

# IONOSPHERIC DATA IN JAPAN

FOR JULY 2011

VOL. 63 NO. 7

## CONTENTS

Preface

Introduction . . . . . 1

### A. Ionosphere

#### A1. Automatic Scalling

Hourly Values at Wakkanai ( $f_oF2$ ,  $fEs$  and  $fmin$ ) . . . . . 4

Hourly Values at Kokubunji ( $f_oF2$ ,  $fEs$  and  $fmin$ ) . . . . . 7

Hourly Values at Yamagawa ( $f_oF2$ ,  $fEs$  and  $fmin$ ) . . . . . 10

Hourly Values at Okinawa ( $f_oF2$ ,  $fEs$  and  $fmin$ ) . . . . . 13

Summary Plots at Wakkanai . . . . . 16

Summary Plots at Kokubunji . . . . . 24

Summary Plots at Yamagawa . . . . . 32

Summary Plots at Okinawa . . . . . 40

Monthly Medians  $h'F$  and  $h'Es$  . . . . . 48

Monthly Medians Plot of  $f_oF2$  . . . . . 50

#### A2. Manual Scalling

Hourly Values at Kokubunji . . . . . 51

$f$ -plot at Kokubunji . . . . . 65

### B. Solar Radio Emission

B1. Outstanding Occurrences at Hiraiso . . . . . 97

B2. Summary Plots of  $F_{10.7}$  at Hiraiso . . . . . 98

«Real Time Ionograms on the Web .....[http://wdc.nict.go.jp/index\\_eng.html](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, Japan.

Stations	Geographic(WGS84)		Geomagnetic (IGRF-10(2005))		Technical Method
	Latitude	Longitude	Latitude	Longitude	
*Wakkanai/Sarobetsu	45°10'N	141°45'E	36.4°N	208.9°	Vertical Sounding (I)
Kokubunji	35°43'N	139°29'E	26.8°N	208.2°	Vertical Sounding (I)
Yamagawa	31°12'N	130°37'E	21.7°N	200.5°	Vertical Sounding (I)
Okinawa	26°41'N	128°09'E	17.0°N	198.6°	Vertical Sounding (I)
Hiraiso	36°22'N	140°37'E	27.6°N	209.1°	Solar Radio Emission (S)

\*We moved the observation facilities at Wakkanai to Sarobetsu on February 2009. The new observatory is located at approximately 26km south from the old observatory. The observation at Sarobetsu commenced on March 6, 2009.

## 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 a 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 by experienced specialists to supplement automatically-scaled parameters.

### A1. Automatic Scaling

Digital ionograms are automatically scaled by the pattern recognition method. The following five characteristics of the ionospheric are listed below. 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 (  $f_oF2$ ,  $fEs$ ,  $fmin$  ) and monthly medians of two factors (  $h'Es$ ,  $h'F$  ), daily Summary Plots and monthly medians plot of  $f_oF2$ .

#### a. Characteristics of Ionosphere

<b><math>f_oF2</math></b>	Ordinary wave critical frequency for the <b><math>F2</math></b> layer
<b><math>fEs</math></b>	Highest frequency of the <b><math>Es</math></b> layer whether it may be ordinary or extraordinary
<b><math>fmin</math></b>	Lowest frequency which shows vertical iono-spheric reflections
<b><math>h'Es</math></b> <b><math>h'F</math></b>	Minimum virtual height on the ordinary wave for the <b><math>Es</math></b> and <b><math>F</math></b> 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  $f_oF2$  ).
- C Impossible measurement because of any failure in observation.
- G Impossible automatic scaling because of very small ionization density of the layer ( for  $fEs$  ).
- N Impossible automatic scaling because of complex echoes.
- Blank No digital record because of problems occurring in the auto matic data processing system, but existence of film record.

#### c. Definitions of 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  $f_oF2$ ,  $fEs$  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  $f_xE$  and  $f_oE$  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

<b><math>fxl</math></b>	Top frequency of spread <b><math>F</math></b> trace
<b><math>f_oF2</math></b> <b><math>f_oF1</math></b> <b><math>f_oE</math></b> <b><math>f_oEs</math></b>	Ordinary wave critical frequency for the <b><math>F2</math></b> , <b><math>F1</math></b> , <b><math>E</math></b> , and <b><math>Es</math></b> (including particle type <b><math>E</math></b> ) layers, respectively
<b><math>fbEs</math></b>	Blanketing frequency of the <b><math>Es</math></b> layer, e.g. the lowest ordinary wave frequency visible through <b><math>Es</math></b>
<b><math>fmin</math></b>	Lowest frequency that shows vertical ionospheric reflections
<b><math>M(3000)F2</math></b> <b><math>M(3000)F1</math></b>	Maximum usable frequency factor for a path of 3000 km for transmission by the <b><math>F2</math></b> and <b><math>F1</math></b> layers, respectively
<b><math>h'F2</math></b> <b><math>h'F</math></b> <b><math>h'E</math></b> <b><math>h'Es</math></b>	Minimum virtual height on the ordinary wave for the <b><math>F2</math></b> , whole <b><math>F</math></b> , <b><math>E</math></b> and <b><math>Es</math></b> layers, respectively
<b>Types of <math>Es</math></b>	See below b. (iii)

## b. Symbols

## (i) Descriptive Letters

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

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

## (ii) Qualifying Letters

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

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

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

(iii) Description of Types of *Es*

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

The types are:

- f** An *Es* trace which shows no appreciable increase of height with frequency.  
**l** A flat *Es* trace at or below the normal *E* layer minimum virtual height or below the 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 as-associated with high absorption and large *fmin*.  
**n** The designation 'n' is used to denote an *Es* trace which cannot be classified into one of the standard types.  
**k** The designation 'k' is used to show the presence of particle *E*. When *foEs* > *foE* ( particle *E* ) the *Es* type precedes k.

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

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

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

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

## B. SOLAR RADIO EMISSION

Solar radio observations at 200, 500 and 2800 MHz are carried out at Hiraiso. The observation equipment consists of three parabolic antennas, one with 10-meter diameter for 200 MHz 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. Outstanding Occurrences at Hiraiso

The table is a list of outstanding occurrences of solar radio

emission bursts observed at 200, 500 and 2800 MHz during a month.

Listed in the table are the date, frequencies, the type of event, the start time and the time of maximum, both in U.T. expressed in hours, minutes and tenths of a minute, the duration in minutes, the peak and mean flux densities in  $10^{-22} \text{ Wm}^{-2} \text{ Hz}^{-1}$  unit, and the polarization.

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

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

## B2. 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

JUL. 2011

LAT. 45° 10.0' N LON. 141° 45.0' E SWEEP 1.0 MHz TO 30.0 MHz 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	52	A	A	50	55	62	64	62	A	A	64	57	A	61	69	67	69	68	84	68	67	65	66	59	
2	63	63	54	52	62	65	62	67	A	A	A	A	A	A		57	60	61	58	65	67	63	66	54	
3	A	50	48	34	44	54	53	58	A	64	A	A	A	49	A	A	A	63	65	A	64	54	62	64	
4	52	53	53	53	54	62	63	A	67	56	A	A	62	A	A	A	A	A	A	66	A	A	A	65	
5	52	47	43	38	38	A	A	A	A	A	A	A	A		57	57	A	A	A	A	A		66	54	54
6	54	54	54	52	52	58	60	A	A	A	A	A	A	A	A	A	57	A	A	A	A	A	64	54	
7	47	50	45	43	44	47	55	A	A	A	A	A	A	A	A	A	A	A		54	56	A	A	A	
8	54	52	47	44	A	A	A		A	61	53	A	A	A	A	A	54	30	58	A	A	73	A	63	
9	54	54	54	48	52	50	61	61	A	A	A	A	A	A			65	67	67	A	61	46	63	53	
10	52	54	48	42	38	A	A	A	A	A	A	A	A	A	A	A	A	A	58	A	A	64	64	A	
11	54	49	A	46	A	A	A	A		A	A	A	A		A	A	A	52	56	62	63	54	62	54	
12	54	54	A	A	46	52	A	A		A	A	A	A		A		A	A	A	46		A	A	A	
13	A	50	46	A	44	A	A	51	A	A	A	A	A		A		A	A		62	64	64	A	58	
14	52	51	50	54	47	55	66	64	A	A	A	A	A	62	60	64	61	A	A	A	64	66	66	61	
15	54	53	51	50	45	A	A	60	58	A	A	A		A	A	56	A	A	A	A	A	A	A	51	
16	58	50	58	48	44	40		58	66	59	64	A	A	64	53	A	A	A		A	A	A	A	62	
17	58	54	54	54	53	52	65	66	69	A	A		62	A	A	A	57	58		A	A	A	66	A	
18	54	52	51	51	54	57	55	70	63	A	60	A			A	A	A		65	62	60	64	66	66	
19	54	52	53	48	46	59	57	A	A							57		56	A	61	66	65	66	65	
20	63	54	58	A	54	62	65	62		A	A		58		A	A	A	A	A	A	74	66	62	66	
21	66	64	58	54	A	A	56	A	A	A	A			A	A	A	A	A	75	A	A	54	54	A	
22	58	61	53	51	52	56	55	57	A	A	A	A	A		A	A	49	58	A	66	A	64	64	A	
23	54	54	58	47	45	52	A	A	65	A	A	A	A	A	A	58	A	A	A	A	61	A	A	A	
24		54	50	46	44	50	60	61	A	A	A	A	A		64	54	57	62	60	64	A	A	64	54	
25	A	A	A		44	44	56	61	56	62	64	62	64	62	54	57	A	A	A		67	63	61	54	51
26	52	54	58	48	34	48	57	A	A	A	49		A		60	65	59	62	A	A	A	A	A	54	
27	54	A	A	A	52	57	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
28	52		52	48	46	54	61	A	A	A	A	A	A	A	A	49	A	53	57	67	66	64	65	62	
29	A	54	51	50	48	60	58	A	61	A	A	A	A	A	A	A	A	A	A	A	A	66	64	65	
30	60	52	53	48	47	55	67	A	A	A	A	A	A	A	A	A	A	A	66	A	A	65	65	65	
31	61	A	52	50	A	A	A	61	A	A	A		A	A	62	58	A	A	62	A	64	66	52	63	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	26	26	26	27	27	23	20	15	8	5	6	3	4	5	8	11	10	13	14	13	14	20	23	23	
MED	54	54	52	48	46	55	60	61	64	61	61	62	62	61	60	57	58	61	61	64	64	64	64	61	
U Q	58	54	54	51	52	59	63	64	66	64	64	64	62	63	63	64	61	64	66	66	66	66	65	65	
L Q	52	51	50	46	44	52	56	58	61	57	53	57	60	51	57	56	57	54	58	60	63	62	62	54	

## HOURLY VALUES OF fEs AT Wakkanai

JUL. 2011

LAT. 45° 10.0' N LON. 141° 45.0' E SWEEP 1.0 MHz TO 30.0 MHz AUTOMATIC SCALING

H D	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	72	40	35	34	31	49	70	68	88	73	52	66	89	G	45	49	50	35	32	27	40	38	34	25	
2	G	26	G	G	G	35	48	70	87	152	102	69	67	40	G	41	46	56	71	28	G	34	37	48	
3	70	G	29	G	G	31	38	47	78	69	68	G	52	G	52	76	76	62	112	93	69	58	70	G	
4	G	G	G	G	G	33	42	69	74	66	71	68	118	76	78	124	132	112	180	93	88	79	72	50	
5	44	24	G	G	25	37	41	71	70	73	40	54	52	G	45	50	59	70	71	88	71	58	33	28	
6	35	29	30	35	G	39	43	72	71	61	100	106	71	70	G	54	51	112	74	109	69	81	40	36	
7	25	40	33	38	G	33	42	56	58	54	62	80	86	69	68	98	114	58	42	51	45	52	50	70	
8	26	34	46	37	59	39	40		57	52	49	59	68	58	65	45	G	56	40	50	49	48	71	38	
9	G	G	34	40	35	34	42	57	76	114	72	50	49	43	G	G	G	G	40	70	33	38	36	43	
10	41	39	32	63	36	110	51	61	116	124	97	179	54	73	80	68	72	103	112	113	113	70	48	71	
11	40	54	59	59	62	58	114	134	G	G	138	147	176	66	G	41	48	40	44	42	44	36	32	37	42
12	36	29	68	69	60	57	54	39			95	67	66	G	68	G	69	72	62	40	68		58	72	
13	71	60	37	59	33	58	60	61	70	66	111	62	G	49	G	57	65	76		66	70	60	53	40	
14	34	34	42	59	50	37	58	70	80	71	73	86	75	G	G	49	51	93	68	60	40	31	33	32	
15	40	40	40	32	36	53	51	61	53	56	64	70	G	67	75	49	76	128	95	103	81	73	69	40	
16	G	G	G	28	G	39		48	G	G	G	57	52	52	G	60	70	70	62	71	72	73	91	56	
17	60	G	28	33	27	35	54	60	68	73	97	G	49	74	86	65	G	36		74	88	72	71	70	
18	32	32	G	32	27	32	39	60	64	66	52	66	G	G	42	60	56	51	36	44	26	32	32	32	
19	29	24	G	G	G	34	43	47	48		G	G	G	G	G	G	G	58	62	40	29	46	40	36	
20	G	G	G	41	G	G	49	67		71	53		G	G	G	62	58	58	74	72	71	102	39	40	46
21	33	40	53	48	72	43	46	58	54	63	59	52	G	G	92	73	89	75	112	72	91	49	52	68	
22	29	G	G	34	32	34	51	61	69	74	114	92	90	G	57	74	66	43	74	35	81	60	58	60	
23	70	G	41	28	G	36	54	67	50	77	87	72	56	80	53	G	91	111	132	92	43	73	71	59	
24		46	36	37	G	36	40	55	111	92	117	92	60	54	G	G	38	59	43	39	60	40	60	68	
25	43	48	39	40	31	34	41	42	56	69	G	57	G	42	G	52	75	75	70	58	29	28	33	36	
26	34	47	36	34	33	33	40	54	69	65	G	G	53	G	G	G	41	54	94	69	69	60	60	48	
27	40	80	70	69	33	45	65	74	75	73	64	70	66	80	74	128	116	170	124	73	93	84	57	71	
28	48		37	28	G	38	43	69	72	69	75	96	89	72	80	G	56	59	32	43	60	67	48	49	
29	72	33	59	32	40	41	48	72	60	69	73	100	70	86	68	72	128	126	127	72	72	40	71	47	
30	68	40	34	26	28	40	54	78	70	91	83	73	68	64	60	60	69	80	64	72	65	72	40	49	
31	59	65	58	36	51	69	81	50	68	74	74	54	102	52	52	71	74	87	86	72	47	71	35	41	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	31	31	31	31	30	30	29	31	31	31	31	31	31	31	31	31	29	31	31	30	31	31	
MED	38	34	35	34	31	37	48	61	69	69	72	67	60	49	52	54	65	70	71	70	68	58	50	47	
U Q	59	40	42	41	36	45	54	70	75	74	97	86	71	70	68	71	76	93	103	74	81	72	69	60	
L Q	29	G	G	28	G	34	42	55	56	63	52	54	49	G	G	41	46	56	42	44	40	39	37	36	

## HOURLY VALUES OF fmin AT Wakkanai

JUL. 2011

LAT. 45° 10.0' N LON. 141° 45.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

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



HOURLY VALUES OF foF2 AT Kokubunji

JUL. 2011

LAT. 35° 43.0' N LON. 139° 29.0' 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	A	A	A	A	45	57	67	A	A	A	A	A	A	A	A	85	97	100	100	90	80	52	53	47	
2	53	A	54	53	59	63	83	78	A	A	A	99	A	A	64	73	74	68	68	74	74	75	75	63	
3	A	A	A	A	27	45	62	67	54				A	A	A	A	74	77	71	67	66	67	54	A	
4	53	54	A	51	44	A	56	75	87	A	139				A	A	A	A	66	78	87	76	65	53	
5	58	54	52	46	46	44	A	101	70	A	A	A			A	A	A	A	A	61		54	A	A	
6	44	A	A	A	A	52	55	65	A	A	A	A			A	A	A		48	63	74	79	67	A	
7	54	53	46	A	54	54	A	A	A	A	A	A	A	A		A		58	A	53	A	A	A	53	
8	A	A	46	44	45	44	A	63	61	A	A	A	A	A	A	A	57	A	A	77	73	61	A	44	
9	52	52	46	44	44	44	63	A	63	A	73	67		59	A	61	73	A	80	77	A	54	54	54	
10	54	53	44	A	A	A	A	A	A	A	A	A	48	A	A	A	A	A	A	A	52	53	A	42	
11	42	44	44	39	A	A	A	63			A			A	A	58		A	69	64	54	53	54	54	
12	52	51	52	42	A		A	48		A		A	A	A		A	A	A	A	A	A	A	A	50	
13	A	42	42	44	45			A	A	A	A						54	A	61		44	A	44	54	
14	52	44	44	A	46	44	64	72	77	59					68	68	63	A	63	75	75	54	A	A	
15	A	54	49	A	45	46	A	A	80	A	A	A		74	74	72	56	64	75	68	54	A	52	54	
16	51	45	46	44	43		53	77	A	55	A	A	A	A	68	A	79	64		A	61	54	A	A	
17	A	A	44	44	44	47	64	A	A	A	A	83	88	A	73	73	74	68	71	77	77	73	53	A	
18	A	A	A	A	44	44	57	55	A	A	A	A		A	A	A	A	A	A	A	77	64	A	A	
19	A	54	A	A	49	59	73	A	A	A	A	A		A	A	A	A	A	A	A	67	A	63	53	
20	53	42	52	44	46	54	72	75	80	A	A	A	A		66	68	64	66	67	77	A	74	39	54	
21	66	54	71	63	N	60	78	81	A	A	A	A		65	66	63	62	59	67	67	50	54	A	51	
22	53	A	A	A	43	A	55	A	64	72	73			A	A	A	71	74	62	67	74	77	54	52	50
23	44	51	A	53	45	47	57		A	A	A	A	A	A	A	A	A	83	67	A	A	A	52	52	
24	53	52	51	52	49	46	58	66	A	A	A	A	64	A	A	76	A	71	A	A	54	A	54	A	
25	A	52	44	51	A	52	54	54	A	A	A	A		67			74	83		A	64	A	A	A	
26	48	A	A	45	39	A	57	67	A	A	A	66	63	64	64	86	74	64	66	66	54	A	47	44	
27	A	A	A	44	44	52	61	73	67	55	A				65	72	73	72	67	66	55	54	54	51	
28	58	52	47	49	45	52	52	59	A	65	A	56	A	A	A	56	61	62	65	72	A	51		A	
29			45	45	44	45	57	62	A	75	A				72	68	63	A	A	73	72	66	A	A	
30	A	A	44	46	44	49	77	A	A	A	A	A	A	A	A	68	65	65	74	80	53	52	51	45	
31	45	48	A	39	42	46	57	A	A	68	A	A	A	A	75	77	73	72	73	77	76	A	A	A	
	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	19	20	21	25	23	23	19	10	7	3	5	4	4	11	17	21	19	21	21	24	21	17	19	
MED	53	52	46	45	45	47	58	67	68	65	73	67	64	66	68	71	73	66	67	74	66	54	53	52	
U Q	54	54	51	51	46	54	67	75	80	72	139	91	76	70	73	74	74	72	73	77	76	66	54	54	
L Q	48	45	44	44	44	45	56	62	63	55	73	61	55	61	65	67	62	64	64	67	54	53	51	47	



HOURLY VALUES OF fEs AT Kokubunji

JUL. 2011

LAT. 35° 43.0' N LON. 139° 29.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	59	70	58	37	35	28	56	120	110	93	100	115	85	74	77	80	68	92	49	53	46	29	29	G	
2	35	47	34	39	32	30	39	61	113	85	49	90	104	47	55	G	48	56	48	39	42	34	28	50	
3	50	69	52	40	G	34	45	35	45				91	97	99	138	60	47	52	40	37	49	41	68	
4	27	43	80	59	73	60	40	52	G	76	186			G	107	104	142	71	62	49	72	48	79	34	
5	31	30	34	26	23	30	90	124	63	87	95	63	70		60	82	62	65	69	41	86	58	109	82	
6	34	79	49	48	35	G	32	62	111	98	64	143		44	72	80	107	50	49	G	60	29	82	49	
7	48	37	26	70	36	30	74	76	58	74	82	81	53	52		54	G	53	52	62	58	42	29	59	
8	69	72	G	G	45	29	46	58	65	58	71	89	80	51	67	76	G	71	94	28	60	59	51	34	
9	33	30	28	24	G	G	G	53	48	42	G	45	68	63	82	G	51	70	52	60	50	46	51	28	
10	34	49	49	58	59	49	59	60	49	78	57	51		50	66	84	132	69	97	69	52	59	49	72	
11	46	43	43	32	57	32	60	56	45		47			55	63	G		63	65	51	40	40	43	41	
12	G	35	33	G	27		60	G	G	48		47	58	84		62	99	152	84	116	70	80	72	49	
13	57	27	33	27	G	G	G	61	58	108	106	47					60	122	34	30	34	29	G	26	
14	30	31	G	24	G	G	G	56	G	52		50	84		59	63	61	81	58	50	60	59	111	89	
15	84	59	40	50	50	28	57	69	71	131	73	126	78	68	55	52	43	62	45	54	33	38	36	52	
16	G	27	G	28	30		G	53	86	61	127	73	82	79	47	169	85	58	152	118	51	59	71	79	
17	71	60	29	30	G	34	42	74	106	78	114	51	47	83	G	G	G	G		40	37	48	35	57	52
18	67	49	38	32	24	29	G	47	62	91	82	59	G	48	49	70	144	116	132	115	79	116	104	59	
19	60	25	79	65	37	53	82	73	81	87	81	69		63	71	69	59	65	179	113	57	85	G	G	
20	G	36	43	36	G	G	53		67	49	84	140	100	70	G	45	60	45	56	42	G	34	70	51	35
21	30	35	45	30			45	59	67	51	50	128	56			G	G	52	44	33	G	25	44	60	60
22	34	52	52	47	27	57	G	81		G	G			68	83	114	58	51	60	G	G	27	G	G	36
23	57	36	50	60	50	29	38		78	68	67	50	78	86	71	75	95	84	32	71	67	43	27	33	
24	32	41	G	26	36	G	38	52	60	127	70	57	G	53	90	70	83	49	53	126	49	58	43	79	
25	80	35	34	30	51	G	G	45	69	91	110	71	44	G	86	176	61	71	139	128	50	60	54	82	
26	48	49	40	39	G	30	50	70	112	148	114	62	59	56	52	54	47	49	53	46	49	91	59	40	
27	78	83	60	29	40	G	G	47	58	47	64		58		93	G	G	G	29	G	G	31	49	39	
28	30	G	G	G	G	G	G	50	96	64	51	50	49	49	48	G	G	G	49	49	28	50	34	82	
29			28	G	G	27	42	66	72	G	79		96		57	G	G	84	107	63	51	52	84	65	
30	57	48	28	28	G	G	60	96	93	95	141	117	73	126	95	G	G	G	G	32	48	57	34	29	
31	G	G	46	30	G	G	37	80	81	64	133	96	132	104	58	G	G	G	G	28	71	81	57	57	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	30	30	31	31	31	28	31	30	31	29	28	25	26	25	28	30	30	31	31	31	31	31	30	31	
MED	40	42	38	30	27	29	40	60	65	78	80	69	69	56	64	61	56	62	52	49	50	49	51	50	
U Q	59	52	49	47	40	33	57	73	86	92	112	98	82	83	84	80	83	71	84	69	60	59	71	68	
L Q	30	31	28	26	G	G	G	52	49	55	60	50	53	48	53	G	43	49	40	28	40	35	34	34	

## HOURLY VALUES OF fmin AT Kokubunji

JUL. 2011

LAT. 35° 43.0' N LON. 139° 29.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	13	14	13	14	15	17	17	34	34	34	37	35	34	33	34	31	14	14	14	14	13	13	40
2	13	14	14	14	13	14	15	17	18	34	34	42	33	37	33	52	33	17	17	14	14	14	13	14
3	14	14	13	14	14	14	14	17	21				40	36	34	36	36	31	14	13	13	14	14	18
4	14	14	15	13	13	14	14	18	47	34	40			53	34	31	42	18	13	17	13	14	14	14
5	14	14	14	15	13	13	13	15	38	38	36	35	38		35	28	28	18	13	17	14	13	14	14
6	13	14	13	14	14	21	14	17	21	37	37	37		37	38	37	36	17	15	18	14	14	13	13
7	14	13	14	14	13	13	13	29	35	34	36	36	39	35		36	44	20	13	15	13	14	14	14
8	13	17	15	14	13	14	14	20	20	36	34	35	39	35	38	34	20	14	18	14	14	14	17	14
9	14	14	13	14	18	21	18	17	33	33	52	38	36	36	34	47	22	21	13	17	14	14	14	14
10	13	14	13	14	13	13	13	18	31	35	37	34	50	36	36	37	33	17	14	17	14	13	13	14
11	13	14	13	14	14	14	13	18	34		38			40	39	46		28	18	17	13	14	14	13
12	14	14	14	17	13		14	14	20	35		39	40	36		39	39	28	13	13	15	14	13	14
13	14	14	15	14	13		14	20	21	30	31	35					34	13	14	30	14	14	15	15
14	14	13	14	14	23	38	20	30	43	34		34	37		37	38	34	24	18	14	13	14	14	17
15	13	14	13	13	13	14	15	30	37	35	36	39	39	37	37	37	29	17	14	13	14	15	14	14
16	14	14	14	13	14		14	17	30	33	40	43	39	39	53	34	33	28	15	14	14	13	14	14
17	13	14	14	14	13	14	15	21	37	35	35	37	38	39	54	52	44	13	17	14	14	14	14	14
18	13	13	13	13	15	13	14	15	33	36	33	33	35	34	29	35	20	15	18	13	14	14	14	14
19	14	17	15	14	13	14	13	14	20	39	36	38		33	33	33	34	22	15	14	15	13	14	15
20	21	15	13	13	14	13	14	24	33	36	37	34	36	54	38	35	44	14	14	18	14	17	13	14
21	14	13	13	14	17	18	14	22	34	35	39	39	38		50	47	33	15	13	15	20	15	14	14
22	14	13	13	13	13	14	14	14	41	53	50		42	37	35	34	30	24	13	14	13	34	14	13
23	14	14	13	17	13	14	14		34	36	37	39	35	40	35	34	34	17	13	14	15	13	17	14
24	13	13	15	17	14	17	13	21	36	34	36	37	61	37	34	37	40	26	14	13	17	15	13	15
25	14	15	15	13	13	17	13	13	36	35	34	38	37	53	39	39	35	28	13	14	13	14	13	14
26	14	14	15	13	14	13	14	15	33	36	36	39	37	37	36	34	15	39	15	13	18	14	14	14
27	14	14	15	13	15	22	14	15	35	36	39		39		42	48	44	18	14	17	40	13	13	14
28	13	14	14	15	14	17	14	33	35	37	40	40	38	42	42	50	37	17	13	13	14	14		15
29			14	14	13	13	13	14	35	53	38		42		40	52	44	15	14	15	14	14	13	14
30	13	13	14	13	15	17	14	15	31	31	36	42	33	37	36	52	49	15	30	13	14	14	17	15
31	18	14	14	14	14	20	13	18	31	34	33	40	43	34	33	48	21	15	39	13	13	13	13	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	30	30	31	31	31	28	31	30	31	29	28	25	26	25	28	30	30	31	31	31	31	31	30	31
MED	14	14	14	14	14	14	14	17	34	35	36	38	38	37	36	37	34	17	14	14	14	14	14	14
U Q	14	14	15	14	14	17	14	21	36	36	38	39	40	39	39	47	40	24	17	17	14	14	14	15
L Q	13	13	13	13	13	13	13	15	30	34	34	35	36	35	34	34	30	15	13	13	13	13	13	14

## HOURLY VALUES OF foF2 AT Yamagawa

JUL. 2011

LAT. 31° 12.0' N LON. 130° 37.0' 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	C	C	C	C	C	C	C	C	C	C	A	A	A	A	A	69	79	94	93	79	72	54	54	43
2	62	65	54	N	58	53	82	77	63	62	58	A	66	A	A	75	76	A	80	71	54	46	54	53
3	54	52	53	53	A	38	50	72	60	A	A	A	A	A	A	A	A	81	A	A	67	A	37	54
4	54	A	A	A	A	A	53	86	74	54	A	A	A	60	A	65	A	67	73	74	67	61	A	A
5	A	42	52	54	A	A	A	A	A	A	A	A	A	64	77	75	67	62	71	78	54	52	30	52
6	A	A	52	A	46	50	56	67	55	A	A	A	A	A	A	A	66	A	A	75	54	52	44	42
7	A	A	A	A	47	42	54	53	A	A	A	A	A	A	A	72	71	A	66	72	65	54	52	52
8	45	52	52	47	44	40	55	57	A	55	A	A	A	A	58		60	60	74	49	52	41	53	52
9	54	52	51	53	52	47	43	54	70	66	68	62	A	A	68	67	59	75	75	72	51	52	54	51
10	54	53	52	52	54	52	51	A	A	A	A	A	A		62	A	46	51	64	71	66	A	50	48
11	42	44	42	40	42	39	47	46	A	A	A	A	A	A	A	57	A	64	52	55	54	54	A	52
12	54	53	54	54	60	29	50	58	A	A	A	A	A			63	58	56	51	36	54	50	50	43
13	A	50	50	A	47	47	51	54	A	A	A	A	A	68	65	43	49	64	60	54	A	52	52	52
14	53	51	48	A	A	42	48	66	67	62	72	59		A	72	A	A	A	76	74	67	54	54	A
15	A	54	48	A	44	A	51	72	77	A	A	A	A	A	A	A	70	N	86	80	43	A	A	A
16	A	A	A	42	41	40	50	47	A	A	A	A			A	A	A	A	A	70	70	51	54	52
17	47	54	43	54	52	48	54	63	70	74	76	78	78	72	74	96	86	72	92	82	71	53	54	A
18	A	A	54	52	47	46	A	A	A	A	A	A	A	66	72	76	73	72	75	84	52	52	58	54
19	A	53	52	54	52	A	50	51	67	65	A	A	A	A	A	A	64	A	A	A	A	66	A	A
20	54	54	52	54	54	54	65	67	55	58	62	66	70	66	71	63	72	65	72	77	54	54	67	54
21	66	54	54	52	52	58	73	71	78	A	A	65	A	70	74	64	75	73	76	72	67	54	A	A
22	A	A	43	42	40	42	52	58	67	70	62	A	64	70	62	A	77	A	78	76	77	65	53	53
23	53	53	46	46	A	A	52	72	72	66	A	A	64	A	77	82	90	88	65	58	54	54	54	51
24	54	52	50	52	47	44	50	72	44	A	A	A	A	70	68	76	75	78	78	67	67	A	52	50
25	A	A	A	45	A	A	50	58	65	A	A	A	A	68	72	78	80	83	91	86	54	51	A	A
26	42	A	54	50	41	42	52	58	60	A	62	59		69	70	74	79	76	A	71	66	A	A	44
27	A	44	42	44	42	42	54	71	64	62	59	A	A	A	A	A	76	72	77	83	67	53	50	42
28	53	50	45	47	44	37	44	57	63	70	68	59	A	65	A	70	72	81	72	67	53	A	54	54
29	54	54	52	43	46	44	52	63	96	62	68	62	62	67	72	75	77	72	78	76	A	51	A	A
30	A	53	52	46	46	50	51	55	A	A	A	A	A	A	72	A	74	A	91	83	67	51	53	54
31	52	52	50	46	45	42	52	66	67	A	A	A	A	A	A	A	87	81	75	68	78	42	A	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	18	22	26	23	24	24	28	27	20	13	10	8	6	13	17	19	26	22	26	29	28	25	22	22
MED	54	52	52	50	46	43	52	63	67	62	65	62	65	68	72	72	74	72	75	72	66	52	53	52
U Q	54	54	52	53	52	49	54	71	71	68	68	65	70	70	73	76	77	81	78	78	67	54	54	53
L Q	52	51	48	45	44	41	50	55	61	60	62	59	64	65	66	64	66	64	71	67	54	51	50	48

HOURLY VALUES OF fEs AT Yamagawa

JUL. 2011

LAT. 31° 12.0' N LON. 130° 37.0' 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	C	C	C	C	C	C	C	C	C	C	132	108	66	86	75	64	76	69	67	34	50	27	26	29
2	34	G	30	28	G	39	58	60	59	64	58	84	65	97	112	60	77	116	69	59	35	36	34	33
3	25	32	43	50	52	35	36	46	44	52	78	69	70	114	116	106	92	60	111	94	37	72	54	84
4	59	72	84	84	73	72	48	50	60	47	74	45	56	64	185	58	154	76	41	34	35	56	58	67
5	59	33	41	46	69	59	50	70	155	60	71	50	57	G	G	53	44	G	34	51	33	36	39	39
6	72	73	57	57	34	50	60	39	50	59	75	81	59	52	185	70	58	64	144	78	48	55	27	30
7	72	45	72	58	34	34	G	48	92	70	82	82	79	115	78	55	56	64	64	54	44	44	34	24
8	57	38	58	40	50	G	G	48	69	53	95	123	75	76	50	G	44	54	72	107	28	G	27	50
9	33	31	50	39	57	G	31	40	51	54	47	55	55	78	46	47	62	G	42	33	34	30	28	37
10	48	G	G	32	25	G	35	54	70	60	52	51	55	G	56	51	G	G	54	35	34	59	30	92
11	57	34	G	30	24	48	56	38	41	50	43	45	44	55	51	57	72	53	59	40	49	67	59	54
12	35	40	37	33	49	38	43	35	49	53	44	50	50	G	G	G	G	51	40	53	46	53	56	40
13	48	40	40	59	32	40	44	70	92	117	114	67	54	G	G	50	G	48	40	40	60	48	46	34
14	40	36	30	70	50	40	34	46	68	42	64	G	G	67	54	72	83	173	49	50	33	59	42	80
15	72	59	44	57	46	74	45	60	70	95	88	102	102	105	102	151	52	62	42	36	43	116	79	70
16	58	58	40	32	G	36	34	60	73	61	58	70	G	G	65	71	97	67	101	33	67	50	26	48
17	40	40	43	39	38	G	33	54	54	60	65	56	64	G	G	G	G	42	38	39	G	59	36	69
18	59	59	38	30	28	25	55	66	78	81	116	72	120	47	55	51	41	61	70	47	32	39	46	49
19	56	49	46	69	40	57	31	59	58	60	88	113	79	85	109	65	61	94	170	116	82	67	70	72
20	59	32	40	36	G	29	39	70	58	49	47	50	44	G	G	52	54	55	48	60	40	40	27	43
21	44	26	23	G	34	43	31	42	52	64	51	64	64	65	51	42	46	51	49	39	39	38	67	51
22	59	71	40	36	G	G	32	G	53	64	72	51	53	64	64	74	G	86	61	33	28	G	G	G
23	G	24	25	34	72	81	42	77	68	53	50	43	G	44	58	49	56	47	G	40	29	46	46	38
24	G	32	24	24	G	G	36	40	59	81	90	100	83	68	G	G	G	41	36	30	34	36	44	50
25	59	72	59	72	48	59	44	38	50	95	139	50	58	G	54	70	61	45	39	51	58	50	56	69
26	34	72	48	36	36	39	28	54	55	92	G	46	G	46	43	55	40	49	78	49	49	50	59	48
27	81	36	G	G	35	G	40	53	54	41	G	62	89	78	79	95	59	62	53	G	40	40	26	33
28	26	26	28	G	34	G	41	45	57	50	G	43	68	50	53	G	G	61	62	50	55	72	49	30
29	23	28	G	G	G	G	28	39	44	G	42	G	56	G	G	G	G	G	35	28	70	30	58	59
30	45	30	G	G	G	G	45	44	78	85	88	94	148	78	56	69	40	82	41	60	58	50	36	33
31	40	29	G	39	33	32	29	36	59	63	130	106	88	150	161	96	64	48	36	26	27	25	57	59
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	48	36	40	36	34	36	38	48	58	60	71	62	59	64	55	55	54	55	49	40	40	48	44	48
U Q	59	58	46	57	49	48	45	60	70	70	88	84	79	78	79	70	64	67	69	54	50	59	57	67
L Q	34	30	24	30	24	G	31	40	52	52	47	50	53	G	43	47	G	47	40	34	33	36	28	33

## HOURLY VALUES OF fmin AT Yamagawa

JUL. 2011

LAT. 31° 12.0' N LON. 130° 37.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	C	C	C	C	C	C	C	C	C	C	20	23	30	30	24	22	18	16	14	14	14	14	15	14
2	14	17	14	14	15	14	14	15	16	18	21	21	21	28	22	22	16	15	14	14	15	15	15	14
3	15	14	14	14	14	14	14	14	15	15	22	26	28	24	20	23	21	14	15	14	15	14	15	14
4	14	14	14	14	14	14	14	14	14	18	27	38	38	39	35	38	32	15	14	14	14	15	14	15
5	15	14	14	14	14	15	14	14	16	17	23	24	32	26	51	20	16	14	14	14	14	14	14	15
6	14	14	14	14	15	14	16	14	20	18	18	34	35	34	33	30	21	16	14	14	15	15	15	14
7	14	14	14	14	14	14	16	15	16	17	20	33	27	33	29	26	20	17	14	14	14	15	15	14
8	15	14	14	14	14	14	14	17	15	16	24	27	26	23	24	23	17	18	14	14	14	15	14	14
9	14	15	14	15	14	15	16	14	17	17	20	26	26	27	29	20	18	15	14	14	14	14	14	14
10	14	15	14	14	15	15	14	14	14	17	18	27	22	24	23	18	17	14	15	14	14	14	15	14
11	14	14	14	14	14	14	14	14	14	15	18	27	28	38	27	35	15	14	14	14	14	15	14	14
12	14	15	15	14	15	14	14	14	15	18	22	26	27	26	22	20	18	15	15	14	14	14	14	14
13	14	14	14	14	14	14	14	14	15	15	20	23	29	27	20	26	18	15	14	14	14	14	14	15
14	14	14	15	14	14	14	14	14	16	18	21	26	91	26	29	22	18	14	14	14	14	14	14	15
15	14	14	14	15	15	14	14	14	16	22	26	23	22	27	28	26	21	17	15	14	14	14	14	14
16	14	14	14	14	16	14	14	15	17	23	26	35	33	66	21	36	20	20	15	14	14	14	14	14
17	14	15	14	14	15	15	14	14	16	21	23	33	26	28	23	18	18	15	14	14	15	14	14	14
18	14	14	14	15	14	15	14	14	15	22	26	23	28	29	28	27	21	16	14	14	14	14	14	15
19	14	15	14	14	14	14	14	14	14	16	21	22	26	32	28	18	20	15	14	14	14	14	14	14
20	14	14	15	15	15	14	14	14	14	18	21	22	30	54	53	26	24	15	14	14	14	14	15	15
21	14	15	14	16	14	14	15	14	14	17	27	35	30	23	28	26	20	16	14	14	15	14	14	14
22	14	14	14	14	14	15	15	14	18	18	26	27	36	36	28	20	18	14	16	14	15	15	15	15
23	15	15	14	14	14	14	14	14	15	17	20	20	27	27	26	21	15	15	15	14	14	15	14	14
24	14	14	14	14	14	14	15	14	15	22	18	26	26	23	26	50	18	16	14	14	14	14	14	15
25	14	15	14	14	14	14	14	14	16	16	23	26	27	28	26	20	18	15	15	14	14	14	14	14
26	15	14	14	14	16	14	14	14	16	18	26	50	57	36	22	26	14	18	14	14	14	15	14	14
27	14	14	14	14	15	14	14	14	18	20	23	38	27	36	36	24	21	14	15	17	15	14	14	15
28	14	14	14	15	14	16	14	14	17	29	26	30	28	27	28	24	18	15	14	15	15	14	15	15
29	15	14	14	16	14	15	15	14	18	23	24	24	29	51	21	23	18	14	14	14	14	14	14	14
30	14	14	14	14	14	14	14	14	16	20	20	23	28	29	27	24	20	14	14	14	15	14	14	14
31	14	14	14	15	14	14	14	14	16	20	22	23	35	26	21	20	17	15	14	14	14	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	30	30	30	30	30	30	30	30	30	30	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	14	14	14	14	14	14	14	14	16	18	22	26	28	28	27	23	18	15	14	14	14	14	14	14
U Q	14	15	14	15	15	15	14	14	16	20	26	33	32	36	29	26	20	16	15	14	15	15	15	15
L Q	14	14	14	14	14	14	14	14	15	17	20	23	26	26	22	20	17	14	14	14	14	14	14	14

## HOURLY VALUES OF foF2 AT Okinawa

JUL. 2011

LAT. 26° 41.0' N LON. 128° 09.0' 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	A	A	A	A	A	A	A	A	62	A	A	A	A	A	87	101	118	118	111	106	82	80	A	A	
2	A	67		39	67	67	81	76	62	61	A	A	A	A	80	77	82	90	86	84	77	80	84	A	
3	83	73	52	N	44	A	54	82	56	51	A		A	A	68	A	82	84	91	87	84	A	54	54	
4	64	A	A	A	A	A	58	82	59	A			A	A	A	A	A		84	86	74	71	54	63	46
5	44	42	A	A	A	45	46	68	52	A	A	A	A		67	82	74		72	88	78	66	52	53	A
6	50	53	52		49	44	63	60	57	A	A	A	A	A		74	76	83	88	88	81	A	52	A	
7	A		34	32	42	A	43	A	68	A	A	A	A	A	A	A	88	91	89	88	86	83	45	52	53
8		54	44		39	43	47	55	48		65	70		67	65	A			68	92	72	54	34	36	53
9		53		A	45	34		63	65	63	66		A	A	83	87	84	90	91	64		A	A	59	
10	A	A	53	53	53	45	52	44	A	A					A				63	73	80	53	A	A	46
11	A	45	39	32	42	38	46	A	A					A	A	70	A	72	A	56	66	41	36	64	
12	A	54			57		45	56	63	A	A				67	71	60	57	52	53	42	A	A	44	
13	42	39	A	A	37	44	44	53	62		A		68	A		85	80	71	63	60	53	53		45	
14	52	47	44	52	43	38	44	A	67	61	78		66	A	79	86	98	105	97	A	A	67	54	53	
15	53	44	A	A	A	A	A	70	60	A	A	A	A	A	73	A	A	84	98	72	58	A	A	A	
16	A	A	A			A	54	A	A	A	A	A		A		72	77		85	85	88	A	A	A	44
17	54	46	47	53	44	44	45	54	76	71	80	84	85	98	97	102	100	105	110	110	78	33	54	49	
18	A	46	43	42	39	45	A		80	72	A	A	A	A	78	N	80	86	A	A	84	54	A	A	
19	A	45	45	43	A	43	51	62	74	A	A	A	A	A	A	65	73	A	75	77	A	A	63	A	
20	A	A	47	44	45	50	59	60	62	A	A		72	68	76	84	A	80	88	86	84	66		A	
21	67	66	A	54	A	54	52	76	82	A	A		67			100	90	87	92	88	88		61	54	
22	A	43	53	53		29	42	67	66	62	A			81	86	90	91	A	91	100	87	78	52		
23	A	53	51	55	46	34	50	73	67	59	A	A		72	84	87	102	116	90	87	85	80	A	A	
24	44	A	44	45	48	42	46	55	52		65	68	77	73	77	77	80	98	103	81	54	A	A		
25	A	A	A	A	A	A	44	61	70	62			70	80	84	86	94	104	101	85		63		A	
26	45	44	53	42	36	32	A	58	54	61	A	A	A	86	86	78	90	90	101	94	81	66		A	
27	A	A	A	A	44	43	50	61	58	66	58	A	A	A	A	78	A	A		92	101	A	43	39	A
28	44	51	45	44	43		42	54	59	78	A			86	84	84	86	90	115	90	70	61	N	54	A
29	53	58				50	63	69	64	64	A	A		75	82	87	88	90	94	87	72	53		A	
30	A		46	43	41	43	53	62	70	A	169	A	A	A	78	78	90	89	102	88	54	A	52	A	
31	42	A	44	43	41	43	A	70		A	A	A		78	78	85	A	A		88	102	N	42		A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	14	20	18	17	21	21	25	25	27	13	8	4	10	11	22	24	22	27	29	29	24	17	18	12	
MED	51	49	46	44	44	43	50	62	62	62	66	71	71	80	81	84	90	87	91	85	74	53	54	51	
U Q	54	54	52	53	47	45	53	70	69	68	79	78	78	84	85	87	94	90	97	88	82	66	61	53	
L Q	44	44	44	42	41	38	44	55	58	61	64	69	68	73	76	77	80	80	86	73	56	42	52	45	

## HOURLY VALUES OF fEs AT Okinawa

JUL. 2011

LAT. 26° 41.0' N LON. 128° 09.0' 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	53	57	51	94	48	93	89	114	92	82	150	124	131	130	62	69	56	56	70	86	36	29	28	38	
2	29	39	G	30	32	G	31	35	49	57	52	78	66	71	50	52	75	44	67	76	50	28	48	29	
3	G	37	27	G	G	57	32	39	49	47	40		99	91	75	95	G	G	52	70	70	82	27	35	
4	37	59	82	85	79	92	51	89	48	48			48	74	79	74	82	50	51	31	26	28	39	39	
5	34	40	35	58	52	32	33	G	G	82	45	123	82	53	G	G	G	46	52	39	49	30	32	28	
6	G	G	G		G	G	G	40	41	79	82	91	73	110		G	41	48	54	92	38	58	51	38	
7	31		G	G	G	36	30	82	61	49	50	181	113	147	129	46	57	40	32	31	60	29	35	G	
8		G	G	G	G	G	G		45		G	52		G	G	46	G	G	38	34	G	G		G	
9		G		G	G			36	42	64	G	66	62	55	78	62	60	50	50	55	90	50	G		
10	29	24	35	30	28	G	G	G	48	50	53		82		G	48		44	38	36	40	54	71	41	
11	32	34	32	33	30	G	32	50	37					45	51	48	83	82	64	G	38	36	29	36	
12	72	36			G	G	G	G	G	57	50				50	G	G	G	G	48	34	30	54	30	
13	45	50	48	38	G	G	G	G	G	G	49		51	74		G	114	52	41	38	33	32	36	39	
14	31	37	28	G	32		31	69	G	80	88	51	G	74	83	83	G	57	78	150	124	69	32	50	
15	48	25	50	58	82	64	58	40	51	82	61	90	98	90	G	91	88	56	37	89	69	50	90	57	
16	30	36	40			34	48	71	82	67	66	56		50	G	60	82	52	50	37	86	70	73	G	
17	26	G	G	G	G	49	28	37	64	52	G	G	50	G	G	G	G	39	34	35	28	G	38	40	
18	58	34	28	38	G	G		30		46	51	82	113	94	91	66	61	55	73	91	82	37	34	49	70
19	59	27	35	35	49	G	43	41	52	130	106	80	92	174	102	163	53	112	97	60	84	79	43	83	
20	50	104	36	G	32	28	33	36		69	52	G	49		G	46	103	62	50	62	34	56	40	34	
21	27	G	73	G	29	38	34	38	58	67	75			G	G	G	G	G	37	G	G		27	34	
22	57	34	49	44		G	32	40	70	58	176			G	G	G	G	68	101	50	50	32	G	G	
23	31	G	G	G	G	G	G	69	46	42	108	72	62	51	50	G	G	G	39	39	32	29		70	
24	27	58	34	G	G	G	G	G	G	G	G	45	G	G	G	G	G	G	44	74	38	35	43	34	
25	59	37	51	49	39	31	30	38	G	G			G	G	G	48	G	50	53	47		33	78	48	
26	34	26	G	26	G	37	69	40	G	49	64	91	70	67	G	G	G	G	59	58	34	30		30	
27	40	49	35	34	G	G	39	38	42	57	52	55	79	106	111	G	106	108	39	36	50	33	36	39	
28	33	G	G	G	G	G	32	35	56	80	54		G	58	76	G	G	G	38	30	32	27	35	27	
29	G	G				G	G	53	G	G				G	G	G	G	G	G	37	G	G		G	
30	24		G	G	G	G		33	72	85	96	64	75	82	52	69	G	G	40	44	45	42	40	28	
31	32	36	28	G	28	G	68	G		52	52	60	58	52	74	102	84	95	38	50	G	G		50	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	29	29	29	27	28	30	30	30	30	29	28	21	25	27	28	31	30	31	31	31	30	29	28	28	
MED	32	34	32	26	G	G	32	38	47	57	52	66	66	67	50	46	47	48	50	44	36	33	37	36	
U Q	49	39	44	38	32	36	39	41	56	79	82	91	87	91	75	69	82	57	59	62	50	52	50	40	
L Q	28	G	G	G	G	G	G	G	G	48	47	51	48	45	G	G	G	G	38	34	32	28	30	28	



