MHz to 25MHz AUTOMATIC 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	15	15	15	15	15	15	17	14	16	18	35	32	34	44	30	21	17	27	15	14	14	17	18	15	
2	14	14	16	14	15	16	18	15	14	16	20	18	18	30	20	17	15	14	14	16	14	15	15	16	
3	17	17		15	14	15	15	15	26	17	20			24	29		18	16	15	14	17	15	15	16	
4	15	15		15	15	20	14	15	15	15	18	17	18	18	18	18	16	15	16	15	15	15	15	15	
5	16	16	15	14	15	16	15	15	22	15		21	20	18	20	C	15	14	16	18	16	16	16	15	
6	15	15	17	14	15	15	18	15	15	16	18			46	38	35	16	15	18	15	14	15	15	15	
7	15	16	16	17	15	16	15	15	16	15	C	17	21	20	21		17	15	14	14	16	14	15	15	
8	15	14	14	15	15	15	15	15	18	15	18	18	20	32	27	21	21	15	17	14	15	15	14	15	
9	15	16	17	14	16	14	15	15	15	17	18	21	28	29	27	24	18	24	14	16	14	15	15	15	
10	15	16	15	14	15	16	15	16	27	16	20	26		33	29	34	21	27	17	15	16	15	15	15	
11	16	15	14	15	15	15	15	16	17	20	17	20		21	22	26	18	16	16	15	15	15	16	15	
12	15	15	15	15	15	18	15	17	16	16	18	43	29	23	22	18	17	15	14	14	14	15	16	17	
13	15	14	15	16	16	15		16	15	16	18			22	26	16		15	15	14	14	14	15	15	
14	16	15	15	15	15	15	15	16	16	16	18			21	20	18	17	15	17	15	15	15	15	15	
15	15	15	15	16	15	15	15	17	14	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
16	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
17	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	
18	C	C	C	C	C	C	C	C		15	14	17	33	21		22		16	15	14	15	15	15	14	15
19	15	15	15	15	15	15	15	15	15	16	16	20	17	22	20	16	16	15	17	15	15	15	18	16	
20	15	15	15	15	15	16	15	17	15	16	15	17	24	18	20		17	16	14	15	15	15	15	16	
21	15	15	14	16	15	21	16	17	15	14	18				20	23		16	18	15	15	14	15		
22	14	15	15	16	15	15	15	17	14		16	21			16	22	21	15	14	15	15	15	14	14	
23	15	15	15	16	15	15	15	17	15	15		18			20	17	17	15	17	14	15	15	15	15	
24	16	15	15	14	15	15	15	17	15	14	16	17	20		18	32	15	14	14	15	17	15	15	14	
25	15	15	14	15	15	15	15	16	15	15	16	21	27	23	18	16	18	16	16	16	14	17	15	16	
26	15	15	14	14	14	15	15	18	15	15	18	17		32		17	15	15	14	14	18	14	15	14	
27	15	15	14	14	15	15	15	18	14	15	17	21			21	20	16	14	14	14	15	16	15	15	
28		15	15	15	14	15	15	14	15	17	18	21		26	33		17	14	18	16	15	16	15	16	
29																									
30																									
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	24	25	23	25	25	25	24	25	26	24	22	20	13	19	24	19	23	25	25	25	25	25	25	24	
MED	15	15	15	15	15	15	15	16	15	16	18	20	21	23	21	20	17	15	15	15	15	15	15	15	
U Q	15	15	15	15	15	16	15	17	16	16	18	21	27	32	27	24	18	16	17	15	15	15	15	16	
L Q	15	15	14	14	15	15	15	15	15	15	17	17	19	21	20	17	16	15	14	14	14	15	15	15	

HOURLY VALUES OF fOF2 AT Okinawa

FEB. 2003

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

D	H																							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	36	34	28	28	28			40	85	111	125	144	141	146	146	144	144	134	110	80	74	66	50	43
2	40	32	34	36	29			40	75	119	84	73	94	104	118	102	97		108	88	53	65	78	50
3	54	49	53	48	42	41	52	60	78	88	120	134	140	138	132	131	127	118	107	88	84	66	53	40
4	36	36	46	30	28			42	74	81	110	112	101	86	94	102	88	84	90	78	86	85	53	32
5	34	34	34		37			45	76	97	106	118	118	117	137	134	123	125	113	86	72	66	64	46
6	44	34	32	44				47	88	108	111	110	118	131	141	159	169	170	146	144	144	144	108	72
7	54	53		42	42		47	54	90	110	136	145	147	162		170	154	166			140	126	100	73
8	51	59	36		45	34	30	47	88	95	91	114	135	147	144	146	144	142	141			109	73	42
9	34	34	36	37	41	32		53	88	106	114	128	131	140	146	145	146	150	148		131	109	98	86
10	67	54	40	42	32	28	30	54	91	105	110	118	126	127	145	136	122	128	110	106		101	86	61
11	53	61	58	28		26	28	53	88	94	120	127	131	140	136	138	140	140	143	142	130	107	87	88
12	81	66	63	53	50	36	34	51	91	116	114	117	116	131	142	141	140	143	135	136	145		134	
13		86	50	40	43	51		42	90	111	102	111	108	112	121	123	117	120	110	124	145	142		107
14		88	76	66	61	40	37	53	97	104	111	117	116	110	114	110	131	126	121	107	108	88	87	85
15	87	104	80	61	48	29	31	50	81	112	128	131	134	144	137	134	131	138	144	144			128	107
16	87	54	61	60	48	60		44	88	116	128	137	131	137	135	127	112	108	101	101	87	89	75	77
17	71	65	76	46	30	29	28	42	90	107	127	140	151	171	173	175	170		172	144	131	134	127	122
18	123	110	84	54	46	42	42	54	89	100	106	117	132	131	123	127	130	123	109	108	107			81
19	66	54	60	46	32	36	36	48	88	101	108	121	146	136	134	125	110	104	107	87	77	66	54	42
20	42	50	47	41	42	32	34	50	86	107	107	109	135	147	168	170	169		144	136	140	124	87	87
21	81	73	74	66	51	37	38	54	73	78	107	124	131	142	151	138	125		106	87	87	83	54	42
22	42	40	39	38	44	45		42	80	98	124	120	131		170	160	156	145	145	131	124	108	87	73
23	66	54	50	53	65	34	29	52	78	87	101	121	107	114	126	126	106	110	110	106	87	74	54	53
24	42	42	54	34		29	30		74	88	101	101	104	120	126	131	140	135	138		142	131	88	85
25	83	74	38	32	32	32	32	51	75	82	90	111	121	140	145	141	141	130	107	124	125	86	64	66
26	66	46	38	41	41	29	28	48	74	81	96	95	97	105	117	107	114	108	100	86	81	60	52	52
27	43	43	44	46	42	38	35	52	80	98	105	108	124	128	123	128	117	107	110	85	74	54	78	54
28	52	54	52	54	48	36		52	82	107	120	120	125	140	148	140	130	120	107	87	74	75	76	54
29																								
30																								
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	28	27	26	25	22	18	27	28	28	28	28	28	27	27	28	28	24	27	24	25	25	26	27
MED	54	54	50	43	42	35	33	50	86	102	110	118	128	136	137	135	130	127	110	106	107	88	78	66
U Q	71	65	61	53	48	40	37	53	88	109	120	127	134	142	146	144	144	141	143	133	135	116	88	85
L Q	42	41	38	37	32	29	30	44	77	91	103	111	116	117	123	126	117	114	107	87	79	66	54	46

HOURLY VALUES OF fEs AT Okinawa

FEB. 2003

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1		G	G	G	G	G		G	24	G	G	G	47	47	52	47	50	G	86	61	43		34	G	G		
2		G	G	G	24	G	G		G	G	G	G	50	49	G	48	48	42	67	49	31	32		G	G	G	
3		G	G	G	G	G	G	G	G	G	G	G	G	G	58	51	G	46	38	G	G	G		40	G	G	
4		G	G	G	G	G		28		G	G	G	G	46	52	50	50	54	G	34	G	G	G	G	G	G	
5		G	G	G	33	G	G	G	G	G	G	G	45	48	49	G	43	G	G	G	G	G	G	G	G	G	
6		G	G	G	G	G	G	G	G	G		G	G	G	G	44	G	G		39	31		G	40	G	G	
7		G	G	34	31	G	30	G	G	G	G	46	52	57	51		53	52	50	G	G	G	G	G	G	G	
8		G	G	33	52	G	G	G	24	G	G	G	55	59	51	48	79	80	68	79	59		G	G	G	G	
9		G	G	G	G	24		G	G	G	G	G	G	52	49	G	G	42	G	G	G	G	G		33	G	
10		G	23	G	G	G	G	G	G	G	G	G	G	50	49	G	G	G	G	G	G		G	G	G	G	
11		G	G	G	G	G	G	G	G	G	G	G		G	49	47	41	44	49	36		G	G	G	G	G	
12		G	G	26	G	G	G	G	G	G	G	G	49	G	45	G	45	49	44	34	39		G	24	G	G	
13		G	G	G	G	G	G		G	G	G	45	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	49	G	49	47	44	38	30	27		G	G	G	G	
15		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	
16		G	G	G	G	G	G		G	G	G	G	43	49	68	68	81	58	96	74	88	59	28		G	G	
17		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	44	40		30	32	26	49	34		G	
18		G	G	G	G	G	27	G	G	38	44	46	52	55	54	47	46	42	38		G	G	G	G	G	G	
19		G	31	G	G	G	G	G	G	G	G	G	47	46	49	47	43	42	36		G	G	G	G	G	G	
20		G	G	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	
21		G	G	G	G	G	G	G	G	G	G	G	G	G	G	57	G	G	G	G	G	G	G	G	G	G	
22		G	G	25	G	G	G		G	G	G	G	G	G		G	50	43	40	34		G	G	G	G	G	
23		G	G	G	G	G	G	G		49	50	G	53	59	58	57	48	45	35		G	G	G	G	G	G	
24		G	G	G	G		G	G		50	42	46	G	G	G	46	46	42	35		G	G	G	G	G	G	
25		G	G	G	G	G	G	G	G	G	G	G	G	G	G	46	G	G	G	G		24		24		G	G
26		G	G	G	G	G	G	G	G	G	G	G	G	G	48	G	48	44	G		42	26	30		G	G	G
27		G	G	G	G	G	G	G	G	G	G	G	G	50	G	G	45	44	G		29	27		G	G	G	G
28		G	G	G	G	G	G		26	G	G	46	48	53	52	47	52	47	42	35	24		G	G	G	G	
29																											
30																											
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		28	28	28	28	27	26	23	26	28	28	28	27	28	27	27	28	28	27	28	28	26	28	28	28	28	
MED		G	G	G	G	G	G	G	G	G	G	G	G	46	49	46	45	42	35	G	G	G	G	G	G	G	
U Q		G	G	G	G	G	G	G	G	G	G	G	47	51	51	48	49	44	44	35	29	G	12	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	G	

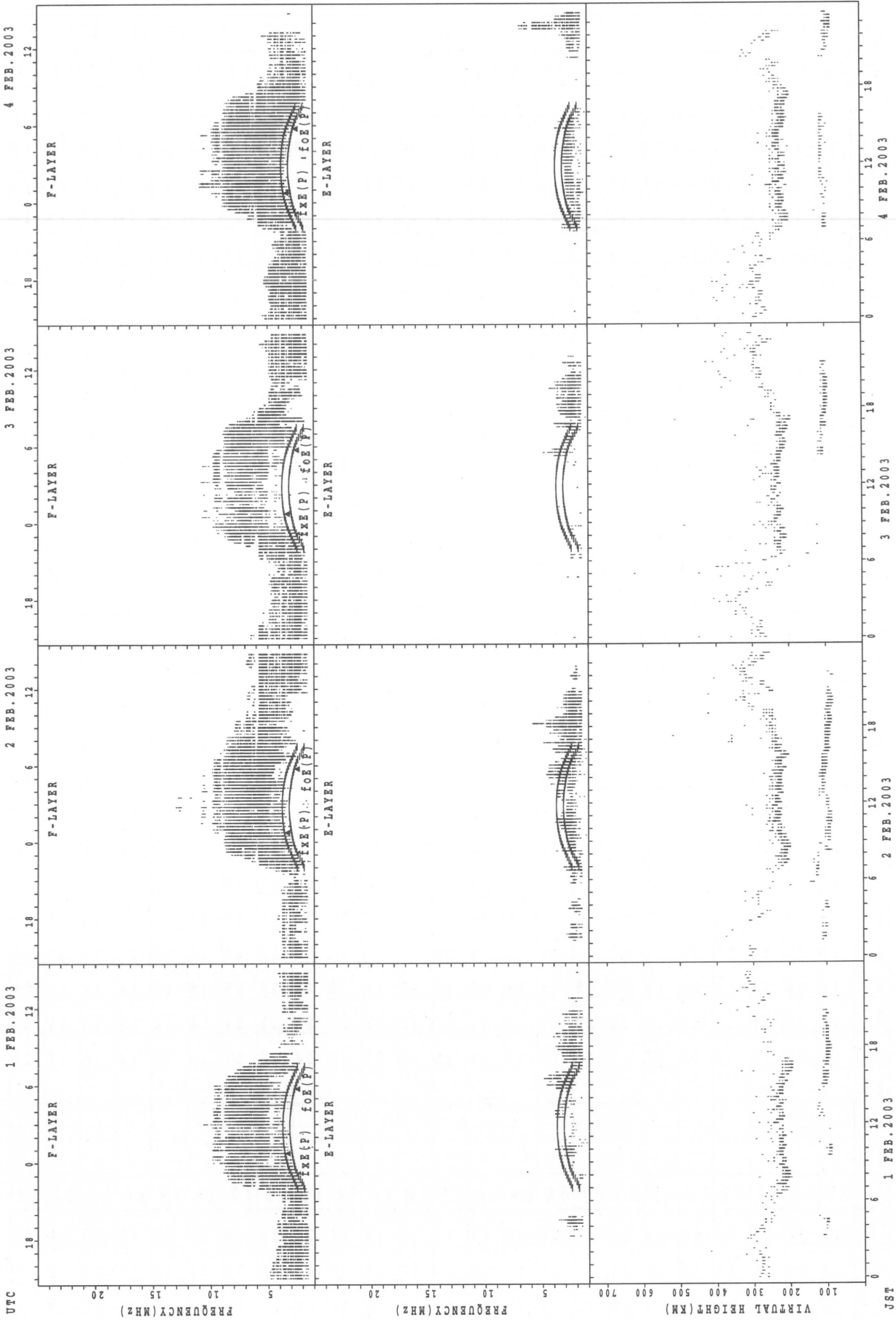
HOURLY VALUES OF fmin AT Okinawa

FEB. 2003

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

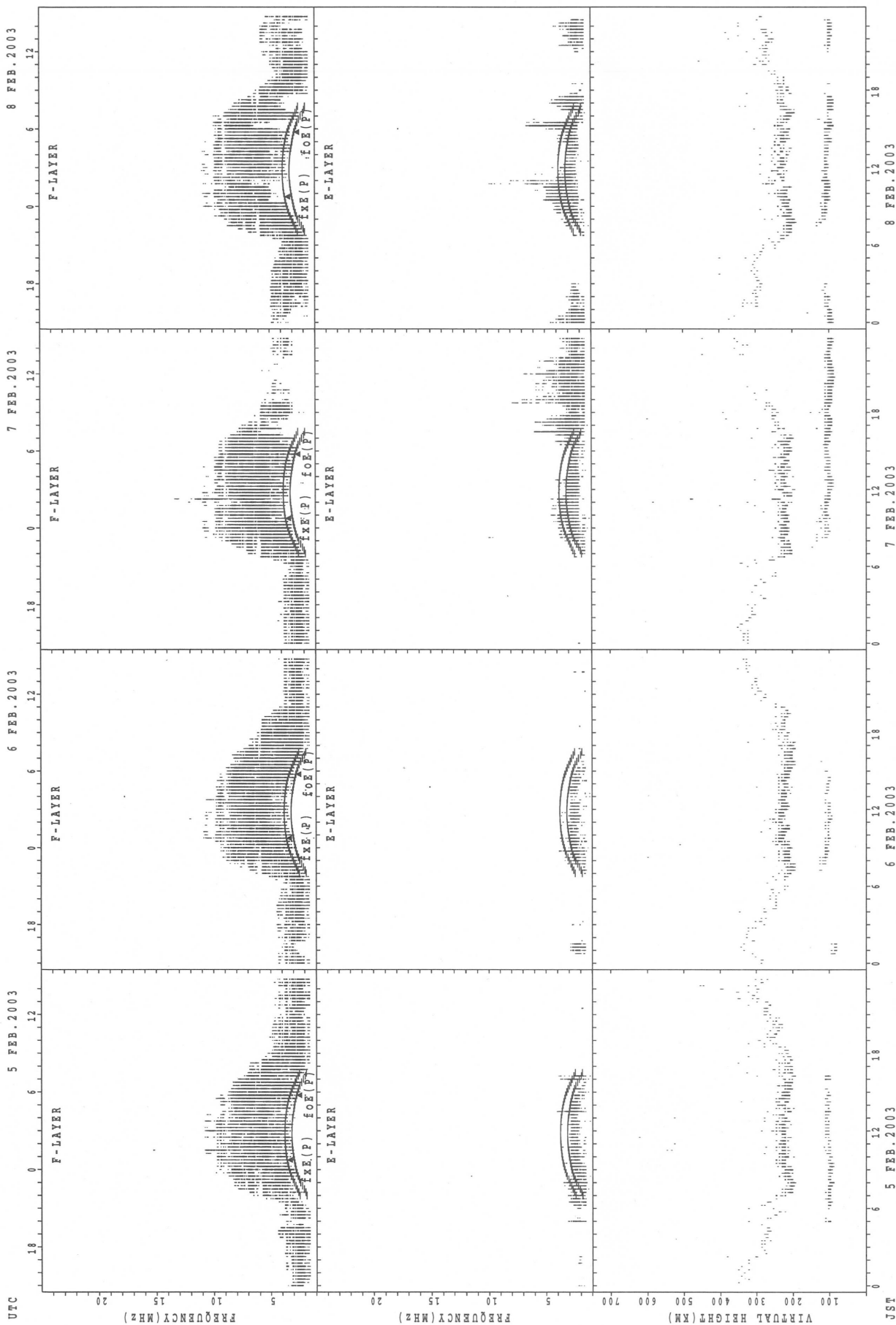
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	15	15		16	14	16	18	22	26	33	28	23	23	18	16	14	15	17	14	15	15
2	16	14	15	14	15	16		15	24	21	18	24	32		20	20	18	15	14	14	14	18	15	15
3	14	15	16	15	18	18	16	15	20	17	17		27	22	22		18	18	20	16	16	14	17	16
4	15	16	15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

SUMMARY PLOTS AT Wakkanai



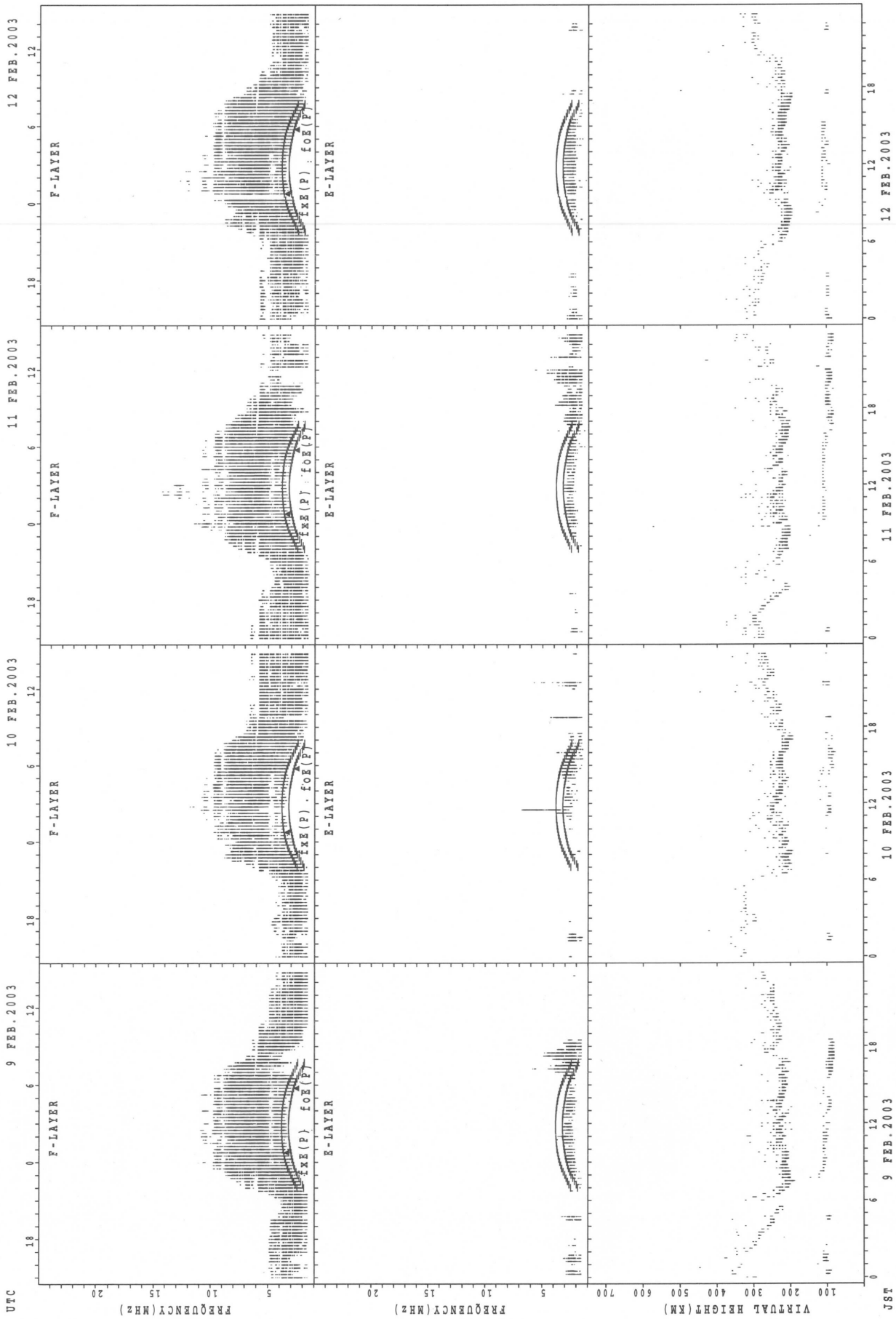
f_{x E(P)}; PREDICTED VALUE FOR f_{x E}
 f_{o E(P)}; PREDICTED VALUE FOR f_{o E}

SUMMARY PLOTS AT Wakkanai



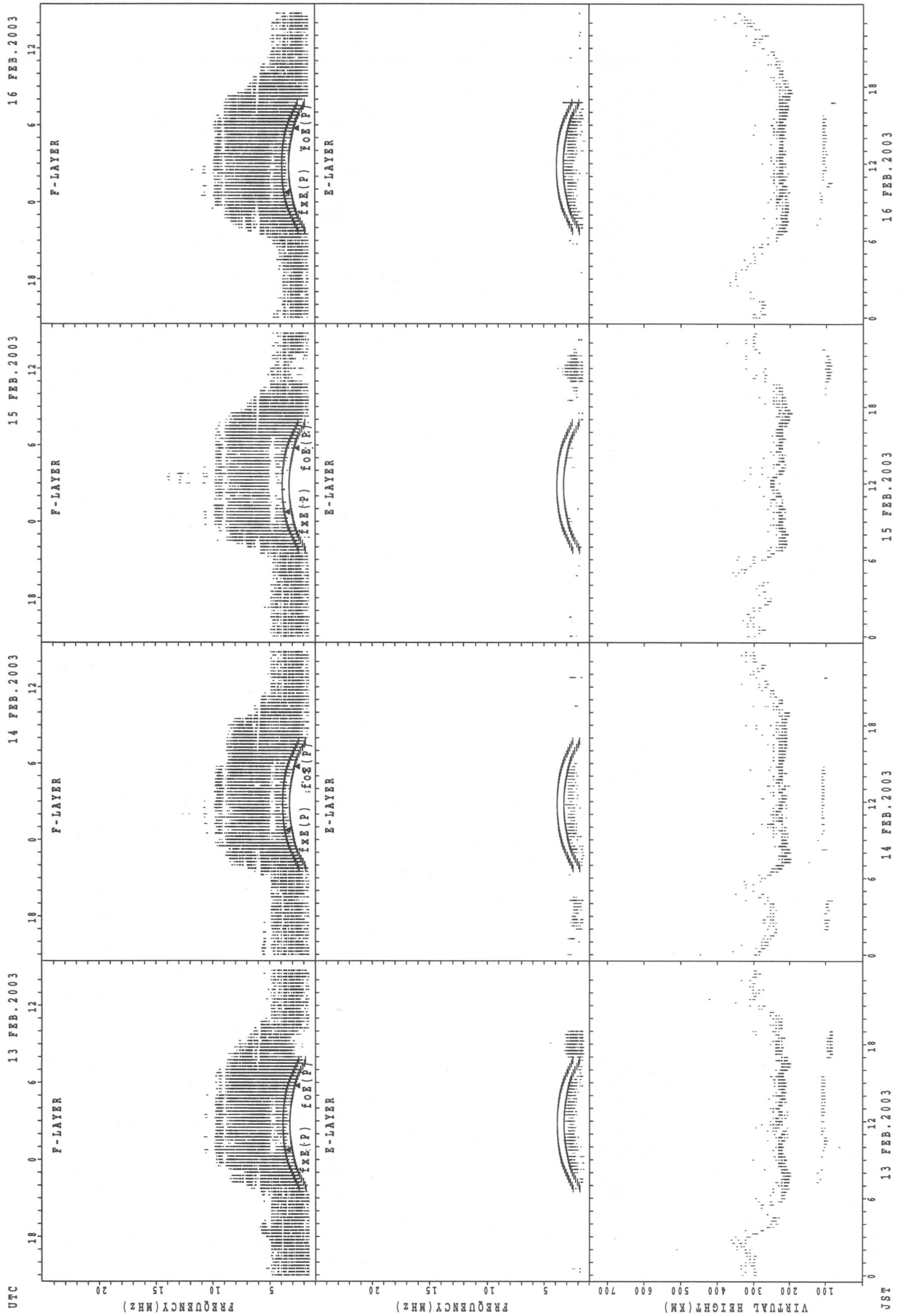
f_{xe}(P); PREDICTED VALUE FOR f_{xe}
 f_{oe}(P); PREDICTED VALUE FOR f_{oe}

