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IONOSPHERIC DATA IN JAPAN

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《Real Time Ionograms on the Web ····· *http://wdc.nict.go.jp/index_eng.html*》

NATIONAL INSTITUTE OF INFORMATION
AND COMMUNICATIONS TECHNOLOGY
TOKYO, JAPAN

INTRODUCTION

This Series contains data on ionosphere (I) and solar radio emission (S) obtained at the following stations under the National Institute of Information and Communications Technology, Independent Administrative Institution in Japan.

Station	Geographic		Geomagnetic (IGRF2000)		Technical Method	
	Latitude	Longitude	Latitude	Longitude		
Wakkanai	45°23.6'N	141°41.1'E	36.4°N	208.6°	Vertical Sounding	(I)
Kokubunji	35°42.4'N	139°29.3'E	26.6°N	207.9°	Vertical Sounding	(I)
Yamagawa	31°12.1'N	130°37.1'E	21.4°N	199.8°	Vertical Sounding	(I)
Okinawa	26°40.5'N	128°09.2'E	16.8°N	198.4°	Vertical Sounding	(I)
Hiraiso	36°22.0'N	140°37.5'E	27.4°N	209.2°	Solar Radio Emission	(S)

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

b. Symbols

(i) Descriptive Letters

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

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

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

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

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

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

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

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

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

K Presence of particle *E* layer.

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

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

N Conditions are such that the measurement cannot be interpreted.

O Measurement refers to the ordinary component.

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

Q Range spread present.

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

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

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

V Forked trace which may influence the measurement.

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

X Measurement refers to the extraordinary component.

Y Lacuna phenomena, severe layer tilt.

Z Third magneto-electronic component present.

(ii) Qualifying Letters

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

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

D Greater than.

E Less than.

I Missing value has been replaced by an interpolated value.

J Ordinary component characteristic deduced from the extraordinary component.

M Mode interpretation uncertain.

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

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

U Uncertain or doubtful numerical value.

X Measurement deduced from the third magneto-electronic component.

(iii) Description of Types of *Es*

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

The types are:

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

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

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

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

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

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

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

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

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

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

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

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

Median count (**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} Wm^{-2} Hz^{-1} unit.

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

* Measurement impossible because of interference.

B Measurement impossible because of bursts.

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

B2. Outstanding Occurrences at Hiraiso

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

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

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

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

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

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

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

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

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

B3. Summary Plots of F10.7 at Hiraiso

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

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

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

HOURLY VALUES OF foF2 AT Wakkanai

DEC. 2008

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1.0MHz TO 30.0MHz 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	30	25	28	25	25		A	A	47	47		60	59		48	43	35	28	34	28	25		34	28
2	28	30	29		28			41					63		45	40	35							
3	30	29	28	28				35	40	29		44	44	48	48	40	34				30	34	25	26
4	31	29	26	26		25		37	42	47			64	56	47	51	38	28		25	32	30	38	32
5	34	30	32	29	29	28		39	44	48	63	57		63	58	53	A	31	32	35	34	29	30	30
6	34	30	29	34	28	30	23		48	60	72	69	64	66	50	56	40	32	23			29	25	31
7	28	28	29	29	39	32	28	29	47	63	49	52	61	60	56	32	45	A	A		28	25	34	23
8	28	26	26	31	31	34		34	58	62	58	62	56		56	51	32				26	A	22	28
9	28		28					34		54	47	A	49	55		44	A	A	A		28			39
10	28	26	26	26	39			32	45	47	31	57	40	54	50	56		37			28	31	28	28
11	29	34	29	29	28	26		32	46	41		53	58	63	49	63	37	A	A		A	A	A	29
12	31	34	34	32	35	40	28	32	48	43	51	62	55	38	A	42	A	A		34	30	30	34	34
13	34	32	34	31	31	34	35	38	46	50	52	65	58	60	60	43	40			30				
14	28	28	30	29	34			40		59					38	54	41			29	31		30	34
15	25	26	24	28				37		47	42	44	54	50	51	39	31			30	28	29	31	
16	31	30		25	28	34			38	34	56	A	53		35	51	39	34				32	34	32
17	28	28						34	45	58	57	61	51	66	46	49	32	40	22	29	32	30	36	37
18	28	32	28	28	36	35	28	32	42		51	59	64	63	56	44	38	29	30	34	38	32	34	36
19	34	34	32	32	28	29	28	41	34	50	58	60	54	44	58	48	37	29	34	35	41	23	32	34
20	30	31	28	30	30	28	40	32	42	56	56	48	48	64	41	60	41	23		32	28	34	40	
21	31	42	44	34	29	26	26	37	39	A	59	A	59	41	47	50	31					30	34	26
22	30	32	32	31	26	34	32	34	34	54	48		52	44	52	46	36			29	32	30	30	30
23	30	30	32	30	26	28		38	46		35	59	60	35	52	38		28	35	42	35	36	53	52
24	48	52	40	41	46	50	29	41	51	62	61	54	50	50	47	55	46	31	28	31	38		34	34
25	34		29	30	24	29	22	37	47	42	63	53	46	50	41	54	47	31	37	52	52	51	53	53
26	54	53	44	41	46	32	31	32	38	39		57	54	55	51	54	47	28	30	28	23		28	31
27	34	32	30	31	30	31	30	30	42		40		62	46	52	42	31	34		29	30	34	34	34
28	32	39	30	28	28	23		24	38		48	57			49	41	45			28		28	29	32
29	31	31	31	31	30	30	A		43		58			39	44	58	55	A	A	A			28	22
30	29	28	30	28					44	59	48	56	59	52	48	A	A	A	29	A		A	A	A
31	A	A	30	29	28	28	A		44	40		48	40	54	58	52					31	25	32	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	28	29	28	25	22	13	25	27	24	23	22	27	25	29	30	24	15	11	18	22	20	26	25
MED	30	30	30	30	29	30	28	34	44	49	52	57	55	54	49	50	38	31	30	30	30	30	33	32
U Q	34	33	32	31	34	34	31	38	47	58	58	60	60	61	54	54	43	34	34	34	34	33	34	34
L Q	28	28	28	28	28	28	27	32	40	42	48	53	50	45	46	42	34	28	28	29	28	29	29	28

HOURLY VALUES OF fEs AT Wakkanai

DEC. 2008

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1.0MHz TO 30.0MHz 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	33	33	30	G		G			G	G	G	G	G	G	G	G	G	G
2	G	G	G	G	G	G		G	G		G		G	G	G	G	36	G		G	G	G		G
3	G	G	G	G	G					36		G	G	48	G	G	G				G	G	G	G
4	G	G	G	G	G	G		G	G	G	G	37	G	G	G	G	G	G	G	G	27	G	G	G
5	G	G	G	G	G	G		G			G	34		37	59	60	48	25	G	26	G	G	G	G
6	G	G	G	G	28	G	G		32	34	38	37	33	G	G	G	11	G	G		24	G	G	G
7	G	G	G	G	G	G	G	28		30	38	38	G	38	48	38	34	37	34	G	32	G	G	G
8	G	G	G	G	G	G	G		G	G	49	G	G	G	G	G		G	G	G	G	33	G	24
9	G	27	24					G	27	G	36	49	G	G	G	G	34	29	29		G	26	G	G
10	G	G	G	G	G	11	23	26	44	33	33	36	G	G	30	G	G	G		G	G	28	G	G
11	G	G	G	G	G	G		G	G	G		G	33	G	30	37	30	33	34	29	31	71	46	G
12	G	G	G	G	G	28	G	11	40	38	33	G	36	G	30	53	69	34		29	G	G	G	G
13	26	28	26	G	G	G	G	24	G		G	G	G	33	30	36	34			26				
14	G	G	G	G	G			G	G	G	G	G			G	35	11			G	G		G	G
15	G	G	G	G				G	38	G	G	G	G	G	39	G	G			G	G	G	G	G
16	G	G		G	G	G	G		38	G	G	34	G		36	G	27	G		G	G	G	G	G
17	G	G	G	G	G	G	G			34	34	G	G	G	G	G	G	G	G	G	G	G	G	G
18	G	G	G	G	G	G	G	G	32	33	G	G	G	G	G	G	G	G	G	G	G	G	G	G
19	G	G	24	G	G	G	G	11	33	35	38	35	G	G	G	G	G	G	G	G	G	G	G	G
20	G	G	G	G	G	G	G	G	27	33	34	35	40	G	G	31	11	G		G	G	G	G	
21	G	G	G	G	G	G	G	G	30	36	40	40	33	G	G	G	G		28		G	G	G	G
22	G	25	G	G	G	G	G	G	G	34	33	G	G	G	G	28	26	26		G	G	G	G	G
23	G	G	G	G	25	G	G	G	26	G	42	G	G	G	35	32	11	G	G	32	G	24	G	G
24	25	25	G	G	G	G	G	25		44	G	46	G	35	33	G	11	G	G	G	32	32	G	G
25	G		G	G	G	G	G	G	G		35	G	G	G	G	G	11	G	26	G	G	G	G	G
26	G	G	G	G	G	11	G	G	G	30		G	46	G	G	G	39	30	27	G	G		G	G
27	G	G	G	G	G	G	G	G		34	G	G		G	44	G	G	G		G	24	G	G	G
28	G	G	G	26	23	26		G	41	G	G	G		G	32	G	G		G	G		G	G	G
29	25	G	24	24	G	32	46	38	34	G	G		G	G	G	G	G	28	28	32	G		G	G
30	35	24	24	29	G	G		G	G	G	G	N	G	G	36	41	38	60	34	34	28	34	28	36
31	49	38	G	G	28	29	39	G	G		G	G	G	G		G	33		26		G	G	30	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	30	30	30	29	27	21	26	25	26	27	28	26	28	30	31	30	24	20	26	29	27	29	29
MED	G	G	G	G	G	G	G	G	27	30	G	G	G	G	G	G	11	G	G	G	G	G	G	G
U Q	G	G	G	G	G	G	G	11	33	34	36	35	G	G	33	32	34	28	28	26	12	24	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Wakkanai

DEC. 2008

LAT. 45°23.5'N LON. 141°41.2'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

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

HOURLY VALUES OF foF2 AT Kokubunji

DEC. 2008

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 30.0MHz 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								43	54	49	56	60	51	52	47	59	43	30		30	33	26		
2			27	26	27			38	49	48	53	54	55	55	55	55	38		27		31	A	27	27
3	26	24	26					39	45	48	51	59	54	54	45	47	44	28						27
4	31	30	24	27	31			39	46	45	49	54	54	65	57	61		30	27				30	30
5	31		26		27			46	49	46	53	54	64	58	59	49	49	A	A	30	34	34	27	28
6	30	32		28	N		31	43	43	54	61	78	87	72	58	51	47	45	28	34				
7		27	30	32	34	28	28	43	45	52	62	68	77	64	66	55	42	32	A				26	28
8	28		28	27	27			44	48	46	68	76	66	57	54	54	51	26						
9		23		26	27			45	47	49	48	54	49	51	48	48				26		30		
10					30			34	46	45	A	54	57	45	60	47	45							
11								39		47	47	54	62	60	59	49	44	34				30	28	
12			28	27	A	A		37	42	47	52	52	58	59	62	45	59				30	A		27
13	30	28	28	28	30			45	54	52	42	57	59	56	51	52	47	34			30			
14			26	27				49	46	46	58	56	52	53	53	48	45	30		28		30		27
15	28			27				38	44	44	44	68	54	60	52	54	42	32	A		31		26	
16	26	27	27					36	43	41	52	59	62	59	58	52	41	30		27	27		27	27
17	28	27	27	26				37	43	45	C	81	82	69	68	55	47		34	27	28	32	28	27
18	27	27	28	30	31			39		47	61	80	85	62	51	51	37	A		30	A			26
19				27				39	43	46	56	65	66	57	52	47	45	29		27		28	21	23
20								38	45	45		41	55	52	54	45	41	A			26	27	27	27
21	27		27					43	46	48	52	52	54	49	52	45	44	30			27	26		
22	25		27	28				44	47	44	52	70	56	49	46	46	41				32			28
23	30	26	26	30	25			41	45	44	59	62	54	52	50	43	46	32			31	34	32	37
24	34	32	30	32	30	27	26	51	55	53	51	67	70	55	56	51	48	39	34	30	28	30		27
25	27				26			38	50	49		54	47	55	48	41	47	39			27	31	30	31
26	32	42	28	41	52	30	32	42	48	47	48	62	58	64	62	49		35			27			
27		26		26	27	30		36	47	44	46	51	55	64	55	50	44	34						
28	20	26	27		27			36	44	46		55	62	58	51	62	49	32			28			26
29	27	26	25	27	27			42	41	47	49	48			59	59	49	A	36	27	30			
30	26							39	51	44	44	52	51	51	60	47	50	37		A	31	A		
31								39	45	45	53	46	48	52	52	45	59	A	A		34	N		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	19	15	19	19	16	4	4	31	29	31	26	31	30	30	31	31	28	20	6	11	19	12	12	17
MED	28	27	27	27	27	29	30	39	46	46	52	56	56	56	54	49	45	32	31	28	30	30	27	27
U Q	30	30	28	30	30	30	31	43	48	48	56	67	64	60	59	54	48	34	34	30	31	31	29	28
L Q	26	26	26	27	27	27	27	38	44	45	48	54	54	52	51	47	42	30	27	27	27	27	26	27

HOURLY VALUES OF fEs AT Kokubunji

DEC. 2008

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

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

HOURLY VALUES OF fmin AT Kokubunji

DEC. 2008

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 30.0MHz 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	13		14	17	14		14	13	14	14	14	14	13	13	13	25	18	14		13	14	14		
2	14	14	13	14	13		17	18	13	13	14	15	15	33	14	14	18	14	14	14	17	13	14	14
3	14	13	13	13				14	13	13	14	14	14	14	14	13	20	14		14	18		14	13
4	13	14	13	13	13			14	18	13	13	15	14	34	18	14	14	14	13			14	13	13
5	14	18	13		13			13	18	14	14	17	14	14	13	13	14	13	13	13	13	13	13	13
6	13	13	13	13	14	13	14	18	13	13	14	14	15	14	13	13	13	13	14	15				13
7	15	17	13	17	15	14	13	13	13	15	14	15	20	18	14	13	13	14	13	14		14	13	13
8	13	13	14	13	14			17	13	17	15	13	14	20	13	23	14	14		13		14		13
9	14	14	14	13	14			17	13	13	14	13	17	13	29	13		15		17	18	13		13
10	14	14	13	14	13			13	13	13	14	14	13	14	13	13	15	13	13	15	15	18	13	13
11	13		14		13	13	15	14	18	13	13	13	13	14	13	13	14	14	14	15		13	13	13
12	13	14	14	15	13	13		15	14	13	14	14	14	13	14	13	13	14	13		13	13	14	13
13	14	13	14	14	17	14		13	13	13	13	13	13	14	15	14	17	13	14		13	15	21	
14		14	15	13	14		17	14	13	13	14	14	14	15	14	22	21	13	13	13		14	14	13
15	14	13	13	13		13	15	15	18	13	13	13	14	14	14	24	15	18	13	15	14	14	13	13
16	14	14	13	20	13		14	13	17	13	13	17	14	13	13	13	15	15	20	17	14		14	13
17	13	13	14	13	13			14	13	13	C	14	14	13	13	13	13	13	17	14	14	13	13	13
18	13	13	13	13	13	14		13	13	13	13	13	13	14	13	13	13	13		14	13	21	13	13
19	13	13		13	13			13	18	13	14	13	13	14	14	13	20	14	14	15	14	14	13	13
20	13	13	13	13		13	14	18	13	13	13	14	17	14	29	13	13	14			14	15	14	13
21	13	14	13	14	13			20	13	13	14	13	15	13	14	13	18	14	14		13	13	13	13
22	13	15	13	14	13		14	14	14	13	14	14	17	13	13	13	13			14	13			14
23	13	14	14	13	13	13		14	13	13	14	15	13	13	13	13	13	18	17		14	14	13	13
24	13	13	14	13	14	14	14	14	13	13	13	15	14	14	18	13	13	14	15	14	14	13	14	14
25	14		15	14	13	22	14	15	14	14	13	13	14	13	13	13	22	13	13	14	13	13	13	13
26	13	13	13	13	14	13	13	15	18	13	13	13	18	13	13	14	13	14		14	14		15	13
27	13	13	14	13	14	14		17	13	18	14	15	13	14	14	13	13	14	15		15	14	15	
28	13	14	14	14	14	13	15	15	18	14		14	17	14	14	30	26	14	18	15	14	14		13
29	14	13	13	14	13	13		14	23	18	37	36	37		20	13	13	14	13	13	14			
30	14				14	15	13	13	13	18	13	14	15	17	14	14	13	13		14	14	13		
31		14			13			15	22	33	18	38	29	14	17	15	21	13	14	14	13	15		
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	29	27	28	27	28	16	15	31	31	31	29	31	31	30	31	31	30	30	22	24	25	25	22	25
MED	13	14	13	13	13	13	14	14	13	13	14	14	14	14	14	13	14	14	14	14	14	14	13	13
U Q	14	14	14	14	14	14	15	15	18	14	14	15	17	14	14	14	18	14	15	15	14	14	14	13
L Q	13	13	13	13	13	13	14	13	13	13	13	13	13	13	13	13	13	13	13	14	13	13	13	13

HOURLY VALUES OF foF2 AT Yamagawa

DEC.2008

LAT.31°12.1'N LON.130°37.1'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	25				22	26		36	47	59	67	70	58	48	55	63	59		32	29	34	26		28
2			28	26	26			32	45	50	48	53		53	54	60	48	40	29	26	30	31		26
3	26	28		28	28			34	46	51	55	53	56	50	52	52	48	46	38	A	A			28
4	26	25	26	26	30			34	46	50	52	53	52	62	64	65	59	50	30		26	29	34	31
5	30	31	30	30	29			32	54	51	54	55	55	63	48	71	50	46	32	34	28	31	29	28
6	30	32	26	29	28		26	34	52	55	58	69	69	78	66	52	54	66		A	34	28	29	
7	28	28	29		28			36		54	55	76	82	65	62		54	40		A	28	34	28	29
8	30		26	25				29	50	51		63	66	73	63	64	55	40				31	29	28
9					30	A		25	47	50	54	51	51	50	56	60	52	44	31			30		28
10				26	26			29	44	54	50		64		47	51	56		31			28		28
11	26		26		28			31	39	46	46	50	65	65	58		A	55	A	A	26	29		
12	25	26	A	29	31	A		29	43	48	42	48	56	46	44	54	43	47	A		29	34		
13	26							30	54	53	54	62	55	56	56	52	58	44	A	A	30	29		
14			28	28	28	29			47	48	48	54	54	54	A	51	52	54	41		29	28	32	
15			26		26		C	30	44	44	45	54	58	6.0	56	59	53	44	34		29	28		
16		26	26					29	42	46	48	57		68	65	62	54	44	34	28	26			
17	26	26		28	29			28	42	45	47	67	82	85	76	60	61	40	32	26	26		28	26
18			26	29	29			28	44	48	57	70	86	72	47	52	48	39	A	A	30			
19				26				30	44	45	48	52	64	63	60	55	52	42	35			28	26	26
20	C	28	29	28	29	28		29	46	57	51	56	58	57	45	45	52	47	A	A	28	30	31	26
21			26	28	26	26		28	50	47	51	50	55	50		49	43	55	A	30	34			
22	25	26				26		28	50	47	45	43	56	58	55	54	45	42			29			
23				26	26			28	44	47	60	71	64	58	72	46	51	43	32			32	32	31
24	32	32	28	28	30	30	28	35	53	47	52	53	75	67	59	59	47	56	45	37	29	30	C	
25		26			26	28		29	44	54	51	48	52	61	52	55	47	44	38	A			A	A
26	28	26	26	29	37			29	42	54	56	47	52	60	71	58	58	42	34					
27						30		26	45	50		51	54	55	51	61		48	34		22	28		
28	28	28	30	25	28	28		26	39	45	50	48	56	63	A	58	62	48	44	30		23		
29	28	25	26	25				29	50	47	41	48	65	71	81	82	60	61	60	40	40	30	28	
30					26	34		29	44	45	47	47	46	54	49	50	50	53	A	34	36		28	C
31								28	41	56	50	46	53	54	57		58	54	36	37	34	28	29	32
	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	15	17	19	23	10	2	30	30	31	29	30	29	30	28	28	29	29	20	11	22	22	13	14
MED	27	26	26	28	28	28	27	29	45	50	51	53	56	60	56	56	52	46	34	30	29	29	29	28
U Q	29	28	28	29	29	30	28	32	50	54	54	62	65	65	63	60	58	53	38	37	34	31	31	29
L Q	26	26	26	26	26	26	26	28	44	47	47	48	54	54	51	52	48	42	32	28	28	28	28	26

HOURLY VALUES OF fEs AT Yamagawa

DEC. 2008

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1.0MHz TO 30.0MHz 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	G	24	G	G	G	G	G	G	N		41	41	36	G	G	30	G	G		G
2		G	G	G	G	G		G	G	G	40	42	49	40	42	G	G	G	G	G	G	G	G	G
3	G	G	G	G	G	G		G	32	34	38	41	G	G	47	48	48	29	35	34	33	27		G
4	G	G	G	G	G	G		G		33	G	40	50	G	G	G	G	G	G		G	G	G	G
5	G	G	G	G	G	19		25	34	40	40	50	51	37	38	G	40	24	G	G	G	G	G	G
6	G	G	G	G	G	G	G	G	34	36	41	43	44	55	47	36	68	59	33	39	G	G	G	G
7	24	G	26	G	23		G	25		32	G	38	40	G	38	39	40	36	42	28	G	G	G	G
8	G	G	G	G				G	G	40	52	40	G	G	38	33	40	27				G	G	G
9			G	G	G	28		G	G	33	38	G	39	G	G	G	G	G	G		23	G	G	G
10	G	28	G	G	G	G		G	G	G	35	G	50	48	44	38	G	G		G	23	G		G
11	G	32	G	29	G	G		G	G	G	35	G	G	60	62	78	83	31	38	42	28	G	G	
12	G	25	38	29	32	29	G	G	28	37	44	47	58	54	56	49	49	57	48		27	27		G
13	G		31					G	32	47	40	50	G	G	G	67	34	30	32	30	G	G	G	G
14			G	G	G	G	G	G	G	34	40	37	40	44	52	G	39	G	27		G	G	G	G
15	G	G	G	G	G	G	C	G	44	39	40	43	47	G	40	41	G	G	G	28	G	G	G	
16	G	G	G	G	G	G		G	40	38	40	41		49	50		33	G	11	G	23	G	G	G
17	G	G	G	G	G			G	29	38	42	41	44	39	G	G	33	G	G	G	G		G	G
18		G	G	G	G			G	G	36	G	40	G	41	G	G	G	35	31	34	32	28	33	
19	28		G	G			G	G		32	G	G	41	50	36	34	G	G	G			G	G	G
20	C	G	G	G	G	G		G		G	G	G	G	39	G		G	32	33	30	G	G	G	G
21	G	G	26	G	G	G		G	44	34	41	44	40	G		36	36	47	39	24	G	G	G	G
22	G	G		G	G	G		G	G	G	G	45	41	G	G	40	31	33	25		G		G	G
23		G		G	G			G	G	34	G	G	43	G	G	35	33	26	26	27		G	26	G
24	G	G	24	G	G	G	G	G	G	G	G	G	49	G	G	35		G	11	G	G	G	C	
25	G	G	G	G	G	G	G	G	G	G	36	46	N	G	G	G	36	26	22	35	G	28	34	36
26	24	G	G	G	G			G	33	35	G	46	42	42	40	G	G	G	G	G			G	G
27					G	G		G	27	G		41	G	37	G	G		G		G	G	G		G
28	G	G	G	G	G	G		G	G	44	38	G	G	46	64	35		G	26	11	G	G		G
29	G	G	G	G	G	G	G	G	G				G	G	G	G		G	11	G	G	G	G	G
30				G	G	G		G	G	32	34	G	G	G	G	G	G	39	36	29	G	G	G	C
31								G	G	35	35	G	G	G	44	38	36	G	32	25	26	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	22	24	26	28	27	22	9	31	27	30	29	30	28	30	30	29	27	31	28	24	27	28	24	26
MED	G	G	G	G	G	G	G	G	G	34	36	40	40	19	38	35	33	G	26	26	G	G	G	G
U Q	G	G	G	G	G	G	G	G	32	37	40	43	45	44	44	39	40	32	33	30	23	G	G	G
L Q	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

HOURLY VALUES OF fmin AT Yamagawa

DEC. 2008

LAT. 31°12.1'N LON. 130°37.1'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

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

HOURLY VALUES OF foF2 AT Okinawa

DEC. 2008

LAT. 26°40.5'N LON. 128°09.2'E SWEEP 1.0MHz TO 30.0MHz 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									44	56	78	98	101	76	72	75	74	58		A		34	34	28
2				N	N			30	56	48	56	44	55	61	56	66	56	45	34	30	14	35	26	27
3			28	26				28	55	47	58	54	60	77	77	78	65	55	51	30	A			30
4	A			25	28			32	42	50	53	56	57	54	81	90	101	76			26	26		34
5								31	48	55	56	55	56	62	61	70	62	52	41	32	29	30	28	26
6			29	32	32			30	47	62	66	83	81	72	90	72	78	88	64	36	A	A	30	
7	A		A	30	29				46	50	62	80	90	87	84	67	66	44	31	29		30		
8	26							29	47	54	64	65	92	88	99	121	88	72	46	31	28	34	40	40
9	32		29	29	35			30	40	52	58	58	56	59	59	65	62	54	37	36			30	34
10					29			29	44	58	55	56	46	70	76	57	47		42	A				
11					26			31	47	47	44	55	57	81	74	A	67	55		36				
12		22		30	36	A		27	47	52	51	A	A	A	56	A	58	63	31			31		
13				28				28	55	71	75	76	87	85	82	92	49	60	43	41	34	36		
14					30	26			44	69	52	48	49	69	62	66	70	72	53	A	A	36	40	29
15									44	51	58	55	59	86	104	91	76	56	48	30		A	49	
16						26			43	46	51	52	66	61	77	58	62	58	34		28			
17				29	29				44	51		67	86	112	113	108	76	52	40				29	26
18			30	30	29				42	52	66	79	70	78	107	99	75	55		A	A	A		
19	A			30		A		29	42	42	52	51	59	66	64	65	67	55	36					
20					29	30		28	47	52	54	55	68	42	56	50	51	54	42	30		30	30	
21					29				47	56	55	56	A	62	71	62	55	52	47	30	24	29	30	
22		A	A	A	30	32		26	49	54			62	65	62	66	50	49		A				
23									40	51	65	63	62	67	56	51	48	46	40			28	34	
24	29		30		28	31		30	51	54	54	58	70	70	71	54	48	50	56	36	37	28	29	
25				25					47	52	57	47	52	56	63	51	52	42	40	26	30	A		A
26	A	A		41	A			29	46	50	57	62	58	70	85	80	78	71	51	38	28	28		
27					30	25		26	44	51	54	56	52	61	85	88	90	90	54	34				
28									43	47	50	56	61	84	90	90	86			36				
29									47	52	50	52	86	123	122	86	86	64	72	32		A	28	
30								26	43	46	47	56	52	51	56	62	66	59	47	38	42			
31									42	57	66	53		65	87	104	116	86	66	A	A	30	32	36
	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	1	5	12	15	6		18	31	31	29	29	28	30	31	29	31	29	25	19	12	15	15	9
MED	29	22	29	30	29	28		29	46	52	56	56	60	70	76	70	66	55	43	32	28	30	30	30
U Q	32	11	30	30	30	31		30	47	55	63	64	75	81	87	90	78	67	52	36	34	34	34	35
L Q	26	11	28	27	29	26		28	43	50	52	53	56	61	62	62	55	52	38	30	27	28	28	26

HOURLY VALUES OF fEs AT Okinawa

DEC. 2008

LAT. 26°40.5'N LON. 128°09.2'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

HD	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				26		G		26	41	G	G	G	G	G	46	37	37	32	30	67	27	G	G	G
2	G		G	G	G	G		G	G	G	36	43	G	48	G	49	32	28	G	G	G	G	G	G
3			G	G				G	G	41	36	G	40	G	39	48	40	35	35	37				29
4	28			G	G			G	38	G	G	46	45	G	G	G	36	29		G	G	G	G	G
5		G	G		G			G	G	G	G	G	G	G	G	G	G	27	40	G	G	G	G	G
6	G		G	G	G			G	G	G	G	47	62	42	54	38	G	40	21	36	60	44	33	
7	33		34	28	G			G	39	G	G	48	39	G	37	39	G	26	G	G		G	G	
8	G							G	33	36	G	41	52	G	G	35	49	28	G	G	G	G	G	G
9	G		G	G	G			G	G	33	39	G	G	G	G	G	G	G	G	G			G	G
10		G		G	G			G	G	33	G	G	G	58	45	38	G	34	29	35				G
11		G	G		24	G		G	G	G	G	G	G	65	74	82	67	34	26	33	30			
12		G		30	26	26		28	28	G	47	53	62	76	57	67	43	29	35		G	G	G	G
13	G	G		G	G			G	G	38	60	50	42		50	41	G	35	24	24	30	26		G
14			G	G	G	G		G	34	41	43	46	46	41	G	G	48	36	34	36	40	G	G	27
15				G		G		G	G	39	G	G	G	40	44	G		G	26	G	24	35	G	
16			G	G	G	G			G	41	53	48	44	40	38	40	35	30	G	G	G			
17	G	G	G	G	11			25	28	34	40	48	46	39	G	G	32	G	G	G	G		G	G
18			G	G	G			24	32	G	36	G	38	38	G	G	37	G	27	36	29	24		
19	34		G	G		28		G	29	G	G	42	43	48	39	G	G	G	11	G		G	G	G
20	G			G	G	G		G	G	G	G	G	G	40	G	41	G	30	G	32	25	G	G	G
21	G			G	G	G		G	G	G	G	52	52	44	39	58	41	28	G	27	G	G	G	
22		51	40	34	G	G		G	42	G		44	G	G	40	41	52	40	35				G	G
23								G	G	G	35	G	G	G	G	G	G	31	27	29		G	29	
24	27		25	G	G	G	G	G	28	37	38	46	G	42	G	G	G	G	G	G	G	G	G	
25				G	G			G	G	39	G	G	G	G	G	40	37	30	G	G	G	33		36
26	36	30	G	G	33			G	G	G	G	G	48	G	G	39	G	G		32	G	G		
27				G	G	11		G		44	35	N	G	G	G	38	43	32	11	20		G		
28				G						G	G	G	G	51	49	38	G		11	G	G			
29									28	G	G	G		G	G	G	G	G	G	31	29	30	G	G
30						G		G		G	G	38	G	38	G	G	37	31	11	G	G	25		
31				G		G			34	G	G	41	G	G	39	42	G	35	35	42	50	G	G	G
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	13	8	15	25	21	15	1	27	28	31	30	30	30	30	31	31	30	30	29	29	23	23	20	18
MED	G	G	G	G	G	G	G	G	G	G	G	40	G	38	G	38	32	30	11	20	G	G	G	G
U Q	30	15	G	G	G	G	0	G	32	37	36	46	45	42	44	41	40	34	29	34	29	25	G	G
L Q	G	G	G	G	G	G	0	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

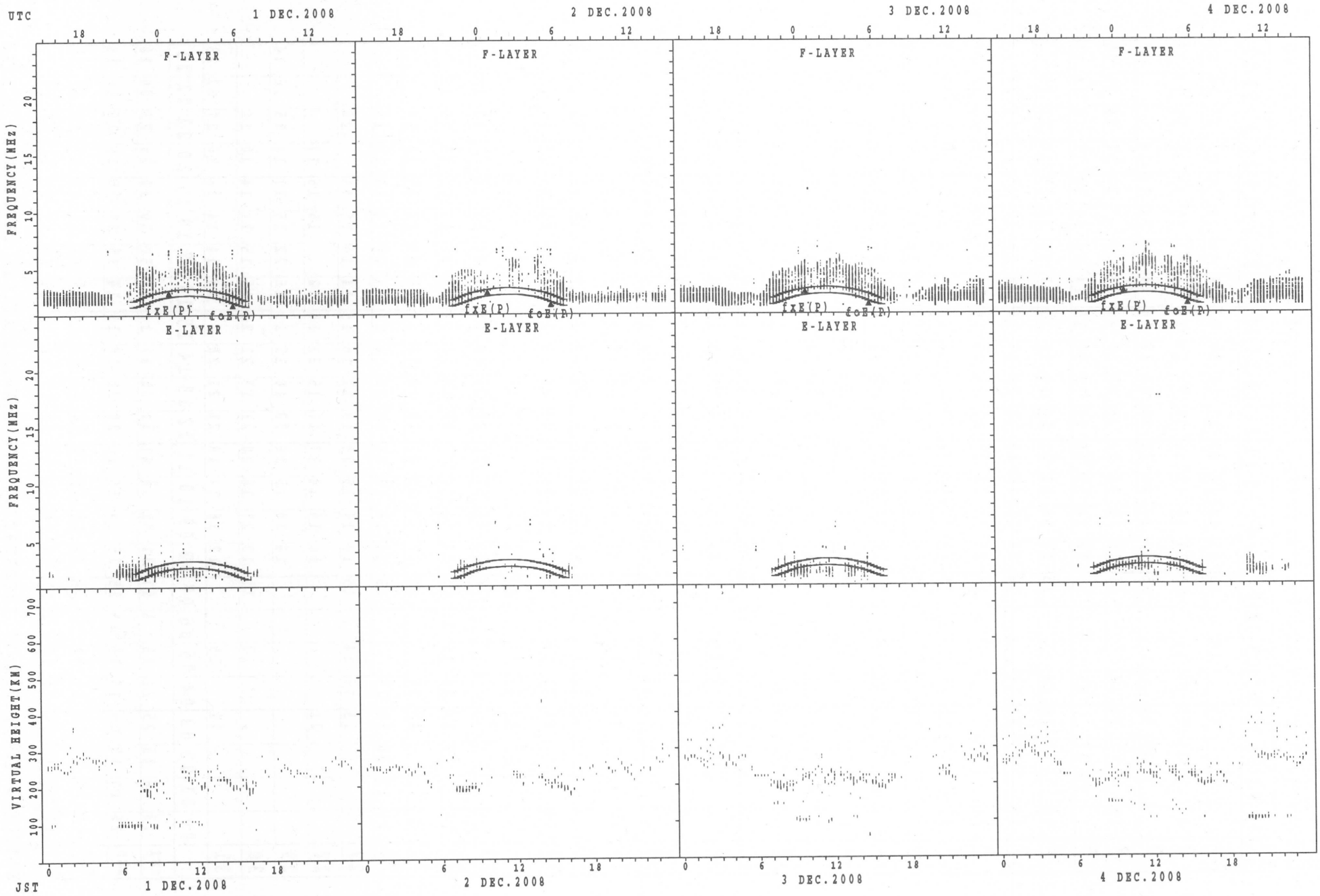
HOURLY VALUES OF fmin AT Okinawa

DEC. 2008

LAT. 26°40.5'N LON. 128°09.2'E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