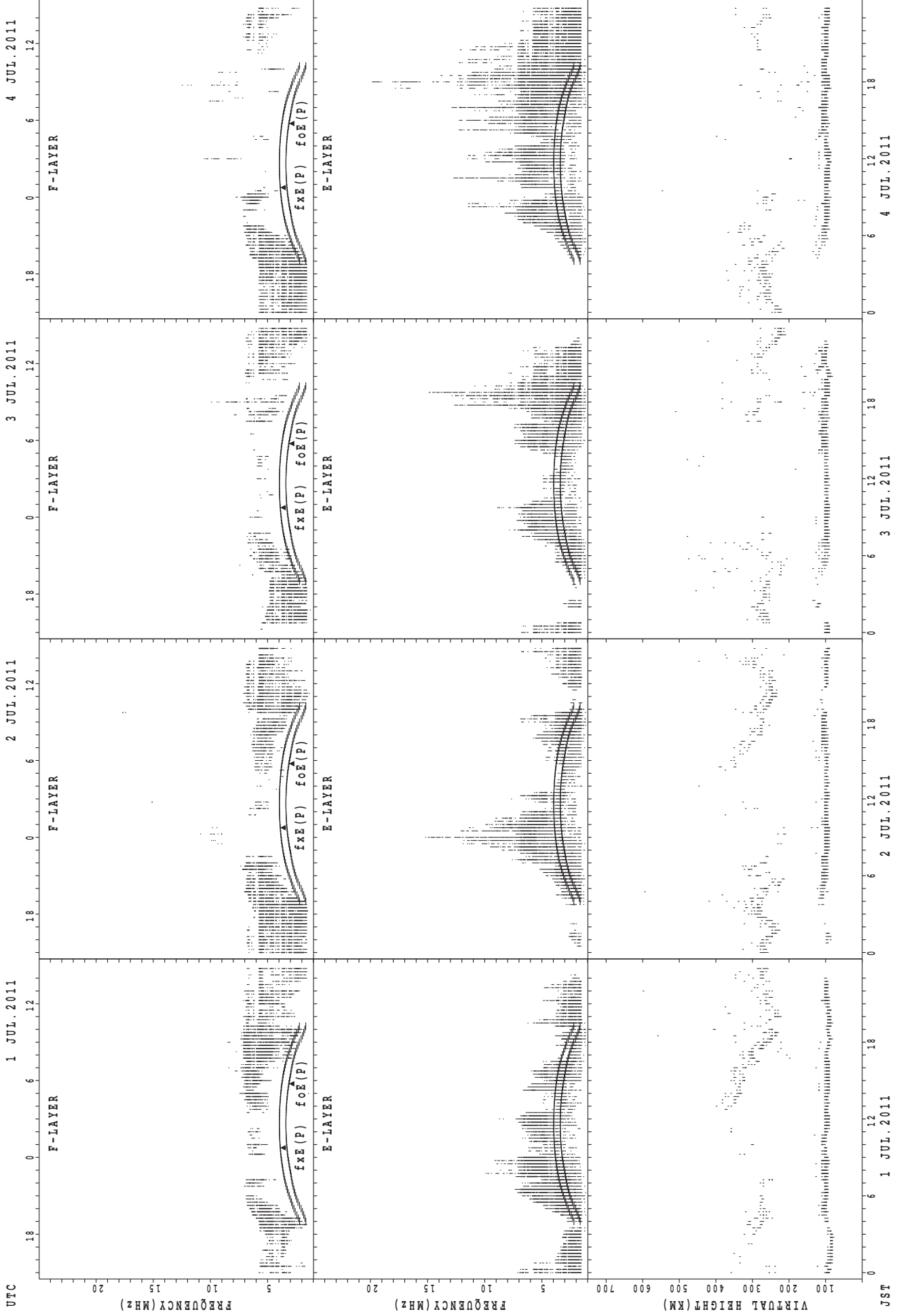
## HOURLY VALUES OF fmin AT Okinawa

JUL. 2011

LAT. 26° 41.0' N LON. 128° 09.0' E SWEEP 1.0MHz TO 30.0MHz AUTOMATIC SCALING

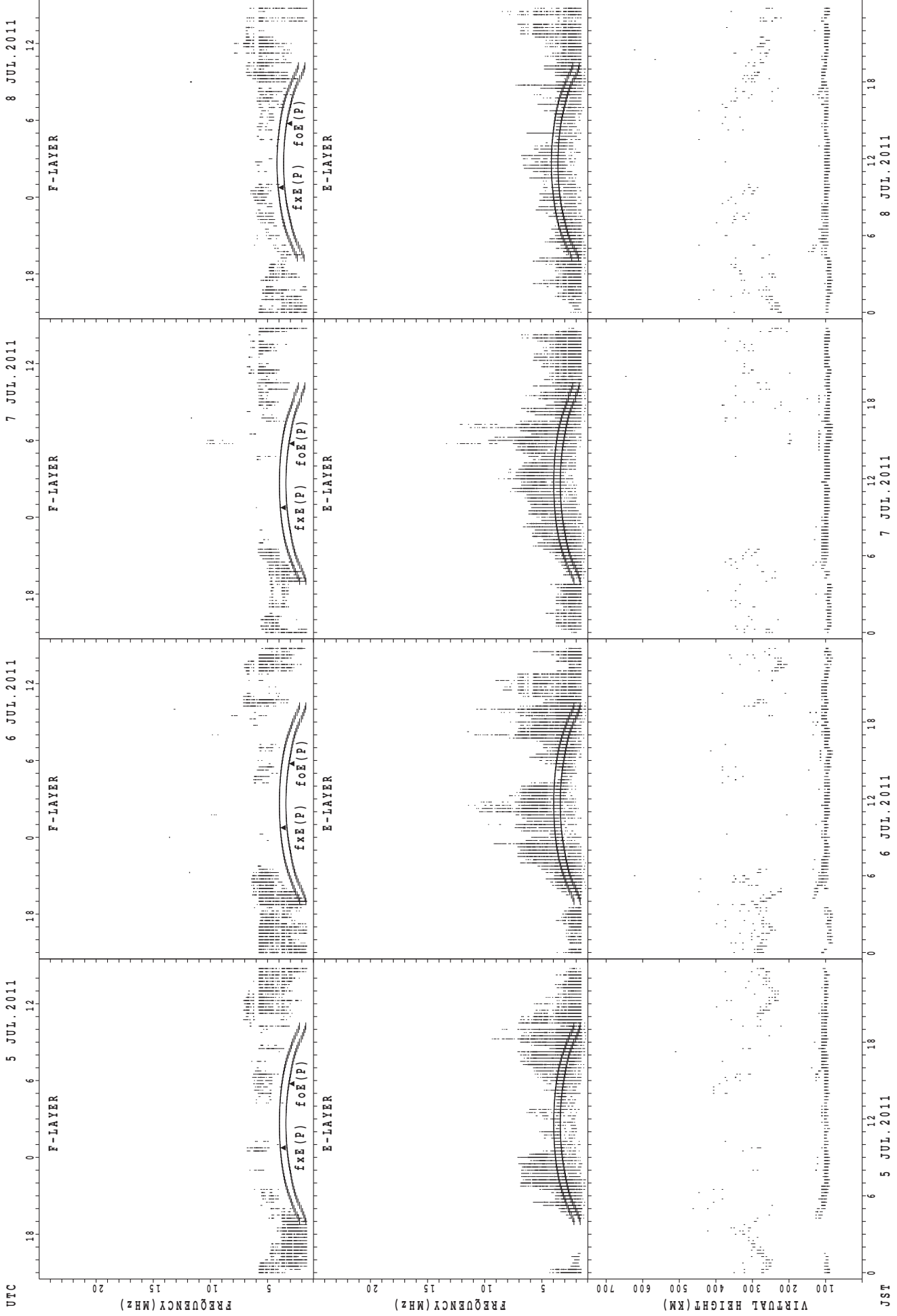
$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	14	15	15	21	17	15	14	15	26	29	33	35	36	35	36	30	28	22	15	15	17	15	18	15
2	52	15	22	14	15	17	14	14	18	28	29	41	34	34	35	27	26	22	18	14	15	16	14	15
3	21	15	18	21	23	16	15	14	20	23	30		38	39	38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

SUMMARY PLOTS AT Wakkanai



$f_xE(P)$  ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$  ; PREDICTED VALUE FOR  $f_oE$

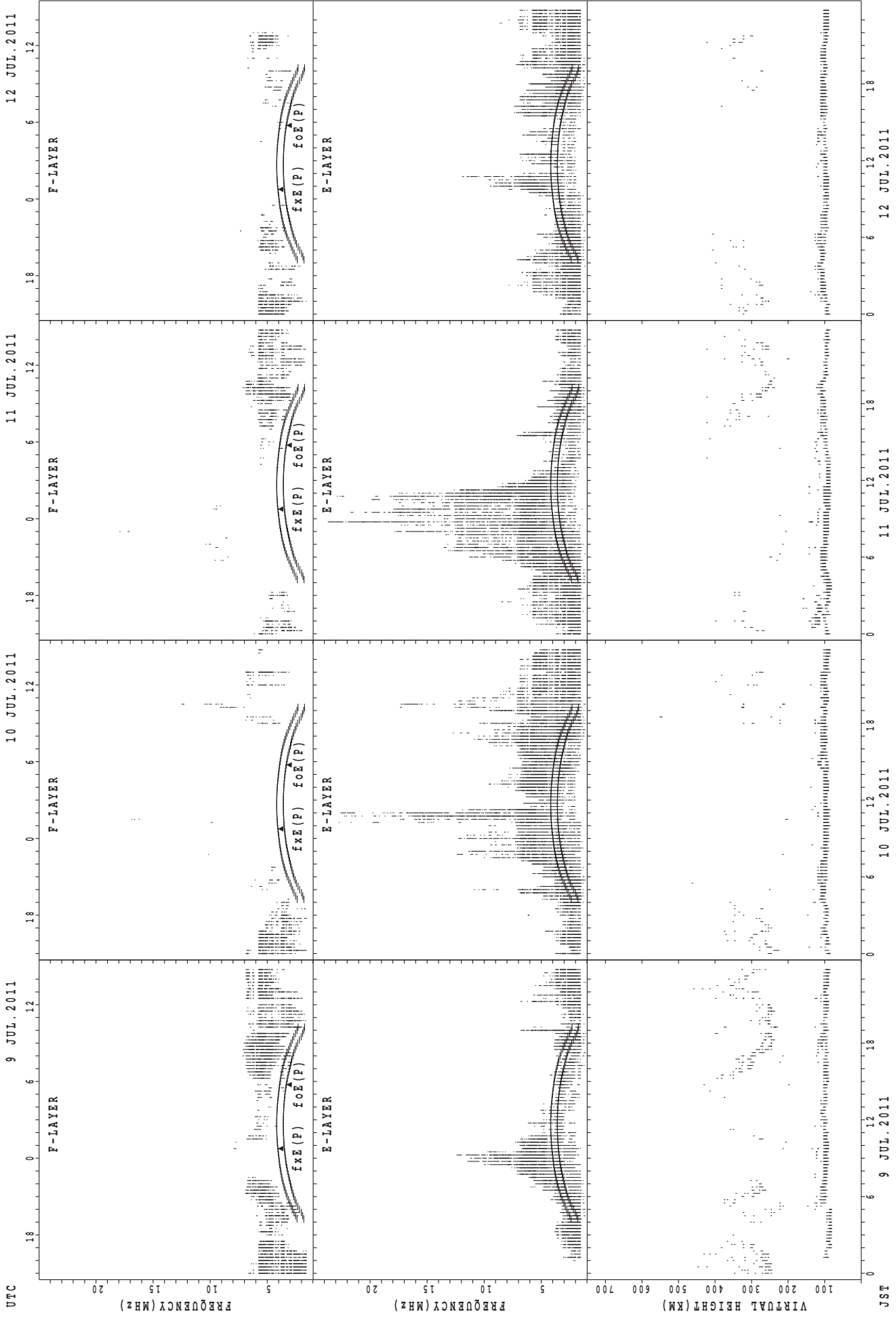
SUMMARY PLOTS AT Wakkanai



JST  
5 JUL. 2011  
6 JUL. 2011  
7 JUL. 2011  
8 JUL. 2011

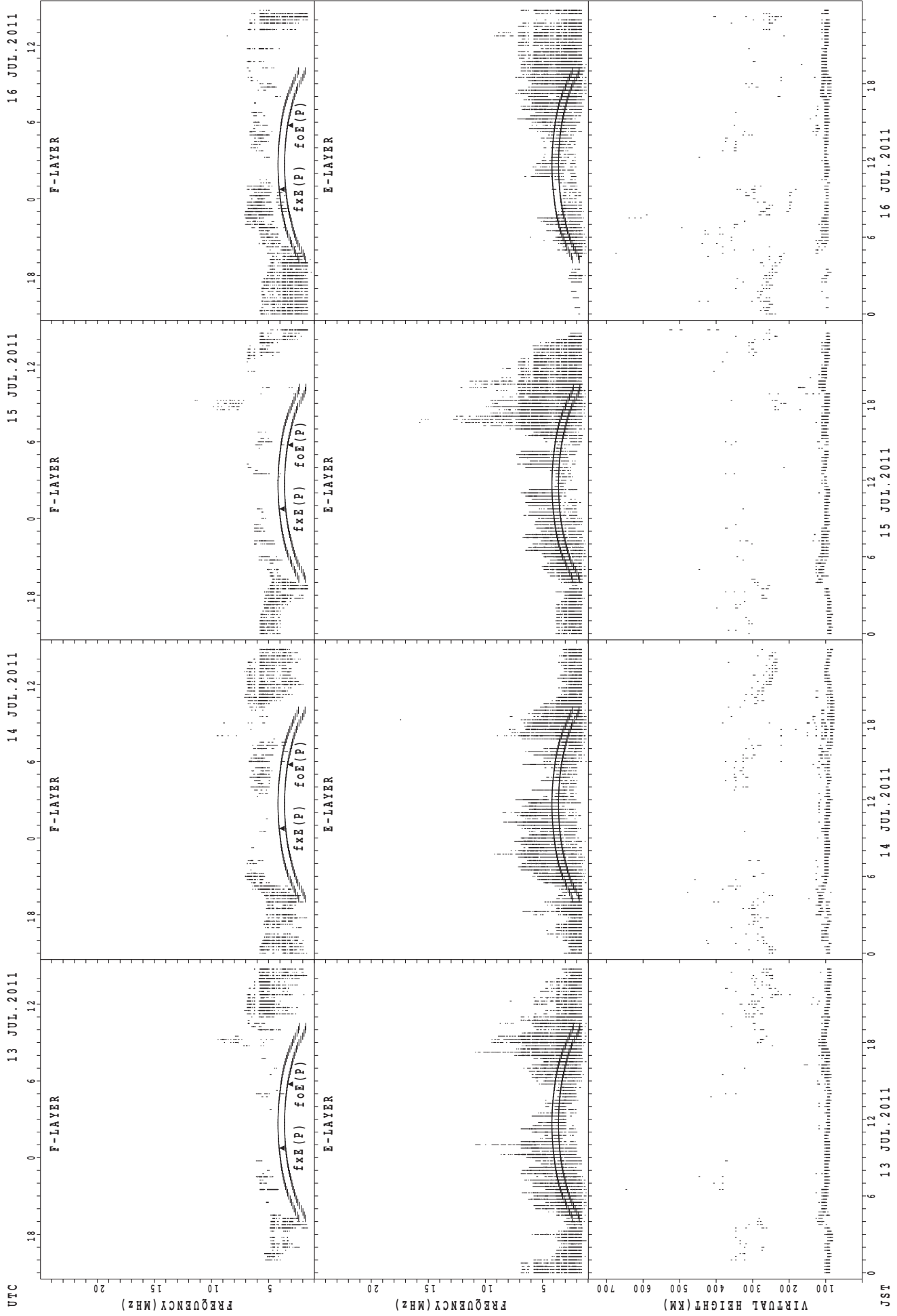
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$ ; PREDICTED VALUE FOR  $foE$

SUMMARY PLOTS AT Wakkanai



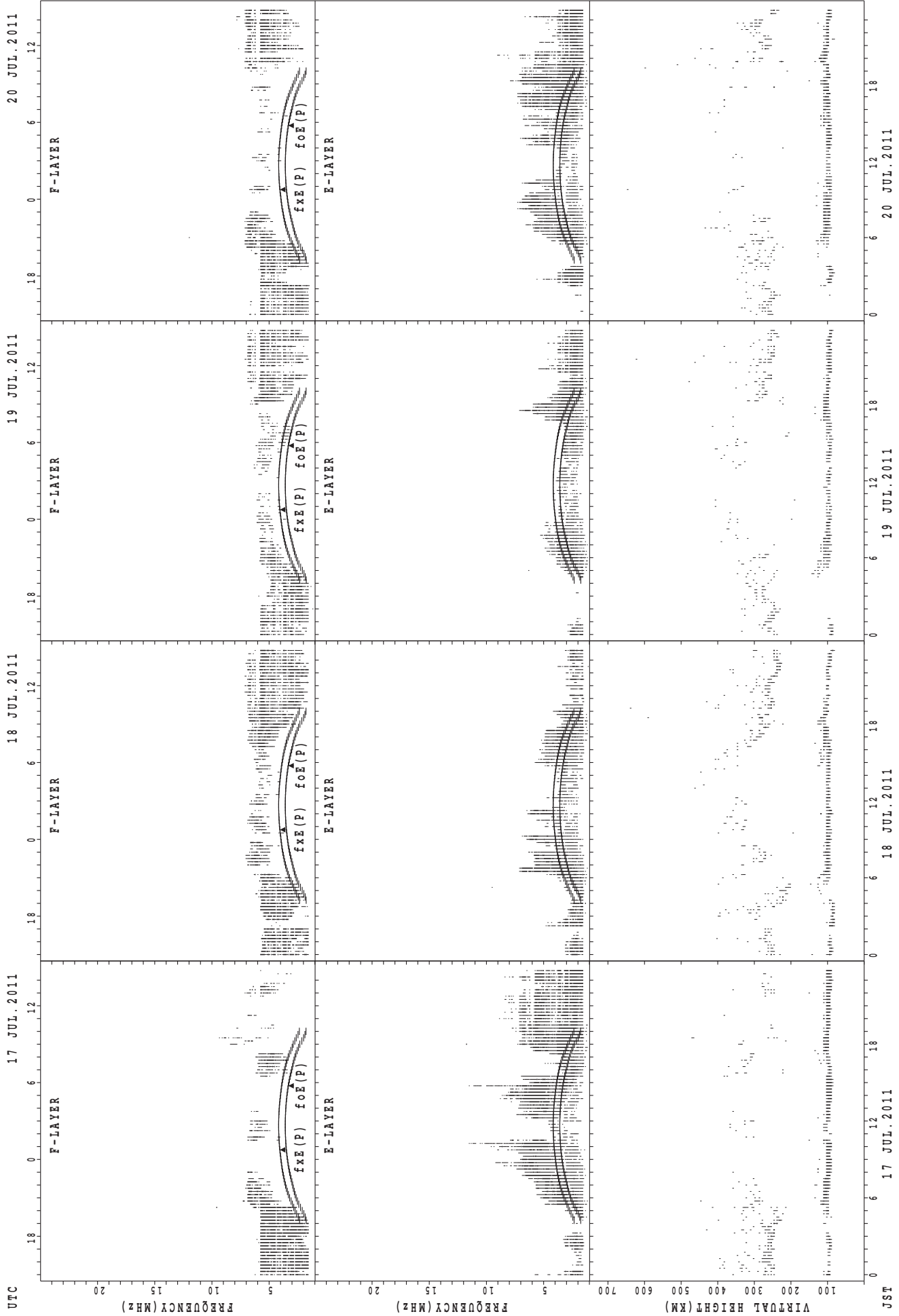
fxE(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Wakkanai



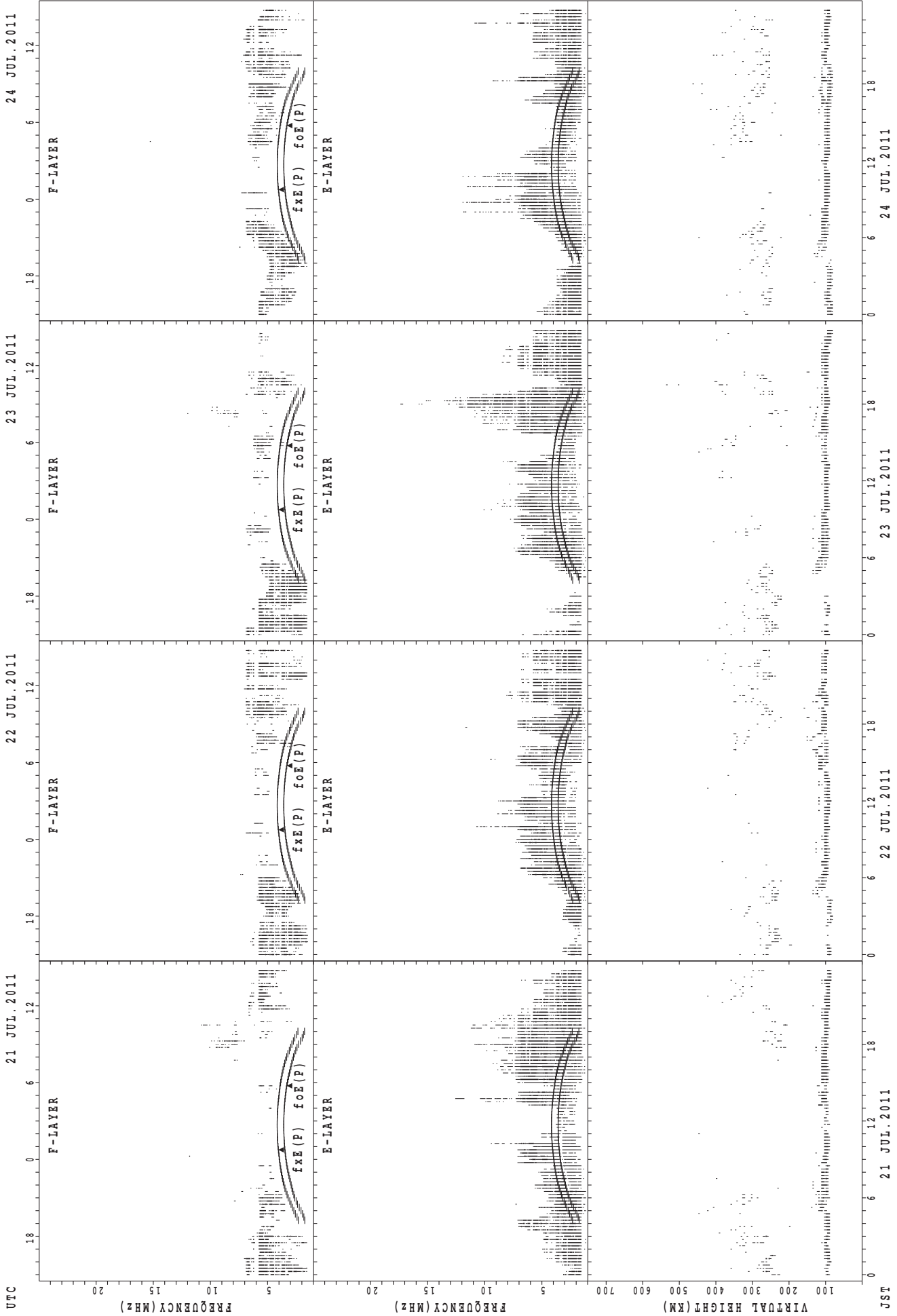
f\_xE(P) ; PREDICTED VALUE FOR f\_xE  
f\_oE(P) ; PREDICTED VALUE FOR f\_oE

SUMMARY PLOTS AT Wakkanai



JST 17 JUL. 2011 18 JUL. 2011 19 JUL. 2011 20 JUL. 2011  
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

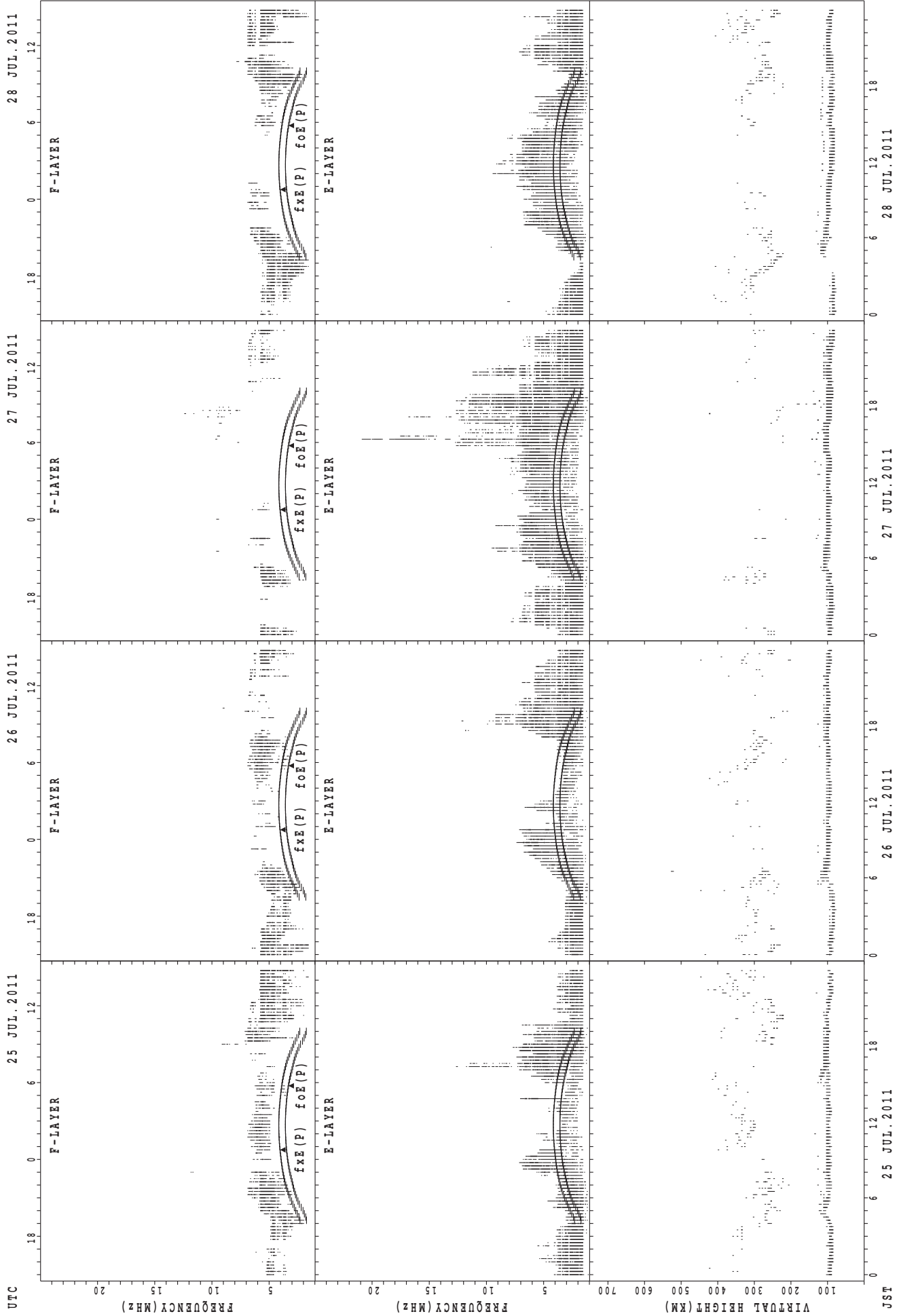
### SUMMARY PLOTS AT Wakkanai



JST 21 JUL. 2011 22 JUL. 2011 23 JUL. 2011 24 JUL. 2011  
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE



SUMMARY PLOTS AT Wakkanai

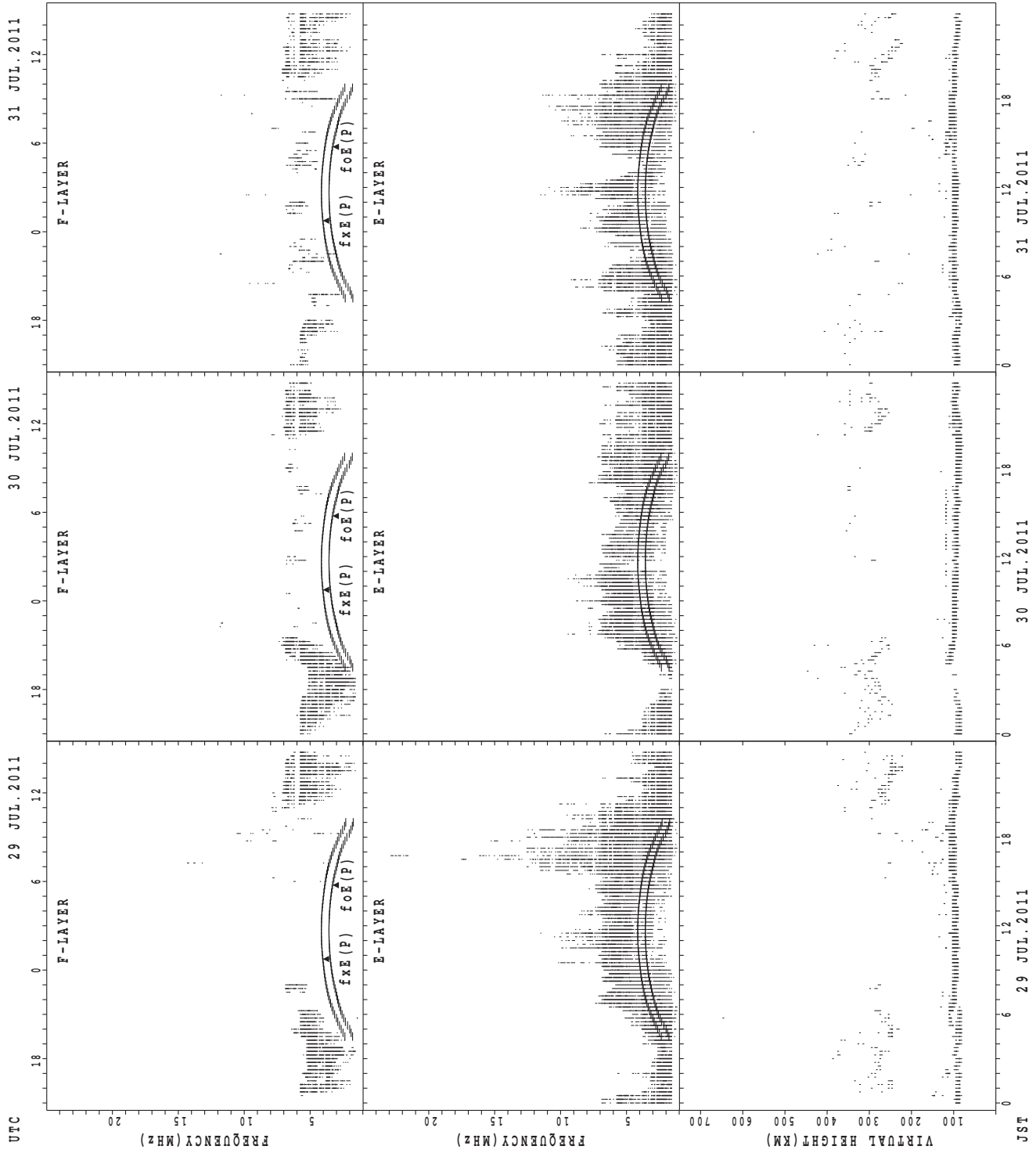


UTC 25 JUL. 2011 26 JUL. 2011 27 JUL. 2011 28 JUL. 2011

JST 25 JUL. 2011 26 JUL. 2011 27 JUL. 2011 28 JUL. 2011

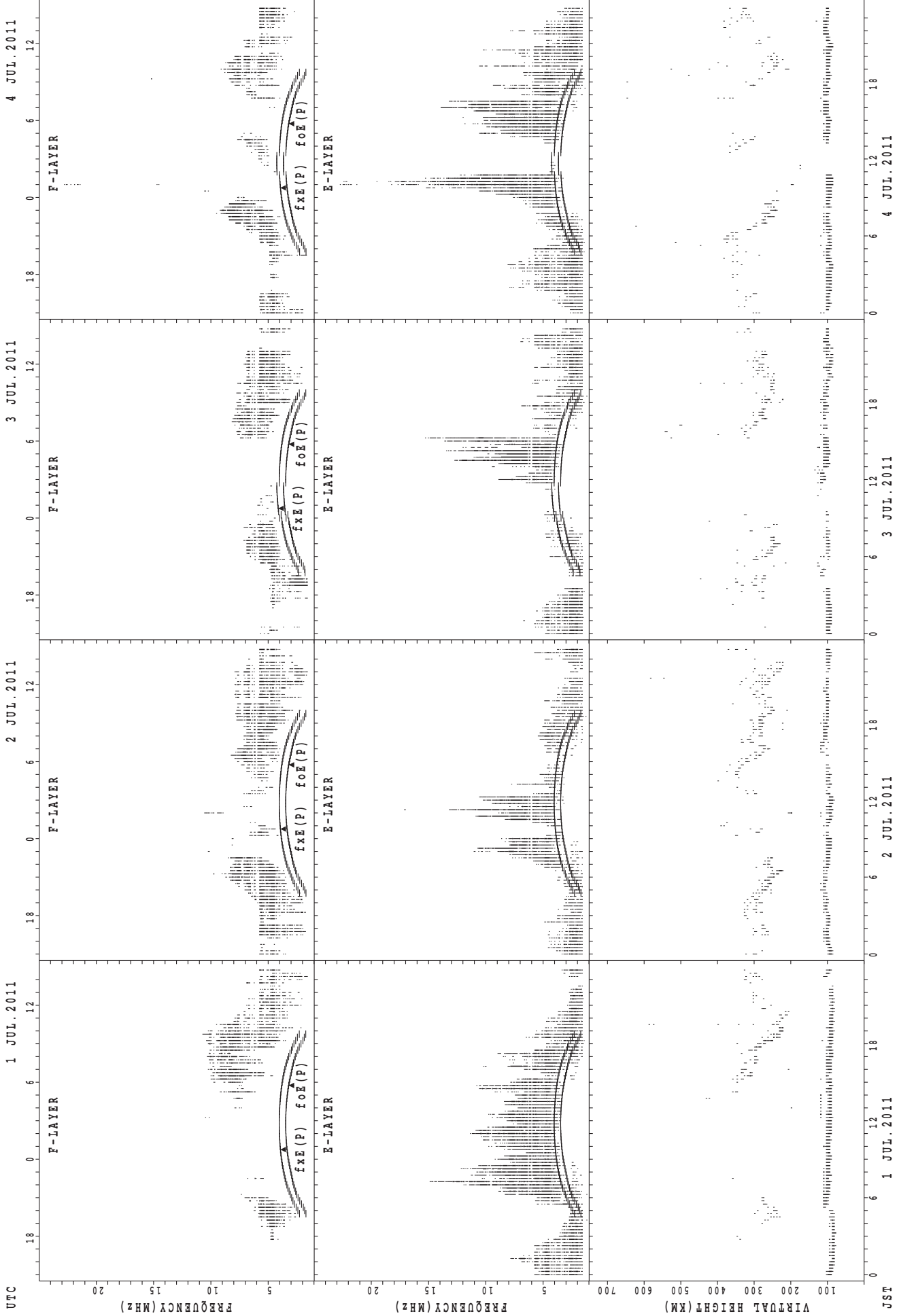
f<sub>x</sub>E (P) ; PREDICTED VALUE FOR f<sub>x</sub>E  
foE (P) ; PREDICTED VALUE FOR foE

### SUMMARY PLOTS AT Wakkanai



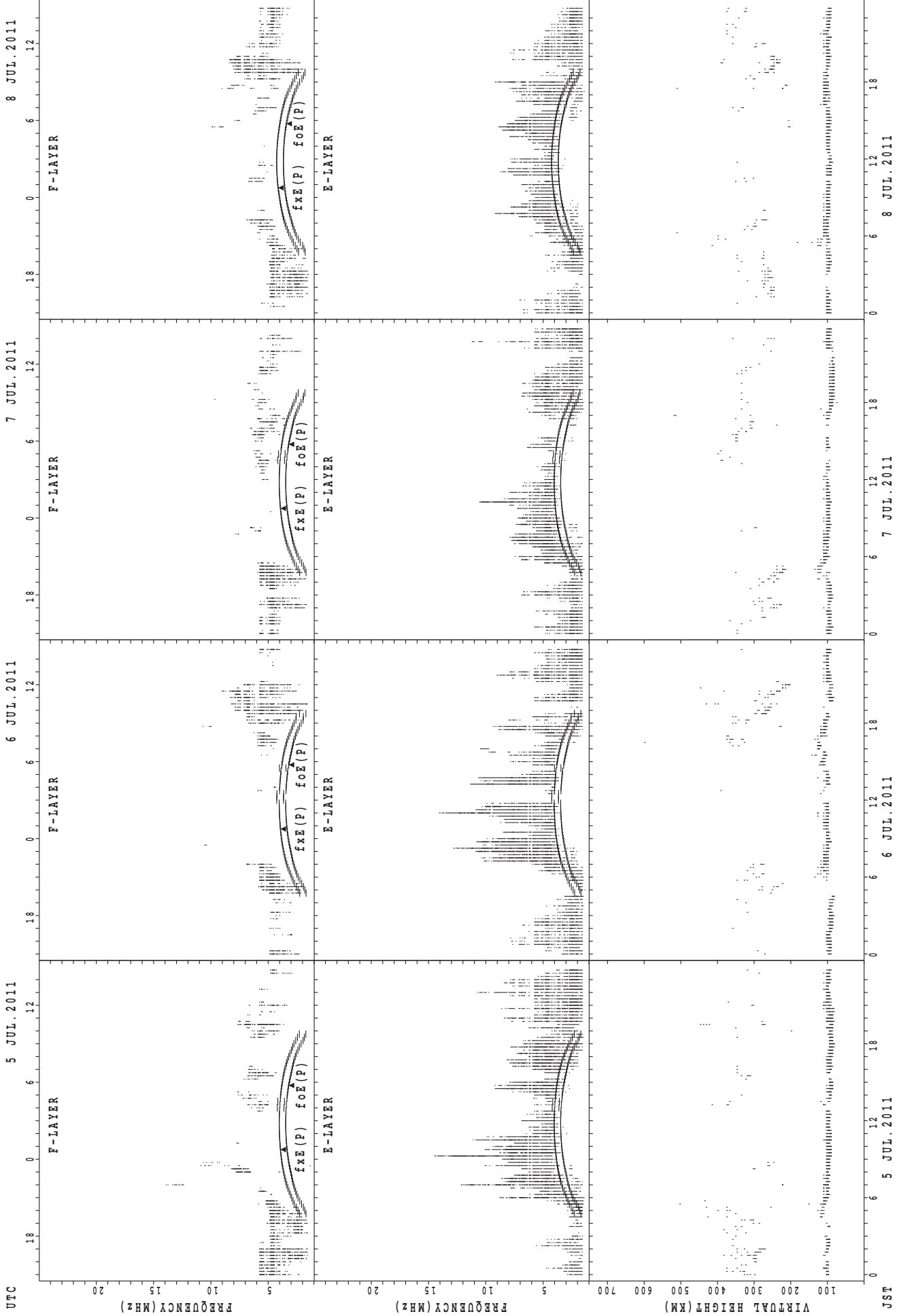
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Kokubunji



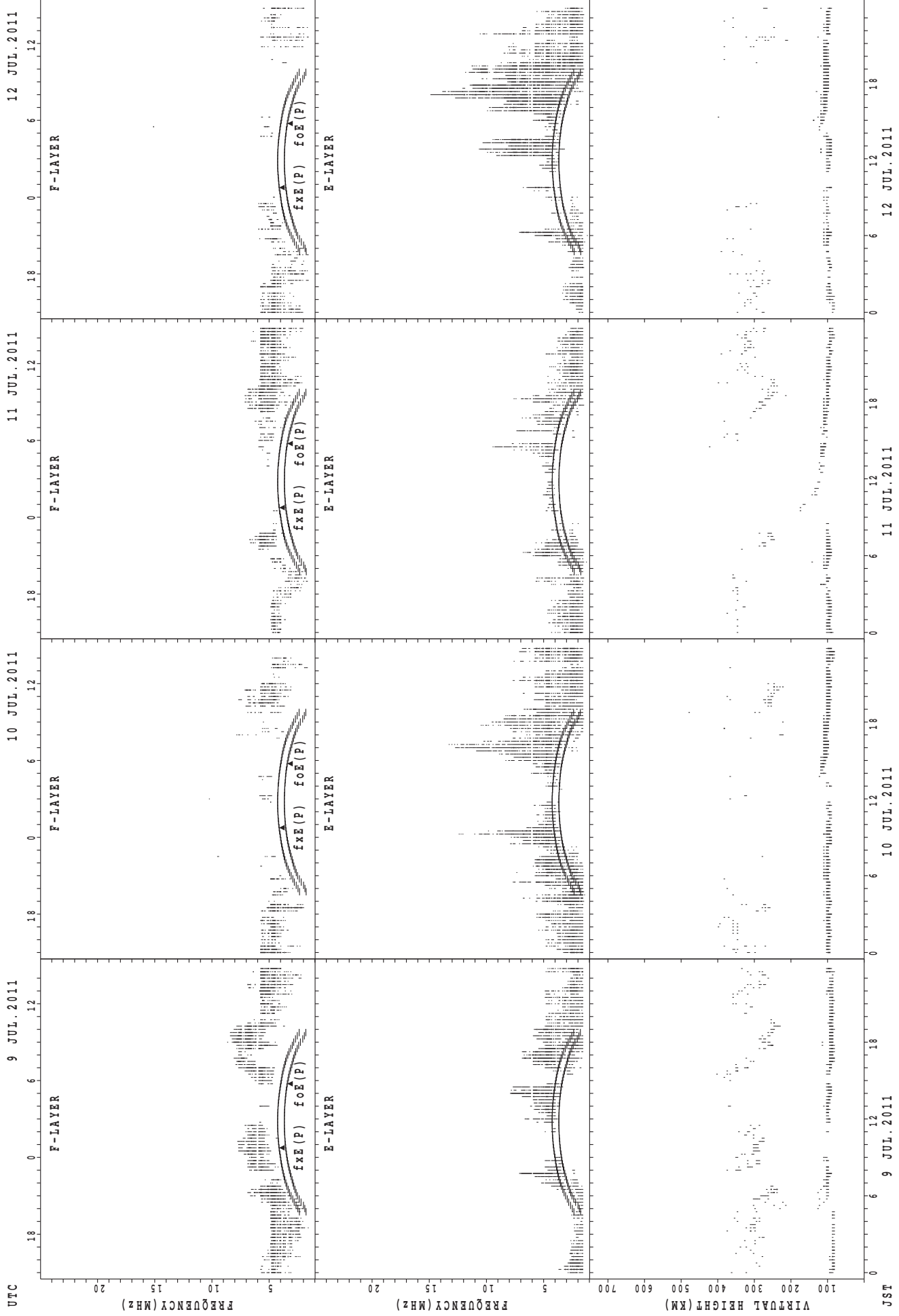
JST 1 JUL. 2011  
foE(P); PREDICTED VALUE FOR foE  
fxe(P); PREDICTED VALUE FOR fxe

SUMMARY PLOTS AT Kokubunji



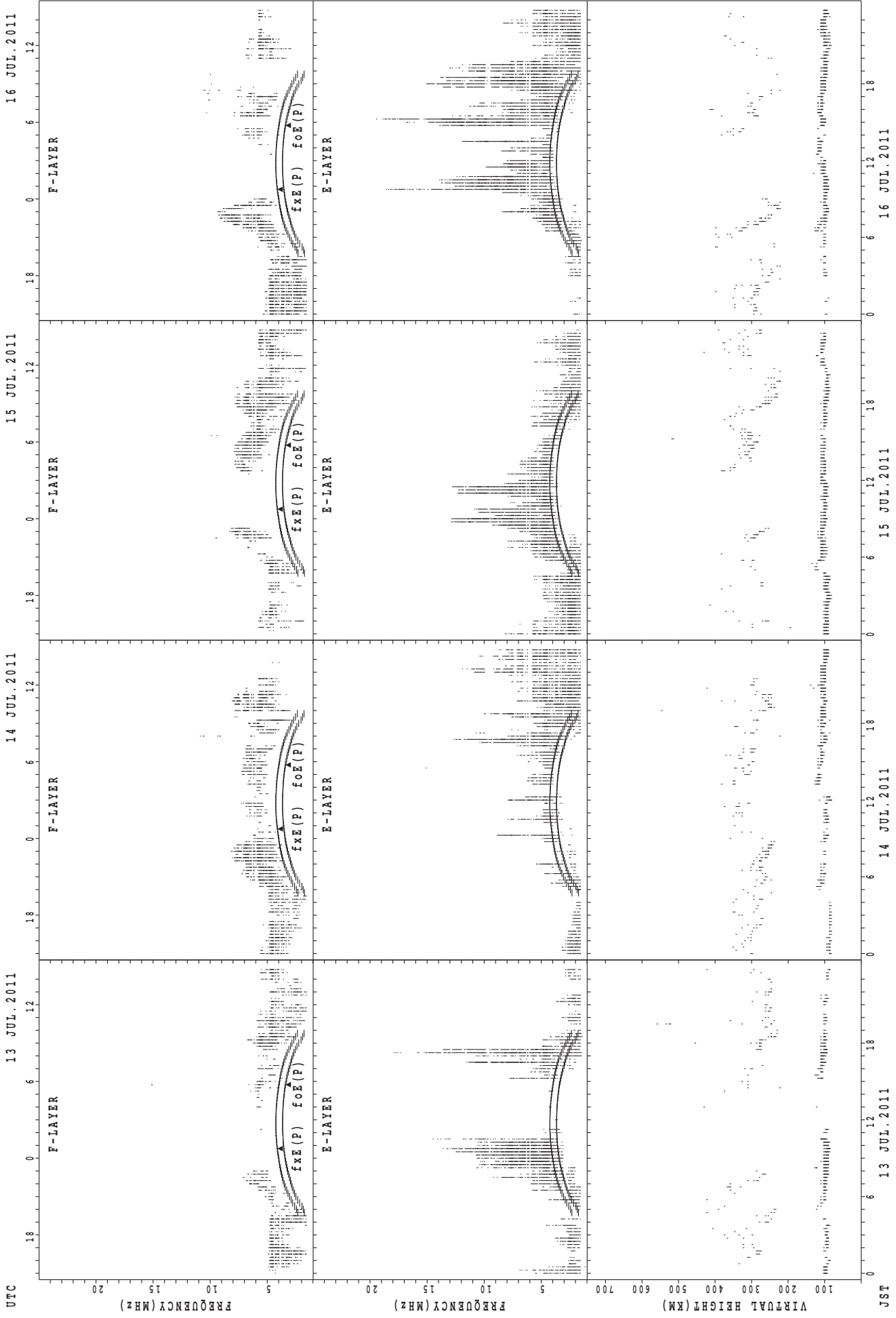
f\_xE(P); PREDICTED VALUE FOR f\_xE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



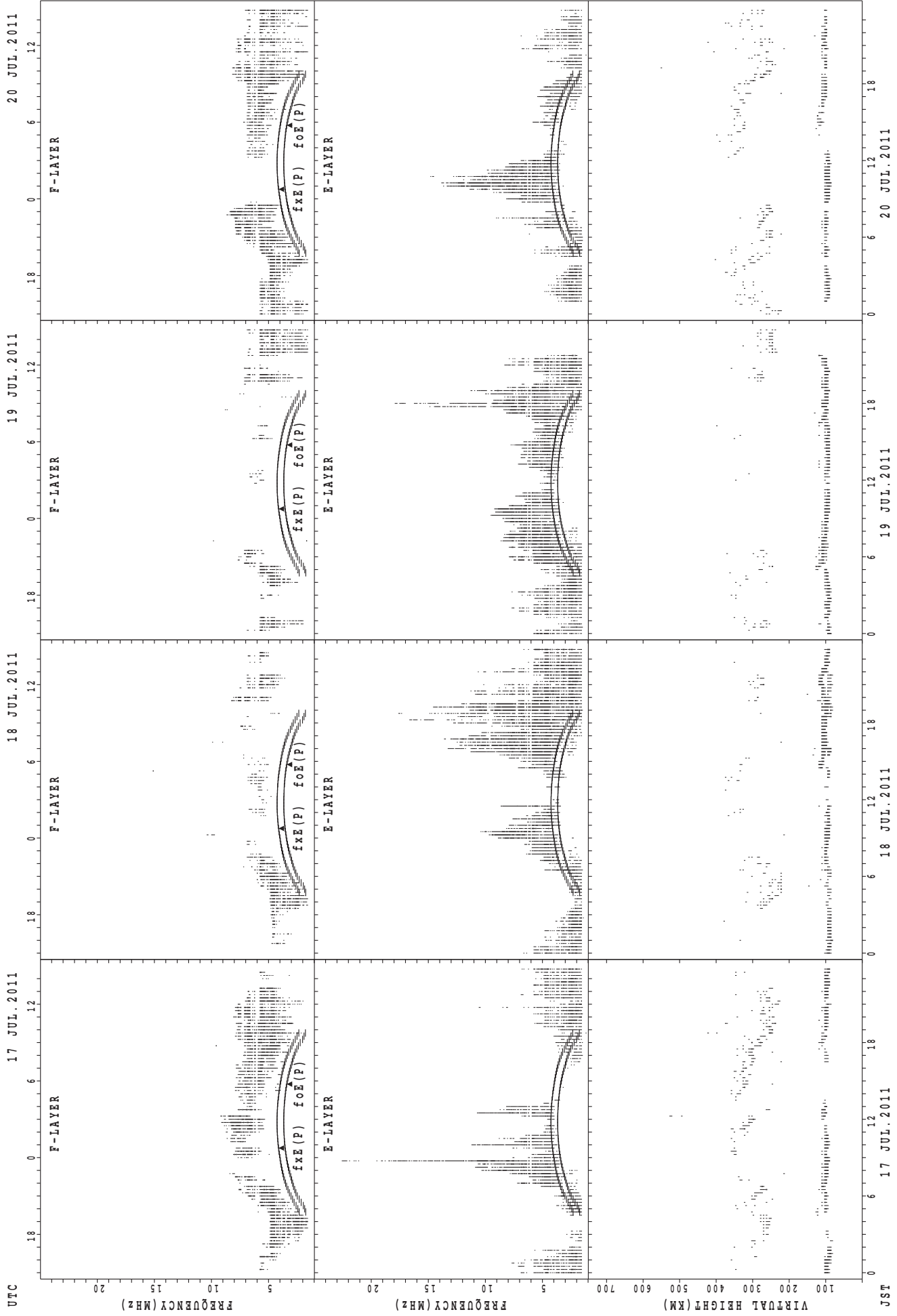
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