SUMMARY PLOTS AT Wakkanai



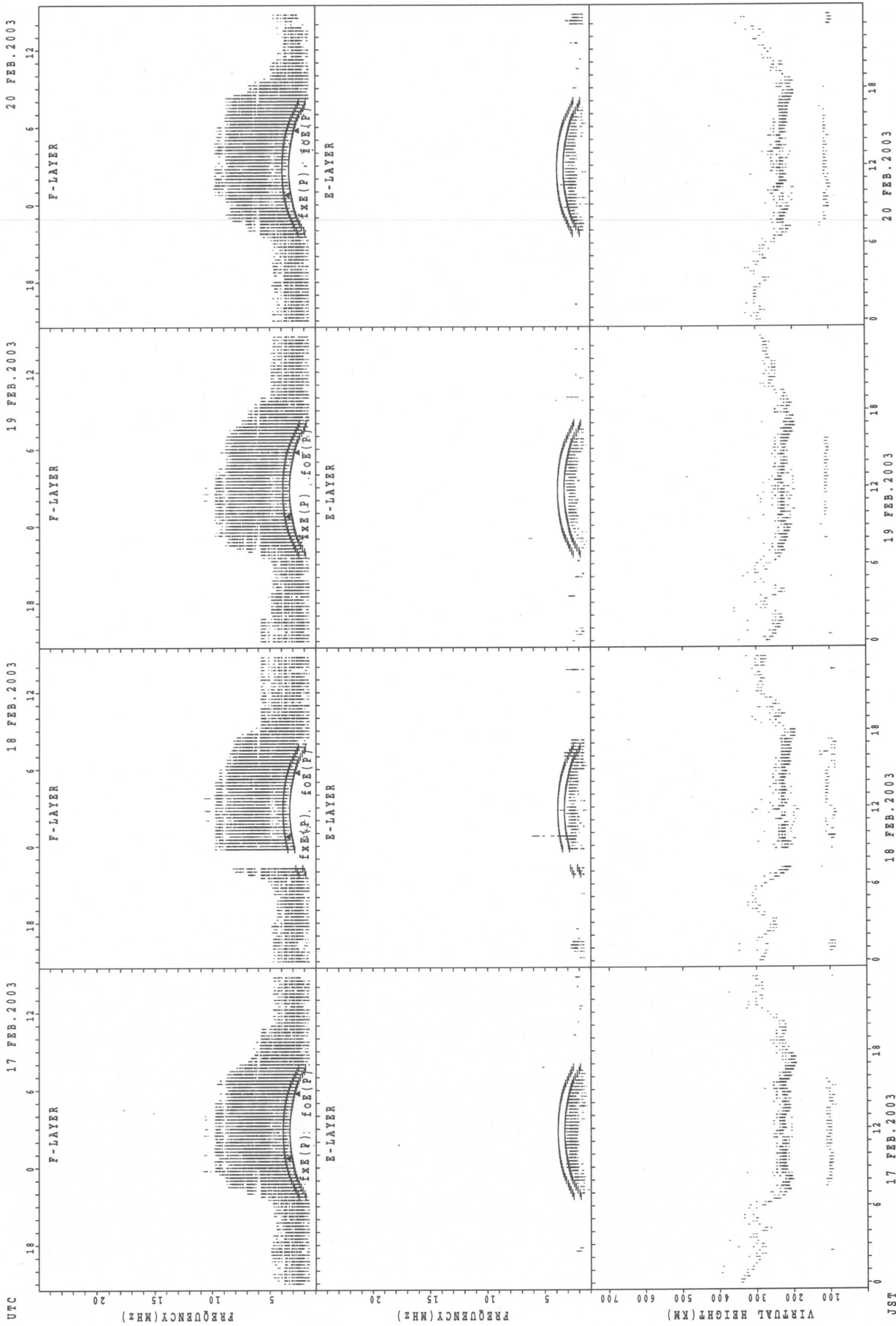
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



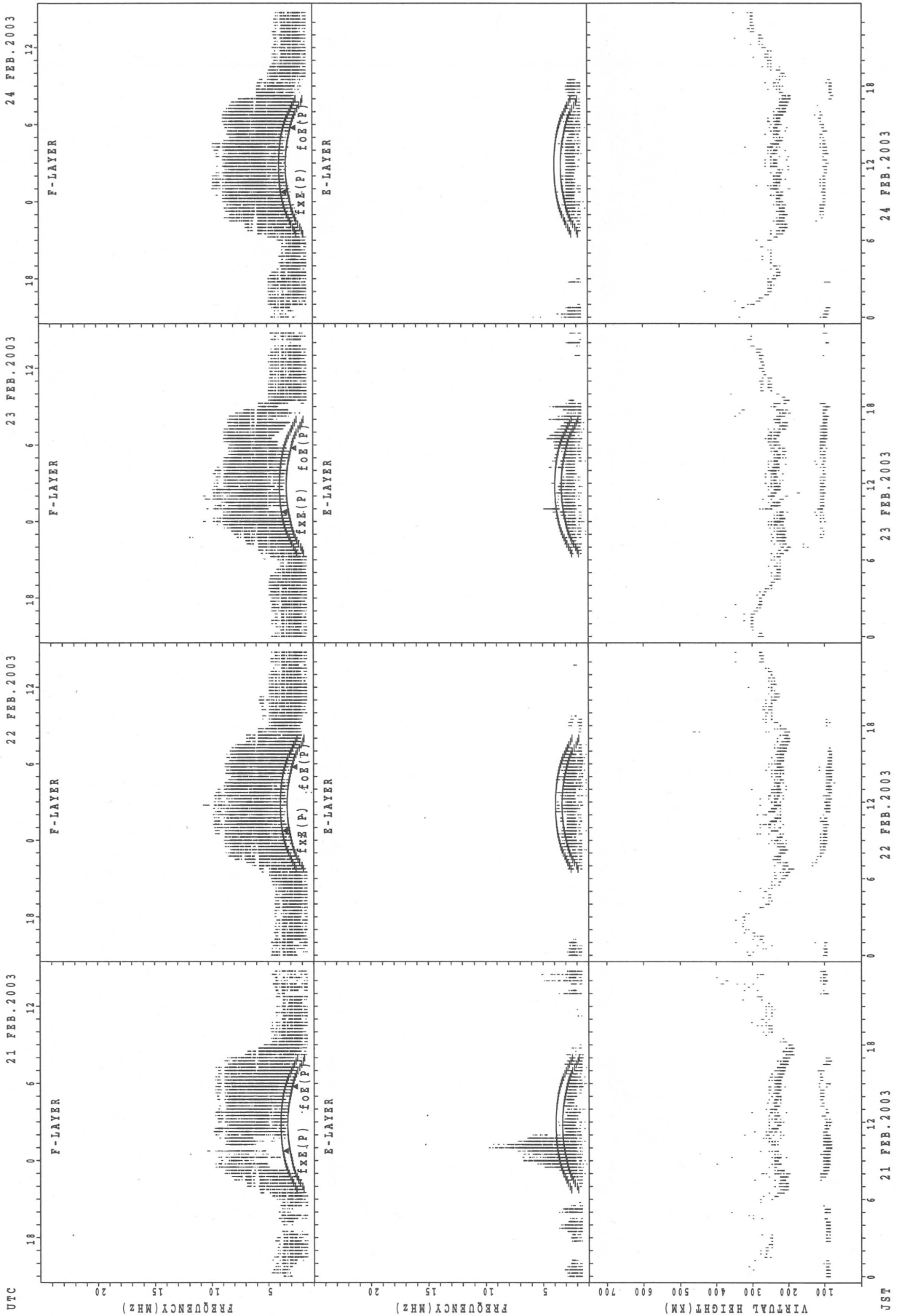
f_oF₂(P); PREDICTED VALUE FOR f_oF₂
 f_oF₂(F); PREDICTED VALUE FOR f_oF₂

SUMMARY PLOTS AT Wakkanai



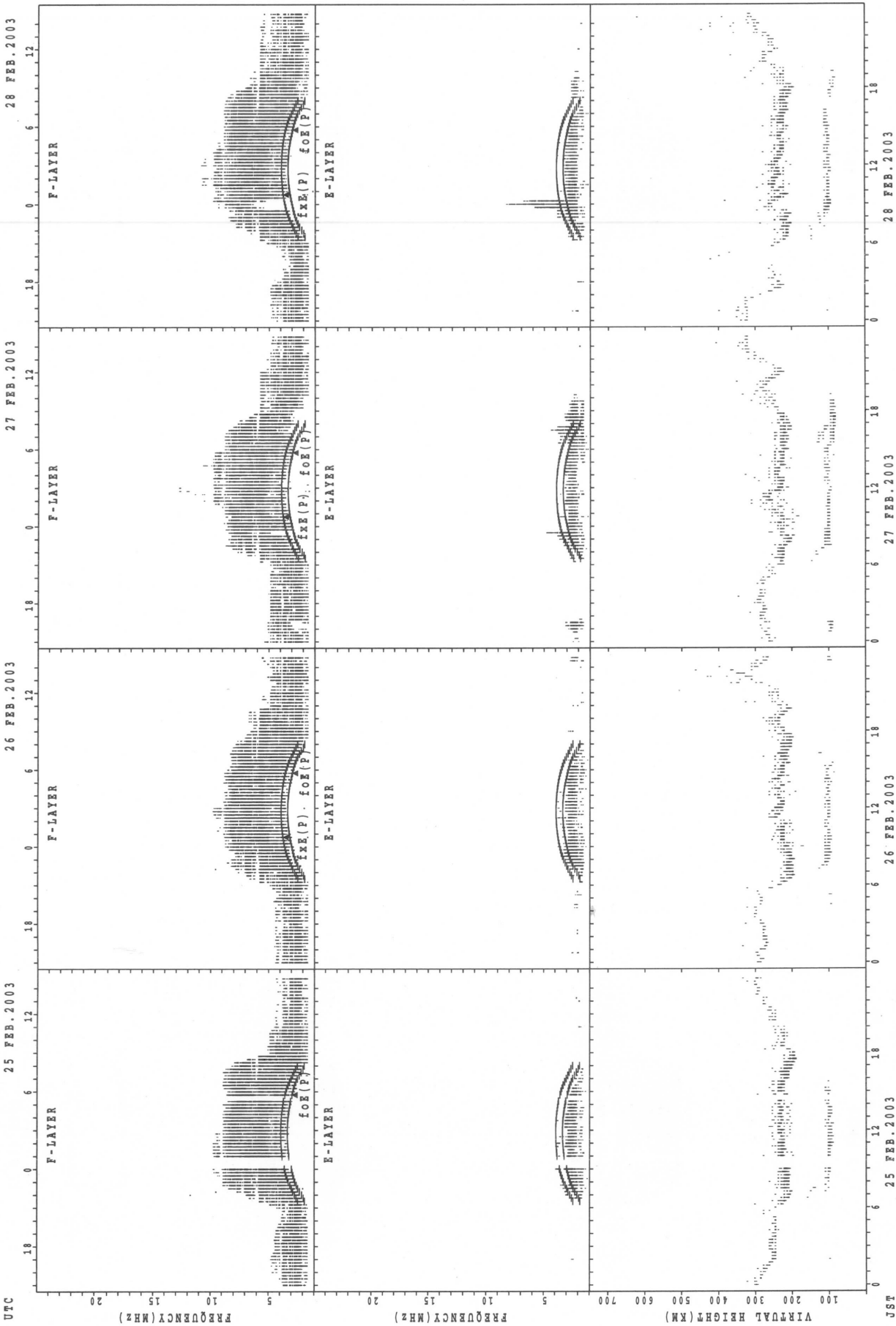
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



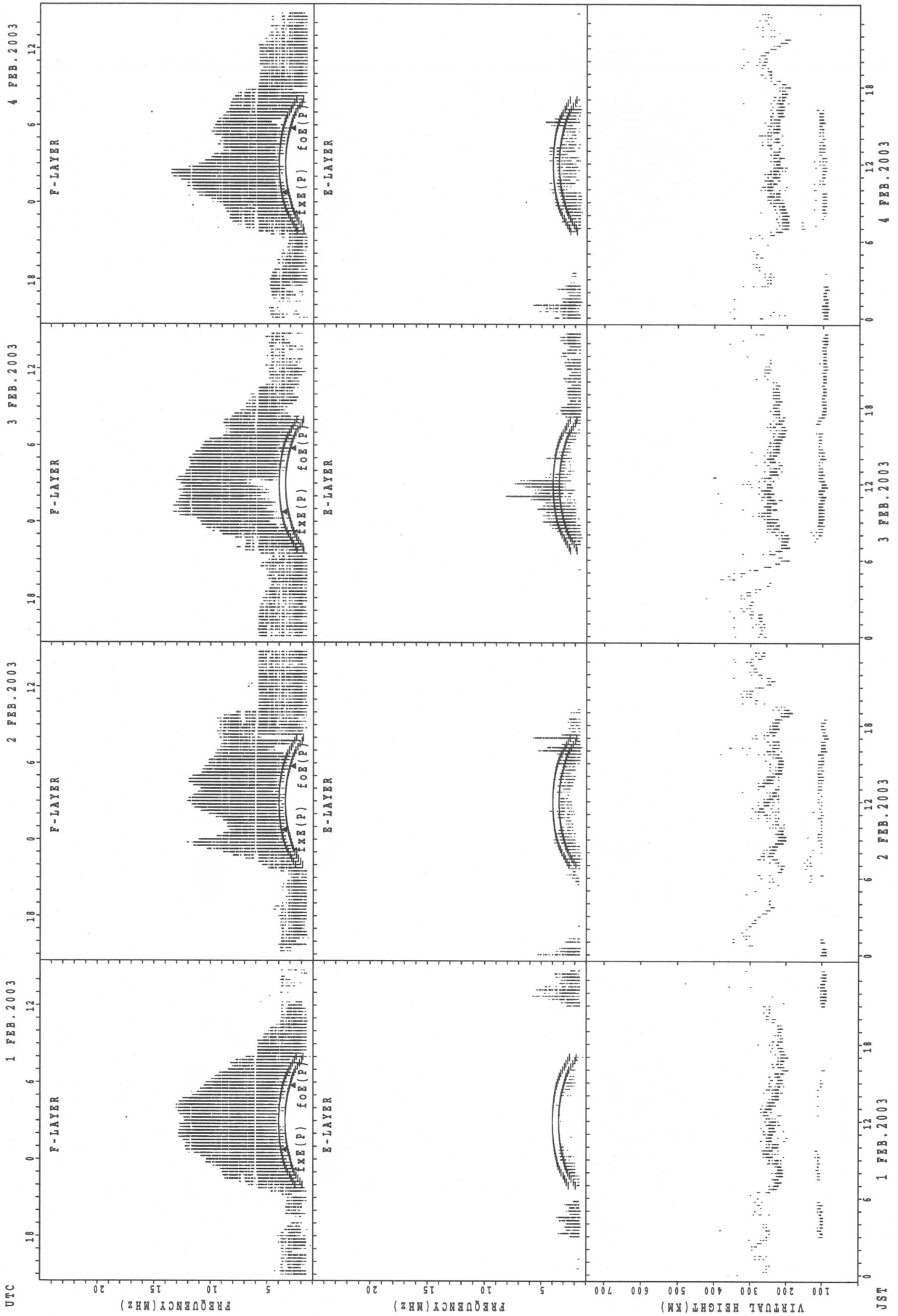
JST 21 FEB.2003
 fxe(p); PREDICTED VALUE FOR fxe
 foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



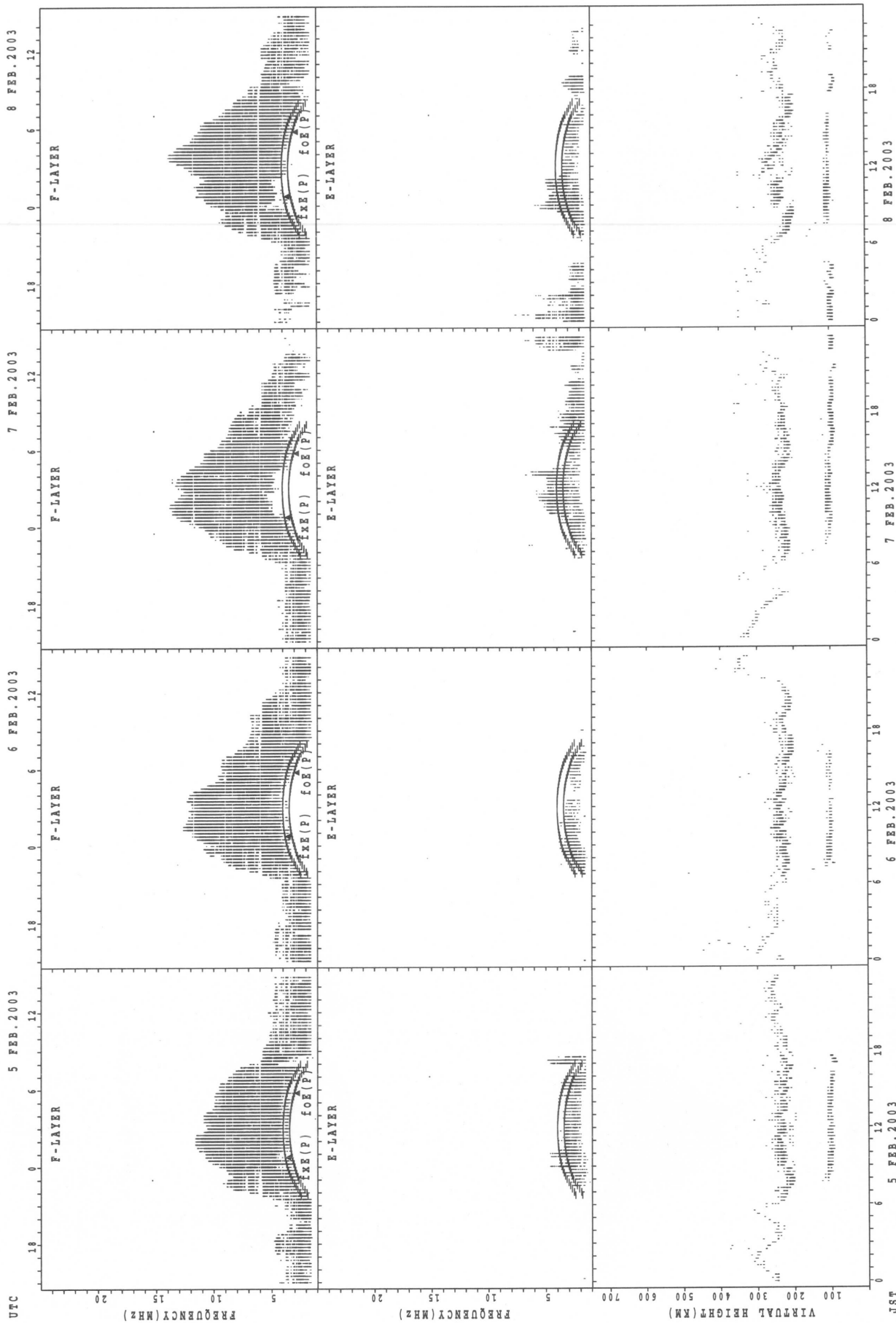
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



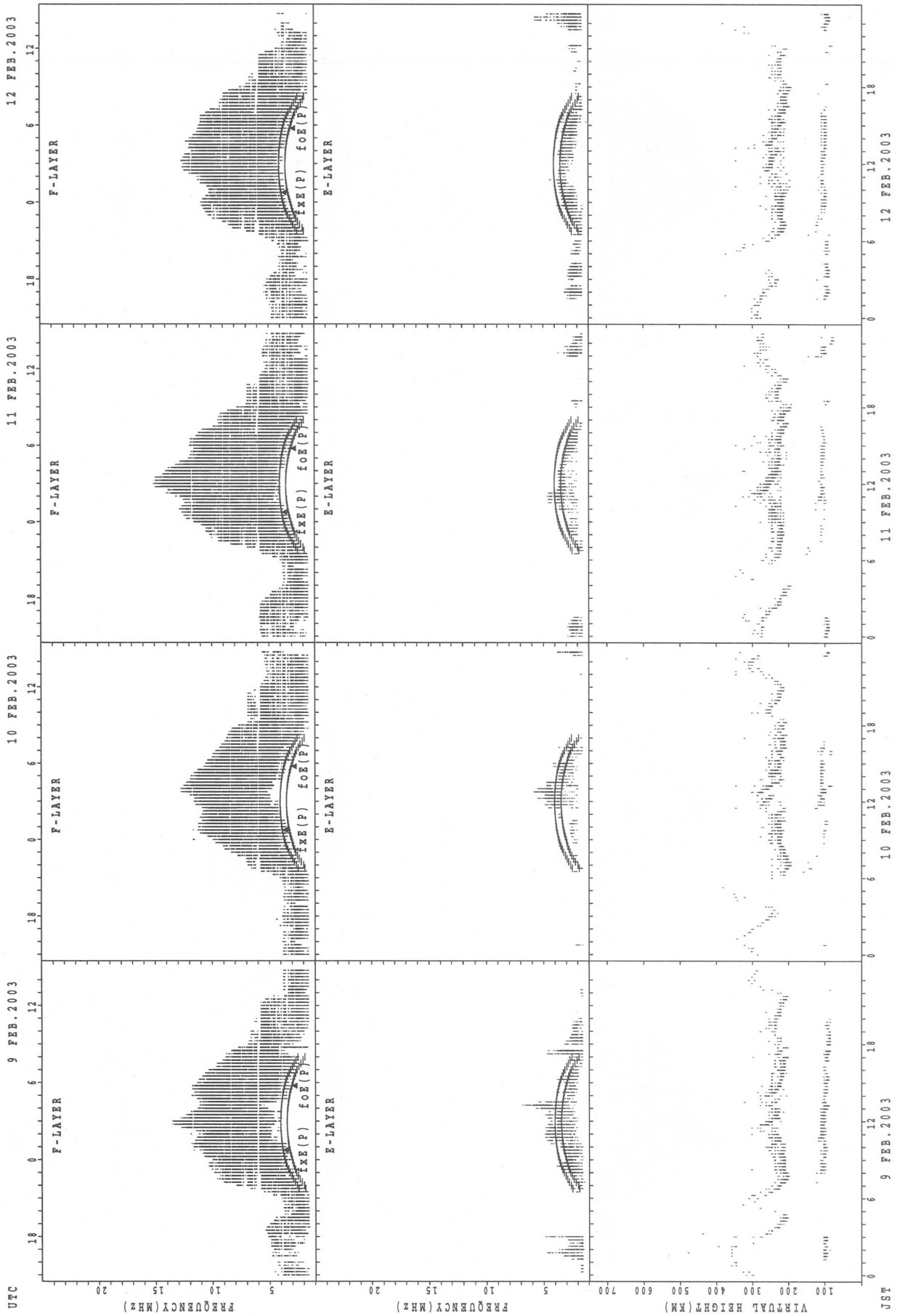
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



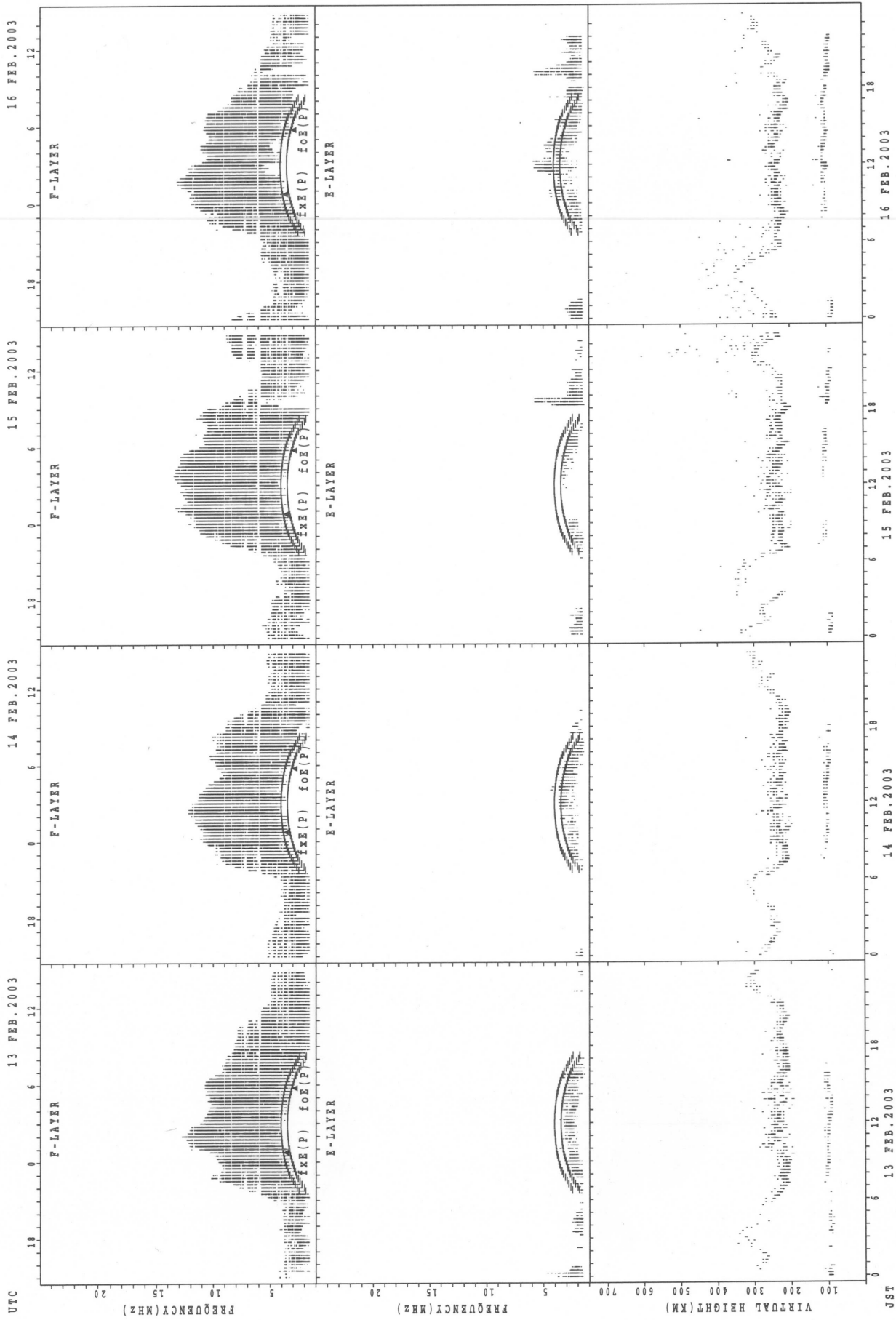
fxe(P); PREDICTED VALUE FOR fxe
fof(P); PREDICTED VALUE FOR fof