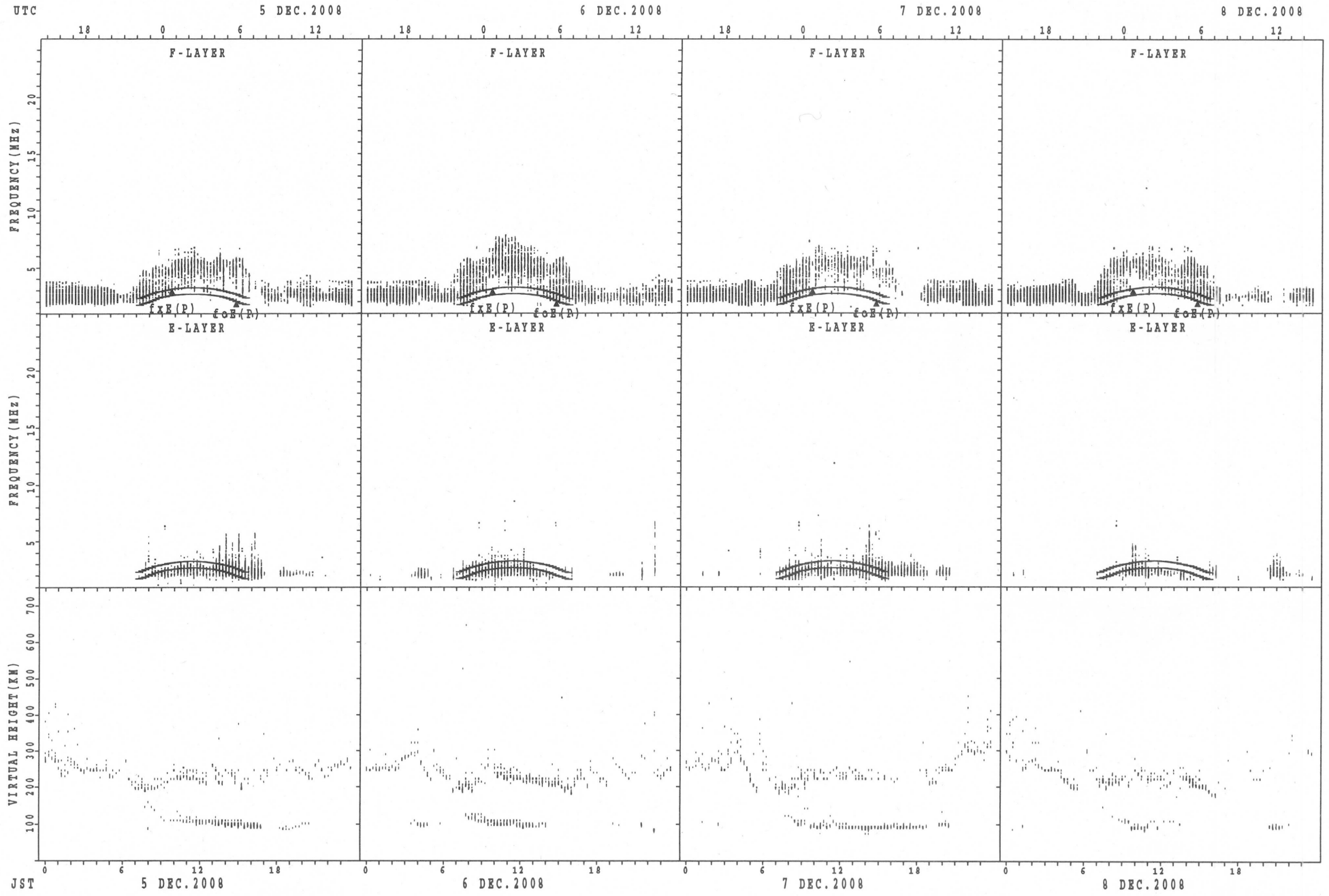
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1				15		16		16	15	14	14	42	17	16	30	14	16	16	14	15	15	15	15	18
2	15		15	15	15	14		15	14	16	15	16	21	29	23	18	16	22	15	15	15	16	14	14
3			15	15				15	23	17	20	22	28	23	18	16	14	14	15	14	14			15
4	15			14	14			15	16	15	36	29	29	20	29	16	14	14		23	21	16	21	15
5		16	17		15			15	14	14	22	18	20	39	38	35	14	16	14	14	15	16	15	15
6	16		15	16	15			15	17	14	14	21	20	18	18	21	29	14	21	15	15	15	15	
7	14		14	16	14			16	14	15	16	18	21	39	17	15	26	14	18	15		14	17	
8	15							22	15	18	26	20	17	21	21	14	14	14	15	23	15	26	18	20
9	15		14	15	16			15	24	17	17	23	23	23	18	20	16	22	16	16			15	20
10		18		21	16			17	21	16	17	17	22	22	23	15	16	26	14	14				16
11		15	16		14	15		15	21	14	38	18	18	20	21	18	14	16	14	16	15			
12		15		14	15	15		14	15	14	18	16	22	20	17	17	14	16	15		18	16	21	17
13	18	15		15	14			15	15	14	15	22	20	20	20	15	15	15	16	16	15	15		21
14			15	16	22	15		15	16	14	14	15	20	20	17	17	14	14	16	15	15	14	16	17
15				14		15		15	26	14	14	17	20	17	17	14	16	26	16	20	15	15	15	
16			16	16	14	16			23	24	15	17	18	16	23	18	14	14	17	16	15			
17	20	15	18	14	15			15	14	14	15	18	18	16	22	20	14	21	18	16	18		16	15
18			15	20	18			15	14	14	23	18	22	20	18	14	14	15	15	16	15	17		
19	14		15	14		15		15	14	14	17	21	21	18	15	15	14	20	14	14		15	15	15
20	16			14	15	18		20	15	15	28	22	42	22	18	14	14	14	16	15	16	15	16	18
21	14			15	21	15		15	26	14	18	27	21	24	23	17	22	20	15	14	15	15	15	
22		15	15	15	17	15		15	14	14		20	27	41	18	15	14	15	14	15			20	15
23								16	21	15	17	26	20	21	38	26	18	14	15	14		18	15	
24	14		14	15	16	15	15	15	15	14	16	17	20	15	14	14	14	16	15	15	15	16	15	
25				15	16			15	22	17	14	17	18	16	36	14	15	14	18	15	14	14		15
26	15	15	20	15	15			15	14	14	15	15	21	20	14	14	14	20	15	15	15	18		
27				15	15	14		15	14	14	15	20	18	22	16	15	14	14	15	15		20		
28				21					16	15	14	17	17	15	21	15	22		15	15	17			
29									14	14	15	16	20	18	15	29	26	22	15	17	14	15	16	14
30						17		15	18	27	16	20	21	17	21	20	15	15	21	14	20	16		
31				14		15			17	16	17	18	21	21	18	15	14	14	14	16	16	21	22	23
	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	13	8	15	25	21	15	1	27	31	31	30	31	31	31	31	31	31	30	30	30	24	23	20	18
MED	15	15	15	15	15	15	15	15	15	14	16	18	20	20	18	15	14	15	15	15	15	16	16	16
U Q	16	15	16	16	16	16	7	15	21	16	18	22	22	22	23	18	16	20	16	16	16	17	17	18
L Q	14	15	15	14	14	15	7	15	14	14	15	17	18	17	17	14	14	14	15	15	15	15	15	15

SUMMARY PLOTS AT Wakkanai

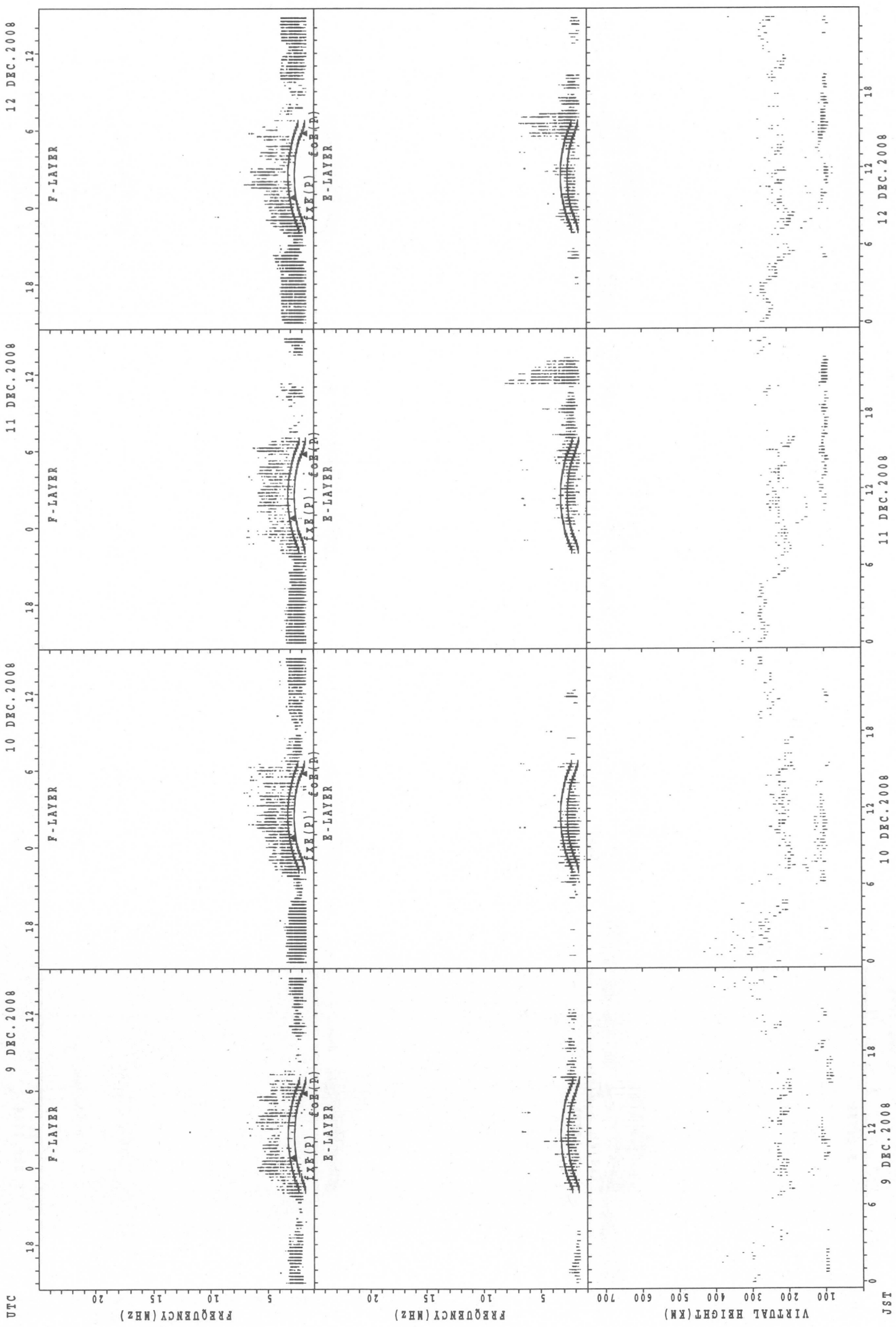


fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

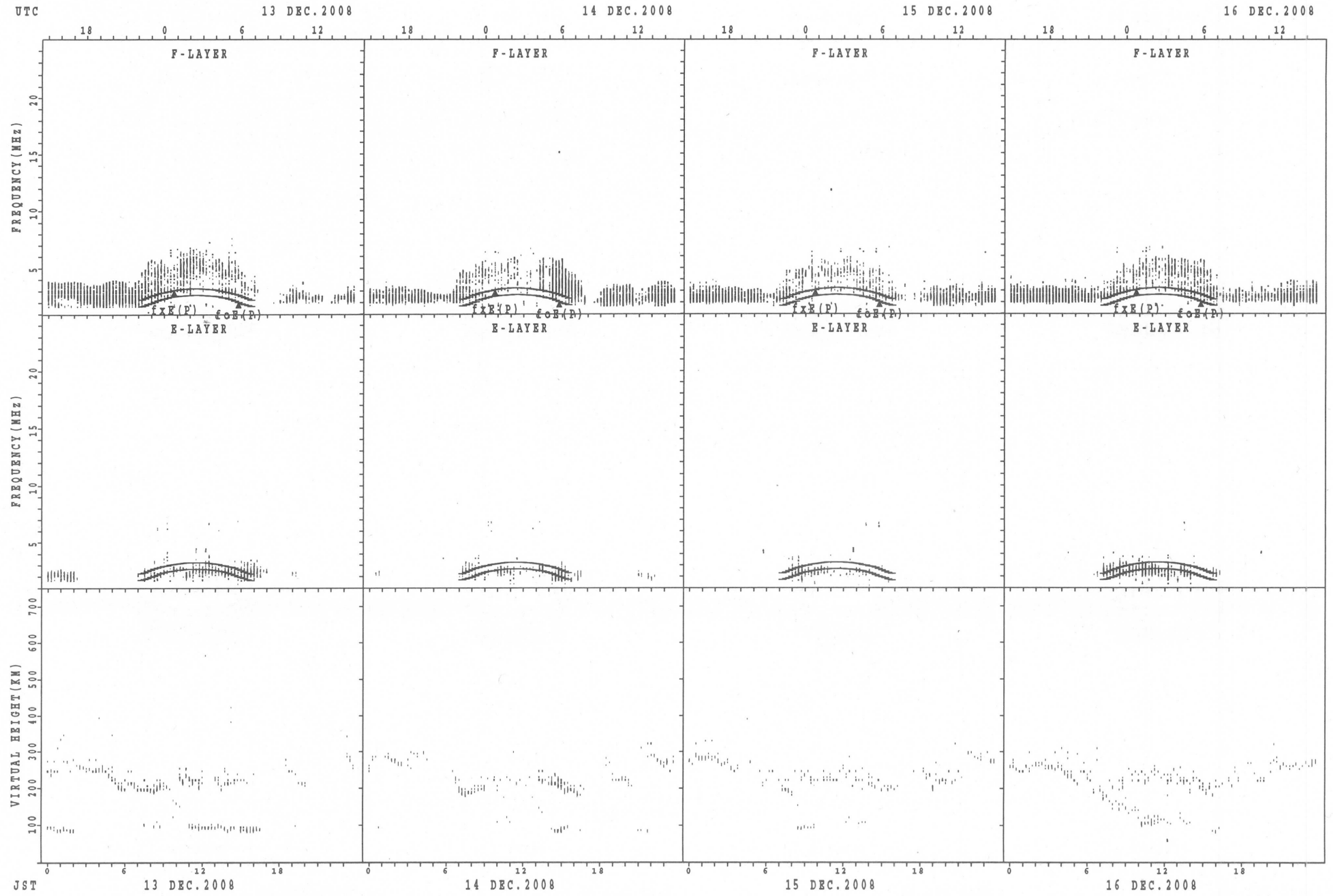
SUMMARY PLOTS AT Wakkanai



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

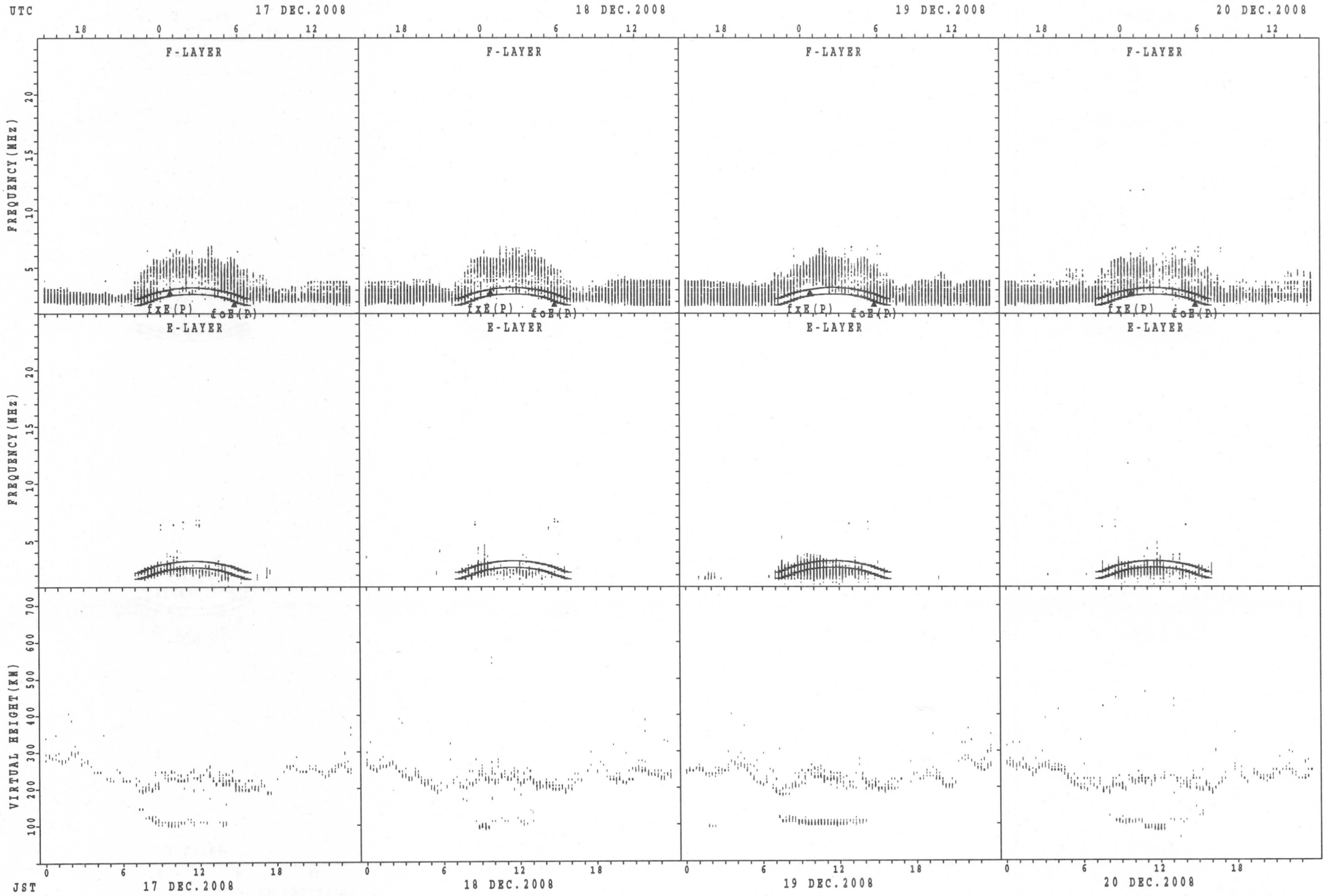

SUMMARY PLOTS AT Wakkanai
UTC
JST
9 DEC.2008
10 DEC.2008
11 DEC.2008
12 DEC.2008
F-LAYER
E-LAYER
FREQUENCY (MHz)
VIRTUAL HEIGHT (KM)
fxE(P)
foE(P)
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



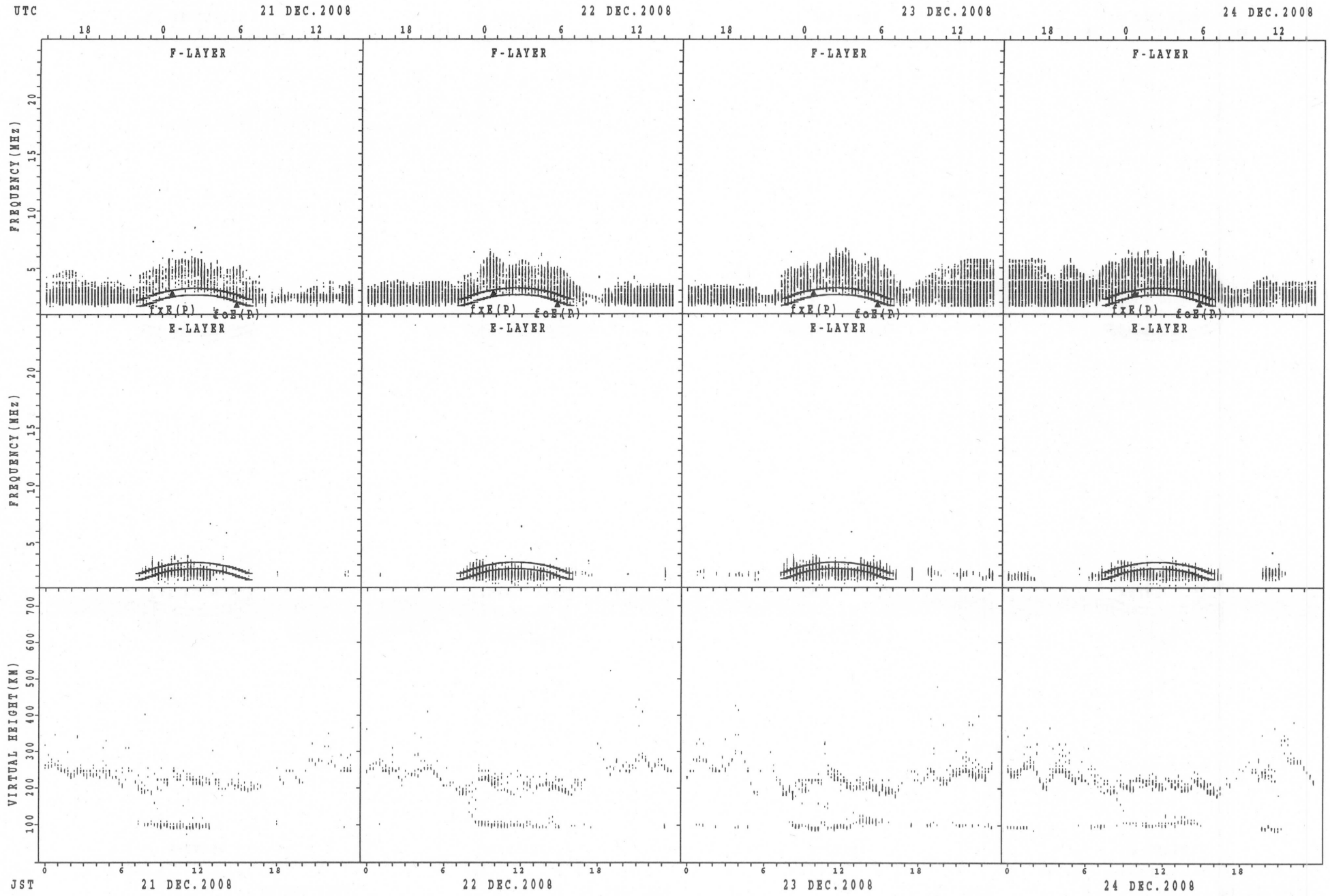
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



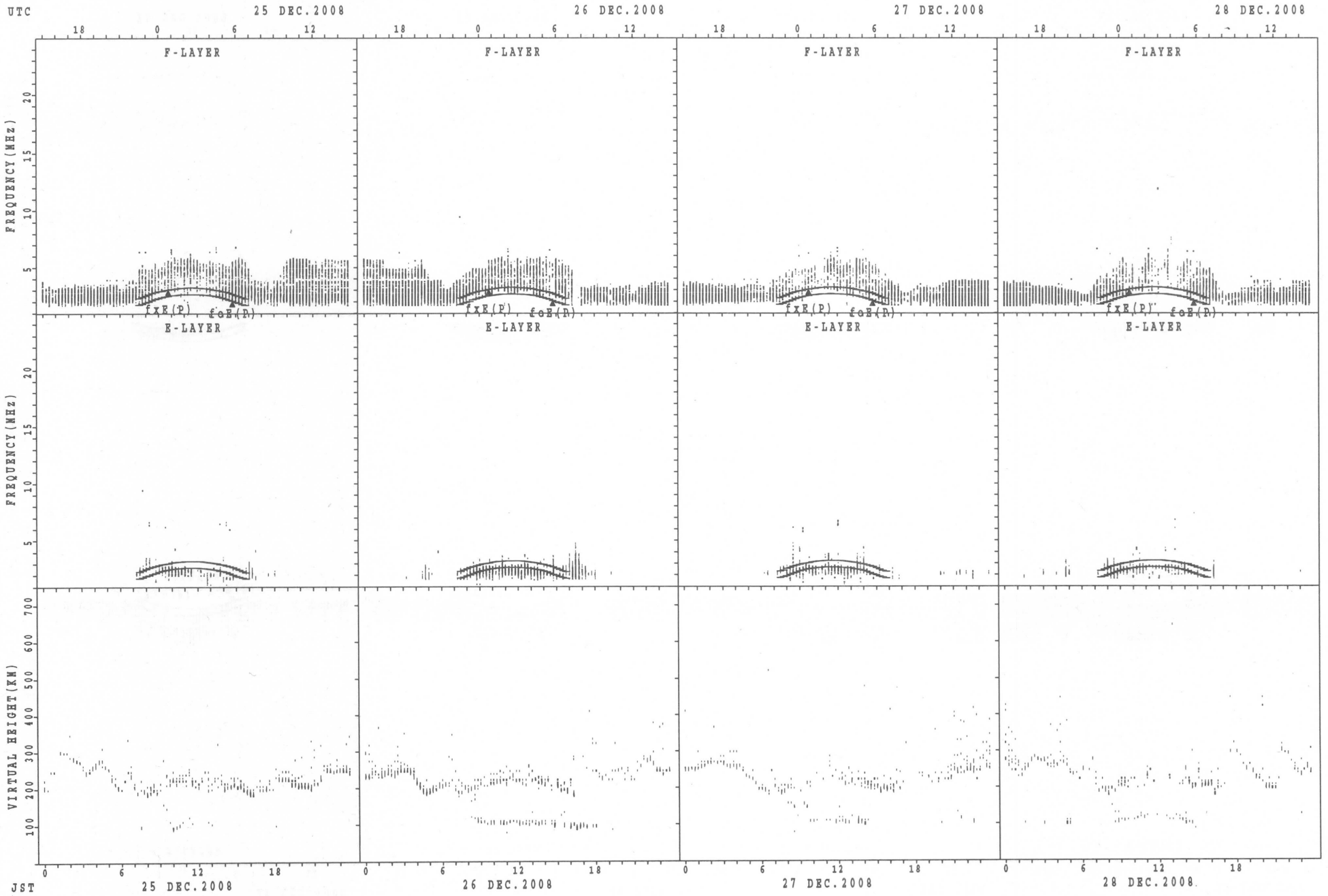
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



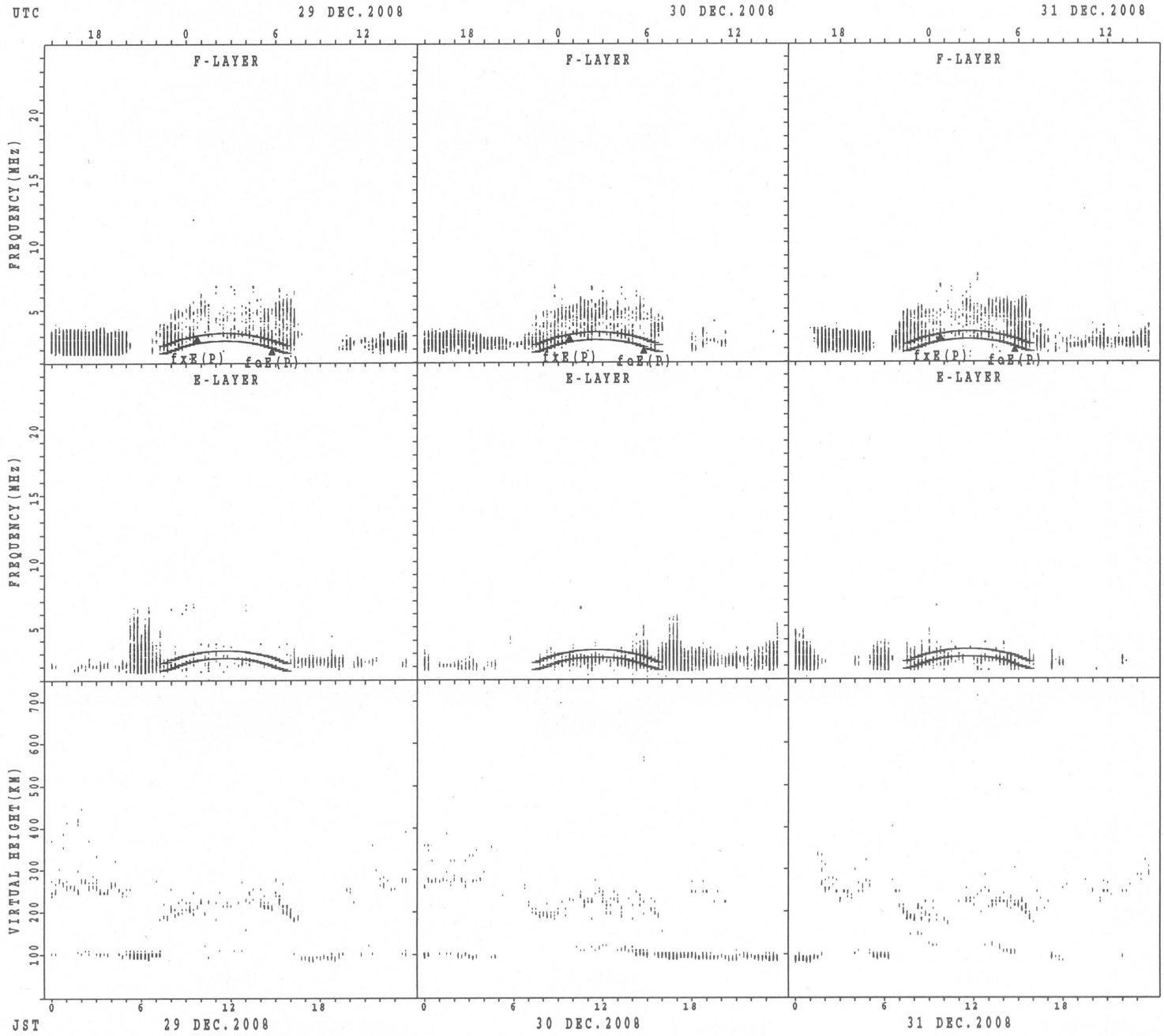
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