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

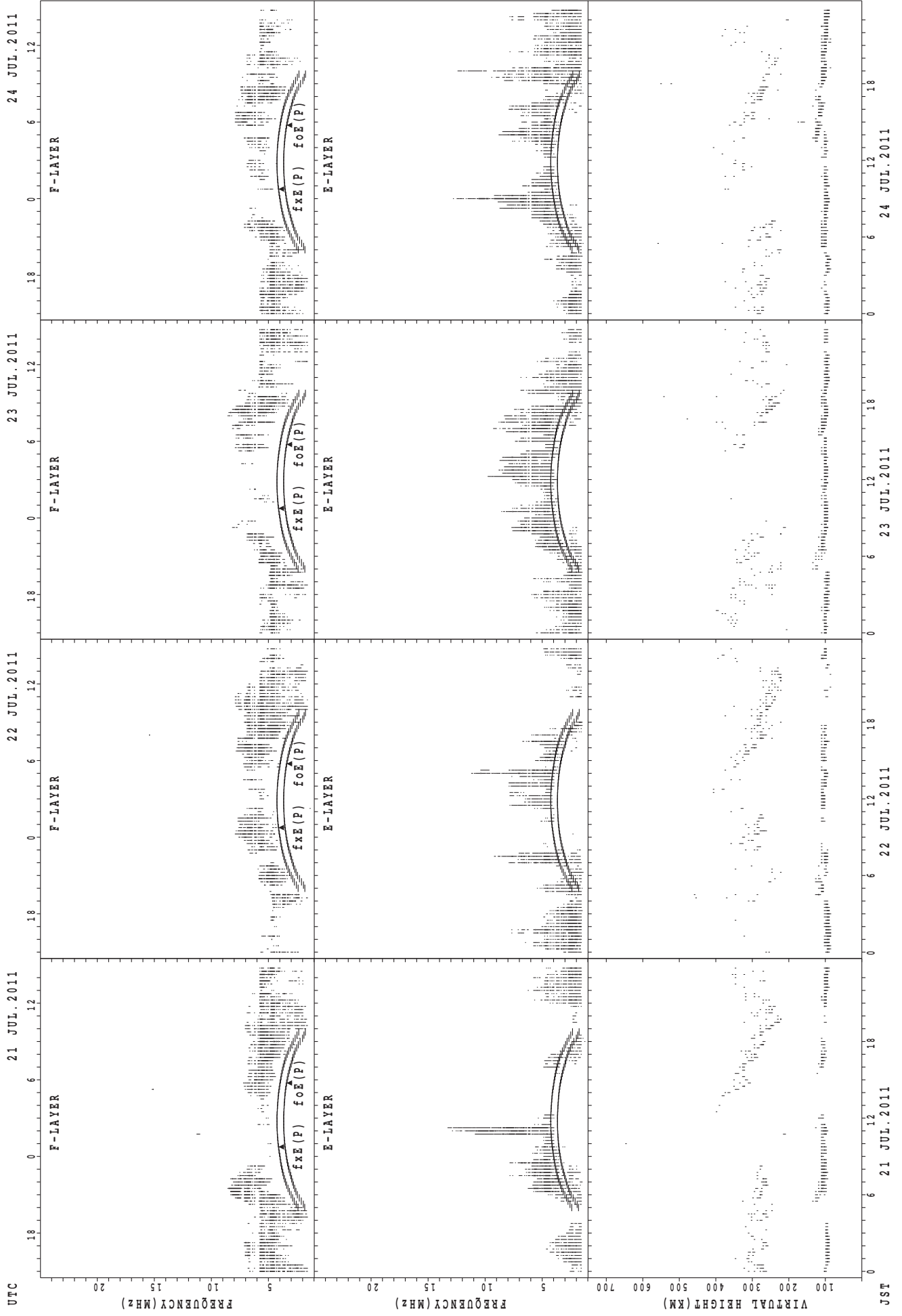
### SUMMARY PLOTS AT Kokubunji



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

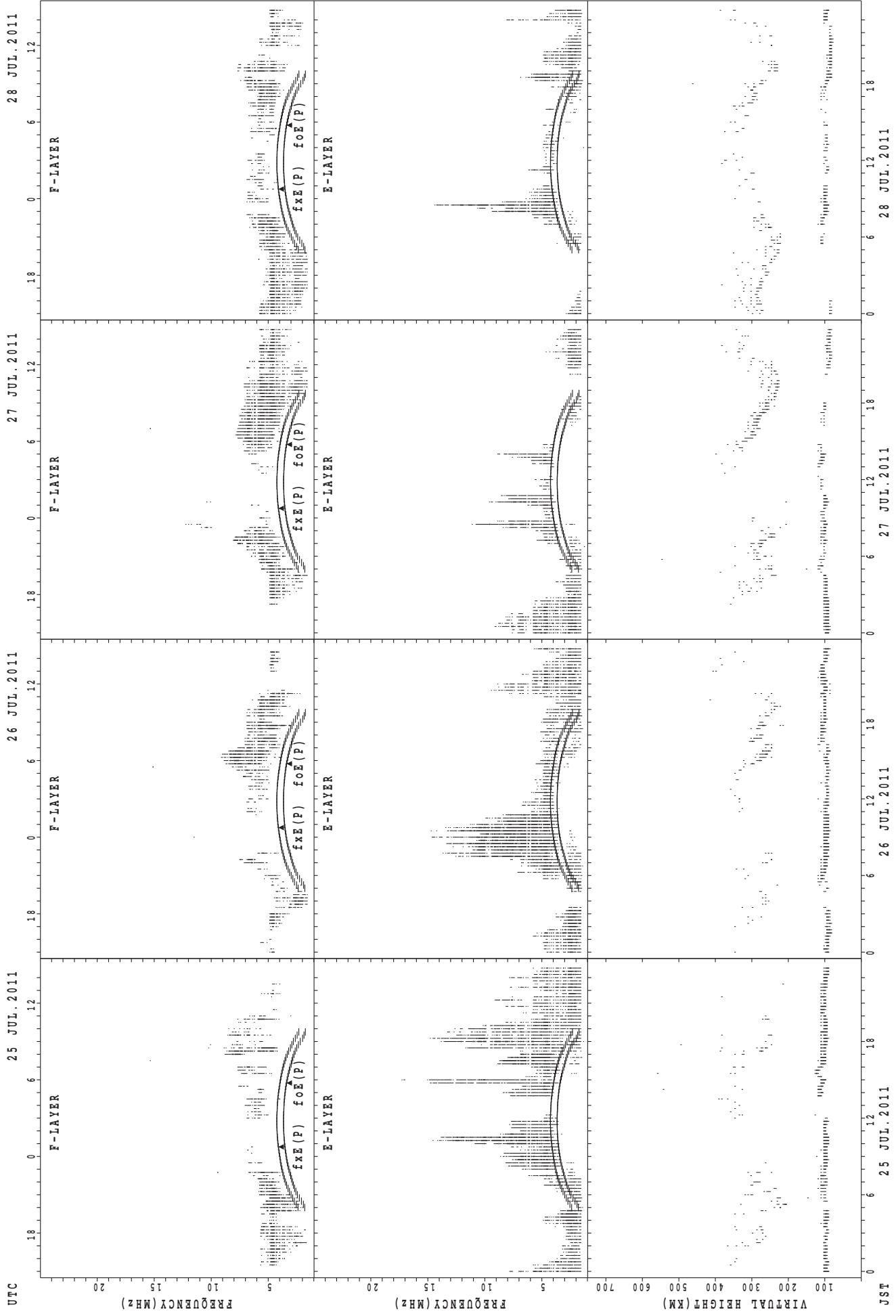


SUMMARY PLOTS AT Kokubunji



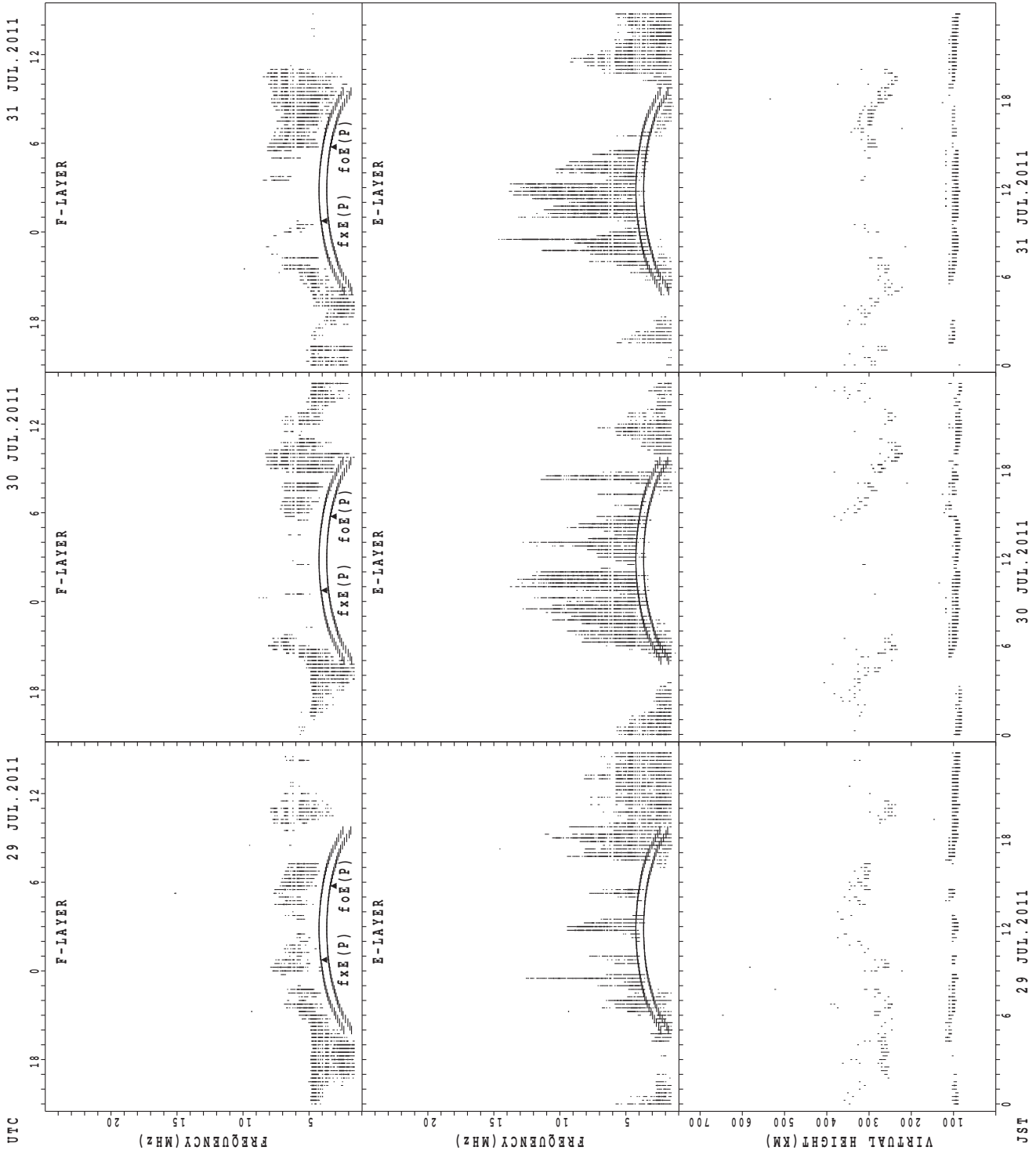
foF(P) ; PREDICTED VALUE FOR foF  
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Kokubunji



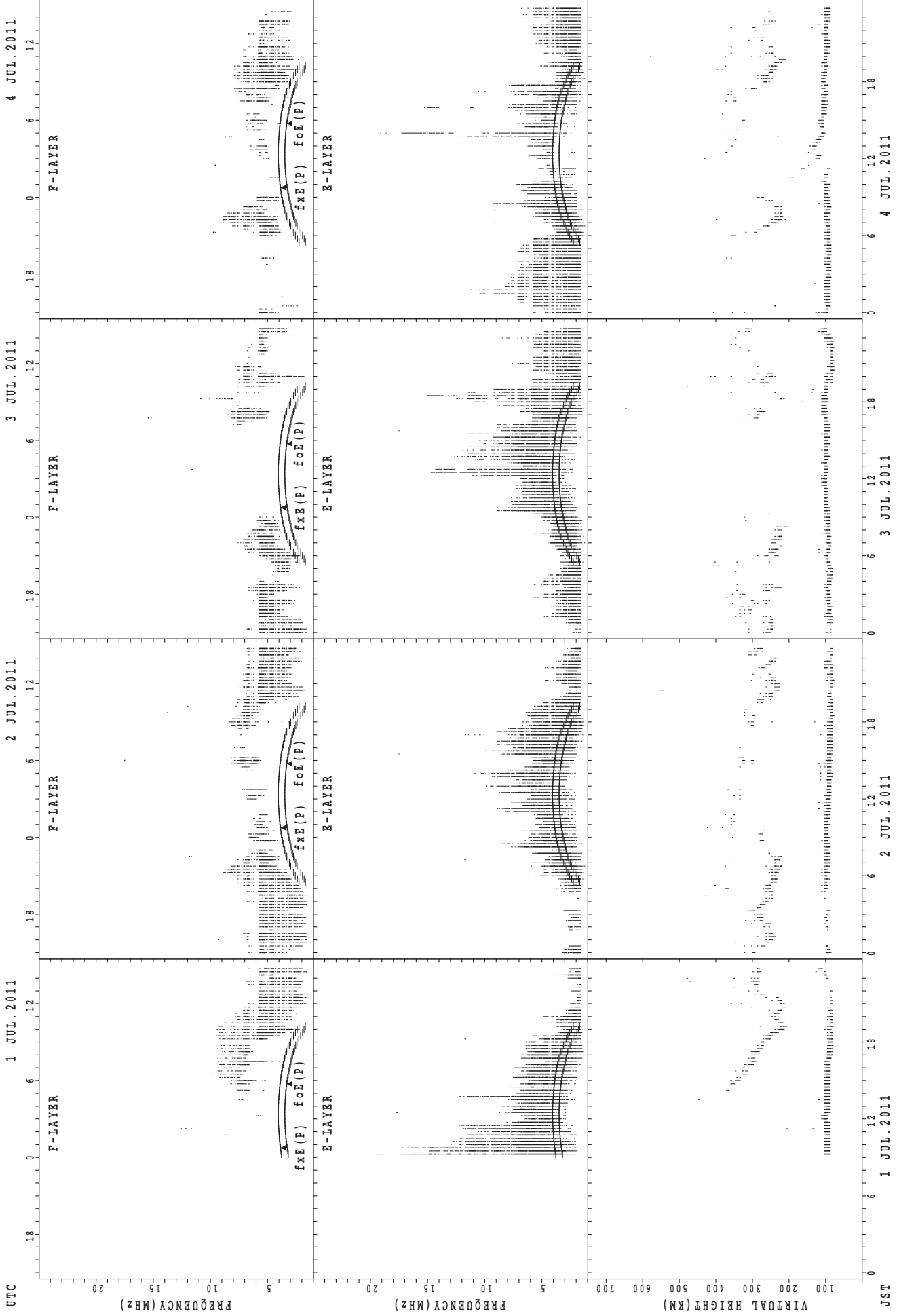
f\_xE(P); PREDICTED VALUE FOR f\_xE  
f\_oE(P); PREDICTED VALUE FOR f\_oE

SUMMARY PLOTS AT Kokubunji



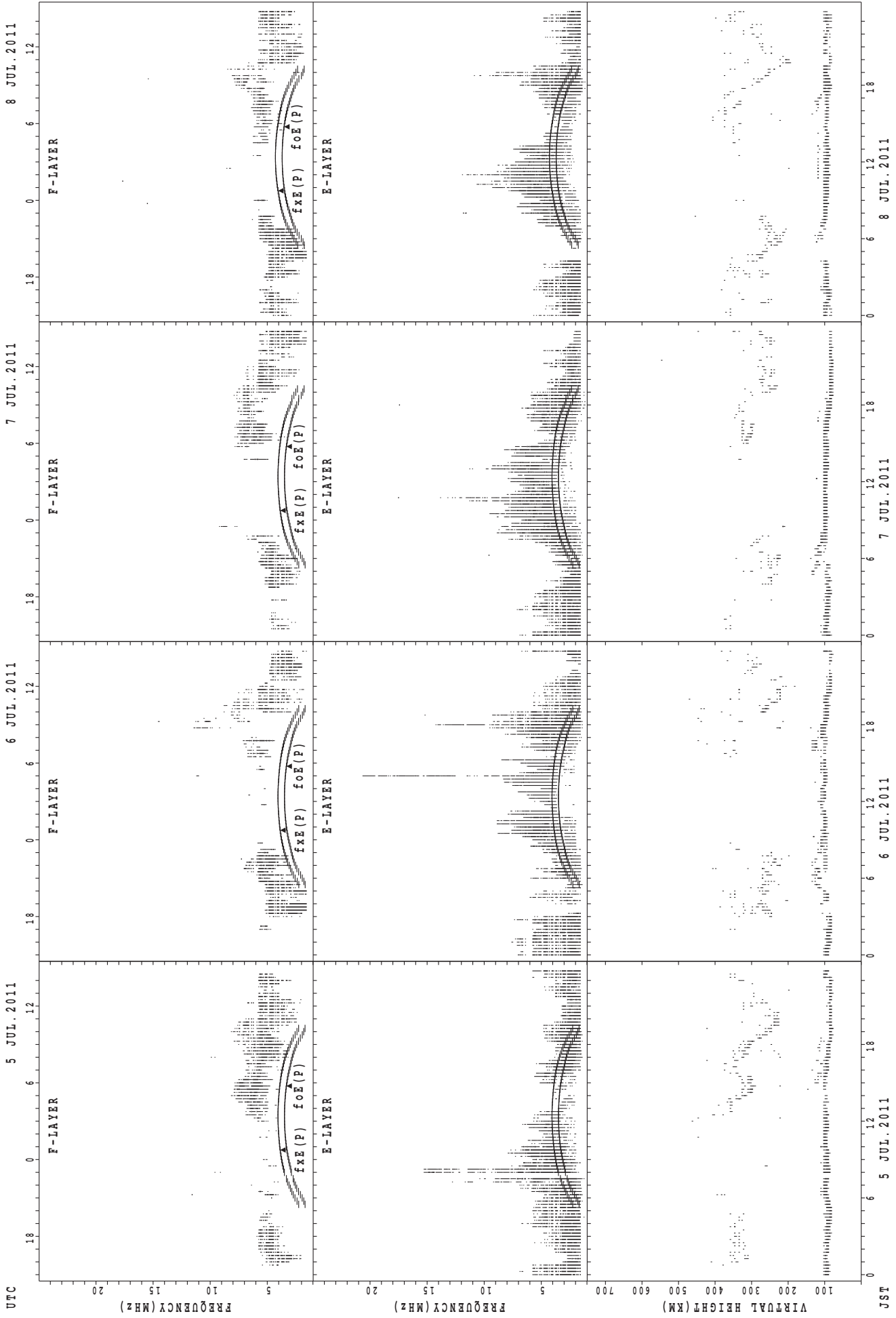
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
f<sub>o</sub>E(P); PREDICTED VALUE FOR f<sub>o</sub>E

SUMMARY PLOTS AT Yamagawa



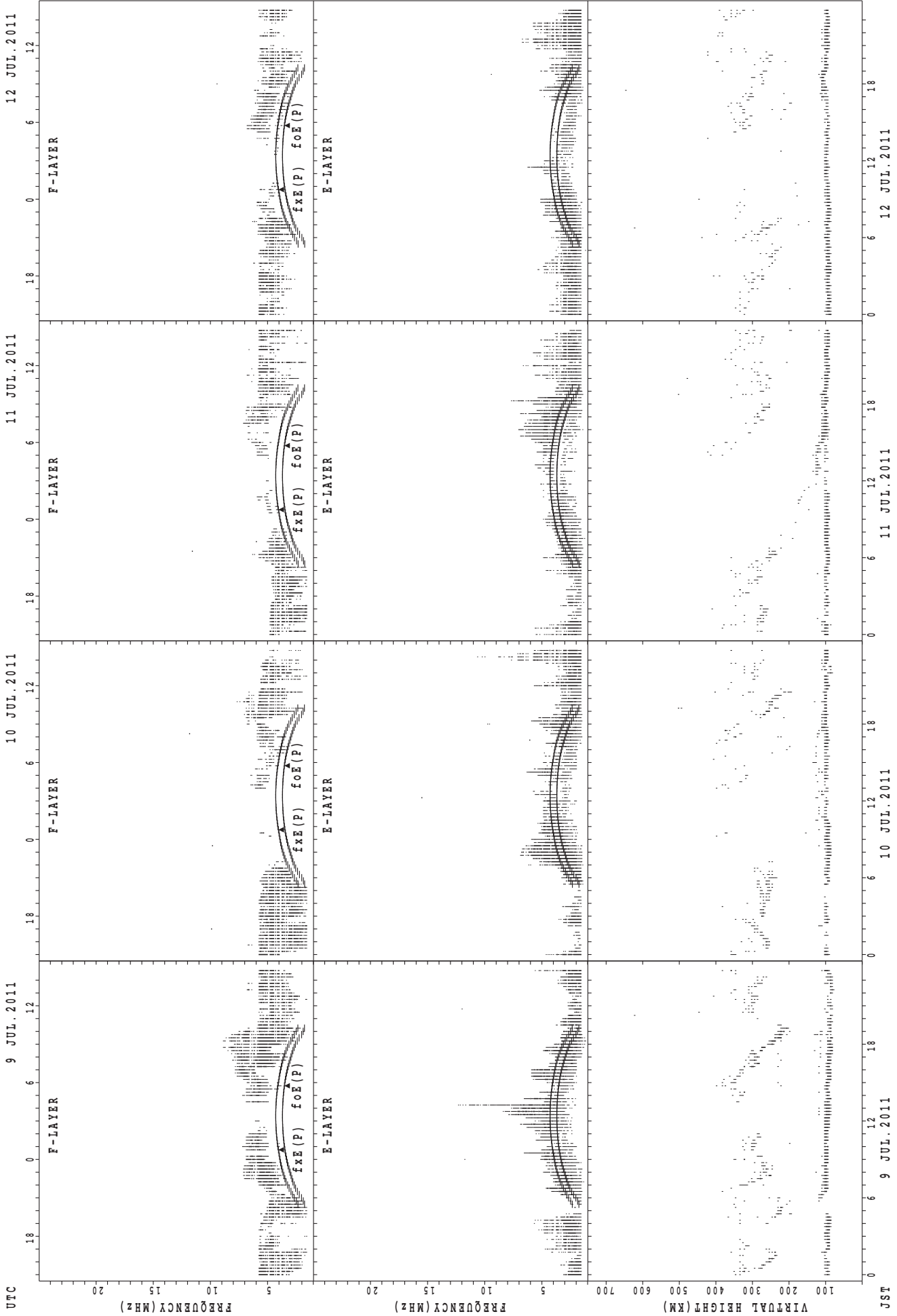
f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
foE(P); PREDICTED VALUE FOR foE

### SUMMARY PLOTS AT Yamagawa



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

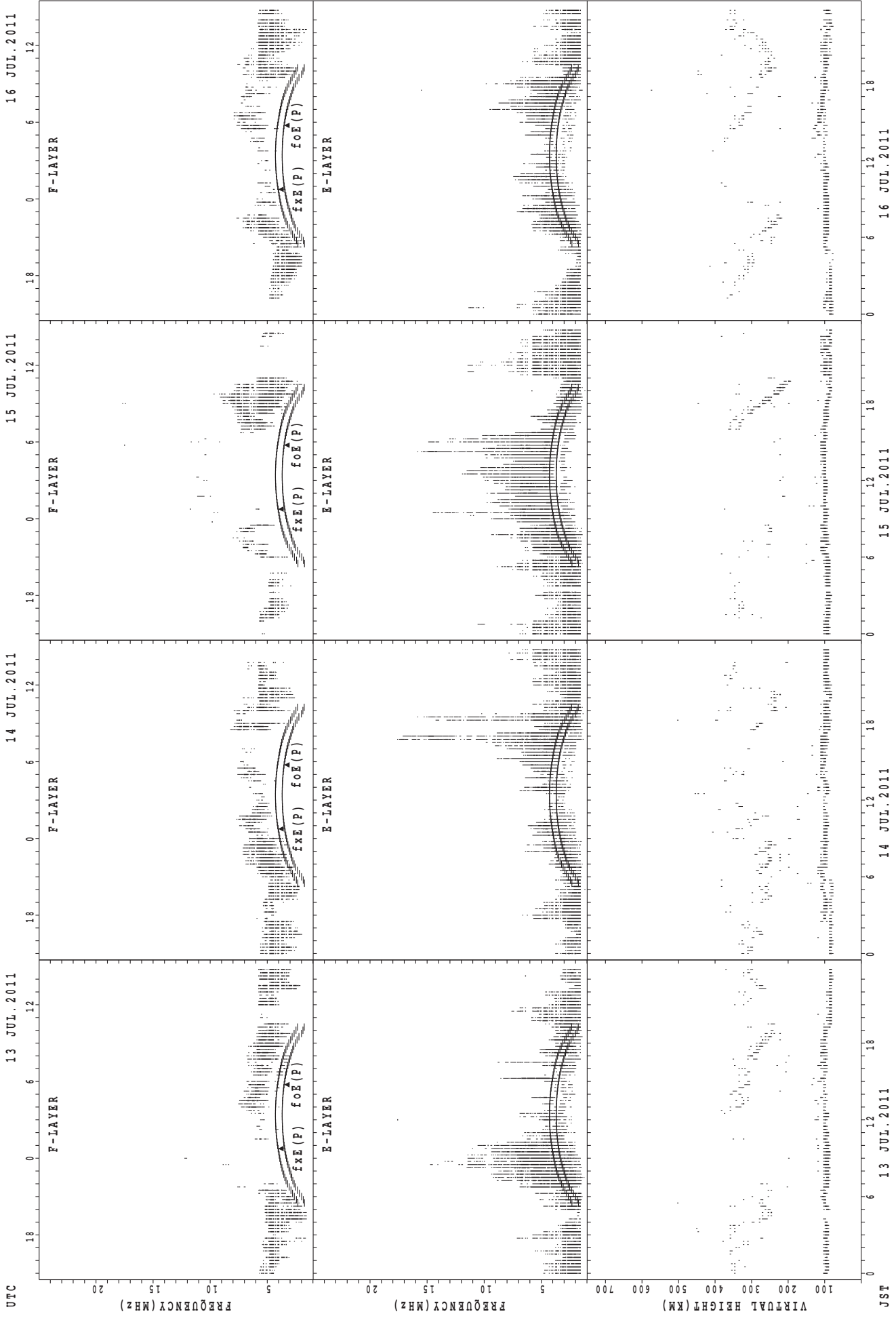
### SUMMARY PLOTS AT Yamagawa



UTC 9 JUL. 2011 12 JUL. 2011  
 JST 9 JUL. 2011 12 JUL. 2011

$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

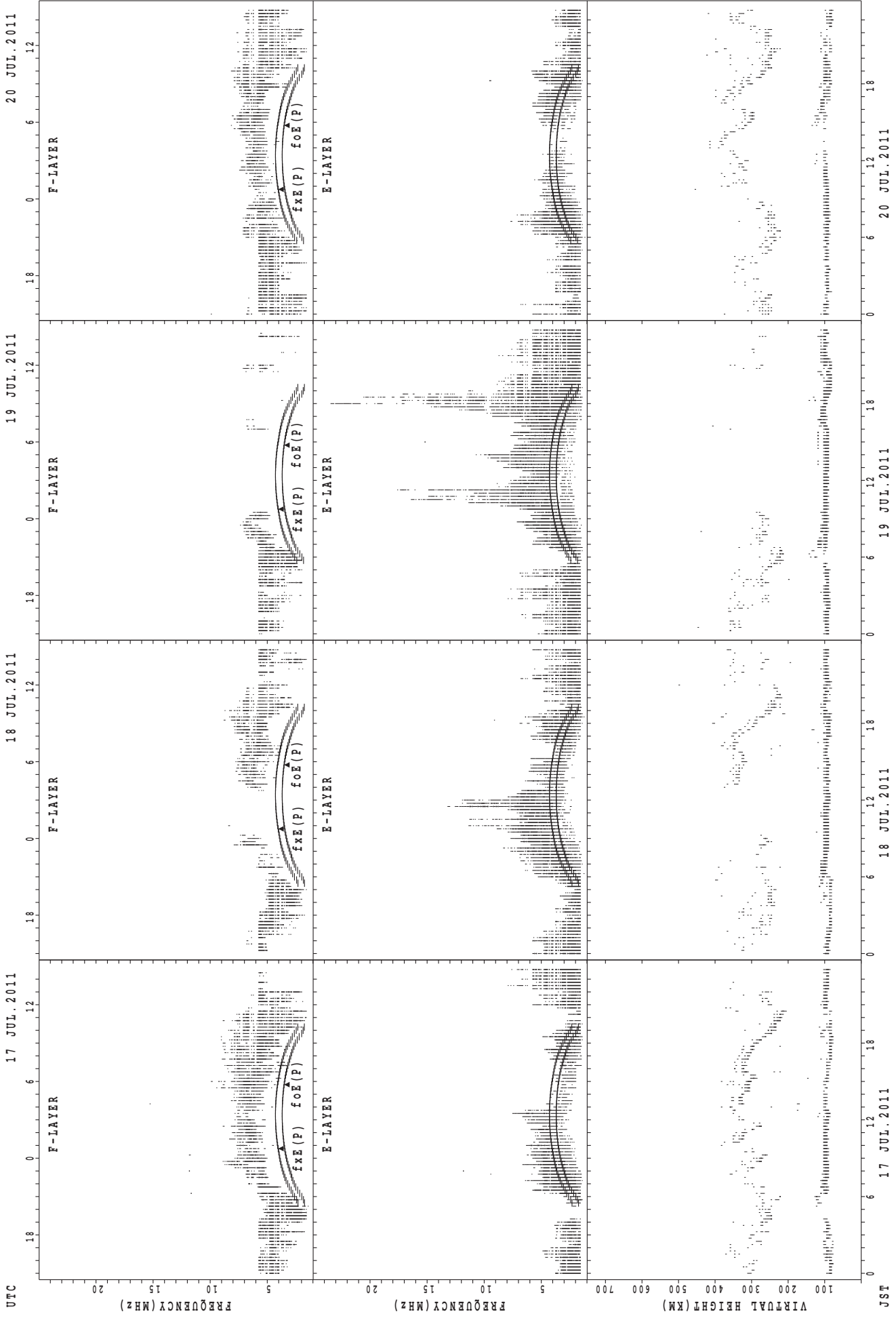
SUMMARY PLOTS AT Yamagawa



f<sub>x E</sub>(P); PREDICTED VALUE FOR f<sub>x E</sub>  
f<sub>o E</sub>(P); PREDICTED VALUE FOR f<sub>o E</sub>

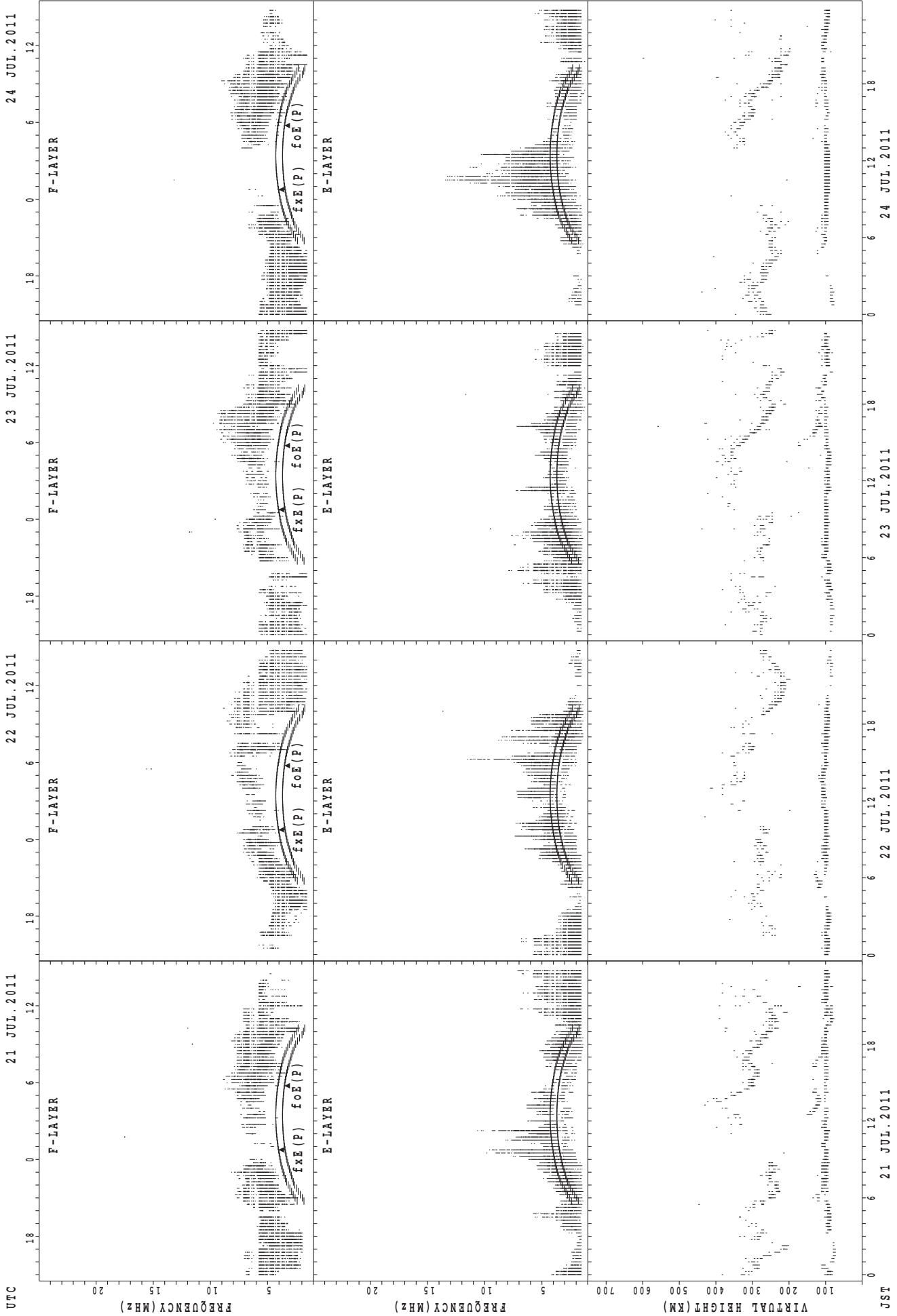


### SUMMARY PLOTS AT Yamagawa



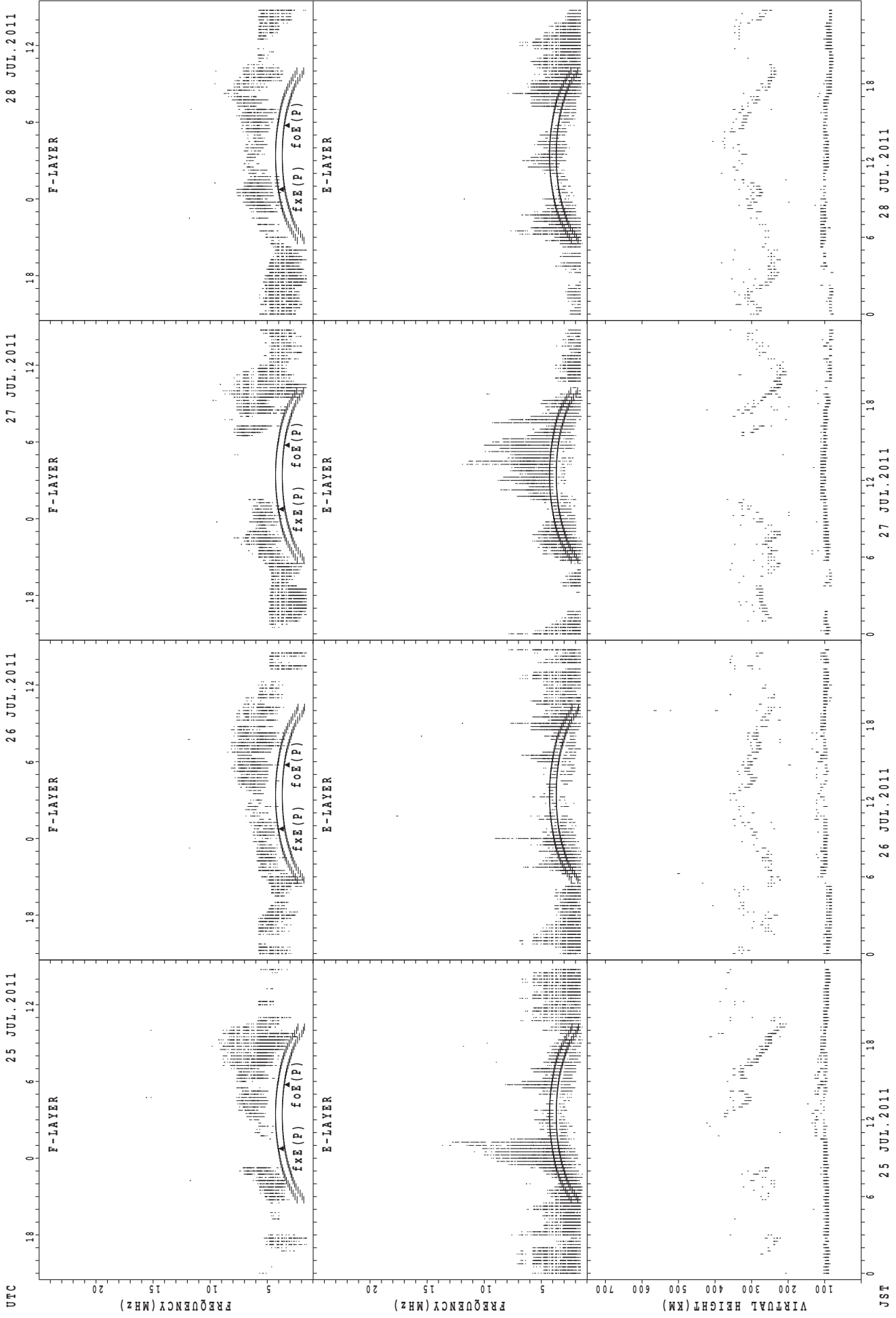
$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

SUMMARY PLOTS AT Yamagawa



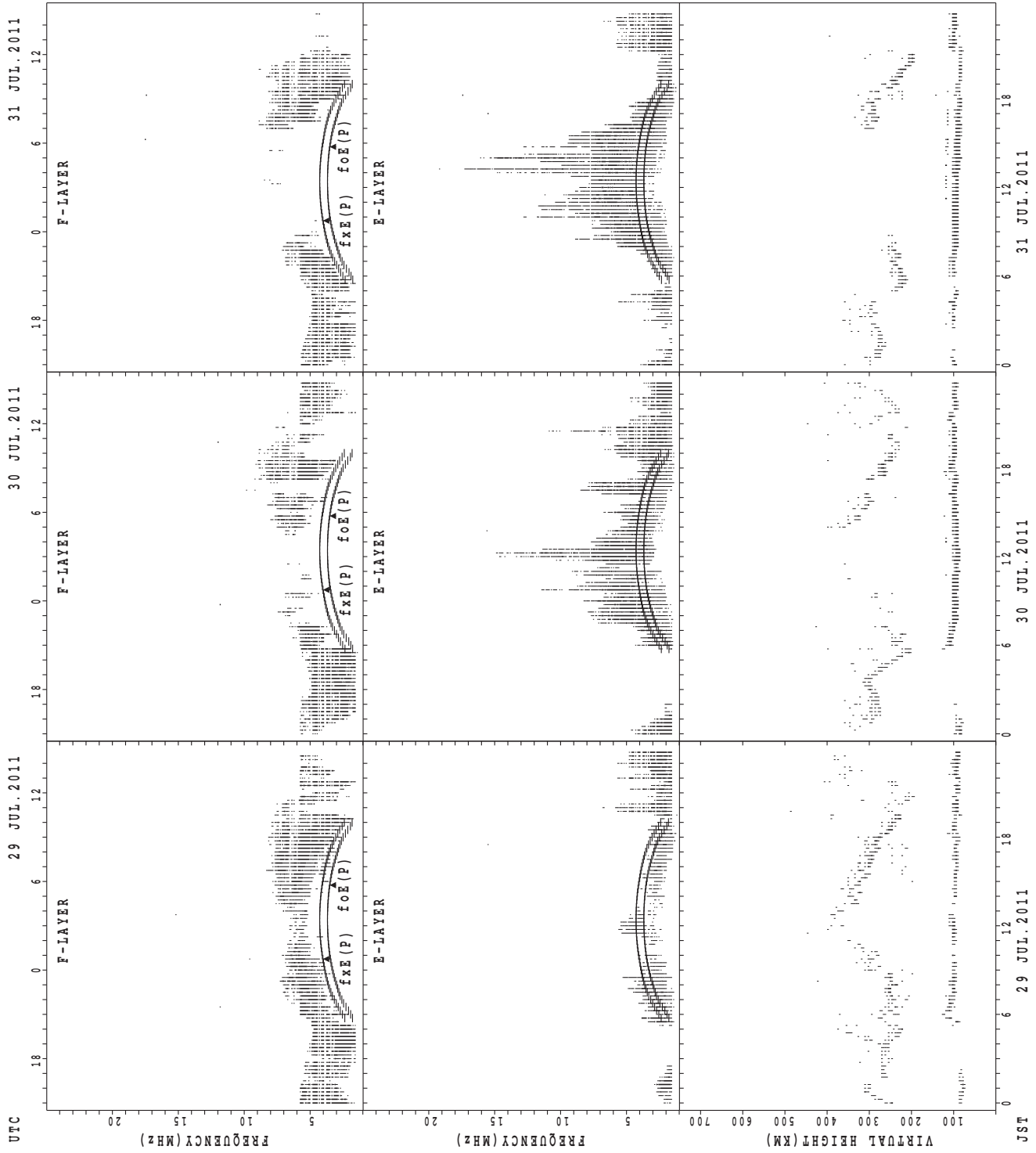
f\_xE(P); PREDICTED VALUE FOR f\_xE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Yamagawa

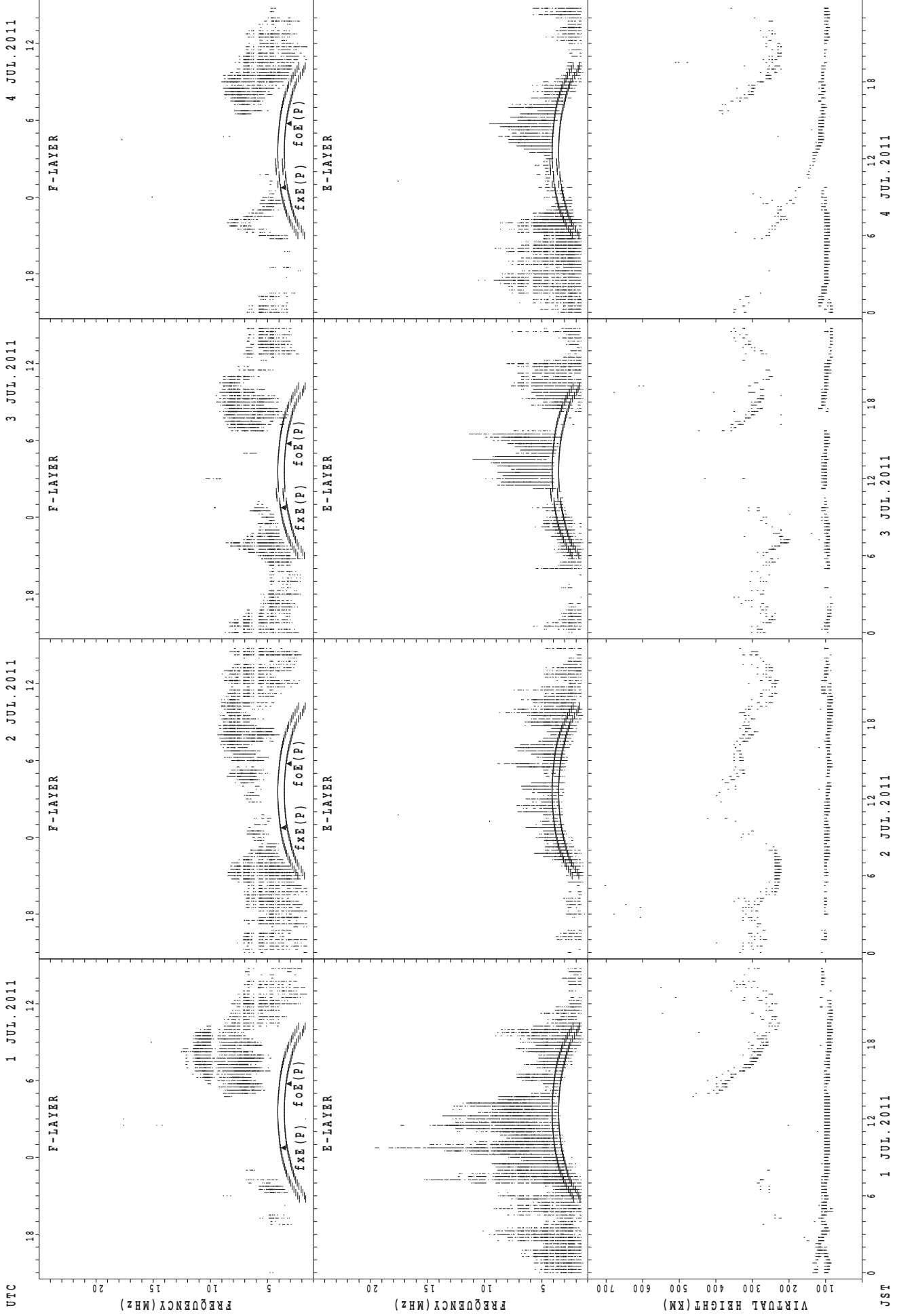


$f_xE(P)$  ; PREDICTED VALUE FOR  $f_xE$   
 $foE(P)$  ; PREDICTED VALUE FOR  $foE$

### SUMMARY PLOTS AT Yamagawa

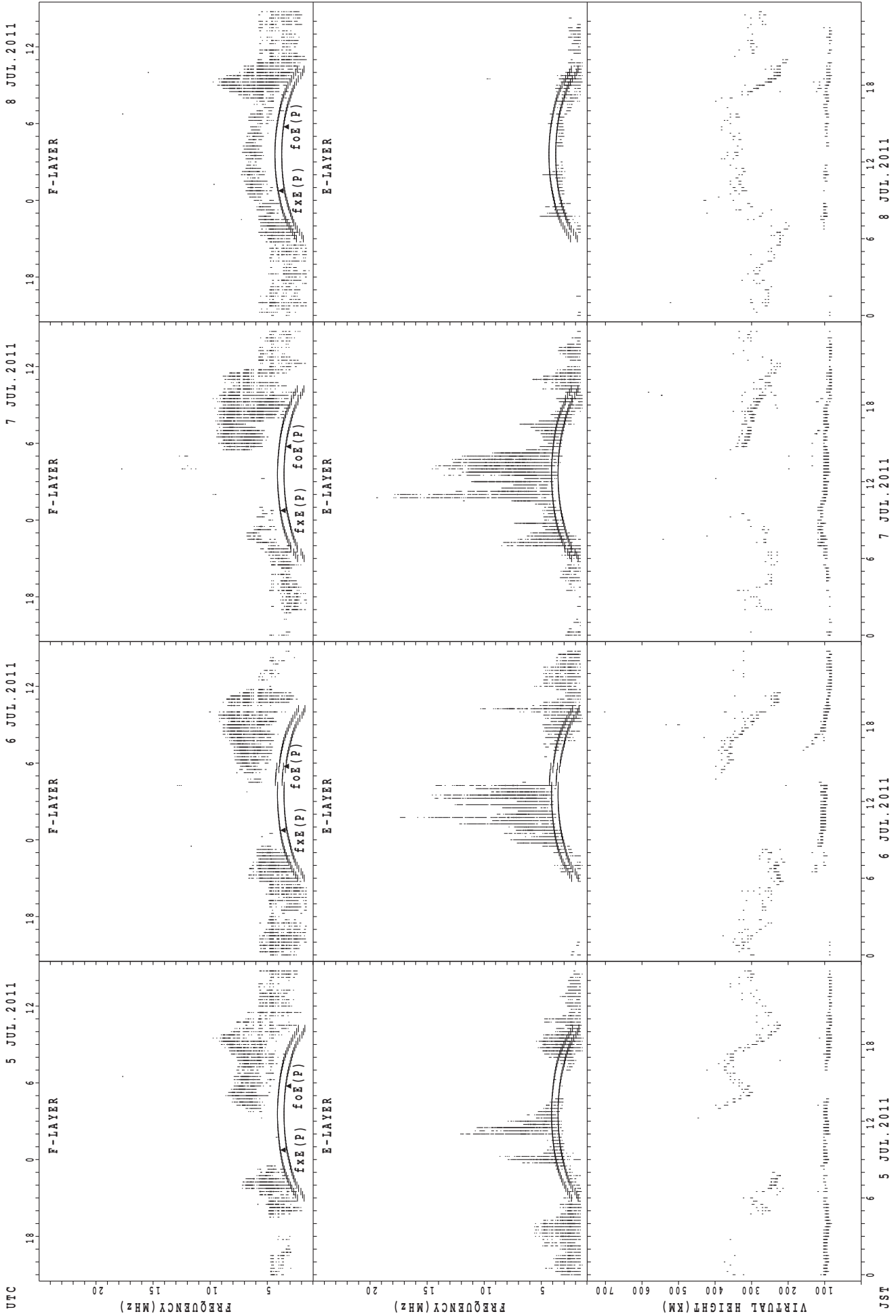


SUMMARY PLOTS AT Okinawa



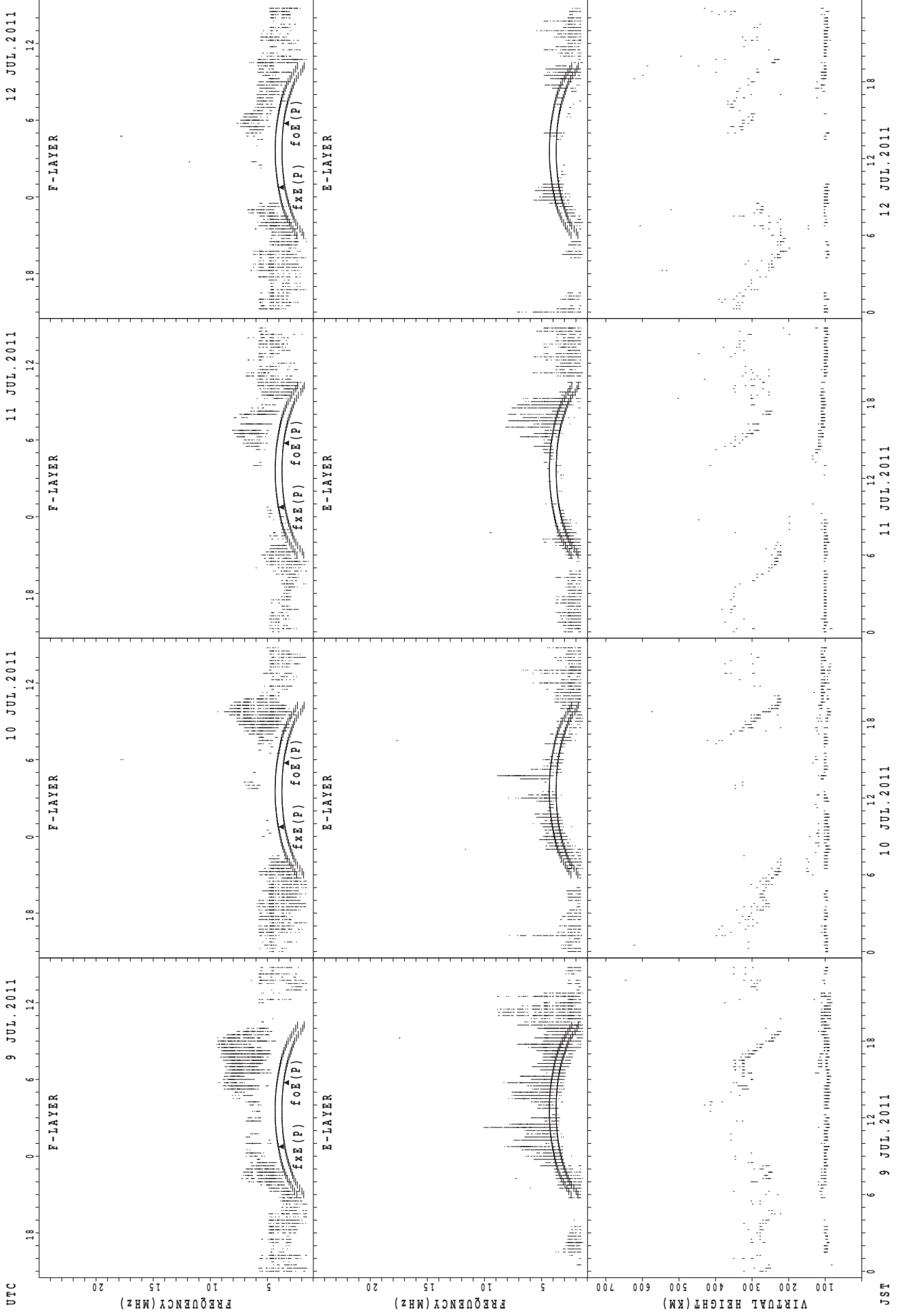
fxe(P) ; PREDICTED VALUE FOR fxe  
foE(P) ; PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