SUMMARY PLOTS AT Kokubunji



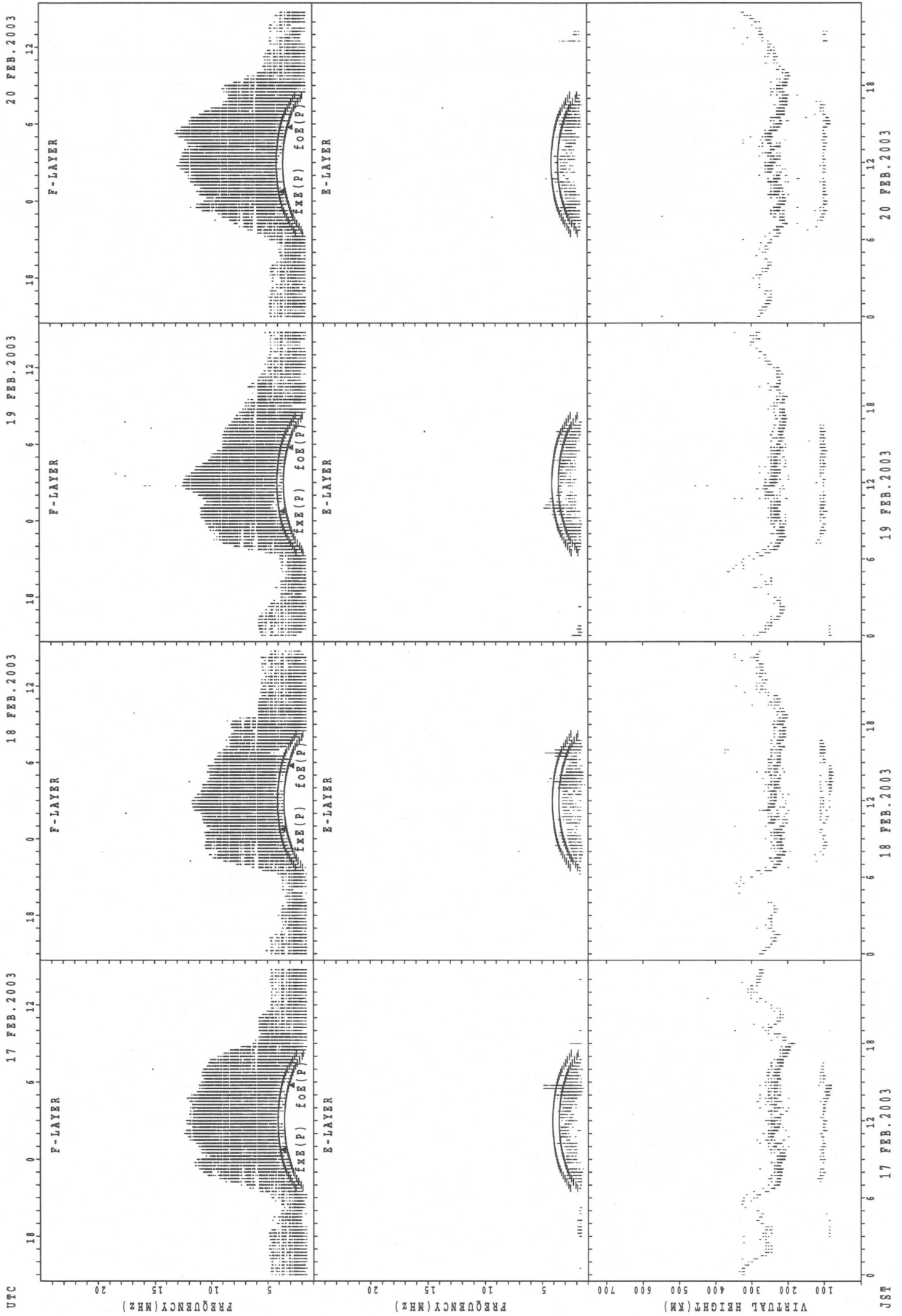
foE(P); PREDICTED VALUE FOR foE
foF(P); PREDICTED VALUE FOR foF

SUMMARY PLOTS AT Kokubunji



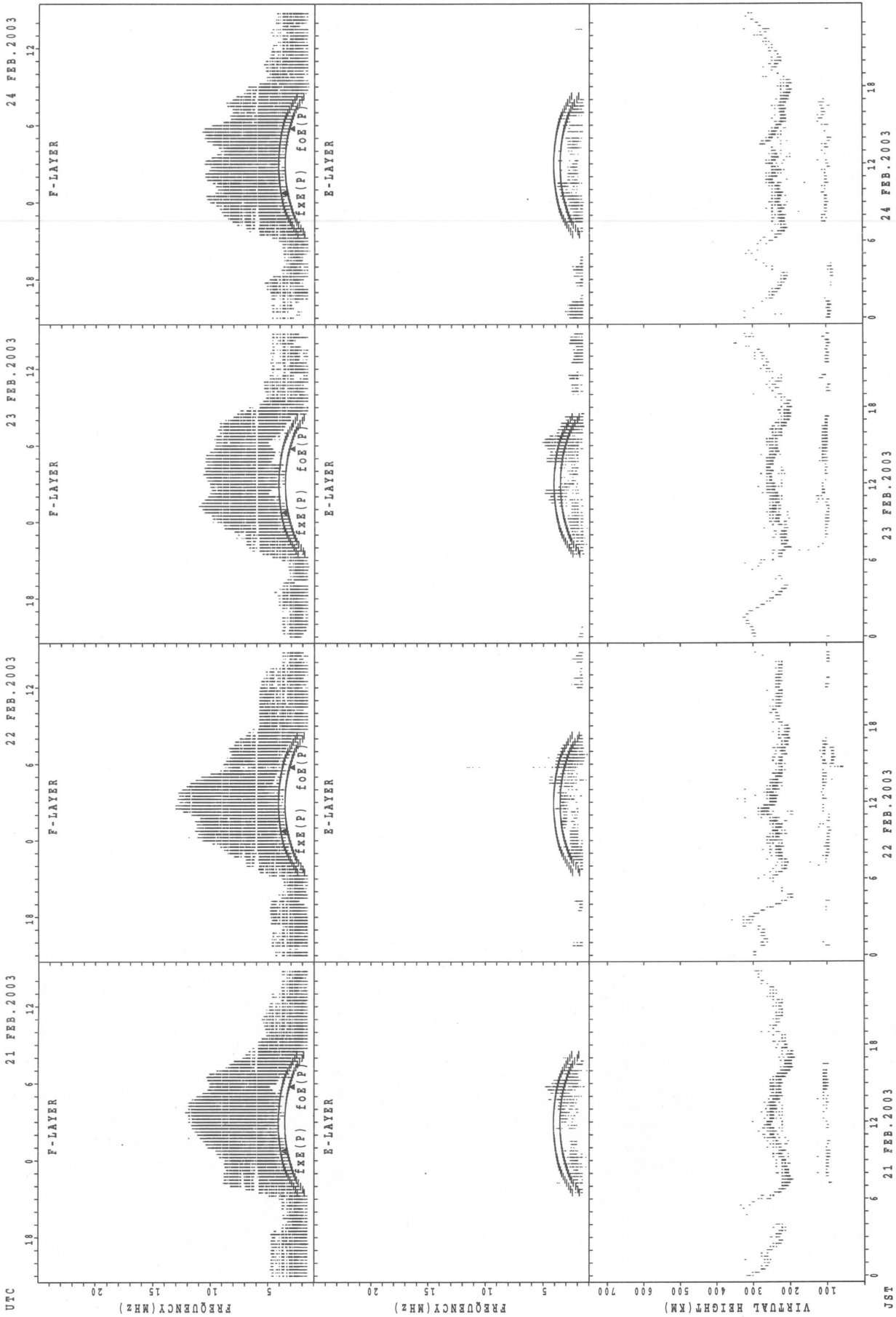
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



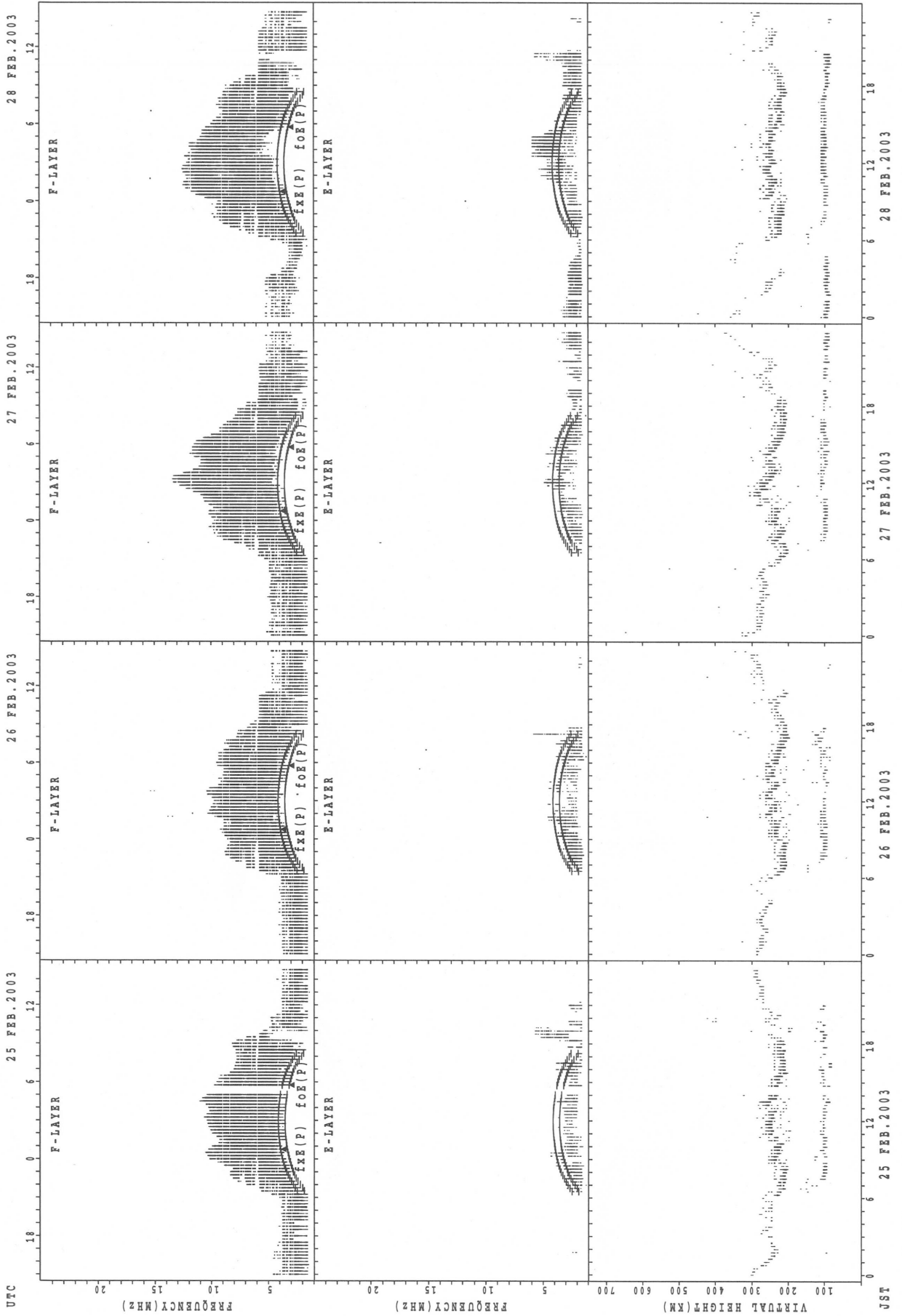
fxe(p); PREDICTED VALUE FOR fxe
 foe(p); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Kokubunji



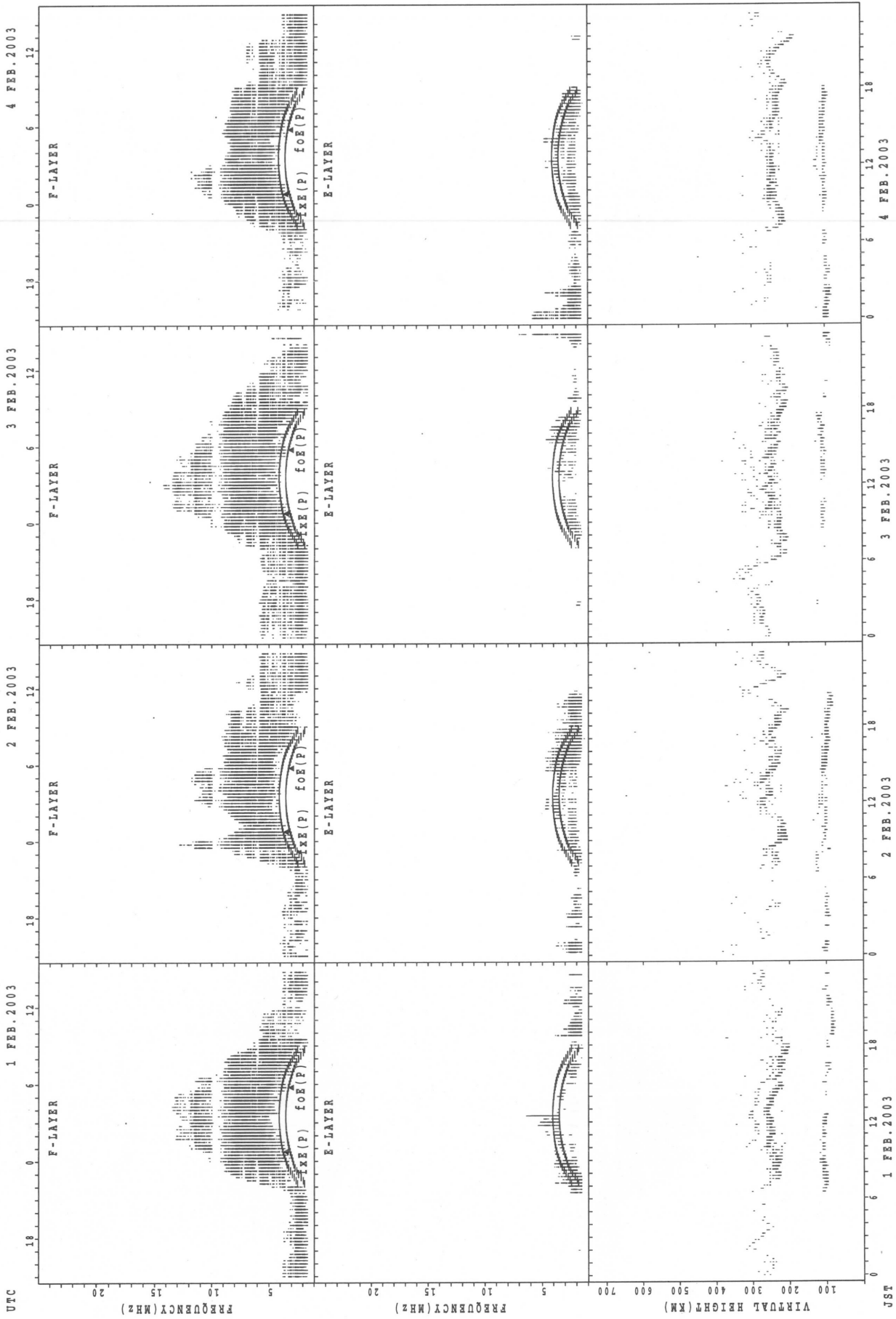
foE(P); PREDICTED VALUE FOR foE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



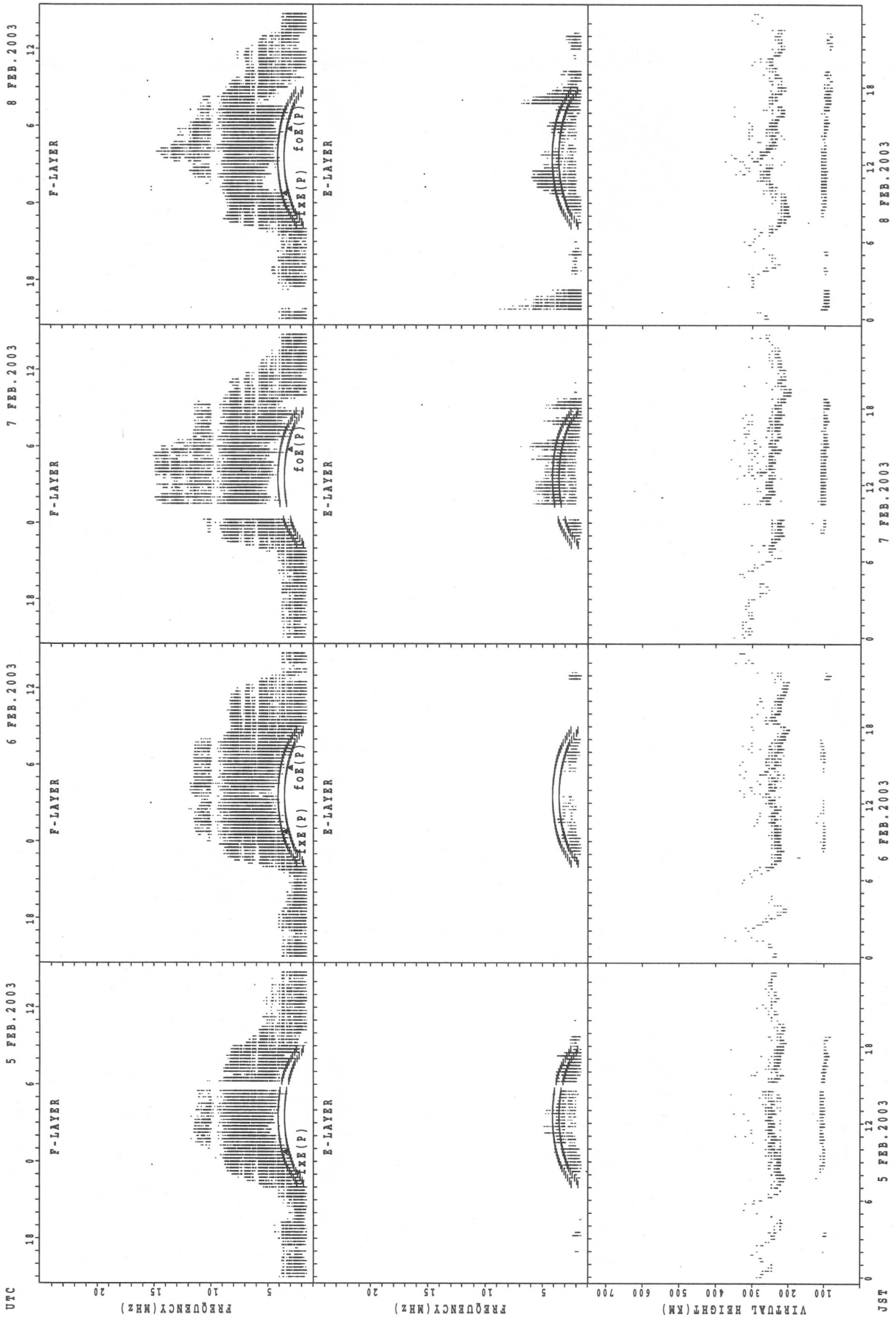
foF2(P); PREDICTED VALUE FOR foF2
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



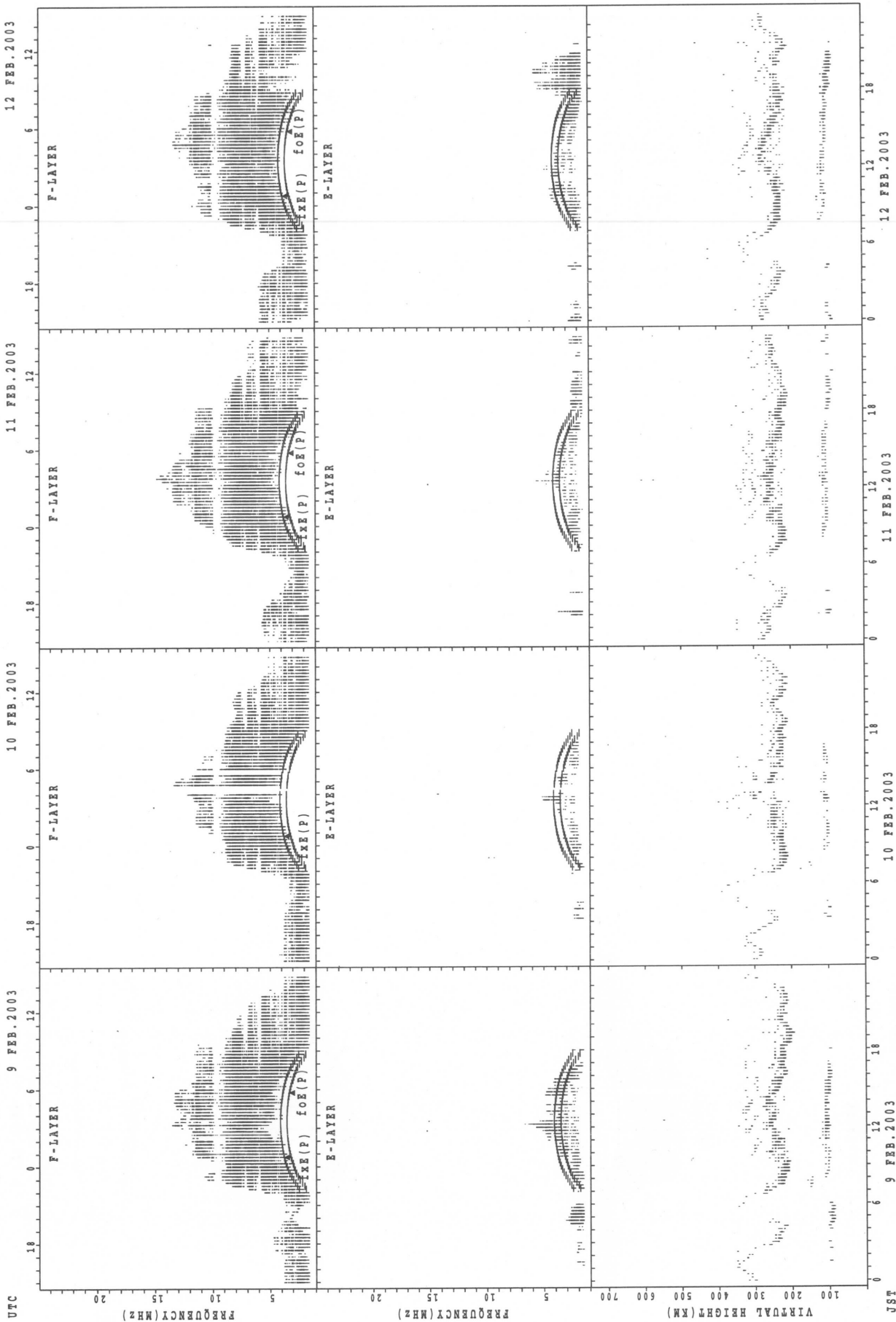
fxe(p); PREDICTED VALUE FOR fxe
foe(p); PREDICTED VALUE FOR foe

SUMMARY PLOTS AT Yamagawa



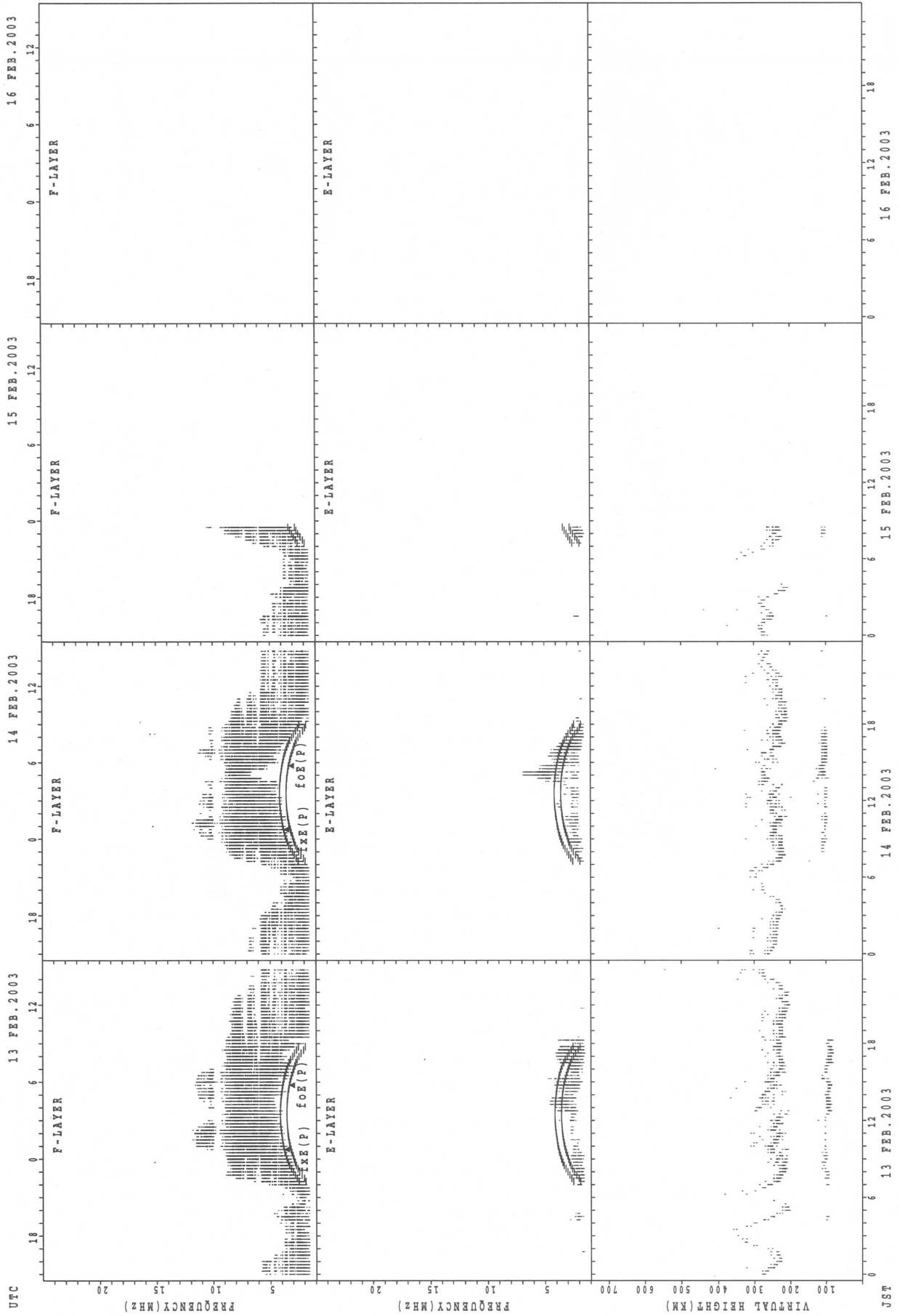
fXfE(P); PREDICTED VALUE FOR fXfE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