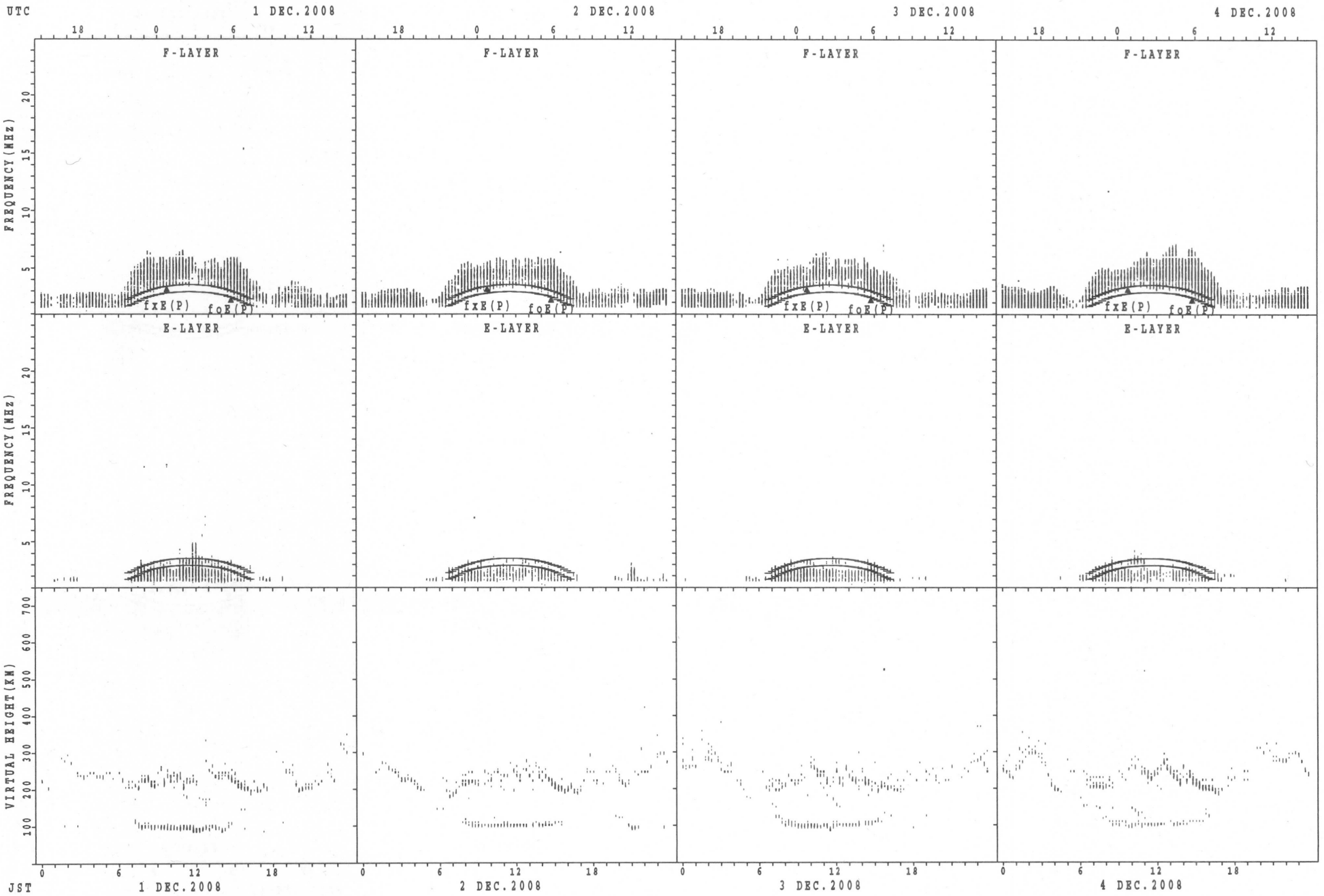
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



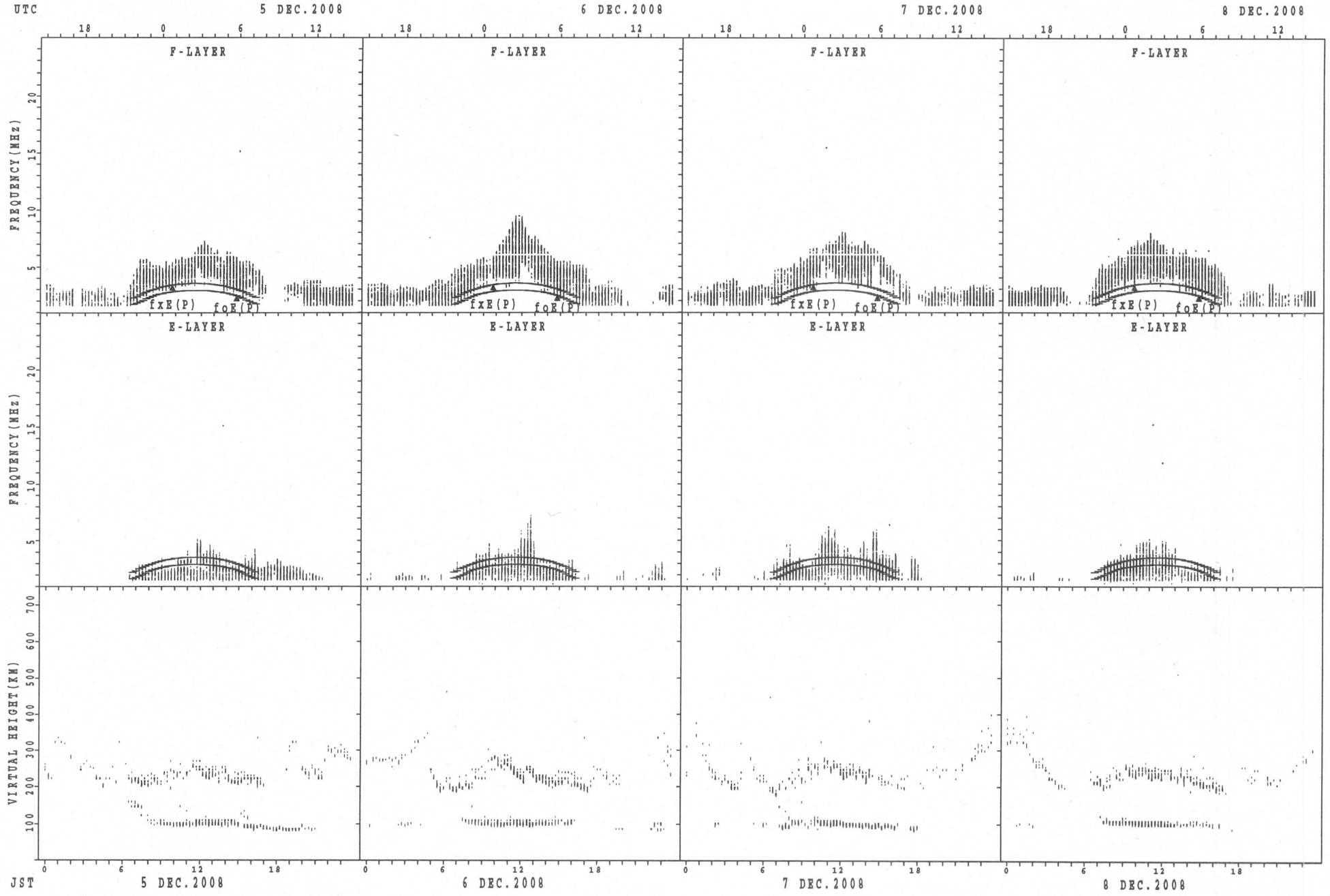
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



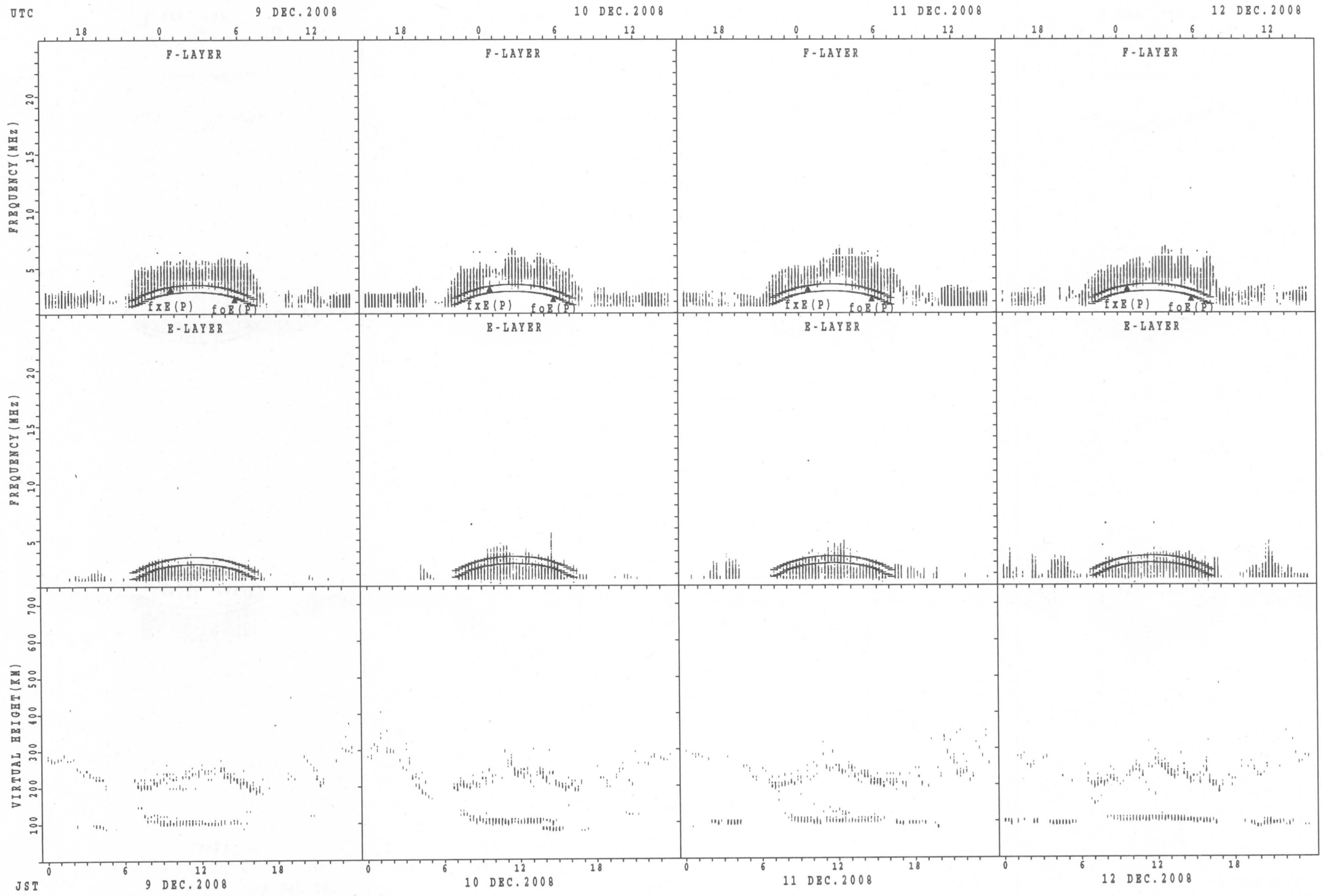
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



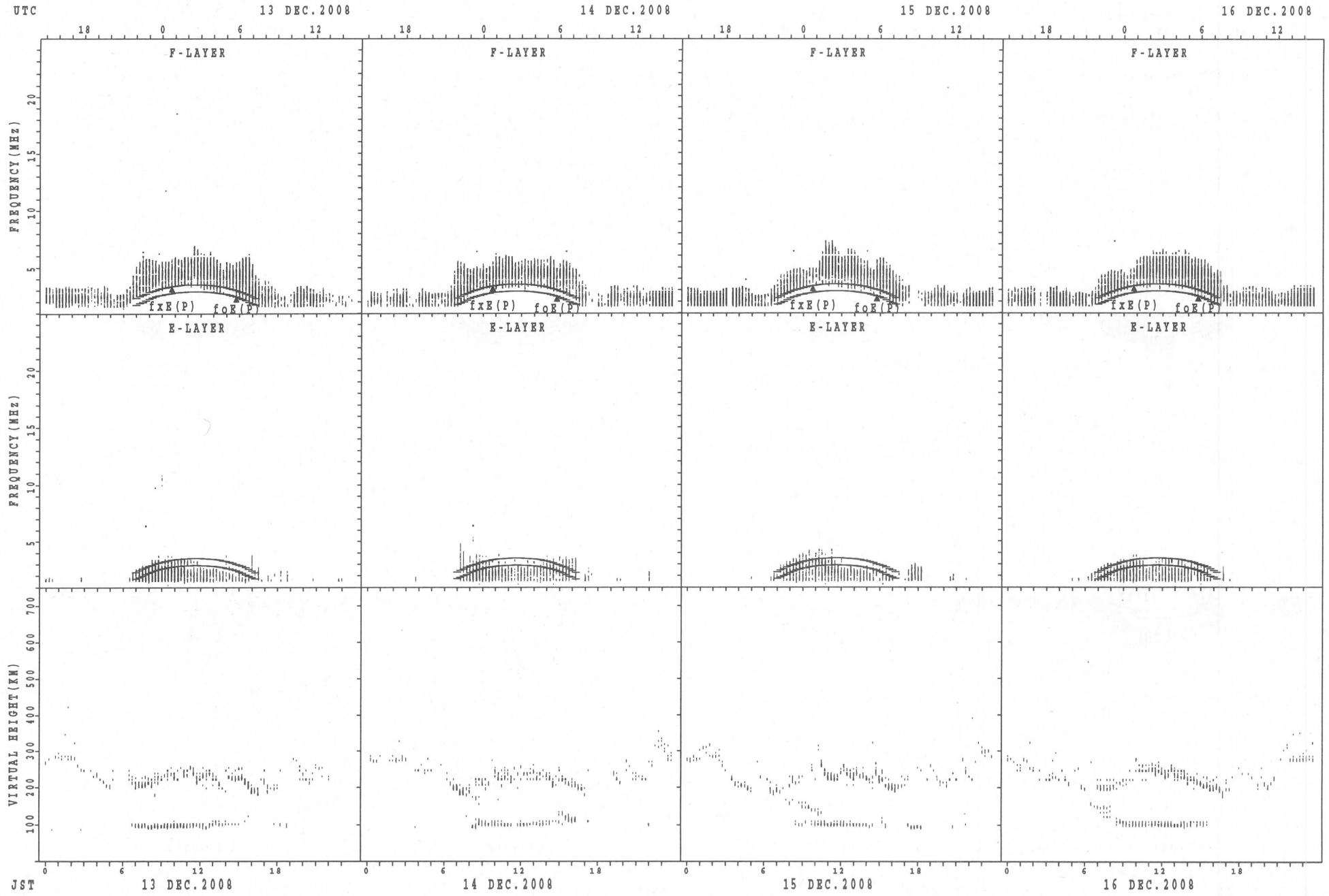
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



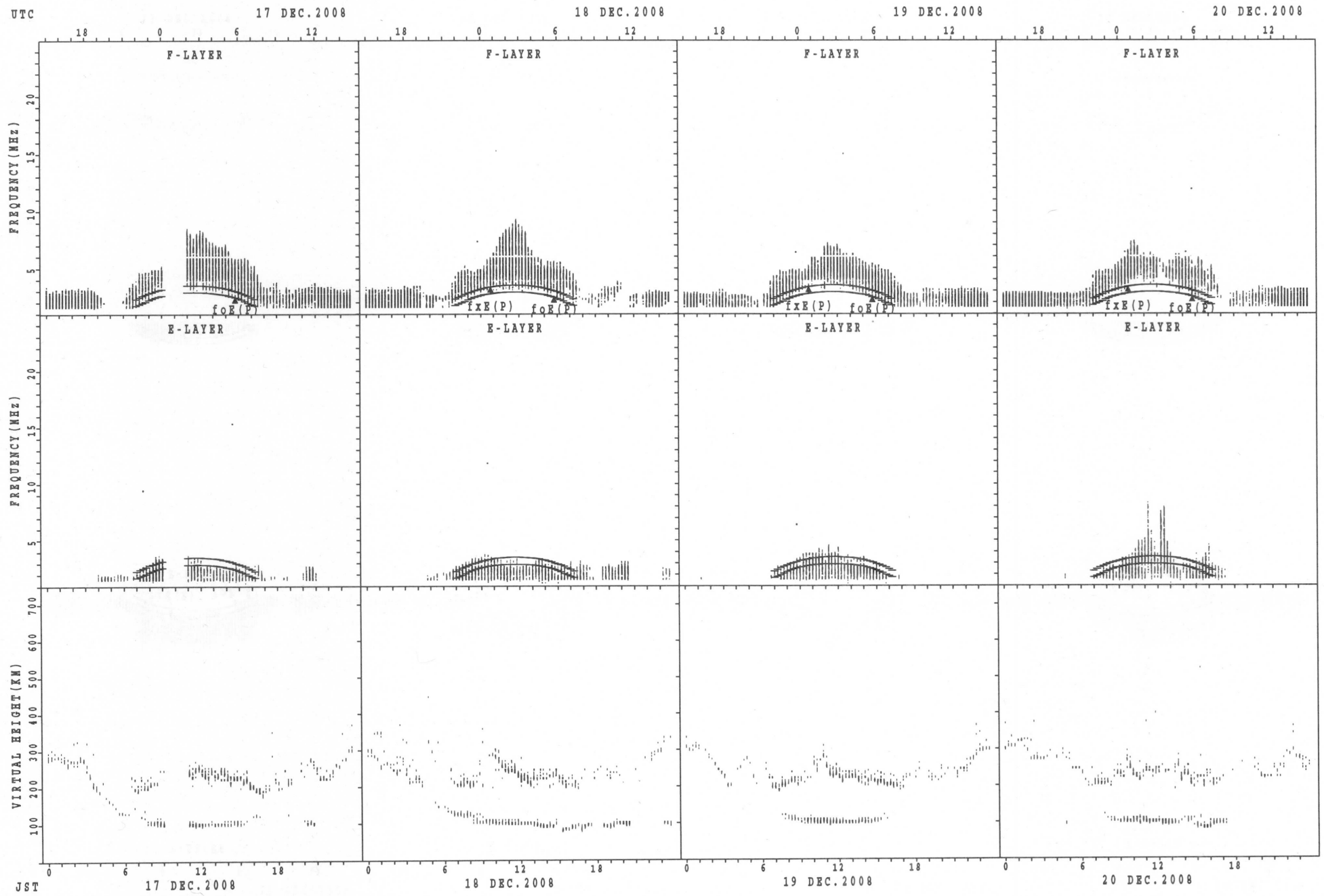
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



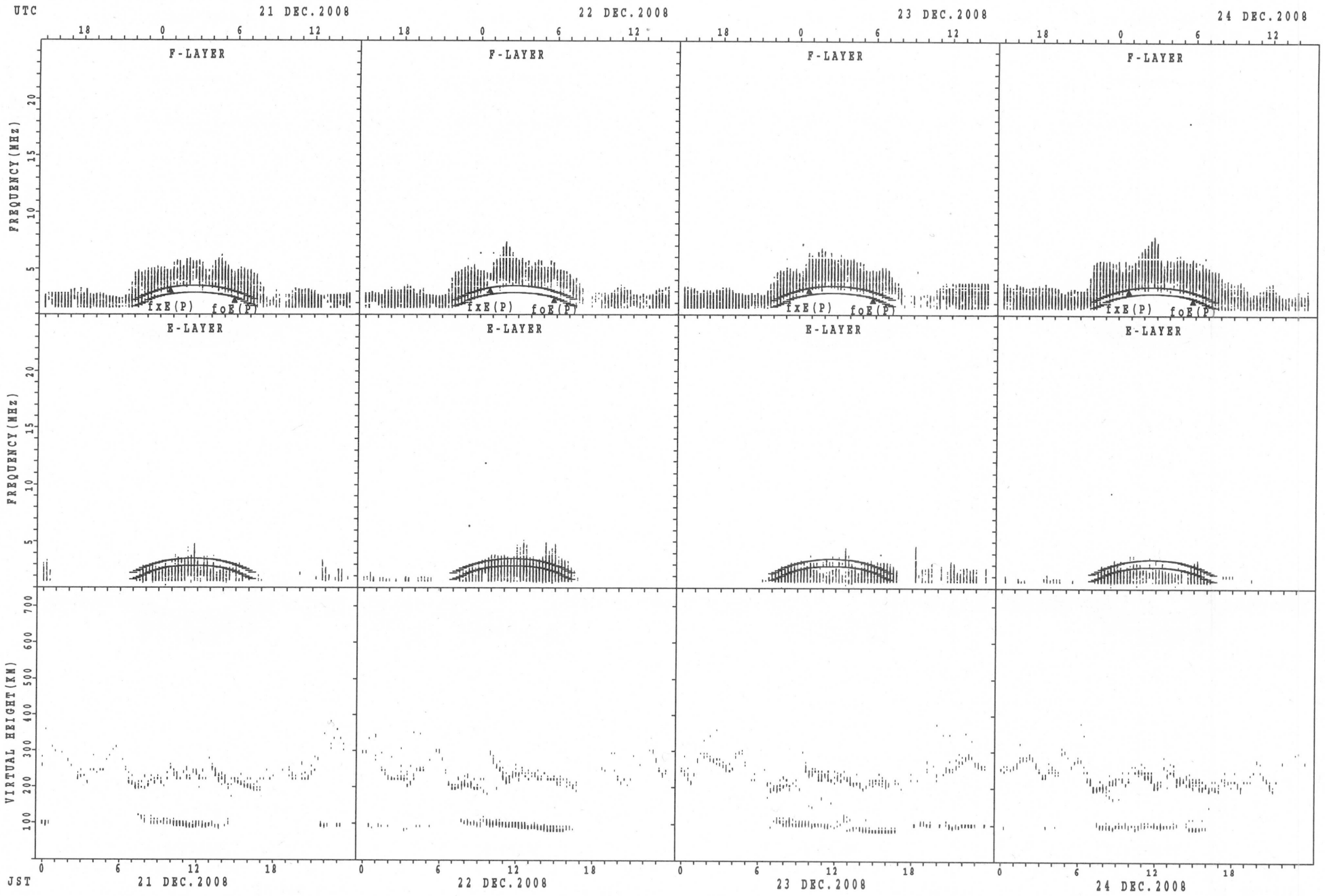
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



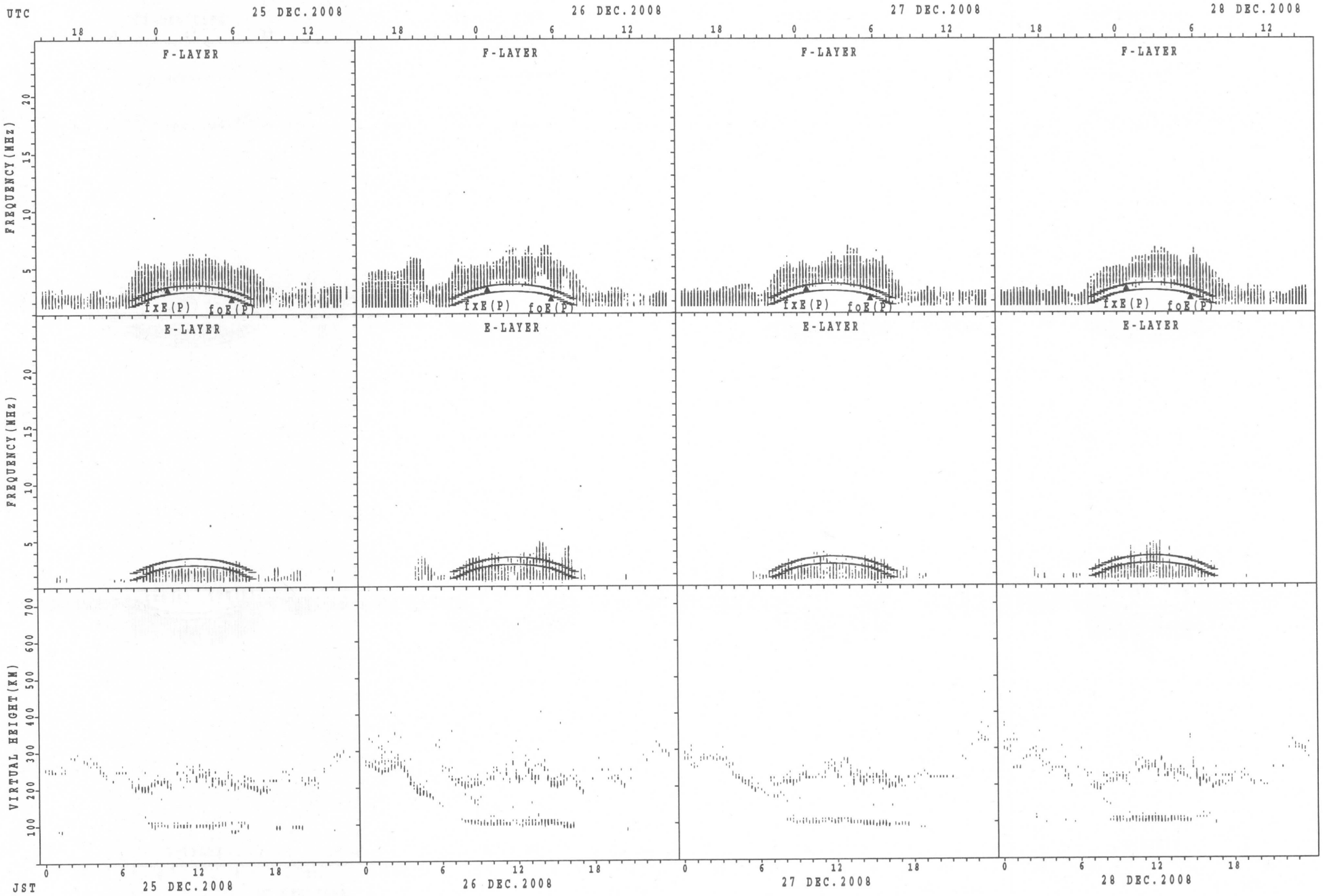
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



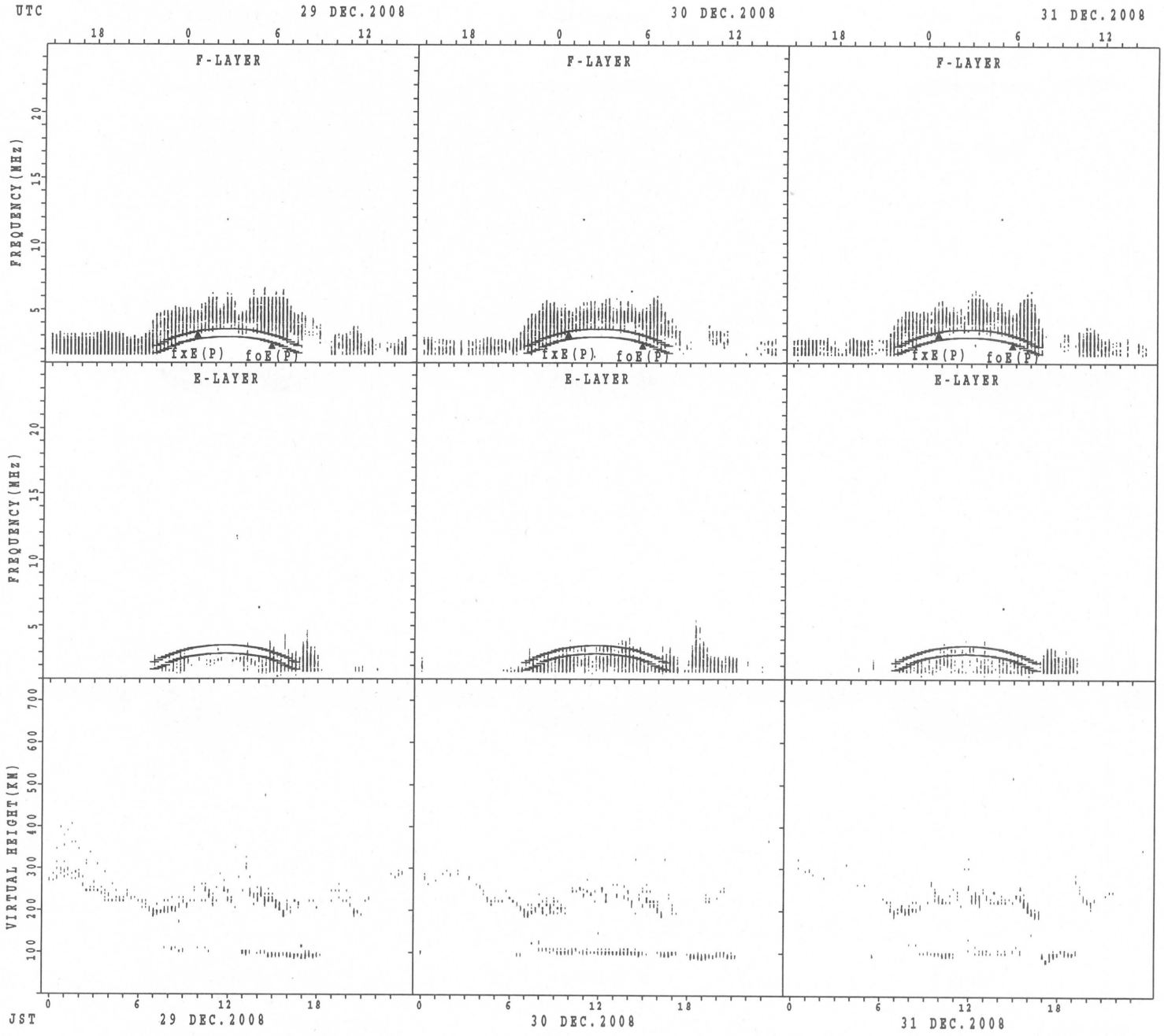
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



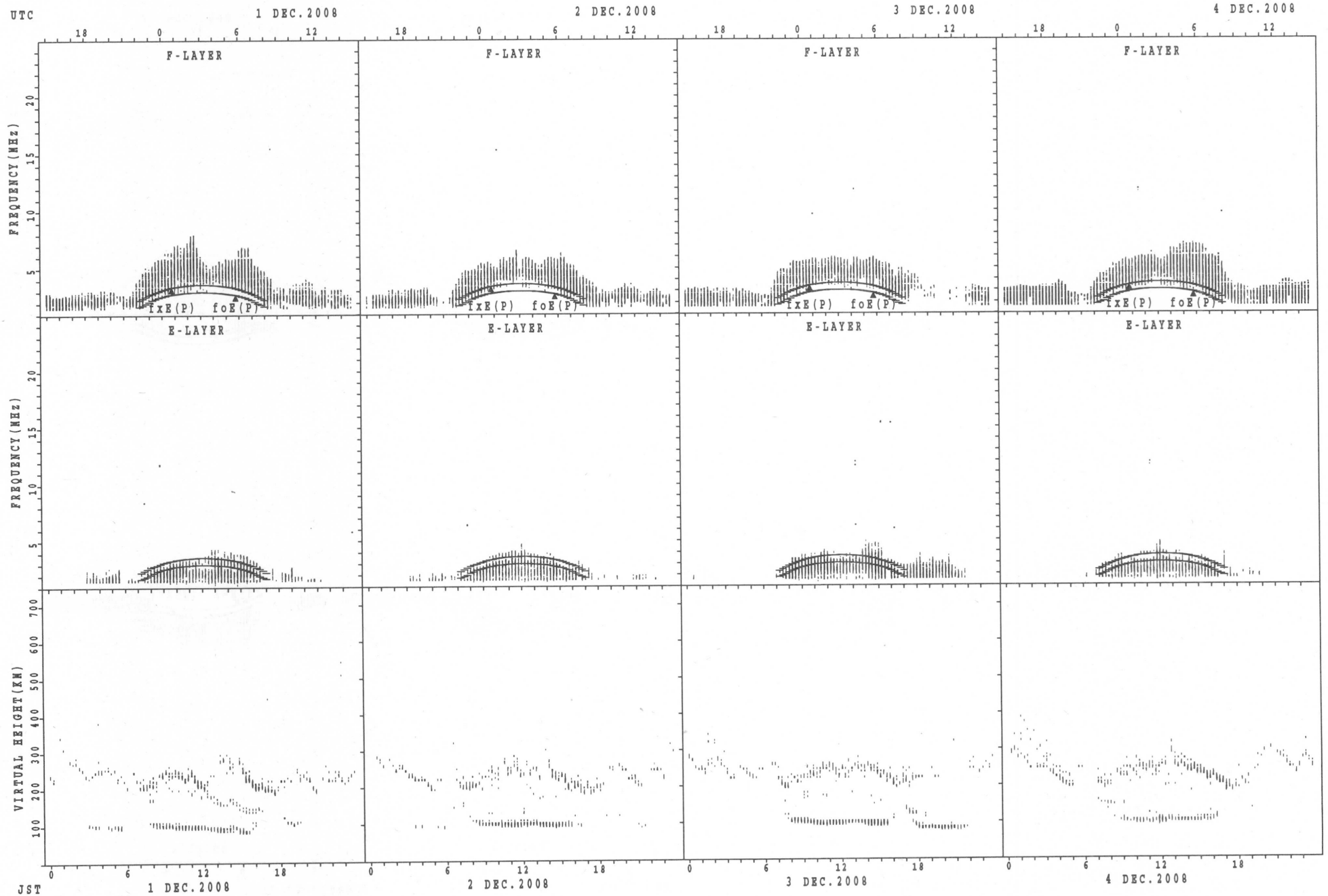
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