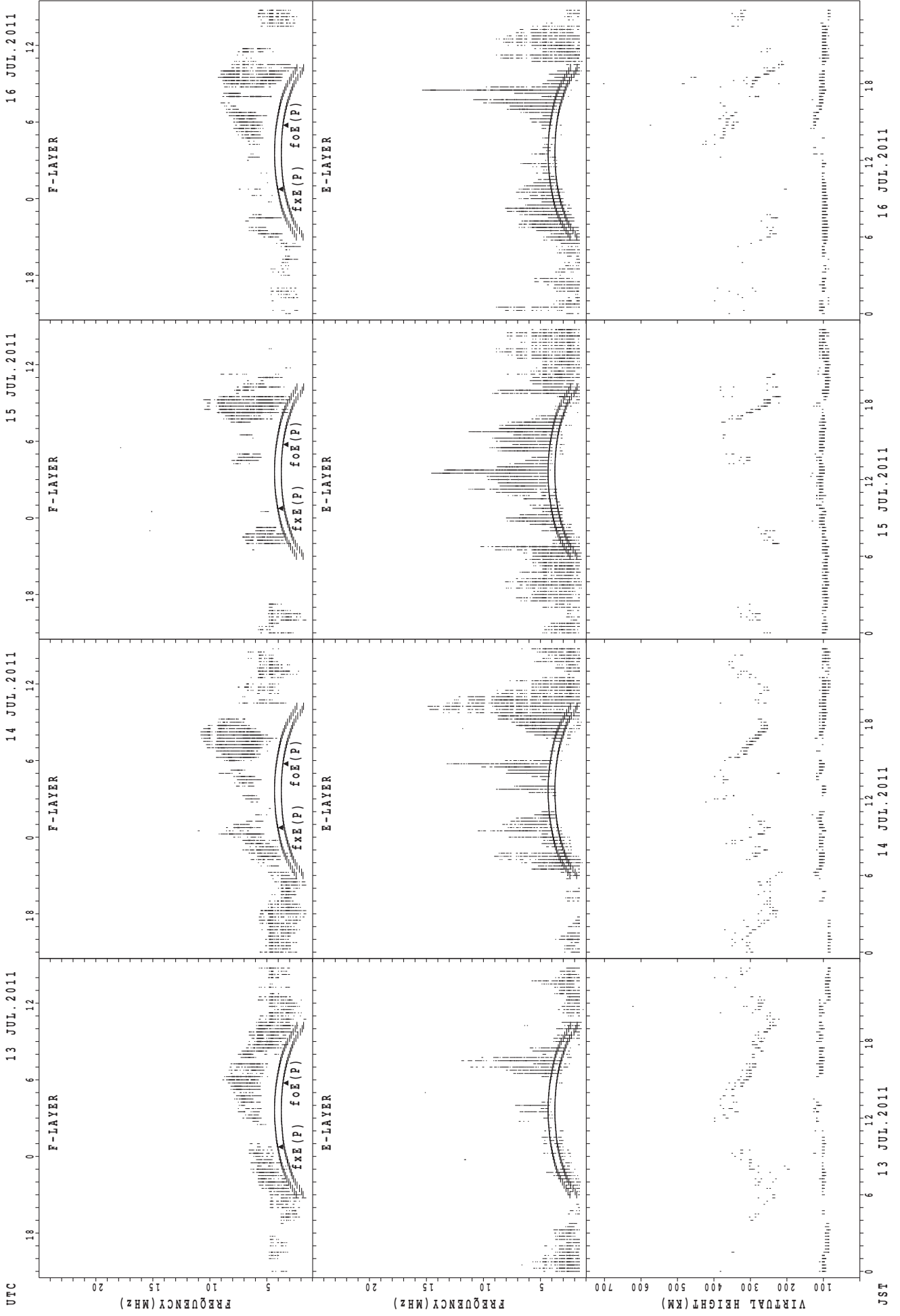
foE(P); PREDICTED VALUE FOR foE  
foF(P); PREDICTED VALUE FOR foF

SUMMARY PLOTS AT Okinawa



f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
foE(P); PREDICTED VALUE FOR foE

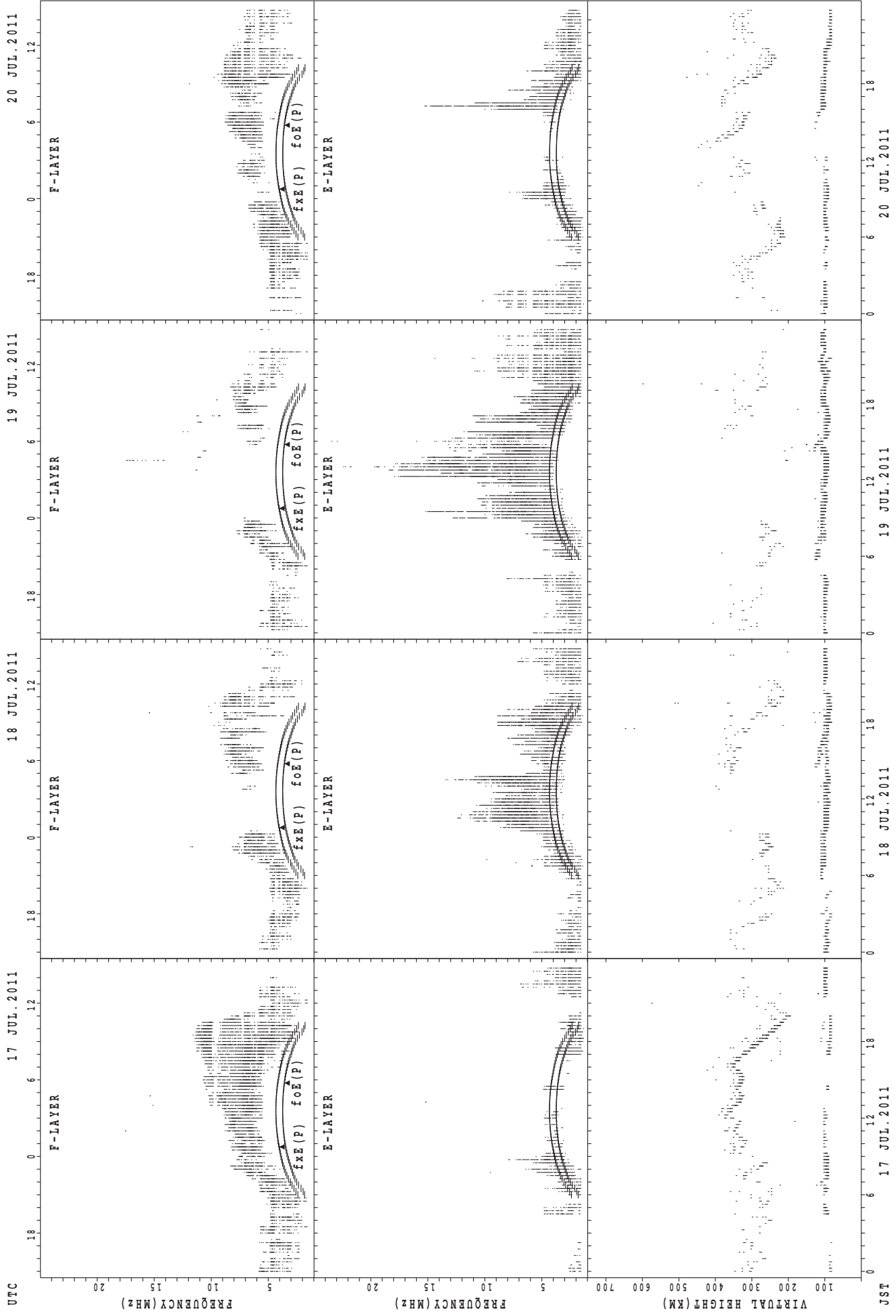
SUMMARY PLOTS AT Okinawa



f\_xE(P); PREDICTED VALUE FOR f\_xE  
f\_oE(P); PREDICTED VALUE FOR f\_oE

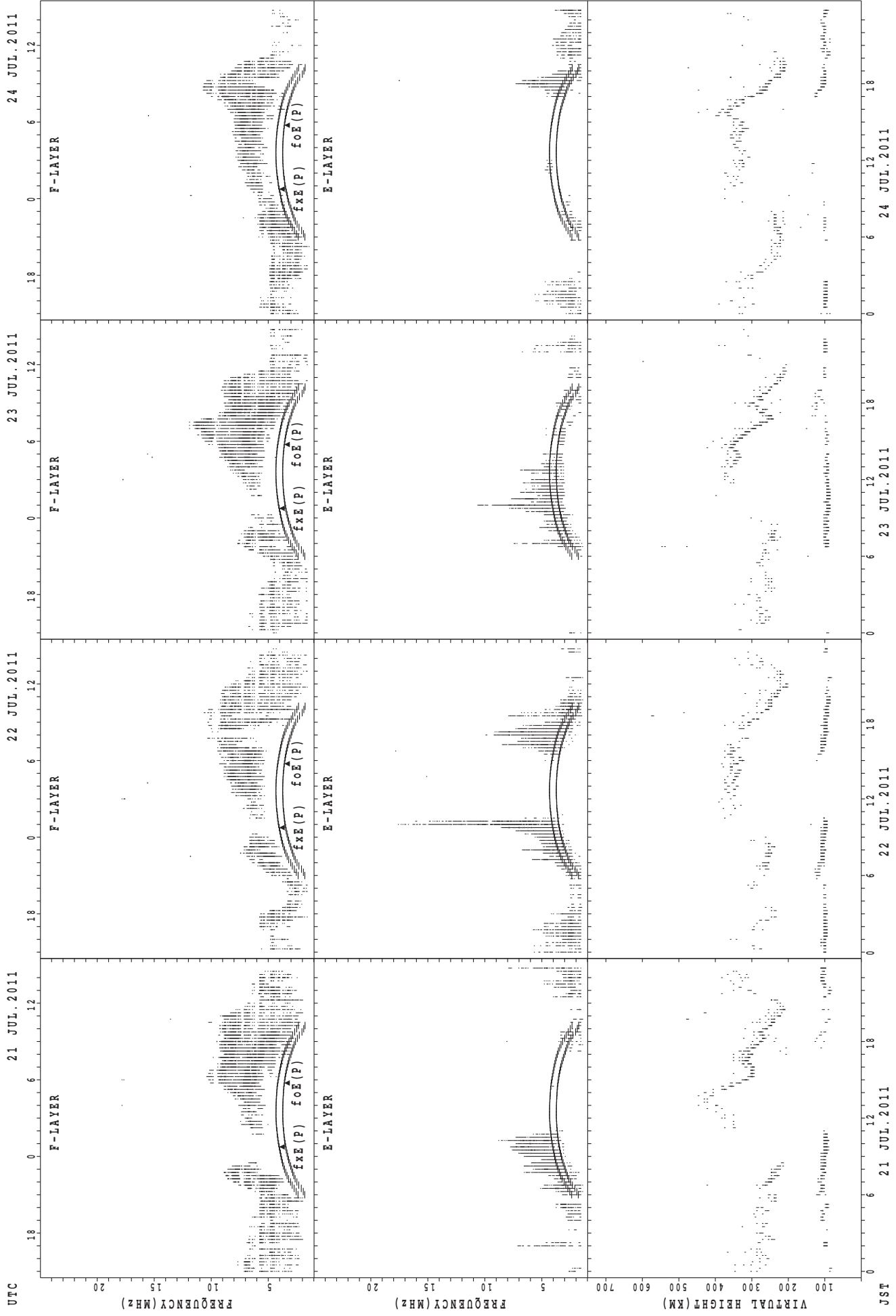


SUMMARY PLOTS AT Okinawa



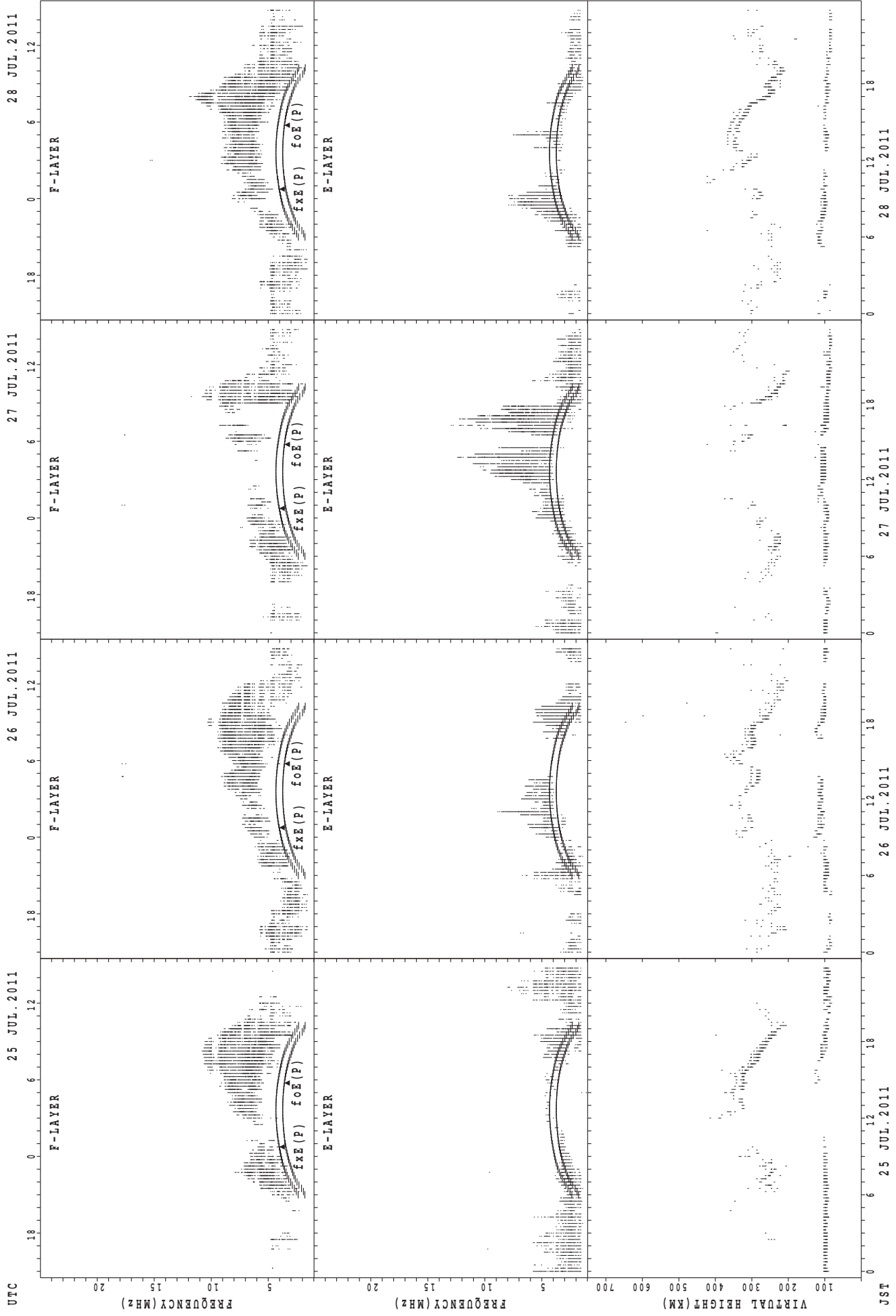
fxE(P); PREDICTED VALUE FOR fxE  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



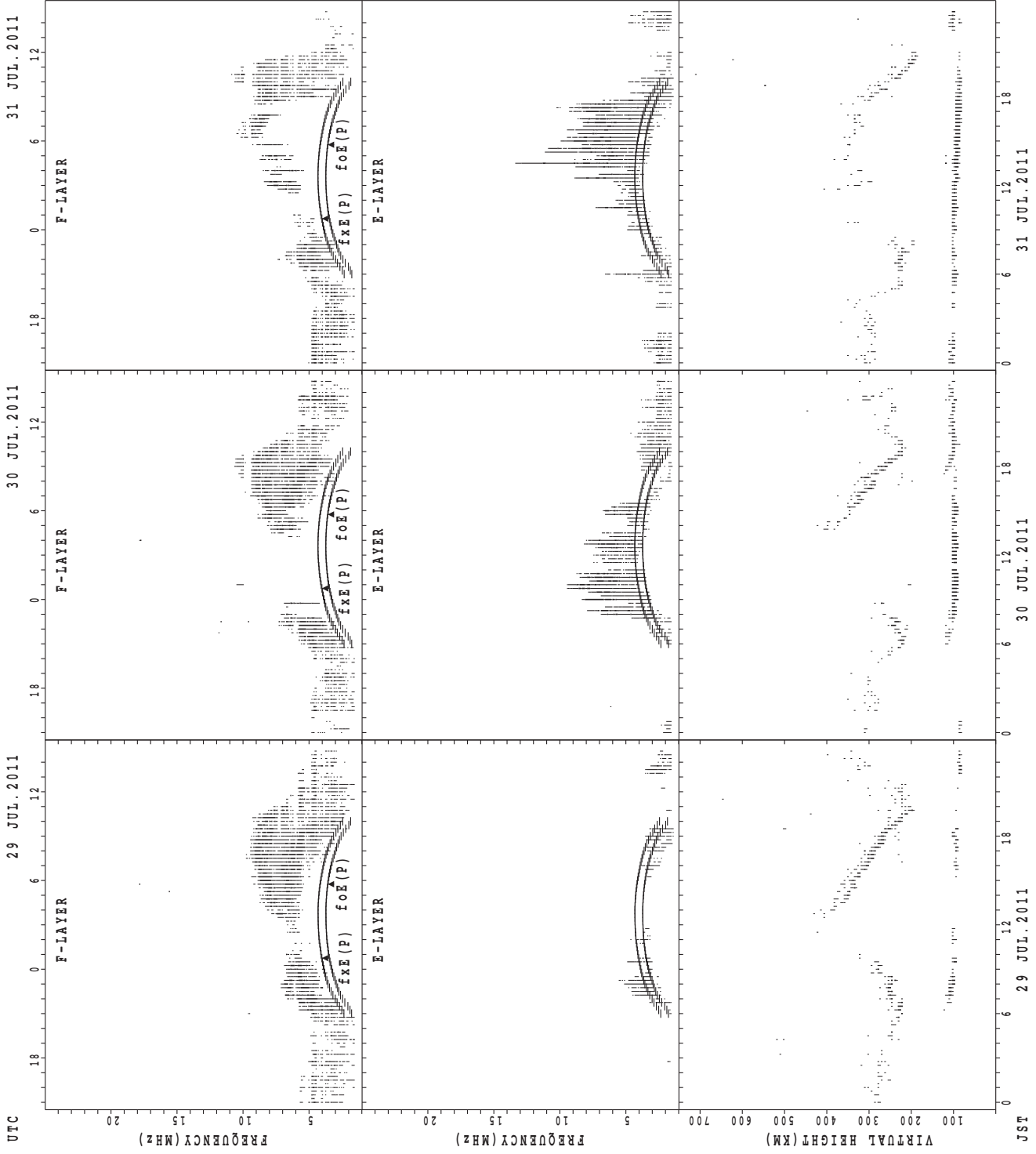
fxe(P); PREDICTED VALUE FOR fxe  
foE(P); PREDICTED VALUE FOR foE

SUMMARY PLOTS AT Okinawa



$f_xE(P)$ ; PREDICTED VALUE FOR  $f_xE$   
 $f_oE(P)$ ; PREDICTED VALUE FOR  $f_oE$

### SUMMARY PLOTS AT Okinawa



f<sub>x</sub>E(P); PREDICTED VALUE FOR f<sub>x</sub>E  
foE(P); PREDICTED VALUE FOR foE

MONTHLY MEDIANS OF h'F AND h'Es  
 JUL. 2011 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

h'F STATION Wakkanai LAT. 45°10.0'N LON. 141°45.0'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	11	6									1	5	6	4	4	8	7	5
MED		298				298	302	311									328	310	269	277	273	287	294	302
U Q		149				149	328	336									164	323	286	295	308	301	312	341
L Q		149				149	284	302									164	295	222	248	250	279	264	277

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	25	22	23	26	20	30	30	30	27	28	27	26	24	19	21	24	27	30	29	31	30	30	31	30
MED	95	94	93	94	96	113	110	106	103	101	103	99	99	97	101	107	109	107	105	103	103	103	101	97
U Q	97	97	99	97	113	115	111	109	105	103	105	101	104	99	111	113	113	111	110	109	105	105	103	101
L Q	93	91	89	89	90	105	105	103	99	99	97	95	96	95	97	101	99	105	103	103	99	99	97	95

h'F STATION Kokubunji LAT. 35°43.0'N LON. 139°29.0'E

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT							7	11									9	9	11	13	10	2	1	
MED							282	276									312	288	288	272	268	296	298	
U Q							292	282									322	314	304	296	284	344	149	
L Q							240	256									290	284	280	254	250	248	149	

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	26	28	26	27	19	18	21	29	27	27	26	25	23	22	26	20	23	27	28	26	30	30	27	29
MED	97	97	97	97	97	104	107	103	103	101	99	99	99	99	103	105	111	107	103	103	101	101	101	101
U Q	103	101	99	99	101	113	113	107	103	103	103	103	105	105	111	113	113	111	107	105	103	105	107	103
L Q	95	93	91	91	95	99	102	101	99	97	97	95	95	97	95	98	105	103	103	95	95	95	101	96

h'F STATION Yamagawa LAT. 31°12.0'N LON. 130°37.0'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		2	10	12									17	17	22	11	1		
MED		338			338		258	245	244									290	278	261	256	288		
U Q		169			169		270	282	263									333	302	272	276	144		
L Q		169			169		246	238	239									287	267	244	240	144		

h'Es

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT	28	28	24	25	23	20	28	28	30	29	28	29	27	22	24	25	23	27	30	30	30	29	30	30
MED	97	94	95	95	95	95	104	102	99	99	101	101	103	98	101	103	105	103	103	99	95	97	97	97
U Q	98	97	97	97	99	96	114	106	105	103	104	104	107	105	112	112	111	111	107	103	101	99	103	101
L Q	91	89	89	90	93	92	95	97	95	97	97	97	97	95	95	95	95	95	95	95	89	89	89	89

MONTHLY MEDIANS OF h'F AND h'Es  
 JUL. 2011 135E MEAN TIME (UTC+9H) AUTOMATIC SCALING

h'F STATION Okinawa LAT. 26°41.0'N LON. 128°09.0'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	2			1		1	11	15	1								22	26	24	14	2	2	
MED	312	306			322		242	238	254	296								298	277	258	256	278	280	
U Q	320	322			161		121	256	266	148								302	300	273	264	290	284	
L Q	304	290			161		121	232	238	148								280	262	238	236	266	276	

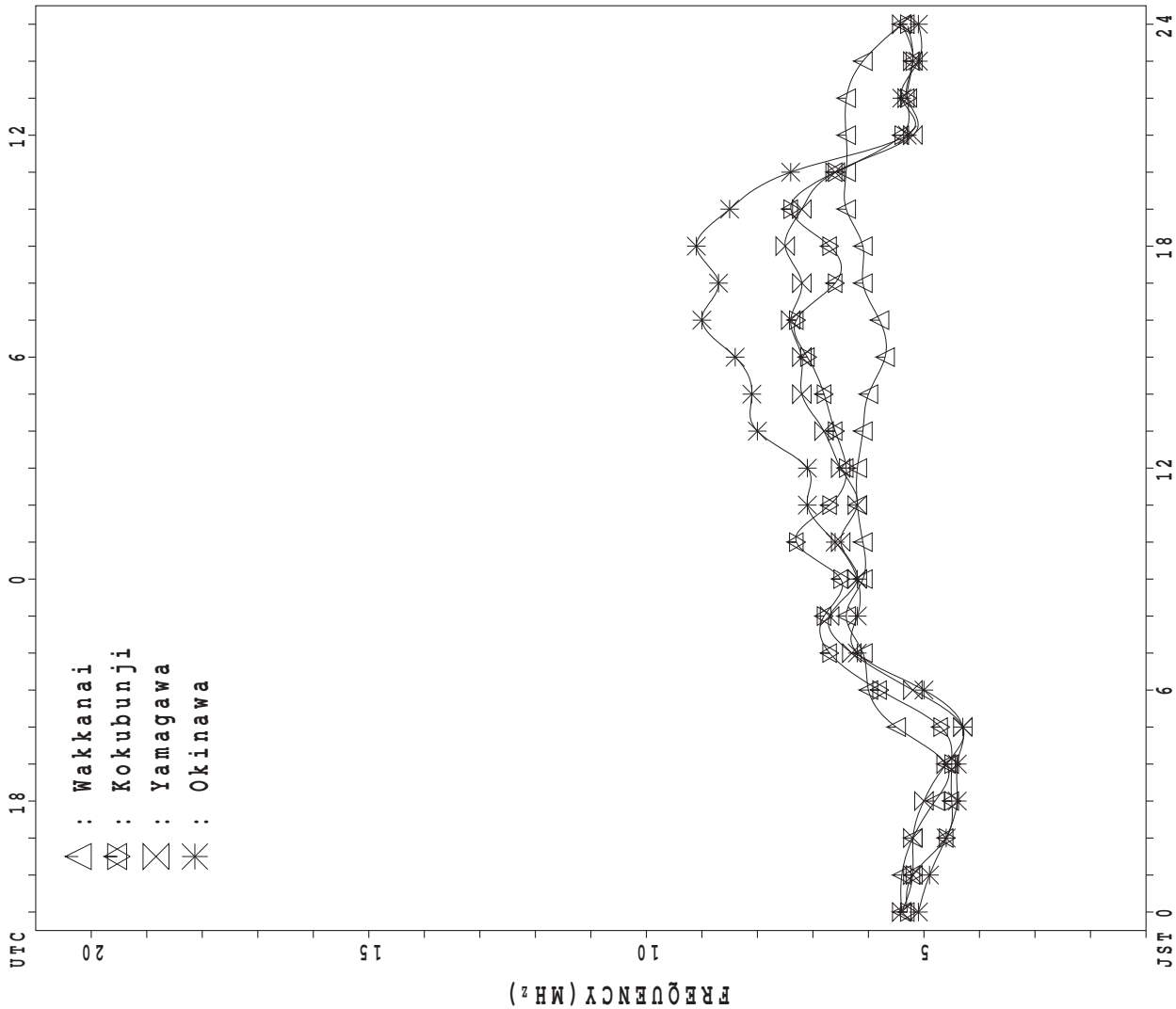
h'Es

	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	26	21	20	15	13	12	21	22	22	25	23	19	20	21	16	18	16	23	30	28	26	24	26	23
MED	99	99	101	99	103	99	99	103	102	101	99	101	99	101	97	106	106	105	103	103	99	97	97	99
U Q	105	104	103	101	107	105	110	113	105	105	105	107	103	104	104	119	111	111	109	103	105	103	101	105
L Q	91	96	98	95	98	96	96	97	97	95	97	97	95	97	95	95	98	95	95	93	89	90	89	89

MONTHLY MEDIANS PLOT OF fOF2

JUL. 2011

AUTOMATIC SCALING



## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 f<sub>XI</sub> (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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	68	A	65	X	X																X	X	X	X		
2	X	X	X	X	X																	88	72	69	72	
3	72	66	53	53	48																	81	83	84	72	
4	X	X	A		X																	X	X	X	X	
5	59	60		60	54																	77	74	75	62	
6	71	70	66	64	56																	X	X	A	A	
7	X	A	X	X	X																	X	X	A	A	
8	54		54	53	46																	87	75		68	
9	66	66	67	52	62																	X	X	X	X	
10	64	X	X	X	51																	63	64	60	58	
11	68	66	60	54	53																	X	X	X	X	
12	X	X	X	X	X																	81	70	68	66	
13	68	66	60	54	53																	X	X	X	X	
14	X	X	X	X	X																	68	66	69	69	
15	68	61	58	62	53																	X	X	X	52	
16	57	54	55	50	48																	75	65	52	52	
17	X	X	X	X	X																	X	X	X	70	
18	65	62	64	55	51																	68	66	60	67	
19	X	X	X	X	X																	X	X	X	X	
20	56	54	54	51	50																	64	62	64	62	
21	X	X	X	X	X																	X	X	A	A	
22	59	57	57	54	54																	80	71			
23	A	X	54	52	55																	X	X	X	X	
24	X	X	55	54	47																	69	60	62	62	
25	58	55	55	54	47																	X	X	X	X	
26	67	67	X	60	57																	74	69	67	71	
27	67	67	57	60	57																	X	X	72	64	
28	66	53	53	52	55																	82	79	72	64	
29	72	X	X	65	62																	X	X	X	76	
30	X	X	X	X	X																	84	79	72	76	
31	72	67	70	65	62																	X	X	X	X	
00	70	66	65	61	62																	76	74	72	70	
01	X	X	X	X	X																	X	X	X	X	
02	74	71	78	67	70																	70	70	67	65	
03	X	X	X	X	X																	X	X	X	X	
04	60	54	56	55	51																	83	71	65	65	
05	66	63	66	66	62																	X	X	X	X	
06	X	61	63	58	55																	65	69	67	63	
07	61	65	63	58	55																	X	X	X	A	
08	X	X	X	X	X																	72	65	67		
09	58	66	66	63	59	63																X	X	X	A	
10	67	66	58	54	49																	76	61	67		
11	67	66	58	54	49																	X	A	57	58	
12	X	60	51	56	53	60																64	71	64	67	
13	X	X	X	X	X	X																74	63	57	55	
14	64	59	57	57	55	57																X	X	A	69	
15	62	62	55	54	52	53																84	71		69	
16	72	67	58	54	57																	X	X	X	55	
17	72	67	58	54	57																	74	74	55	55	
18	X	X	X	X	X																	X	X	X	55	
19	53	54	50	50	48																	82	72	56	62	
20	30	29	30	31	31	4																2	30	30	27	27
21	66	62	58	55	54	58																X	X	X	66	
22	68	66	65	61	57	62																78	76	70	67	66
23	X	X	X	X	X																	X	X	X	X	
U Q	68	66	65	61	57	62																82	74	72	70	
L Q	X	X	X	X	X																	X	X	X	X	
	59	58	54	53	51	55																69	65	60	62	

JUL.2011 f<sub>XI</sub> (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 foF2 (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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	F	A	F	54	50	56	66	A	A	A	A	A	A	72	85	94	96	99	97	101	81	66	63	66		
2	64	60	61	60	F	69	84	78	A	A	61	A	A	57	64	73	73	68	69	75	75	77	78	66		
3	F	F	F	F	F	44	61	68	63	56	57	55	A	59	A	A	76	78	74	72	F	68	F	56		
4	53	53	A	F	48	46	57	73	87	74	A	A	R	60	66	69	A	A	67	80	86	76	68	F	F	
5	F	F	F	F	50	46	A	A	71	A	A	A	A	63	72	A	A	A	A	A	66	A	63	A	A	
6	48	A	48	F	40	51	53	64	A	A	A	A	44	58	A	58	59	58	63	77	81	69	A	F		
7	F	F	F	F	F	56	A	55	60	A	A	A	58	61	60	A	A	59	60	61	65	57	57	54	52	
8	F	54	48	46	F	42	48	62	63	A	61	62	59	50	A	A	58	A	A	82	75	64	F	F		
9	F	F	F	F	F	48	63	54	64	70	74	67	A	61	A	61	73	78	78	79	62	60	63	63		
10	F	55	52	F	46	40	45	56	A	A	A	52	59	A	A	A	A	A	A	58	A	69	59	46	F	
11	F	F	F	F	F	40	46	61	48	R	R	R	56	54	55	56	58	61	A	68	64	62	59	63	F	
12	59	56	58	49	45	40	51	50	55	50	A	A	A	A	56	A	A	A	A	A	A	53	F	53	F	
13	50	F	48	45	43	40	50	62	61	A	A	59	55	56	62	60	55	58	62	54	58	56	58	56	A	A
14	53	51	51	48	48	48	64	69	78	60	62	62	65	62	70	68	66	61	62	77	74	65	F	56	F	
15	A	54	F	F	F	45	52	A	82	A	A	A	65	74	74	72	62	65	75	75	62	54	F	56	F	
16	52	49	F	F	41	43	54	75	91	60	A	A	A	61	68	A	A	A	A	66	68	63	F	F	F	
17	F	F	51	F	F	49	61	71	A	78	A	82	88	75	72	74	74	68	70	76	76	73	F	F	F	
18	F	F	F	F	F	48	54	60	64	64	67	64	59	62	64	69	A	A	69	A	78	73	66	F	F	
19	F	61	64	F	F	59	72	A	A	A	A	A	60	57	A	61	A	A	A	A	70	68	66	64	F	
20	63	F	58	F	F	55	68	74	79	A	A	A	62	66	66	69	65	65	71	78	75	74	69	65	F	
21	68	65	71	61	64	60	78	78	66	54	55	A	56	59	64	64	63	62	61	67	64	64	61	58	F	
22	54	48	F	F	F	A	55	54	64	73	73	64	61	A	68	70	73	68	67	73	77	65	59	F	F	
23	F	F	F	F	F	46	58	61	A	71	A	63	A	70	71	75	82	82	68	68	59	63	61	57	F	
24	55	F	F	52	49	45	57	70	61	A	A	64	65	63	A	76	74	71	A	A	66	55	F	A	F	
25	51	F	F	F	53	F	56	55	66	A	A	61	66	66	A	A	73	84	A	83	70	55	F	A	F	
26	F	F	F	F	F	41	51	67	A	A	A	67	63	64	70	86	74	65	65	66	57	A	F	F	F	
27	52	F	45	F	F	53	60	70	66	60	62	60	A	61	64	71	74	71	68	67	68	65	58	F	F	
28	57	53	F	51	48	51	54	62	A	64	63	64	64	60	61	60	61	61	65	74	68	57	51	F	F	
29	F	F	F	F	F	F	56	62	61	73	66	62	A	67	72	68	62	A	A	75	78	65	A	F	F	
30	F	F	F	F	F	49	76	A	A	65	A	A	A	A	A	66	68	66	72	81	67	68	49	F	F	
31	47	48	44	F	F	45	56	A	A	67	A	A	A	A	78	77	71	72	74	80	76	F	F	F	F	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	15	13	13	9	13	28	29	25	20	16	11	17	19	26	22	22	25	23	23	26	29	28	17	11		
MED	53	54	51	51	48	47	56	62	64	64	62	62	60	62	68	69	68	67	68	75	69	64	61	58		
U Q	59	58	60	57	50	52	64	70	74	72	67	64	65	66	72	74	74	72	74	79	76	68	64	65		
L Q	51	50	48	47	44	44	52	58	61	60	61	60	58	59	64	61	62	62	63	67	62	59	54	56		

JUL. 2011 foF2 (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 foF1 (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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							A	A	A	A	A	A	A	A	A	A	A	A						
2						L	L	A	A	A	U L 504	A	A	472	A	452	A	A	A					
3						A	A	U L 404	456	444	456	A	A	A	A	A	A	A	A					
4						A	U L 408	A	A	A	A	U L 496	468	472	A	A	A	A	A					
5					296		A	A	A	A	A	A	U L 448	A	A	A	A	A	A					
6							L	A	A	A	A	A	U L 476	A	A	A	A	A	A					
7							A	A	A	A	A	A	A	A	464	A	A	A	A	A				
8							A	A	A	A	A	A	A	A	A	A	A	A	A					
9						L	L	A	A	U L 500	468	A	A	A	A	A	452	A	A	A				
10						A	A	A	A	A	A	U L 456	A	A	A	A	A	A	A	A				
11					288		A	412	432	448		R	U L 472	A	A	440	L	A	U L 352					
12					U L 320		A	U L 436	U L 428	U L 444	A	A	A	A	A	A	A	A	A	A				
13					336	400		A	A	A	A	492	U L 484	A	456	460	A	400	L					
14						L	L	A	U L 452	500	476	480	A	U L 516	484	A	440	A	A					
15						L	A	A	A	A	A	A	A	A	A	A	444	424	A					
16								A	A	A	A	A	A	A	A	A	A	A	A					
17						384		A	A	A	A	U L 500	516	A	U L 484	496	440	A	A					
18							L	A	A	A	A	A	U L 496	460	484	A	A	A	A	A				
19						A	A	A	A	A	A	A	U L 492	A	A	A	A	A	A	A				
20							L	A	A	A	A	A	A	A	480	A	U L 432	A	A					
21							A	A	A	A	A	A	480	472	472	444	A	L	L					
22						A		A	A	A	A	U L 500	500	A	A	A	432	A	L					
23							L	A	A	A	A	A	A	A	A	A	A	A	L	A				
24							L	A	A	A	A	A	U L 500	476	A	A	A	A	A	A				
25								L	A	A	A	A	A	U L 488	A	A	A	A	A					
26							A	A	A	A	A	A	A	A	A	A	A	A	A					
27							L	A	A	A	A	A	A	A	A	460	428	A	L					
28								L	A	A	A	A	A	A	U L 492	452	428	420	A					
29							L	A	A	A	A	A	U L 468	A	468	436	A	A	A					
30						L	A	A	A	A	A	A	A	A	A	A	A	A	A					
31							A	A	A	A	A	A	A	A	A	A	444	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						4	5	3	5	9	5	8	8	10	9	9	9	3	1					
MED					308	400	412	452	456	476	490	U L 488	472	480	452	436	420	U L 352						
U Q					U L 328	U L 408	U L 436	U L 510	U L 486	U L 502	U L 498	U L 498	U L 476	U L 484	U L 464	U L 442	U L 424							
L Q					292	386	404	430	446	462	478	476	468	468	448	430	400							

JUL.2011 foF1 (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 foE (0.01MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
2						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
3						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
4						A	A	A	A	A	A	R	A	R	A	A	A	A	A	A	B			
5						A	A	A	A	A	A	A	A	R	A	A	A	A	A	A	B			
6						R	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
7					196	B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
8						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
9						A	A	A	A	A	R	A	A	A	A	A	A	A	A	A	B			
10						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
11						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
12						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
13						A	A	A	A	A	A	A	A	A	R	R	A	A	A	A	B			
14						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
15						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
16						B	R	A	A	A	A	A	A	A	A	A	A	A	A	A				
17						B	A	A	A	A	A	A	A	A	R	R	R	A	A	A	B			
18						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
19						A	A	A	A	A	A	A	A	A	A	A		A	A	A	B			
20						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
21						R	A	A	A	A	A	A	A	A	R	R	A	A	A	A	B			
22					188	A	A	A	A	R	R	A	A	A	A	A	A	A	A	U	A	B		
23						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
24						R	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
25						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
27							A	A	A	A	A	A	A	A	A	R	R	A	A	A	B			
28							A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
29							A	A	A	A	A	A	A	R	A	A	R	A	A	A	B			
30						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B			
31						B	A	A	A	A	A	A	A	A	A	A	A	A	A	A	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						3	4												1					
MED						R	U	A											U	A				
U Q						196	248																	
L Q						R	U	A																
						176	236																	

JUL.2011 foE (0.01MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 foEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	20	
2	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
3	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
4	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
5	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
6	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
7	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
8	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
9	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
10	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
11	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
12	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
13	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
14	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
15	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
16	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
17	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
18	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
19	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
20	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
21	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
22	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
23	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
24	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
25	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
26	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
27	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
28	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
29	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
30	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
31	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23		
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
UQ	61	62	50	58	41	31	54	68	86	87	110	92	75	74	76	76	77	75	79	63	78	75	75	74		
LQ	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A	J	A
	29	31	27	24	20	21	32	48	45	50	52	47	47	44	45	42	43	44	30	27	45	40	28	36		

JUL.2011 foEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 fbEs (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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	40	A A 77	45	22	25	24	46	A A A 116	A A A 108	A A A 89	A A A 107	A A A 110	A A A 81	60	64	53	58	44	38	32	31	18	18	E B 14	
2	24	E B 21	E B 15	26	18	22	30	A A A 111	A A A 82	40	A A A 95	A A A 100	42	46	35	38	48	35	28	21	E B 15	E B 15	20		
3	38	30	35	27	E B 15	28	39	33	37	38	38	41	85	55	A A A 95	A A A 131	38	37	29	32	20	28	27	37	
4	17	A A 33	A A 76	E B 16	19	40	32	40	43	66	225	G	41	G	53	A A A 107	A A A 136	42	57	42	17	28	38	19	
5	E B 17	E B 15	E B 16	E B 16	15	20	A A A 84	A A A 118	53	A A A 84	A A A 92	A A A 82	64	G	45	A A 76	45	A A A 60	A A A 63	35	A A 85	22	A A A 114	A A A 80	
6	A A 20	A A 77	30	33	25	G	32	44	A A A 105	A A A 98	A A A 59	A A A 137	35	40	A A 72	49	46	40	33	19	32	19	A A 76	30	
7	30	28	E B 14	37	18	22	A A 71	48	48	A A A 68	A A A 78	75	46	48	39	A A 56	40	38	43	45	48	37	19	16	
8	38	30	E B 16	E B 13	17	20	37	47	52	53	55	49	47	44	A A A 61	A A A 70	42	A A A 64	A A A 88	19	39	22	22	23	
9	22	22	20	E B 15	E B 15	19	26	40	41	42	G	A A 43	A A 63	49	A A 76	36	40	59	43	52	34	32	20	20	
10	21	30	30	39	28	26	38	49	A A A 44	A A A 76	52	39	48	A A A 51	A A A 60	89	A A A 134	A A A 76	A A A 37	A A A 63	20	22	30	E B 16	
11	26	26	31	E B 17	E B 16	19	38	33	37	36	G	49	41	46	48	37	37	A A 68	29	39	17	28	18	22	
12	16	23	22	E B 15	17	20	44	36	33	37	A A A 58	A A A 46	A A A 64	A A A 83	40	A A A 56	A A A 93	A A A 145	A A A 79	A A A 119	22	40	37	30	
13	E B 15	E B 16	16	19	E B 14	18	28	42	44	118	120	40	38	43	G	G	42	30	25	26	20	18	E B 15	22	
14	20	19	18	19	E B 15	18	29	42	37	40	37	41	58	43	40	50	34	44	33	22	21	20	A A A 109	A A A 102	
15	A A 84	17	25	38	17	18	44	A A 67	49	126	70	123	58	52	46	45	37	35	30	39	22	27	18	30	
16	E B 14	E B 15	E B 14	18	19	18	21	42	75	50	122	72	77	56	40	A A A 166	A A A 81	A A A 39	A A A 148	57	20	37	30	31	
17	35	34	27	20	E B 16	21	30	60	A A 100	58	112	44	42	57	G	G	G	27	33	31	34	24	21	41	36
18	25	19	23	20	E B 14	20	27	39	51	58	58	52	41	38	39	53	A A A 138	A A A 113	60	A A A 129	29	34	36	40	
19	49	17	46	31	22	31	53	A A A 68	A A A 75	A A A 82	A A A 77	62	41	48	A A 67	56	A A A 53	A A A 61	A A A 177	A A A 110	17	30	E B 15	E B 14	
20	E B 15	E B 15	31	19	E B 15	34	27	55	42	78	139	99	52	47	42	50	34	44	34	17	24	30	24	24	
21	E B 15	23	28	20	E B 15	G	34	46	55	42	44	126	42	34	G	G	42	32	22	E B 16	E B 15	20	21	22	
22	19	19	28	36	18	A A 54	27	33	38	G	G	42	51	78	53	43	38	38	22	E B 16	18	20	E B 15	20	
23	26	18	34	16	19	20	29	48	72	65	A A 67	46	73	56	54	68	67	49	23	60	38	33	E B 15	20	
24	18	24	E B 16	E B 15	21	G	29	41	48	134	64	48	40	40	A A 83	54	62	38	A A A 52	A A A 120	18	34	30	A A 75	
25	39	27	20	19	25	17	26	34	59	87	106	56	48	38	A A A 82	A A A 170	46	61	138	45	34	23	31	A A 82	
26	25	36	22	22	E B 14	23	34	46	107	142	110	54	47	50	48	45	39	40	46	37	21	108	31	34	
27	36	29	36	19	E B 16	20	28	39	43	41	52	41	58	41	58	G	G	34	20	E B 15	19	14	21	23	
28	20	E B 16	E B 15	E B 16	E B 15	18	29	36	A A 90	39	49	43	45	47	42	40	38	33	29	21	37	20	22	20	
29	34	20	E B 15	E B 14	E B 15	20	29	44	49	36	54	41	91	A A 45	38	G	A A 80	A A A 100	51	18	44	A A 85	40		
30	38	23	23	20	E B 14	18	44	A A A 93	A A A 87	59	A A A 137	A A A 112	68	123	93	44	43	36	28	18	32	34	E B 28	15	
31	E B 16	E B 15	32	17	E B 16	E B 16	35	A A A 74	A A A 86	51	A A A 143	A A A 92	A A A 129	A A A 103	49	41	33	29	21	20	45	52	37	40	
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
CNT	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	
MED	24	23	23	19	E B 16	20	32	44	51	59	A A 64	49	51	47	48	50	42	42	35	35	22	28	27	23	
U Q	36	30	31	26	19	23	39	A A A 55	A A A 86	A A A 84	A A A 110	A A A 92	A A A 68	56	A A A 64	A A A 68	58	A A A 61	A A A 60	52	34	34	37	37	
L Q	E B 17	E B 17	E B 16	E B 16	E B 15	18	28	39	43	41	49	42	42	40	40	38	37	36	29	20	19	20	E B 18	20	

JUL.2011 fbEs (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 fmin (0.1MHz) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'E SWEEP 1.0MHz TO 30.0MHz IN 15.0SEC IN MANUAL SCALING

$\begin{matrix} H \\ D \end{matrix}$	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	15	14	15	14	14	14	14	14	17	21	21	25	22	25	28	22	24	14	14	15	15	14	15	14
2	14	14	15	15	14	14	14	14	14	17	18	27	25	25	24	24	16	14	14	14	15	15	15	15
3	14	14	15	15	15	14	13	14	14	18	22	24	28	30	27	21	17	15	14	14	14	15	15	14
4	15	15	15	16	15	14	17	15	16	23	22	20	21	25	26	24	20	15	14	15	15	15	15	16
5	15	15	15	16	15	14	14	13	20	26	18	23	21	22	22	23	16	14	13	15	16	15	15	15
6	15	15	15	14	14	14	13	16	17	18	18	24	23	24	22	25	19	13	13	15	16	14	16	15
7	15	15	14	14	14	14	15	14	16	19	27	22	24	20	22	20	17	14	13	14	16	15	15	15
8	15	15	16	13	14	14	14	12	15	18	23	29	22	23	19	20	18	14	14	15	14	15	15	15
9	14	15	14	15	15	14	12	15	11	19	27	28	28	23	23	17	12	16	14	14	14	13	15	15
10	14	15	14	14	14	14	14	15	14	16	20	20	20	16	18	16	16	14	14	14	15	15	14	15
11	14	15	14	14	16	14	13	19	17	22	18	20	23	23	18	20	17	16	15	14	15	15	15	13
12	15	14	15	15	14	14	14	14	14	17	20	19	23	23	20	23	18	15	15	13	15	15	15	15
13	15	16	15	15	14	14	14	17	18	20	20	19	18	23	20	20	19	15	13	13	14	14	15	14
14	15	14	15	15	15	14	15	14	15	20	20	22	22	20	22	18	20	15	15	15	15	15	16	14
15	14	15	14	13	14	15	15	14	17	16	22	25	25	26	25	22	18	13	15	14	15	14	15	14
16	14	15	14	14	15	14	14	15	15	22	26	26	34	27	26	25	20	14	13	15	15	14	15	15
17	14	14	16	15	16	14	14	15	16	21	24	24	24	30	24	18	19	13	14	15	15	14	15	14
18	16	16	15	13	14	15	14	16	16	18	22	25	23	21	25	24	18	14	16	14	16	15	16	16
19	16	14	15	14	14	14	14	15	17	18	22	24	24	26	25	24	19	13	14	14	15	14	15	14
20	15	15	15	15	15	14	14	16	16	22	26	25	24	20	20	23	19	14	14	15	14	15	15	14
21	15	14	15	14	15	14	14	14	14	19	20	28	25	22	23	19	17	14	13	15	15	15	15	15
22	15	15	14	13	15	14	14	14	15	22	22	22	27	27	28	18	16	16	15	16	15	14	15	14
23	15	15	16	15	14	14	14	14	14	21	24	21	27	32	26	25	19	16	15	13	15	15	15	14
24	15	14	16	14	15	16	14	15	14	20	20	22	23	22	16	17	16	14	14	15	15	15	14	13
25	16	15	14	12	14	15	13	14	17	17	22	24	20	25	23	25	18	16	13	14	14	16	14	14
26	15	16	14	14	14	15	14	13	14	18	22	26	29	23	22	20	17	13	13	14	15	15	14	15
27	14	16	14	14	16	14	14	15	18	22	24	28	27	25	25	22	21	14	13	15	15	14	15	15
28	14	16	15	16	15	14	13	17	20	24	24	22	22	25	23	22	20	13	14	14	16	15	15	16
29	15	15	15	14	15	13	14	14	20	18	24	23	29	23	28	21	18	14	14	14	14	14	13	14
30	15	15	14	14	14	14	14	13	18	25	28	26	24	25	24	25	19	15	14	15	14	15	16	15
31	16	15	15	14	16	16	14	13	18	22	26	22	28	28	23	17	15	14	12	14	15	14	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	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31
MED	15	15	15	14	15	14	14	14	16	20	22	24	24	24	23	22	18	14	14	14	15	15	15	15
U Q	15	15	15	15	15	14	14	15	17	22	24	26	27	26	25	24	19	15	14	15	15	15	15	15
L Q	14	14	14	14	14	14	14	14	14	18	20	22	22	22	22	19	17	14	13	14	14	14	15	14