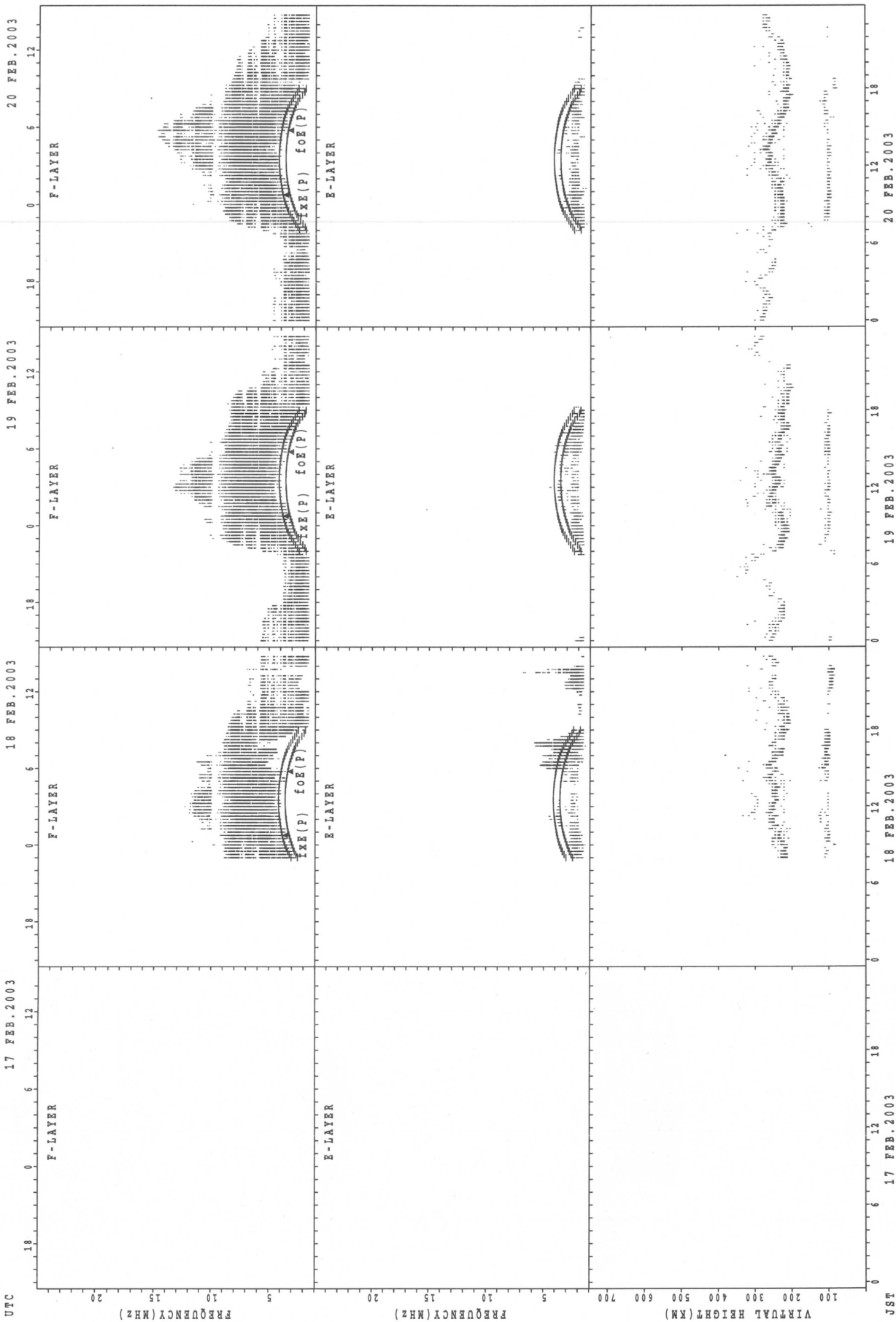
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



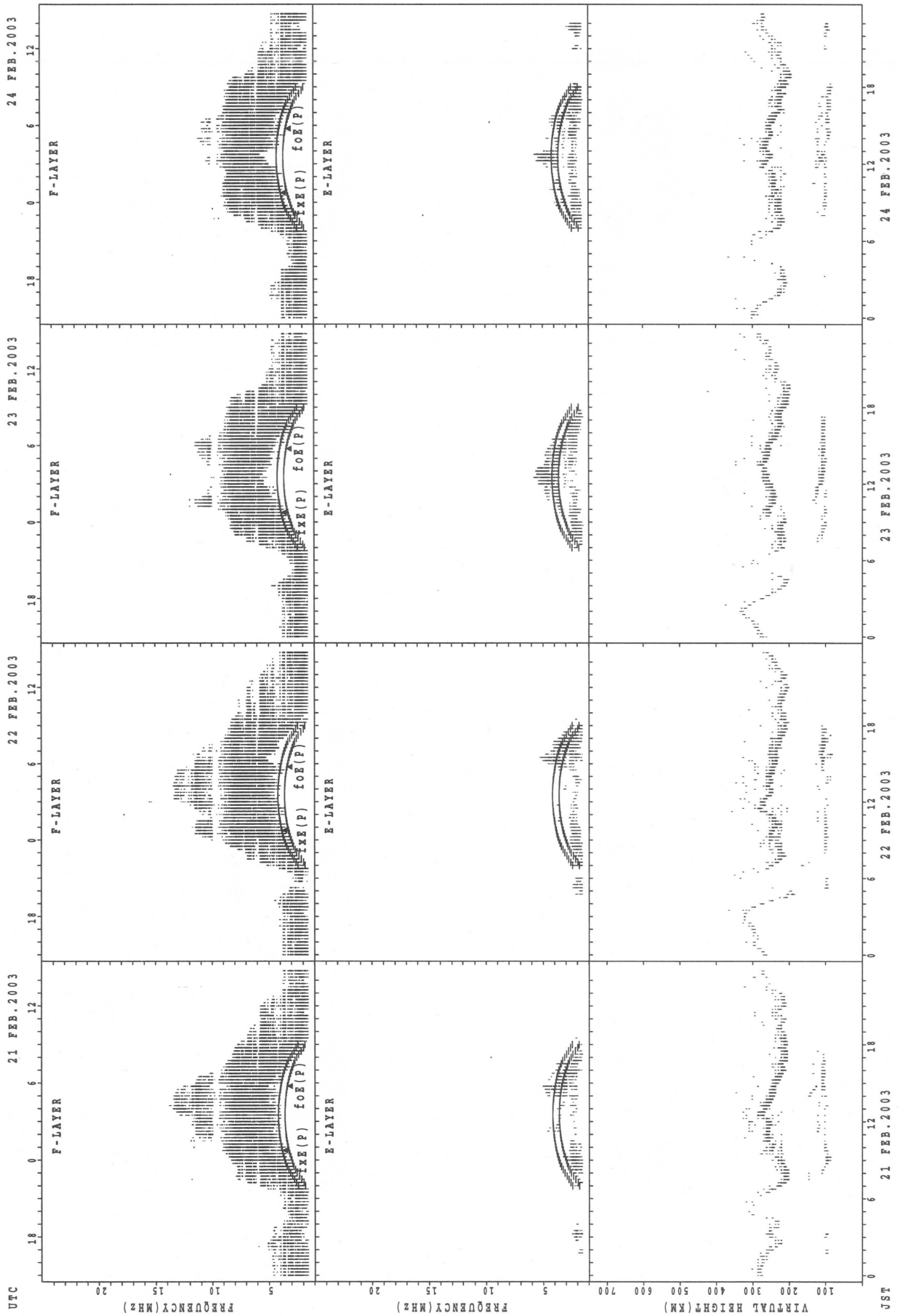
foE(P); PREDICTED VALUE FOR foE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



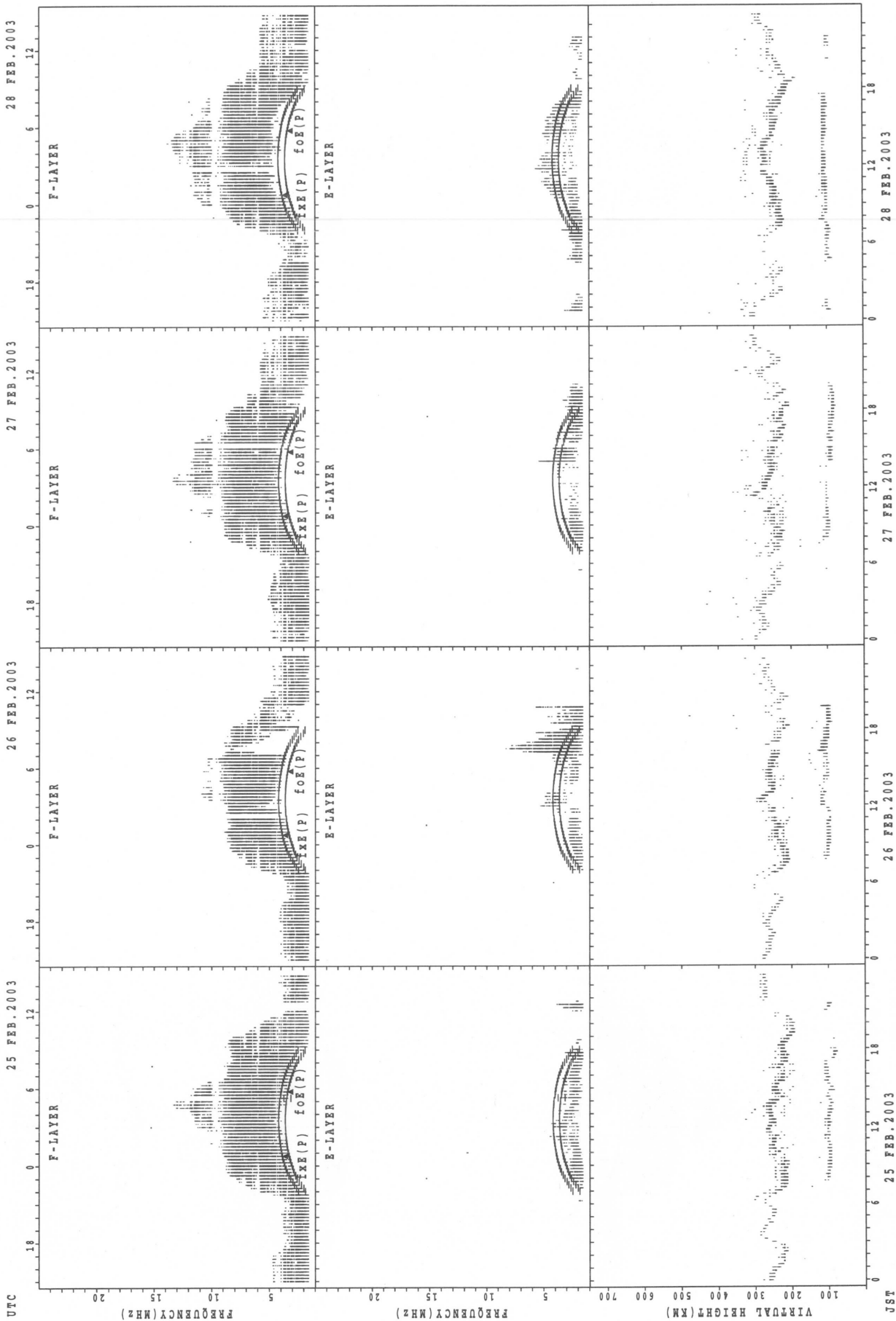
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



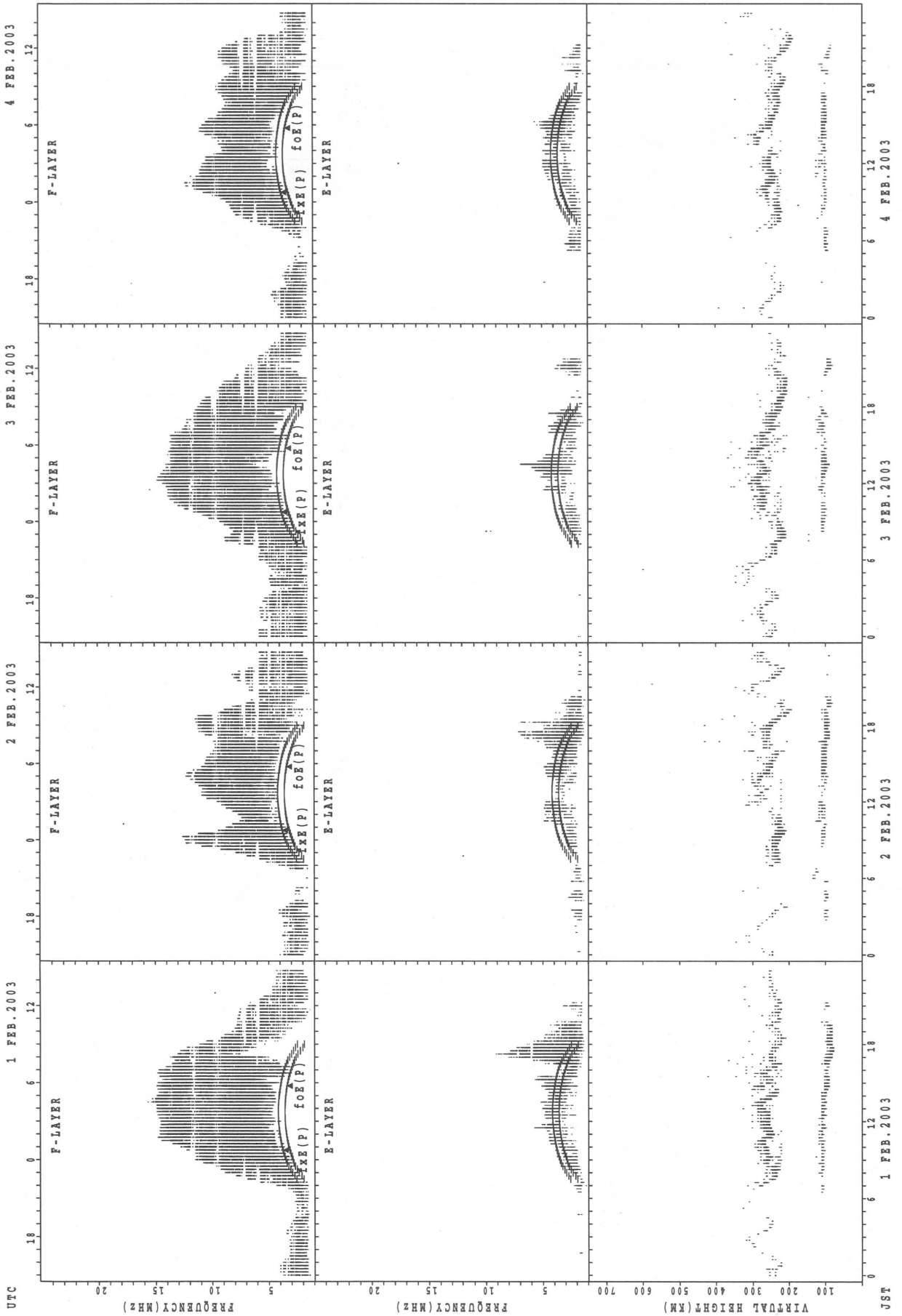
f_oF₂(P); PREDICTED VALUE FOR f_oF₂
 f_oF₁(P); PREDICTED VALUE FOR f_oF₁
 f_oE(P); PREDICTED VALUE FOR f_oE

SUMMARY PLOTS AT Yamagawa



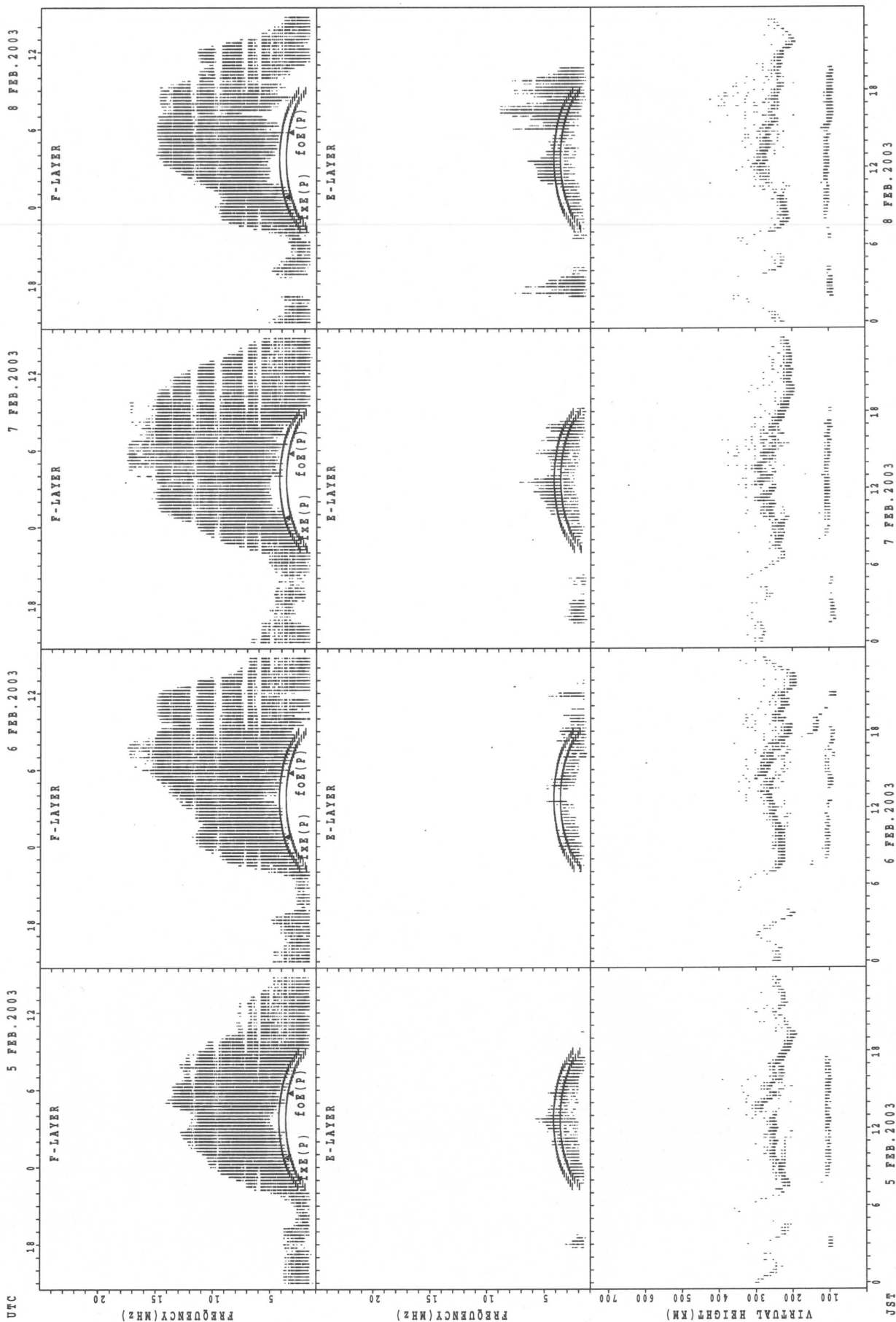
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



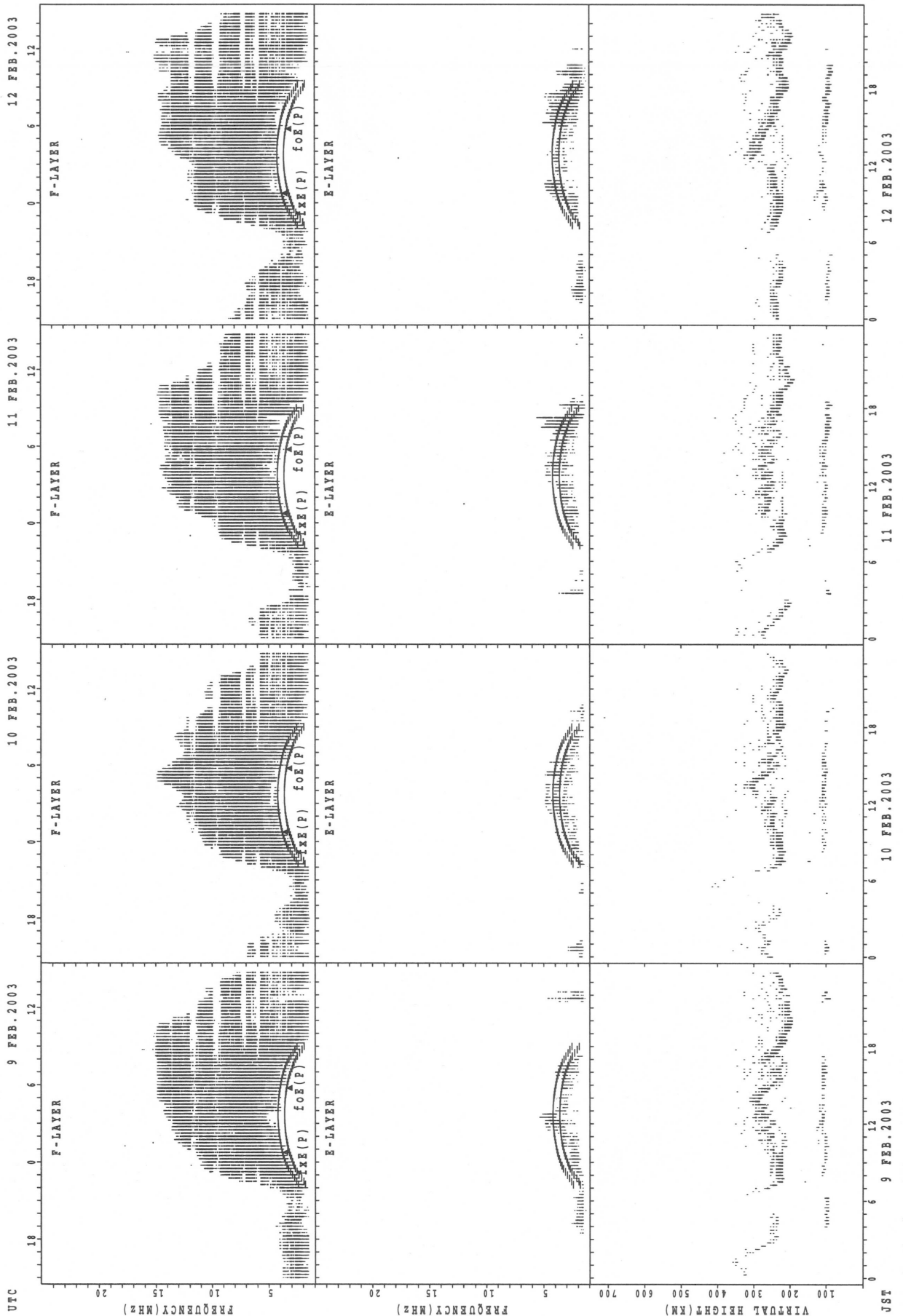
fxe(p); PREDICTED VALUE FOR fxe
foE(p); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



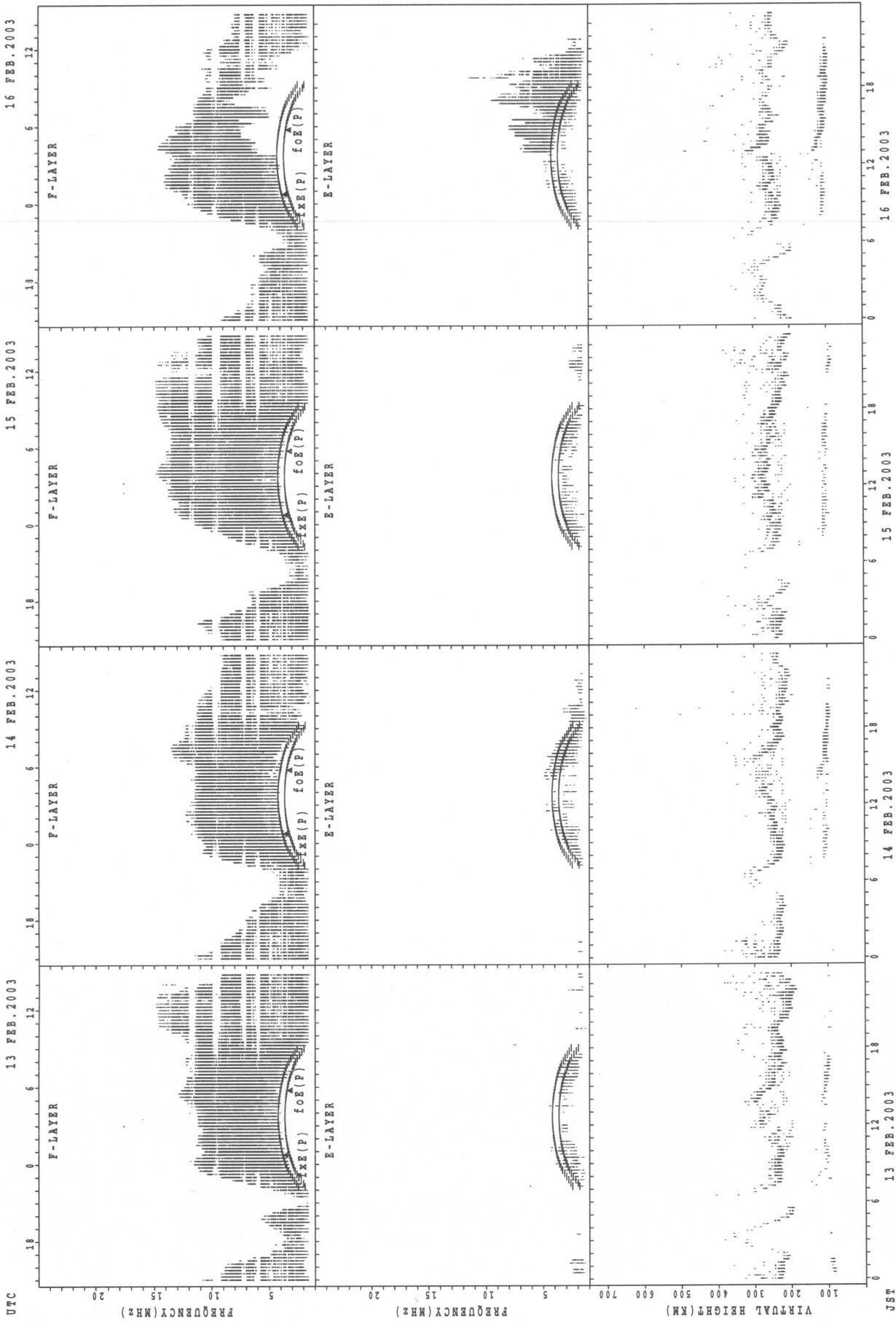
fxe(P); PREDICTED VALUE FOR fxe
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