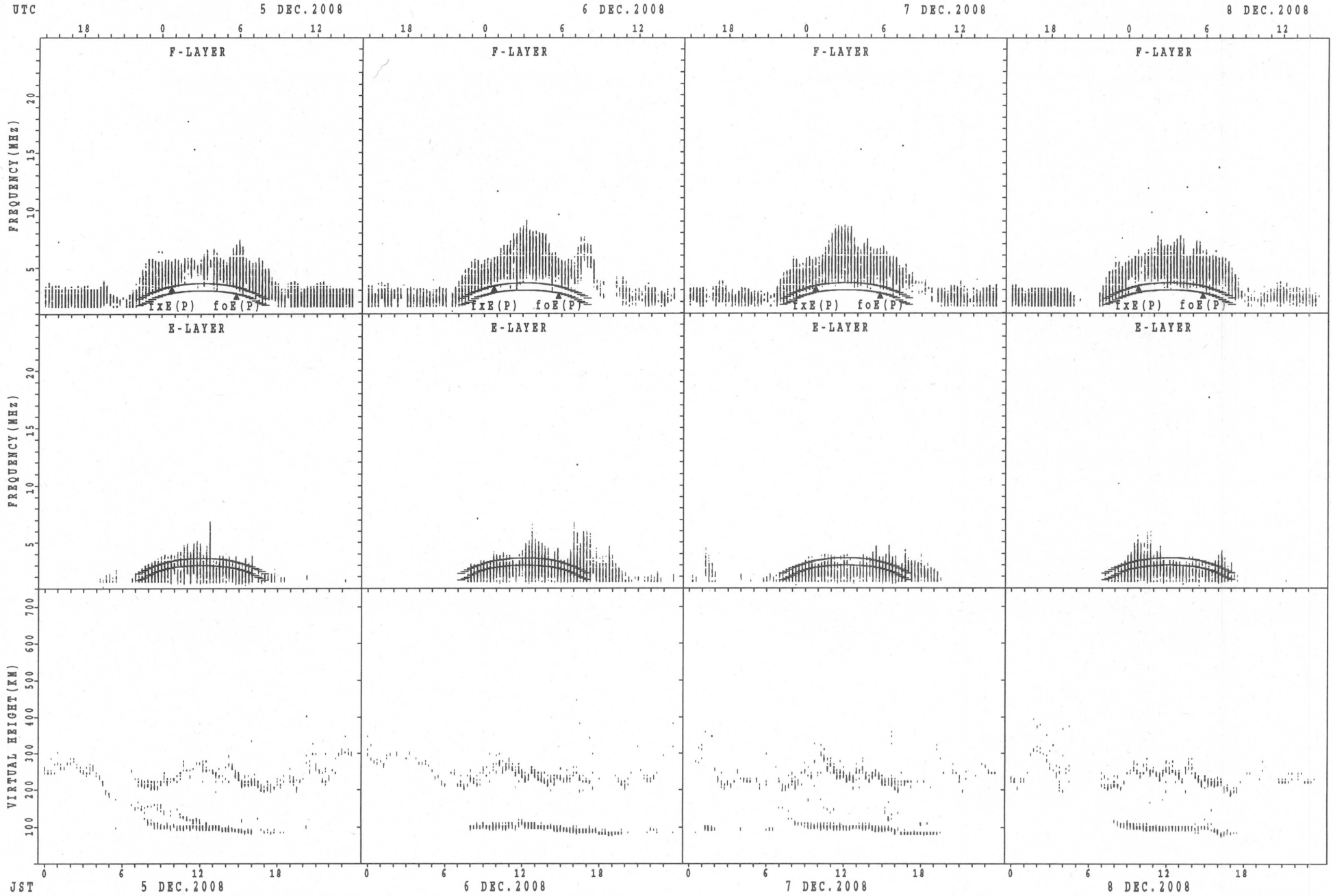
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



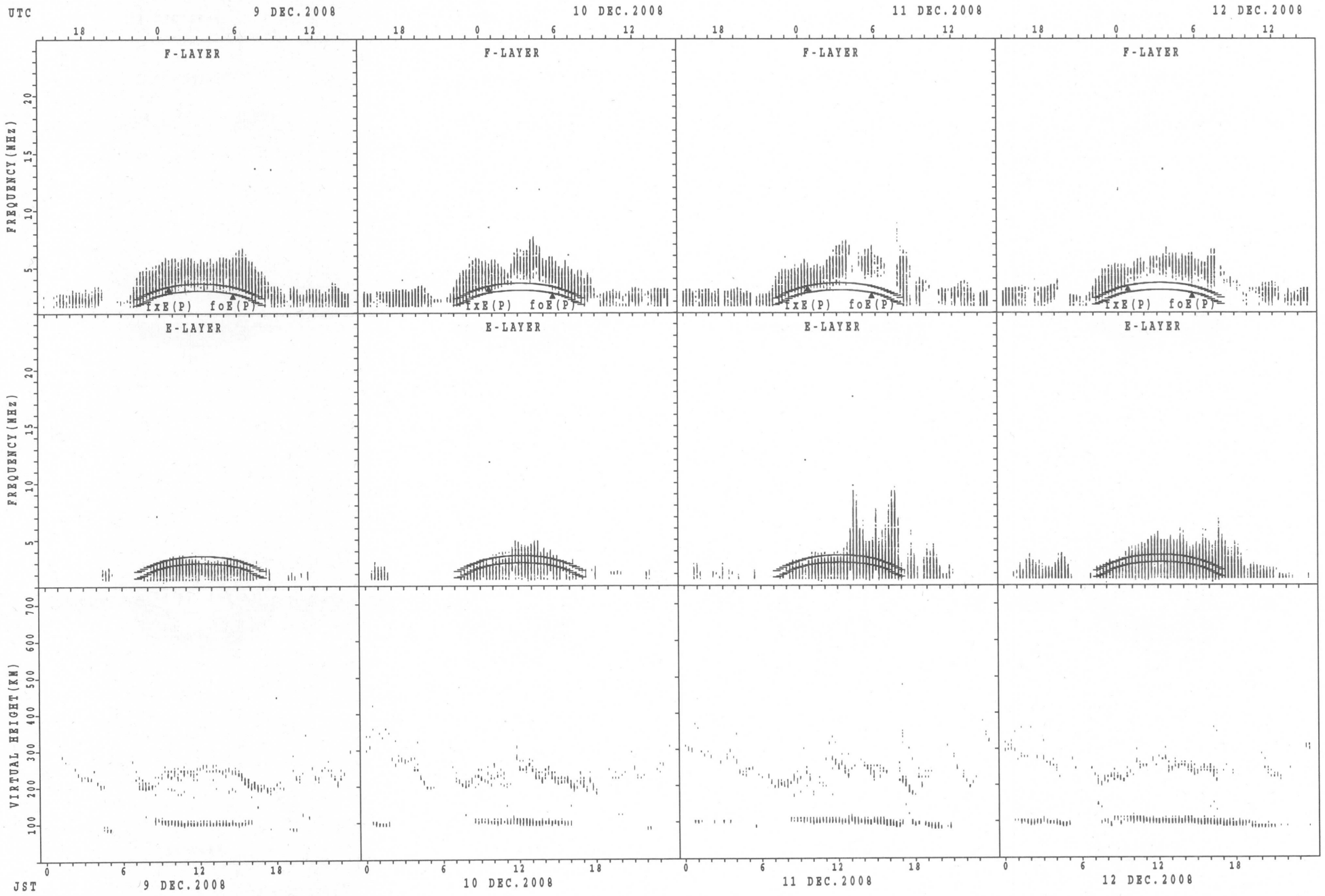
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



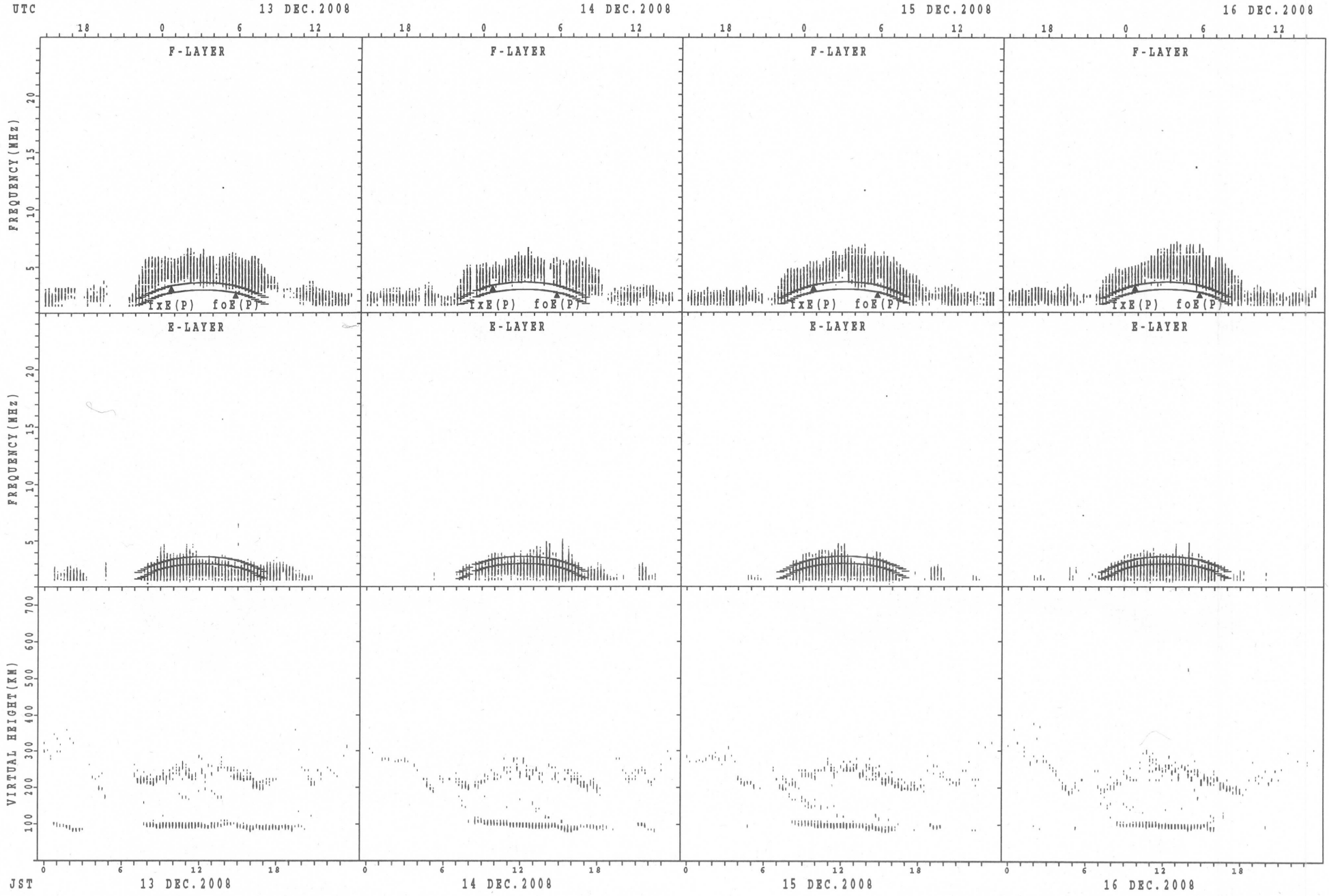
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



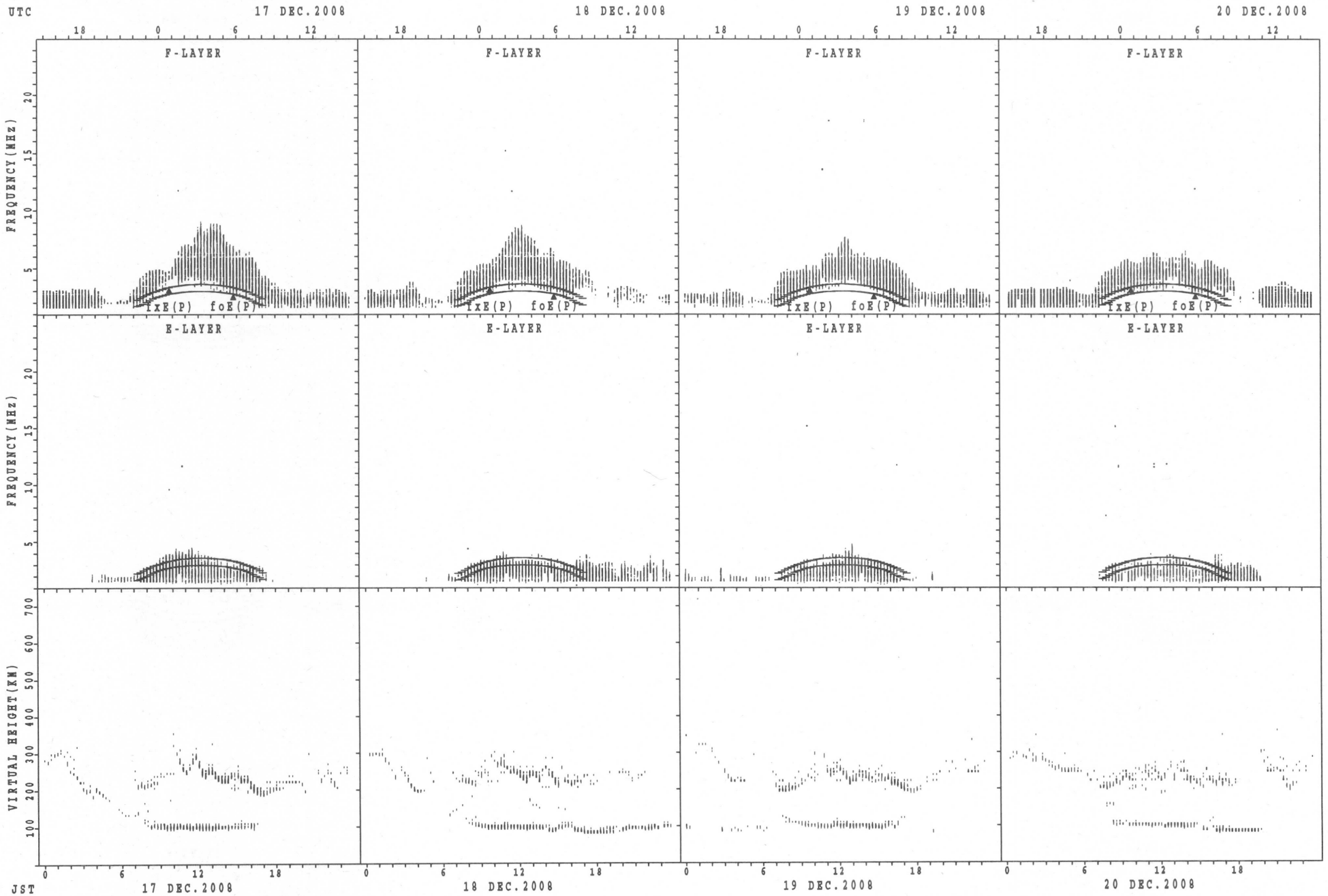
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



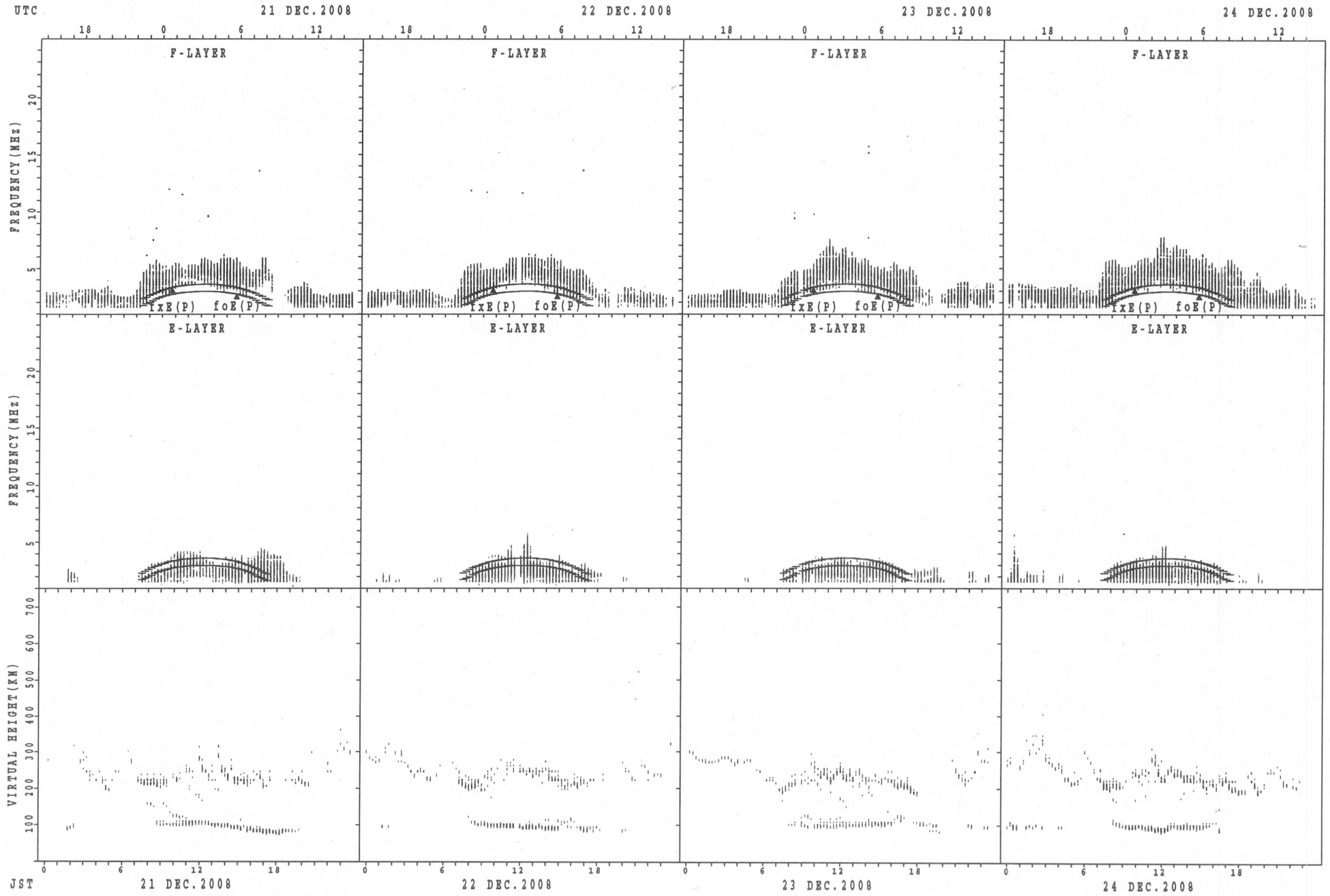
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



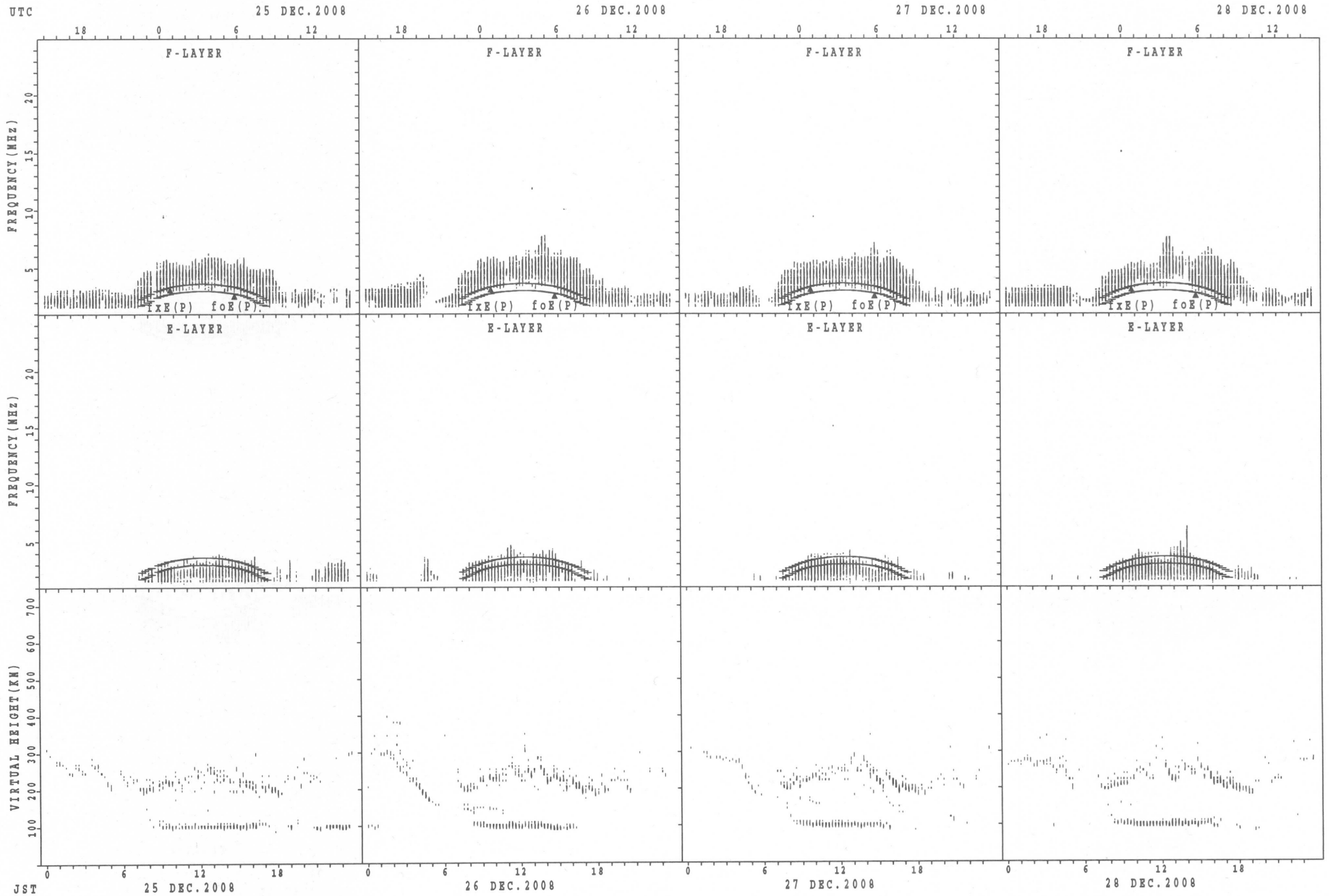
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



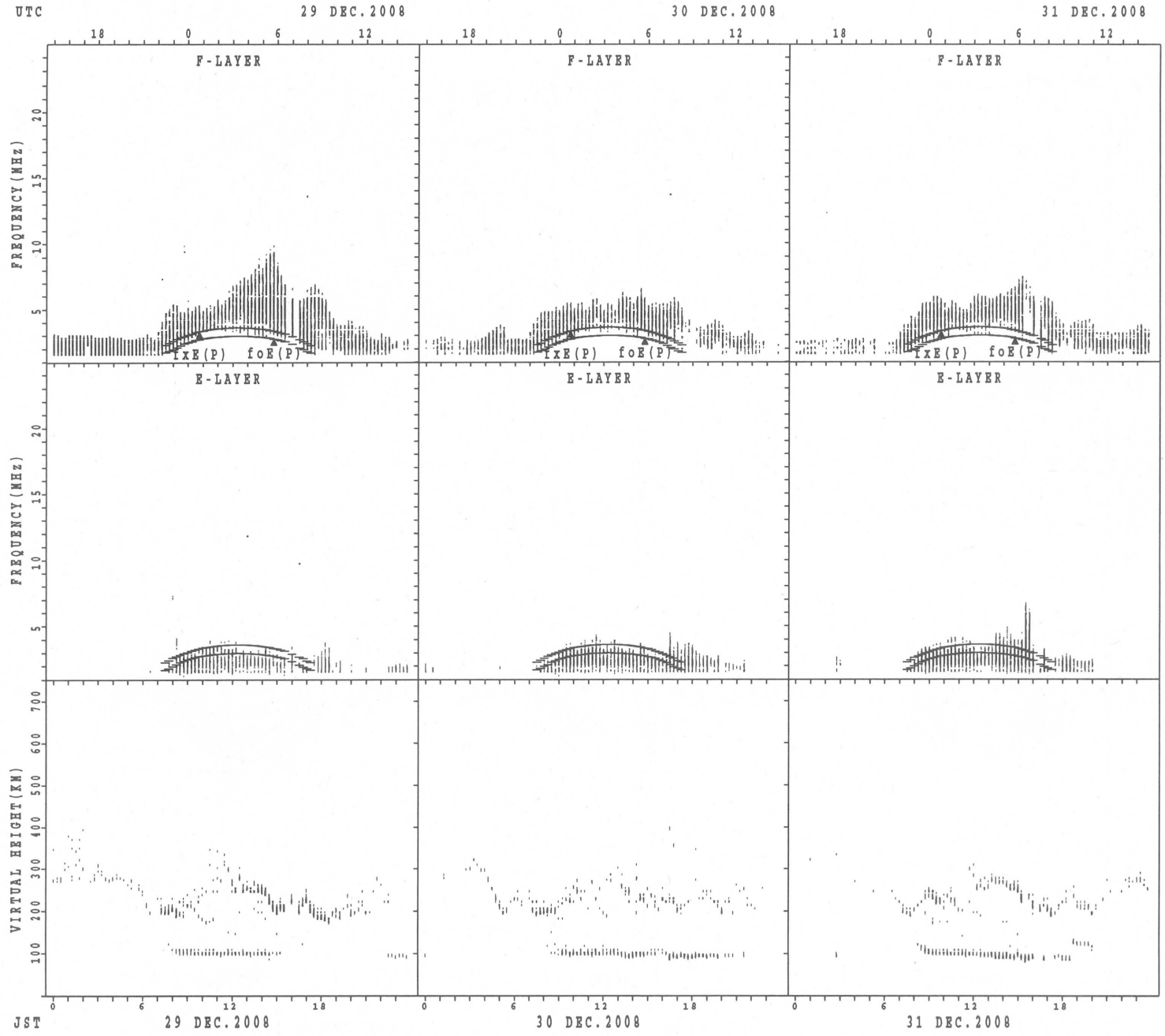
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



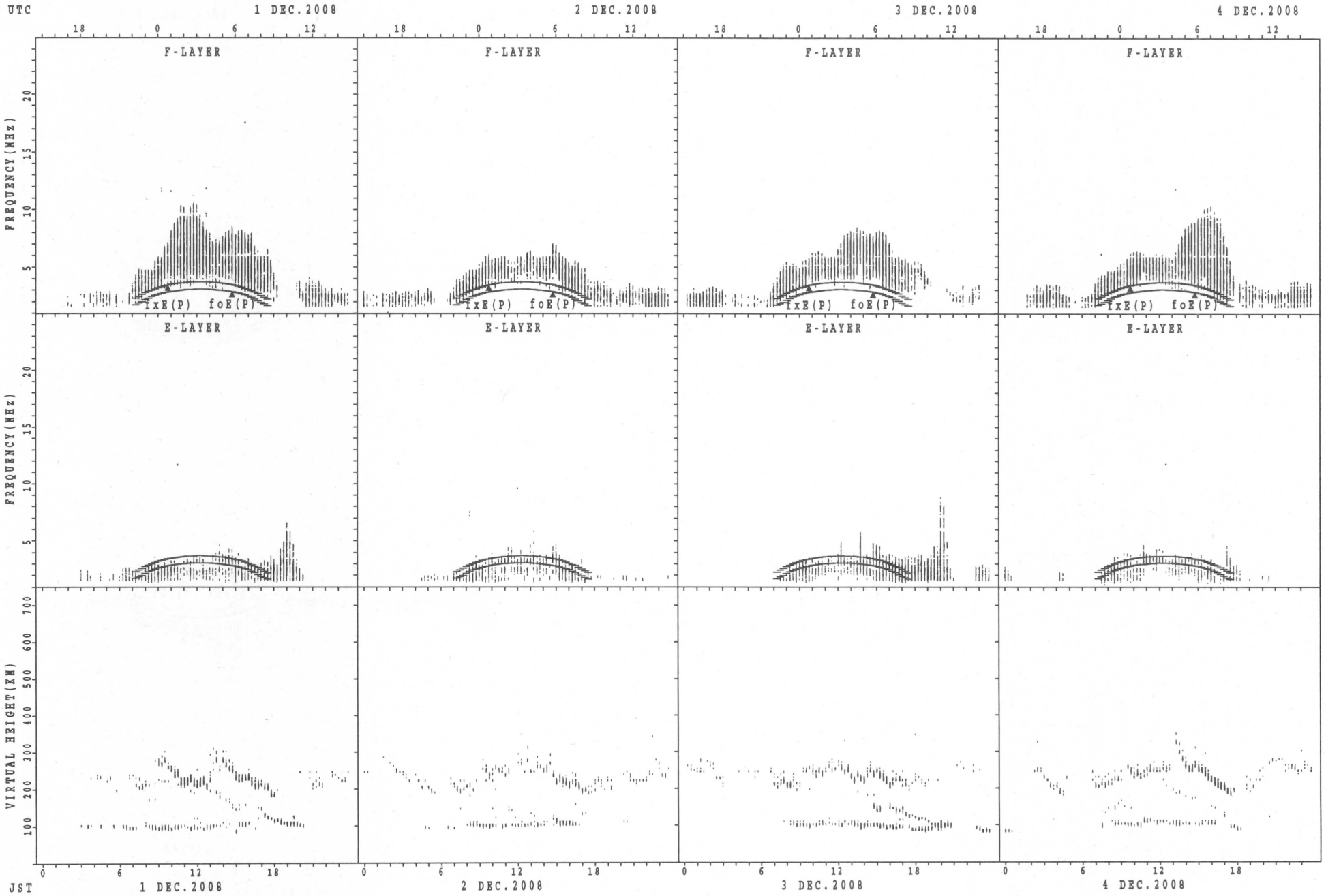
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa



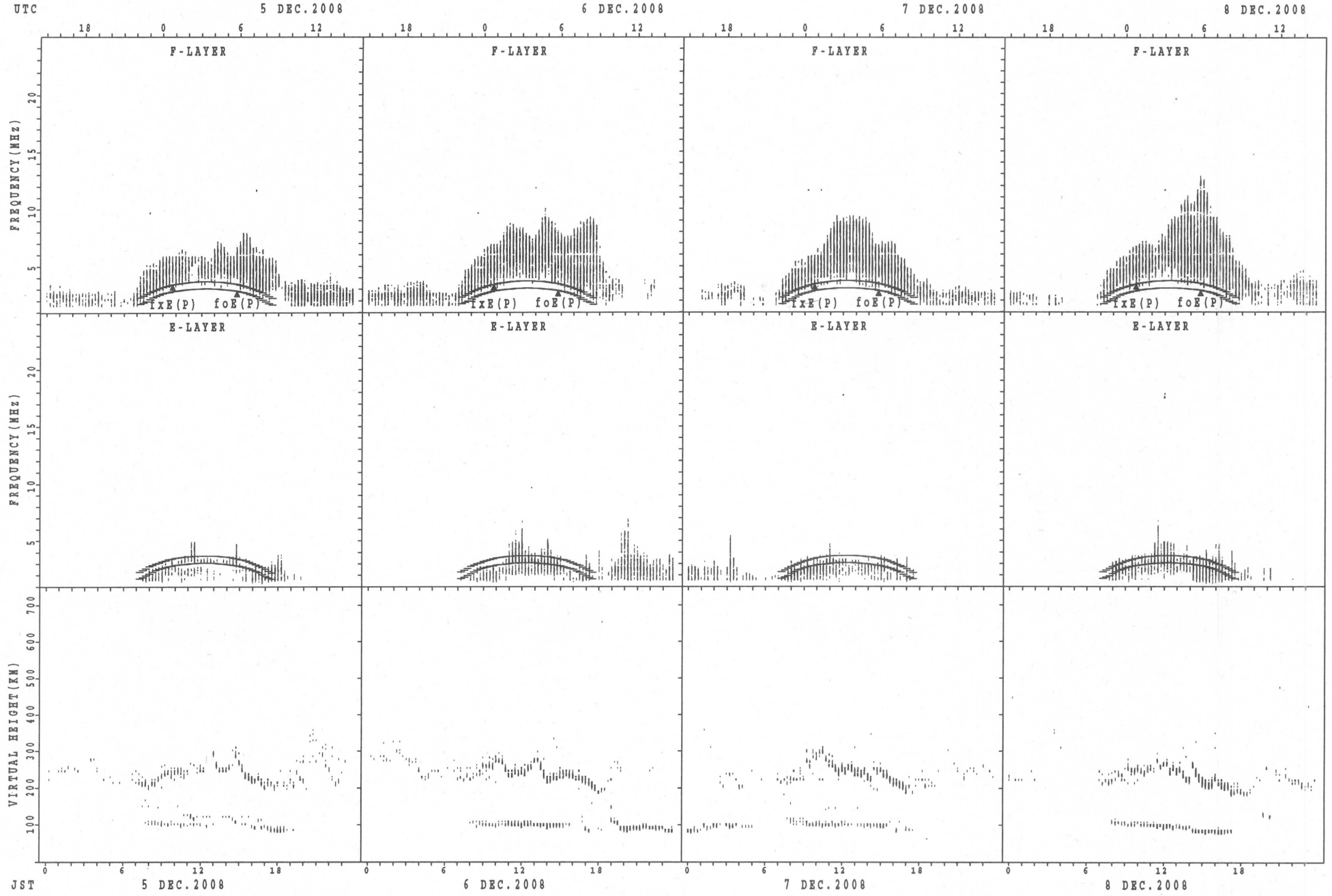
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