JUL. 2011 fmin (0.1MHz)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 M(3000)F2 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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		F	A	F	291	327	346	342		A	A	A	A	A	278	278	288	293	306	307	345	325	303	294	282				
2		304	324	300	285	F	307	338	331		A	A	297	A	309	303	310	343	324	305	312	298	299	312	324				
3		F	F	F	F	F	301	338	362	318	314	316	334	A	285		A	305	305	318	324		295	F	298				
4		288	292	A	F	311	313	286	329	357	349		A	R	309	316	325		A	297	299	310	330	302	F	F			
5		F	F	F	F	297	295		A	A		A	A	A	286	301		317		A	A	301		290	A	A			
6		307	A	292	F	297	325	332	338		A	A	A	A	314	273		308	296	294	286	303	313	367	A	F			
7		F	F	F	F	F	345		A	320	329		A	A	296	288	287		A	321	301	313	308	308	318	319	325		
8		F	295	306	302	F	312	296	329	348		A	299	311	294	337		A	307		A	317	338	299		F	F		
9		F	F	F	F	F	323	344	323	302	307	323	324		299		A	294	303	303	316	332	307	295	292	303	F		
10		F	303	287	F	291	285	297	337		A	A	A	283	305		A	A	A	A	A	313		A	334	329	281	F	
11		F	F	F	F	F	290	276	347	337		R	R	R	269	291	294	300	315	319		A	327	314	287	287	290	F	
12		292	297	304	289	301	292	315	296	306	260		A	A	A	A		287		A	A	A	A	A	270	F	311	F	
13		290		305	302	298	297	290	315	341		A	301	276	298	301	329	342	319	327	318	312	297	312	305	A	A		
14		293	292	303	295	299	308	332	321	353	317	317	318	348	298	322	327	327	306	310	313	324	296		F	289	F		
15		A	308	F	F	F	328	270		A	337		A	A	298	313	317	331	309	292	330	342	325	306		F	289	F	
16		291	286	F	F	312	286	297	312	356	361		A	A	279	302		A	312		A	323	323	286		F	F		
17		F	F	301	F	F	296	324	299		A	306		287	310	292	307	305	303	309	307	310	310	331		F	F		
18		F	F	F	F	F	349	329	342	320	318	349	320	300	298	299	314		A	A	318		A	306	303	308		F	
19		F	304	285	F	F	321	354		A	A	A	A	A	317	284		304		A	A	A	A	289	281	297	303		
20		320		304	F	F	288	319	334	349		A	A	A	278	313	296	307	299	309	289	303	290	299	304	279			
21		294	289	313	304	288	288	305	329	342	295	302		A	270	290	292	317	307	309	314	317	299	306	301	297		F	
22		310	308	F	F	F		340	331	336	309	327	303	293		301	307	318	328	300	302	320	329	320					
23		F	F	F	F	F	307	320	319		A	343		A	301		302	287	289	299	331	340	317	290	291	312	295		
24		288	F	F	306	318	350	342	357	312		A	A	304	321	306		A	307	323	328		A	321	285		F	A	
25		301	F	F	F	F	308		327	342	338		A	A	302	320	304		A	A		A	330	326	301		F	A	
26		F	F	F	F	F	333	313	356		A	A	A		327	316	306	299	325	345	327	337	335	310		A	F	F	
27		312	F	318	F	F	333	334	338	347	339	340	307		313	298	310	321	325	330	321	316	306	283			F		
28		295	291	F	300	318	327	361	333		A	315	306	329	313	284	314	319	311	324	325	335	325	307	309		F		
29		F	F	F	F	F		339	354	315	333	350	313		A	306	305	310	317		A	A	313	330	306		A	F	
30		F	F	F	F	F	291	358		A	A	332		A	A	A	A		312	319	303	310	334	306	317	338		F	
31		297	308	298	F	F	321	331		A	A	338		A	A	A	A		309	315	309	306	317	328	323		F	F	F
		00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23				
CNT		15	13	13	9	13	28	29	25	20	16	11	17	19	26	22	22	25	23	23	26	29	28	17	11				
MED		295	297	303	300	301	310	329	331	338	318	317	307	305	298	301	310	311	309	314	317	313	302	308	298				
U Q		307	308	306	303	315	328	340	342	348	338	340	322	316	306	307	317	321	324	327	330	325	306	312	305				
L Q		291	292	295	290	297	294	301	320	319	308	302	301	293	286	296	307	303	303	307	310	302	295	293	289				

JUL. 2011 M(3000)F2 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 M(3000)F1 (0.01) 135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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							A	A	A	A	A	A	A	A	A	A	A	A	A					
2						L	L	A	A	A	U L 380	A	A	393	A	356	A	A	A					
3						A	A	U L 405	396	437	434	A	A	A	A	A	A	A	A					
4						A	U L 345	A	A	A	A	U L 413	422	378	A	A	A	A	A					
5					332		A	A	A	A	A	A	U L 389	A	A	A	A	A	A					
6							L	A	A	A	A	A	U L 379	A	A	A	A	A	A					
7							A	A	A	A	A	A	A	A	367	A	A	A	A	A				
8							A	A	A	A	A	A	A	A	A	A	A	A	A					
9						L	L	A	A	U L 337	409	A	A	A	A	A	349	A	A	A				
10						A	A	A	A	A	A	U L 296	A	A	A	A	A	A	A	A				
11					333	A	383	426	443	A	R	U L 407	A	A	A	405	L	A	U L 361					
12					U L 317	A	U L 408	U L 372	U L 432	A	A	A	A	A	A	A	A	A	A	A	A			
13					326	349	A	A	A	A	A	U L 410	372	A	358	385	A	A	L					
14					L	L	A	U L 393	378	408	418	A	U L 359	383	A	A	370	A	A					
15					L	A	A	A	A	A	A	A	A	A	A	A	A	370	352	A				
16						356	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
17					L	U L 368	A	A	A	A	U L 388	366	A	U L 390	363	364	A	A	A	A				
18						L	A	A	A	A	A	U L 417	435	351	A	A	A	A	A	A				
19					A	A	A	A	A	A	A	U L 383	A	A	A	A	A	A	A	A				
20						L	A	A	A	A	A	A	A	A	366	A	U L 379	A	A					
21						A	A	A	A	A	A	A	316	340	373	328	A	L	L					
22					A		A	A	A	A	U L 371	409	387	A	A	A	A	366	A	L				
23						L	A	A	A	A	A	A	A	A	A	A	A	A	A	L	A			
24						L	A	A	A	A	A	U L 395	403	A	A	A	A	A	A	A				
25						371	L	A	A	A	A	A	U L 371	A	A	A	A	A	A	A				
26						A	A	A	A	A	A	A	A	A	A	A	A	A	A	A				
27						L	A	A	399	A	409	A	A	A	A	360	372	A	L					
28							L	A	421	A	A	A	U L 330	365	375	352	A	A						
29						L	A	A	397	A	394	A	U L 367	A	372	384	A	A	A					
30					L	A	A	A	A	A	A	A	A	A	A	A	A	A	A					
31						A	A	A	A	A	A	A	A	A	A	A	375	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						4	5	3	5	9	5	8	8	10	9	9	9	3	1					
MED						329	356	405	393	399	409	402	U L 389	378	367	363	372	352	U L 361					
U Q						332	370	U L 408	411	434	422	412	U L 412	393	386	378	377	374						
L Q						322	347	383	363	374	394	U L 388	U L 369	U L 367	354	352	368	352						

JUL.2011 M(3000)F1 (0.01)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN



## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 h'F2 (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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						268		A	A	A	A	A	A	E A	E A	E A	E A	E A	278	276				
2						268	248	258		A	A		A				318	266	278	276				
3						E A	280	268	234	312	290	344	328	A	E A	A		A	310	276	274			
4						E A	326	352	274	240	278		A	376	352	342	290		A		E A	302		
5							A	A		A	A	A	A		A			A		A	A			
6							296	274		A	A	A	E A	E A		A	E A							
7							A	E A		A	A	A		270	396		358	356	358	324				
8							322	304						368	372	384		A		304	308	300	294	
9							358	292	264		A	E A		E A	E A		A				A	A		
10						280	268	262	336	334	294	310		A	364		368	318	304	256				
11						354	E A	E A	A	A	A			420	358		A	A			A			
12						E A	362	422	274	318	236		R	370	392	392	360	344	310		A			
13							360	328	354	362	460		A	A	A		388				A			
14							384	388	320	282				382	458	380	356	306	294	318	278			
15						306	272	284	256	268	338	316	E A	296	372	314	288	296	326	300				
16						E A	292	396		264		A	A	E A	E A			A						
17							352	282	252	252		A	A	A	E A			A		272				
18						318	298	E A	380		288		308	300	342	336	320	320	302	278				
19							312	258	338	348	278	328	398	372	350	324		E A	A	E A	A			
20						278	250	A	A	A	A	A		E A	340	336	E A			A	A			
21							262	274	252			A	A	E A	390	326	358	316	338	312	312			
22							280	262	E A	E A	A		A	440	386	362	310	322	298	274				
23						A			286	320	290	318	E A	380		340	324	288	268	286				
24							302	304	E A	E A	A			E A	E A	E A	E A				E A			
25							254	252	298		A		350	322	356		A	314	310	276				
26							302	280	E A	A	A	E A	E A	368	322	336		A		E A	A			
27							E A	290	262		A	A	A	306	314	348	346	278	250	272	266			
28							268	276	262	294	296	312		A	334	E A	364	312	284	278	262			
29								264	A	302	E A	292	336	E A	356	352	338	312	296	274				
30							280	236	E A	302	288	E A	262	324	A	332	330	320	308		A	E A	272	
31						316	234	A	E A	306	A	A	A	A	A		A	332	306	304	274			
							268		A	284		A	A		A	300	290	318	294	272				
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
CNT						14	27	24	20	17	11	18	19	26	22	22	25	23	23	3				
MED						314	281	272	274	287	312	326	344	349	346	316	311	296	275	E A	294			
U Q						360	352	298	315	318	362	368	390	374	360	338	322	312	300	E A	308			
L Q						280	268	262	259	278	290	312	322	334	332	310	300	276	272	E A	272			

JUL. 2011 h'F2 (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 h'F (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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	E A 304	AE AE 334	AE AE 278	AE AE 256	AE AE 222		A	A	A	A	A	A	A	A	A	A	A	A	A	222	210	210	E AE 274	E B 262		
2	E AE 286	AE AE 240	BE AE 262	BE AE 298	AE AE 276	AE AE 238	226		A	A	A		A	A		224		A	A	AE AE 238	AE AE 248	BE BE 256	BE B 232	218		
3	E AE 300	AE AE 314	AE AE 318	AE AE 290	AE B 256		A	A	200	188	196	200		A	A	A	A	A	A		238	AE AE 242	AE AE 262	AE AE 258	AE A 296	
4	E AE 284	AE A 316	AE AE 276	BE AE 264	AE AE 264		AE AE 248		A	A	A	A	182	196	222		A	A	A	AE AE 242	208	AE AE 270	AE AE 316	AE A 288		
5	E AE 298	BE AE 286	BE AE 272	BE AE 302	BE AE 286	AE A 268		A	A	A	A	A	A				A	A	A	AE AE 280		AE AE 274		A		
6	E A 256	AE AE 306	AE AE 306	AE AE 302	AE AE 248	224		A	A	A	A	A	A				A	A	A	AE AE 254	AE AE 250	204	AE AE 330			
7	E AE 312	AE A 288	AE AE 226	AE AE 324	AE AE 248	AE AE 216		A	A	A	A	A	A		AE AE 256		A	A	A	A	A	AE AE 324	AE AE 282	AE AE 246	AE A 230	
8	E AE 296	AE AE 278	AE BE 242	BE AE 254	BE AE 280	AE A 228		A	A	A	A	A	A		A		A	A	A		246	AE AE 224	AE AE 232	AE AE 318	AE A 324	
9	E AE 276	AE AE 254	AE AE 268	AE AE 266	AE BE 274	AE BE 224	AE A 220		A	AE AE 244	198		A	A	AE AE 274		A	A	A	AE AE 242	AE AE 256	AE AE 304	AE AE 302	AE A 256		
10	AE AE 286	AE AE 288	AE AE 326	AE AE 298	AE AE 306		A	A	A	A	A	AE AE 330		A	A	A	A	A	A				AE AE 228	AE AE 212	AE AE 304	AE A 296
11	E AE 302	AE AE 312	AE AE 306	AE BE 310	AE BE 298	AE A 258		222	196	190		R	A	A	A	198	230		AE AE 240	AE AE 248	AE AE 250	AE AE 300	AE AE 290	AE A 284		
12	E AE 264	AE AE 284	AE AE 270	BE AE 276	BE AE 264	AE A 246		214	226	194		A	A	A	A	A	A	A	A		AE AE 242	AE AE 320	AE AE 272	AE A 316		
13	E BE 270	AE AE 282	AE AE 266	AE AE 284	AE BE 250	AE BE 228	238		A	A	A		194	222		234	196		A	212	214	216	244	252	250	248
14	E AE 278	AE AE 284	AE AE 274	AE AE 266	AE BE 266	AE A 224	216		212	202	186	192		AE AE 238	226		216		A	AE AE 260	AE AE 236	AE AE 244		A	A	
15	AE AE 256	AE AE 306	AE AE 306	AE AE 366	AE AE 254	226		A	A	A	A	A	A	A	A	A	230	226		A	230	218	AE AE 268	AE AE 308	AE AE 302	
16	E BE 270	BE BE 278	BE BE 274	AE AE 250	AE AE 256	AE AE 222	232		A	A	A	A	A	A	A		A	A	A	AE AE 318	AE AE 236	AE AE 286	AE AE 310	AE AE 308		
17	E AE 302	AE AE 296	AE AE 282	AE AE 254	AE BE 252	AE BE 238	214		A	A	A	A	206	212		198	198	216		AE AE 240	AE AE 234	AE AE 228	AE AE 260	AE AE 298		
18	E AE 248	AE AE 296	AE AE 306	AE AE 280	AE BE 258	AE BE 218	208		AE AE 280	A	A	A	A	212	198	236		A	A	AE AE 260	AE AE 260	AE AE 290	AE AE 310			
19	E AE 312	AE AE 256	AE AE 330	AE AE 292	AE AE 258		A	A	A	A	A	A		226		A	A	A	A	AE AE 264	AE AE 282	AE AE 230	AE BE 244			
20	E BE 220	AE AE 252	AE AE 266	AE AE 332	AE BE 294	AE BE 290	222		A	A	A	A	A	A	AE AE 258		198		A	AE AE 250	AE AE 246	AE AE 256	AE AE 246	AE AE 292		
21	E BE 254	AE AE 298	AE AE 262	AE AE 282	AE BE 266	AE BE 228		A	A	A	A	A	AE AE 292	AE AE 256	198	218		A	222	222	252	218	AE AE 248	AE AE 256	AE AE 272	
22	E A 252	AE AE 224	AE AE 308	AE AE 316	AE AE 290		224	208		228	198	220		A	A	A		226		A	214	254	232	AE AE 226	AE AE 308	
23	E AE 332	AE AE 314	AE AE 348	AE AE 248	AE AE 252	220	240		A	A	A	A	A	A	A	A	A	A	A		208	AE AE 290	AE AE 282	AE BE 258	AE A 284	
24	E AE 278	AE AE 282	AE AE 248	AE AE 254	AE BE 272	AE BE 220	218		A	A	A	A	A	206	206		A	A	A	A	A	A	AE AE 224	AE AE 328	AE AE 310	A
25	E AE 338	AE AE 326	AE AE 300	AE AE 260	AE AE 280	AE A 224	208	206		A	A	A	A	A	A	212		A	A	A	234	236	AE AE 280	AE AE 352	A	
26	E AE 312	AE AE 302	AE AE 308	AE AE 252	AE BE 256	AE BE 256		A	A	A	A	A	A	A	A	A	A	A	A		228	AE AE 242	AE AE 364	AE AE 304		
27	E AE 302	AE AE 318	AE AE 306	AE AE 288	AE BE 270	AE BE 236	210		A	A	A	A	A	A	A		192	210		A	214	228	AE AE 226	AE AE 230	AE AE 280	AE AE 276
28	E AE 262	AE BE 264	AE BE 270	AE BE 260	AE BE 246	AE BE 224	222	214		204		A	A	AE AE 284	220		236	222		A	230	AE AE 234	AE AE 240	AE AE 246	AE AE 322	
29	E AE 330	AE AE 252	AE BE 248	AE BE 256	AE BE 254	AE BE 234	216		A	A	200		A	192		212		216	224			AE AE 236	AE AE 288	AE AE 328		
30	E AE 288	AE AE 272	AE AE 278	AE AE 304	AE BE 298	AE BE 240		A	A	A	A	A	A	A	A	A	A	A	A		222	AE AE 252	AE AE 256	AE AE 234	AE BE 282	
31	E BE 280	BE BE 262	AE AE 330	AE AE 304	AE BE 276	AE BE 232		A	A	A	A	A	A	A	A	A		218	246	226	238	AE AE 240	AE AE 286	AE AE 306	AE AE 356	
	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	29	30	31	31	26	17	6	5	9	5	8	8	10	9	9	10	5	7	23	30	30	27	27		
MED	E AE 286	AE AE 284	AE AE 280	AE AE 282	AE BE 266	AE BE 224	AE BE 221	AE BE 211	AE BE 204	AE BE 201	AE BE 198	AE BE 194	AE BE 211	AE BE 216	AE BE 212	AE BE 207	AE BE 219	AE BE 222	AE BE 214	AE BE 234	AE AE 238	AE AE 261	AE AE 274	AE AE 296		
U Q	E AE 302	AE AE 300	AE AE 308	AE AE 304	AE AE 280	AE AE 240	AE AE 229	AE AE 214	AE AE 253	AE AE 223	AE AE 202	AE AE 213	AE AE 224	AE AE 232	AE AE 257	AE AE 222	AE AE 230	AE AE 236	AE AE 226	AE AE 252	AE AE 250	AE AE 282	AE AE 308	AE AE 310		
L Q	E AE 270	AE AE 259	AE AE 266	AE AE 260	AE AE 256	AE AE 224	AE AE 215	AE AE 206	AE AE 192	AE AE 195	AE AE 192	AE AE 192	AE AE 207	AE AE 212	AE AE 198	AE AE 197	AE AE 216	AE AE 217	AE AE 214	AE AE 230	AE AE 228	AE AE 240	AE AE 246	AE AE 272		

JUL. 2011 h'F (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL.2011 h'E (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT.35°43.0'N LON.139°29.0'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						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
2						B	A	A	A	A	A	A	A	A	A	A	116	A	A	B				
3						B	112	A	A	A	120	114	A	A	A	A	A	A	A	B				
4						A	A	A	A	A	A	120	A	120	A	A	A	A	A	B				
5						120	A	A	A	A	A	A	A	128	A	A	A	A	A	B				
6						120	114	A	A	A	A	A	A	A	A	A	118	116	A	B				
7						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
8						120	A	A	A	A	A	A	A	A	A	A	118	A	A	B				
9						118	114	A	A	A	118	A	A	A	A	A	A	A	A	B				
10						A	A	A	A	A	A	A	A	A	120	A	A	A	A	B				
11						B	A	A	A	A	124	124	122	120	118	A	A	A	A	B				
12						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
13						108	A	A	A	A	A	A	A	A	114	120	A	A	A	B				
14						B	116	A	A	A	A	A	A	110	120	114	A	A	A	B				
15						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
16						B	116	A	A	A	A	A	A	A	A	A	A	A	A					
17						B	122	A	A	A	A	A	120	A	120	120	116	112	A	B				
18						B	114	A	A	A	A	A	A	A	A	114	A	A	A	B				
19						A	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
20						A	120	A	A	A	A	A	A	A	120	120	120	A	A					
21						124	124	A	A	A	A	A	A	126	110	120	A	A	A	B				
22						A	114	A	A	114	122	A	A	A	A	A	A	A	B					
23						116	116	A	A	A	A	A	A	A	A	A	A	A	A	B				
24						116	A	A	A	A	A	A	A	A	A	116	A	A	A	B				
25						A	120	A	A	A	A	A	110	120	A	A	A	A	A	B				
26						B	A	A	A	A	A	A	A	A	A	A	A	A	A	B				
27						112	A	A	A	A	A	A	A	114	A	114	114	A	A	B				
28						A	A	A	A	A	A	A	A	A	A	A	126	114	A	B				
29						114	A	A	A	A	A	A	A	116	A	A	114	A	A	B				
30						B	A	A	A	A	A	A	A	A	A	120	A	A	A	B				
31						B	A	A	A	A	A	A	A	A	A	A	A	118	118	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						8	14			1	4	3	3	8	8	10	7	4	2					
MED						119	115			114	121	120	120	120	120	120	116	115	116					
U Q						120	120				123	124	122	123	120	120	118	117						
L Q						116	114				119	114	110	115	116	114	114	113						

JUL.2011 h'E (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 h'Es (KM)

135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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	98	90	90	88	88	92	106	106	102	102	104	102	100	98	96	98	98	98	98	92	92	92	92	92		
2	94	98	104	100	104	108	102	106	102	102	102	98	94	94	96	100	116	104	104	104	102	104	104	102		
3	98	98	98	100	B	110	110	100	102	104	116	124	108	108	102	106	108	108	106	106	98	94	94	100		
4	102	102	98	96	92	102	102	106	102	102	98	G	98	G	106	104	108	108	102	102	102	98	104	106		
5	100	102	102	108	104	118	104	104	102	102	98	98	98	G	100	94	96	96	92	92	96	96	98	102		
6	98	96	96	94	96	G	120	108	104	104	104	104	104	110	104	110	126	122	106	102	94	94	102	102		
7	96	98	98	98	98	122	104	104	104	100	102	102	104	104	100	102	106	102	96	90	90	86	88	98		
8	98	100	102	102	100	128	108	106	106	106	98	96	98	96	98	100	122	106	102	104	100	100	106	102		
9	92	90	88	88	86	120	120	106	100	104	G	104	104	104	98	100	96	92	96	92	92	90	94	90		
10	94	98	98	98	102	102	102	102	104	100	100	96	104	100	112	108	106	108	104	100	98	100	100	92		
11	94	96	96	98	104	104	98	98	100	104	G	130	120	118	118	112	104	106	106	106	102	102	100	92		
12	90	90	94	94	96	106	104	106	108	104	108	102	102	96	104	118	G	G	108	106	104	102	106	106	100	100
13	98	96	96	96	108	114	106	106	100	100	100	100	98	110	G	G	108	106	100	100	102	102	98	96		
14	94	94	90	88	88	108	116	104	104	104	104	102	90	122	118	114	108	106	104	104	106	104	104	104		
15	100	98	98	94	98	114	108	104	110	106	104	102	104	106	106	106	104	104	102	96	94	104	112	108		
16	98	98	B	100	100	112	102	108	98	102	96	104	108	112	128	106	108	108	102	102	100	98	104	104		
17	102	96	92	88	B	120	118	108	102	100	100	100	114	104	G	G	102	120	108	102	100	100	100	100		
18	94	92	92	92	88	90	130	104	102	100	98	98	98	94	96	118	106	104	104	104	102	110	110	100		
19	94	100	96	96	96	100	108	106	102	100	96	96	100	96	94	94	94	104	104	100	104	104	112	B		
20	B	106	96	94	102	102	144	104	100	102	98	98	98	98	116	116	118	106	102	104	102	104	102	104		
21	102	94	96	94	94	G	122	106	104	108	108	104	108	112	G	G	108	106	106	110	100	98	96	96		
22	98	94	94	94	102	114	116	104	104	G	G	110	108	104	104	106	108	102	122	B	102	90	94	104		
23	104	106	106	100	96	122	122	106	104	102	102	106	104	104	100	100	106	106	100	106	98	98	98	98		
24	100	98	100	98	94	G	104	102	100	100	102	102	108	102	130	118	110	110	106	106	108	108	102	98		
25	98	98	98	100	100	104	128	102	102	98	98	102	128	130	106	106	110	106	104	102	102	102	102	100		
26	96	96	94	90	110	98	106	102	98	98	96	98	98	98	98	98	94	106	102	102	102	102	108	102		
27	94	94	98	98	98	106	112	106	106	104	106	106	110	116	106	G	G	104	104	B	94	94	92	90		
28	90	88	B	B	B	110	108	106	104	100	102	98	96	96	96	116	116	116	102	92	90	92	88	96		
29	98	96	96	100	128	116	112	104	102	100	98	102	96	G	106	106	G	104	100	100	98	98	98	96		
30	92	90	88	90	90	104	104	100	96	94	94	90	94	94	94	114	108	104	106	98	94	104	94	94		
31	90	100	104	104	100	B	106	102	100	100	100	96	94	98	98	96	98	126	114	108	104	104	104	100		
	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	31	29	30	28	27	31	31	31	30	28	30	31	28	28	27	29	31	31	29	31	31	31	30		
MED	98	96	96	96	98	108	108	104	102	102	100	102	102	104	103	106	108	106	104	102	100	100	100	100		
U Q	98	98	98	100	102	116	118	106	104	104	104	104	108	110	106	114	109	108	106	104	102	104	104	102		
L Q	94	94	94	94	94	102	104	102	100	100	98	98	98	97	98	100	103	104	102	99	94	94	94	96		

JUL. 2011 h'Es (KM)

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## IONOSPHERIC DATA STATION Kokubunji

JUL. 2011 TYPES OF Es 135°E MEAN TIME (G.M.T. + 9 H)

LAT. 35°43.0'N LON. 139°29.0'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	F3	F4	F3	F2	F2	L2	L2	L3	L3	L2	L2	L2	L2	L2	L2	L3	L2	L2	L2	L3	F3	F3	F2	F1
2	F4	F3	F2	F3	F5	L3	L2	L2	L2	L3	L2	L3	L3	L2	L2	L2	CL22	L4	L3	L5	F4	F2	F3	F3
3	F4	F3	F3	F2		L3	C2	L2	L2	L2	CL11	C1	L2	L2	L2	L2	L2	L2	L3	L4	F3	F3	F3	F3
4	F3	F4	F4	F3	F2	L2	LC22	L2	L3	L2	L3		L2		L2	L3	L3	L2	L3	L3	F2	F3	F3	F2
5	F2	F2	F3	F2	F2	C2	L3	L4	L2	L2	L3	L3	L2		L2	L3	L2	L3	L4	L3	F4	F2	F4	F3
6	F2	F4	F4	F3	F3		C2	L2	L3	L2	L2	L3	L2	L2	L3	L2	CL21	C3	L2	L2	F2	F2	F3	F4
7	F4	F3	F2	F3	F3	C3	L3	L3	L3	L3	L3	L3	L2	L2	L2	L3	L2	L2	L3	L5	F5	F4	F3	F3
8	F2	F4	F2	F2	F3	CL21	L2	L3	L3	L3	L2	L2	L2	L2	L3	L4	CL22	L3	L4	L2	F3	F3	F4	F2
9	F3	F3	F3	F2	F2	C2	C2	L2	L2	L2		L2	L3	L2	L3	L2	L3	L3	L3	L4	F5	F5	F4	F2
10	F2	F4	F5	F4	F4	L3	L2	L3	L2	L4	L2	L2	L2	L2	C2	L2	L3	L2	L3	L3	F4	F4	F3	F4
11	F3	F4	F3	F2	F2	L2	L3	L2	L2	L2		C2	C2	C2	C2	L2	L2	L3	L3	L3	F2	F2	F2	F3
12	F2	F3	F2	F2	F2	L2	L3	L2	L2	L2	L2	L3	L2	L3	L2	L2	L2	L3	L4	L4	F3	F3	F3	F3
13	F2	F2	F2	F5	F2	C2	L3	L2	L2	L3	L3	L2	L2				L2	L3	L2	L2	F3	F3	F1	F2
14	F4	F4	F3	F3	F2	L1	C2	L2	L2	L2	L2	L2	L2	CL11	C2	C2	L2	L3	L2	L3	F5	F3	F5	F4
15	F5	F4	F3	F3	F4	C2	L3	L3	L2	L3	L2	L3	L2	L2	L2	L2	L2	L2	L2	L2	F3	F3	F3	F4
16	F2	F2		F3	F2	C1	L2	L2	L2	L2	L3	L2	L3	L2	L2	L3	L2	L2	L3	L3	F2	F3	F3	F3
17	F3	F3	F2	F2		CL22	L2	L2	L3	L3	L3	L2	C1	L2			L2	CL21	L2	L5	F3	F3	F4	F5
18	F4	F4	F3	F2	F2	L2	CL12	L2	L2	L2	L2	L2	L2	L2	L2	CL22	LL22	L3	L3	L3	F3	F23	F3	F4
19	F6	F2	F5	F4	F3	L3	L4	L3	L2	L2	L3	L3	L2	L2	L3	L2	L2	L3	L4	L3	F3	F3	F2	
20		F2	F4	F3	F1	L3	HL11	L2	L2	L3	L3	L2	L2	L2	C1	C2	C2	L2	L2	L1	F3	F3	F4	F4
21	F2	F5	F3	F2	F1		C2	L3	L2	L2	L2	L3	L2	C2			L2	L2	L2	L1	F2	F3	F3	F3
22	F3	F3	F2	F3	F5	L3	C2	L3	L2			L2	L2	C2	L2	L2	L2	L2	L1		F2	F2	F2	F2
23	F3	F4	F4	F4	F4	C3	C2	L3	L3	L3	L3	L2	L2	L2	L2	L2	L3	L3	L2	L5	F4	F3	F3	F3
24	F3	F3	F1	F4	F3		L3	L2	L3	L3	L2	L2	L2	L2	CL32	CL22	L2	L2	L2	L5	F3	F4	F4	F5
25	F4	F4	F5	F3	F2	L2	CL12	L2	L3	L3	L2	L3	CL12	C1	L2	L2	L2	L3	L3	L3	F6	F3	F4	F4
26	F4	F4	F2	F2	F2	L2	L2	L3	L3	L2	L2	L2	L2	L2	L2	L2	L2	L2	L5	L5	F3	F4	F4	F5
27	F3	F3	F3	F3	F3	F2	C2	L2	L2	L2	L2	L2	L2	C1	L2			L2	L2		F1	F3	F3	F3
28	F2	F2				L3	L2	L2	L3	L2	L2	L2	L2	L2	L2	CL11	L2	CL11	L2	L3	F3	F3	F2	F2
29	F3	F3	F1	F2	F1	F3	L2	L3	L2	L2	L2	L2	L3		L2	L2		L4	L3	L4	F3	F5	F5	F5
30	F3	F3	F2	F2	F2	L1	L3	L3	L3	L2	L2	L2	L2	L3	L2	C1	L2	L2	L2	L3	F3	F24	F4	F2
31	F2	F1	F3	F2	F1		L3	L3	L4	L3	L2	L2	L2	L3	L2	L2	L2	CL11	C1	L2	F4	F4	F3	F3
	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																								

JUL. 2011 TYPES OF Es

NATIONAL INSTITUTE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY, JAPAN

## f-PLOTS OF IONOSPHERIC DATA

KEY OF f-PLOT	
	SPREAD
◊	f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E
×	f <sub>x</sub> F <sub>2</sub>
*	DOUBTFUL f <sub>o</sub> F <sub>2</sub> , f <sub>o</sub> F <sub>1</sub> , f <sub>o</sub> E
⊗	f <sub>b</sub> E <sub>s</sub>
└	ESTIMATED f <sub>o</sub> F <sub>1</sub>
†, ‡	f <sub>min</sub>
^	GREATER THAN
∨	LESS THAN

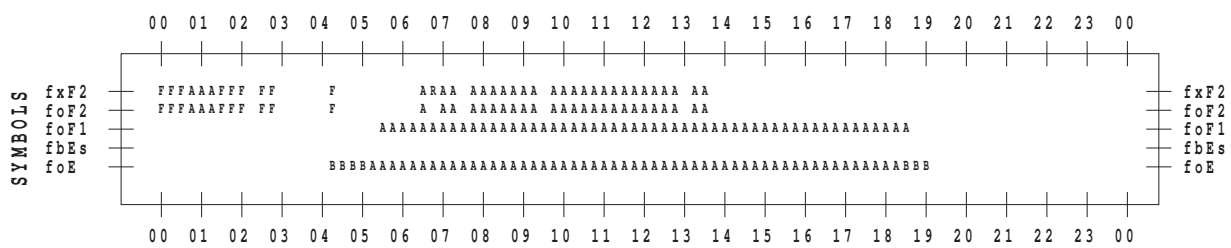
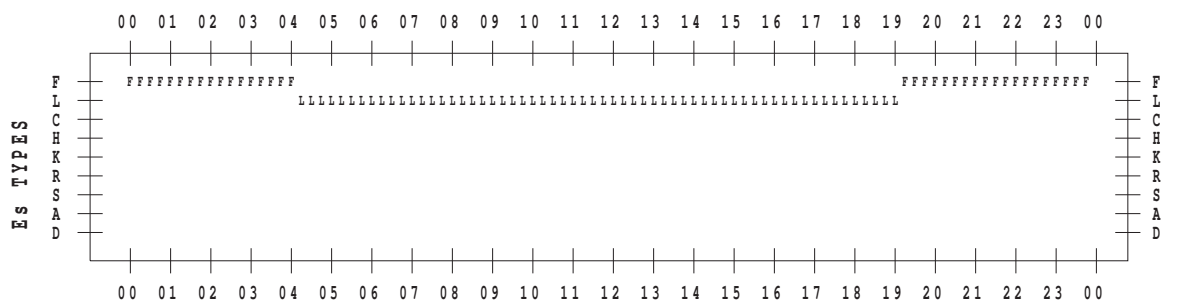
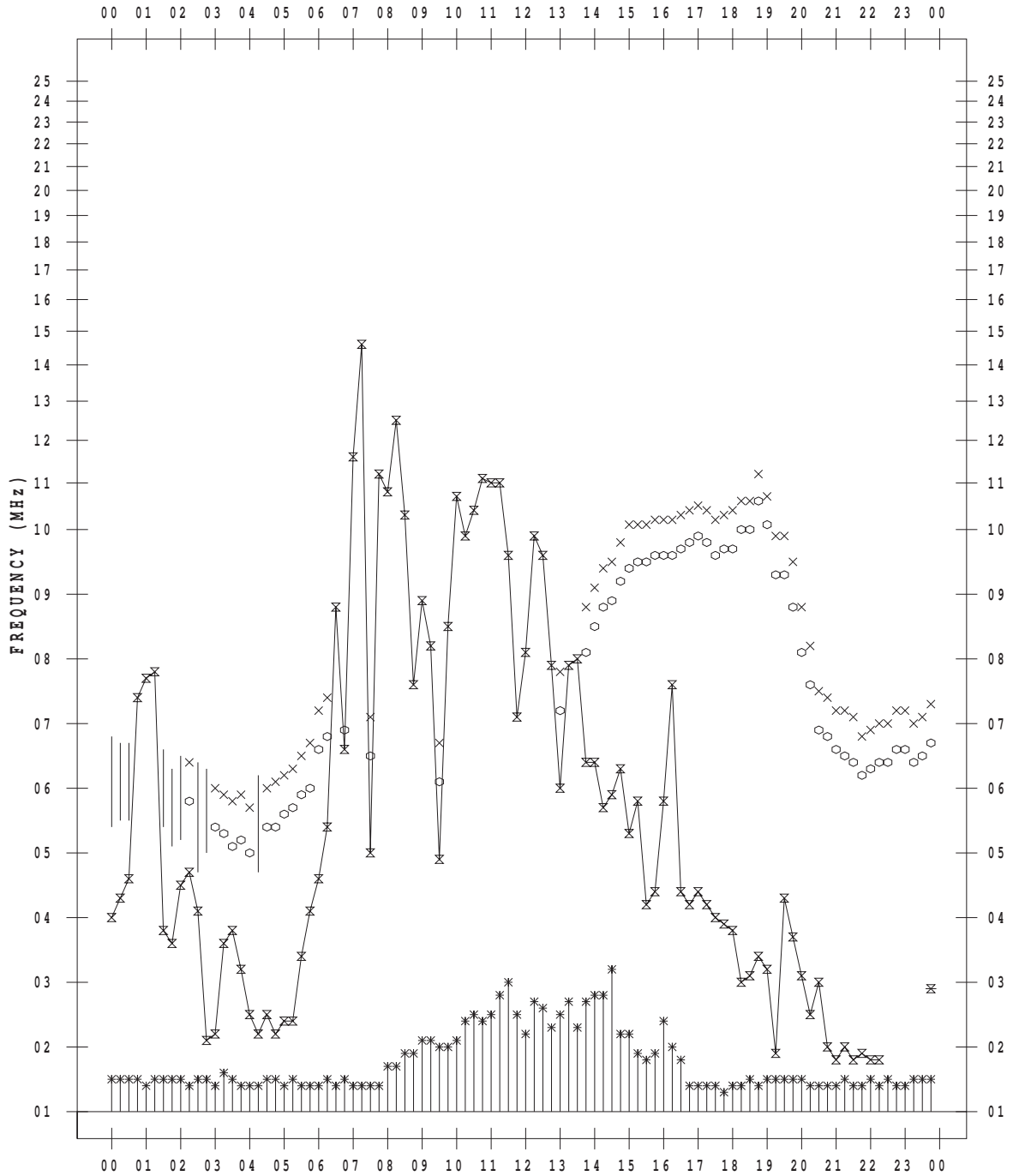
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 1

135 ° E MEAN TIME



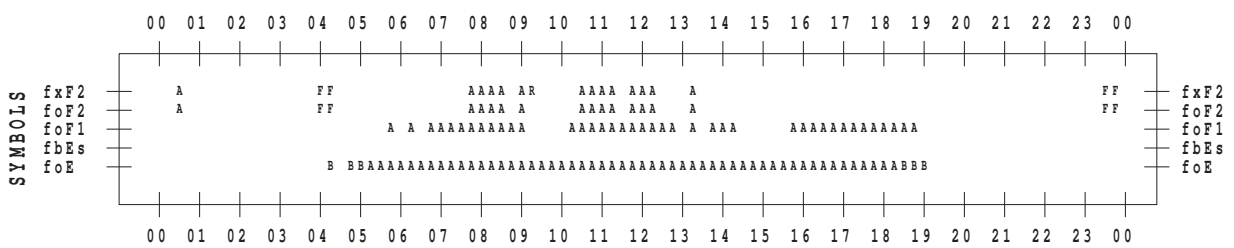
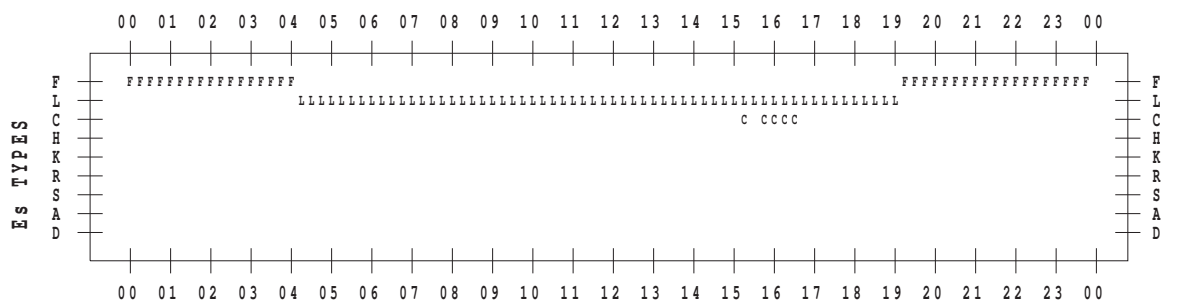
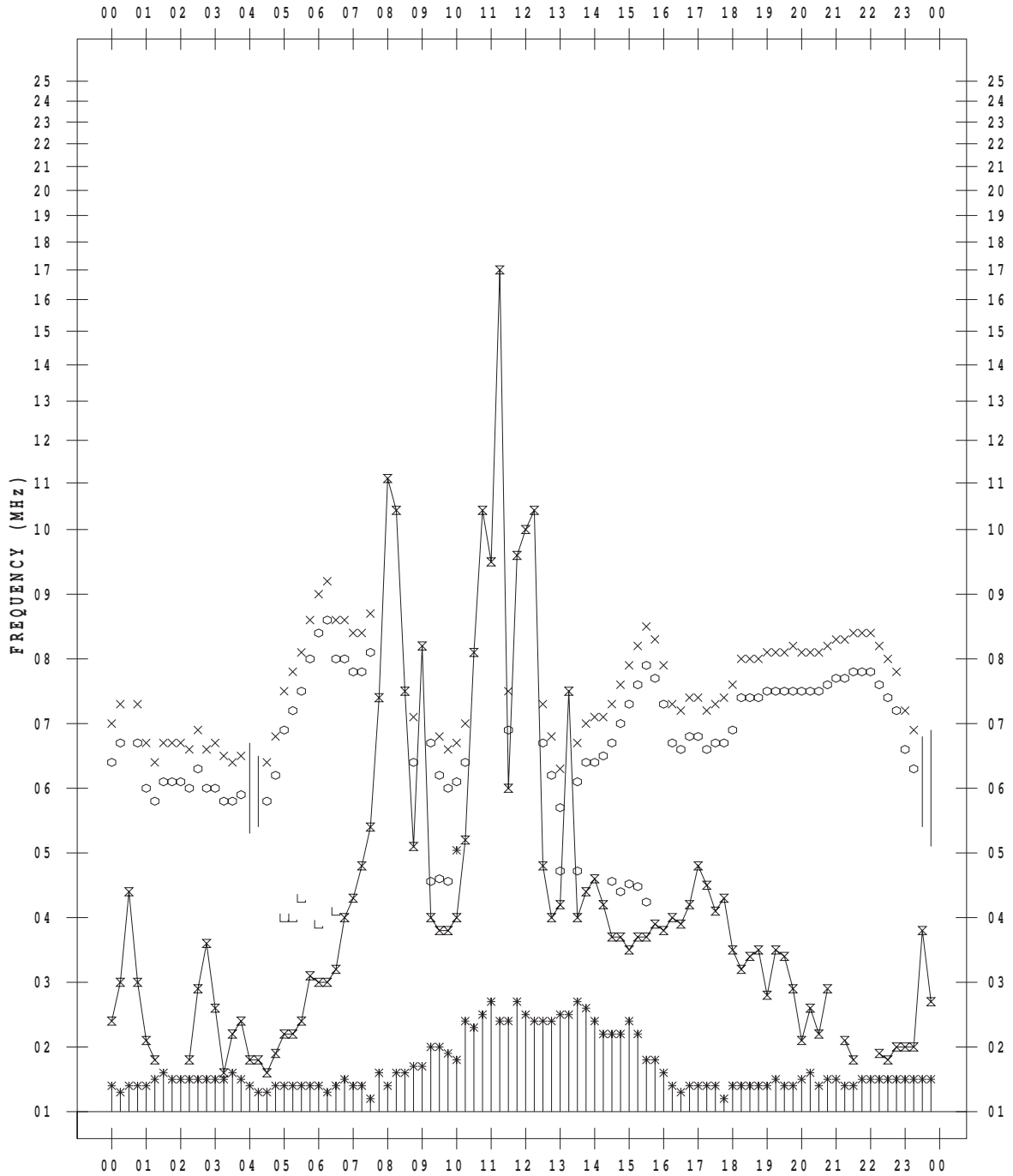
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 2

135 ° E MEAN TIME





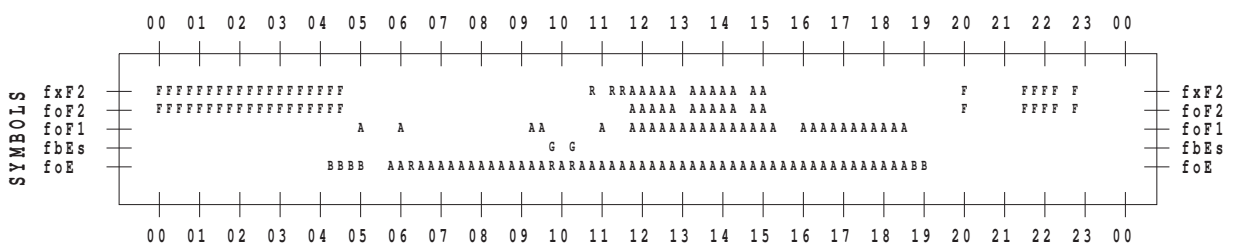
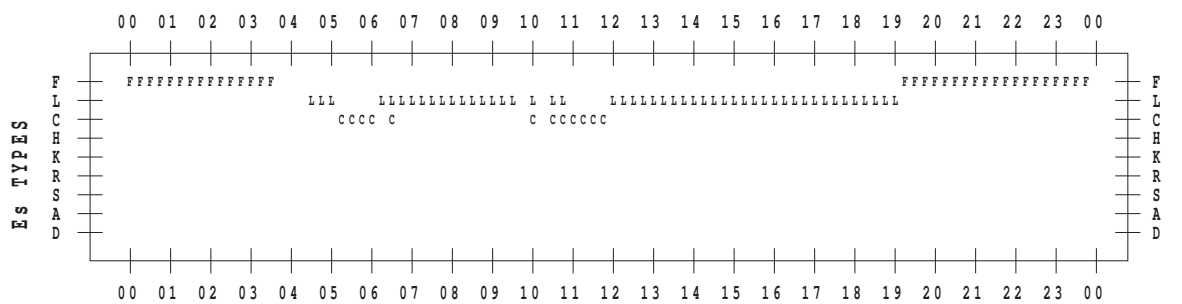
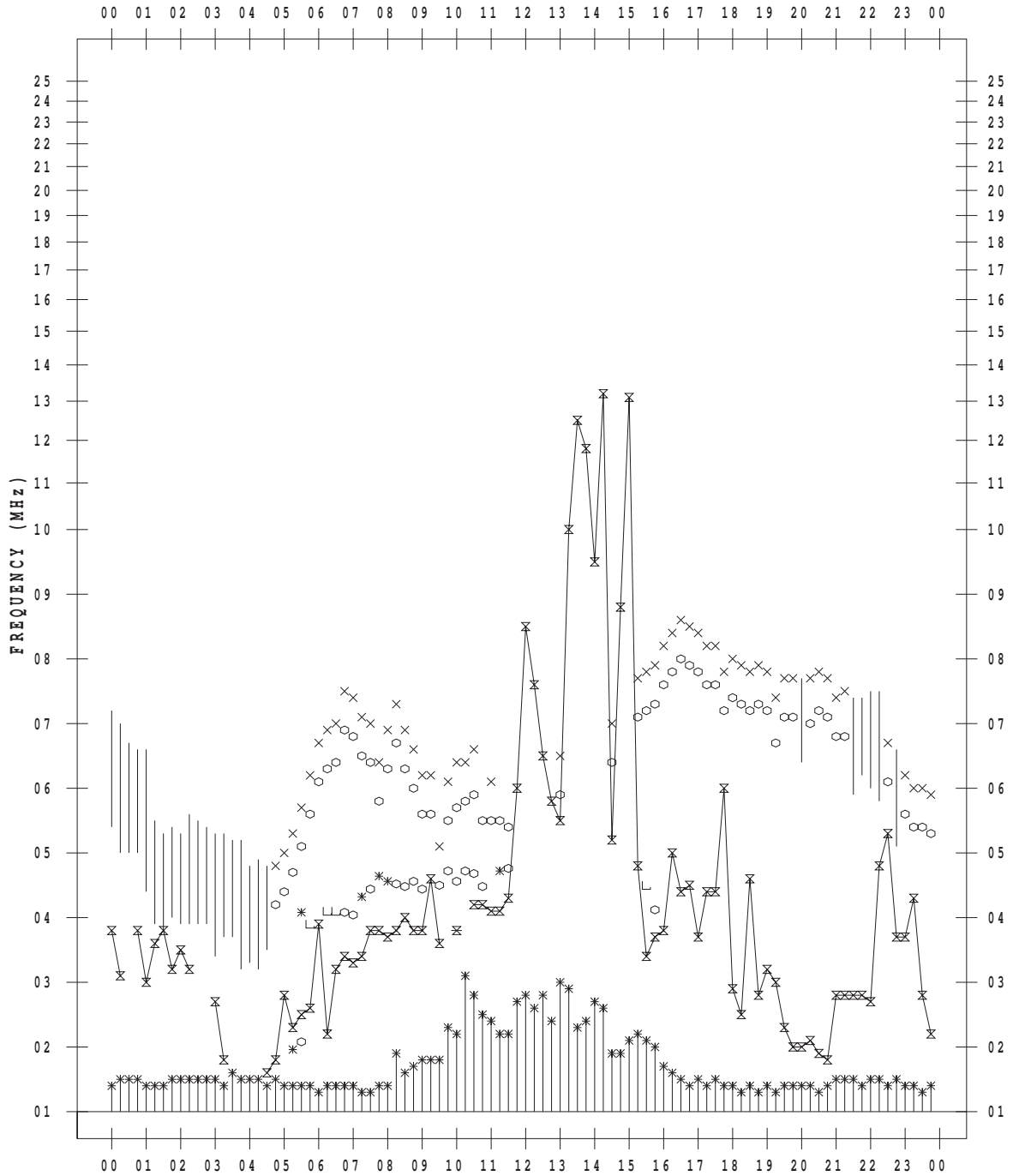
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 3