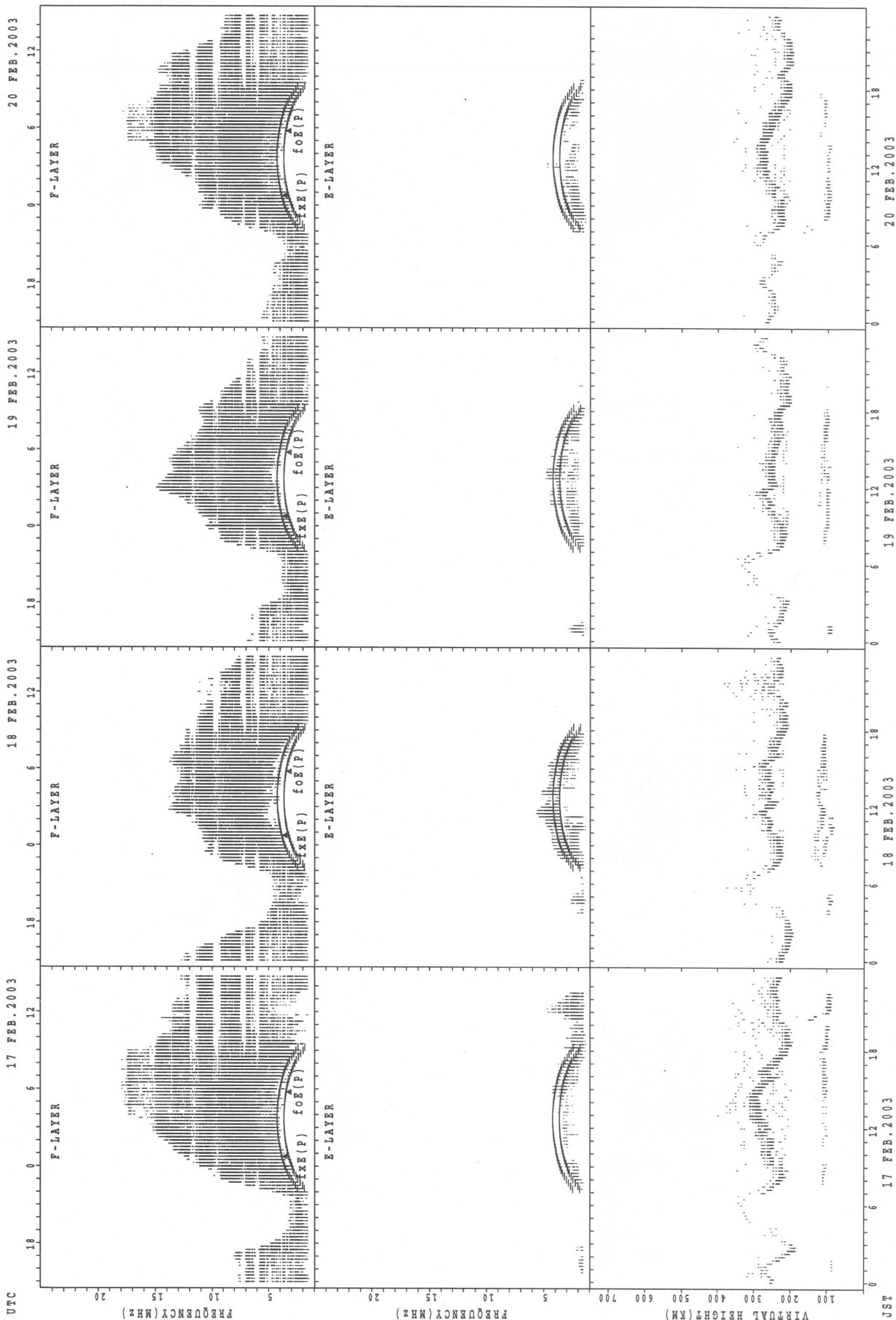
f_{x E(P)}; PREDICTED VALUE FOR f_{x E}
 f_{o E(P)}; PREDICTED VALUE FOR f_{o E}

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

20 FEB.2003

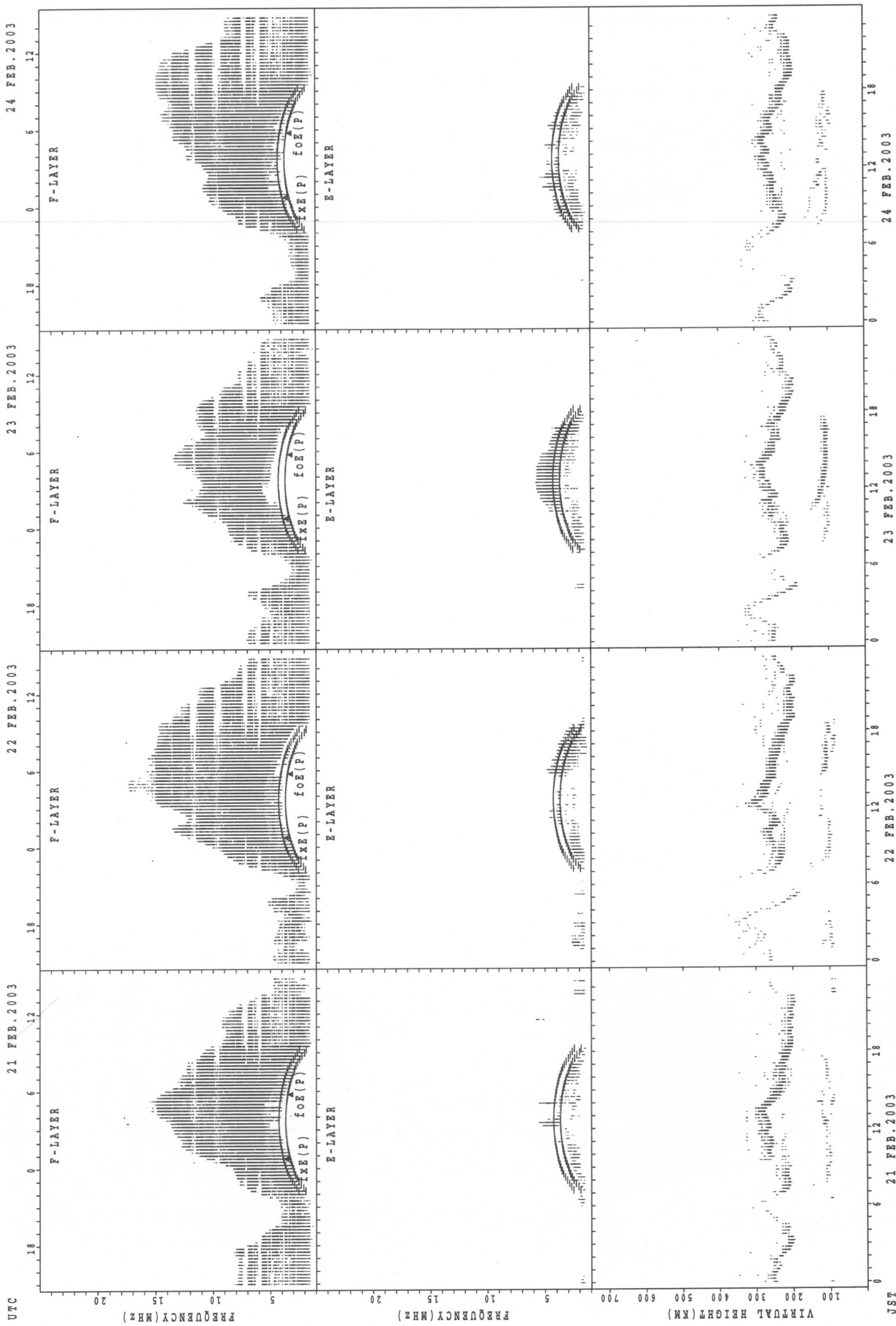
19 FEB.2003

18 FEB.2003

17 FEB.2003

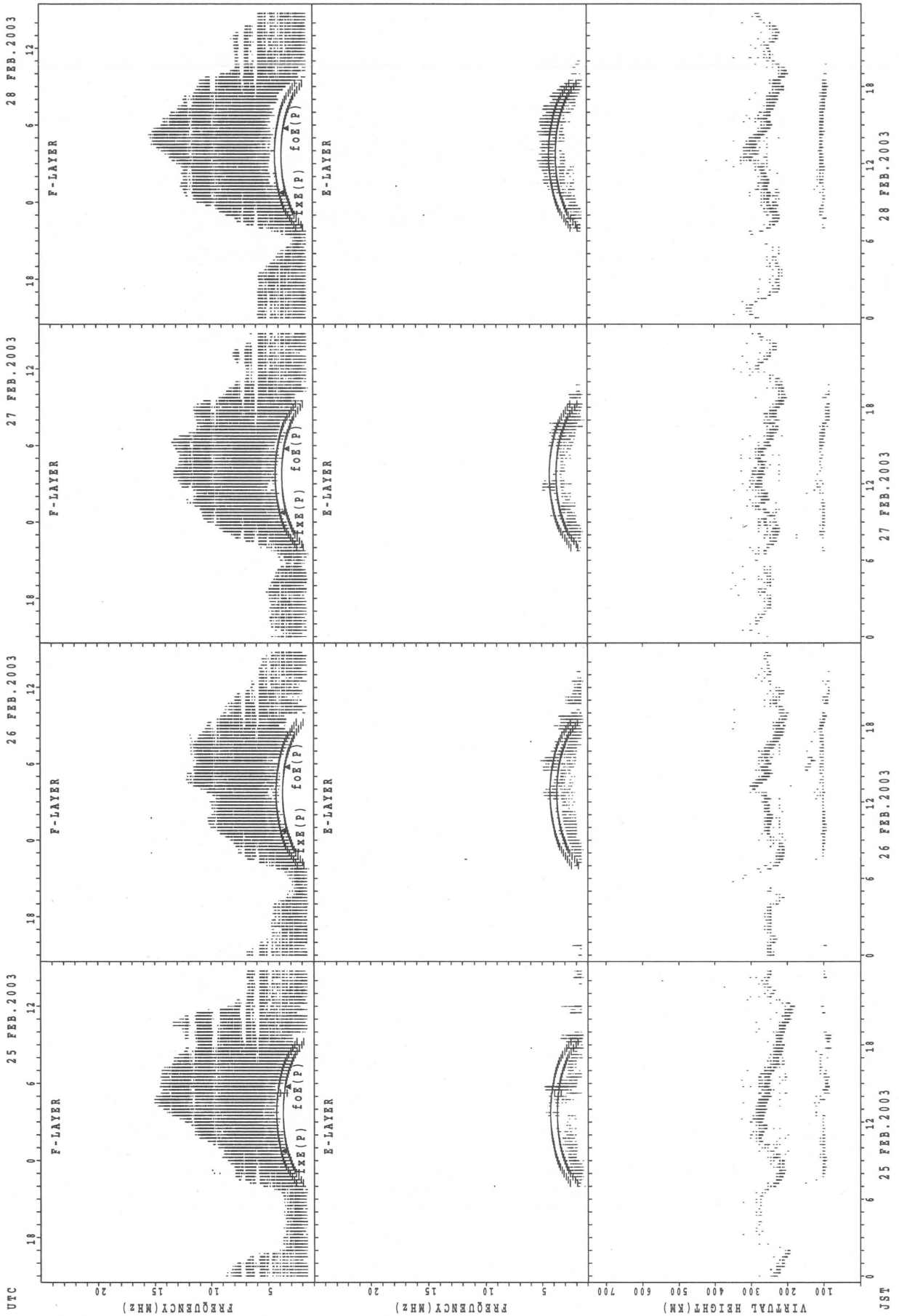
JST

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

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								20	27	27	26	17	15	22	26	28	27	25	7	1				
MED								246	222	224	230	230	230	230	228	230	232	264	288					
U Q								248	230	232	238	243	234	236	238	236	230	239	276	144				
L Q								240	214	222	224	225	222	226	226	222	222	230	256	144				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	5	7	4	4	4	3	1	5	6	5	5	4	3	1	3	4	10	11	12	6	6	7	8	8
MED	97	95	101	105	99	91	105	121	109	111	109	113	107	119	99	106	101	95	95	97	98	99	97	99
U Q	113	129	104	110	104	103	52	146	115	112	111	124	109	59	111	110	107	99	101	103	103	107	102	99
L Q	91	93	98	96	93	89	52	102	99	99	95	100	91	59	87	104	93	89	89	95	95	95	95	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1							18	28	28	23	6		7	27	28	27	23	8	1				
MED	376							235	222	233	234	241		240	238	232	230	240	242	224				
U Q	188							246	234	238	242	244		246	246	238	232	248	252	112				
L Q	188							230	214	223	232	234		238	232	229	222	232	237	112				

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	10	9	5	4	6	2	1	9	5	7	7	7	7	9	8	6	12	9	9	9	5	9	8	7
MED	95	97	97	103	95	100	95	149	113	109	107	105	105	107	107	108	106	103	99	99	97	97	99	97
U Q	97	98	100	116	97	103	47	168	151	131	119	115	109	111	110	111	107	111	102	104	97	103	105	99
L Q	91	91	95	99	91	97	47	137	110	107	105	103	103	103	103	107	102	93	91	93	95	96	96	95

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									23	24	22	10			9	22	24	23	21	14	5	1		
MED									234	232	243	246			258	246	238	242	248	258	280	262		
U Q									248	240	248	254			262	254	249	256	260	264	303	131		
L Q									224	230	236	240			245	238	231	238	234	252	256	131		

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	3	5	3	3	7	3	4	5	1	1	3	9	12	11	8	11	10	14	15	7	6	6	5	3
MED	97	99	97	97	97	97	98	97	103	115	109	113	111	111	112	107	109	103	97	95	95	100	95	97
U Q	97	103	109	99	103	101	100	134	51	57	111	126	116	113	118	113	111	107	101	99	97	105	101	97
L Q	87	95	97	95	97	91	96	92	51	57	107	110	105	105	107	103	99	97	89	87	89	91	88	93

MONTHLY MEDIANS OF h'F AND h'Es
 FEB. 2003 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	9	8	6	2					28	28	28	9				28	28	27	28	26	21	22	18	11
MED	262	256	255	247					238	242	254	246				254	249	244	230	236	238	240	242	264
U Q	284	292	260	264					248	249	262	275				262	257	254	238	246	246	264	266	280
L Q	247	247	246	230					231	234	246	246				248	242	232	223	222	221	228	228	260

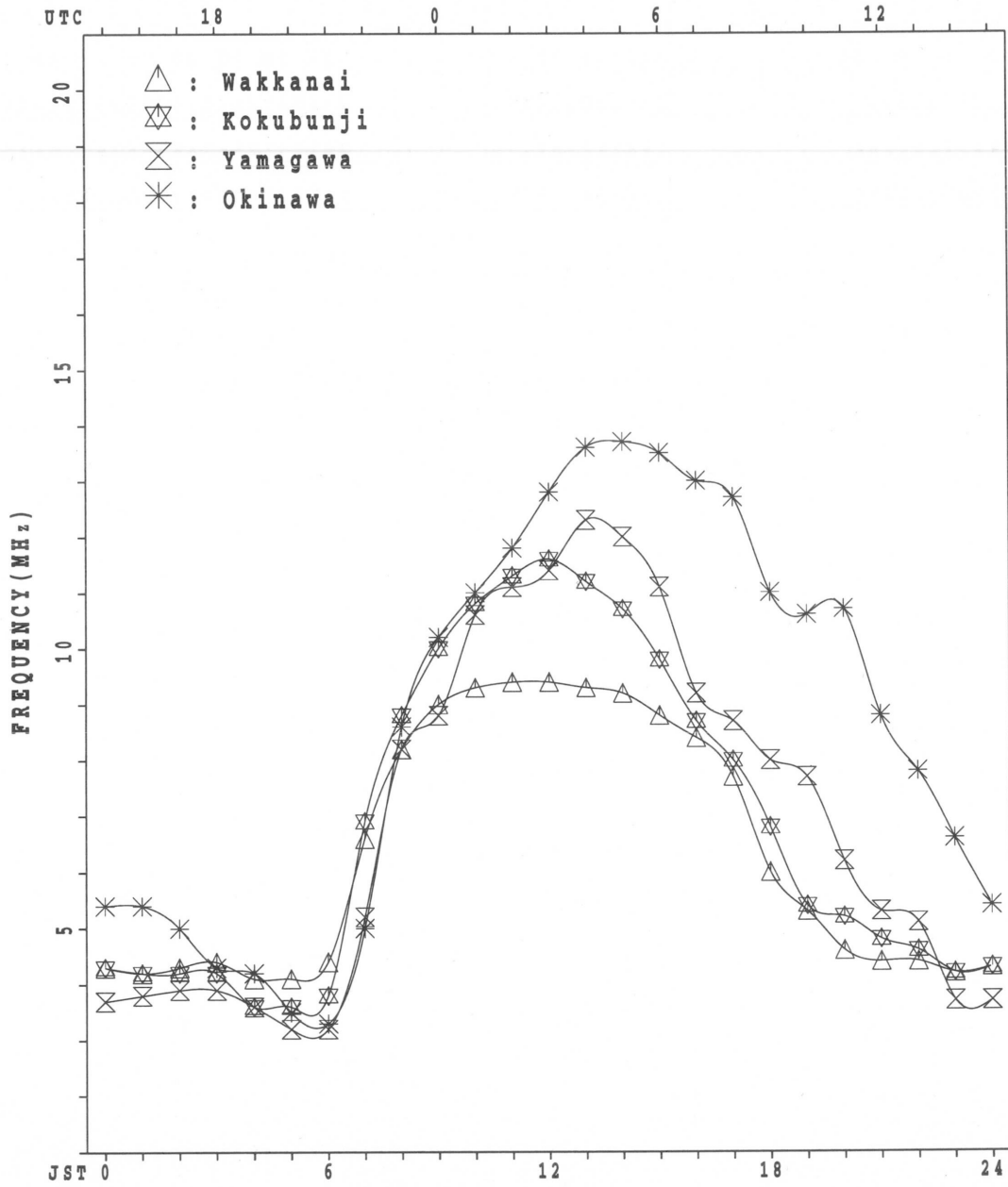
h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT		2	4	4	1	2	1	3	3	4	6	11	15	16	16	19	18	16	13	12	4	7	2	
MED		100	94	97	103	94	103	103	163	130	116	113	111	112	113	109	107	103	103	98	97	101	101	
U Q		105	97	99	51	95	51	111	163	164	119	115	115	115	120	115	111	109	105	103	99	103	107	
L Q		95	91	94	51	93	51	101	123	111	113	109	111	108	107	105	105	101	96	95	93	91	95	

MONTHLY MEDIANS PLOT OF f_oF₂

FEB. 2003

AUTOMATIC SCALING



IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 f_{XI} (0.1MHz)

135°E MEAN TIME (G.M.T. + 9 H)

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

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 45	X 44	X 41	X 43	X 37	X 37	X 36												X 62	X 53	X 44	X 41	X 42	X 42
2	X 42	X 43	X 42	X 43	X 42	X 39	X 32												X 95	X 80	X 64	X 70	X 65	X 66
3	X 66	X 64	X 60	X 57	X 51	X 52	X 49												X 74	X 68	X 51	X 54	X 50	X 51
4	X 49	X 49	X 48	X 49	X 45	X 43	X 37												X 67	X 60	X 60	X 62	X 54	X 48
5	X 47	X 44	X 44	X 48	X 41	X 38	X 42												X 60	X 54	X 51	X 54	X 50	X 50
6	X 48	X 47	X 49	X 44	X 43	X 43	X 44												X 69	X 71	X 65	X 49	X 42	X 43
7	X 44	X 45	X 44	X 46	X 42	X 41	X 44												X 78	X 65	X 61	X 52	X 46	X 47
8	X 48	X 49	X 47	X 49	X 48	X 46	X 47												X 72	X 60	X 56	X 60	X 53	X 46
9	X 48	X 47	X 50	X 52	X 52	X 42	X 44												X 75	X 70	X 68	X 63	X 45	X 45
10	X 45	X 44	X 44	X 46	X 42	X 42	X 46												X 80	X 75	X 75	X 62	X 55	X 57
11	X 58	X 60	X 63	X 56	X 44	X 41	X 44												X 81	X 75	X 68	X 56	X 56	X 55
12	X 52	X 53	X 56	X 53	X 44	X 43	X 47												X 77	X 68	X 67	X 50	X 43	X 45
13	X 46	X 47	X 45	X 42	X 46	X 42	X 48												X 84	X 81	X 72	X 58	X 52	X 51
14	X 55	X 56	X 50	X 46	X 43	X 44	X 44												X 92	X 79	X 59	X 55	X 54	X 54
15	X 54	X 58	X 52	X 50	X 44	X 46	X 48												X 107	X 80	X 68	X 60	X 62	X 70
16	X 88	X 55	X 48	X 45	X 48	X 56	X 50												X 79	X 68	X 65	X 57	X 50	X 52
17	X 51	X 51	X 52	X 51	X 46	X 45	X 47												X 70	X 61	X 61	X 49	X 49	X 50
18	X 50	X 51	X 44	X 44	X 38	X 40	X 41												X 84	X 64	X 59	X 57	X 56	X 56
19	X 58	X 61	X 55	X 44	X 45	X 40	X 41												X 75	X 66	X 64	X 53	X 52	X 52
20	X 53	X 52	X 48	X 47	X 48	X 47	X 48												X 89	X 60	X 54	X 49	X 48	X 48
21	X 50	X 52	X 50	X 49	X 40	X 40	X 44												X 62	X 53	X 57	X 54	X 48	X 45
22	X 46	X 47	X 47	X 49	X 51	X 41	X 45												X 63	X 61	X 62	X 59	X 54	X 42
23	X 42	X 41	X 43	X 47	X 41	X 36	X 42												X 70	X 54	X 56	X 50	X 48	X 48
24	X 48	X 49	X 52	X 54	X 41	X 40	X 44												X 69	X 54	X 54	X 48	X 48	X 48
25	X 46	X 48	X 46	X 44	X 43	X 42	X 45												X 84	X 56	X 50	X 43	X 44	X 43
26	X 44	X 43	X 44	X 44	X 43	X 44	X 48												X 68	X 62	X 65	X 48	X 49	X 49
27	X 50	X 51	X 51	X 52	X 50	X 50	X 55												X 75	X 60	X 58	X 60	X 54	X 53
28	X 55	X 53	X 56	X 54	X 37	X 35	X 48												X 86	X 65	X 60	X 62	X 62	X 55
29																								
30																								
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	28	28	28	28	28	28	28												28	28	28	28	28	28
MED	X 48	X 49	X 48	X 48	X 44	X 42	X 44												X 75	X 64	X 60	X 54	X 50	X 50
U Q	X 54	X 53	X 52	X 52	X 47	X 44	X 48												X 84	X 70	X 65	X 60	X 54	X 54
L Q	X 46	X 46	X 44	X 44	X 42	X 40	X 43												X 69	X 60	X 56	X 50	X 48	X 46

IONOSPHERIC DATA STATION Kokubunji

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	S	39	38	35	37	31	31	30	63	86	100	118	124	120	126	114	100	79	65	56	46	38	35	36	36
2		36	37	36	37	36	32	26	51	86	106	82	99	117	108	114	97	90	90	89	74	58	64	59	59
3		60	58	54	51	45	46	43	74	86	106	124	123	123	119	117	103	84	84	68	62	45	48	44	45
4		43	43	42	43	39	37	30	65	79	92	114	129	108	84	89	92	82	78	61	53	54	56	48	42
5		41	38	38	42	35	32	36	65	84	92	103	113	102	105	95	92	83	66	54	48	45	48	44	44
6		42	41	43	38	37	37	37	67	91	102	116	119	114	117	94	90	84	69	63	65	58	43	36	37
7		38	39	38	40	36	35	38	69	96	109	132	130	126	125	107	98	85	83	72	59	55	46	40	40
8		42	43	41	43	42	40	41	74	90	98	109	102	121	134	115	107	92	78	66	54	50	54	47	40
9		42	41	44	46	46	36	38	76	95	96	113	110	131	109	113	110	99	84	69	64	62	57	39	39
10		39	38	38	40	36	36	40	65	81	96	109	106	112	123	114	102	94	84	74	69	68	56	49	51
11		52	54	57	50	38	35	38	70	98	114	124	130	148	139	117	115	108	91	75	69	62	50	50	49
12		46	47	50	47	38	37	41	77	98	104	98	111	122	114	114	108	100	90	71	62	61	44	37	38
13		40	41	39	36	40	36	42	72	96	91	109	123	108	101	99	103	90	85	78	74	66	52	46	45
14		49	50	44	40	37	38	38	76	95	106	107	114	114	106	92	93	94	96	86	73	53	49	48	48
15		48	52	46	44	38	40	42	71	102	119	127	121	124	130	124	108	104	105	101	74	62	54	56	64
16	F		49	42	39	42	49	44	72	96	113	119	126	114	105	100	103	100	80	73	62	58	51	44	46
17		45	45	46	45	40	39	41	72	104	109	107	120	118	114	113	106	103	92	64	55	54	43	43	44
18		44	45	38	38	32	34	35	74	96	100	100	105	112	104	97	94	88	81	78	58	53	51	50	50
19		52	55	49	38	39	34	35	75	94	101	104	107	121	110	96	88	83	75	69	60	58	47	46	46
20		47	46	42	41	42	41	42	71	93	100	104	115	123	118	122	114	99	80	83	54	48	43	42	42
21		44	46	44	43	34	34	38	78	84	84	98	108	116	116	108	97	90	69	56	47	51	48	42	38
22		40	41	41	43	45	35	39	65	81	103	108	114	124	120	103	84	80	71	57	55	56	53	48	36
23		36	35	37	41	34	30	36	64	71	91	103	98	97	102	100	92	90	84	63	48	49	44	42	42
24		42	43	46	48	35	33	38	67	85	98	90	101	102	87	101	95	77	77	63	48	48	42	42	42
25		40	42	40	38	37	36	39	67	80	98	96	96	100	98	100	92	76	73	78	50	44	37	38	37
26		38	37	38	38	37	38	42	71	84	81	86	99	95	97	88	91	87	75	62	56	59	42	43	43
27		44	45	45	46	44	44	49	69	95	94	94	106	130	112	111	111	89	77	69	54	52	54	48	47
28		49	47	50	48	30	29	42	78	94	92	117	118	118	113	107	96	88	89	80	59	54	56	55	49
29																									
30																									
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	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED		42	43	42	42	38	36	38	71	92	100	108	114	118	112	107	98	90	80	69	58	54	48	44	44
U Q		47	47	46	46	41	38	42	74	96	106	116	122	123	120	114	106	96	87	78	64	58	54	48	48
L Q		40	40	38	38	36	34	36	66	84	93	99	106	110	104	98	92	84	75	63	54	50	44	42	40

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 foF1 (0.01MHz) 135'E MEAN TIME (G.M.T. + 9 H)