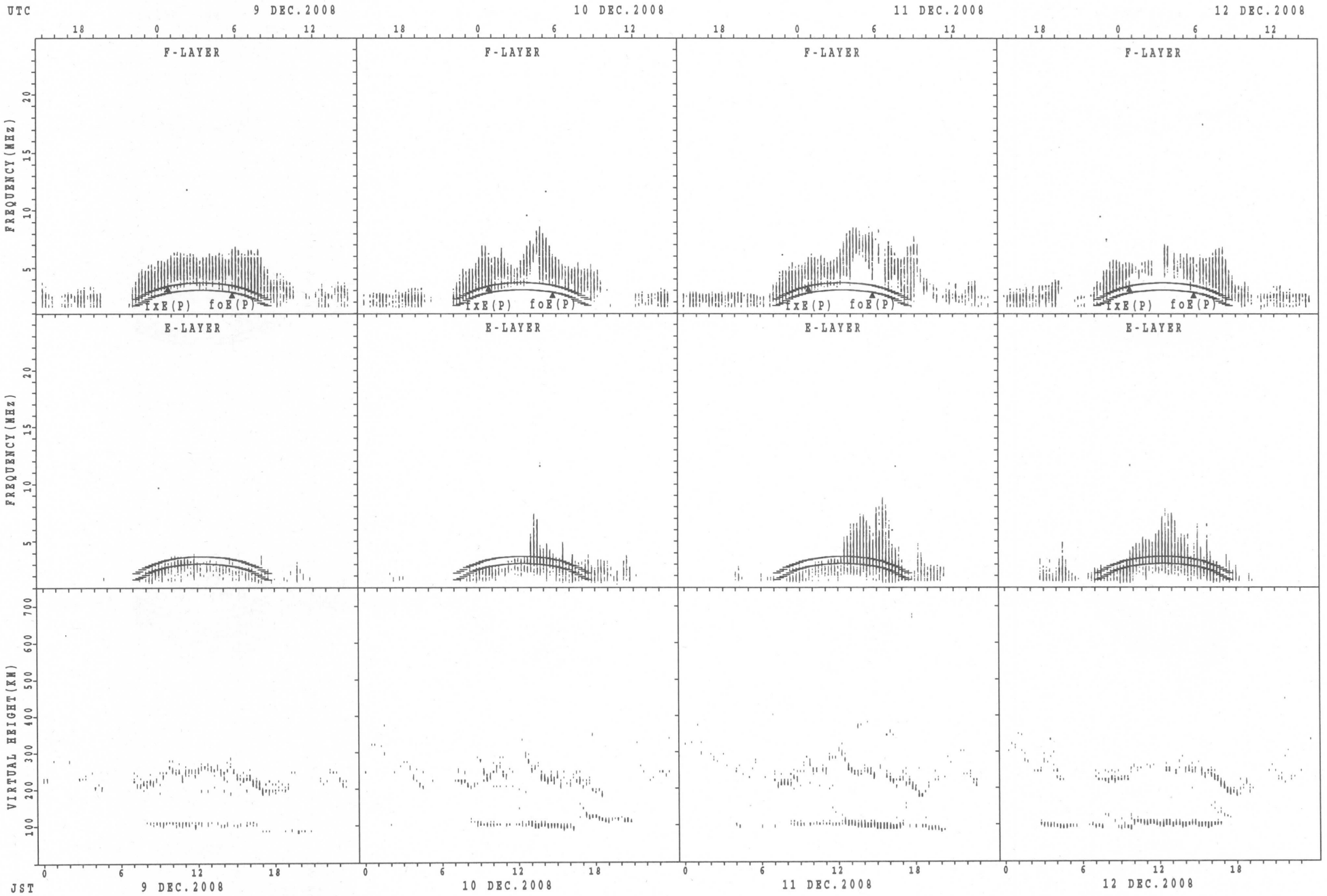
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



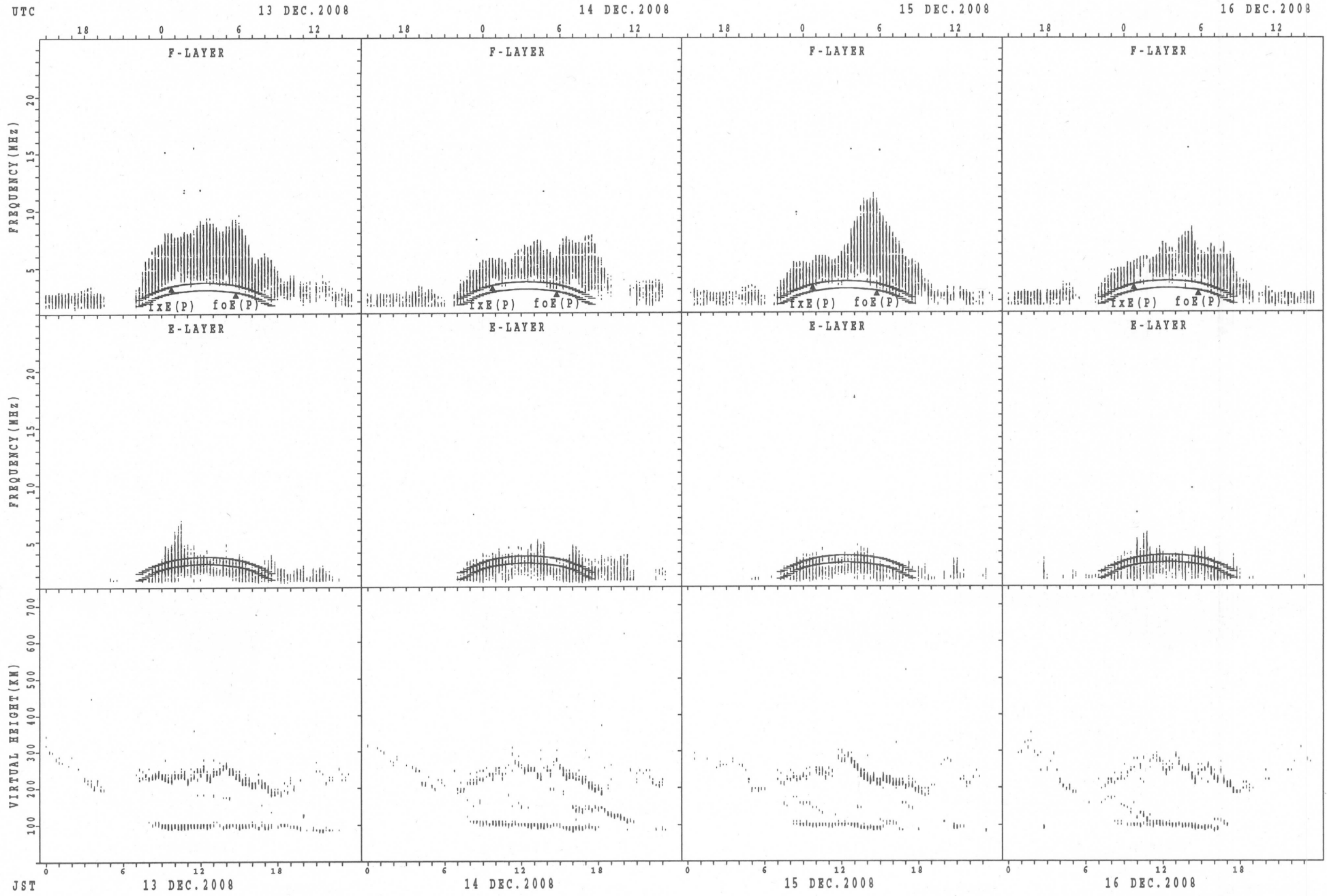
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



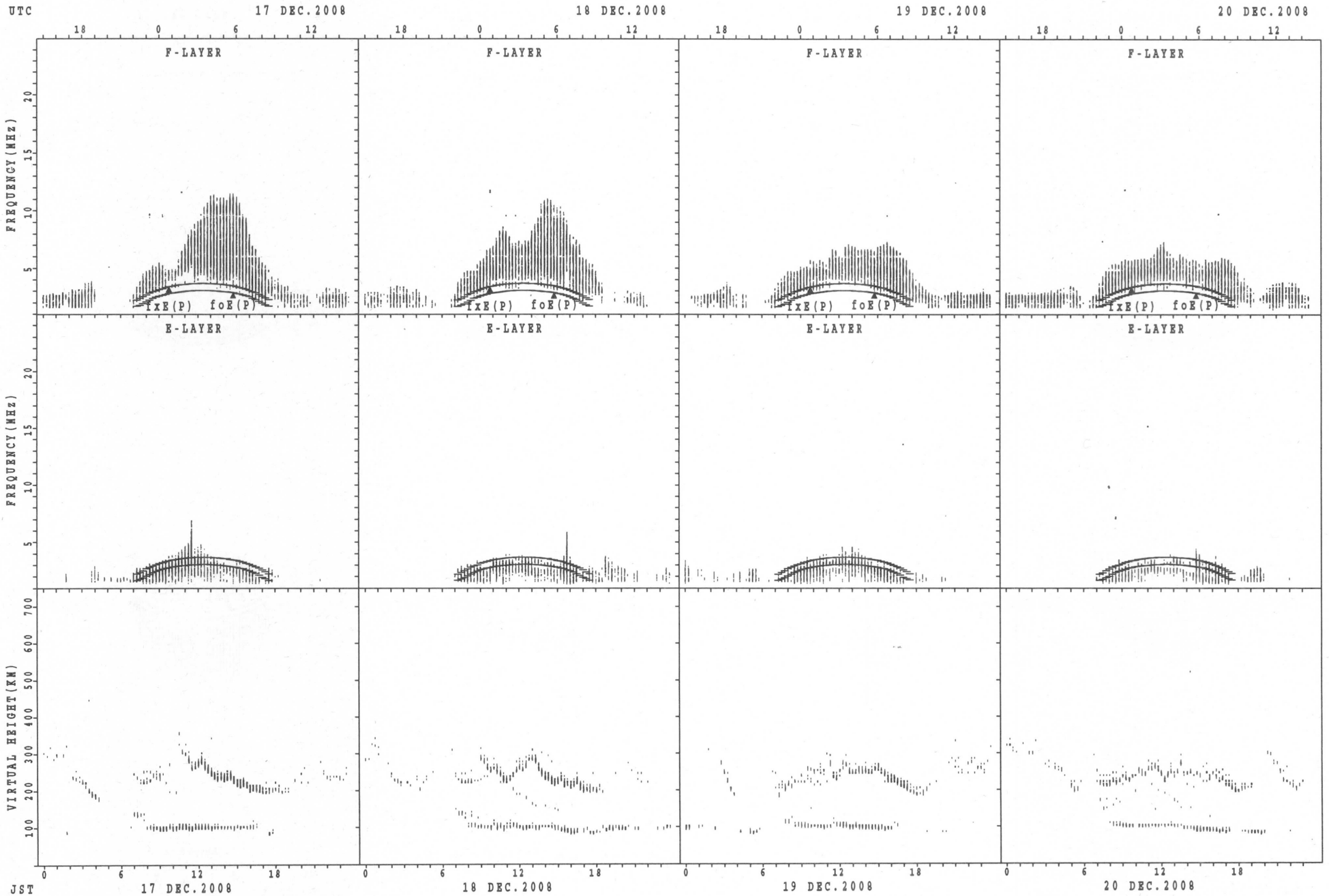
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



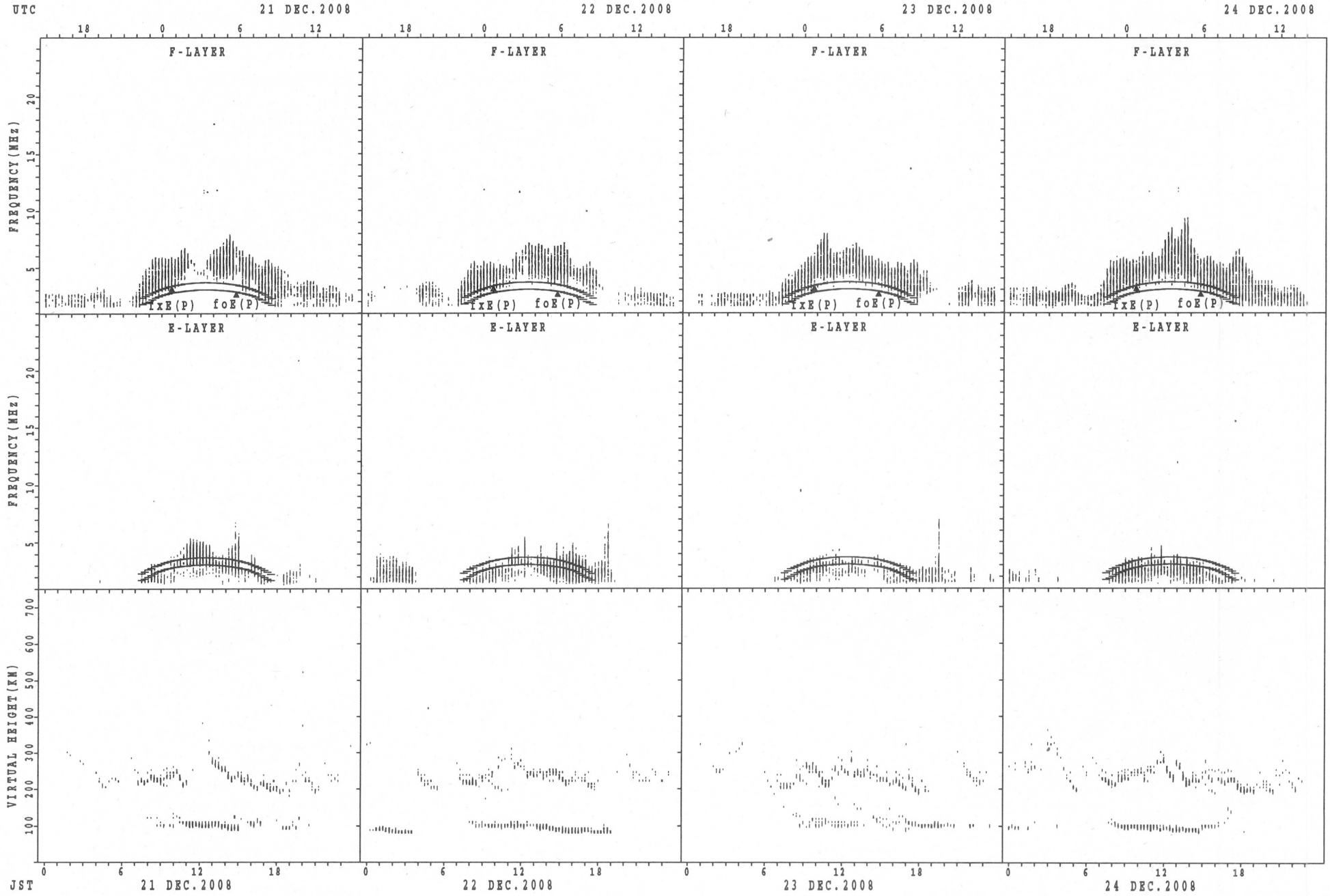
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



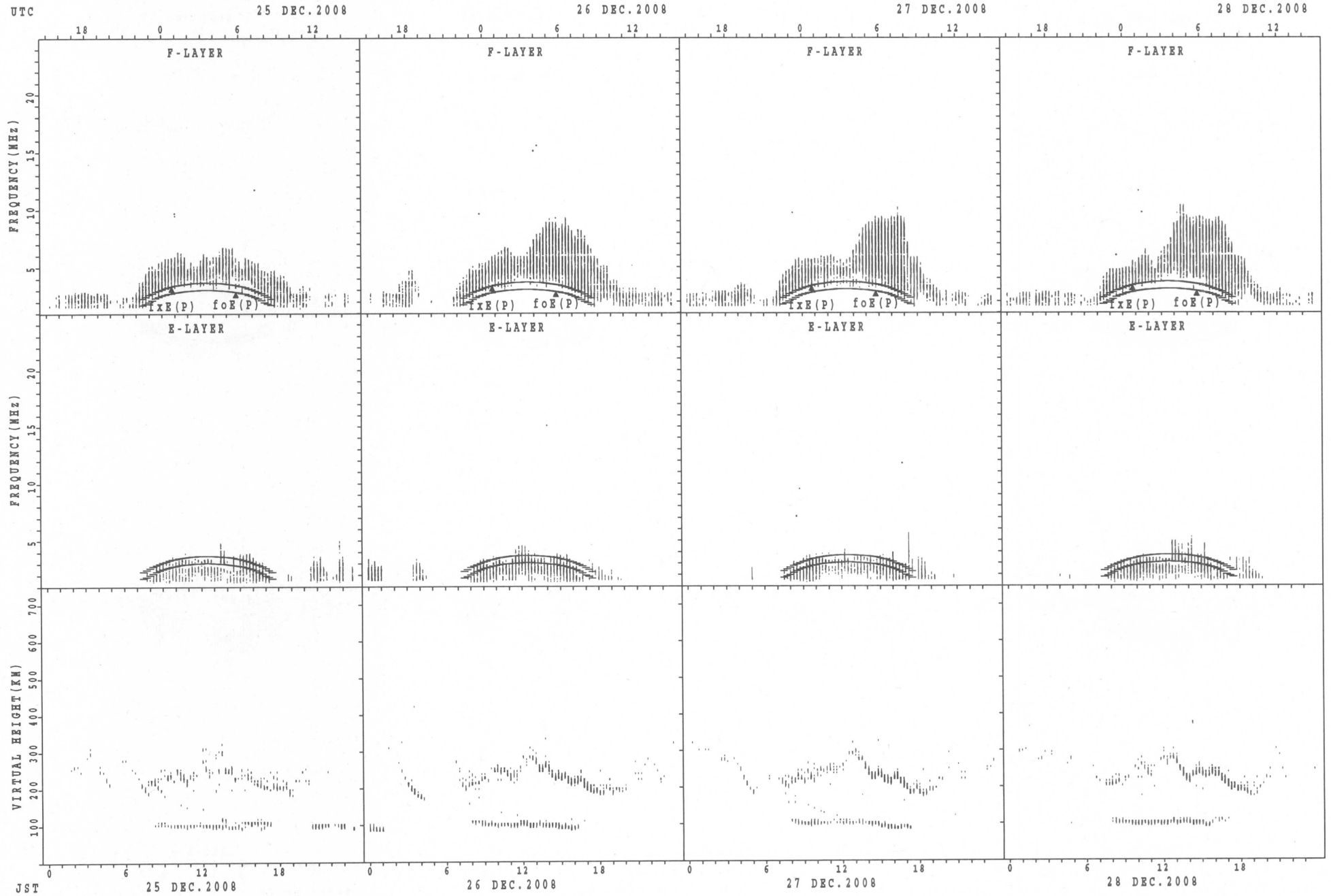
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



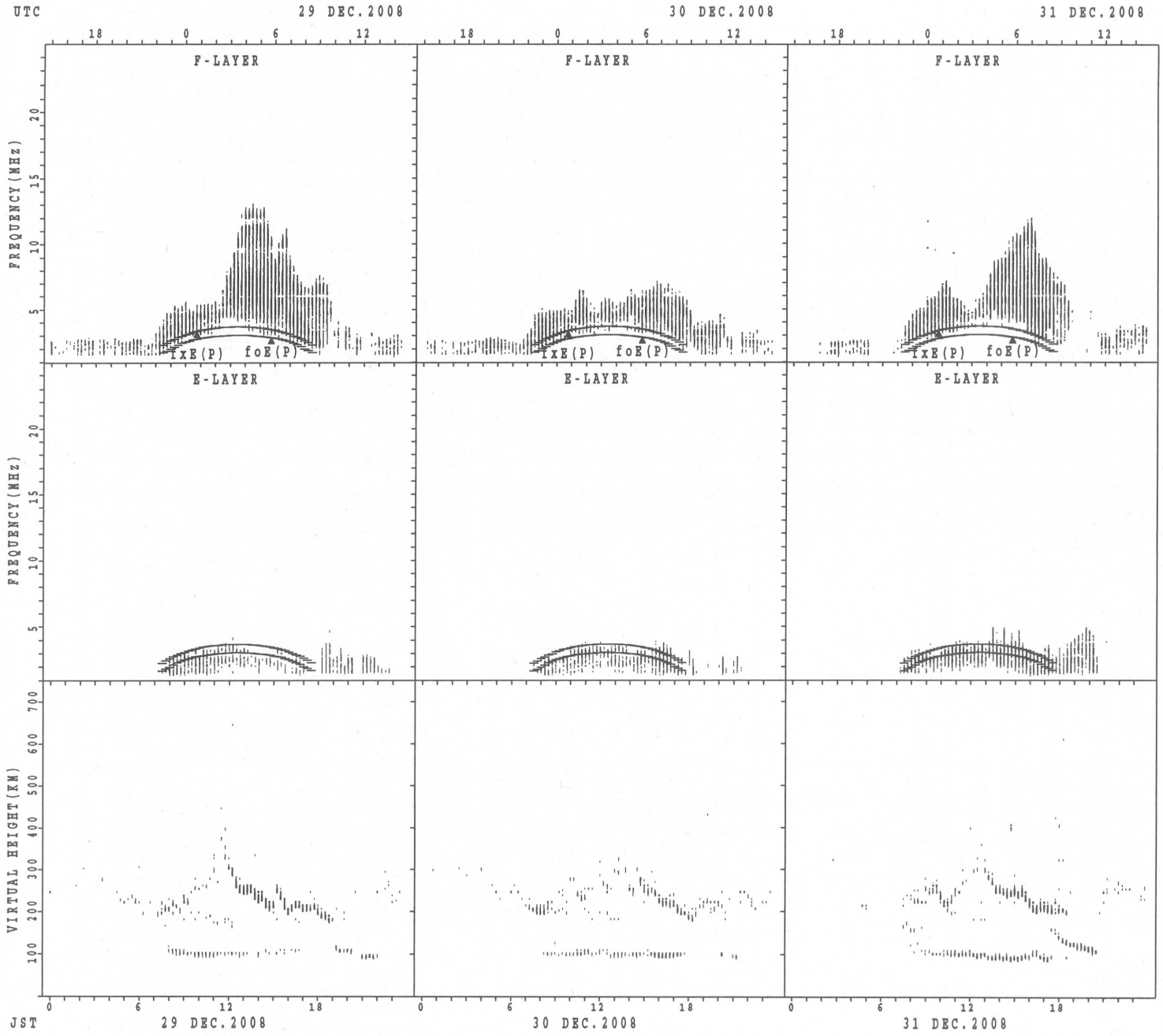
fxE(P); PREDICTED VALUE FOR fxE
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



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

SUMMARY PLOTS AT Okinawa



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

MONTHLY MEDIANS OF h'F AND h'Es

DEC.2008 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

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

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	1									1	4	8	5	4		1								
MED	320									276	256	243	232	232		228								
U Q	160									138	266	252	236	235		114								
L Q	160									138	242	234	220	231		114								

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	6	5	3	4	4	4	6	14	14	13	11	6	5	13	10	12	9	9	7	7	7	3	2
MED	97	94	97	103	102	104	101	106	134	109	97	107	97	97	111	100	97	97	97	95	103	99	97	96
U Q	102	103	105	107	104	105	118	107	159	149	106	113	107	144	116	105	101	102	105	103	105	105	99	97
L Q	90	89	90	97	99	99	98	103	113	103	96	95	91	95	102	95	92	93	95	93	97	95	93	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											5	10	13	10	7	2	1							
MED											240	242	238	239	238	230	224							
U Q											274	252	259	254	256	232	112							
L Q											231	238	226	236	230	228	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	3	1	2		3	2	1	12	14	12	15	13	13	15	10	16	14	9	7	4	5	4	3	3
MED	103	101	101		95	137	97	154	119	116	111	105	105	105	105	97	95	97	97	92	97	95	103	99
U Q	103	50	103		99	179	48	165	155	159	145	106	119	113	109	113	97	98	97	98	104	98	105	103
L Q	103	50	99		95	95	48	144	107	107	105	103	102	101	103	92	95	91	93	89	95	95	95	89

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										2	1	5			9	9	2	2						
MED										255	244	262			242	230	225	221						
U Q										268	122	277			258	255	228	224						
L Q										242	122	243			228	222	222	218						

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	3	5	3	2	3		2	11	21	19	19	17	15	17	17	17	15	16	14	8	4	3	1
MED	101	105	95	105	97	95		154	123	119	107	105	107	103	103	105	97	91	92	93	96	92	101	97
U Q	103	107	98	107	99	101		155	161	155	143	113	141	107	109	109	110	99	94	101	119	98	103	48
L Q	95	97	93	103	95	87		153	101	107	103	103	102	101	95	95	89	89	90	89	88	85	97	48

MONTHLY MEDIANS OF h'F AND h'Es

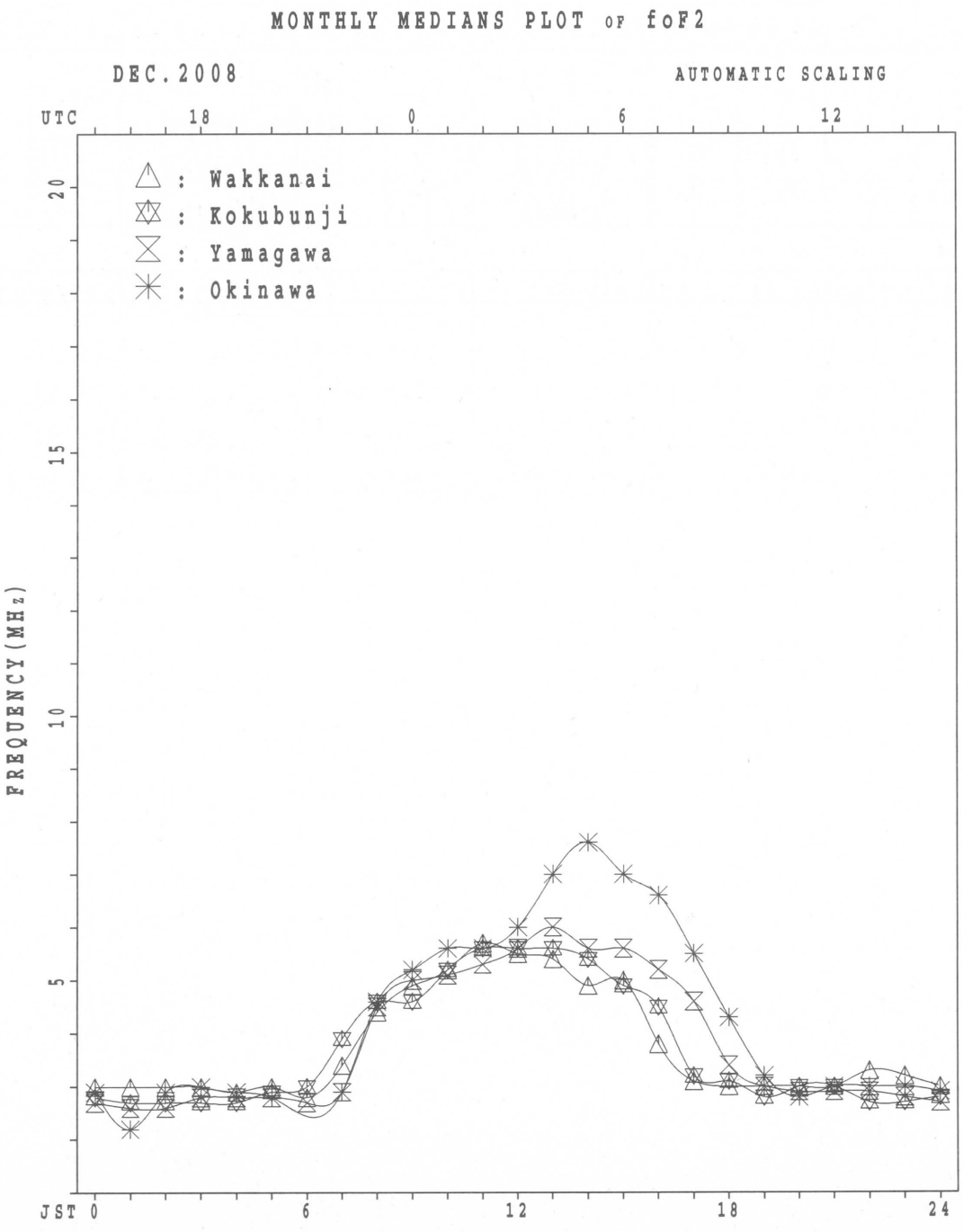
DEC.2008 135E MEAN TIME(UTC+9H) AUTOMATIC SCALING

h'F STATION Okinawa LAT. 26°40.5'N LON. 128°09.2'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										2	11					23	21	8	3					
MED										251	256					236	224	215	216					
U Q										272	272					252	233	224	224					
L Q										230	246					222	217	208	212					

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	2	3	4	3	2		4	13	12	12	16	14	16	15	19	16	22	14	15	10	7	2	3
MED	91	93	99	102	105	93		119	155	123	111	105	104	105	101	97	99	105	101	109	110	97	100	93
U Q	99	95	113	104	177	97		147	167	165	125	111	105	144	103	101	111	137	127	129	115	99	105	101
L Q	87	91	89	94	99	89		96	115	104	103	104	101	102	99	95	89	93	91	97	89	95	95	93


MONTHLY MEDIANS PLOT OF foF2
DEC.2008
AUTOMATIC SCALING
UTC
18
0
6
12
△ : Wakkanai
✡ : Kokubunji
⧖ : Yamagawa
✳ : Okinawa
FREQUENCY(MHz)
20
15
10
5
JST 0
6
12
18
24

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 fxI (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	X 31	X 26	X 28	X 32	X 30	X 30	X 29												X 29	X 37	X 43	X 34	X 28	X 27
2	X 30	X 31	X 32	X 34	X 33	X 25	X 25												X 34	X 32	X 37	A	X 33	X 32
3	X 34	X 34	X 31	X 31	X 31	X 26	X 24												X 31	X 32	X 32	X 30	X 31	34
4	38	X 35	35	37	X 36	X 25	X 23												X 32	X 29	X 32	X 35	X 35	X 35
5	X 37	X 32	X 32	X 33	X 34	X 29	X 27											X 38	A	X 37	X 41	X 40	X 33	X 35
6	X 36	X 37	X 35	X 34	X 32	X 38	X 36											X 51	X 36	X 40	X 31	X 29	X 28	X 33
7	X 32	X 32	X 34	42	X 33	X 32	X 33											X 40	X 35	X 30	X 34	X 32	X 32	38
8	36	35	36	X 32	X 33	C	X 22											X 34	X 30	X 32	X 34	X 30	X 29	X 30
9	X 31	X 32	X 30	X 31	X 33	X 24	X 24											X 33	X 32	X 34	X 31	X 37	X 25	29
10	X 29	X 29	X 28	X 32	X 35	X 26	X 30											X 33	X 33	X 28	X 32	X 28	X 30	X 31
11	X 30	X 30	X 30	X 29	X 28	X 28	X 25											X 41	X 33	X 24	X 30	X 34	36	X 30
12	X 31	X 32	X 34	X 34	X 34	X 32	X 27											X 34	X 30	X 34	X 35	A	X 28	X 32
13	X 34	X 34	X 34	X 33	X 35	X 29	X 29											X 40	X 30	X 31	X 37	X 31	X 32	X 29
14	X 32	X 32	X 33	X 33	X 32	X 29	X 30											X 36	X 30	X 34	X 32	X 36	X 32	34
15	X 33	X 32	X 31	X 32	X 31	X 28	X 27											X 38	X 32	X 34	X 37	X 30	X 33	X 31
16	X 34	X 34	X 34	X 34	X 33	X 28	X 27											X 35	X 34	X 35	X 36	X 30	X 33	38
17	36	34	35	37	X 27	X 22	X 24				C							X 39	X 39	X 32	X 34	43	X 34	36
18	X 32	36	38	37	X 35	X 27	X 24											X 34	X 34	X 37	X 40	X 30	X 31	X 32
19	X 30	X 30	X 31	X 33	X 28	X 27	X 26											X 37	X 30	X 35	X 33	X 34	X 33	34
20	34	34	33	X 30	X 29	X 29	X 29											X 33	X 31	X 33	X 38	X 34	X 33	X 33
21	X 33	X 30	X 32	X 33	X 30	X 27	X 25											X 36	X 35	X 33	X 34	34	X 28	X 29
22	X 31	X 31	37	38	36	32	32											X 35	X 32	X 32	X 37	X 30	X 30	X 34
23	X 35	X 31	35	38	X 31	X 30	X 28											X 42	X 32	X 32	X 37	X 38	X 40	46
24	X 39	X 39	X 37	X 40	X 35	X 33	X 32											X 45	X 39	X 36	X 35	X 42	X 29	X 35
25	X 35	X 34	X 33	X 32	X 32	X 31	X 30	X 46										X 46	X 35	X 34	X 40	X 40	X 36	41
26	44	54	52	52	64	42	X 38											X 42	X 31	X 35	X 35	X 29	X 28	X 29
27	X 31	X 31	X 31	X 32	X 32	X 35	X 27											X 40	X 32	X 31	X 29	X 32	X 31	X 32
28	34	X 32	X 32	X 32	X 30	34	X 25											X 44	X 33	X 36	X 37	X 28	X 28	X 31
29	X 32	34	35	38	37	X 30	X 31											X 50	X 43	X 34	X 38	X 28	X 28	X 30
30	X 31	X 31	X 30	X 30	X 31	X 31	X 30											X 43	X 33	X 38	X 37	X 33	X 25	X 28
31	X 30	X 31	X 30	X 31	X 30	X 28	X 29											X 33	X 35	X 33	X 40	X 33	X 30	X 33
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	1										27	30	31	31	29	31	31
MED	X 33	X 32	X 33	X 33	X 32	X 29	X 27	X 46										X 38	X 32	X 34	X 35	X 33	X 31	X 32
U Q	35	X 34	35	37	X 35	X 32	X 30											X 42	X 35	X 35	X 37	X 36	X 33	35
L Q	X 31	X 31	X 31	X 32	X 30	X 27	X 25											X 34	X 31	X 32	X 32	X 30	X 28	X 30

DEC. 2008 fxI (0.1MHz)