135 ° E MEAN TIME



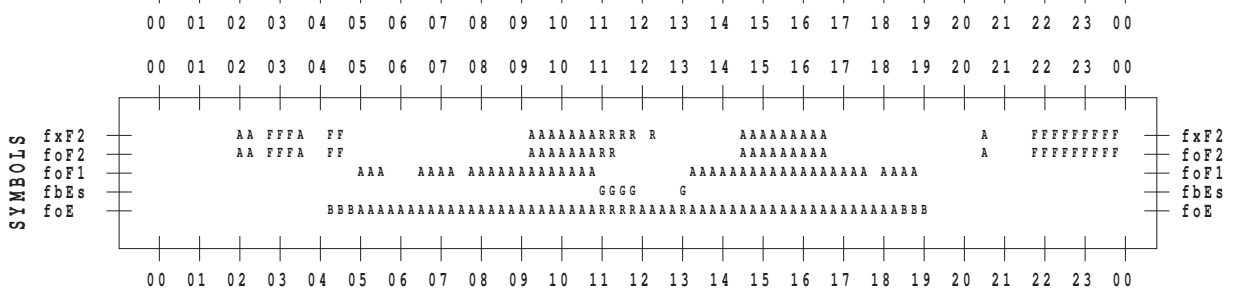
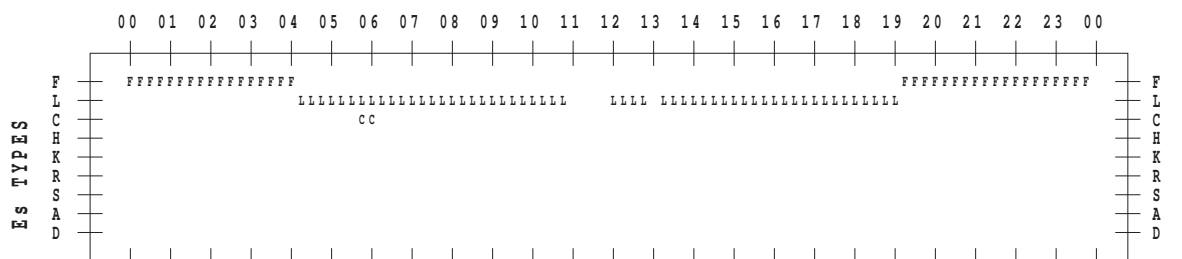
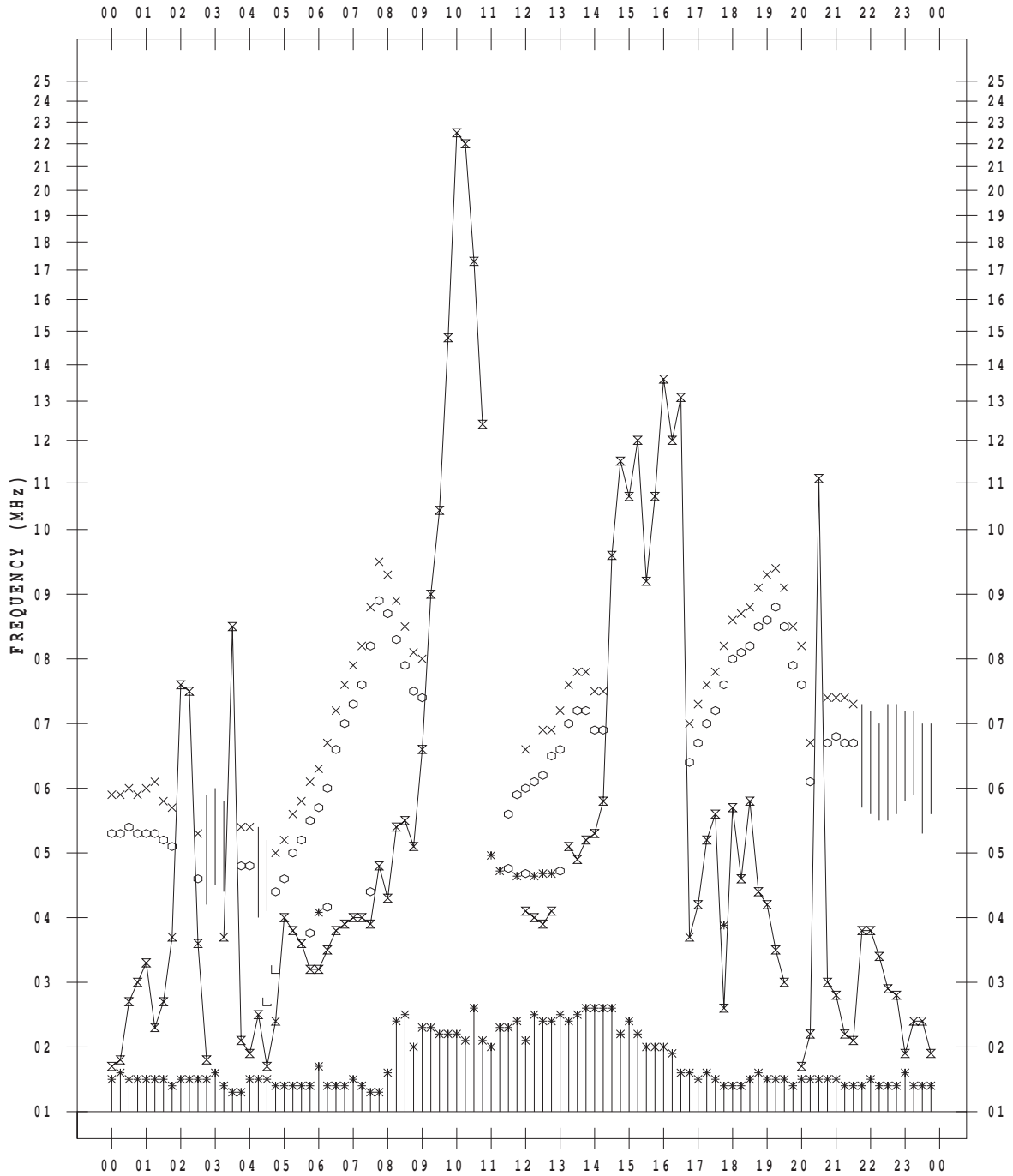
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 4

135 ° E MEAN TIME



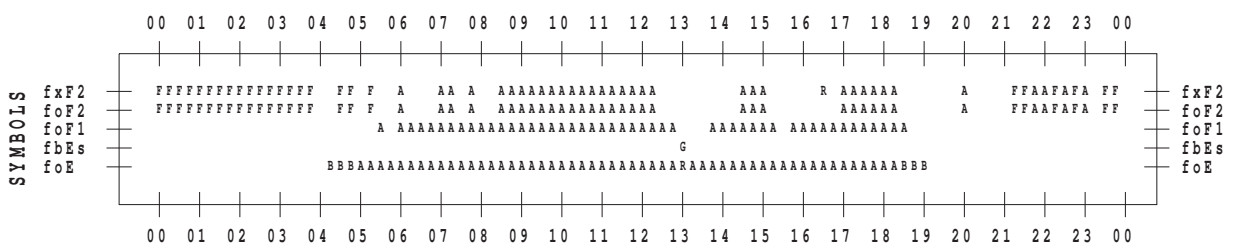
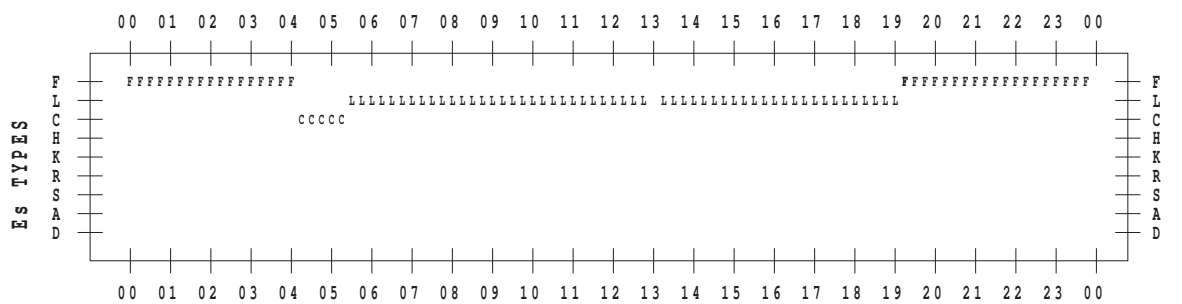
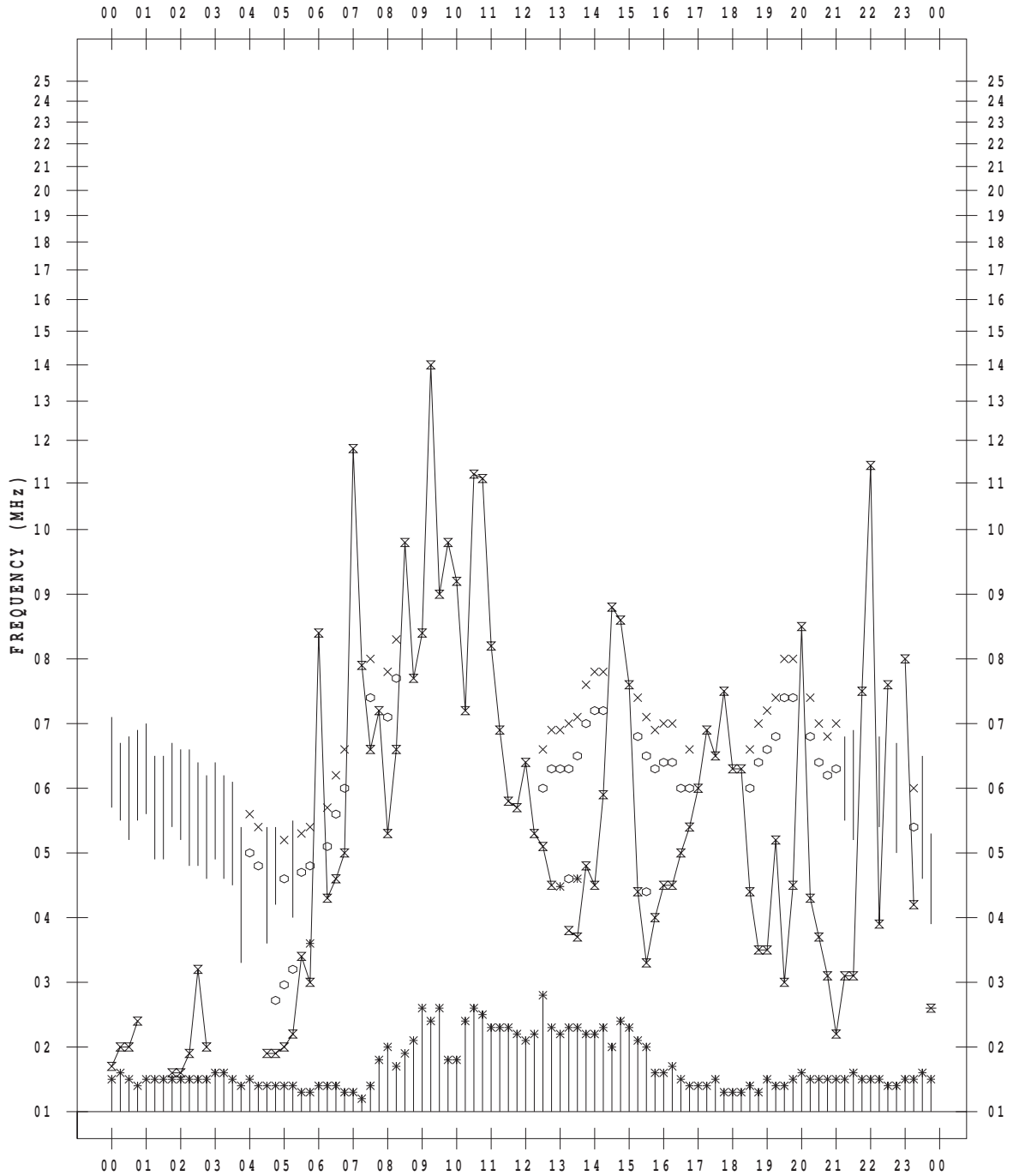
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 5

135 ° E MEAN TIME



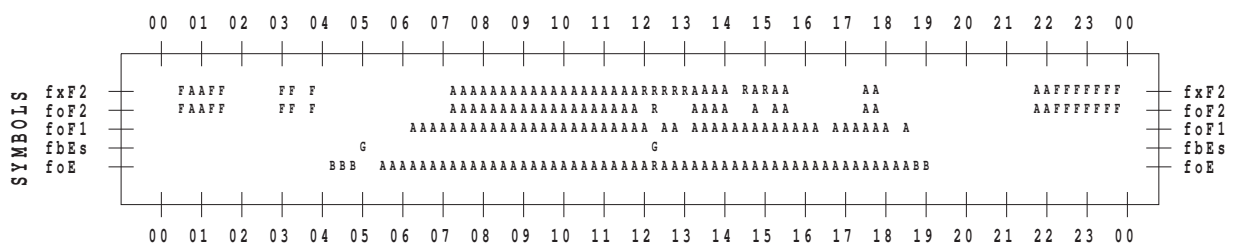
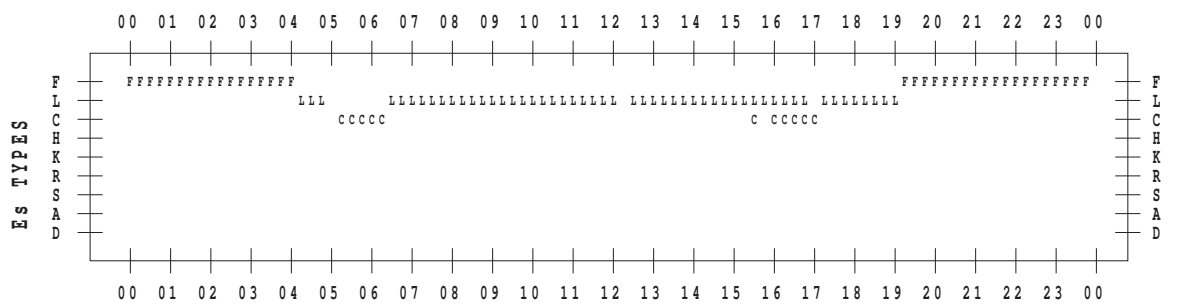
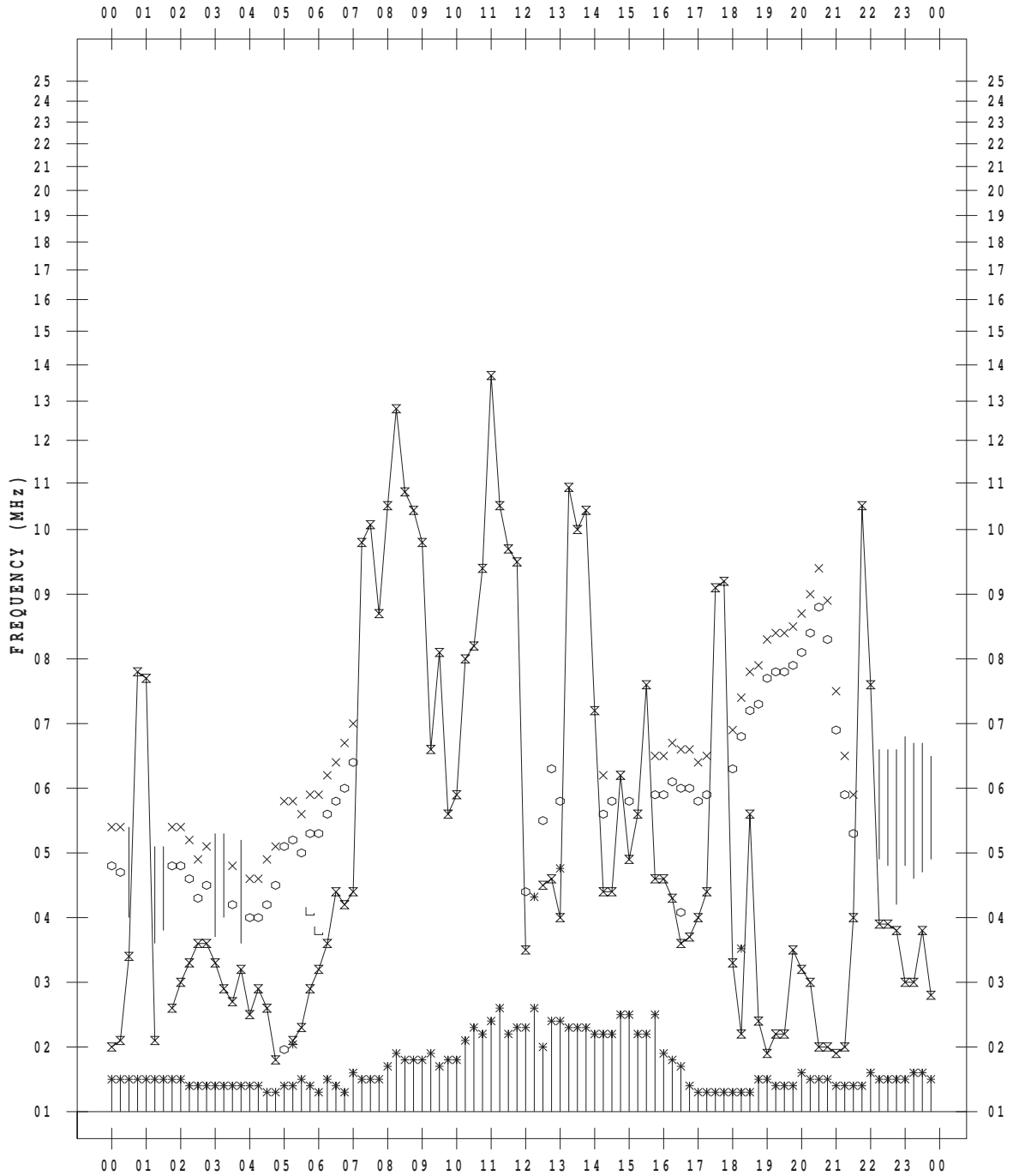
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 6

135 ° E MEAN TIME



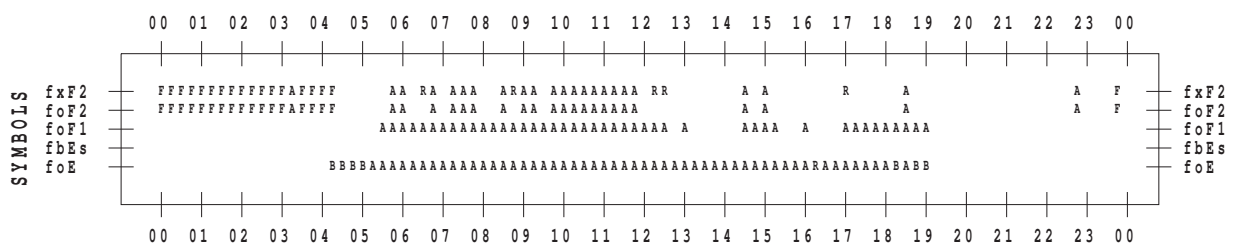
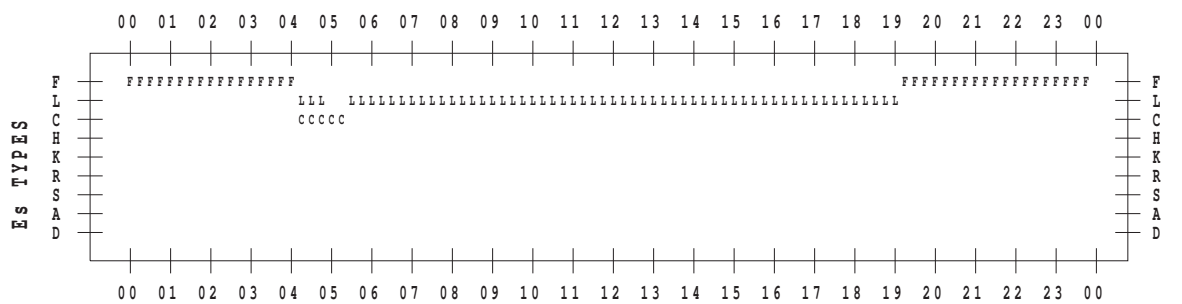
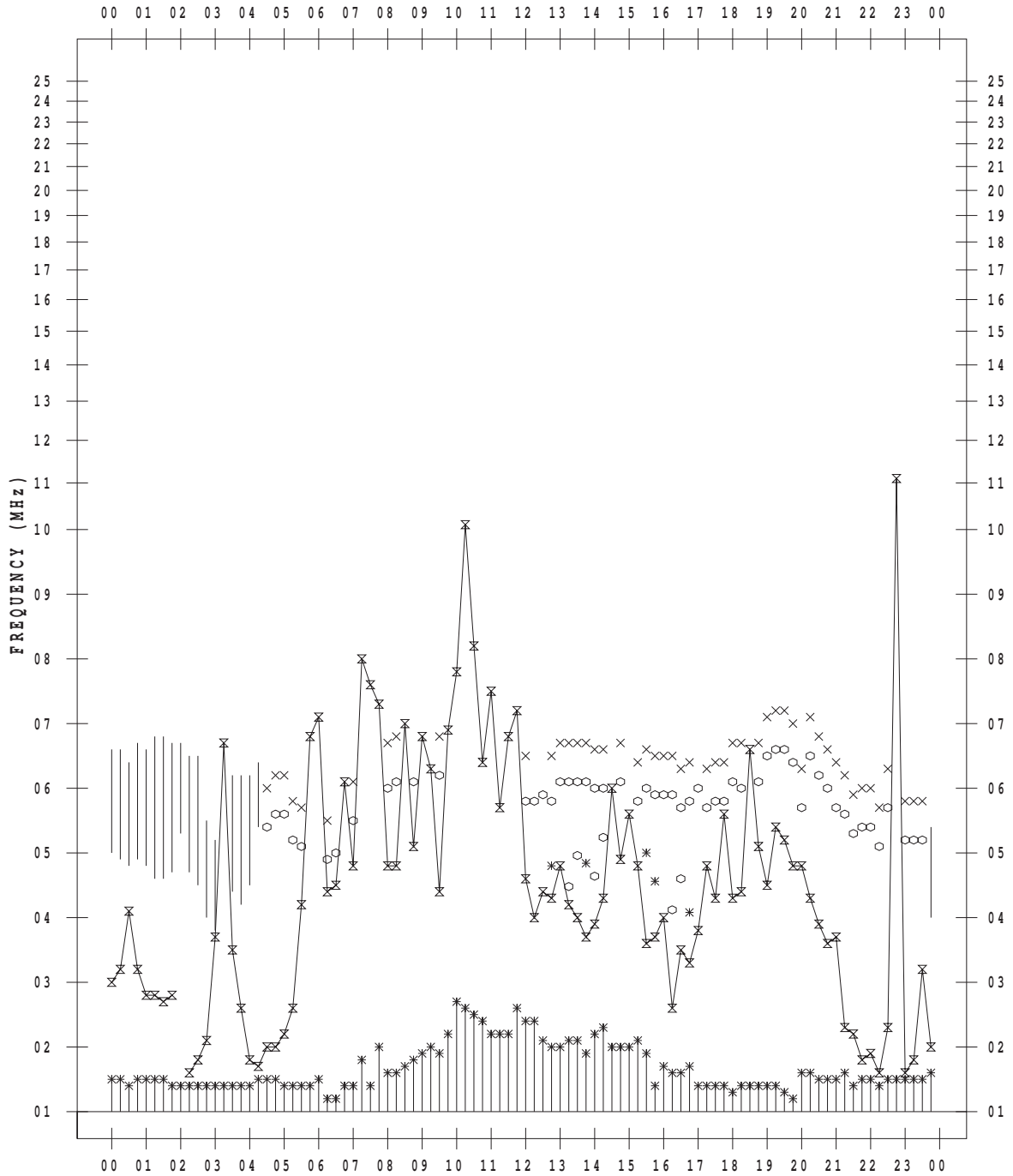
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 7

135 ° E MEAN TIME



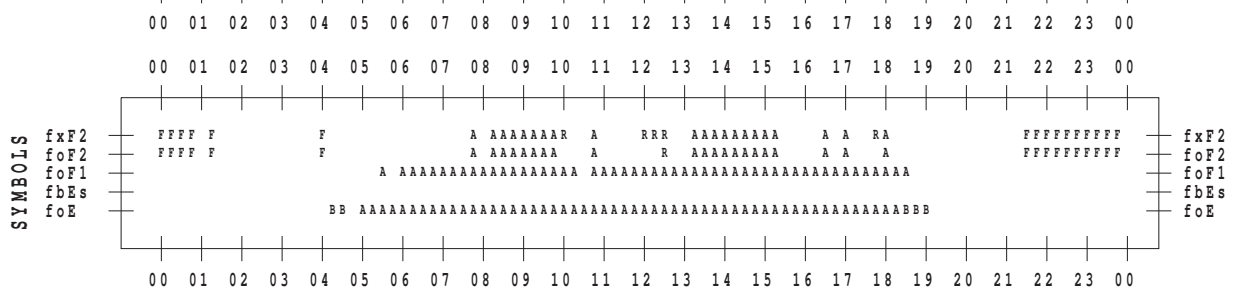
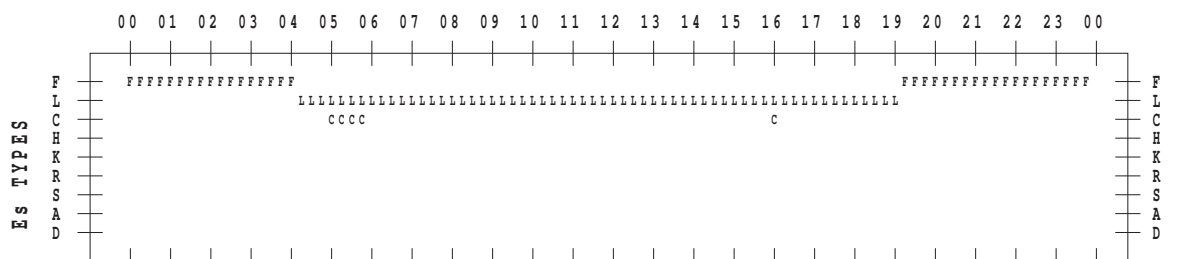
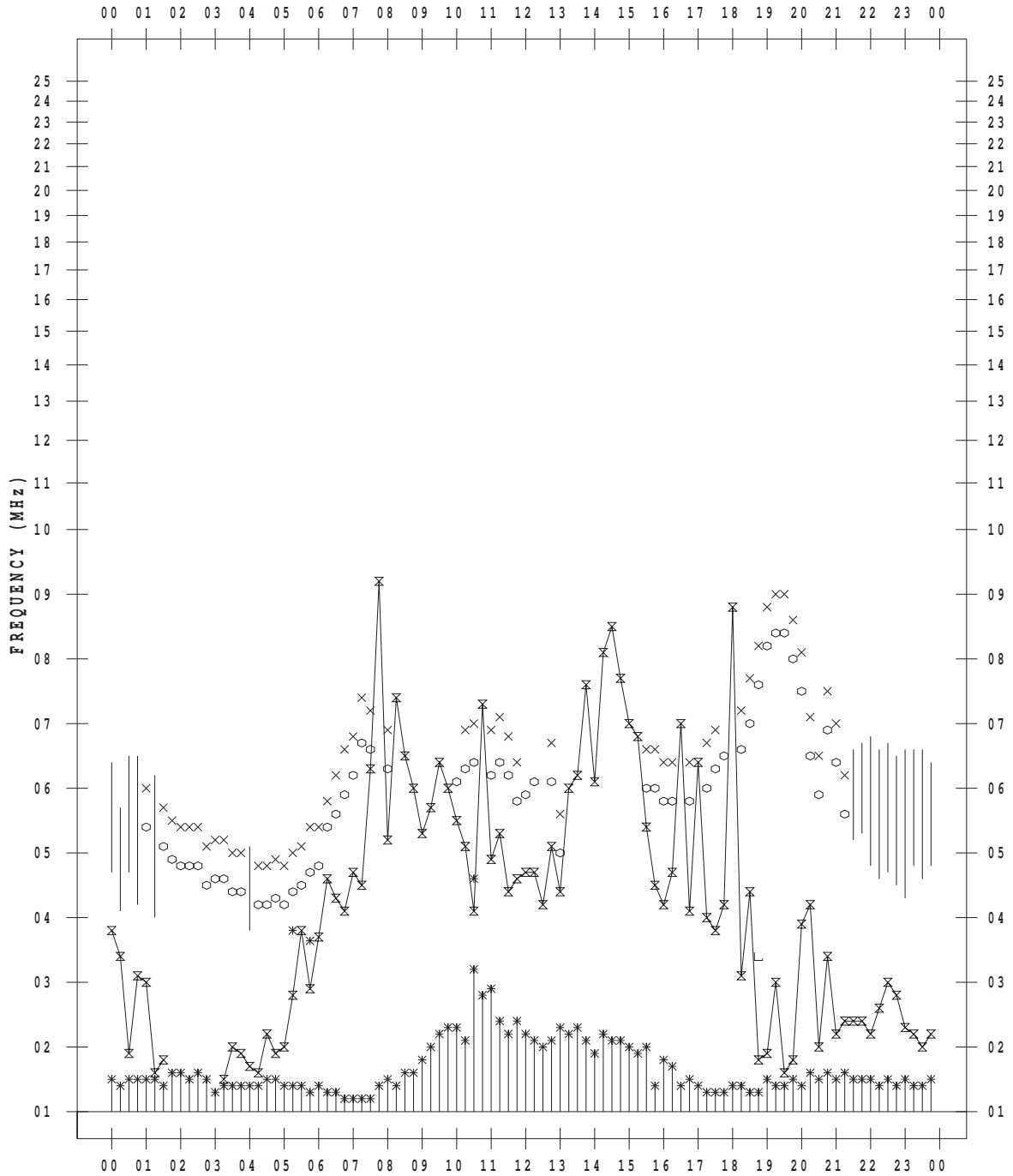
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/ 8

135 ° E MEAN TIME



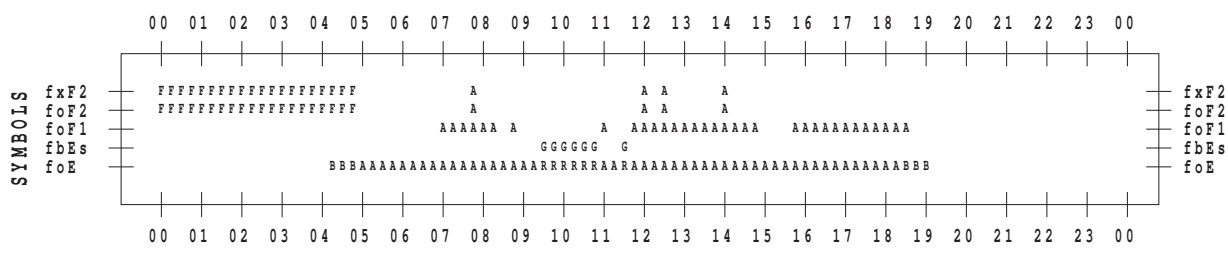
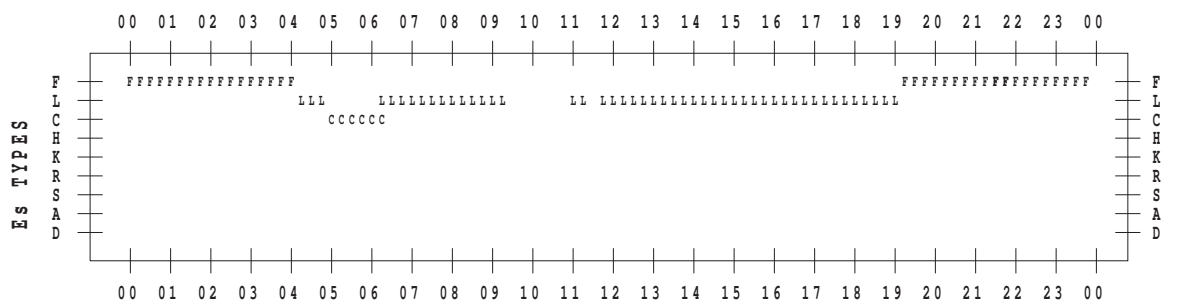
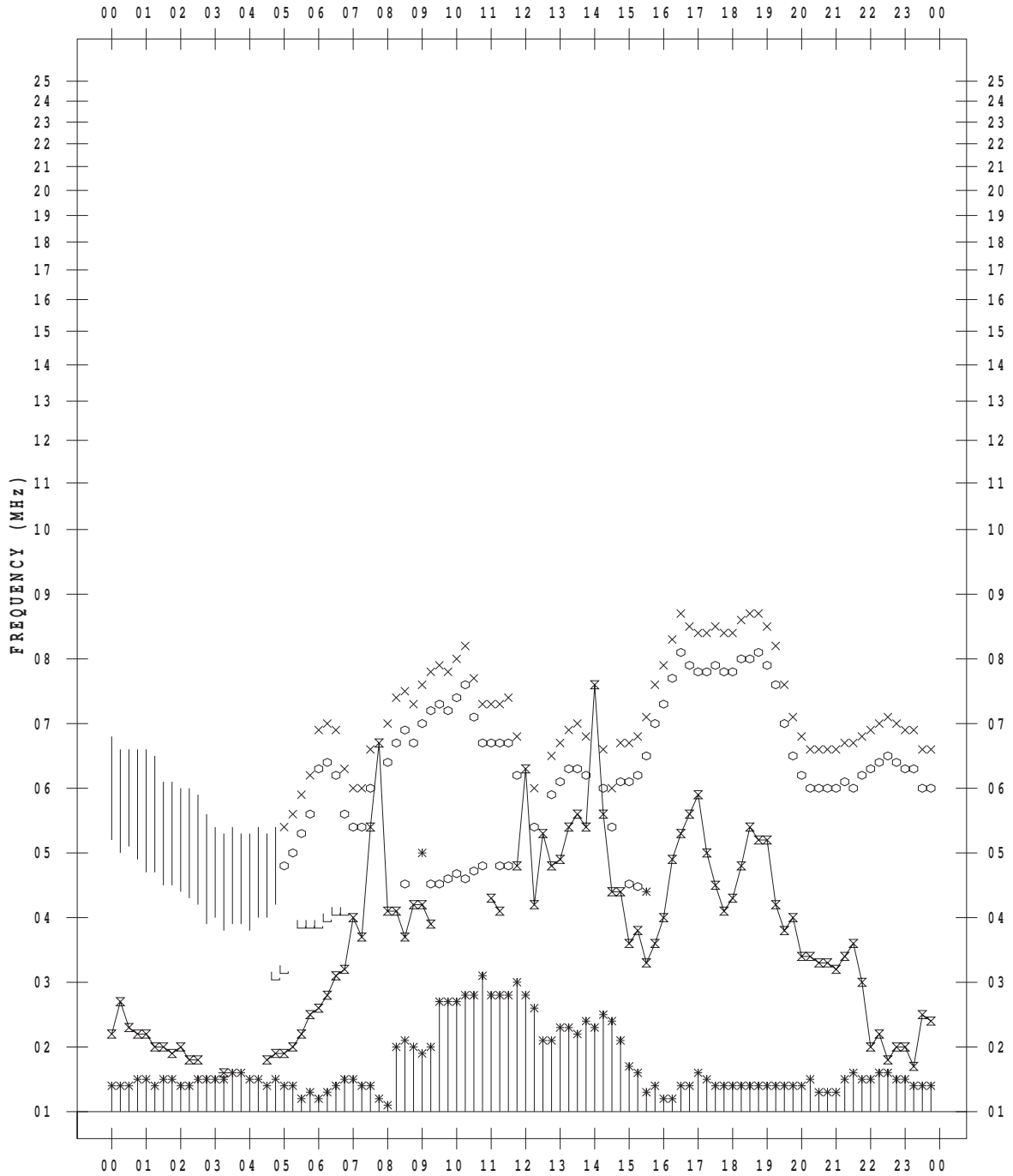
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011 / 7 / 9

135 ° E MEAN TIME



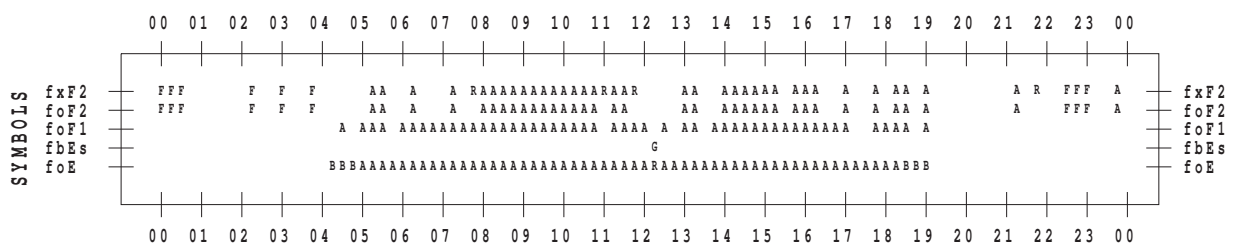
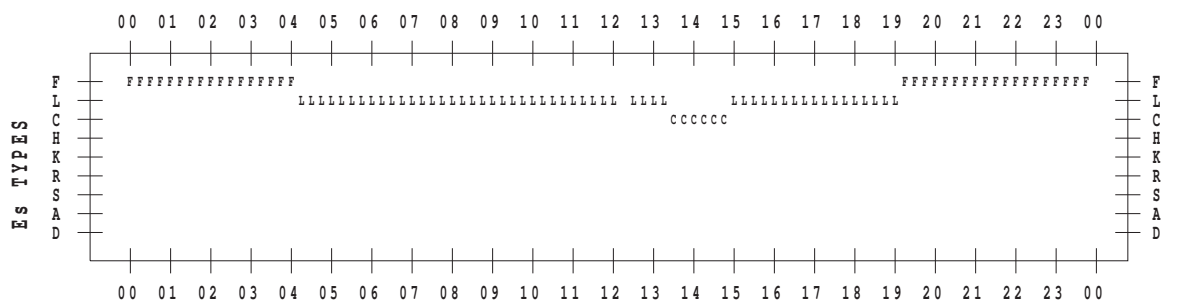
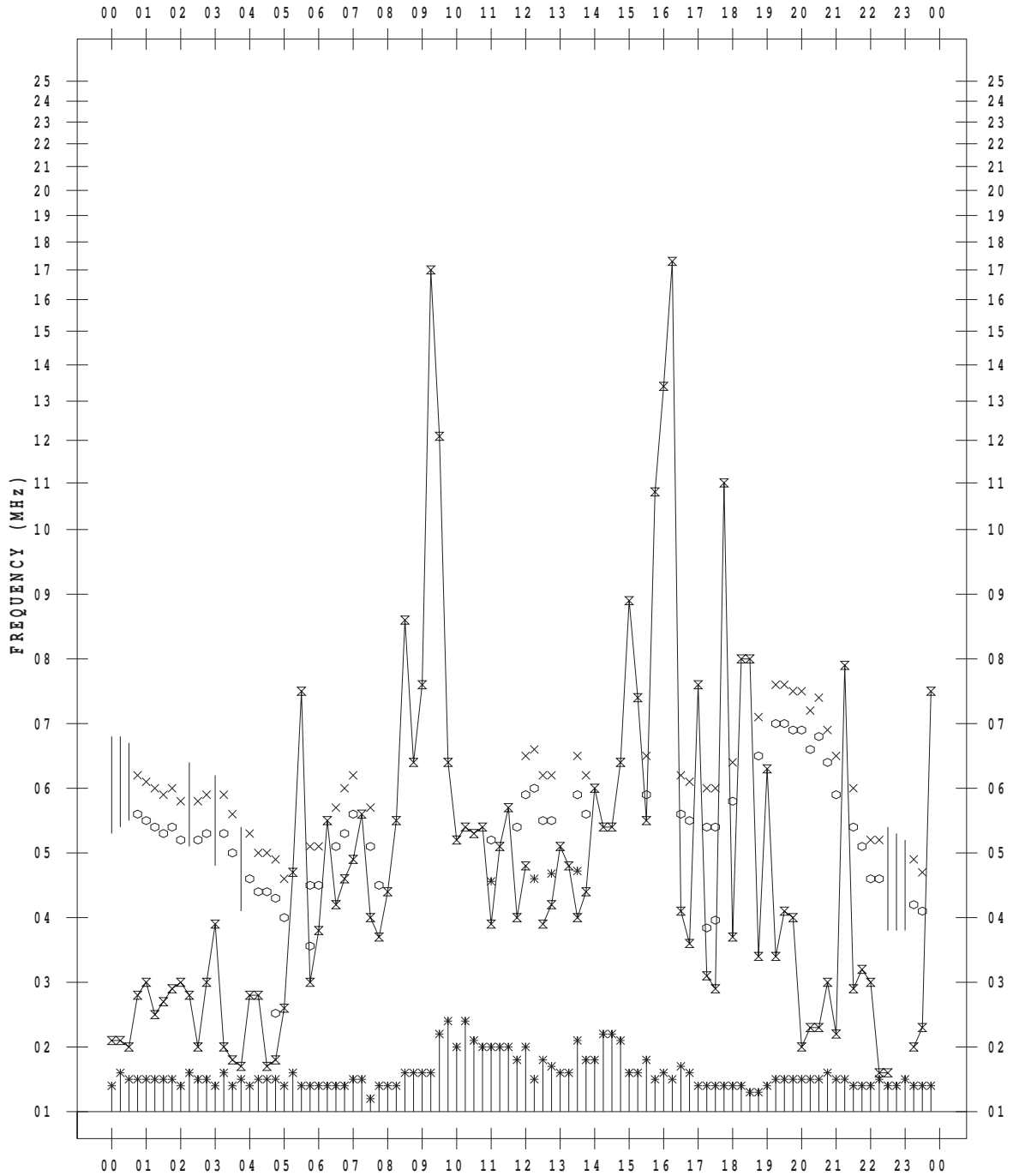
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/10

135 ° E MEAN TIME





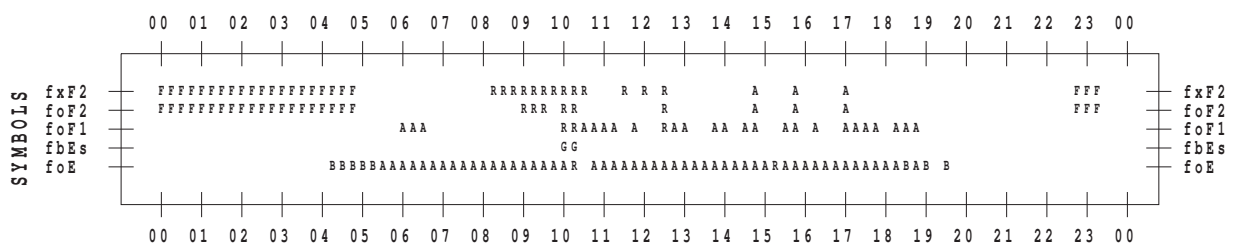
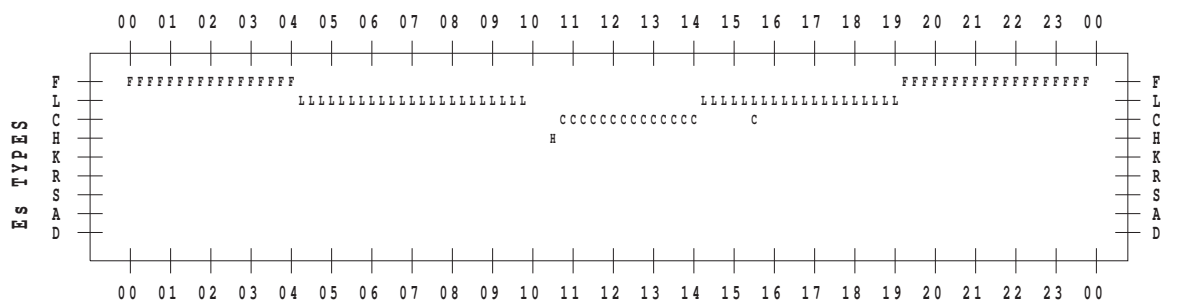
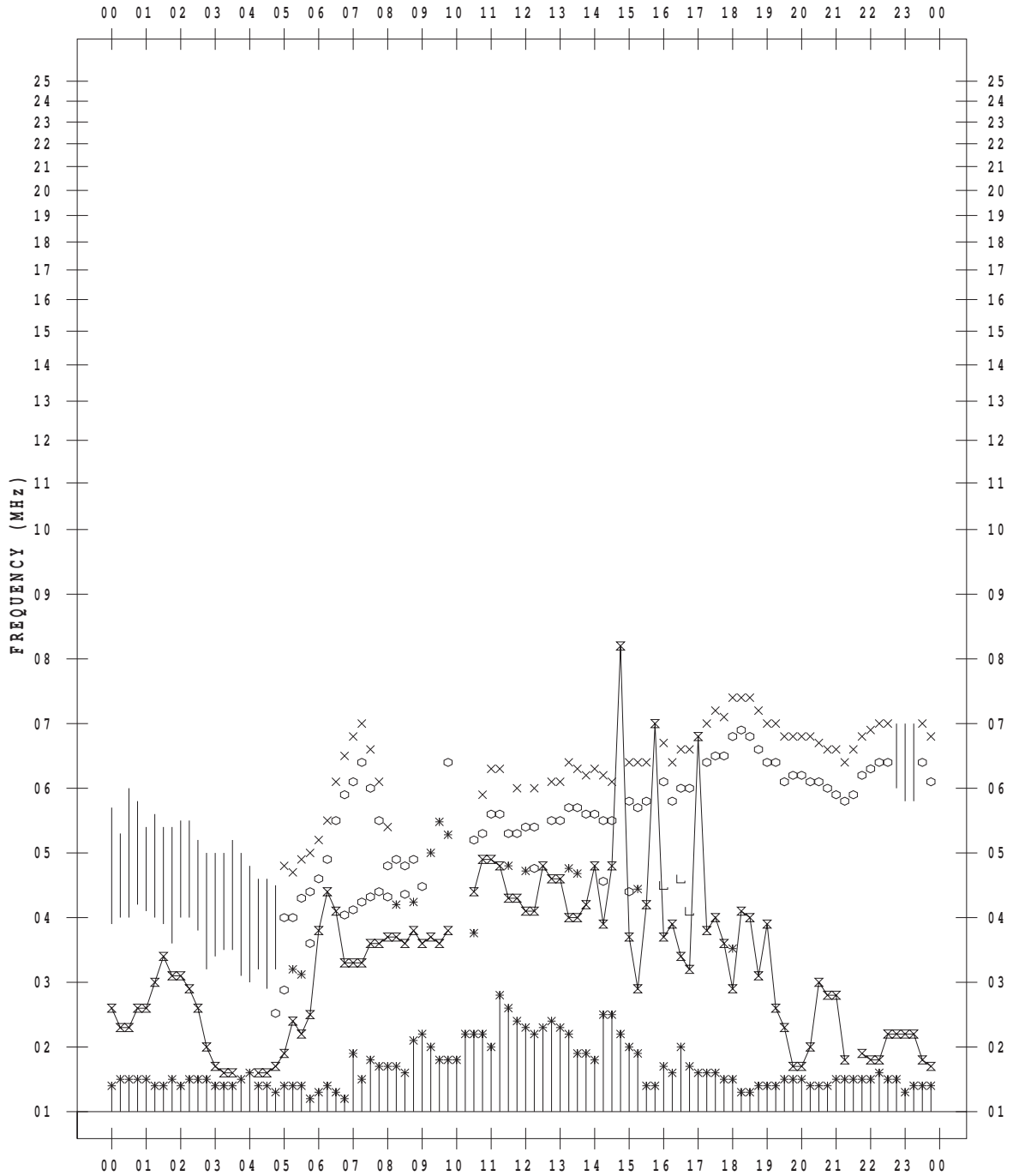
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/11