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

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												L		L										
2												L	L											
3																								
4											L			L	L									
5												L	L	L										
6												L	L											
7													L	L										
8													L											
9													L		L									
10													L		L									
11											L	L	L											
12												L	L		L									
13											L	L		L		L								
14											L		L	L										
15											L	L	L	L										
16									L	L	L		L			L								
17										L	L	L												
18											L	L	L	L										
19										L	L	L		L	L									
20								L		L		L	L	L										
21									L	L	L	L	L											
22										L	L	L	L	L		L								
23										L	L	L	L	L	L									
24										L	L	L	L	L	L									
25										L	L	L	L		L	L								
26										L	L	L	L	L	L									
27									L		L	L	L	L										
28										L	L	L	L			L								
29																								
30																								
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											
MED												L	L											
U Q												508	478											
L Q																								

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 foEs (0.1MHz)

135°E MEAN TIME (G.M.T. + 9 H)

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

H	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	E	BE	BJ	AJ	AJ	A		G	G	G		GE	B		G	GE	BE	BE	BE	BE	BJ	AJ	AJ	A			
2	54	J	AJ	AE	BE	BE	BE	BJ	A				G				GJ	AJ	AJ	AJ	AJ	AE	BE	BE	B			
3	15	E	BE	BE	BE	BE	BE	BE	B	G	GJ	AJ	AJ	AJ	A				J	AJ	AJ	AJ	AJ	AJ	A			
4	36	J	AJ	AJ	AJ	AJ	AE	BE	B				G					E	BE	BE	BE	BE	BE	BE	B			
5	16	E	BE	BE	BE	BE	BE	BE	B		GJ	AJ	AJ	A	G		J	AJ	AJ	AE	B		E	BE	BE	B		
6	18	E	BE	BE	BE	BE	BE	BE	B		GJ	A	G	G	GE	B	G					E	BE	BE	BE	B		
7	16	E	BE	BE	BE	BE	BE	BE	B		G		J	AJ	AJ	A	G	J	AJ	AJ	AJ	AJ	AJ	A	J	A		
8	31	J	AJ	AJ	AJ	AJ	AE	BE	B		J	AJ	AJ	A	G	G	G	GE	BJ	AJ	A		J	AJ	AJ	A		
9	18	J	AJ	AE	BE	BE	BE	B					J	A	GJ	A	GJ	AJ	AJ	AJ	AJ	AE	B		E	B		
10	16	E	BE	CE	BE	BE	CE	BE	BE	C	G	G	G		J	A						E	BE	BE	B	E	B	
11	26	J	AJ	AE	BE	BE	BE	BE	B		G	G	J	A			G	GE	BJ	AE	BE	BE	BE	BJ	AJ	A		
12	23	J	AE	BJ	AJ	AJ	AJ	AJ	A		G	G		G	G	G	G	GJ	AJ	AE	B		J	AE	BJ	A		
13	40	J	AJ	AJ	A		J	AJ	A		G	G	G	G	G	G	G	GE	B			E	BE	BE	B			
14	18	J	A	E	BE	BE	BE	BE	B		G	G	G		J	A	G	G	GJ	AE	BJ	A			E	B		
15	15	E	BJ	AJ	AE	BE	BE	BE	B		G	GE	B	G		G	G	G				E	BJ	AJ	AJ	AJ	AE	B
16	21	J	AJ	A		E	BE	BE	BE	B		G	G	J	A		G					J	AJ	AJ	A	J	AE	B
17	18	18	18	18	19	20	20	16	22		G	G	G	G			G	GE	BJ	AE	BE	BE	BE	BJ	AJ	A		
18	16	E	BE	BE	BE	B		E	BE	B				J	AJ	G	G					E	BE	BE	BE	BE	BE	B
19	19	J	AE	BE	BE	BE	BE	BE	B		G	J	A		G			E	BE	CE	BE	BE	BE	BE	BE	BE	B	
20	18	E	BE	BE	BE	BE	BE	BE	B		G	G		G	G	G	G					E	BE	BE	BE	BJ	AE	B
21	15	E	BE	BE	BE	BE	BE	BE	B		G	G	G	G				GE	BE	BE	BE	BE	BE	BE	BE	BE	B	
22	15	E	BJ	AE	BE	B		E	BE	B			G									E	BE	BE	BJ	AJ	AJ	A
23	21	E	B		E	BE	BE	BE	B		G	G	G		J	AJ	AJ	AJ	AE	BJ	AE	B		J	AJ	A		
24	22	J	AJ	A		J	AJ	AJ	AE	B	G		G		G	G	G					E	B		E	BE	B	
25	14	E	BE	BE	BE	BE	CE	BE	B		G	G	G	G	G	G	G					J	AJ	AE	BJ	A	E	B
26	15	E	BE	BE	BE	BE	BE	BE	B		G		G					J	AE	BE	BE	BE	BJ	A				
27	14	E	BE	BE	BE	BE	BE	BE	B		GJ	G		J	A							J	A		J	A	J	A
28	35	J	AJ	AJ	AJ	AJ	AJ	A		G	G		J	AJ	AJ	AJ	A	G				J	AJ	AJ	AE	BE	B	
29																												
30																												
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	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28			
MED	18	E	E	BE	BE	BE	BE	B		G	G						G					E	BE	B				
UQ	22	J	AJ	AJ	AJ	AJ	AJ	A				J	AJ	A				J	AJ	AJ	AJ	AJ	AJ	AJ	A			
LQ	16	E	BE	BE	BE	BE	BE	B		G	G	G	G	G	G	G	G					E	BE	BE	BE	BE	B	

FEB. 2003 foEs (0.1MHz)

COMMUNICATIONS RESEARCH LABORATORY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

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

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
1	E	16	16	15	16	19	17	15	19	G	G	G	G	U	Y	E	B	G	G	E	B	E	B	E	B	E	B
2	E	21	16	15	15	15	16	16	21	27	34	34	35	30	36	34	20	43	48	18	16	14	15	15	15	16	
3	E	15	14	16	15	15	15	15	G	21	35	39	44	65	34	39	31	28	20	20	19	22	20	E	C	28	19
4	E	15	32	17	15	15	15	15	22	28	32	36	36	37	37	34	34	26	15	15	16	15	16	16	15	15	
5	E	16	15	16	16	15	15	15	17	G	22	30	34	36	30	34	34	23	37	E	B	E	B	E	B	E	B
6	E	16	15	16	15	14	16	15	21	22	31	29	29	30	42	26	G	25	19	15	16	15	15	15	15	15	
7	E	16	15	15	16	14	16	15	21	G	22	25	40	40	39	41	30	24	31	23	21	21	19	17	E	B	
8	E	23	21	27	16	18	15	15	20	27	35	36	37	28	32	26	28	21	20	21	20	E	B	16	16	16	15
9	E	16	17	18	17	14	14	15	21	27	32	35	40	39	44	31	26	G	22	24	23	18	E	B	15	15	15
10	E	16	28	16	14	27	15	15	28	G	25	28	37	41	48	37	35	U	Y	18	15	15	16	16	16	16	
11	E	16	16	16	15	15	15	15	22	G	G	36	38	37	36	34	G	G	E	B	E	B	E	B	E	B	
12	E	16	15	16	16	17	16	15	22	G	20	27	35	37	29	30	30	G	19	17	16	16	15	16	16	16	
13	E	21	16	16	14	16	15	16	22	G	22	27	29	30	29	27	25	G	19	G	E	B	E	B	E	B	
14	E	16	16	16	15	14	16	15	22	G	G	29	36	38	38	35	25	G	G	G	18	15	15	16	16	15	
15	E	15	14	17	15	16	15	16	22	G	20	23	35	38	G	G	G	U	Y	25	18	15	16	22	17	16	
16	E	15	20	15	15	16	16	16	20	G	22	20	38	38	47	39	37	G	29	25	20	18	21	20	20	15	
17	E	15	15	16	16	15	15	16	20	G	24	28	29	29	31	28	18	G	18	20	15	16	E	B	15	15	
18	E	16	15	16	15	15	20	16	22	29	33	35	36	19	29	22	24	U	Y	32	16	15	16	15	14	15	
19	E	16	15	15	15	14	15	16	21	G	31	35	37	27	36	33	32	G	30	E	B	E	B	E	B	E	
20	E	18	15	14	15	15	15	15	22	G	28	24	30	38	29	28	34	G	27	19	14	15	14	16	17	14	
21	E	15	15	16	16	15	15	16	22	G	23	27	26	G	26	37	37	G	27	G	E	B	E	B	E	B	
22	E	15	15	15	15	16	14	16	23	29	33	33	25	36	36	37	34	G	29	19	16	16	15	16	16	15	
23	E	16	15	16	14	14	15	15	22	G	19	24	24	38	36	34	41	G	33	22	16	16	15	15	16	18	
24	E	16	21	15	16	16	14	15	G	30	23	36	36	36	22	22	31	G	28	19	15	16	15	16	15	16	
25	E	14	15	15	15	28	15	15	24	29	34	20	27	G	G	G	G	G	32	21	18	16	15	21	15	15	
26	E	15	15	16	16	16	15	15	23	21	32	35	36	28	38	35	34	G	29	24	15	16	18	15	15	16	
27	E	14	15	16	15	14	15	15	22	G	18	23	36	28	40	38	36	G	29	21	16	19	15	16	16	15	
28	E	15	16	15	16	16	15	15	24	G	19	26	36	37	38	41	49	G	20	24	19	21	40	14	15	16	
29																											
30																											
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		28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28		
MED		E	B	E	B	E	B	E	B	G	G	35	36	35	36	34	G	27	19	16	16	15	16	16	16		
U Q		16	16	16	16	16	16	16	22	27	32	36	38	38	38	36	33	30	22	18	17	16	16	16	16		
L Q		E	B	E	B	E	B	E	B	G	G	G	G	G	G	G	G	G	G	E	B	E	B	E	B		
		15	15	15	15	14	15	15	20	21	24	29	29	32	28	26	22	22	18	15	16	15	15	15	15		

IONOSPHERIC DATA STATION Kokubunji

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

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

D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	16	16	15	14	14	14	15	15	16	20	20	24	28	35	23	19	16	15	15	16	15	15	16	15
2	16	14	15	15	15	16	16	14	15	15	20	21	23	22	18	16	14	15	13	16	14	15	15	16
3	15	14	16	15	15	15	15	15	15	18	18	19	22	20	20	21	16	14	14	14	15	15	E C 28	15
4	15	15	15	16	16	15	15	15	16	15	E C 28	15	16	17	20	17	15	15	15	16	15	16	16	15
5	16	15	16	16	15	15	15	15	17	16	16	16	18	20	20	15	15	14	15	16	15	16	16	15
6	16	15	16	15	14	16	15	16	14	16	19	20	20	42	16	19	15	16	15	16	15	15	15	15
7	16	15	15	16	14	16	15	16	15	16	16	17	19	19	19	14	15	15	15	15	14	14	15	16
8	15	15	15	16	15	15	15	15	14	15	18	20	20	20	19	18	15	20	14	15	16	14	15	15
9	14	13	15	14	14	14	15	14	16	16	16	19	20	20	20	20	18	15	15	15	15	15	15	15
10	16	E C 28	16	14	E C 27	15	15	28	19	19	20	20	20	19	23	21	16	14	16	15	16	16	16	16
11	14	16	16	15	15	15	15	16	21	19	21	20	21	21	19	21	16	19	16	15	15	15	15	14
12	16	15	14	12	13	14	15	15	15	16	20	27	22	21	21	20	16	15	16	16	15	16	16	16
13	15	16	15	14	16	15	14	13	14	16	18	20	21	22	16	18	15	14	15	15	15	15	15	15
14	15	16	16	15	14	16	15	15	20	18	18	19	19	20	23	19	15	15	15	15	15	16	15	15
15	15	14	14	15	16	15	16	13	15	20	35	26	31	25	20	19	16	16	15	15	16	14	16	16
16	15	15	15	15	16	16	16	16	15	16	18	18	20	24	18	19	15	14	14	14	14	14	14	15
17	15	15	14	15	15	15	16	14	14	17	21	20	18	23	16	16	14	13	15	15	16	15	15	16
18	16	15	16	15	15	20	16	15	14	15	16	16	14	15	14	18	15	14	15	16	15	14	15	16
19	15	15	15	15	14	15	16	14	15	14	20	18	20	20	18	19	14	18	E C 28	15	15	16	15	16
20	18	15	14	15	15	15	15	14	13	13	15	24	19	18	15	15	16	14	14	15	14	16	15	14
21	15	15	16	16	15	15	16	15	16	15	22	20	20	20	16	16	15	15	16	15	15	15	14	16
22	15	15	15	15	16	14	16	15	13	14	14	21	18	22	20	15	13	16	16	16	15	15	16	15
23	16	15	15	14	14	15	15	15	14	15	16	28	20	20	20	16	14	15	16	16	15	15	14	16
24	14	14	15	14	15	14	15	15	14	14	20	19	20	16	15	15	15	14	15	14	15	15	15	16
25	14	15	15	15	E C 28	15	15	14	15	E C 29	14	23	23	18	18	15	18	14	15	16	15	14	16	15
26	15	15	16	16	16	15	15	14	15	16	16	19	20	19	18	E C 28	16	15	15	16	18	15	15	16
27	14	15	16	15	14	15	15	15	15	18	14	20	20	23	26	15	15	15	14	15	15	15	15	15
28	15	15	15	15	14	15	15	15	15	18	16	19	24	21	18	18	16	14	15	14	15	14	15	16
29																								
30																								
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	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED	15	15	15	15	15	15	15	15	15	16	18	20	20	20	19	18	15	15	15	15	15	15	15	15
U Q	16	15	16	15	16	15	16	15	16	18	20	21	22	22	20	19	16	15	16	16	15	16	16	16
L Q	15	15	15	14	14	15	15	14	14	15	16	19	19	19	17	16	15	14	15	15	15	14	15	15

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	S																								
1		310	306	294	333	274	307	321	355	360	328	330	332	317	319	330	331	330	343	339	340	330	318	311	307
2		281	277	285	296	307	303	342	342	338	371	341	309	316	304	336	315	335	312	323	345	272	300	284	275
3		290	298	272	267	264	276	375	374	308	325	325	322	307	320	325	330	328	340	330	341	303	321	296	287
4		289	315	300	312	290	297	298	360	367	349	331	327	351	343	316	339	339	337	329	301	293	299	309	316
5		320	300	280	305	318	301	325	334	367	333	329	335	325	332	326	319	341	349	320	313	311	323	307	312
6		329	288	300	308	300	302	323	346	350	343	336	336	337	337	342	323	347	335	318	317	332	337	282	273
7		271	282	287	310	300	276	314	346	346	326	328	326	312	330	319	340	333	335	327	316	321	307	307	289
8		282	293	283	274	285	296	310	349	374	335	336	308	312	324	322	324	325	325	324	300	302	319	325	297
9		278	282	271	301	339	276	295	346	357	339	323	318	334	317	318	325	338	328	324	305	324	330	310	293
10		287	268	292	309	268	255	315	367	348	336	333	323	312	323	321	322	330	317	325	294	322	316	279	272
11		280	289	311	323	280	282	320	335	336	324	324	294	321	317	312	314	318	319	316	312	333	296	298	298
12		290	288	302	323	276	272	307	356	351	354	336	324	317	317	326	322	331	330	332	318	327	320	271	270
13		297	306	288	269	288	287	319	351	363	339	316	333	335	322	318	330	334	324	304	318	331	314	287	285
14		295	311	314	301	289	289	291	355	353	343	327	315	325	325	329	320	332	321	319	333	314	283	294	282
15		265	299	288	309	267	266	281	324	331	329	319	312	305	312	314	318	320	318	339	321	313	287	275	281
16	F		295	286	266	277	283	305	328	343	344	324	337	333	322	322	330	345	332	326	308	318	307	286	282
17		269	286	308	305	295	274	294	336	344	357	334	334	332	320	324	326	341	350	313	301	326	298	281	296
18		300	327	306	322	285	276	288	342	349	353	323	310	332	326	330	338	347	335	338	320	320	293	295	280
19		288	319	336	317	318	276	301	348	354	342	343	320	334	336	341	343	349	338	319	317	336	309	294	293
20		291	306	299	295	307	306	312	354	336	342	334	326	332	328	331	335	342	330	343	327	315	306	295	293
21		282	302	320	332	318	287	309	370	358	343	328	322	323	328	339	333	361	348	332	307	328	331	320	297
22		281	310	301	287	332	316	317	348	335	328	337	315	324	337	338	347	340	344	318	318	323	321	333	329
23		299	290	288	325	348	305	328	361	343	339	339	337	329	325	336	338	339	353	342	308	326	305	311	278
24		285	296	323	353	304	299	323	359	354	338	345	341	337	328	337	360	351	355	350	310	330	314	305	290
25		292	316	323	321	319	314	318	355	369	345	354	332	337	327	339	347	354	345	347	355	326	313	309	299
26		297	305	313	311	317	288	321	368	367	359	350	338	321	344	337	338	354	353	340	315	333	289	286	290
27		266	296	296	306	306	302	334	336	351	330	310	297	316	318	309	331	344	339	332	297	291	306	288	284
28		268	280	311	329	283	285	313	348	358	318	326	316	316	311	321	339	321	342	339	315	296	297	300	284
29																									
30																									
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	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
MED		288	297	300	309	298	288	314	348	351	339	330	324	324	324	326	330	339	336	328	316	322	308	296	290
U Q		297	306	311	322	318	302	322	358	359	344	336	334	334	329	336	338	346	344	339	320	329	320	309	297
L Q		280	288	288	298	282	276	303	342	343	330	324	315	316	318	320	322	330	326	320	308	312	298	286	282

IONOSPHERIC DATA STATION Kokubunji

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

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

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												L		L										
2												L	L											
3																								
4											L			L	L									
5												L	L	L										
6												L	L											
7													L	L										
8													L											
9													L		L									
10													L		L									
11											L	L	L											
12												L	L		L									
13											L	L		L		L								
14											L		L	L										
15											L	L	L	L										
16										L	L	L		L		L								
17											L	L	L											
18												L	L	L	L									
19											L	L	L		L	L								
20									L		L		L	L	L									
21										L	L	L	L	L										
22										L	L	L	L		L									
23										L	L	L	L	L	L									
24										L	L	L	L	L	L									
25										L	L	L	L		L	L								
26										L	L	L	L	L	L	L								
27										L		L	L	L	L									
28											L	L	L	L		L								
29																								
30																								
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											
MED												L	L											
U Q												386	372											
L Q																								

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 h'F2 (KM)
135°E MEAN TIME (G.M.T. + 9 H)
LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 25.0MHz IN 24.0SEC IN MANUAL SCALING

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												248		248										
2												280	270											
3																								
4											260			230	254									
5												256	250	262										
6												248	244											
7													268	258										
8													276											
9													256		270									
10													278		264									
11											260	294	268											
12												256	256		248									
13											272	254		260		260								
14											252		256	256										
15											256	274	272	258										
16										244	250	246		272		258								
17											250	252	250											
18												254	248	254	264									
19											242	262	246		250	248								
20									248		232		250	250	260									
21										238	264	258	262	258										
22										258	252	268	244		238									
23										258	252	248	262	258	260									
24										254	248	250	264	250	252									
25										248	236	258	250		244	244								
26										244	234	264	258	246	252									
27										254		286	270	256	280									
28											262	258	256	260		252								
29																								
30																								
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	8	16	20	23	16	13	5								
MED									248	251	252	257	256	257	254	252								
U Q										256	260	266	268	259	264	259								
L Q										244	245	251	250	250	249	246								

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
1		248	250	272	246	E A E A	276	256	250	226	216	214	224	198	H	206	204	220	210	206	H	216	214	226	E A E A E A	250	282	288		
2		E A E A E B	314	294	294	260	232	256	234	208	236	206	212	214	212	220	216	216	226	256	222	194	E B	276	264	264	E B	286		
3		256	258	E B E B	290	292	236	E B	316	202	200	204	226	230	244	246	216	230	218	214	216	214	216	222	250	E C E A	294	278		
4		270	E A	288	272	238	264	258	E B	280	202	204	214	206	198	H	206	202	204	226	218	H	182	200	238	254	236	212	248	
5		240	250	E B	294	248	230	266	244	H	186	208	210	216	202	204	198	214	214	218	212	216	222	234	244	246	254			
6		230	E B	278	254	228	238	248	222	218	220	220	200	202	H	198	238	208	204	216	204	218	224	212	212	242	E B	332		
7		E B E B E B	324	300	284	266	224	E B	320	242	218	220	224	222	222	198	218	210	212	218	222	216	228	226	244	234	E A	338		
8		E A E A E A E B	286	282	336	292	270	264	250	212	204	202	222	222	202	216	218	200	208	204	230	E A	256	232	236	216	254			
9		E A E A E A E A	294	332	324	270	220	220	E B	274	220	208	216	214	216	212	218	206	224	214	206	214	234	230	216	206	E B	278		
10		E B E C E B	282	350	288	242	E C E B	342	336	246	202	216	224	218	220	210	258	214	222	220	216	216	248	232	212	246	E B	290		
11		E A	276	268	252	218	196	E B	282	236	224	220	220	218	214	228	216	208	216	220	216	198	230	210	228	256	258			
12		E B	276	282	258	236	258	E A	320	252	220	220	220	208	200	208	218	210	218	216	H	186	198	222	220	212	E B E B	306	304	
13		E A	294	264	E A E B	308	270	256	242	220	214	206	H	184	208	216	208	208	204	210	214	216	228	216	220	262	E B	296		
14		272	246	230	232	248	E B E B	278	276	224	216	216	208	204	214	214	218	216	218	224	214	206	216	256	248	E B	278			
15		E B E B E A	302	268	268	234	300	E B E B	320	286	208	222	H	188	192	208	202	204	214	218	226	232	204	210	216	246	E B	282	264	
16		232	250	E B E B	280	326	300	248	220	H	208	212	210	208	206	228	208	228	202	H	224	206	220	228	234	250	E A E B	282	288	
17		E B E B	314	294	248	252	252	E B	282	228	216	214	198	200	H	194	202	206	200	226	208	190	238	216	228	E B	286	272		
18		266	236	230	238	232	E B E B	336	292	228	208	212	210	206	208	196	214	220	220	214	214	208	222	256	258	E B	280			
19		268	244	214	218	252	E B E B	316	284	230	216	210	200	198	210	220	212	204	214	210	232	210	224	218	254	E B	284			
20		E B	276	252	244	272	246	256	240	218	212	210	H	188	218	200	210	196	206	216	H	206	208	202	232	236	256	276		
21		E B	300	256	252	226	220	E B	290	252	214	210	200	204	206	214	218	224	228	208	194	208	222	228	220	234	256			
22		E B	282	266	260	302	228	198	240	212	228	218	218	196	H	194	234	218	218	216	206	206	230	226	224	220	218			
23		E B E B E A	268	298	300	244	204	258	242	202	216	210	200	208	218	204	224	234	222	208	200	220	224	250	264	E A	318			
24		E A E A	290	282	238	210	238	E B	278	246	214	212	208	202	198	206	H	194	212	218	218	214	206	220	222	230	264	274		
25		E B	290	254	232	242	E C	262	244	234	218	210	204	210	H	186	196	206	H	194	214	212	216	216	200	230	E A	272	E B	274
26		E B	284	270	254	258	246	268	242	208	212	194	202	186	H	208	E A	226	210	226	222	208	208	222	226	218	262	266		
27		E B	308	266	260	260	258	268	228	208	204	H	192	H	H	224	218	214	226	220	212	218	234	246	250	264	E B	302		
28		E B E A	320	304	248	226	204	E B	292	256	228	222	214	208	214	214	212	238	214	216	224	210	214	304	254	240	E B	282		
29																														
30																														
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		28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	
MED		E	U	U			U																				E	278		
U Q		E B E	297	291	E B E B E	286	268	263	E B E B	304	265	222	220	217	217	214	214	218	218	221	220	216	216	230	232	250	E	E B	289	
L Q		268	253	248	233	229	256	238	208	209	206	200	H	198	H	202	204	208	208	214	206	206	212	221	220	241	265			

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 h'E (KM)

135'E MEAN TIME (G.M.T. + 9 H)

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

D	H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1									B	112	118	114	118	118	B	110	122	120	B							
2									B	114	116	118	118	116	116	116	114	A	B							
3									E B	122	116	A	A	A	A	A	A	114	B							
4									B	120	116	110	112	110	114	112	A	A	B							
5									B	118	A	A	A	116	A	A	A	120	B							
6									B	122	A	120	116	118	B	112	110	112	B							
7									B	120	114	112	A	A	A	118	118	A	B							
8									B	112	116	A	A	120	116	112	116	114	B							
9									E B	122	112	112	118	118	A	A	116	114	114	B						
10									E C	118	116	118	120	116	A	118	A	110	B							
11									B	114	112	116	116	114	116	A	112	118	B							
12									122	116	116	114	110	116	118	118	112	114	B							
13									116	122	114	116	112	112	110	112	112	110	112							
14									124	114	112	116	108	112	112	A	116	112	120							
15									E B	130	116	110	B	120	118	114	116	112	A	B						
16									B	120	114	116	114	A	A	A	112	116	B							
17									114	110	114	118	116	116	116	112	110	110	112							
18									E B	134	112	112	114	114	108	108	106	114	110	B						
19									120	118	114	A	A	116	112	A	116	114	B							
20									110	116	116	118	120	114	110	114	112	110	114							
21									118	126	118	120	120	116	114	118	A	A	122							
22									122	122	118	112	118	112	114	112	112	108	B							
23									118	118	116	114	110	114	116	116	A	A	B							
24									116	108	112	118	118	116	110	112	112	118	B							
25									108	114	E C	128	116	116	116	112	108	108	112	B						
26									E B	122	118	118	116	116	116	112	112	110	106	114						
27									112	116	116	112	112	112	116	116	114	112	B							
28									118	112	114	114	A	A	A	A	108	114	108							
29																										
30																										
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									18	28	26	23	22	23	19	21	22	22	7							
MED									117	116	116	116	116	116	114	112	112	113	114							
U Q									E B	122	120	116	118	118	116	116	116	114	114	120						
L Q									116	113	114	114	112	112	112	112	112	110	112							