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IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC 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	25	20	22	26	24	23	23	43	55	50	55	60	50	52	50	57	45	29	23	31	36	28	22	21
2	24	25	26	28	27	18	19	37	49	46	52	54	54	54	54	54	38	25	28	26	31	A	27	26
3	28	28	25	25	25	20	18	40	45	47	50	59	54	53	51	48	43	30	24	26	26	24	25	F
4	F	29	F	F	30	19	17	39	46	45	50	58	54	64	58	61	45	30	26	22	26	28	29	28
5	30	26	26	27	28	22	21	46	51	46	52	55	65	57	60	51	49	32	A	30	35	33	27	28
6	30	30	29	28	26	33	30	43	48	53	60	78	90	72	58	50	49	45	29	34	25	23	22	26
7	26	26	28	F	27	26	27	42	44	50	62	69	76	62	65	55	42	34	29	24	28	26	26	F
8	F	F	F	26	27	C	16	43	49	51	68	74	66	57	55	54	50	28	23	26	27	24	23	24
9	25	26	24	25	27	18	18	44	47	48	48	52	51	51	56	49	45	27	26	28	25	31	19	F
10	23	23	22	26	29	20	22	36	45	51	45	53	55	50	54	46	45	27	27	21	26	22	24	25
11	24	24	24	23	22	22	19	39	44	46	48	54	61	62	59	49	44	34	28	18	23	28	F	24
12	25	26	28	28	28	26	21	36	41	46	53	48	57	60	62	46	58	28	24	27	29	A	22	26
13	28	28	28	27	29	23	23	45	53	50	57	58	58	56	50	50	49	34	24	25	30	25	26	23
14	26	26	27	27	26	23	24	52	45	48	57	56	52	52	54	48	46	30	24	28	26	30	26	F
15	27	26	25	26	24	21	21	38	42	43	46	67	54	61	51	53	42	31	26	27	30	24	27	25
16	28	28	28	27	27	22	21	36	42	41	52	56	60	57	57	53	41	29	28	29	30	23	26	F
17	F	F	F	F	21	16	18	36	42	49	C	80	79	68	66	54	48	32	33	26	28	F	27	F
18	26	F	F	F	29	21	18	39	46	45	60	80	84	62	51	51	44	28	27	31	34	24	25	26
19	24	24	25	26	22	21	20	39	43	46	55	65	66	56	51	48	44	31	24	29	27	28	27	F
20	F	F	F	24	23	23	23	38	45	51	69	60	53	53	54	46	46	27	25	27	32	28	27	27
21	26	24	26	27	24	20	19	42	46	48	51	56	53	51	50	44	44	30	29	27	28	F	22	23
22	25	25	F	F	F	F	F	44	47	44	52	69	54	50	48	46	42	28	25	25	31	24	24	27
23	28	25	F	F	25	24	22	40	46	43	58	61	52	54	50	44	46	35	26	26	30	32	34	F
24	33	32	30	33	29	26	26	50	53	53	50	67	70	54	54	53	48	39	33	30	29	36	23	27
25	29	28	26	26	26	25	23	40	50	48	46	54	54	56	49	46	48	39	29	28	34	34	30	F
26	F	F	F	F	F	F	32	39	47	46	48	56	58	61	62	51	44	36	24	29	29	23	22	23
27	25	25	24	26	26	29	21	36	48	45	45	50	55	64	54	52	46	34	26	25	22	26	25	26
28	F	26	25	26	24	F	18	34	44	45	48	54	61	58	50	61	50	36	27	30	30	21	22	25
29	26	F	F	F	F	23	24	40	46	48	50	54	57	45	57	58	51	43	37	27	32	22	21	24
30	25	25	24	24	25	25	23	40	50	49	45	51	51	51	50	48	51	37	27	32	31	27	19	22
31	24	25	24	25	24	22	23	39	45	44	52	48	58	51	51	50	58	27	29	27	33	27	24	26
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	22	23	28	27	30	31	31	31	30	31	31	31	31	31	31	31	30	31	31	27	30	22
MED	26	26	26	26	26	22	21	40	46	47	52	56	57	56	54	50	46	31	26	27	29	26	25	26
U Q	28	28	28	27	28	25	23	43	49	50	57	67	65	61	58	54	49	35	29	29	31	28	27	26
L Q	25	25	24	25	24	20	19	38	44	45	48	54	54	52	50	48	44	28	24	26	26	24	22	24

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L			L	400	L	U L 396	A	A								
2											L	L	U L 400	L										
3											U L 376	392	A	U L 388	L									
4										L	U L 404	A	L	U L 388	L									
5											L		A	A	L									
6										L	L	L	A	L										
7											L	A		U L 392	A									
8											L	A	L	U L 388	L									
9										L	L	L	L	L	L									
10										L		A	L	U L 396										
11												A	A	A	L	L								
12											L		U L 404											
13										L	L	U L 392	L	L										
14										A	U L 392	L	L	L										
15										A	U L 412	U L 396	L	L										
16											L	L	L	L	L									
17										L	C	U L 416	L	L	A	L								
18										U L 396	U L 400	L		L	L	L								
19											L	U L 396	U L 396		L									
20												A	L	L	A									
21									L	L	U L 392	L	L	L										
22											U L 404	U L 396	L	A										
23											A	U L 400	A	L	L									
24										L	A	U L 404	L	L										
25													L	A										
26											L	L	A	A	A									
27												L												
28											U L 384	U L 400	A	L	L									
29										L	U L 400	L			L									
30										L		A	A	L	A	L								
31											A	U L 396	A	L		L								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	9	11	3	6										
MED										U L 396	U L 400	U L 396	U L 400	U L 390										
U Q											U L 404	U L 400	U L 404	U L 396										
L Q											U L 388	U L 396	U L 396	U L 388										

DEC. 2008 foF1 (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°42.4'N LON. 139°29.3'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC 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	U R 236	R	280	A	A	U R 288	256	220	B	B						
2								B	228	264	A	A	R	R	A	U R 236	B	B						
3								B	232	272	296	R	296	276	260	224	B	B						
4								B	232	264	304	A	R	288	U R 264	228	B	B						
5								B	216	264	288	A	A	A	A	A	A							
6								B	228	A	A	A	A	A	U R 280	U R 228	B							
7								B	A	272	A	A	A	A	A	A	A							
8								B	A	A	A	A	A	A	U R 248	R	B							
9								B	240	A	U R 284	A	R	R	264	220	B							
10								B	228	252	A	A	A	A	A	A	B							
11								B	208	264	284	304	A	A	A	A	B							
12								B	212	260	296	A	A	A	A	A	A							
13								B	A	A	R	U R 288	R	R	260	224	B							
14								B	224	268	288	R	R	R	U A 272	A	C							
15								B	208	256	288	A	R	R	256	236	B							
16								B	204	260	A	A	R	288	U R 264	U R 224	B							
17								B	A	A	C	A	R	R	R	U R 224	B							
18								B	A	A	A	R	R	R	R	U R 212	A							
19								B	U R 216	A	A	A	A	A	A	R	B							
20								B	U R 212	A	A	A	A	A	264	U R 228	B							
21								B	U R 224	R	R	A	A	U R 280	252	224	B							
22								B	U R 208	U R 264	A	A	A	280	A	A	A							
23								B	A	A	300	R	288	A	U R 272	A	A							
24								B	A	A	296	A	R	R	R	A	U A 196							
25									216	252	280	R	U A 300	280	U A 252	A	B							
26								B	220	260	308	316	A	A	A	A	A							
27								B	212	272	276	A	R	A	264	U A 224	A							
28								B	208	A	A	A	A	A	A	224	A							
29								B	U R 228	U R 260	300	A	316	A	R	A	A							
30								B	204	A	A	312	312	A	A	U R 252	R							
31								B	208	R	308	304	308	A	R	R	172							
	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	16	16	5	6	7	15	16	2							
MED									216	264	292	304	304	280	264	224	184							
U Q									228	266	300	314	312	288	U R 264	U R 228								
L Q									208	260	284	296	296	280	256	224								

DEC. 2008 foE (0.01MHz)

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IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC IN MANUAL SCALING

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

DEC. 2008 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	E B 15	E B 14	E B 15	E B 16	E B 15	E B 16	E B 15	E B 16	G 19	G 21	32	31	32	G 22	31	26	E B 17	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14
2	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15	E B 18	25	29	30	31	G 25	G 25	28	G 20	E B 16	E B 15	E B 16	E B 15	E B 15	A A 29	E B 15	E B 16
3	E B 16	E B 15	E B 16	E B 15	E B 15	E B 14	E B 15	E B 19	26	31	32	G 25	36	31	28	26	20	E B 15	16	E B 15	E B 14	E B 15	E B 14	E B 15
4	E B 16	E B 15	E B 14	E B 14	E B 15	E B 14	E B 14	E B 19	26	29	36	36	G 20	30	G 20	26	20	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
5	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 19	25	29	31	34	42	32	29	21	19	17	A A 29	18	E B 15	15	15	E B 16
6	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 18	24	30	33	31	40	31	G 24	G 19	E B 15	E B 15	E B 15	E B 15	16	18	16	16
7	E B 16	E B 15	E B 15	E B 15	E B 14	E B 15	E B 16	E B 16	18	30	33	53	32	31	30	24	20	E B 15	18	E B 14	E B 15	E B 15	E B 15	E B 15
8	E B 16	E B 16	E B 15	E B 15	E B 15	C	E B 15	E B 16	24	28	31	35	31	31	G 23	G 21	18	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
9	E B 15	E B 15	E B 15	E B 15	16	E B 15	E B 15	E B 18	26	28	G 20	29	G 25	G 22	29	24	18	E B 14	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
10	E B 15	E B 15	E B 15	E B 14	E B 15	E B 14	E B 15	E B 16	G	27	37	36	31	31	29	26	18	18	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15
11	E B 15	E B 15	E B 16	E B 14	E B 15	E B 15	E B 15	E B 16	24	28	34	36	34	34	28	25	E B 15	20	16	16	E B 15	E B 16	E B 15	E B 14
12	17	E B 15	E B 15	E B 16	16	18	E B 15	E B 18	26	G	32	31	34	31	30	29	20	E B 14	E B 15	E B 15	E B 15	A A 35	E B 15	16
13	15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 17	21	25	G 23	G 20	G 21	G 19	33	25	E B 16	E B 15	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15
14	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15	E B 15	E B 15	G	31	31	G 24	G 23	G 20	31	29	29	E B 15	E B 15	E B 15	E B 15	E B 15	16	E B 15
15	E B 16	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 16	26	32	35	33	G 27	G 24	30	G	E B 16	18	20	E B 15	E B 16	E B 15	E B 15	E B 14
16	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	E B 14	E B 19	24	30	32	33	G 27	32	G 20	G 19	E B 14	E B 15	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15
17	E B 16	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 16	23	30	C	30	G 24	G 23	G 24	G 21	18	E B 14	E B 14	E B 15	E B 15	E B 15	E B 14	E B 15
18	E B 15	E B 15	E B 15	E B 14	E B 14	E B 14	E B 15	E B 21	24	28	28	G 26	G 25	G 22	G 20	G	24	21	E B 14	16	19	E B 14	E B 15	E B 16
19	E B 14	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	G	28	31	31	34	30	28	G 19	E B 16	E B 15	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14
20	E B 15	E B 15	E B 15	E B 15	E B 13	E B 15	E B 15	E B 15	G 18	27	31	36	33	33	30	G 16	18	17	E B 15	E B 15	E B 15	E B 16	E B 15	E B 15
21	E B 15	E B 15	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	G	G	G 24	30	32	G 21	28	26	18	E B 15	E B 16	E B 15	E B 16	E B 15	16	E B 15
22	E B 15	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	E B 14	G 18	G 21	30	30	30	33	28	32	18	E B 16	E B 14	E B 15	E B 15	E B 14	E B 14	E B 15
23	E B 15	E B 16	E B 15	E B 15	E B 14	E B 15	E B 15	E B 15	22	29	32	G 21	32	31	G 18	25	22	18	E B 14	17	16	E B 15	E B 16	E B 15
24	E B 16	E B 15	E B 14	E B 16	E B 15	E B 15	E B 15	E B 15	22	23	33	32	G 27	G 24	G 20	27	E B 14	E B 15	E B 16	E B 15	E B 15	E B 15	E B 15	E B 14
25	E B 14	E B 15	E B 15	E B 15	E B 16	E B 16	E B 15	E B 15	G	28	32	G 24	32	30	28	27	19	E B 15	17	16	E B 15	E B 14	E B 15	E B 14
26	E B 15	E B 15	E B 16	E B 15	E B 15	E B 16	E B 15	E B 16	26	28	33	34	32	31	41	23	36	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	E B 15
27	E B 15	E B 16	E B 15	E B 14	E B 15	E B 15	E B 14	E B 14	25	30	30	33	G 28	G 30	29	25	20	E B 14	E B 16	E B 15	E B 14	E B 15	E B 15	E B 15
28	E B 15	E B 14	E B 15	E B 14	E B 15	E B 15	E B 15	E B 14	24	29	30	30	34	30	27	27	20	E B 14	E B 15	E B 15	E B 15	E B 15	E B 14	E B 15	E B 14
29	E B 15	E B 14	E B 13	E B 14	E B 14	E B 14	E B 15	E B 16	G 18	G 22	32	32	G	29	G 23	28	24	29	18	E B 15	E B 14	E B 15	15	E B 15
30	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	E B 15	22	26	30	33	35	29	33	G 20	G	18	16	24	E B 15	19	16	E B 15
31	E B 15	E B 15	E B 15	E B 14	E B 15	E B 15	E B 14	E B 14	24	G 19	33	35	35	32	G 22	G 19	20	21	20	E B 15	E B 16	E B 15	E B 15	E B 14
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	31	30	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 16	24	28	32	31	32	30	28	25	18	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15
U Q	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 18	25	30	33	34	34	31	30	26	20	18	16	15	E B 15	15	15	E B 15
L Q	E B 15	E B 15	E B 15	E B 14	E B 14	E B 15	E B 15	E B 15	G	G 25	30	G 30	G 27	G 24	G 23	G 21	E B 16	E B 15	E B 15	E B 15	E B 15	E B 15	E B 15	E B 14

DEC. 2008 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC IN MANUAL SCALING

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

DEC. 2008 fmin (0.1MHz)

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC 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	376	370	334	354	347	355	357	366	381	374	392	412	421	359	344	380	397	409	299	330	390	387	330	305
2	321	341	336	352	357	323	355	398	390	385	393	378	380	381	361	403	403	388	361	354	371	A	331	312
3	324	335	307	335	367	393	343	395	385	398	376	379	373	376	362	388	386	391	385	366	373	362	343	F
4	F	329	F	F	387	342	289	407	397	372	359	375	365	371	354	374	403	381	367	377	323	321	323	323
5	332	299	317	336	384	355	330	374	389	368	365	358	370	370	361	382	391	382	A	340	339	333	302	307
6	313	318	322	316	292	318	375	410	398	363	335	339	377	377	384	375	359	380	349	362	381	328	312	348
7	356	317	367	F	339	325	394	394	401	386	361	362	372	359	398	380	395	372	338	336	333	361	313	F
8	F	F	F	332	386	C	323	391	381	347	385	390	386	361	364	387	392	394	380	373	336	391	346	344
9	321	326	332	359	380	353	347	399	400	379	387	389	365	373	380	411	399	382	347	379	331	360	320	F
10	310	293	303	330	385	320	312	398	411	390	404	357	379	354	394	408	386	401	374	397	336	330	336	316
11	319	320	326	331	333	338	374	386	402	414	368	367	373	373	389	394	376	404	325	383	335	327	F	320
12	342	327	346	333	337	342	354	403	398	390	375	399	359	379	389	370	399	381	378	322	370	A	312	341
13	338	321	320	342	357	378	323	403	393	382	392	356	361	394	361	386	396	367	380	337	359	328	366	301
14	318	325	321	318	339	345	354	403	420	402	384	368	369	381	365	357	380	366	368	342	359	357	336	F
15	305	308	301	311	371	415	363	400	400	400	337	384	367	372	393	376	399	391	379	336	370	380	369	312
16	318	332	321	361	333	329	408	383	399	402	349	355	376	380	385	377	383	393	353	373	381	342	315	F
17	F	F	F	F	416	324	359	398	388	331	C	361	362	376	386	372	385	358	397	387	326	F	343	F
18	306	F	F	F	381	320	348	385	406	327	332	349	378	379	368	377	388	355	360	375	408	354	341	306
19	305	307	327	355	353	347	337	389	361	369	362	363	383	379	381	381	397	381	358	340	356	336	337	F
20	F	F	F	332	330	338	386	394	399	371	385	375	379	350	380	392	376	400	357	347	358	340	299	312
21	324	307	332	351	327	329	343	382	397	391	376	358	386	338	386	388	389	382	370	332	352	F	330	301
22	314	329	F	F	F	F	F	405	403	415	341	387	383	364	382	399	382	362	376	350	366	368	349	315
23	332	335	F	F	326	335	364	388	390	391	367	383	372	393	415	378	389	356	364	331	349	353	304	F
24	337	324	322	337	332	323	330	391	399	390	367	361	397	368	387	391	375	373	358	358	333	372	316	316
25	329	344	325	319	328	359	351	383	389	384	371	363	374	408	369	382	383	386	382	346	347	357	327	F
26	F	F	F	F	F	F	314	365	405	392	381	381	387	387	375	394	398	396	299	356	382	367	336	312
27	317	307	333	322	352	385	367	393	404	386	396	377	376	381	400	381	407	379	396	326	355	357	343	298
28	F	353	323	314	346	F	345	403	412	389	341	364	365	364	382	390	374	388	344	357	384	368	312	324
29	320	F	F	F	F	357	329	411	397	384	357	401	393	371	370	375	378	325	381	372	364	403	312	321
30	332	319	314	327	325	355	373	404	385	380	362	365	333	352	386	357	388	403	331	356	374	393	344	316
31	309	323	313	340	334	344	356	396	399	388	390	366	371	383	386	345	393	384	359	319	349	340	313	315
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	25	25	22	23	28	27	30	31	31	31	30	31	31	31	31	31	31	31	30	31	31	27	30	22
MED	321	324	322	333	346	342	352	395	398	386	370	367	374	373	382	381	389	382	362	354	358	357	330	315
U Q	332	334	332	351	376	355	364	403	402	391	385	383	383	381	387	391	397	393	379	373	373	368	343	321
L Q	314	312	317	322	332	325	330	386	389	372	359	361	367	364	365	375	382	372	349	336	336	336	313	307

DEC. 2008 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC IN MANUAL SCALING

D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1								L			L	417		L	U L 408	A	A							
2											L	L	U L 393		L									
3											U L 443	416		A	U L 411		L							
4										L	U L 391	A		L	U L 393		L							
5											L			A		A	L							
6										L	L	L		A		L								
7											L	A			U L 397		A							
8											L	A		L	U L 404		L							
9										L	L	L		L		L	L							
10										L		A		L	U L 402									
11												A		A		A	L		L					
12											L		U L 392											
13										L	L	U L 417		L		L								
14										A	U L 392	L		L		L								
15										A	U L 377	U L 389		L		L								
16											L	L		L		L	L							
17										L	C	U L 370		L		L	A		L					
18										U L 386	U L 368	L				L	L		L					
19											L	U L 381	U L 388				L							
20												A		L		L	A							
21										L	L	U L 398		L		L								
22											U L 383	U L 383		L		A								
23											A	U L 405		A		L	L							
24										L	A	U L 380		L		L								
25														L		A								
26											L	L		A		A	A							
27												L												
28											U L 413	U L 394		A		L	L							
29										L	U L 390	L					L							
30										L		A		A		L	A		L					
31												A	U L 402			A			L					
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT										1	9	11	3	6										
MED										U L 386	U L 391	U L 394	U L 392	U L 403										
U Q											U L 406	416	U L 393	U L 408										
L Q											U L 380	U L 381	U L 388	U L 397										

DEC. 2008 M(3000)F1 (0.01)

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC 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								230			226	216	206	252	230	224								
2											228	234	240	244										
3											262	236	240	240	232									
4										248	274	248	238	242	264									
5											254		248	230	248									
6										252	284	268	226	238										
7											262	E A 246		244	220									
8											240	230	224	234	240									
9										234	236	230	256	246	240									
10										232		260	236	276										
11												250	244	242	230	218								
12											244		260											
13										234	232	238	222	234										
14										216	236	236	260	254										
15										210	310	234	238	232										
16											282	250	242	244	216									
17										290	C	242	244	236	224	234								
18										320	284	246		232	240	228								
19											258	254	228		232									
20												236	240	256	228									
21									232	228	258	248	236	278										
22											288	228	236	228										
23											240	226	240	230	208									
24										220	230	242	212	236										
25													246	220										
26											248	248	222	228	242									
27												246												
28											276	252	226	242	236									
29										222	266	226			238									
30										230		238	234	264	232	230								
31											228	250	260	248		254								
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT								1	1	13	24	28	27	27	18	6								
MED								230	232	232	256	241	238	242	232	229								
U Q										250	275	249	244	248	240	234								
L Q										221	236	234	226	232	228	224								

DEC. 2008 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC 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	212	204	E B 272	E B 234	E B 240	222	224	178	H 194	210	206	184	180	178	A	A	202	186	E B 288	E B 234	194	198	206	222
2	E B 284	E B 234	E B 252	218	210	194	E B 254	186	212	210	200	190	200	180	206	206	H 176	192	220	214	214	A	E B 238	E B 280
3	E B 256	E B 254	E B 268	E B 250	234	186	E B 290	202	200	206	172	198	A	182	198	214	206	194	214	214	200	222	222	E B 268
4	E B 246	E B 238	E B 284	E B 254	198	E B 260	220	204	202	196	222	A	196	H 198	H 186	212	198	190	200	212	E B 276	E B 260	E B 266	E B 282
5	E B 232	E B 272	E B 276	E B 248	222	214	E B 264	216	204	194	192	224	A	A	214	212	206	198	A	E A 256	E B 246	224	E B 272	E B 280
6	E B 260	E B 260	E B 260	E B 276	E B 314	E B 232	192	188	194	208	214	198	A	202	206	208	H 178	194	210	198	206	E A 290	E A 280	E A 270
7	216	E B 280	232	204	192	E B 248	208	182	198	210	214	A	232	202	A	208	194	196	224	226	E B 214	210	E B 270	E B 290
8	E B 308	E B 314	E B 260	E B 240	202	C	E B 288	212	202	190	216	A	198	182	192	196	200	188	218	210	E B 246	200	E B 246	E B 258
9	E B 276	E B 268	E B 272	E B 236	208	E B 258	E B 276	202	204	192	194	182	194	212	210	208	194	186	E B 246	208	E B 250	216	E B 294	E B 300
10	E B 278	E B 260	E B 288	228	200	E B 280	E B 258	194	H 186	196	216	A	216	192	216	204	198	194	224	198	226	E B 232	E B 240	E B 266
11	E B 270	E B 274	E A 268	E B 270	E B 272	E B 244	198	200	202	206	210	A	A	A	204	192	204	196	E A 232	190	206	E B 254	E B 220	E B 284
12	E A 250	E B 262	238	E B 260	E B 244	E A 252	E B 242	190	202	196	200	200	200	224	224	206	208	186	E B 204	230	204	A	E B 292	E A 256
13	E B 248	E B 268	E B 266	E B 238	214	198	E B 260	204	198	192	168	H 176	180	198	E A 230	224	190	206	190	E B 230	214	214	208	E B 288
14	E B 276	E B 262	E B 260	E B 270	E B 230	222	222	200	182	A	184	182	230	210	214	208	204	182	210	E B 250	202	214	E A 238	E B 302
15	E B 270	E B 266	E B 280	E B 240	208	190	206	192	198	A	214	214	200	200	220	H 170	206	202	226	214	202	204	E B 222	E B 282
16	E B 270	E B 238	E B 234	E B 218	216	210	198	196	198	210	230	206	212	218	190	210	196	196	212	E B 204	204	212	E B 266	E B 274
17	E B 274	E B 278	E B 260	E B 244	188	E B 306	E B 264	192	206	212	C	212	210	208	A	194	202	184	198	204	228	E B 230	E B 218	E B 262
18	E B 284	E B 246	E B 244	E B 234	214	E B 244	E B 280	206	202	204	H 182	194	218	194	196	192	208	E A 238	210	218	202	E B 234	E B 252	E B 286
19	E B 294	E B 296	E B 264	218	E B 230	E B 254	E B 268	192	204	212	216	196	E A 226	212	198	202	206	194	E B 206	214	214	218	E B 236	E B 278
20	E B 302	E B 304	E B 270	E B 266	E B 270	E B 264	226	H 178	H 174	206	226	A	204	202	A	206	202	196	222	226	220	E B 234	E B 252	E B 268
21	E B 264	E B 284	E B 254	210	E B 236	E B 262	E B 284	208	194	186	206	198	198	208	204	214	198	190	210	E B 232	208	E B 222	E A 284	E B 302
22	E B 288	E B 260	222	214	206	E B 238	E B 278	198	204	194	202	198	190	A	204	206	202	192	E B 234	218	212	198	E B 234	E B 256
23	228	220	E B 278	E B 260	E B 248	E B 264	208	194	206	202	A	H 170	A	196	H 178	H 188	202	204	208	E A 250	220	222	E B 264	E B 262
24	E B 246	E B 252	E B 272	E B 240	E B 240	E B 274	E B 262	216	202	178	A	198	196	202	218	206	208	196	206	204	E B 242	204	E B 258	E B 280
25	E B 248	E B 230	E B 256	E B 272	E B 266	218	E B 236	206	200	218	204	216	210	A	204	206	206	192	198	214	220	208	224	E B 284
26	E B 262	E B 250	E B 242	E B 248	196	182	E B 240	208	204	212	216	222	A	A	A	204	208	190	202	212	198	200	E B 250	E B 300
27	E B 274	E B 254	E B 268	E B 268	218	204	194	H 174	210	212	196	208	212	H 226	202	H 164	198	196	200	208	204	204	E B 238	E B 306
28	E B 284	E B 238	E B 268	E B 250	218	210	E B 262	190	204	202	186	184	A	214	200	220	204	196	200	208	196	210	E B 246	E B 286
29	E B 260	E B 272	E B 272	E B 242	210	208	216	192	188	176	194	188	218	206	216	222	208	224	196	210	198	188	E B 282	E B 268
30	E B 258	E B 258	E B 278	E B 278	E B 252	212	220	192	204	192	184	A	A	208	A	184	200	196	E A 246	220	206	206	E A 268	E B 286
31	E B 284	E B 278	E B 270	E B 246	E B 264	E B 252	E B 236	196	194	206	A	200	A	210	210	194	208	216	E A 240	E B 272	216	218	E B 260	E B 268
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	31	31	31	31	31	30	31	31	31	29	27	24	22	26	25	30	31	31	30	31	31	29	31	31
MED	E B 270	E B 260	E B 268	E B 244	U 207	E 235	E B 240	196	202	204	204	198	201	202	204	206	202	194	208	211	208	209	E B 250	E B 280
U Q	E B 284	E B 274	E B 272	E B 260	E B 244	E B 258	E B 264	204	204	210	216	207	216	210	215	210	206	196	E 224	E B 230	E B 220	E B 227	E B 268	E B 286
L Q	E B 248	E B 246	E B 254	234	208	210	216	190	194	193	192	186	196	196	198	194	198	190	202	208	202	204	234	E B 268

DEC. 2008 h'F (KM)

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IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC 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	124	122	114	A	A	114	110	120	B	B						
2								B	120	118	118	A	118	124	A	122	B	B						
3								B	122	122	130	114	114	112	120	120	B	B						
4								B	116	122	122	120	112	120	122	126	B	B						
5								B	126	124	122	114	A	A	A	A	A							
6								B	114	116	A	A	A	A	120	126	B							
7								B	116	126	126	A	A	A	A	A	A							
8								B	A	A	A	A	A	A	120	120	B							
9								B	126	A	126	A	122	118	120	122	B							
10								B	116	122	A	A	118	A	110	A	B							
11								B	116	114	120	124	122	120	116	114	B							
12								B	114	108	112	A	A	A	A	A	A							
13								B	A	A	118	116	114	116	116	114	B							
14								B	118	128	128	124	120	116	118	120	C							
15								B	116	122	118	120	118	118	122	118	B							
16								B	118	122	126	A	120	118	118	116	B							
17								B	126	A	C	A	118	116	120	122	B							
18								B	126	124	118	126	120	114	112	112	A							
19								B	128	120	122	A	A	A	A	122	B							
20								B	126	118	A	A	A	A	122	112	B							
21								B	114	116	120	A	114	118	114	118	B							
22								B	122	120	A	A	A	114	A	A	A							
23								B	A	116	118	120	114	114	114	A	A							
24								B	A	A	122	120	120	120	116	A	116							
25									116	114	122	122	122	118	120	112	B							
26								B	116	122	122	122	122	A	116	A	A							
27								B	114	116	112	114	120	A	116	118	A							
28								B	116	112	A	A	A	A	A	118	118							
29								B	116	120	118	118	114	A	118	A	A							
30								B	120	122	118	122	122	A	A	126	114							
31								B	126	124	122	114	120	116	118	116	106							
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT									27	26	24	16	21	18	23	22	4							
MED									118	121	121	120	120	117	118	119	115							
U Q									126	122	122	122	121	118	120	122	117							
L Q									116	116	118	115	114	114	116	116	110							

DEC. 2008 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC 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	106	102	104	B	B	B	112	102	102	150	100	92	94	154	150	B	90	88	B	B	B	B	B
2	B	B	B	B	B	B	B	142	168	150	118	102	102	104	108	104	B	B	B	B	122	98	98	96
3	B	B	B	B	B	B	148	156	146	156	152	100	142	146	140	152	140	B	94	122	120	B	B	B
4	B	B	B	B	B	B	B	154	156	156	144	124	102	134	102	156	122	B	96	102	B	100	100	B
5	B	B	B	B	B	B	B	146	152	154	148	120	104	102	104	102	94	92	88	90	92	90	96	B
6	96	B	102	102	102	102	B	154	136	116	108	108	102	100	104	100	106	B	100	94	92	92	88	100
7	88	B	96	B	B	B	102	96	94	146	120	102	104	98	98	98	98	90	94	B	B	B	B	B
8	B	102	92	B	96	C	B	B	106	106	106	106	106	102	102	102	98	B	92	B	B	B	B	B
9	B	B	100	100	94	98	94	138	144	104	106	106	106	106	158	146	128	B	B	B	B	B	104	B
10	B	B	B	B	B	B	B	136	G	146	102	102	122	106	108	90	124	86	B	B	124	B	114	B
11	B	102	104	B	98	B	B	B	152	158	146	130	126	124	120	116	B	98	102	98	B	B	106	B
12	106	100	B	102	98	94	146	146	148	G	146	106	106	106	102	98	100	B	110	92	92	94	96	94
13	92	B	98	100	B	B	B	102	102	102	100	102	102	96	162	164	B	B	104	96	B	106	98	92
14	94	B	B	94	98	B	B	B	G	152	152	106	100	102	134	126	118	102	B	98	98	B	100	102
15	B	B	B	B	B	B	B	B	150	152	136	130	106	104	144	G	B	104	98	B	B	B	B	B
16	B	B	B	B	B	96	B	146	136	152	128	108	102	154	102	100	B	B	B	B	B	B	B	B
17	B	B	B	B	B	B	132	B	136	104	C	108	100	98	102	104	126	B	B	B	120	106	B	B
18	B	B	B	B	B	B	136	126	130	122	118	106	100	102	94	G	92	96	86	92	110	B	B	B
19	102	106	B	B	B	B	B	B	G	132	112	104	106	106	108	104	B	B	102	B	B	B	B	B
20	B	B	B	B	B	98	B	B	108	128	108	100	104	102	154	92	96	98	92	B	B	B	B	B
21	100	96	B	B	B	B	B	B	G	G	106	102	122	98	152	166	146	96	B	B	100	100	98	102
22	96	96	96	96	98	100	B	B	100	98	100	100	98	156	94	86	88	B	92	B	B	B	B	B
23	B	B	B	B	B	B	98	98	110	114	150	100	142	116	94	88	88	90	B	106	106	104	100	102
24	114	B	B	B	96	B	96	B	106	108	154	116	104	104	102	98	98	98	96	B	B	B	B	B
25	B	92	90	B	B	B	104	98	G	160	154	106	130	148	124	110	150	B	94	92	98	B	B	B
26	B	B	B	B	B	B	B	B	156	156	146	142	122	102	118	104	96	B	B	B	B	B	B	B
27	B	B	B	B	B	B	B	B	158	144	154	120	104	102	154	126	98	96	90	120	B	B	B	B
28	B	108	B	110	B	B	B	B	144	114	104	106	104	102	104	152	114	100	B	94	B	B	B	B
29	B	B	B	B	B	B	B	B	106	106	152	120	G	104	102	100	96	96	96	94	B	B	142	108
30	102	B	B	B	B	104	100	100	154	118	120	144	142	104	106	100	G	100	102	96	96	94	96	94
31	90	B	B	90	96	104	B	B	148	108	142	130	136	114	106	102	156	98	98	102	B	B	B	B
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	11	9	9	9	9	8	10	16	26	29	30	31	30	31	31	29	23	17	21	16	13	10	14	9
MED	96	102	98	100	98	99	103	137	140	128	132	106	104	104	106	104	100	96	96	96	100	99	99	100
U Q	102	106	102	103	98	103	136	146	152	152	150	120	122	114	140	136	126	99	101	102	120	104	104	102
L Q	92	96	94	95	96	97	98	101	106	107	108	102	102	102	102	99	96	91	92	93	94	94	96	94

DEC. 2008 h'Es (KM)