135 ° E MEAN TIME



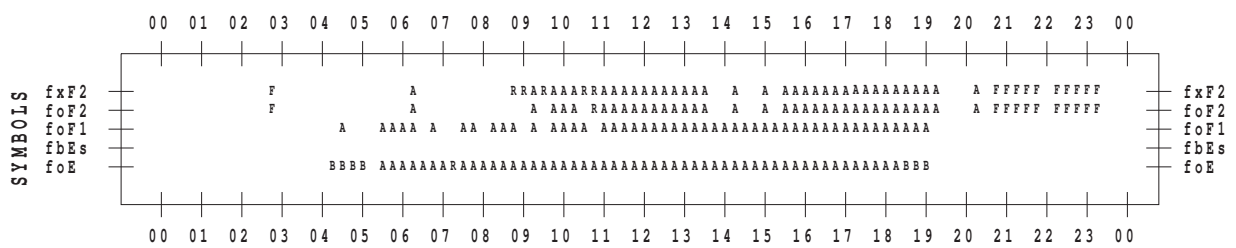
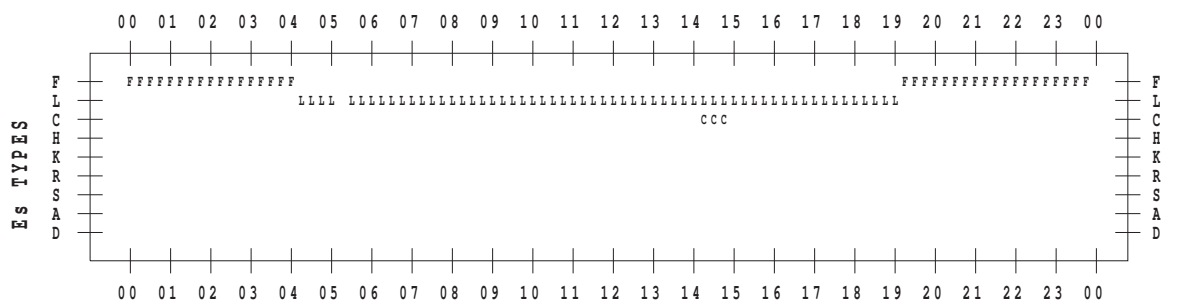
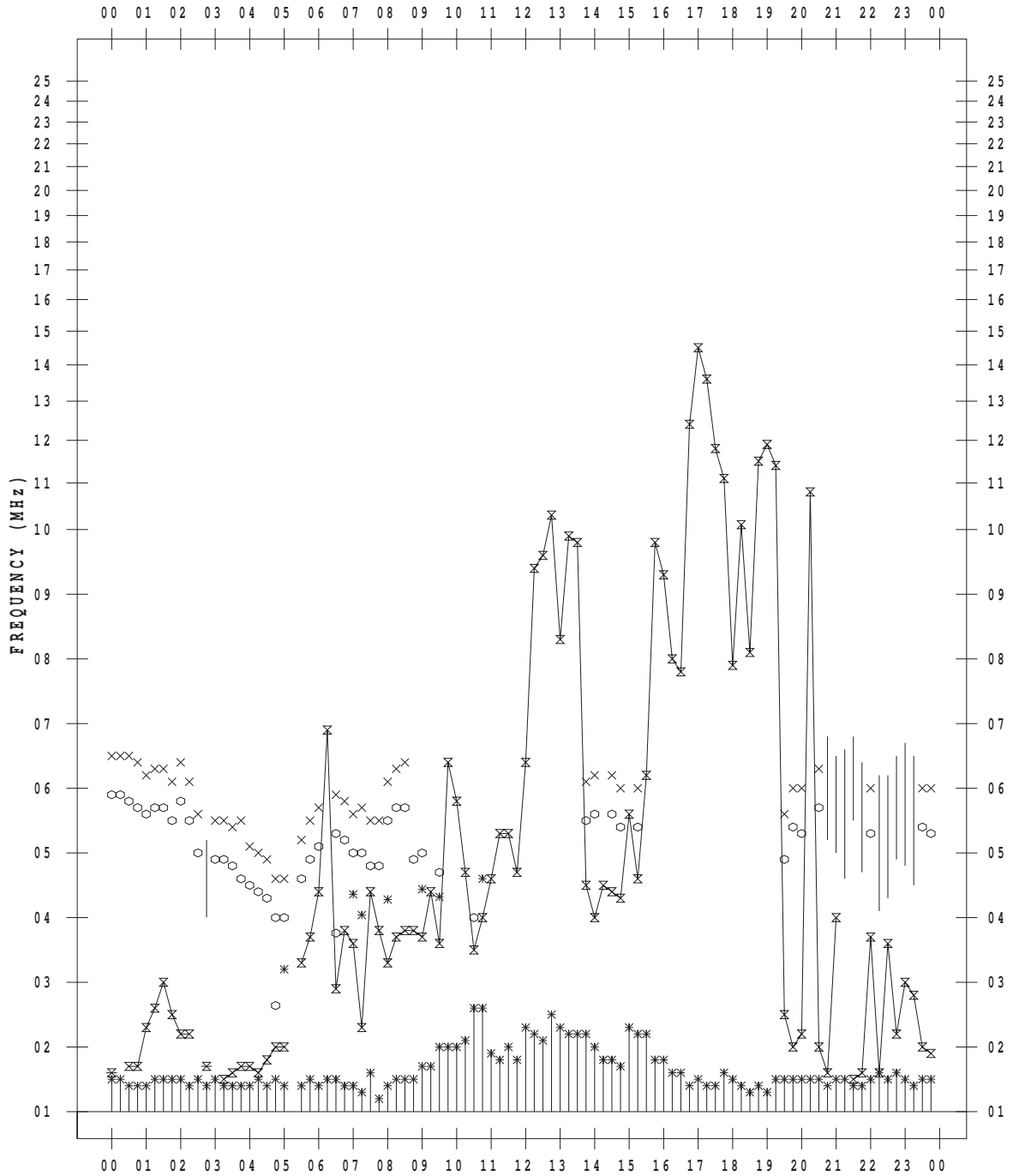
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/12

135 ° E MEAN TIME



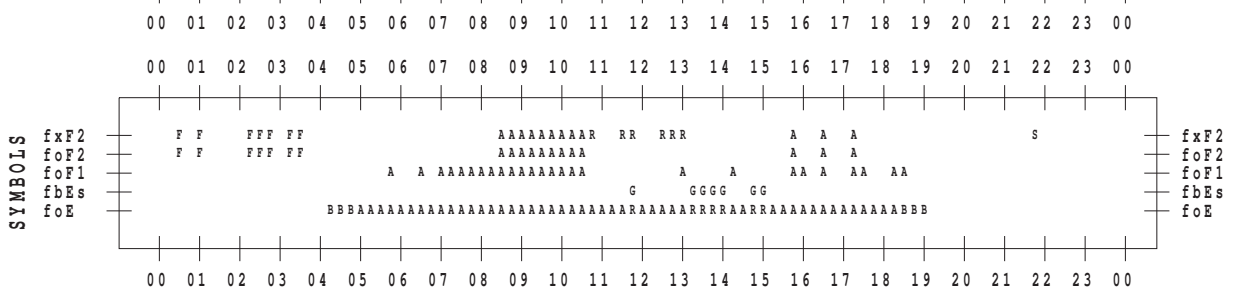
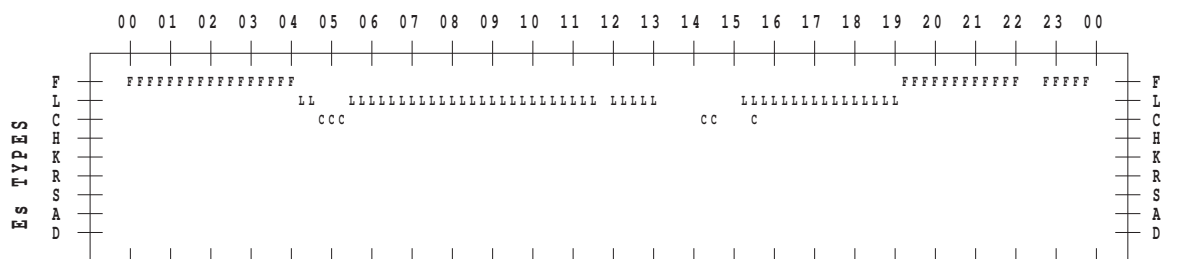
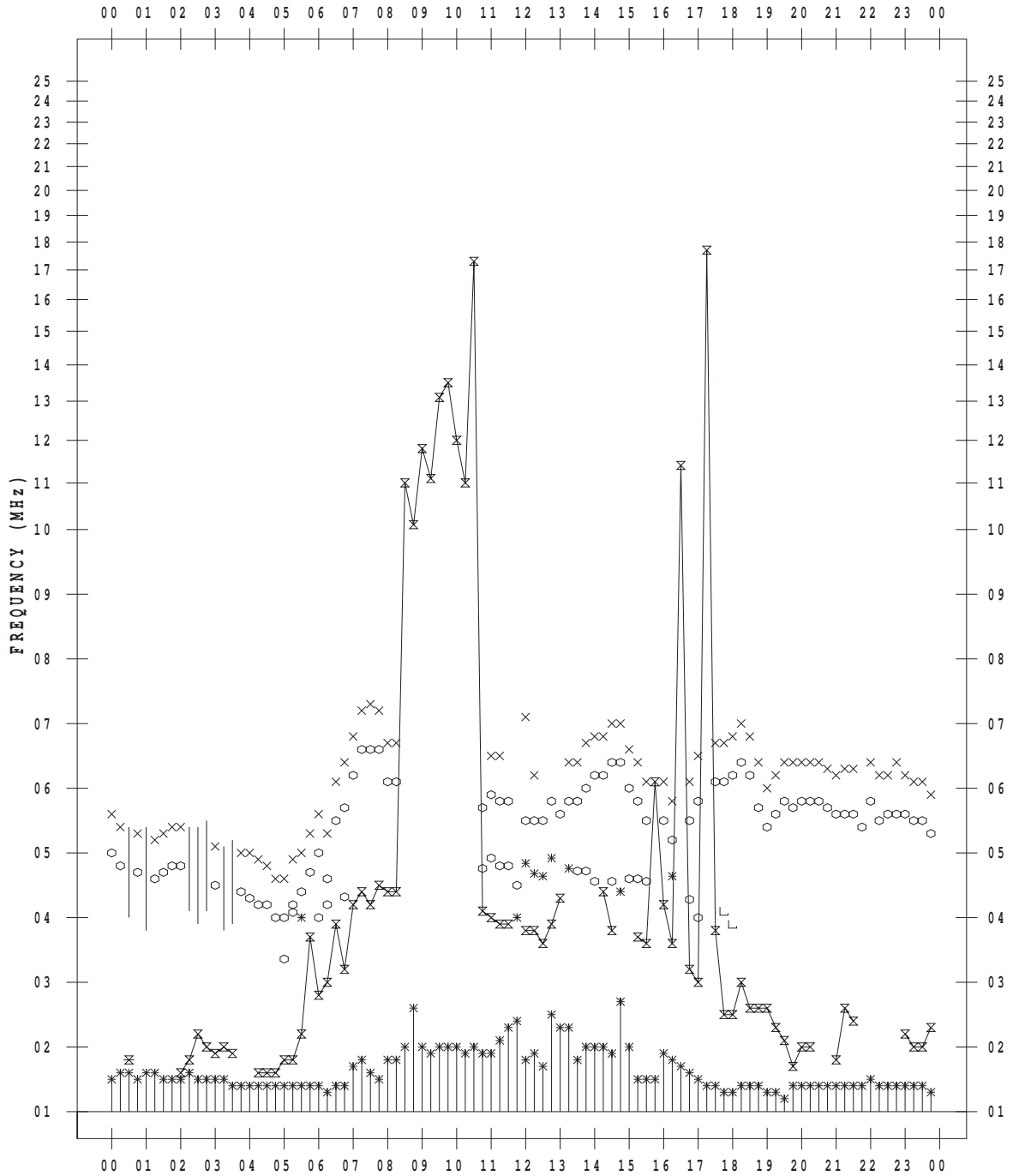
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/13

135 ° E MEAN TIME



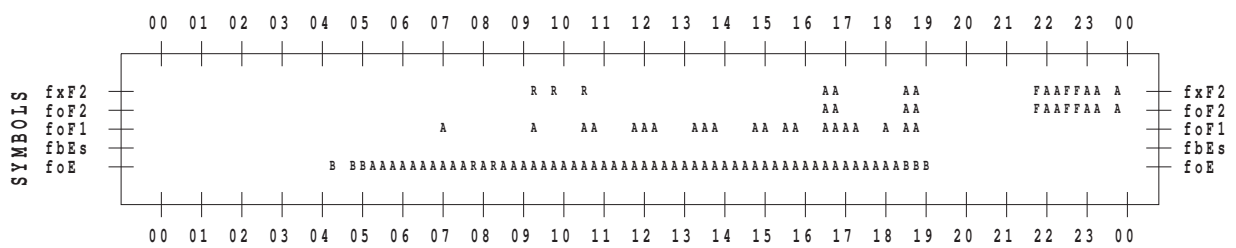
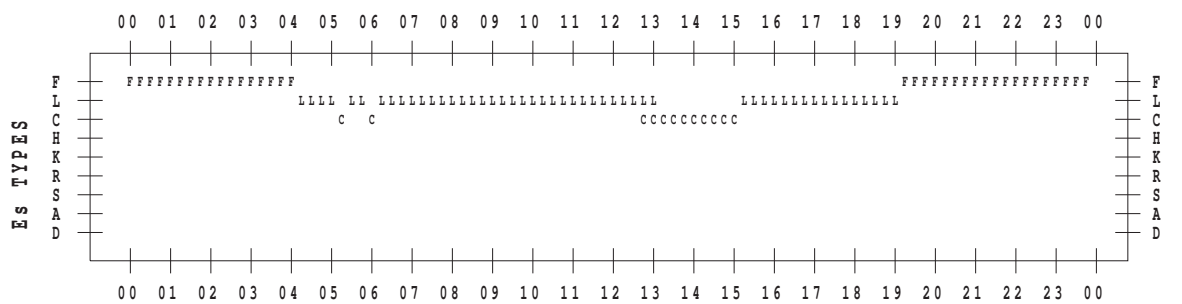
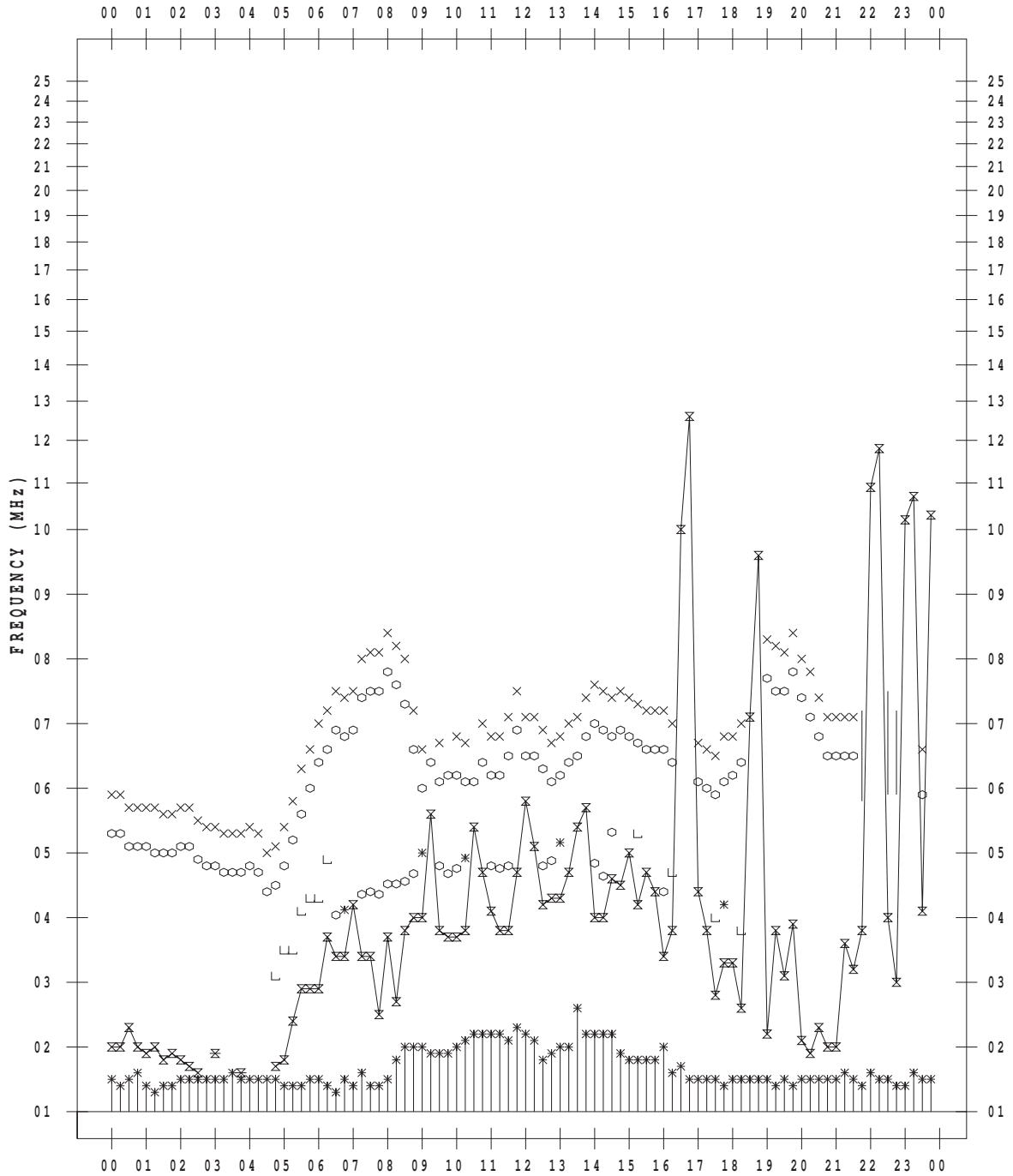
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/14

135 ° E MEAN TIME



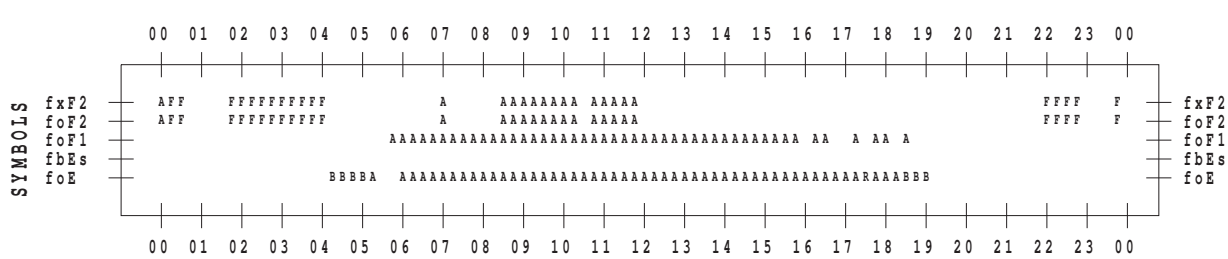
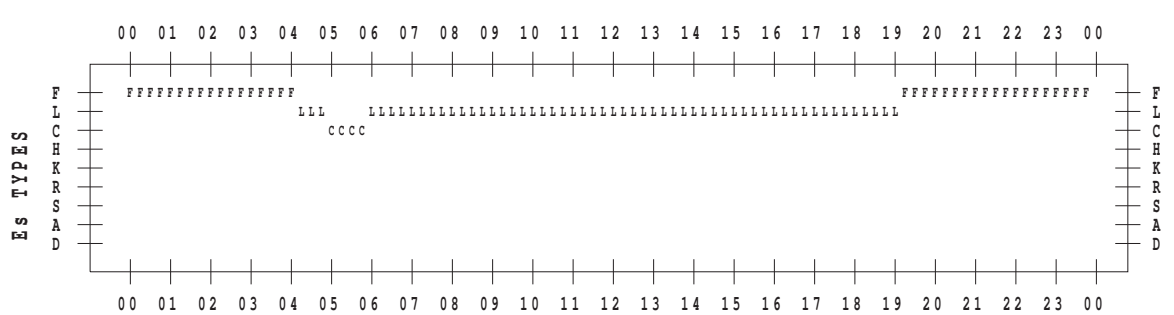
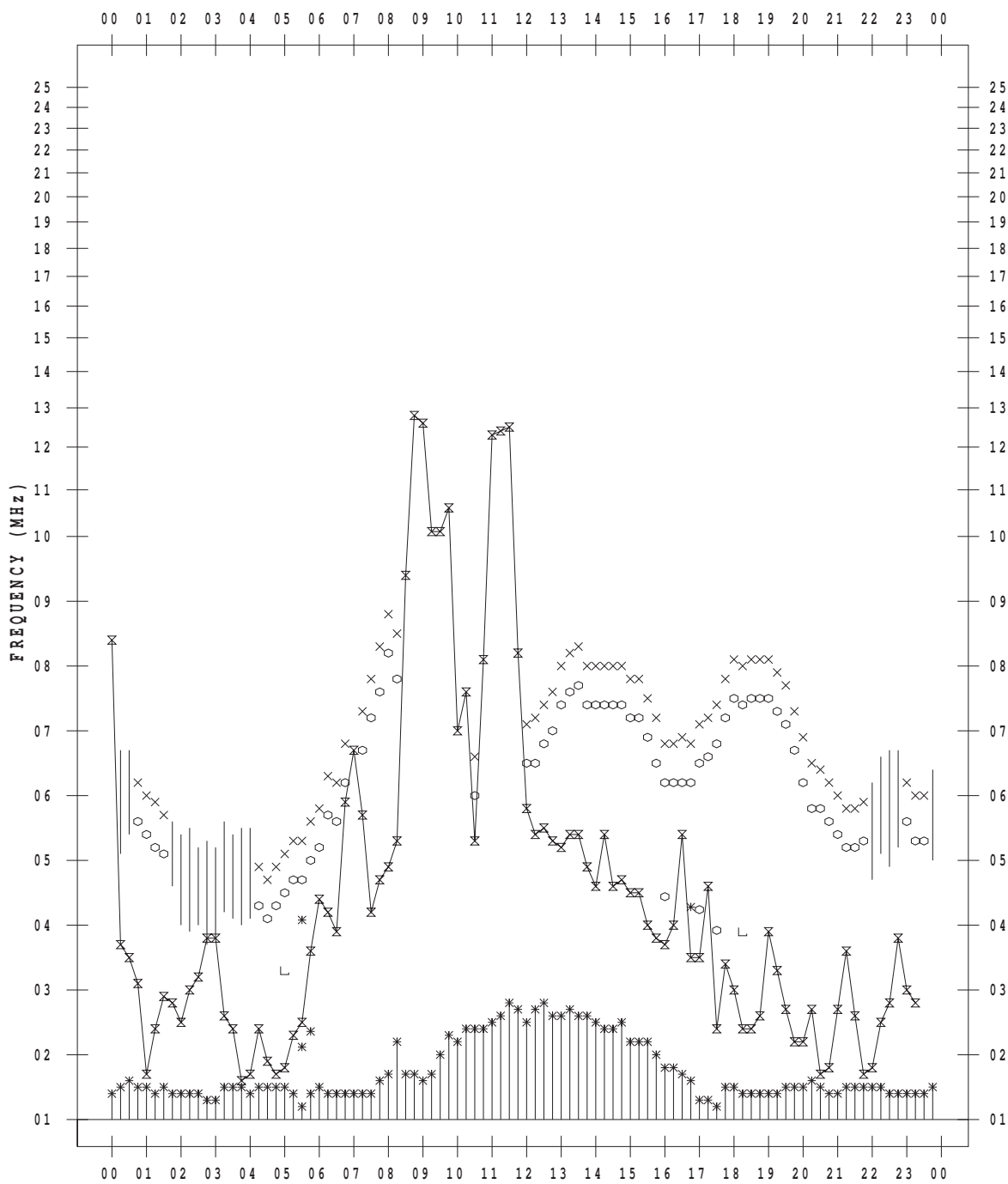
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/15

135 ° E MEAN TIME



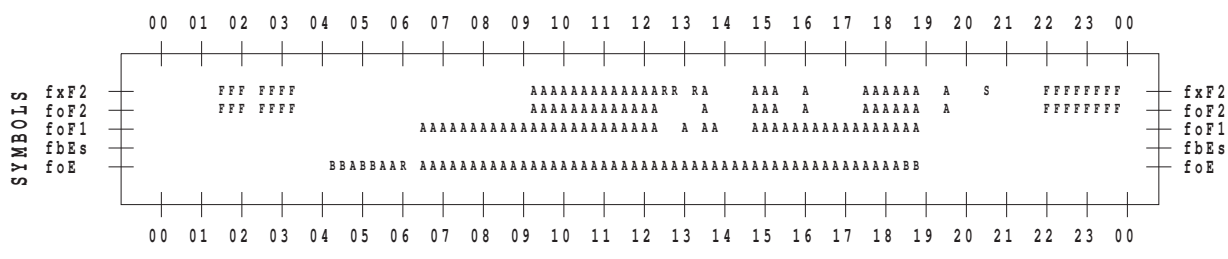
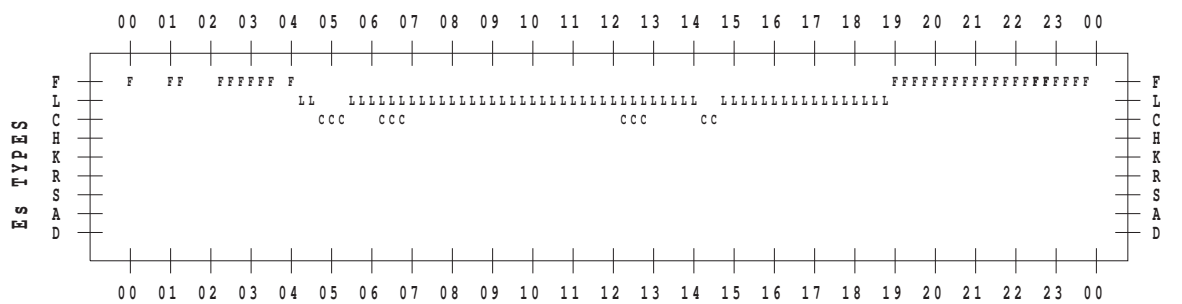
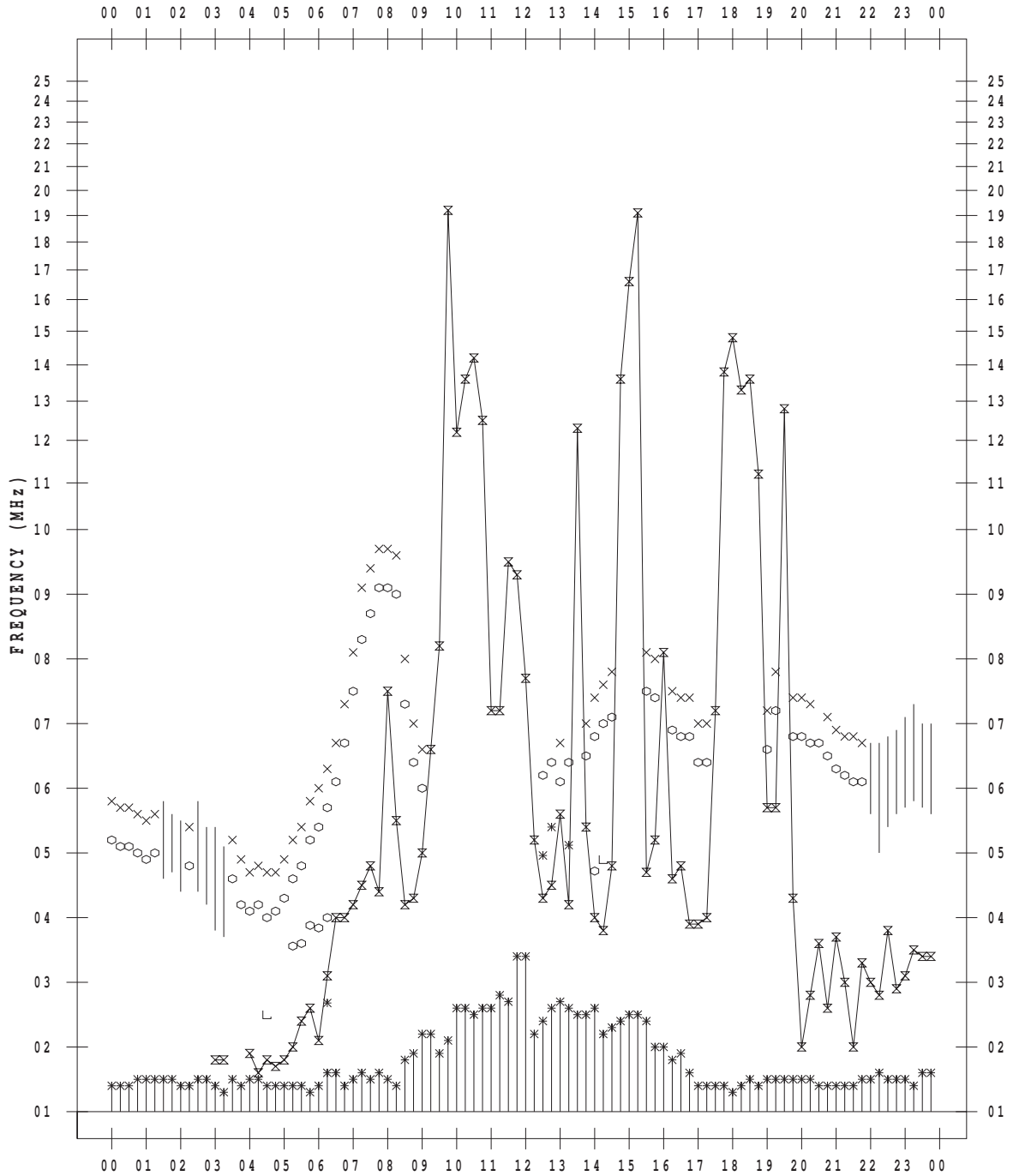
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/16

135 ° E MEAN TIME



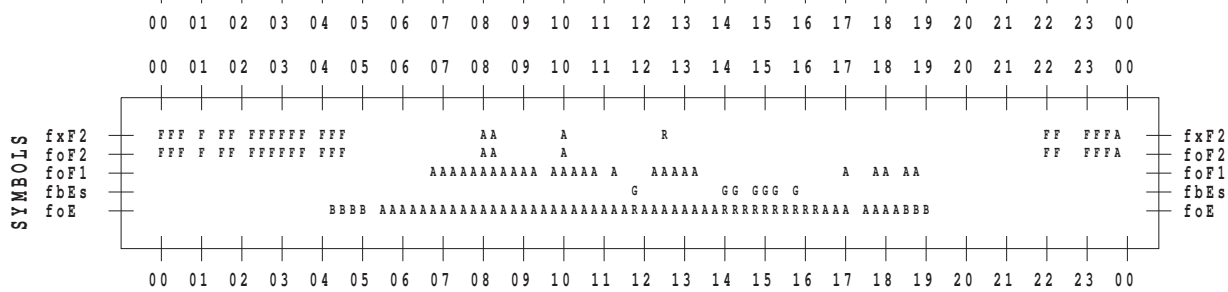
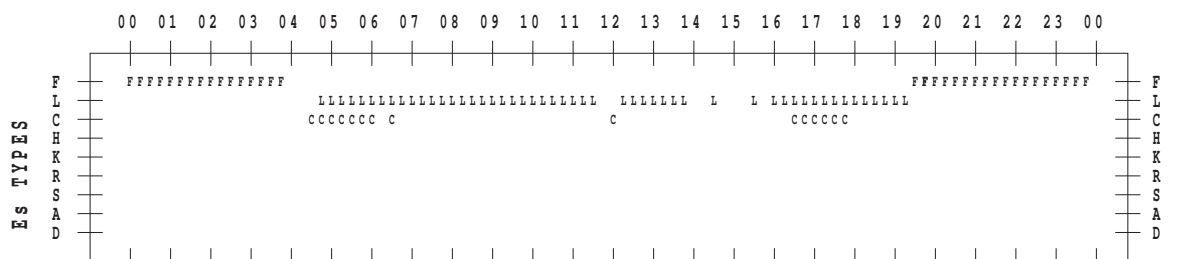
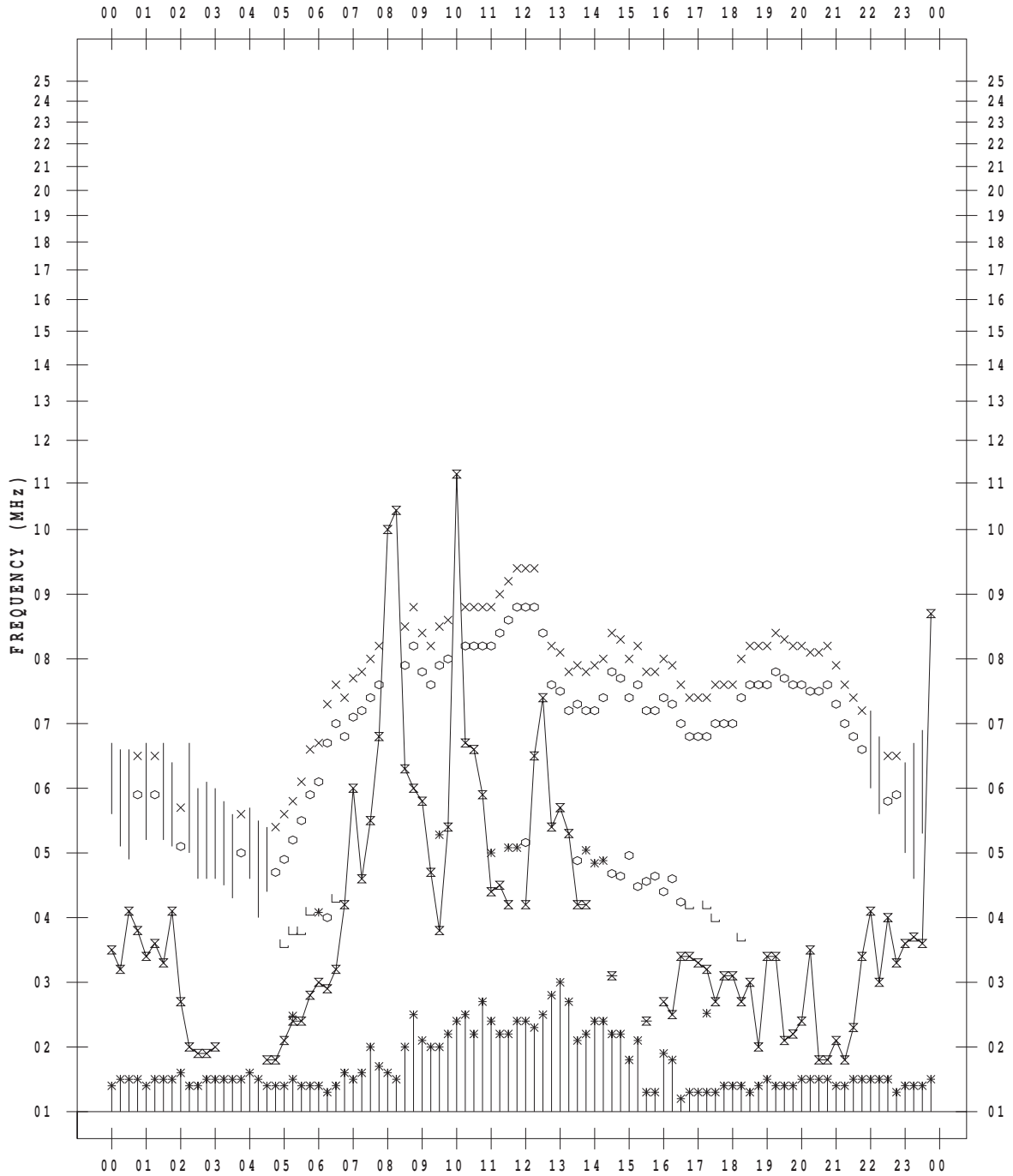
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/17

135 ° E MEAN TIME



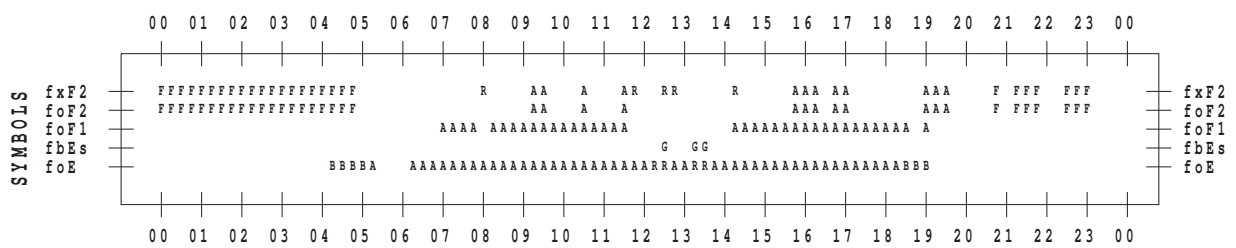
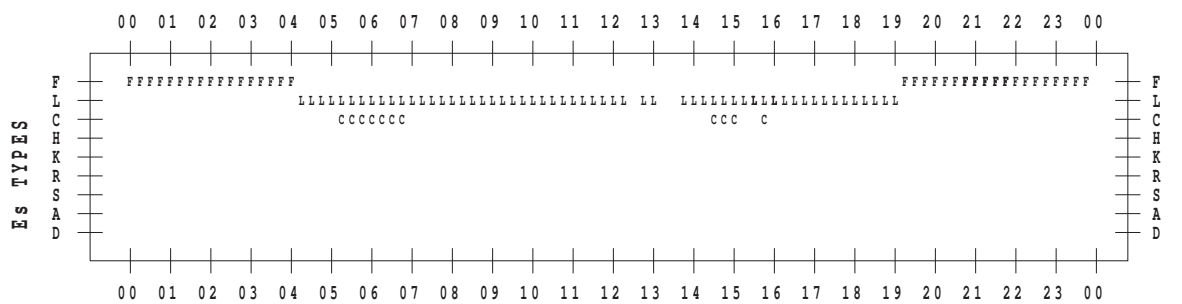
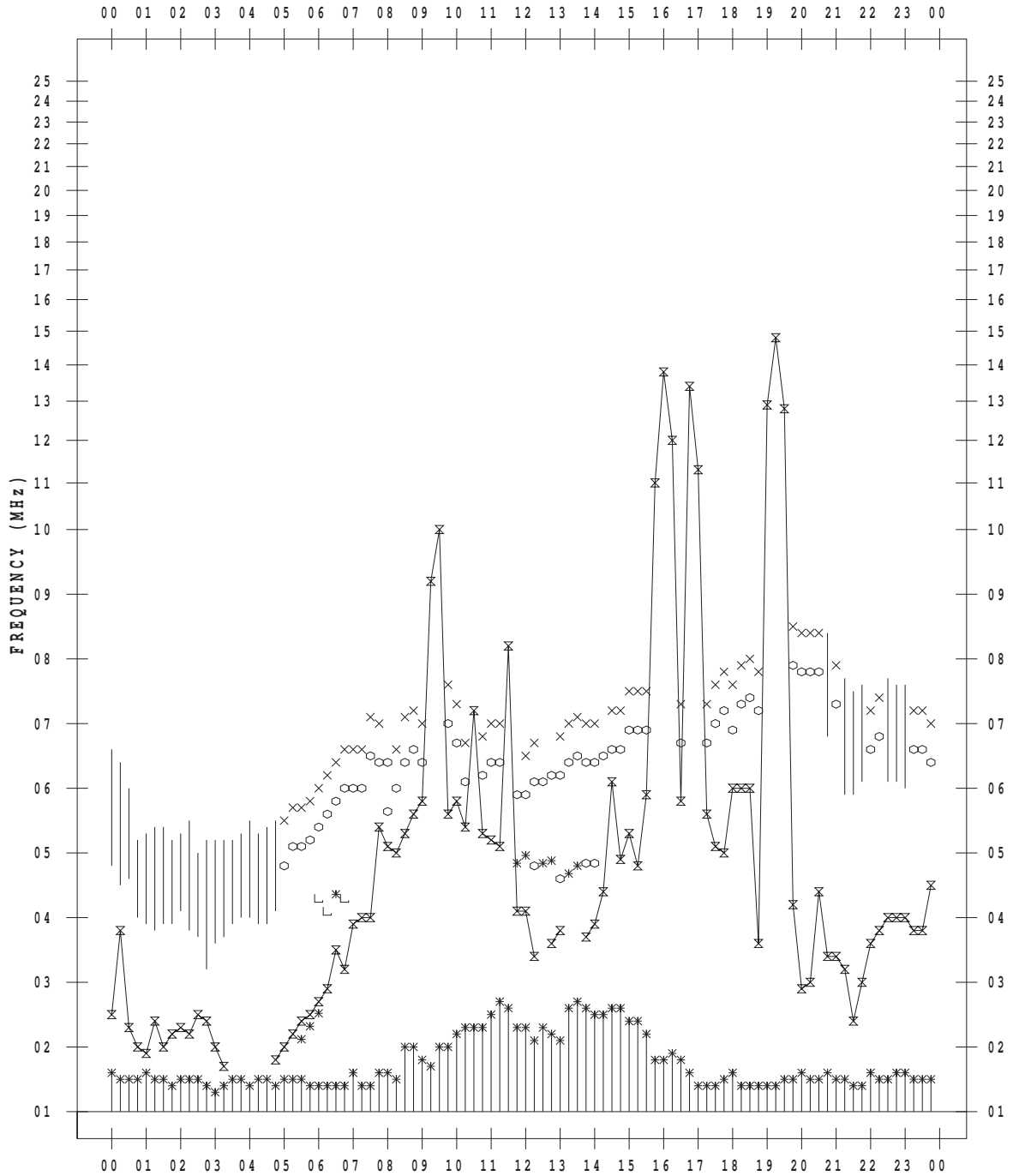
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/18

135 ° E MEAN TIME





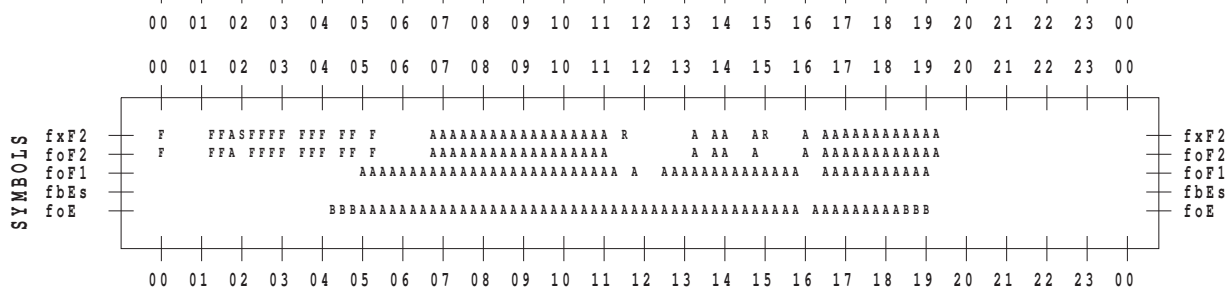
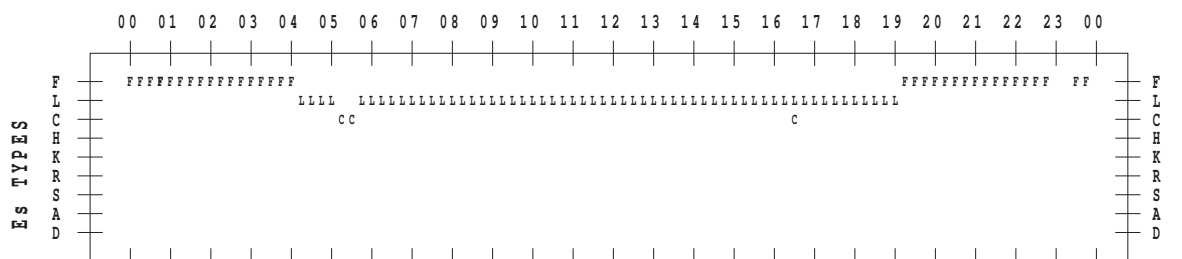
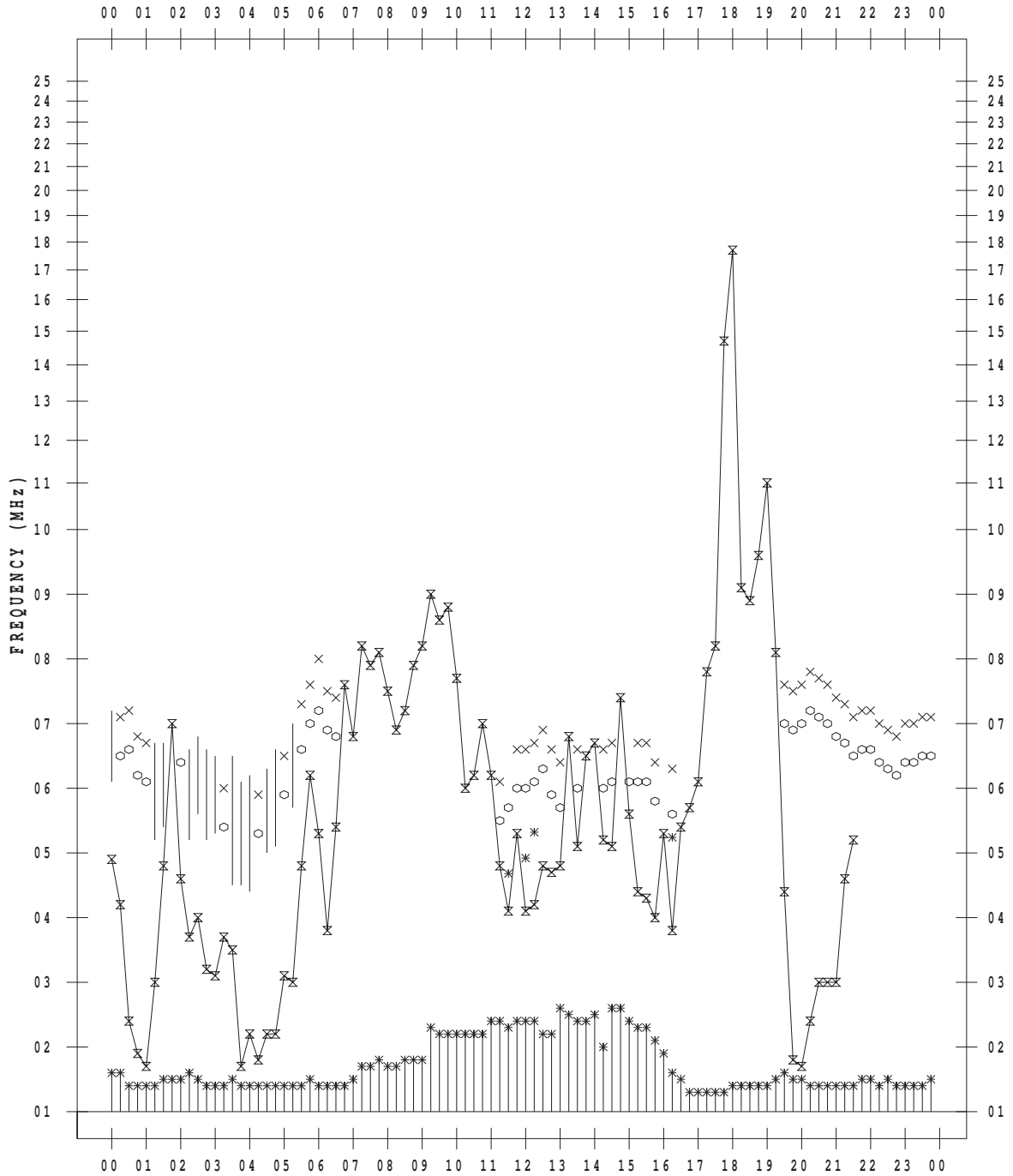
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/19

135 ° E MEAN TIME



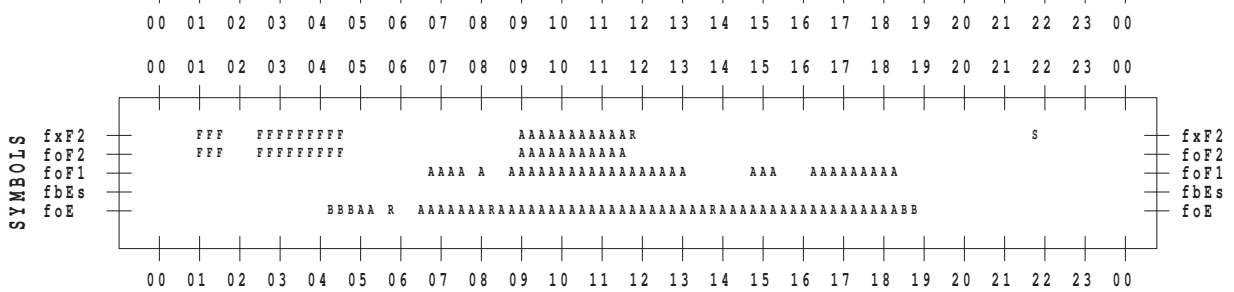
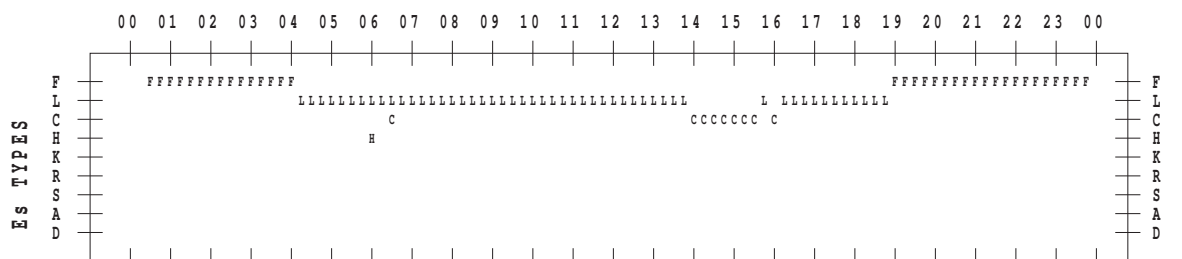
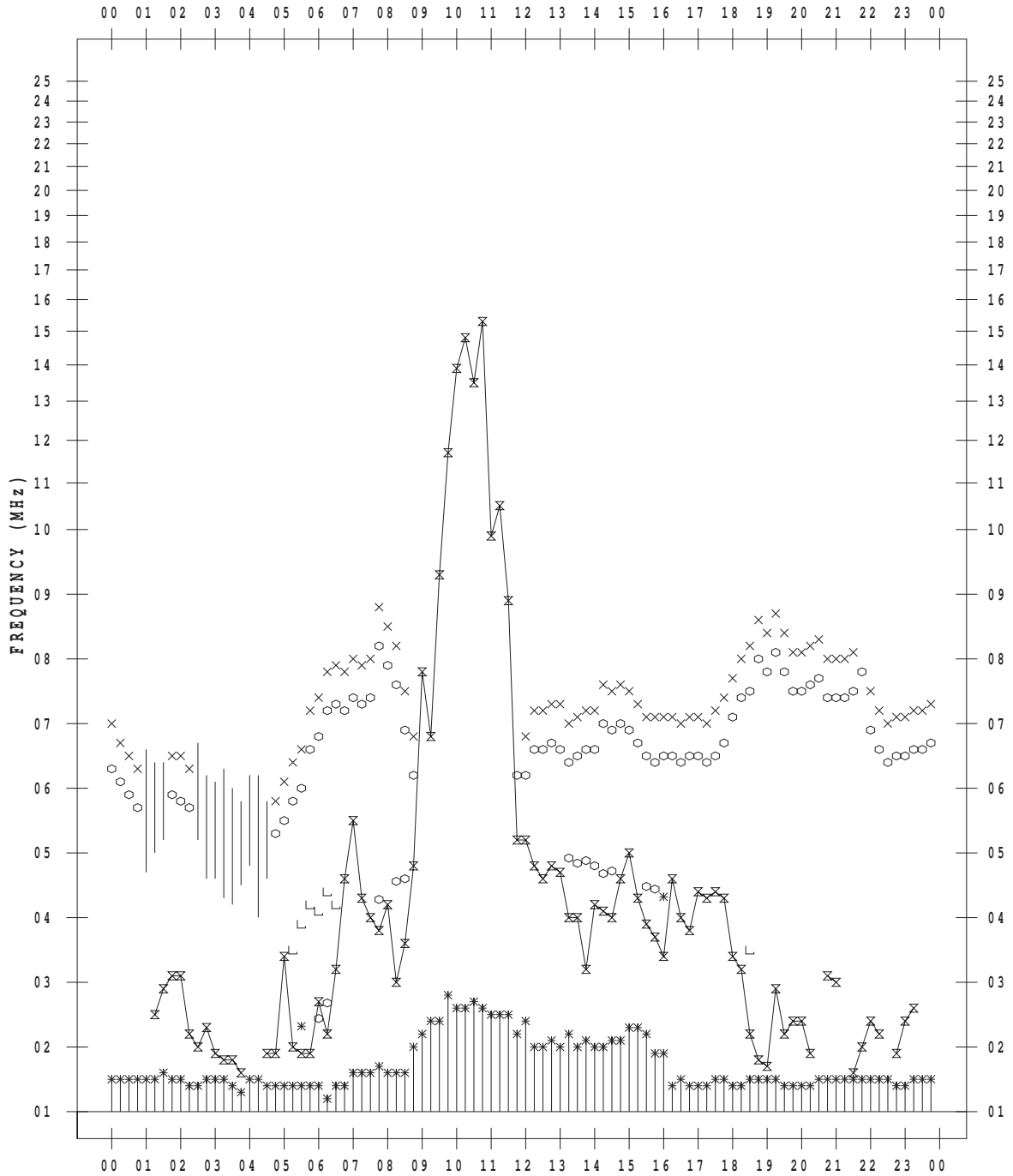
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/20