IONOSPHERIC DATA STATION Kokubunji

FEB. 2003 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

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

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	102	B	B	104	104	104	118	E B 152	G	G	110	G	110	B	108	100	96	B	B	B	B	98	96	96
2	96	100	B	B	B	B	124	126	128	114	120	122	108	116	114	102	100	90	100	96	92	B	B	B
3	B	B	B	B	B	B	B	G	108	112	106	100	98	104	102	108	112	112	96	100	98	96	98	98
4	94	92	96	98	94	B	B	152	156	124	118	114	118	112	116	106	104	B	B	B	B	B	B	B
5	B	B	B	B	B	B	B	136	106	102	102	104	100	104	104	106	100	92	B	94	B	B	B	B
6	118	B	B	B	B	B	B	152	104	104	104	100	102	B	102	G	138	160	94	B	B	B	B	96
7	B	B	B	B	B	B	B	142	104	98	114	104	106	102	104	102	94	96	100	96	94	94	88	96
8	96	98	94	106	92	B	B	142	120	112	104	104	102	100	104	104	102	B	96	92	86	92	96	94
9	86	84	100	98	B	B	B	150	124	118	120	112	108	100	100	98	100	98	94	90	94	B	88	B
10	B	C	B	B	C	B	B	C	G	102	100	132	114	104	114	106	112	106	88	B	B	B	B	B
11	98	98	B	B	B	B	B	144	G	G	122	118	120	116	106	G	G	B	104	B	B	B	100	88
12	110	B	98	120	96	98	94	138	100	108	118	114	106	106	106	104	104	98	98	B	100	104	B	104
13	98	98	116	94	88	92	90	146	104	102	102	100	98	92	94	G	98	G	B	90	B	B	B	96
14	90	92	B	B	B	B	B	162	G	G	102	110	114	112	102	100	98	G	98	B	100	94	90	B
15	B	90	90	B	B	B	B	154	102	102	B	G	130	G	104	G	106	132	B	100	96	92	96	B
16	90	86	88	B	B	B	B	146	106	98	146	118	104	108	106	G	122	110	104	102	96	96	94	B
17	94	94	94	92	90	92	B	158	G	100	104	108	100	102	98	90	88	146	B	90	B	B	B	94
18	B	B	B	B	94	B	B	170	166	148	152	138	92	90	86	98	108	106	B	B	B	B	B	B
19	88	B	B	B	B	B	B	160	104	118	106	106	106	112	102	130	116	B	C	B	B	B	B	B
20	B	B	B	B	B	B	B	160	166	100	98	160	102	104	142	92	136	126	B	B	B	B	B	B
21	B	B	B	B	B	B	B	156	104	104	100	G	108	134	118	108	106	G	B	B	B	B	B	B
22	B	102	B	B	102	B	B	172	168	176	118	94	116	122	116	118	110	108	B	B	B	104	96	96
23	96	B	96	B	B	B	B	162	104	100	100	118	132	128	112	106	102	100	B	102	108	96	98	B
24	94	94	100	90	92	90	B	G	170	98	132	148	130	98	94	126	116	114	B	92	90	90	B	B
25	B	B	B	B	C	B	B	146	146	128	96	102	106	98	98	102	110	106	104	106	108	108	108	B
26	B	B	B	B	B	B	B	144	100	144	120	110	102	134	128	178	150	116	104	B	B	B	96	90
27	B	B	B	B	B	B	B	156	100	100	116	102	110	114	114	110	110	150	104	102	88	102	94	100
28	100	96	96	96	98	100	140	140	98	102	116	104	106	106	102	G	104	106	100	98	96	B	B	96
29																								
30																								
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	16	13	11	9	10	6	5	25	23	25	27	25	28	25	28	22	27	20	15	15	12	13	16	14
MED	96	94	96	98	94	95	118	152	106	104	110	110	106	106	104	105	106	107	100	96	95	96	96	96
U Q	99	98	100	105	98	100	132	159	146	118	120	118	114	115	114	108	112	121	104	102	97	104	97	98
L Q	92	91	94	93	92	92	92	143	104	100	102	103	102	101	102	100	100	99	96	92	91	93	94	94

IONOSPHERIC DATA STATION Kokubunji

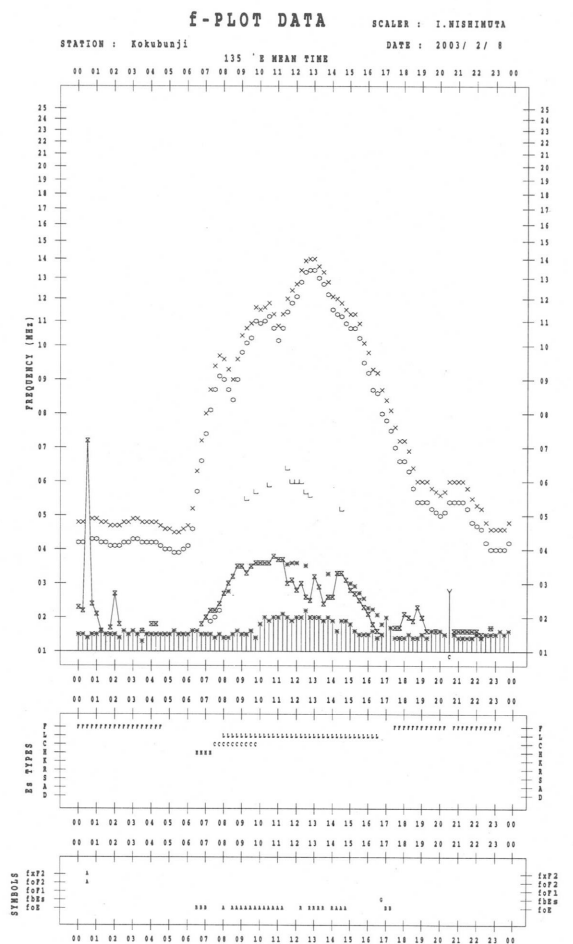
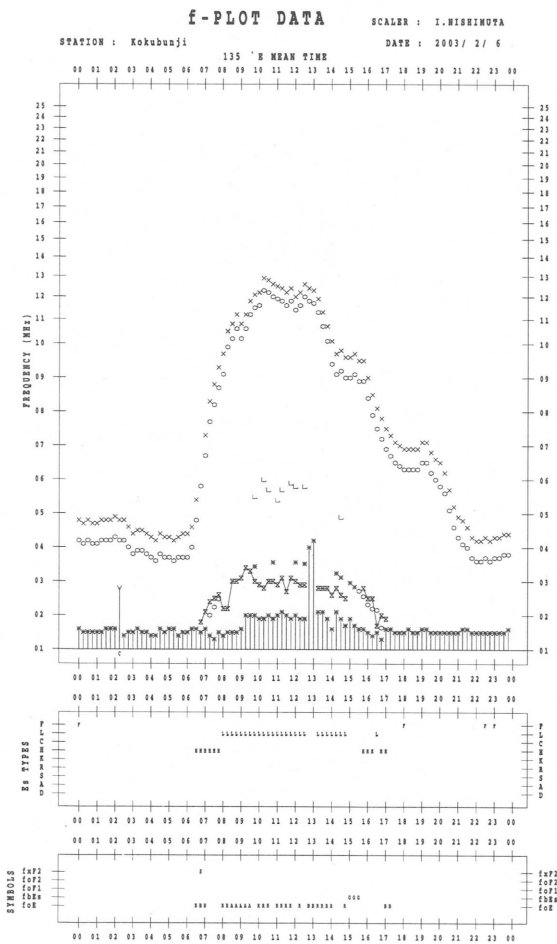
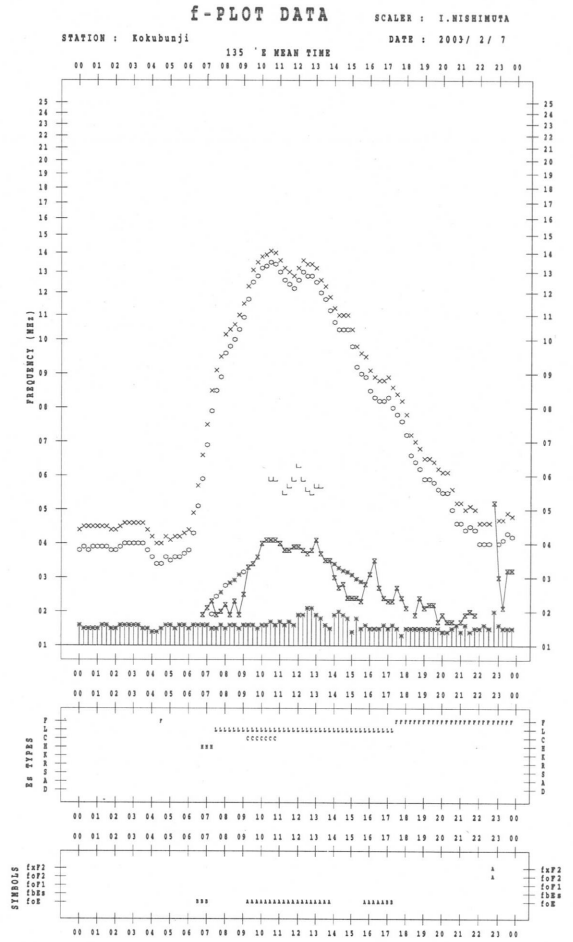
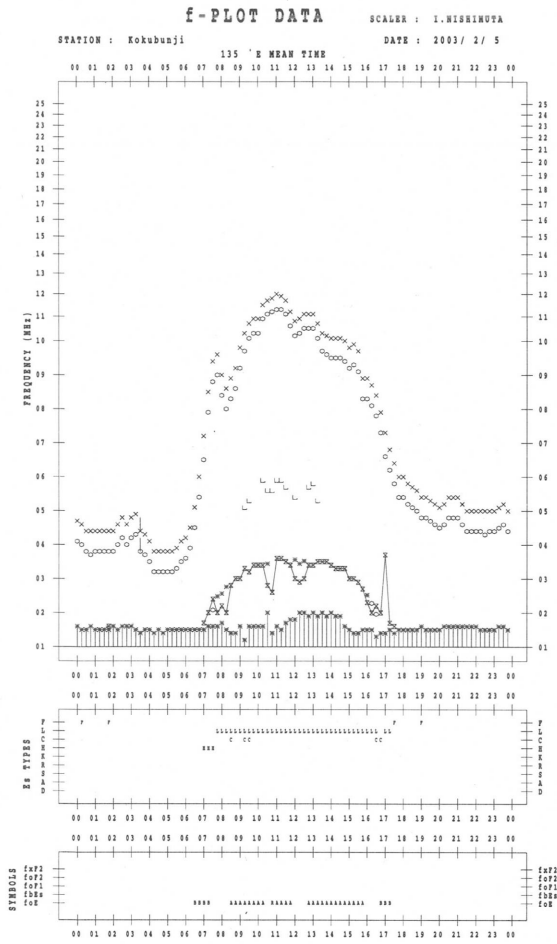
FEB. 2003 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

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

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	F1			F2	F5	F4	F1	H1			L1		L1		C1	L1	L1					F2	F4	F5
2	F2	F1					F1	C3	C	CL	CL	CL	L	CL	CL	L	L	L	F	F	F			
3									L	L	L	L	L	L	L	L	C	C				F	F	F
4	F3	F3	F2	F1	F1			H2	HL	HL	C	CL	CL	CL	CL	L	L							
5								H1	L	L	L	L	L	L	L	L	L	L			F			
6	F1							H2	L	L	L	L	L	L	L	L	H	H	F					F
7								H2	L	L	CL	L	L	L	L	L	L	L	F	F	F	F	F	F
8	F3	F3	F3	F1	F2			H1	CL	CL	L	L	L	L	L	L	L			F	F	F	F	F
9	F1	F1	F2	F2				H2	C	CL	CL	CL	L	L	L	L	L	L	F	F	F	F	F	F
10									L	L	HL	CL	CL	L	C	L	CL	L	F					F
11	F3	F2						H1		C	CL	CL	CL	L					F					F
12	F1		F	F	F	F	F	H2	L	L	CL	C	L	L	L	L	L	L	F		F	F		F
13	F3	F1	F1	F1	F2	F1	F1	H1	L	L	L	L	L	L	L	L	L			F				F
14	F2	F1						H1			L	CL	CL	CL	L	L	L			F		F	F	F
15		F2	F2					H1	L	L			C		L		L	H		F	F	F	F	F
16	F3	F2	F1					H1	L	L	HL	CL	L	L	L		CL	C	F	F	F	F	F	F
17	F1	F1	F1	F1	F2	F1		H1		L	L	L	L	L	L	L	L	H		F				F
18				F1				H1	HL	HL	HL	HL	L	L	L	L	C	L						
19	F2							H1	L	L	CL	L	L	CL	L	CL	CL							
20								H2	HL	L	L	HL	L	L	HL	L	CL	C					F	F
21								H2	L	L	L		L	CL	CL	L	L							
22		F1			F1			H1	HL	HL	C	L	CL	C	C	CL	CL	C				F	F	F
23	F2		F2					H1	L	L	L	C	CL	CL	CL	LL	L	L	F		F	F	F	F
24	F4	F5	F1	F2	F2	F2		H	L	HL	HL	CL	L	L	CL	CL	C	F	F	F	F	F	F	F
25								H2	HL	HL	L	L	L	L	L	L	C	F	F	F		F	F	F
26								H2	L	HL	CL	CL	L	HL	CL	H	H	C	F				F	F
27								H1	L	L	CL	L	CL	CL	CL	CL	CL	HL	F	F	F	F	F	F
28	F3	F2	F2	F2	F2	F1	F1	H2	L	L	CL	L	L	L	L	L	C	F	F	F	F	F	F	F
29																								
30																								
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																								

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
◊	f _o F ₂ , f _o F ₁ , f _o E
×	f _x F ₂
✱	DOUBTFUL f _o F ₂ , f _o F ₁ , f _o E
⊗	f _b E _s
└	ESTIMATED f _o F ₁
†, ‡	f _{min}
^	GREATER THAN
v	LESS THAN



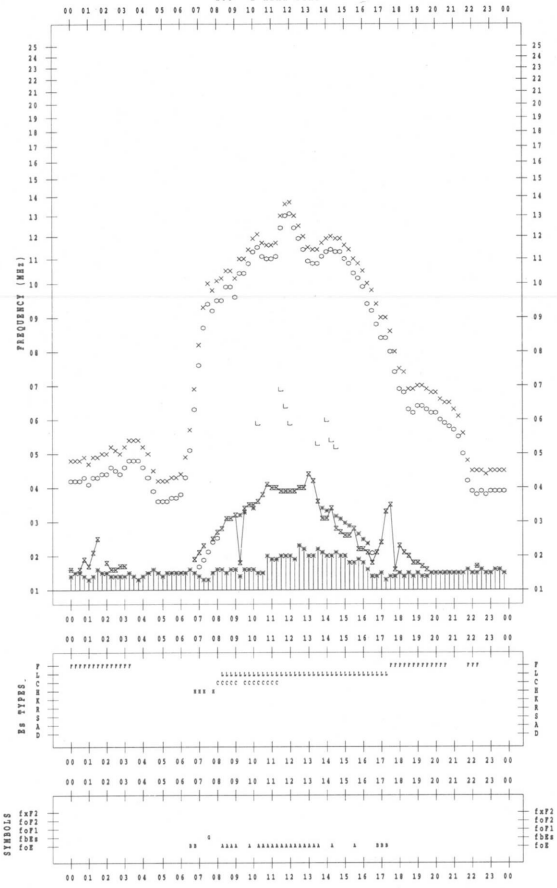
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/ 9

135 °E MEAN TIME



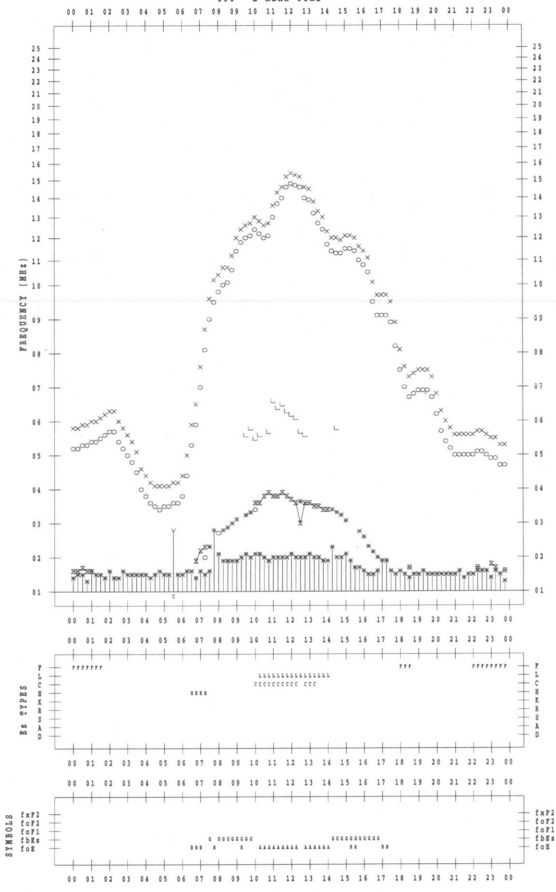
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/11

135 °E MEAN TIME



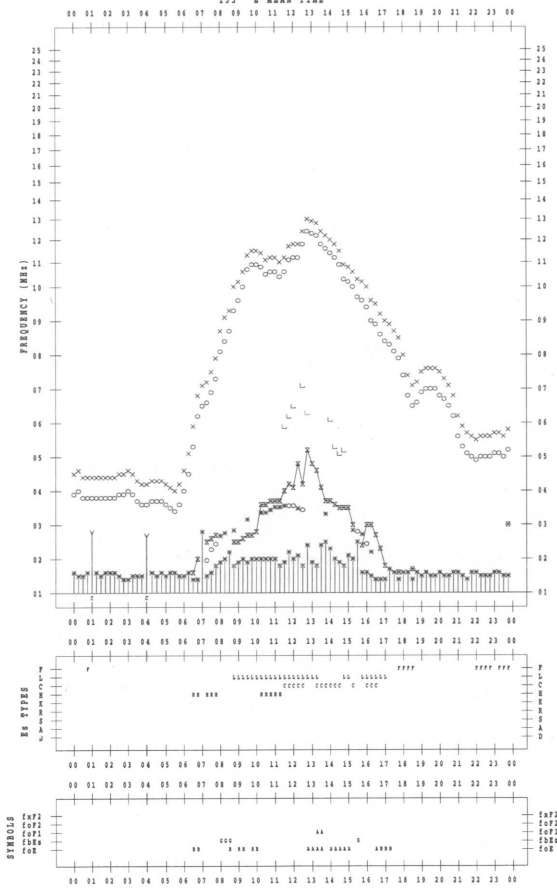
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/10

135 °E MEAN TIME



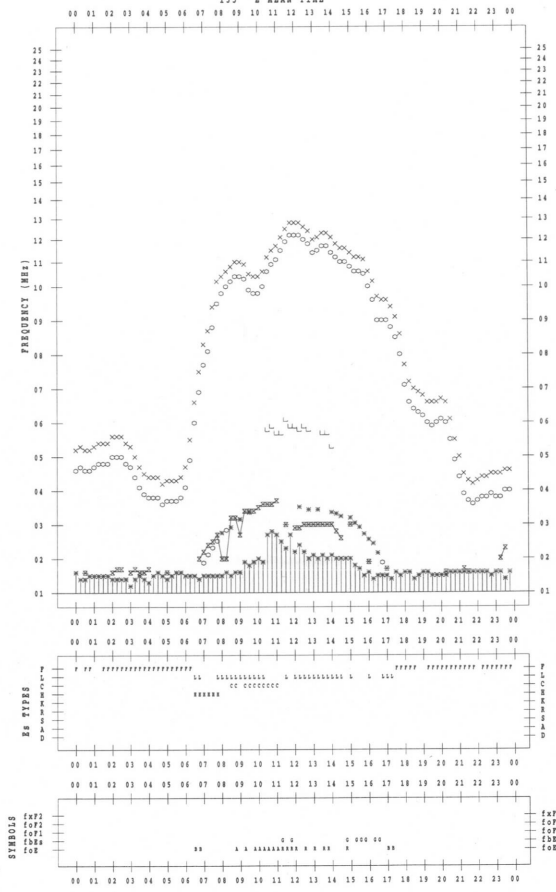
f-PLOT DATA

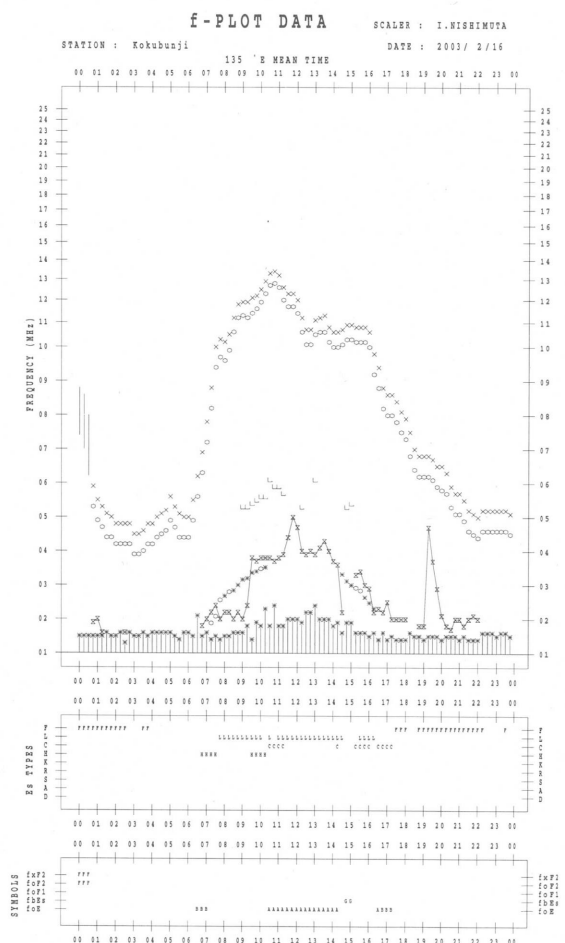
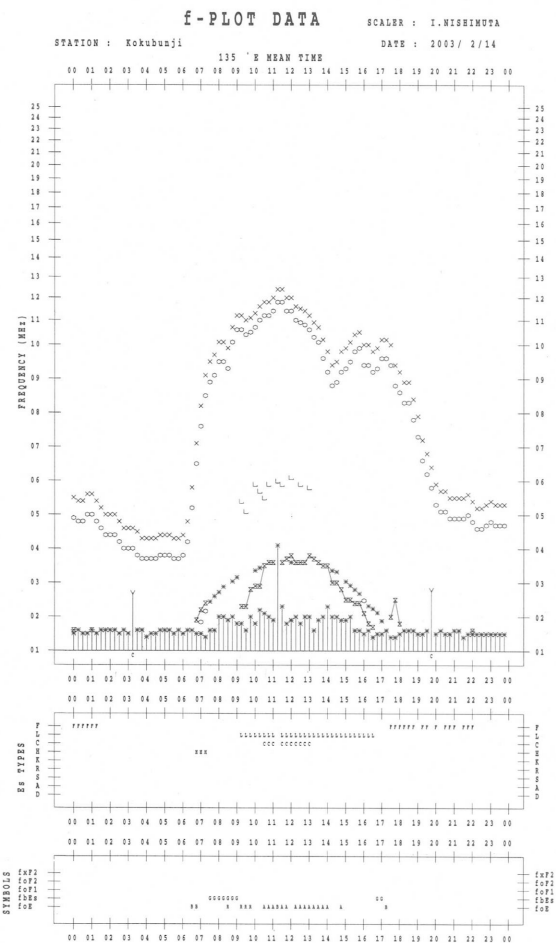
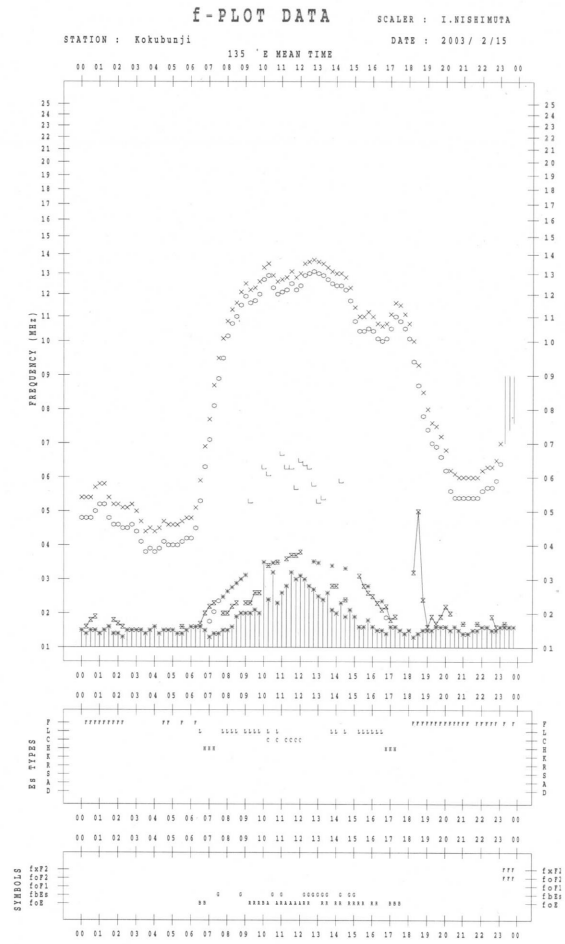
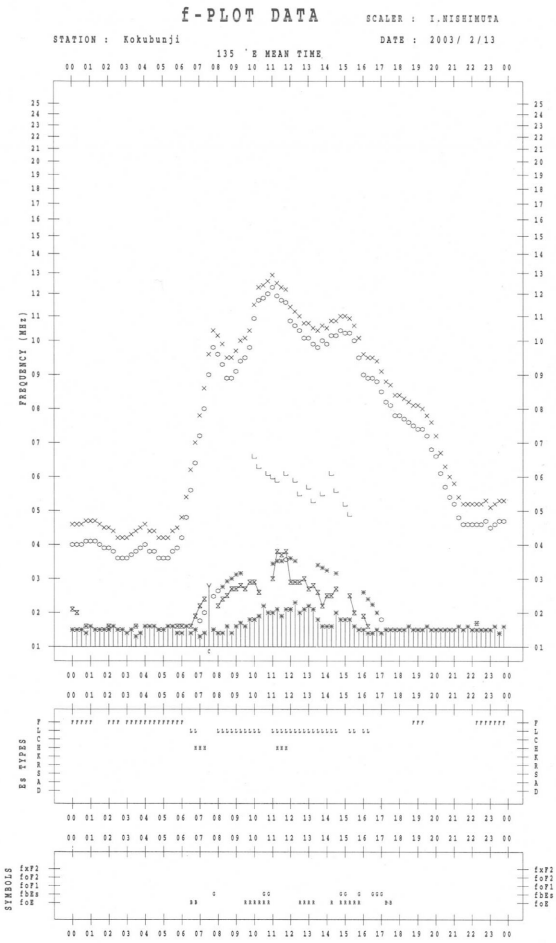
SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/11