IONOSPHERIC DATA STATION Kokubunji

DEC. 2008 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 30.0MHz IN 15.0SEC IN MANUAL SCALING

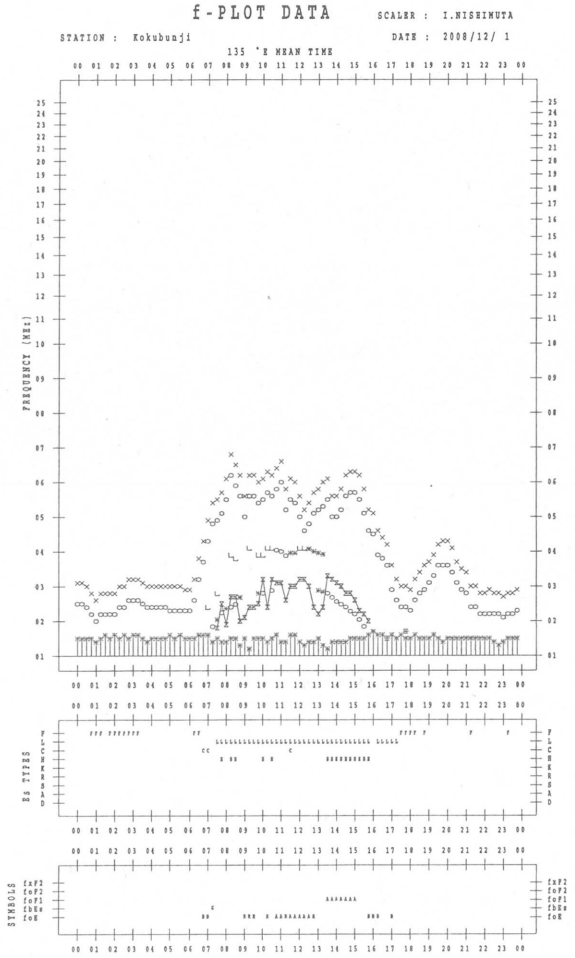
D \ H	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		F2	F1	F1				C2	L2	L2	HL22	L2	L2	L2	HL22	HL22		L2	F2					
2								H2	H2	HL12	CL11	L2	L2	L2	L2	L2					F1	F4	F3	F2
3							F2	H2	HL22	HL22	HL12	L2	HL22	HL12	HL12	HL22	H3		F2	F1	F1			
4								H2	H3	HL22	HL12	CL11	L2	HL12	L2	HL22	C2		F2	F1		F1	F1	
5								H3	H2	HL12	HL12	CL12	L3	L3	L2	L3	L3	F2	F4	F4	F2	F4	F1	
6	F3		F2	F2	F2	F1		H2	H2	C2	L2	L2	L2	L2	L2	L2	L2		F1	F2	F2	F1	F2	FF22
7	F2		F2				F1	F2	LC22	HL12	CL22	L3	L2	L2	L2	L3	L3	F1	F2					
8		F1	F2		F1				L2	L2	L2	L2	L2	L2	L2	L2	L2		F1					
9			F2	F1	F2	F2	F2	H2	H2	L2	L2	L2	L2	L2	HL11	HL22	H2						F1	
10								H1		H1	L2	L2	CL11	L2	CL22	L2	C1	F2			F1		F2	
11		F1	F2		F3				H2	HL22	HL22	CL22	CL22	CL22	CL22	CL22		F3	F3	F2			F1	
12	F3	F3		F3	F7	F6	F1	H2	H2		HL11	L2	LH21	L2	L2	L2	L3		F2	F2	F3	F3	F2	F2
13	F2		F1	F2				L2	L3	L2	L2	L1	L1	L1	HL22	H1			F1	F2		F1	F1	F2
14	F1			F1	F1					HL22	HL12	L2	L2	L2	CL11	CL21	C2	F1		F1	F1		F2	F1
15									H2	HL22	HL32	CL12	L2	L2	HL12			F3	F3					
16						F1		H3	H2	HL22	CL22	L2	L2	HL22	L2	L2								
17							F2		CL32	L2		L2	L2	L2	L2	L2	C2				F1	F3		
18							F2	C4	C3	CL22	CL11	L2	L2	L2	L3		L3	F3	F2	F3	F2			
19	F1	F1								C2	C2	L2	L2	L2	L2	L3			F1					
20						F1			L2	CL22	L2	L3	L2	L2	HL12	L2	L2	F2	F1					
21	F3	F1									L2	L2	CL12	L2	HL11	HL11	H2	F1			F1	F1	F3	F2
22	F2	F2	F1	F2	F2	F2			L2	L2	L2	L2	L2	HL12	L3	L3	L2		L1					
23							F1	L1	L2	C2	HL22	L2	HL12	CL22	L2	L3	L2	F2		F2	F2	F3	F3	F2
24	F2				F3		F1		L3	L2	HL22	CL12	L1	L2	L2	L2	L2	F2	F2					
25		F2	F2				F1	L2		HL22	HL22	L2	CL11	HL11	CL21	CL12	HL22		F3	F2	F2			
26									H2	HL22	HL11	HL12	CL11	L2	CL32	L2	L4							
27									H3	H2	H2	CL21	L2	L2	HL12	CL22	L3	F2	F2	F2				
28		F2		F1					H3	C2	L2	L2	L2	L2	L2	H2	C2	F1		F1				
29									L2	L2	HL12	CL12		L2	L2	L2	L2	F4	F2	F1			F1	F1
30	F3					F2	F1	L2	H2	C2	CL12	HL12	HL22	L2	L2	L2		F2	F3	F3	F2	F2	F2	F1
31	F1			F1	F1	F1			H1	L2	HL22	HL22	HL22	CL22	L2	L2	H1	F2	F2	F1				
	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																								

DEC. 2008 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
	foF2, foF1, foE
	fxF2
	DOUBTFUL foF2, foF1, foE
	fbEs
	ESTIMATED foF1
	fmin
	GREATER THAN
	LESS THAN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STATION : Kokubunji
DATE : 2008/12/ 1
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
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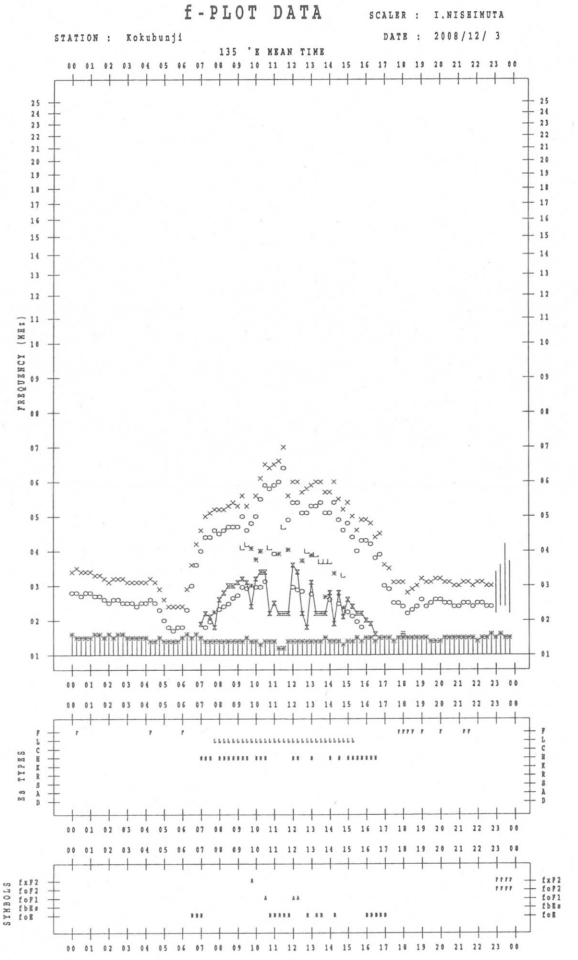
foF2
foF1
fbEs
foE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STATION : Kokubunji
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SYMBOLS
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foF1
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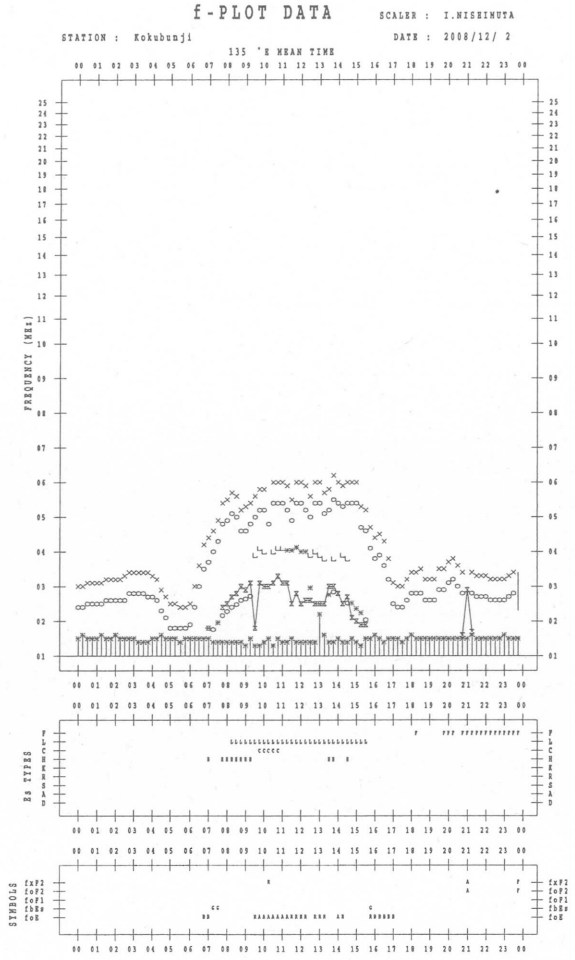
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Es TYPES
SYMBOLS
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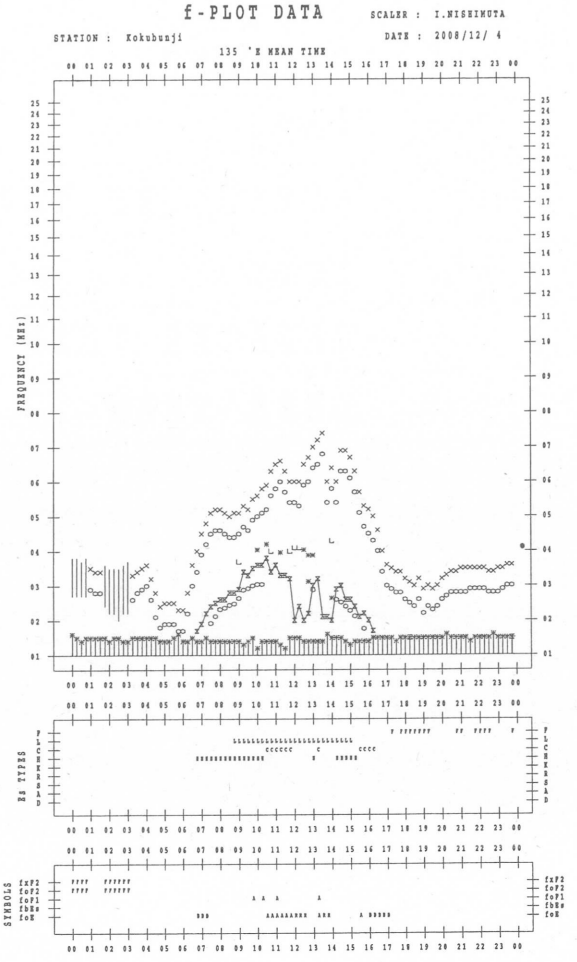
foF1
fbEs
foE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Es TYPES
SYMBOLS
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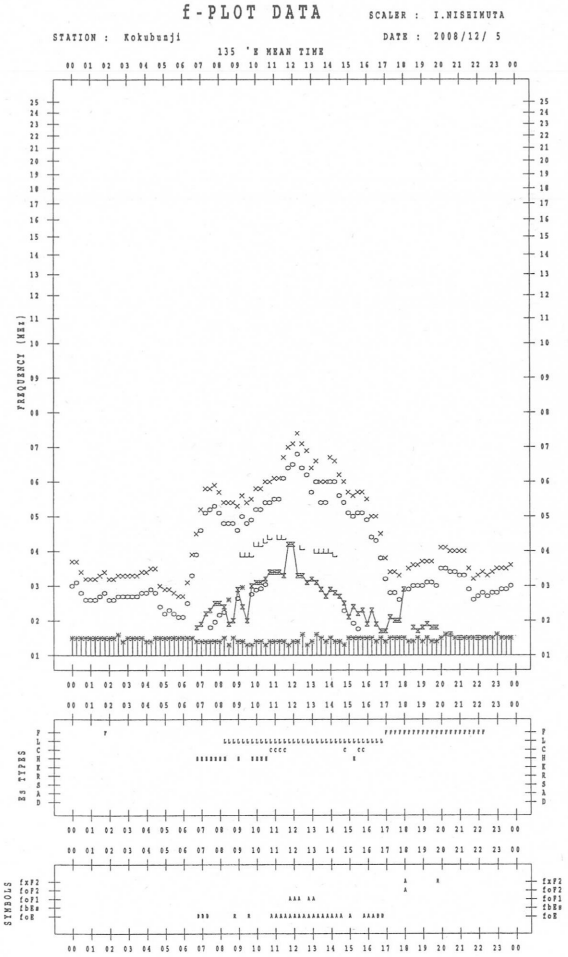
foF1
fbEs
foE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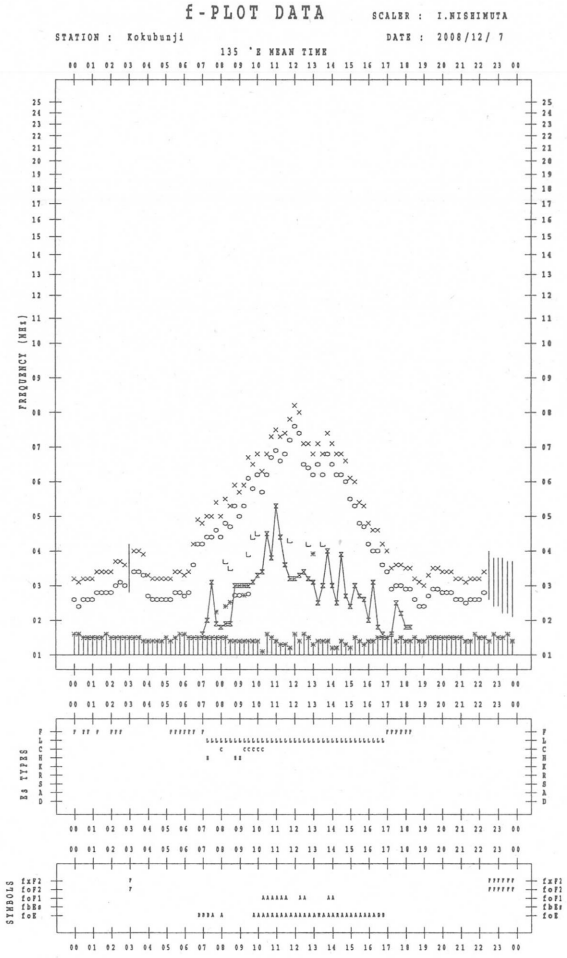
FREQUENCY (MHz)
Es TYPES
SYMBOLS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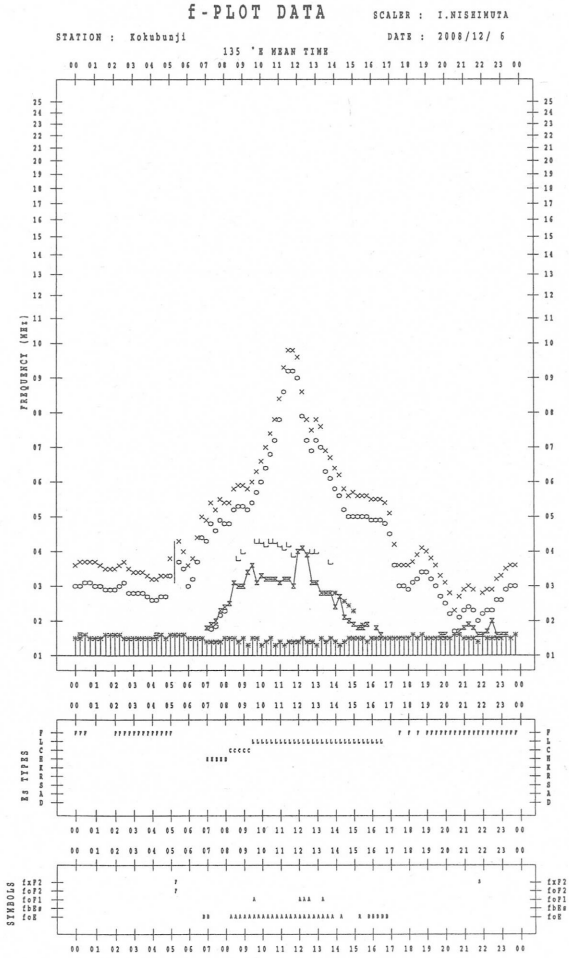
FREQUENCY (MHz)
Es TYPES
SYMBOLS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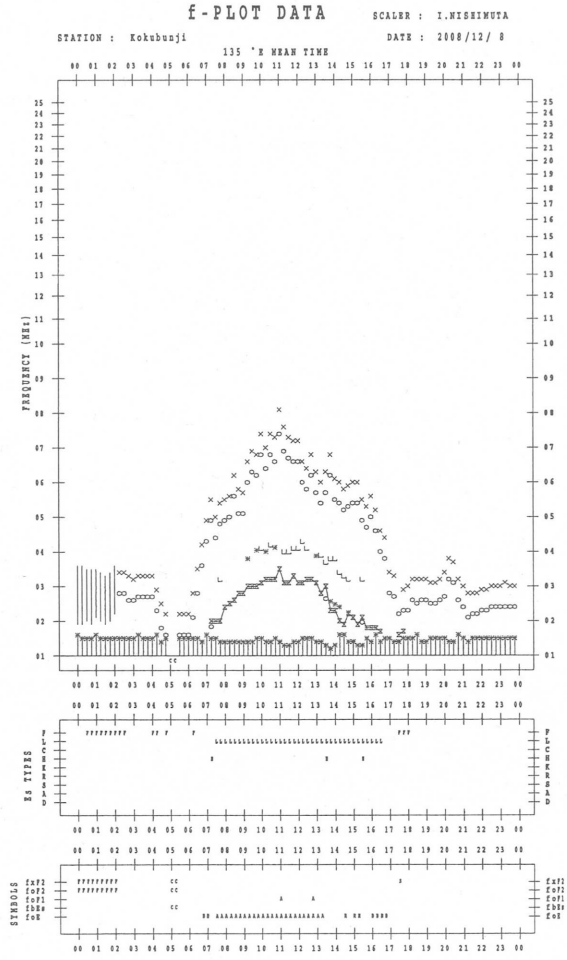
FREQUENCY (MHz)
Es TYPES
SYMBOLS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DATE : 2008/12/ 8
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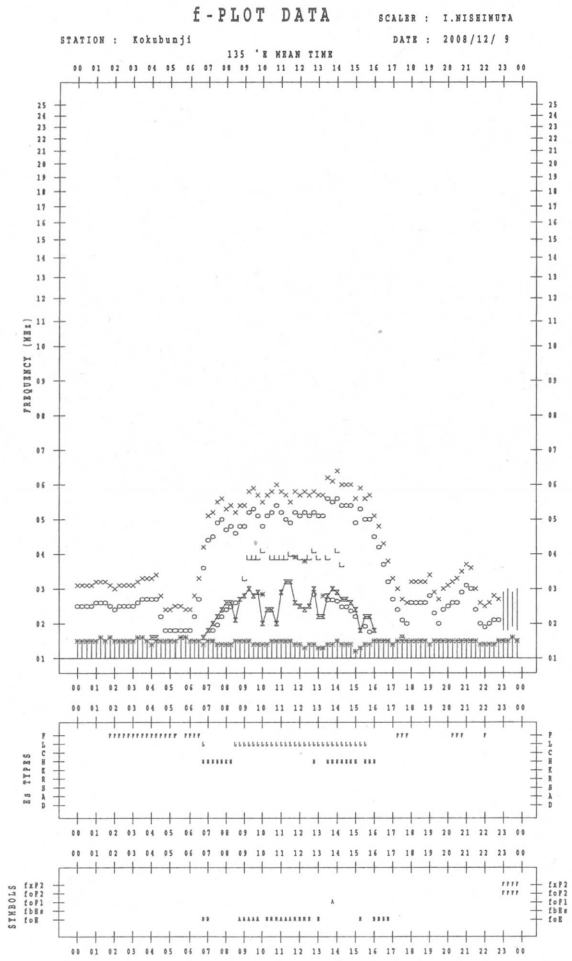
FREQUENCY (MHz)
Es TYPES
SYMBOLS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STATION : Kokubunji
DATE : 2008/12/ 9
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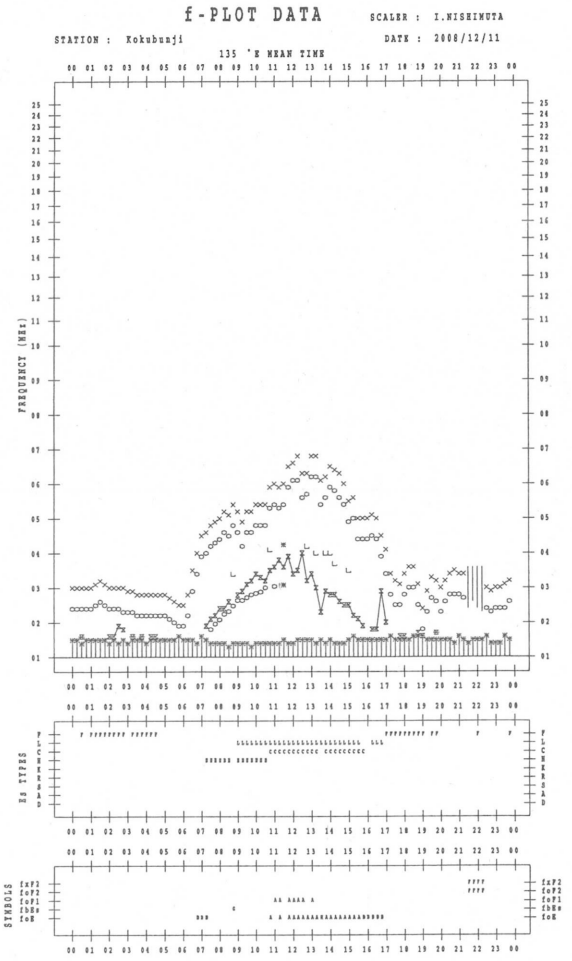
FREQUENCY (MHz)
Es TYPES
SYMBOLS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STATION : Kokubunji
DATE : 2008/12/11
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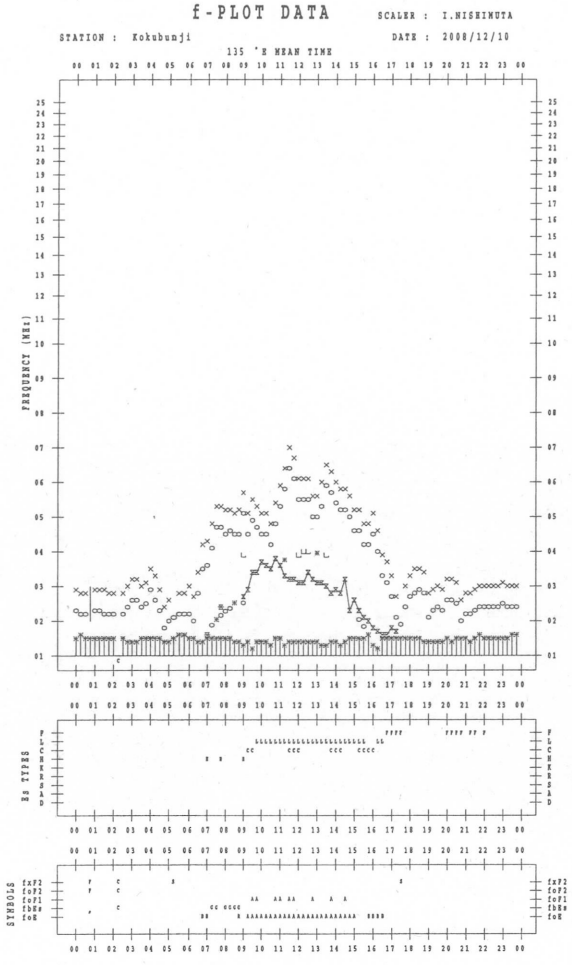
FREQUENCY (MHz)
Es TYPES
SYMBOLS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STATION : Kokubunji
DATE : 2008/12/10
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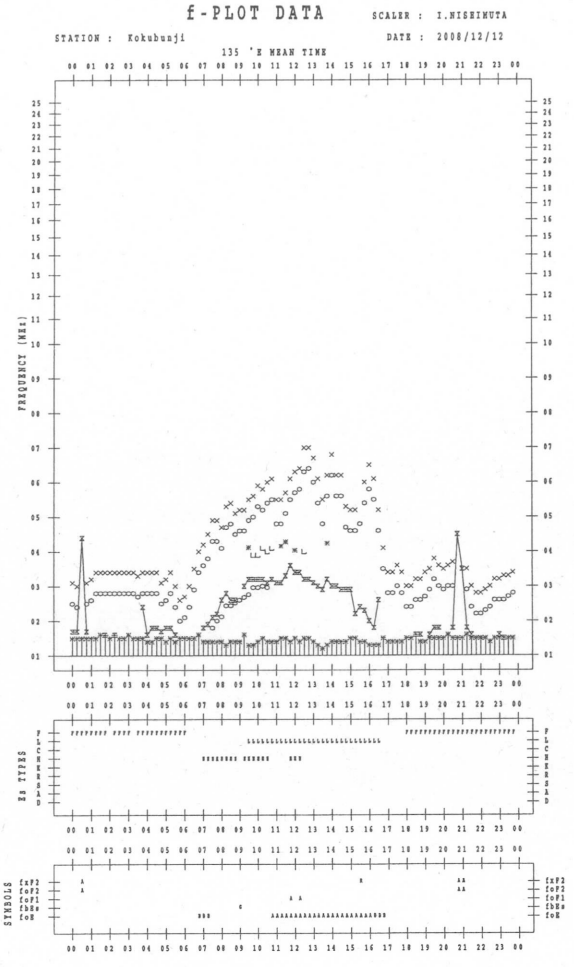
FREQUENCY (MHz)
Es TYPES
SYMBOLS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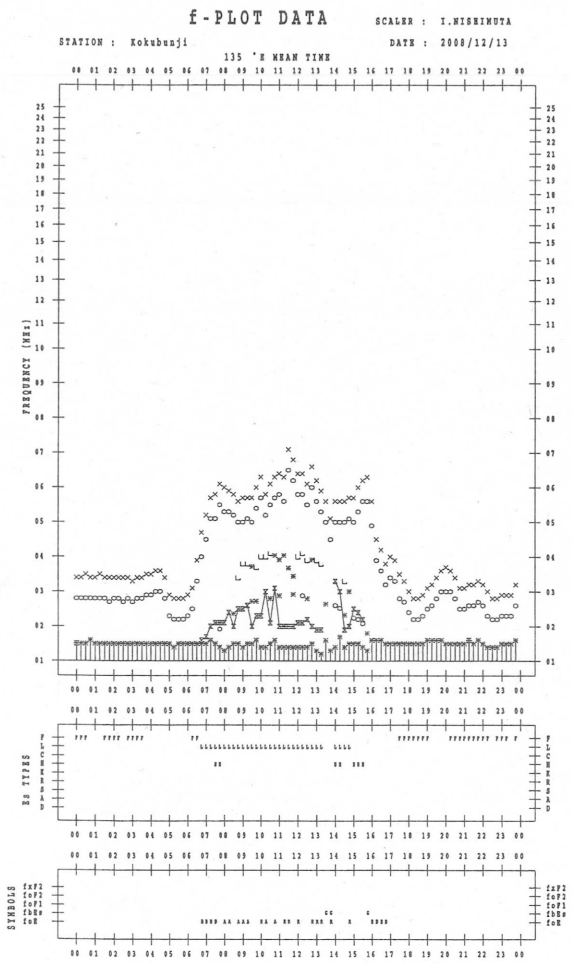
STATION : Kokubunji
DATE : 2008/12/12
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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DATE : 2008/12/13
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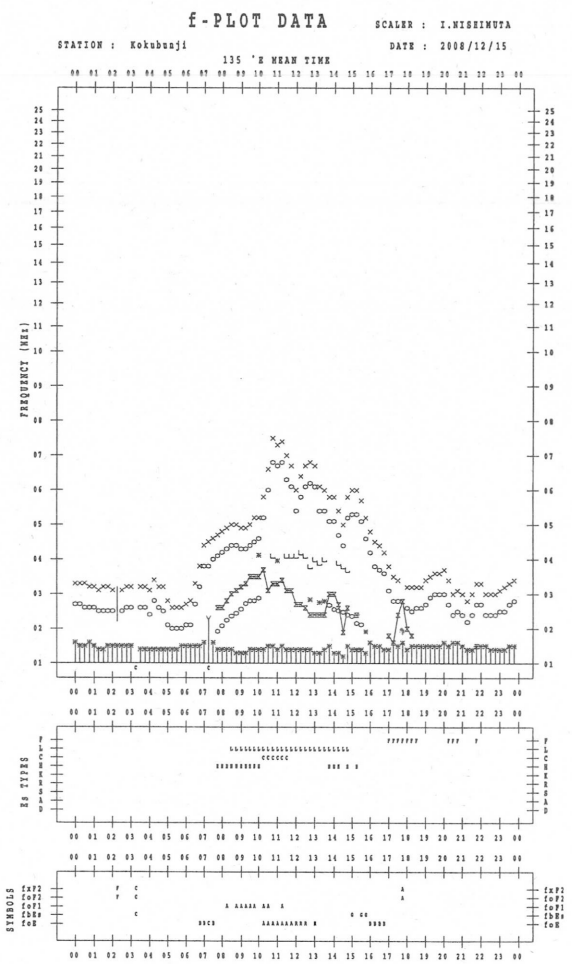
FREQUENCY (MHz)
Es TYPES
SYMBOLS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STATION : Kokubunji
DATE : 2008/12/15
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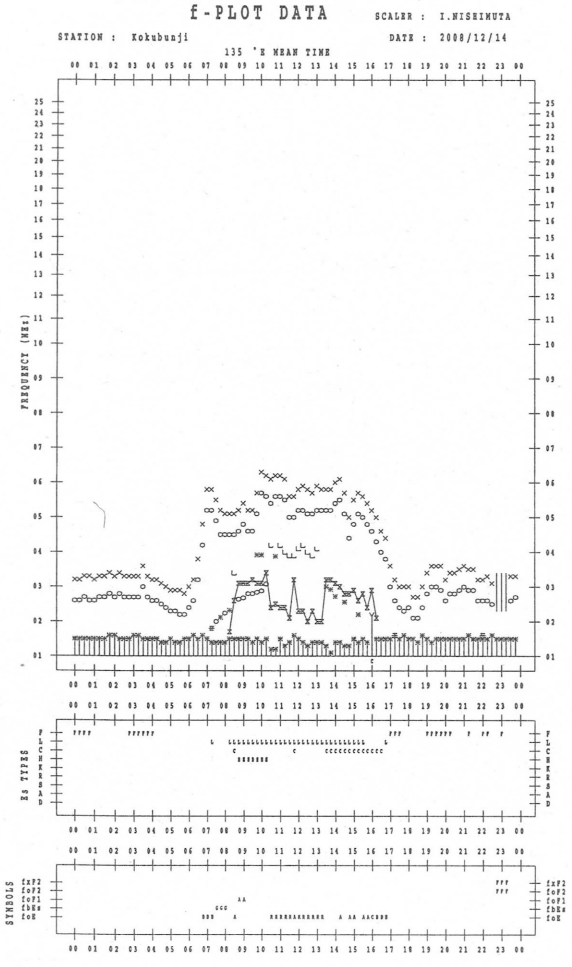
FREQUENCY (MHz)
Es TYPES
SYMBOLS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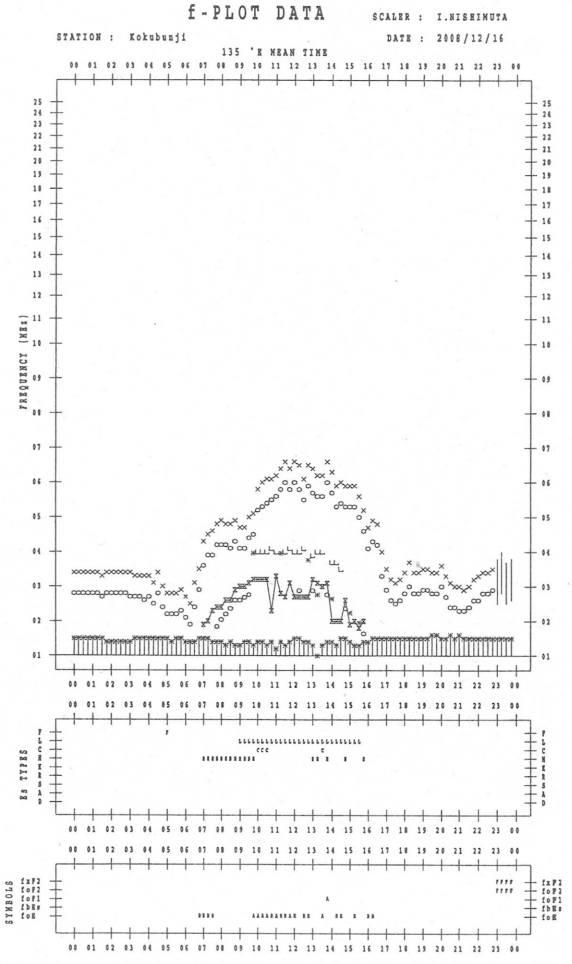
STATION : Kokubunji
DATE : 2008/12/14
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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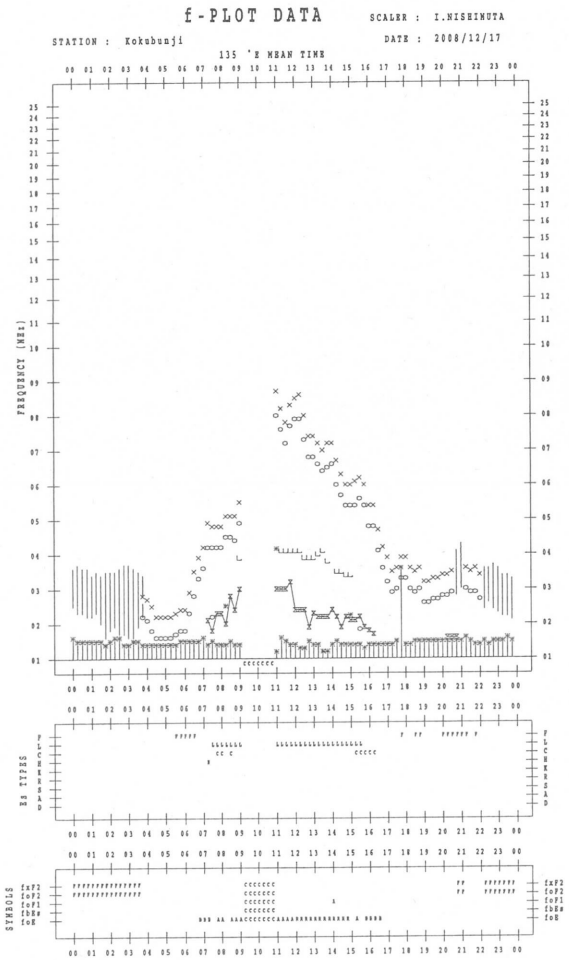
STATION : Kokubunji
DATE : 2008/12/16
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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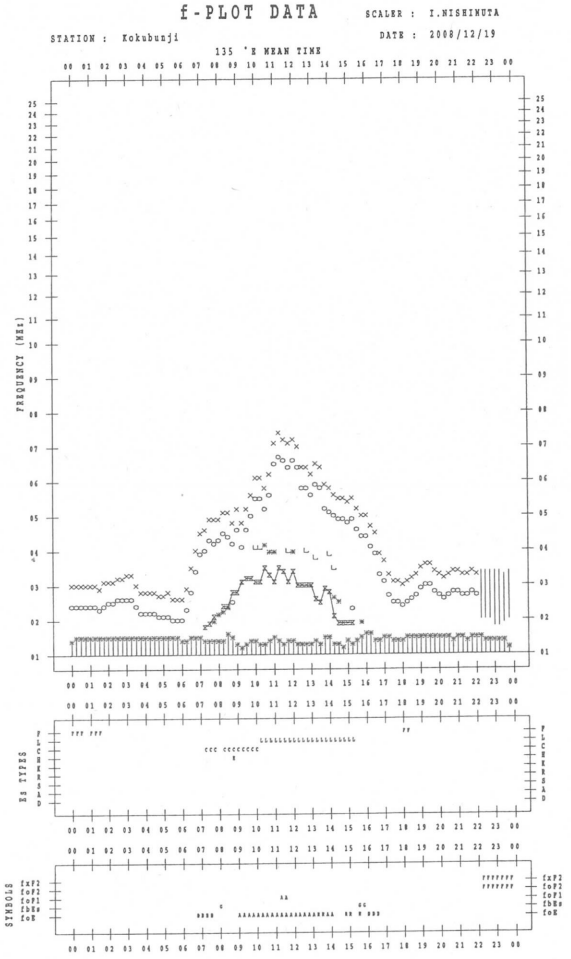
STATION : Kokubunji
DATE : 2008/12/17
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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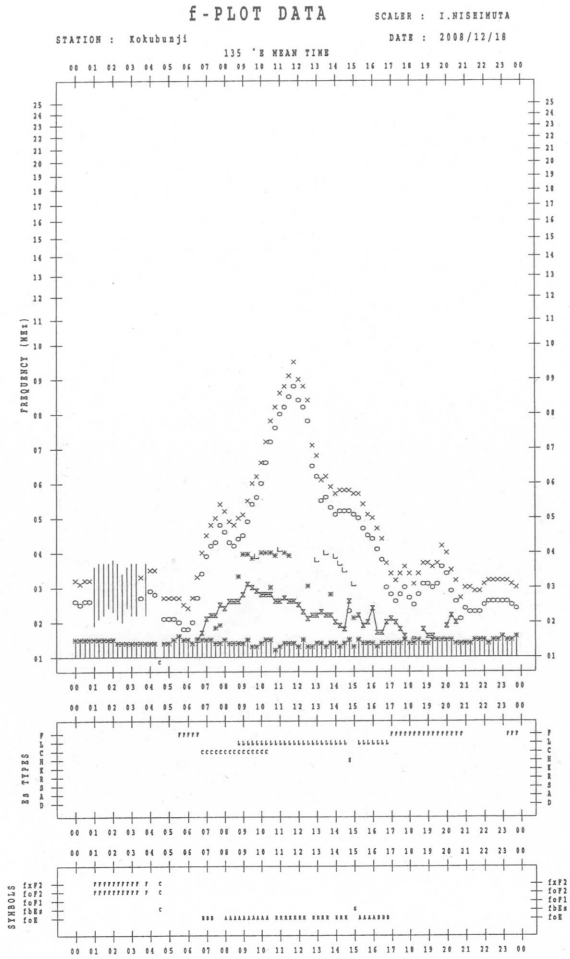
STATION : Kokubunji
DATE : 2008/12/19
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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STATION : Kokubunji
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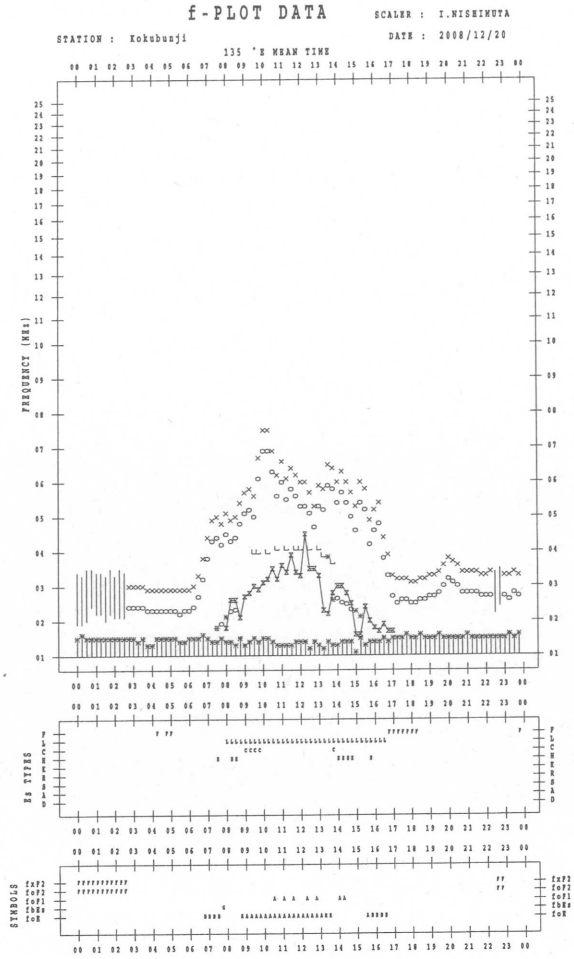
FREQUENCY (MHz)
Es TYPES
SYMBOLS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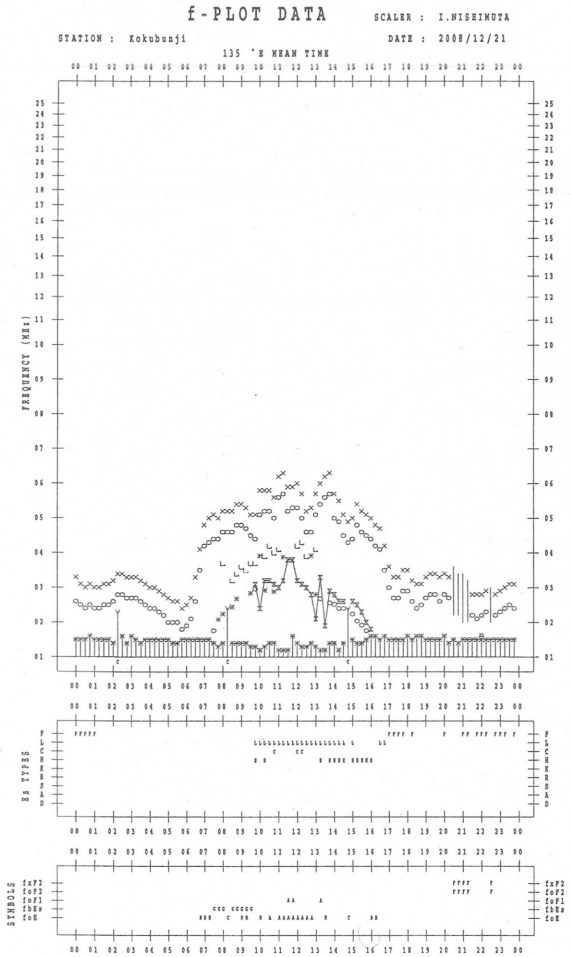
STATION : Kokubunji
DATE : 2008/12/20
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS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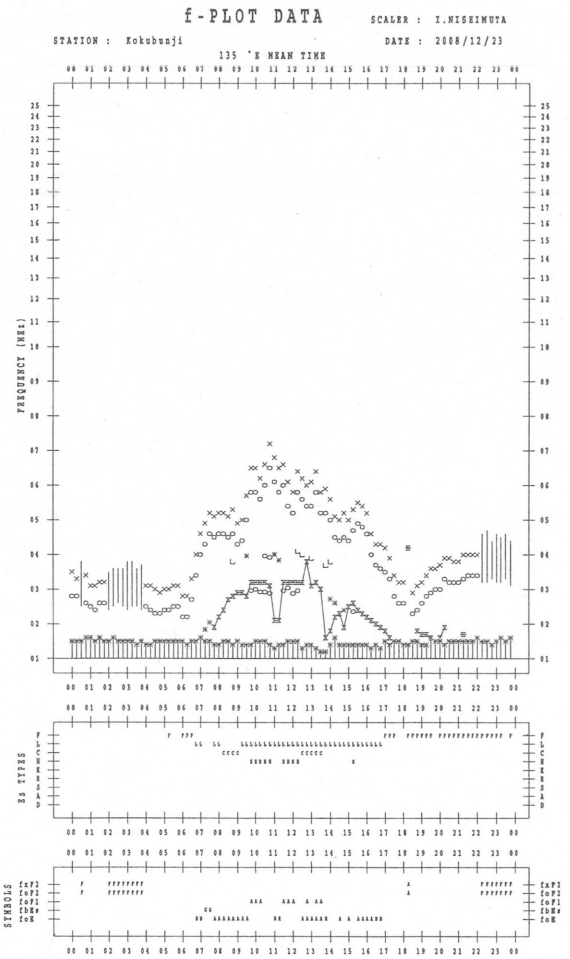
STATION : Kokubunji
DATE : 2008/12/21
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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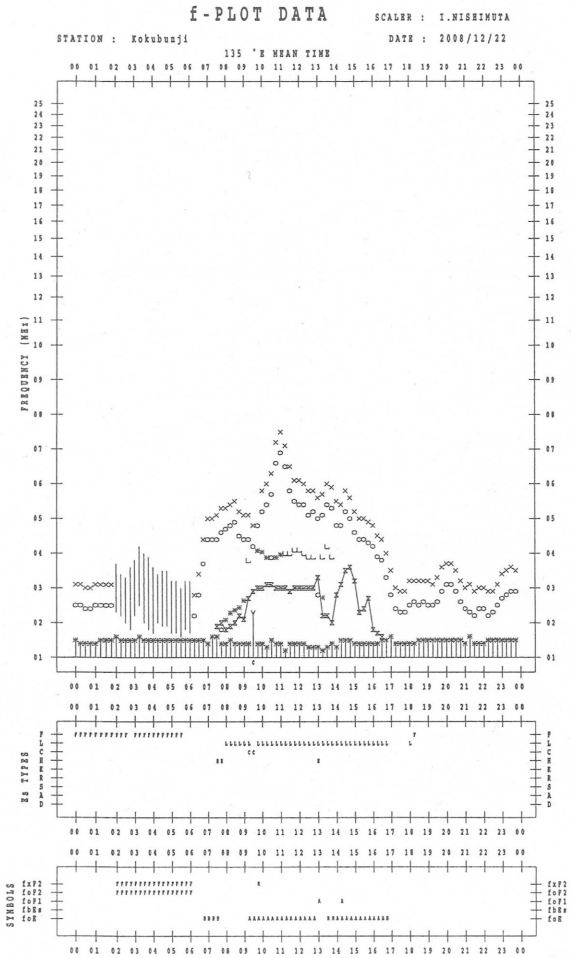
STATION : Kokubunji
DATE : 2008/12/23
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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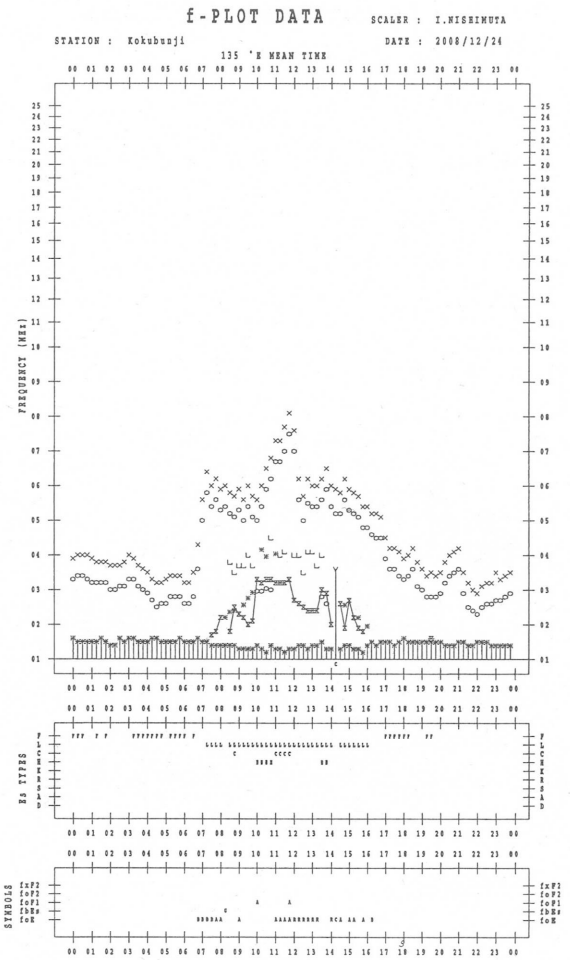
STATION : Kokubunji
DATE : 2008/12/22
135 °E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS
fxF2
foF2
foF1
fbEs
foE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STATION : Kokubunji
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FREQUENCY (MHz)
Es TYPES
SYMBOLS
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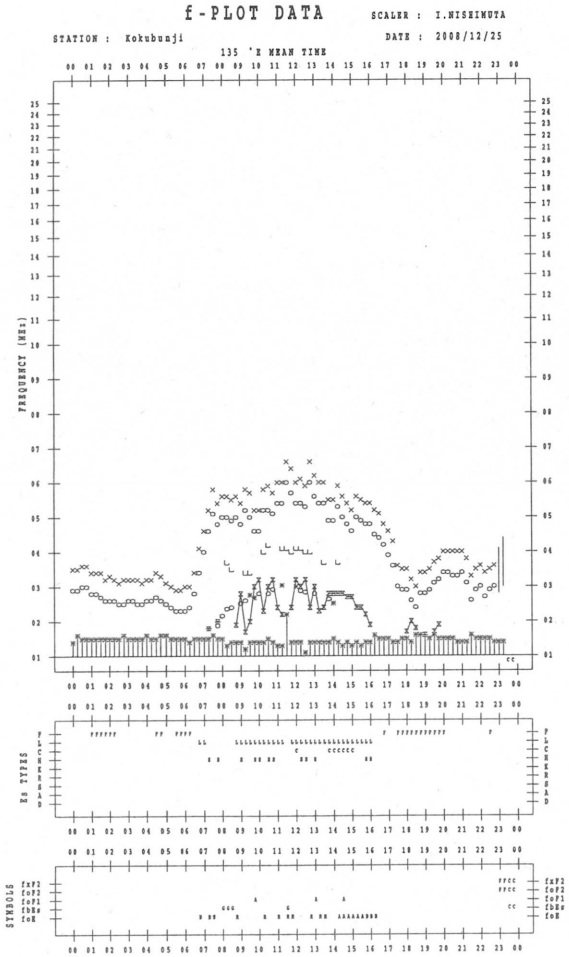
foF2
foF1
fbEs
foE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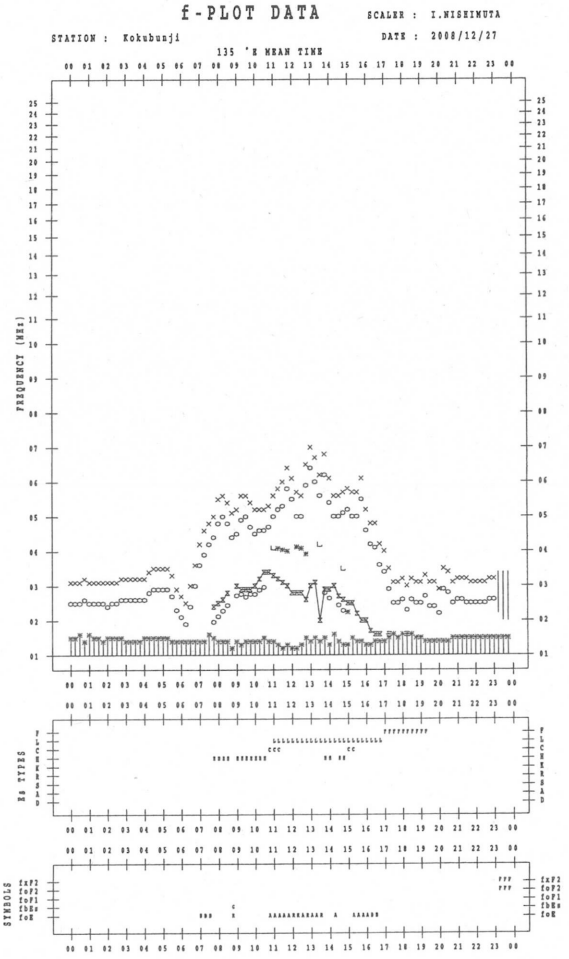
FREQUENCY (MHz)
Es TYPES
SYMBOLS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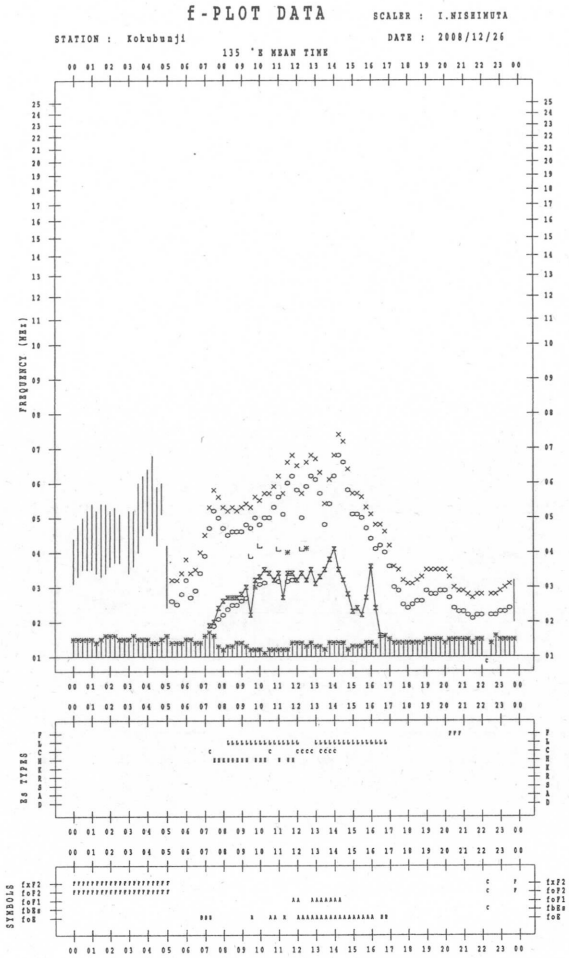
FREQUENCY (MHz)
Es TYPES
SYMBOLS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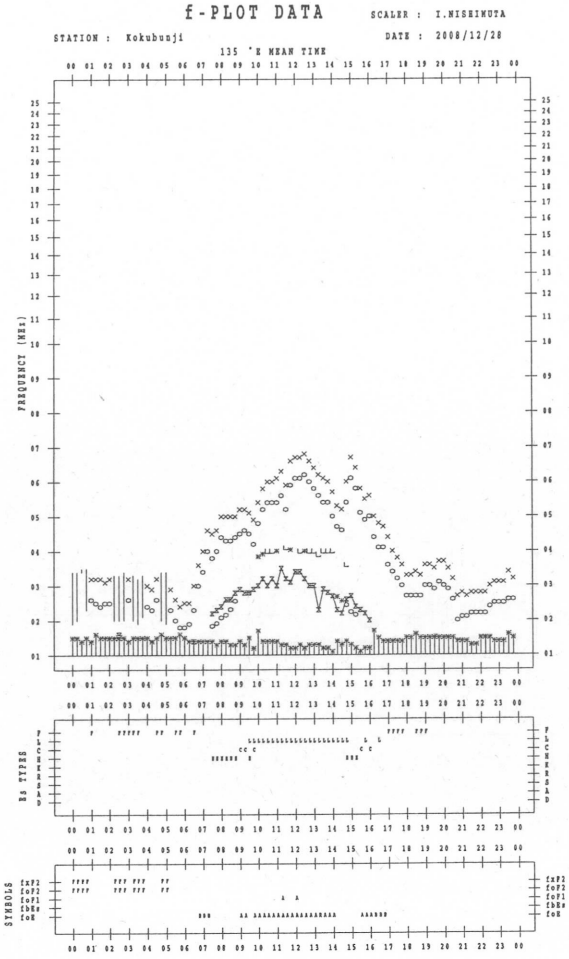
FREQUENCY (MHz)
Es TYPES
SYMBOLS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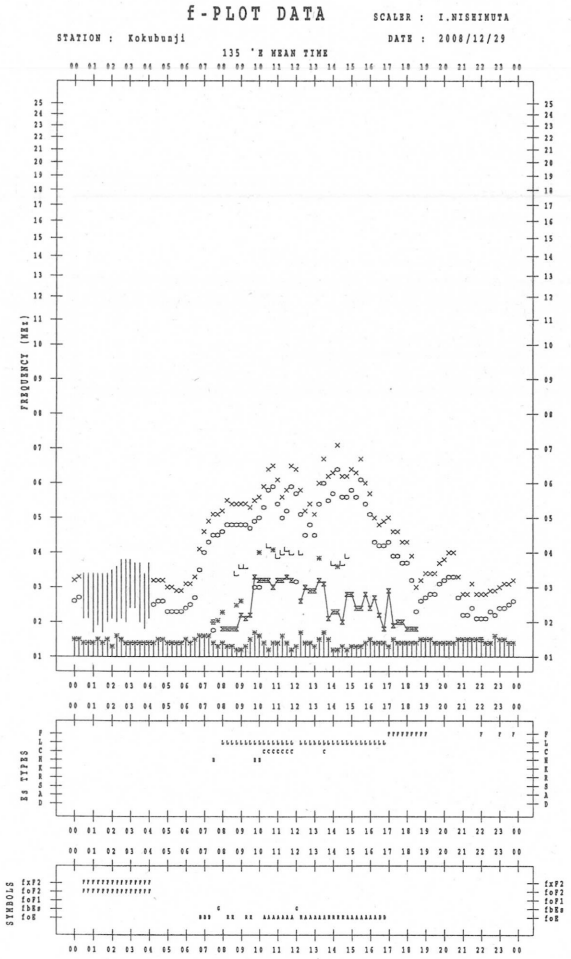
FREQUENCY (MHz)
Es TYPES
SYMBOLS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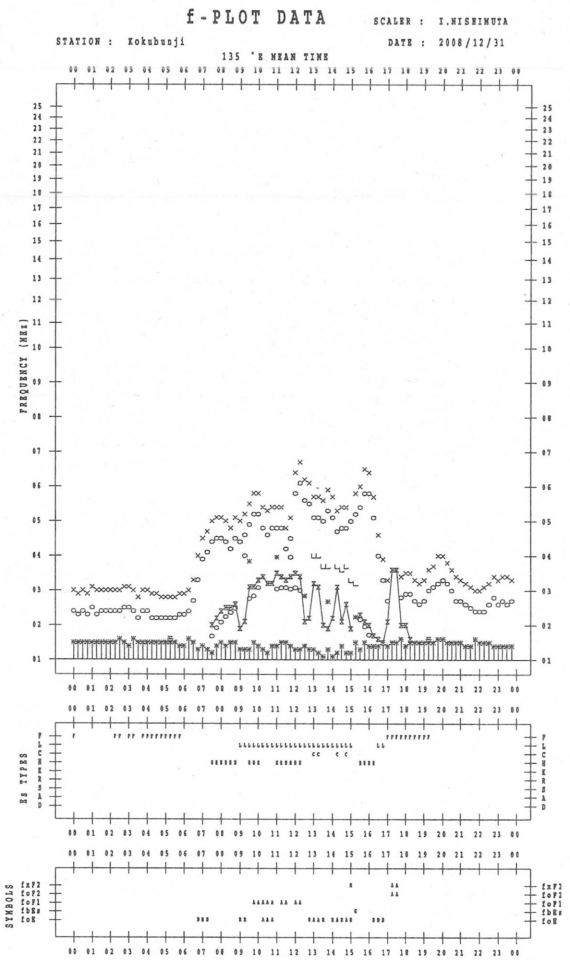
FREQUENCY (MHz)
Es TYPES
SYMBOLS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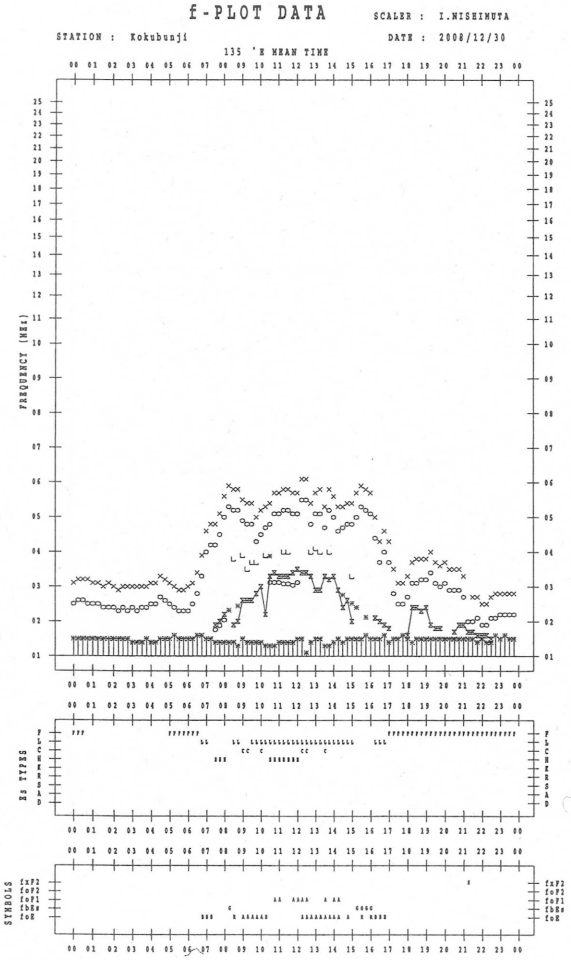
FREQUENCY (MHz)
Es TYPES
SYMBOLS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STATION : Kokubunji
DATE : 2008/12/30
135 'E MEAN TIME
FREQUENCY (MHz)
Es TYPES
SYMBOLS

B. Solar Radio Emission

B1.Outstanding Occurrences at Hiraiso

Hiraiso December 2008

Single-frequency observations

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

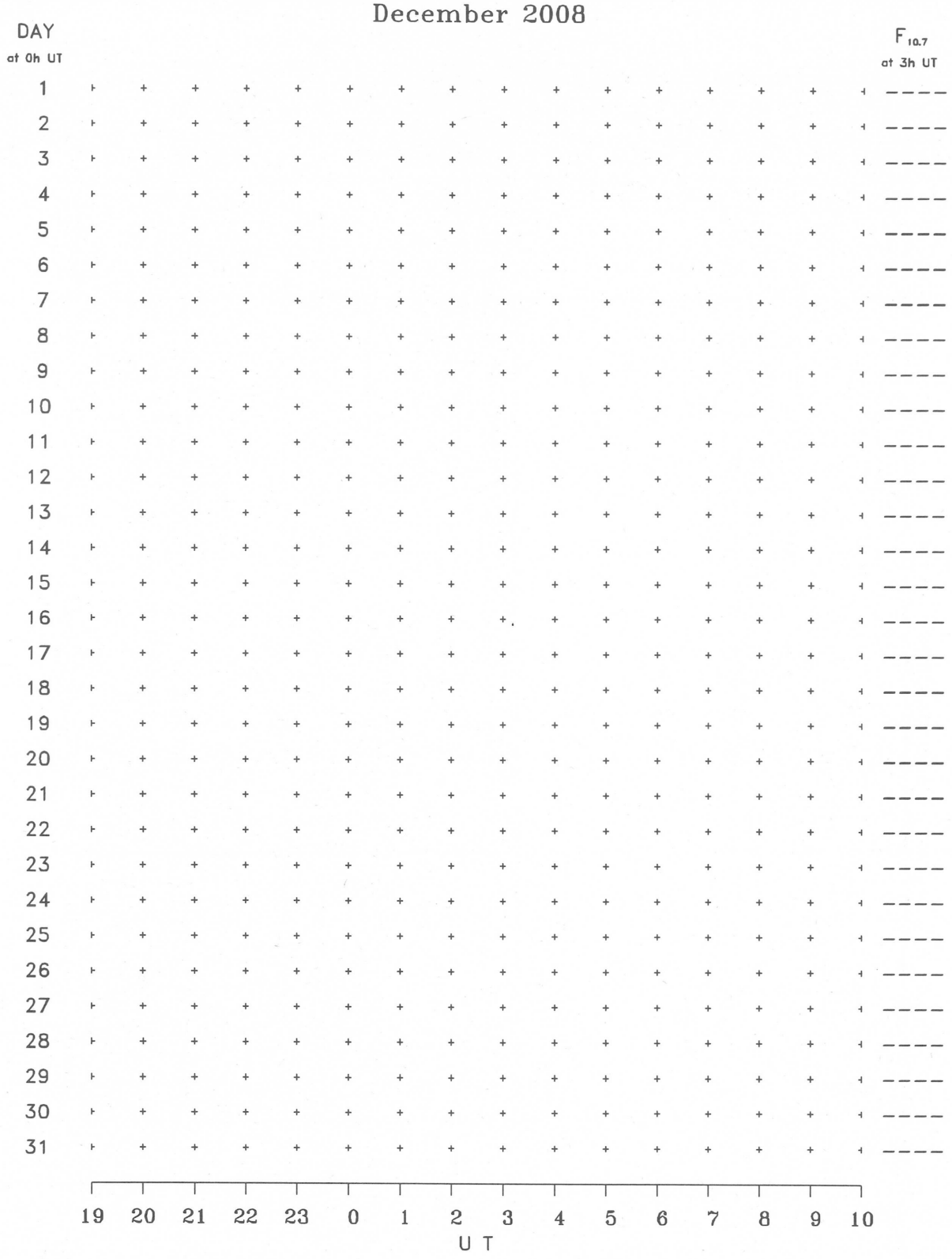
DEC. 2008	FREQ. (MHz)	TYPE	START TIME (U.T.)	TIME OF MAXIMUM (U.T.)	DUR. (MIN.)	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) PEAK	FLUX DENSITY (10^{-22} W m^{-2} Hz^{-1}) MEAN	POLARIZATION REMARKS

No data for the 2800MHz fixed-frequency observation are available due to system maintenance.

B. Solar Radio Emission

B2. Summary Plots of $F_{10.7}$ at Hiraiso

December 2008



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

IONOSPHERIC DATA IN JAPAN FOR DECEMBER 2008
F—720 Vol.60 No.12 (Not for Sale)

電離層月報（2008年12月）
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☎(042)(327)7540(直通)

Queries about "Ionospheric Data in Japan" should be forwarded to:
National Institute of Information and Commnications Technology
2-1 Nukui-Kitamachi 4-chome, Koganei-shi, Tokyo 184-8795 JAPAN