135 °E MEAN TIME





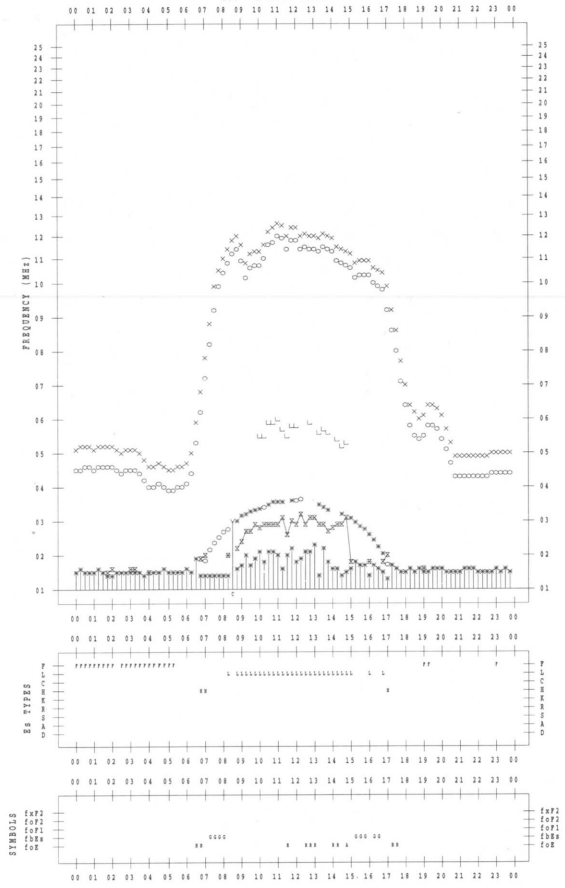
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/17

135 °E MEAN TIME



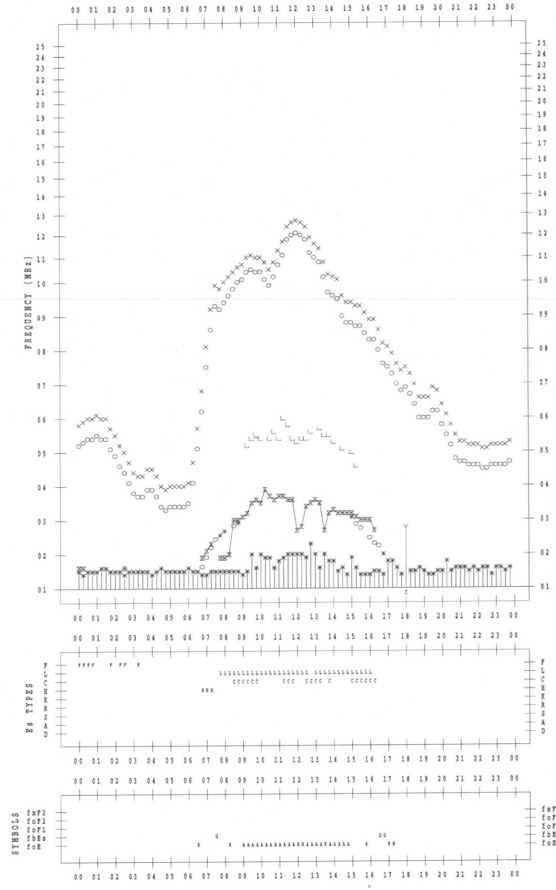
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/19

135 °E MEAN TIME



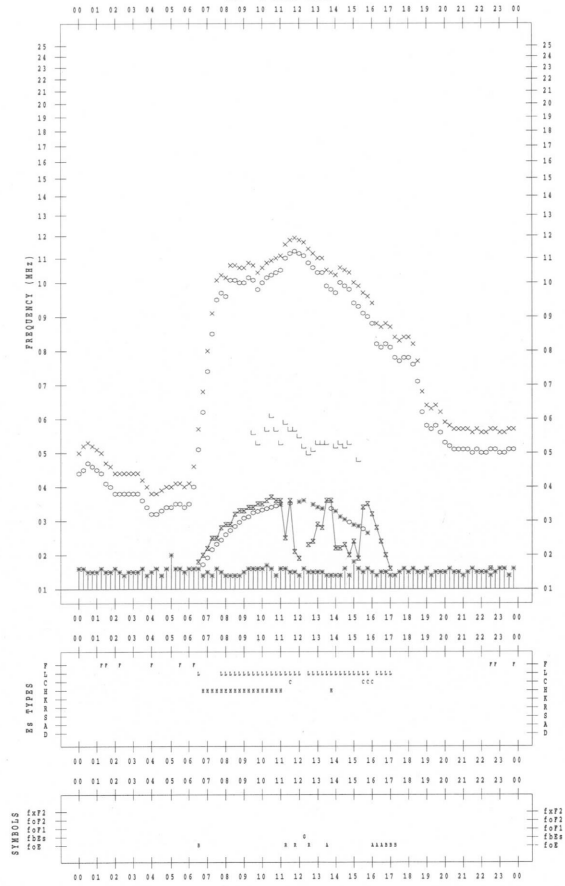
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/18

135 °E MEAN TIME



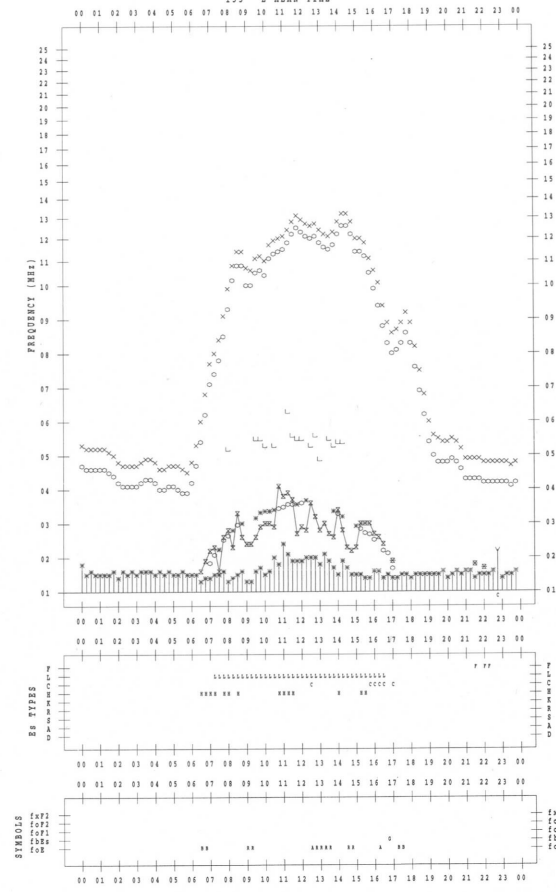
f-PLOT DATA

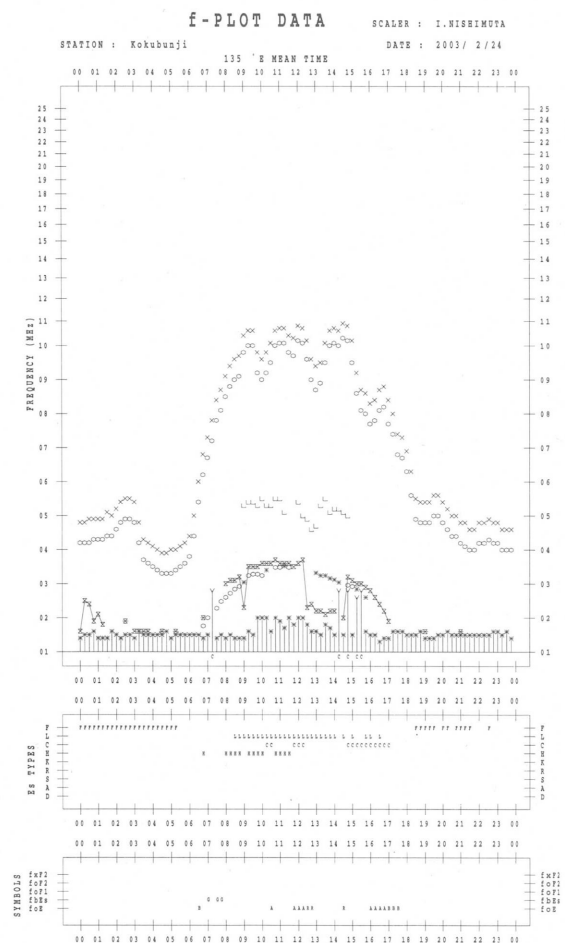
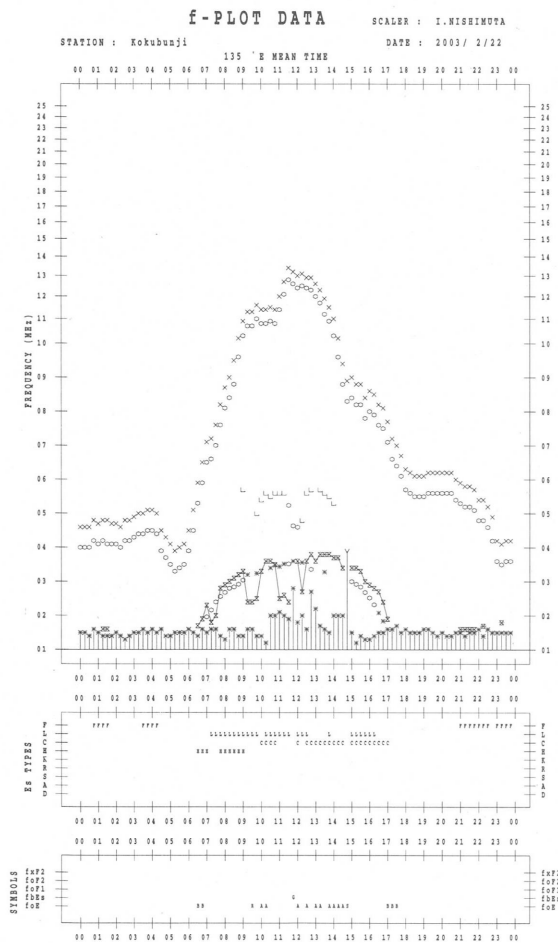
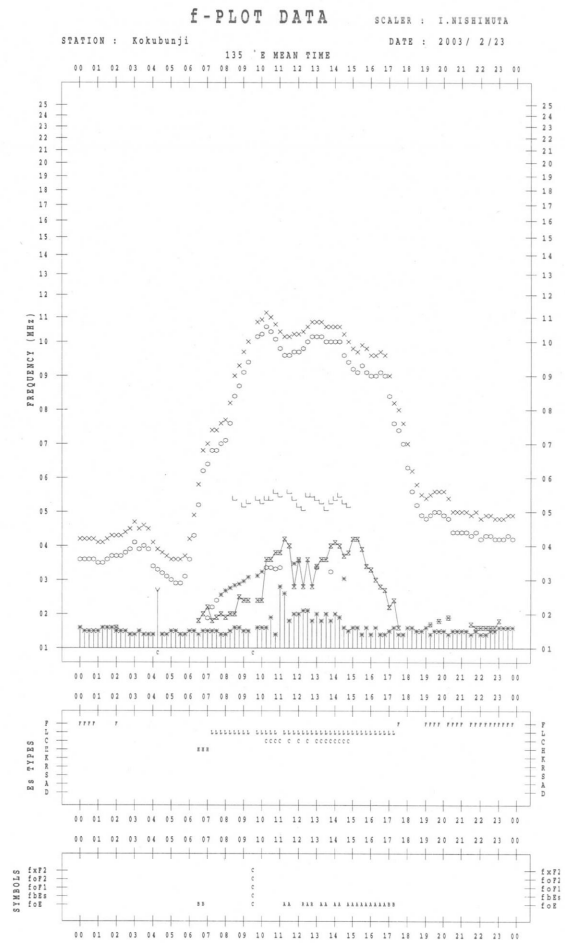
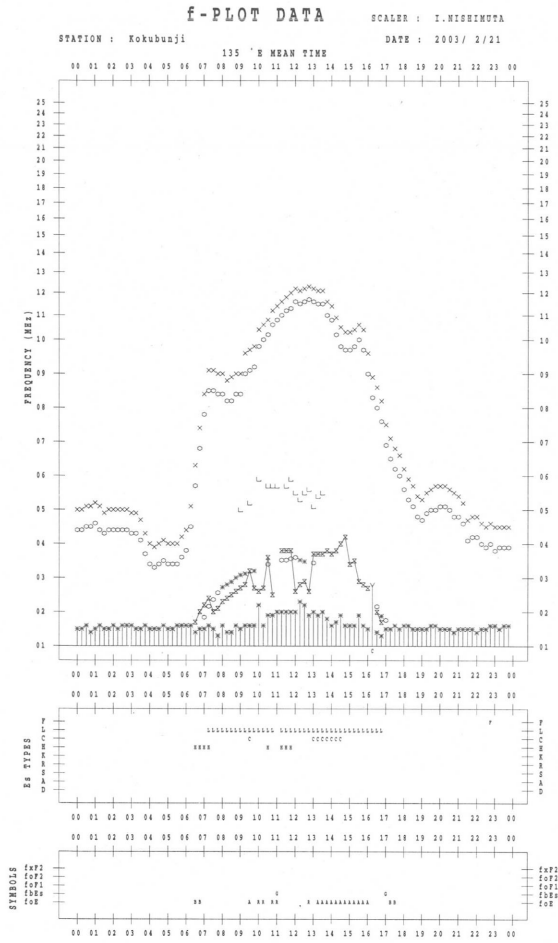
SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/20

135 °E MEAN TIME





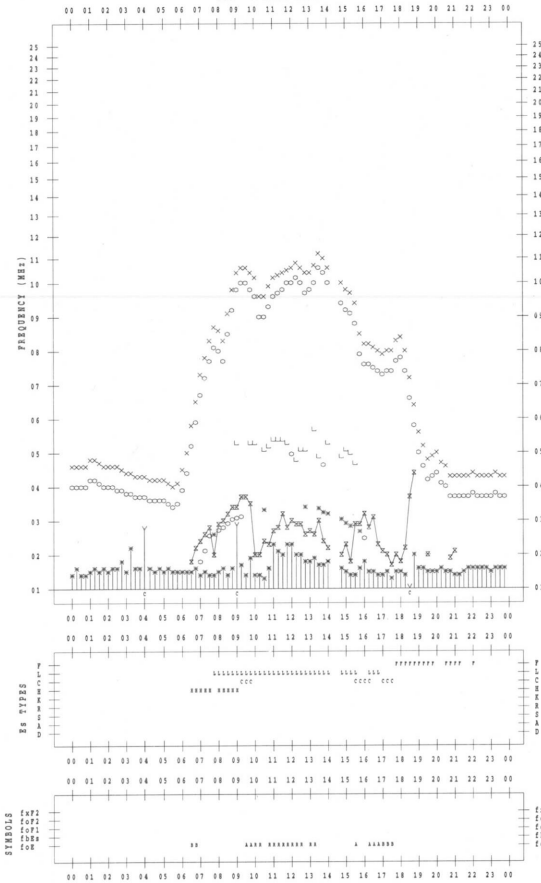
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/25

135 °E MEAN TIME



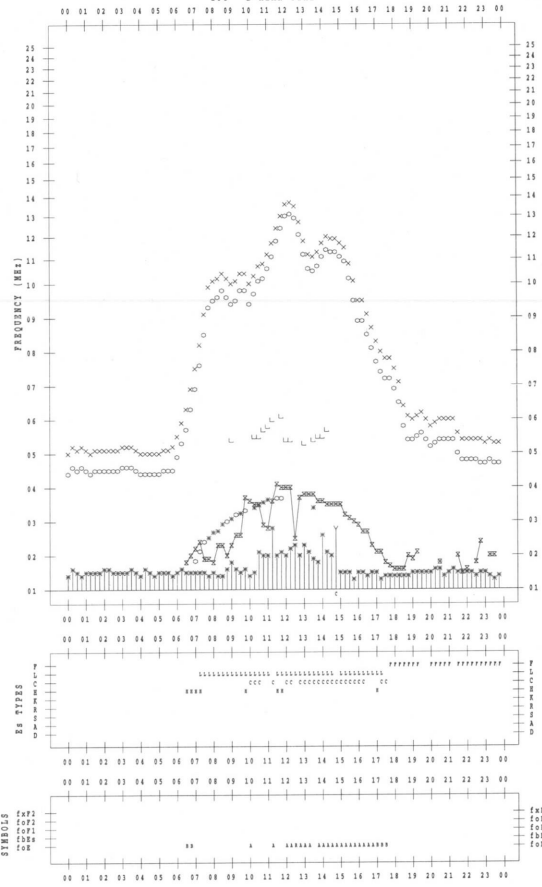
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/27

135 °E MEAN TIME



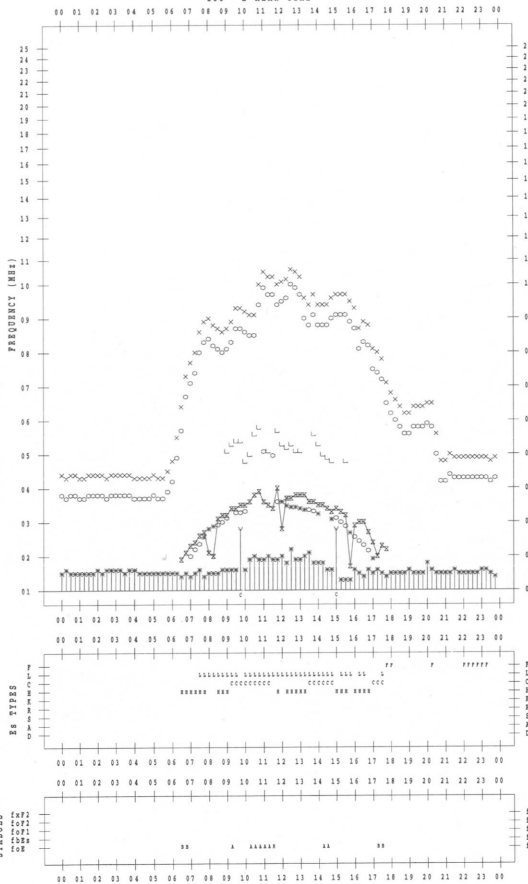
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/26

135 °E MEAN TIME



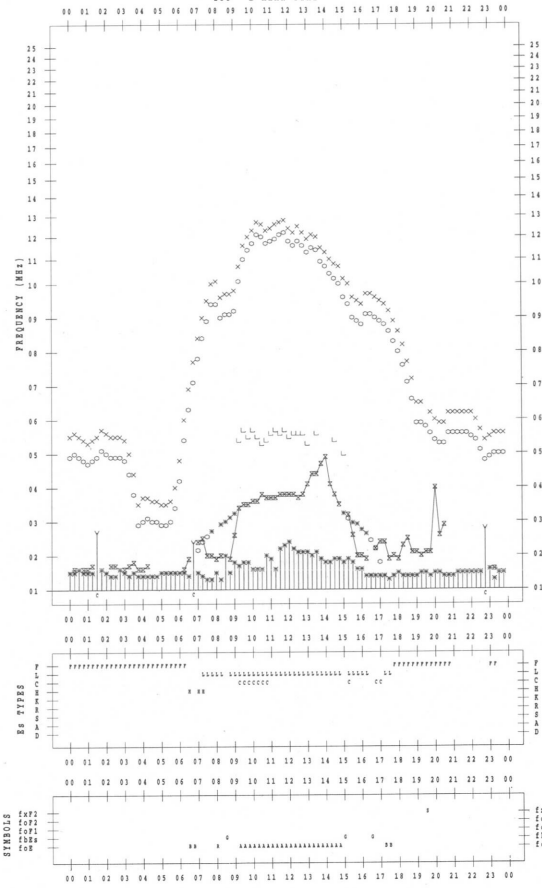
f-PLOT DATA

SCALER : I.NISHIMUTA

STATION : Kokubunji

DATE : 2003/ 2/28

135 °E MEAN TIME



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

Hiraiso

February 2003

Single-frequency total flux observations at 500 MHz					
Flux density: $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$					
Date \ UT	00-03	03-06	06-09	21-24	Day
1	38	36	35	41	38
2	38	36	36	42	38
3	38	35	31	41	37
4	37	36	34	39	37
5	38	36	37	42	38
6	40	39	35	45	40
7	40	37	37	43	39
8	38	36	36	39	37
9	37	36	36	38	37
10	37	34	-	-	36
11	-	-	-	-	-
12	-	-	-	-	-
13	-	-	-	-	-
14	-	-	36	41	38
15	37	34	34	36	35
16	35	33	33	37	34
17	34	33	36	37	35
18	35	35	35	37	35
19	34	33	34	38	35
20	39	38	34	43	38
21	39	39	38	46	40
22	42	39	38	34	38
23	34	34	34	33	34
24	32	31	32	37	33
25	34	33	33	37	34
26	35	33	32	37	34
27	35	34	34	39	35
28	35	34	33	37	35
29					
30					
31					

Note: No data is available during the following periods.

10th 0500 - 14th 0630

A superscript * stands for being superposed on a burst.

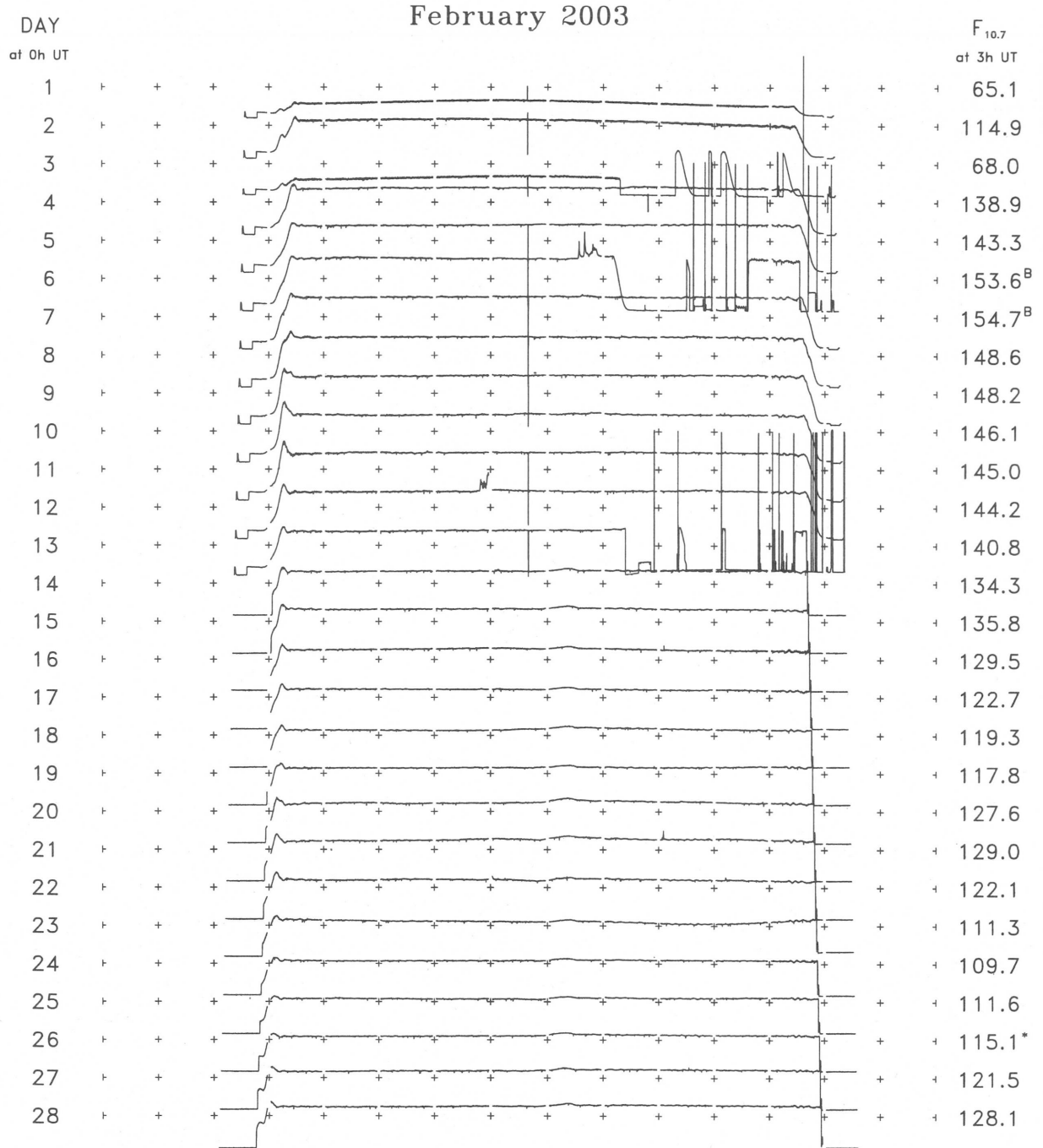
B. Solar Radio Emission
B2.Outstanding Occurrences at Hiraiso

Hiraiso

February 2003

Single-frequency observations								
Normal observing period: 2125 - 0815 U.T. (sunrise to sunset)								
FEB. 2002	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY ($10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$)		POLARIZATION
						PEAK	MEAN	REMARKS
1	200	7 C	23260	23260	5.0	20	-	WL
3	200	8 S	01190	01190	2.0	35	-	0
5	200	8 S	23170	23170	1.0	15	-	0
12	2800	7 C	01490	01580	12.0	45	-	0
12	200	47 GB	01500	01530	10.0	2240	-	0
13	200	8 S	02430	02430	1.0	10	-	0
13	200	8 S	04540	04540	1.0	10	-	0
14	2800	8 S	05200	05200	1.0	45	-	0
21	500	8 S	01550	01550	1.0	10	-	0
21	500	8 S	01570	01570	1.0	10	-	0
21	500	8 S	05050	05050	1.0	40	-	0
21	2800	1 S	05050	05050	1.0	25	-	0
22	500	8 S	02010	02010	1.0	215	-	0
22	500	8 S	02150	02150	1.0	25	-	0
22	500	8 S	03100	03100	1.0	30	-	0
22	2800	1 S	02010	02020	3.0	40	-	0
24	500	8 S	22210	22220	1.0	10	-	
24	500	8 S	22310	22310	1.0	10	-	
26	500	8 S	01390	01400	1.0	45	-	

B. Solar Radio Emission B3.Summary Plots of $F_{10.7}$ at Hiraiso



19 20 21 22 23 0 1 2 3 4 5 6 7 8 9 10
U T

Note: A vertical grid space corresponds to a 100 sfu.
Elevation angle range $\geq 6^\circ$.
The data are incorrect due to trouble until 4, Feb, 2003.

IONOSPHERIC DATA IN JAPAN FOR FEBRUARY 2003
F-650 Vol.55 No.2 (Not for Sale)

電離層月報 (2003年2月)

第55卷 第2号 (非売品)

2003年5月9日 印刷

2003年5月15日 発行

編集兼 独立行政法人通信総合研究所

発行所 〒184-8795 東京都小金井市貫井北町4丁目2-1

☎ (042) (327) 7 4 7 8 (直通)

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