135 ° E MEAN TIME



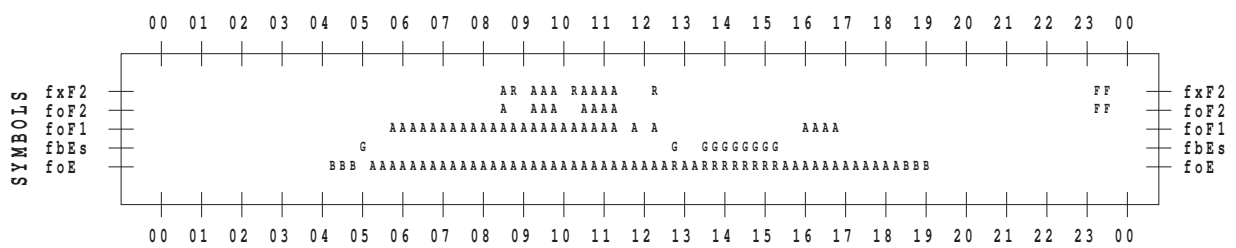
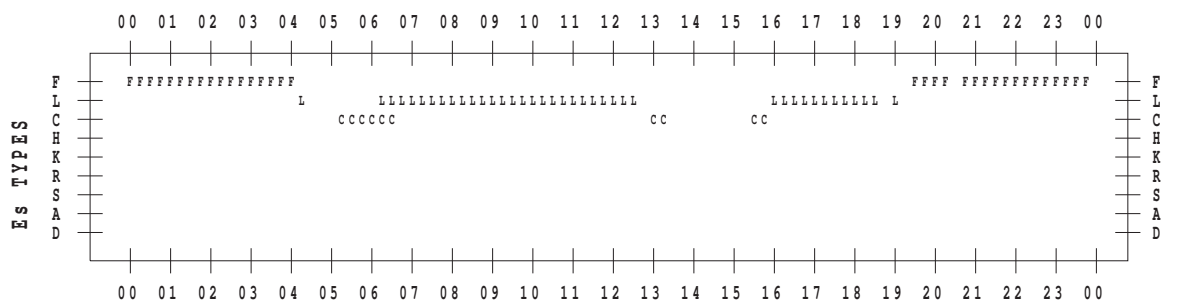
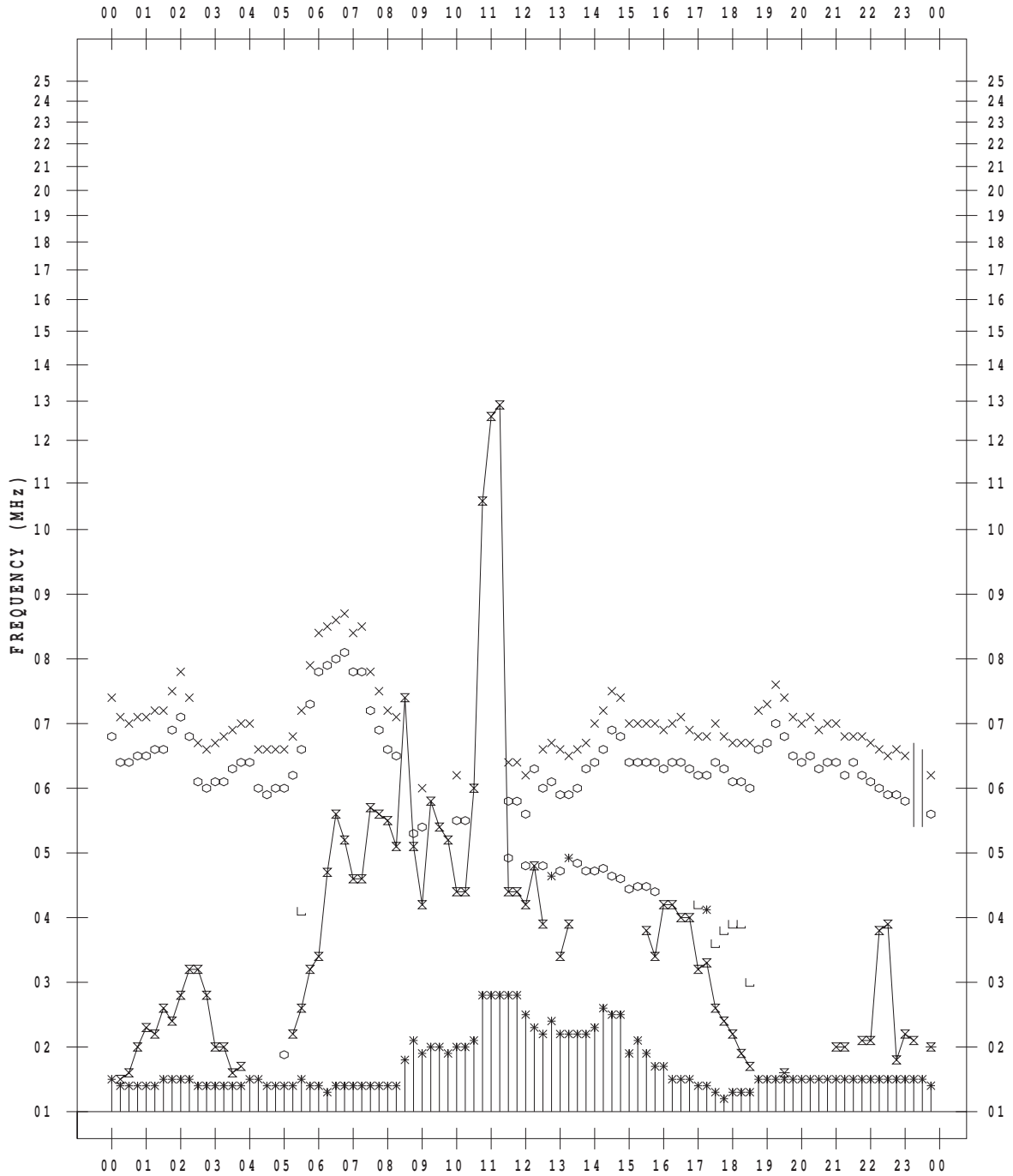
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/21

135 ° E MEAN TIME



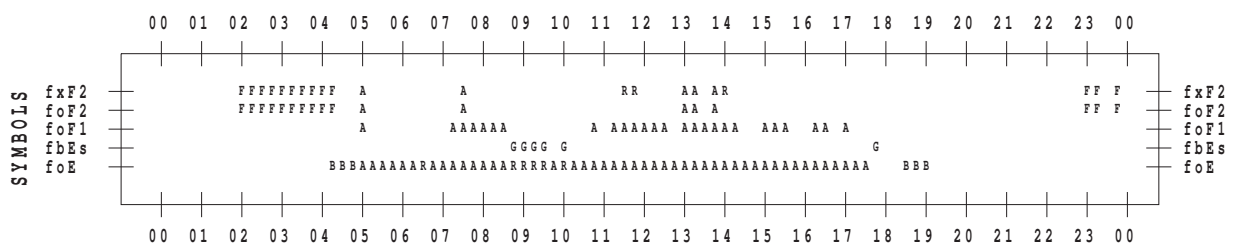
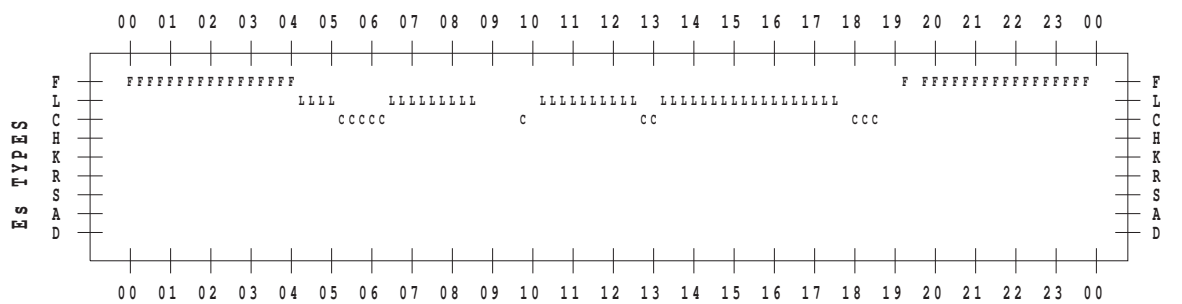
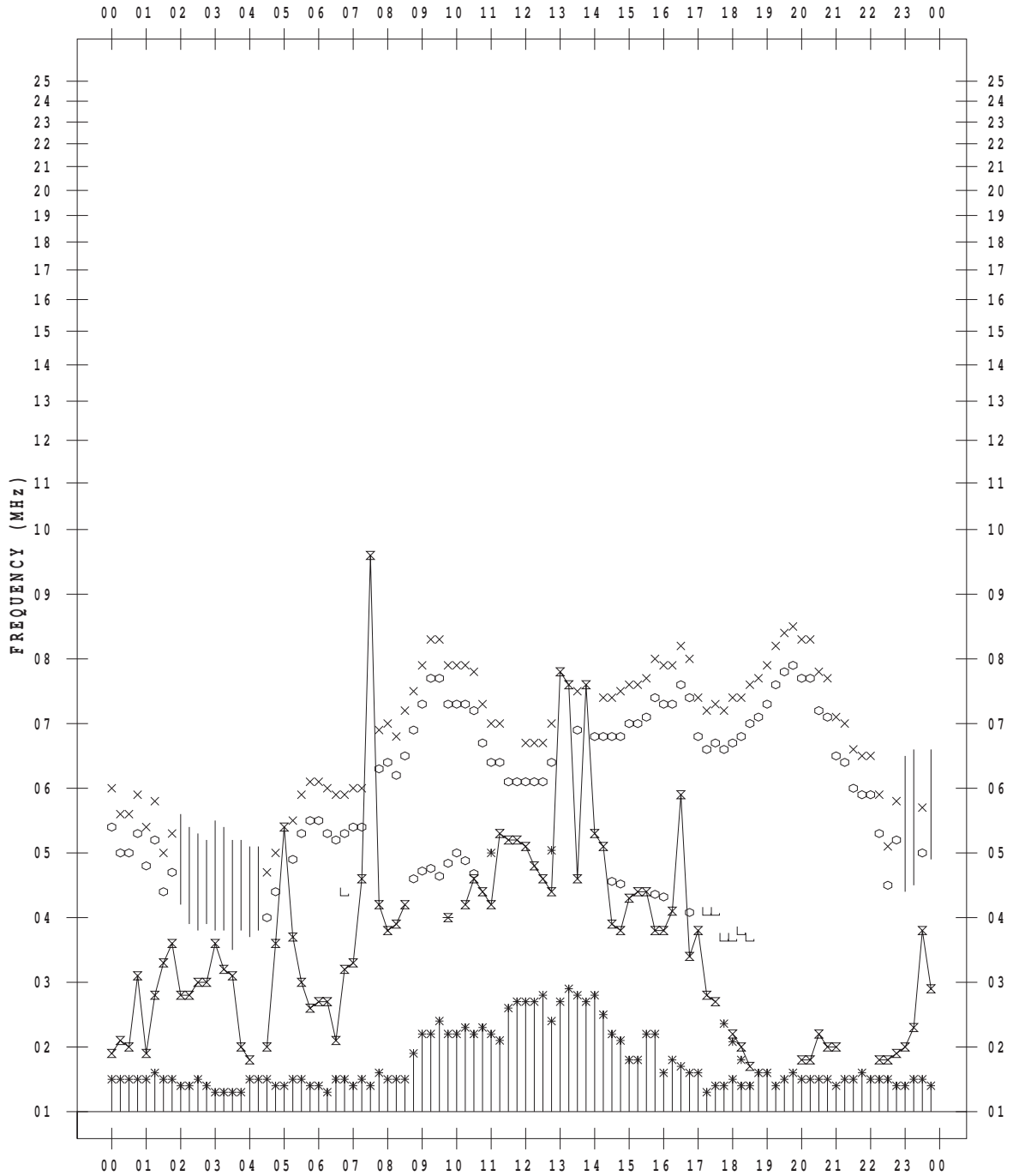
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/22

135 ° E MEAN TIME



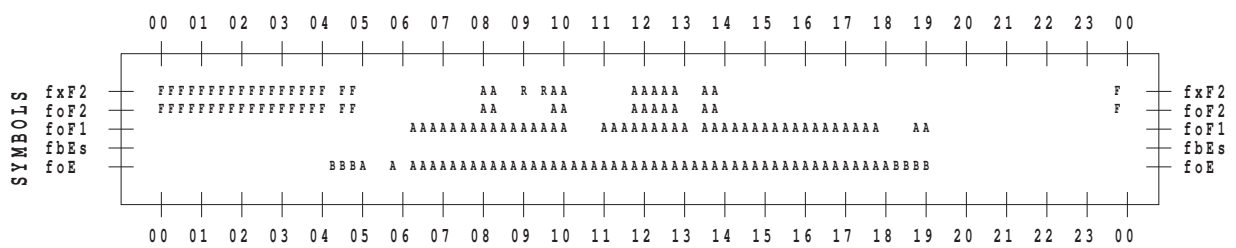
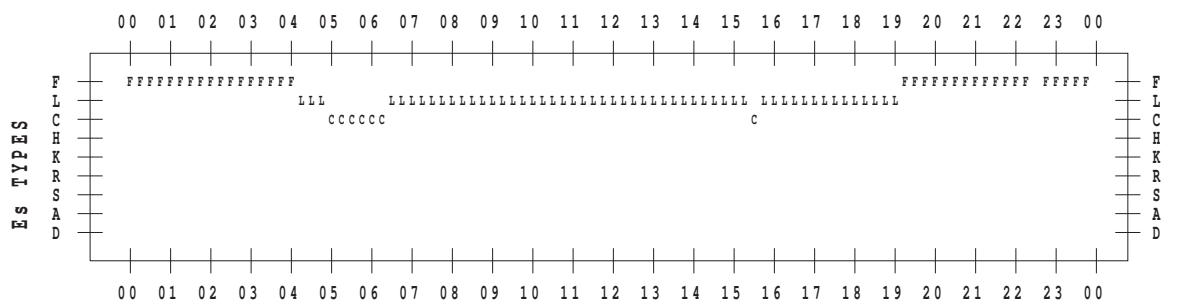
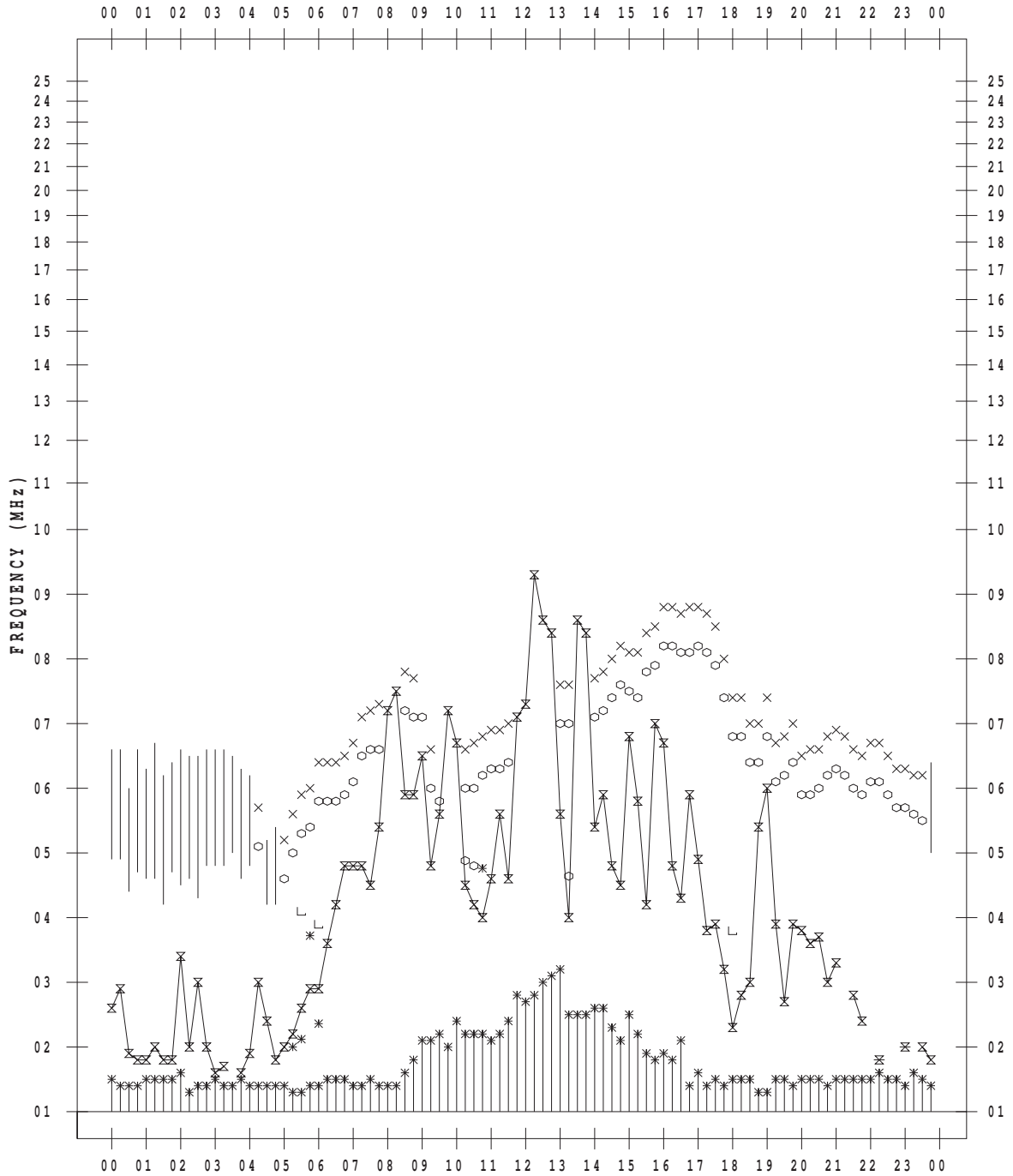
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/23

135 ° E MEAN TIME



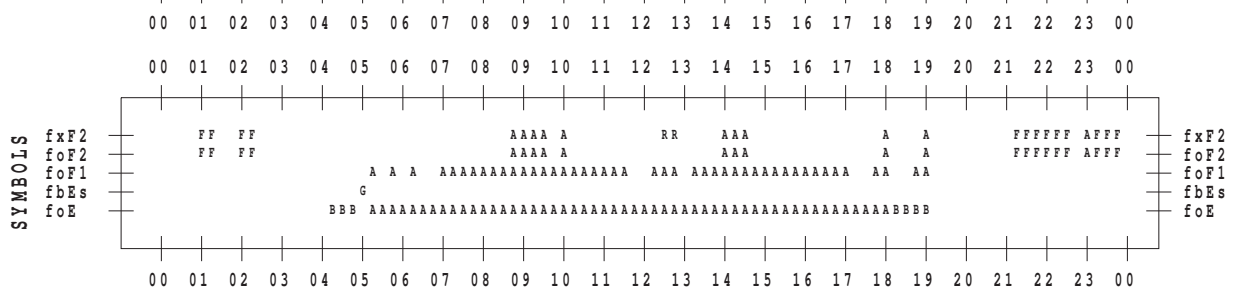
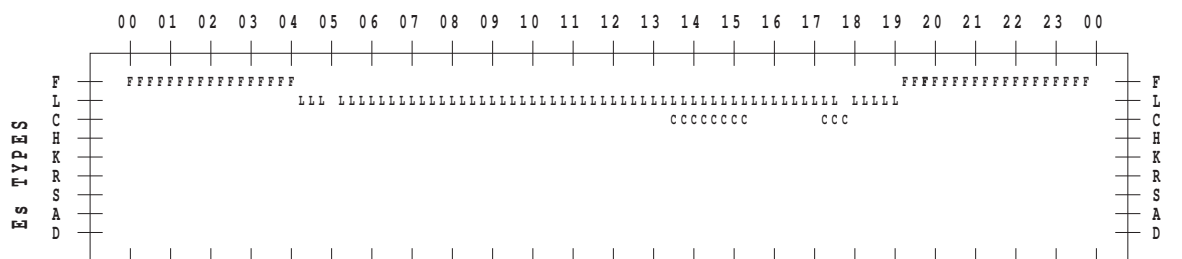
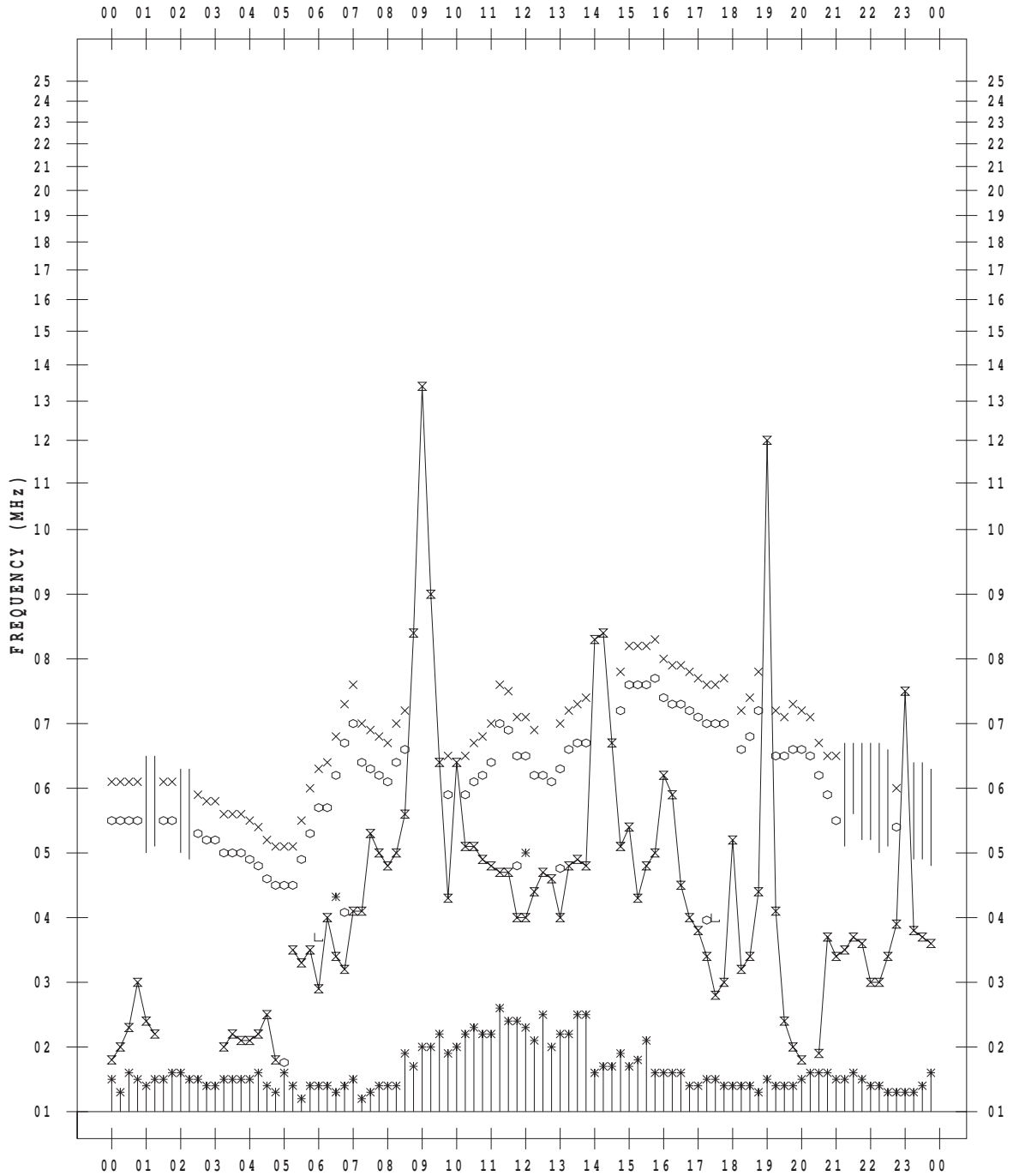
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/24

135 ° E MEAN TIME



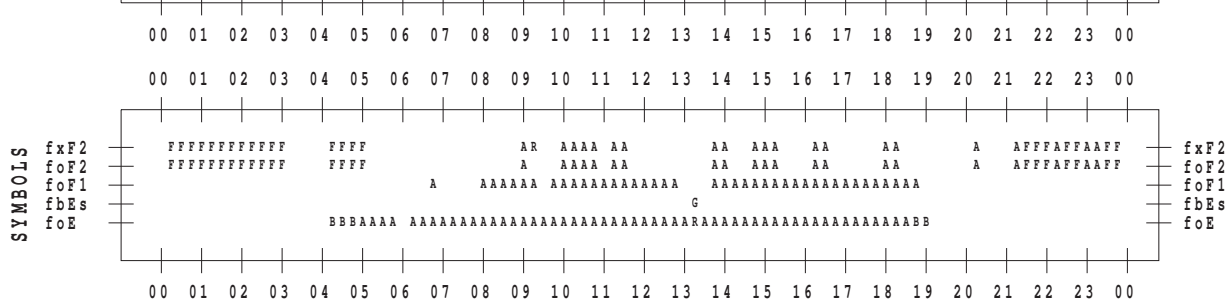
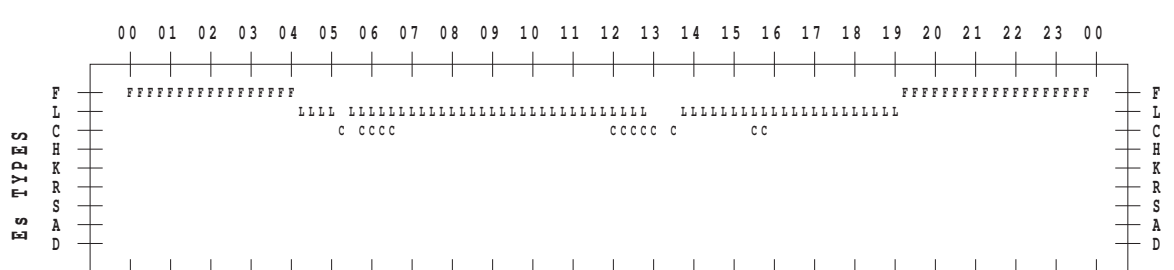
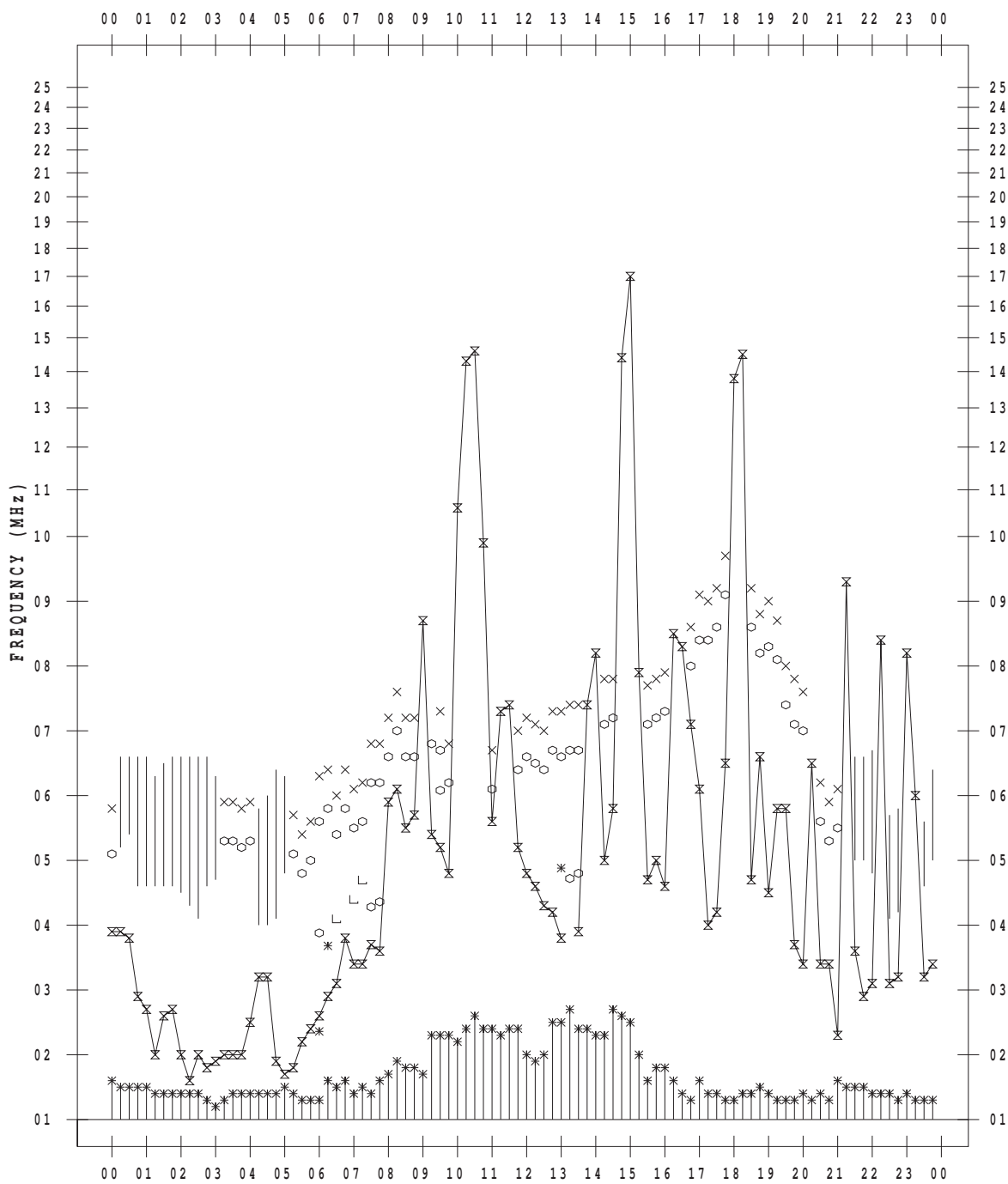
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/25

135 ° E MEAN TIME



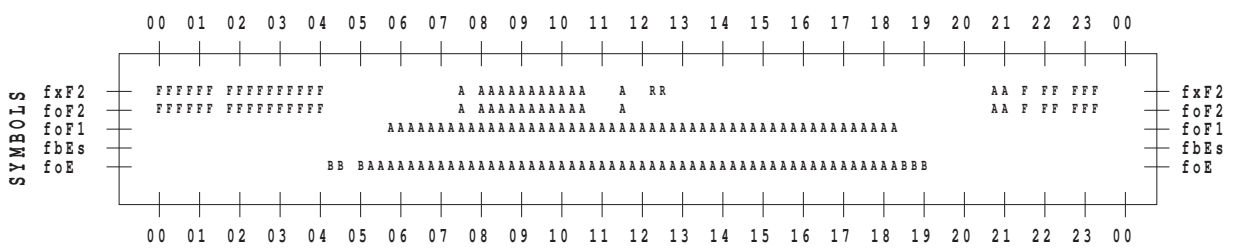
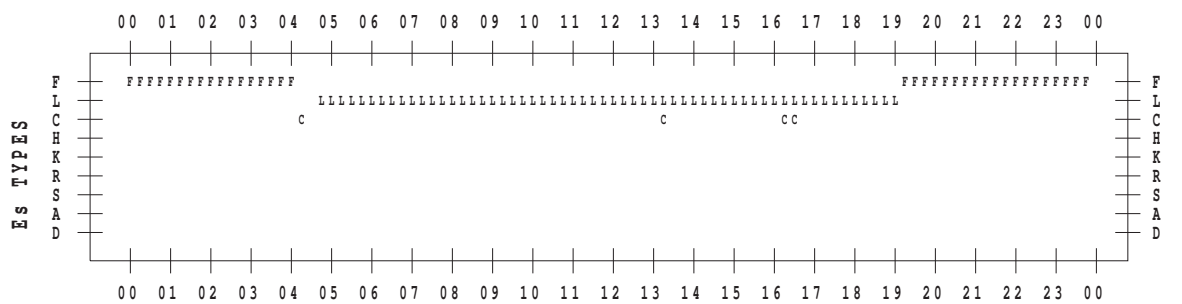
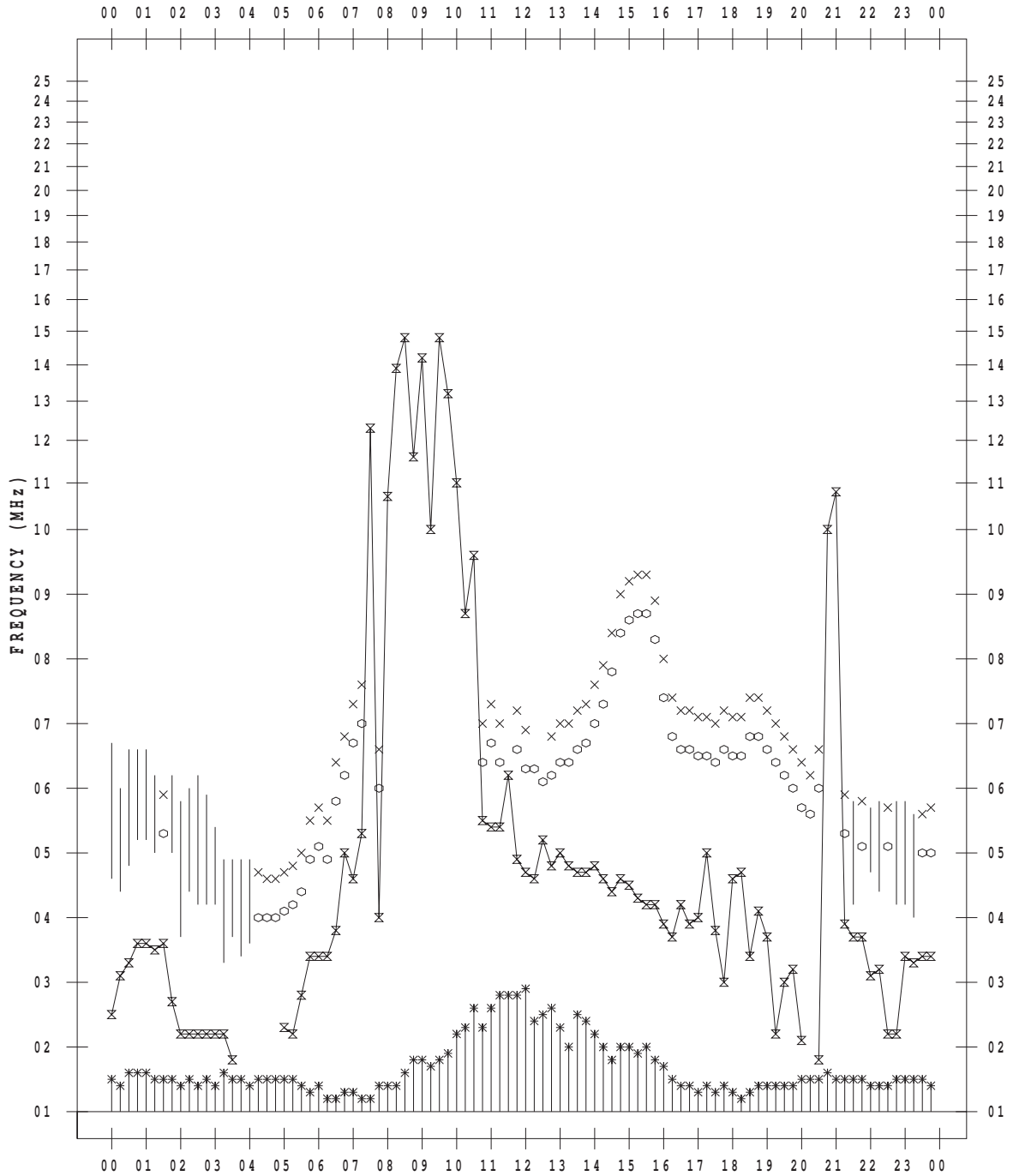
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/26

135 ° E MEAN TIME





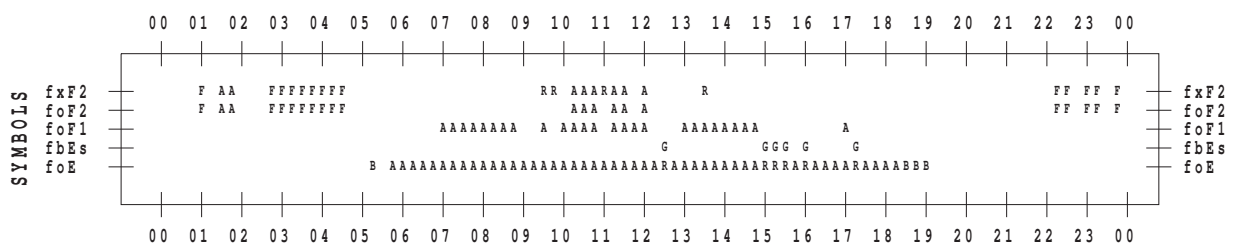
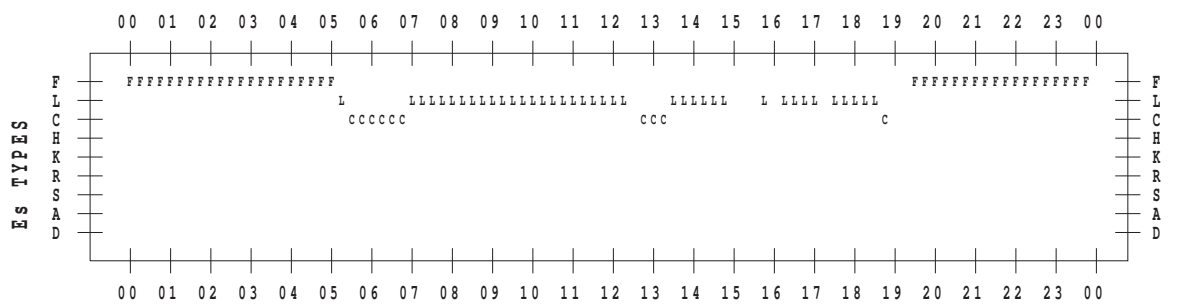
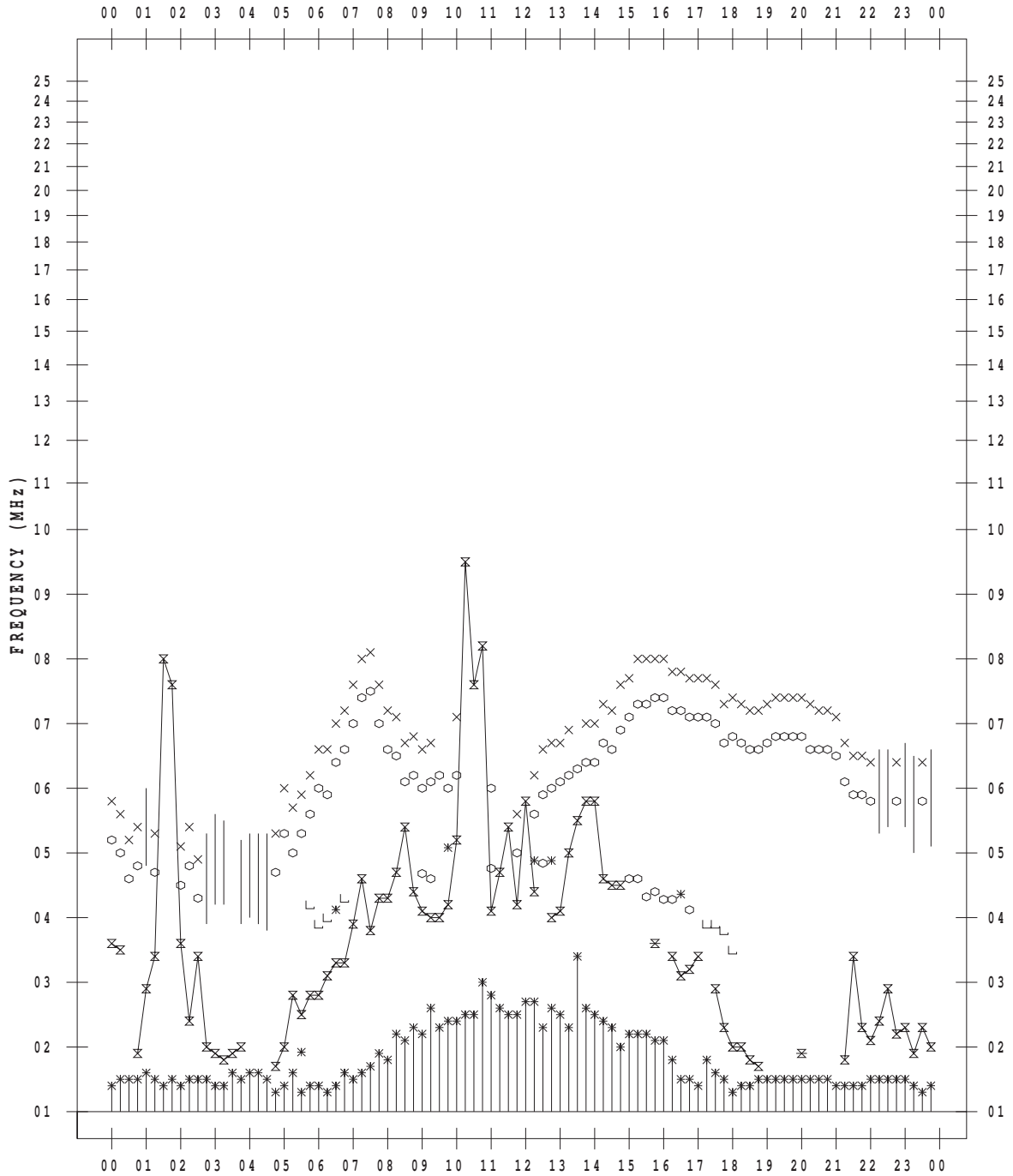
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/27

135 ° E MEAN TIME



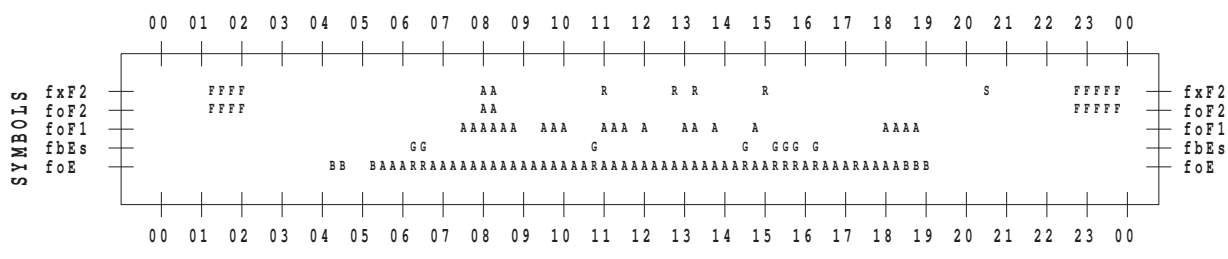
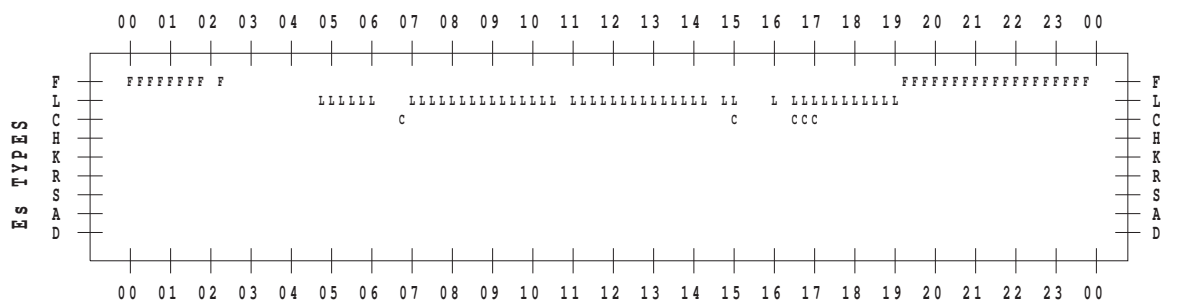
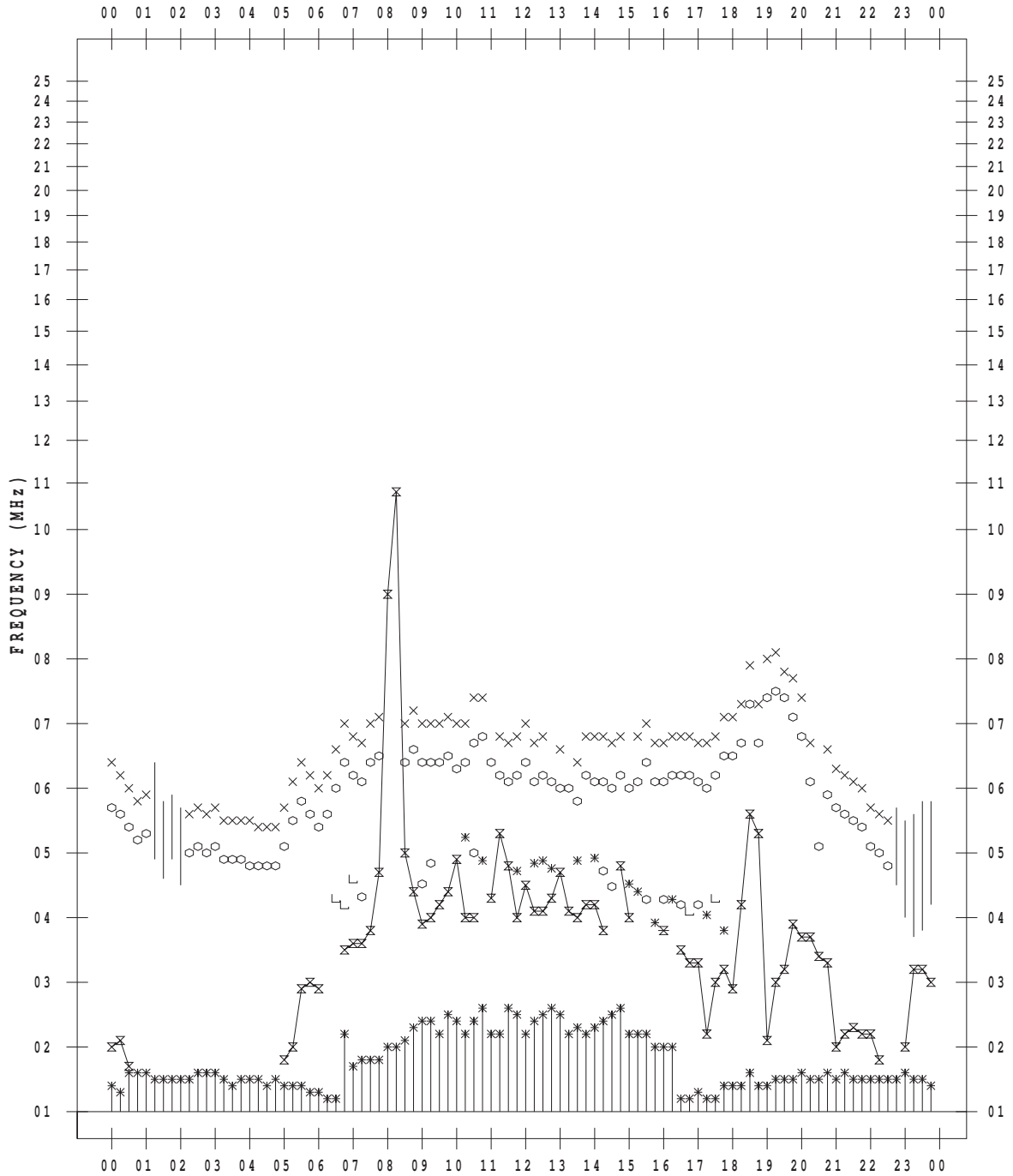
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/28

135 ° E MEAN TIME



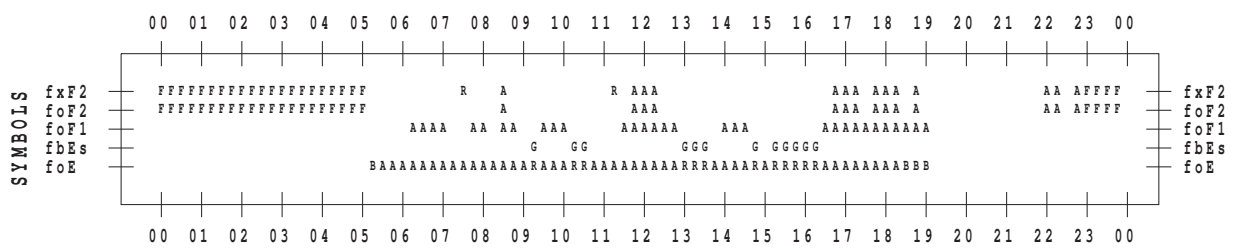
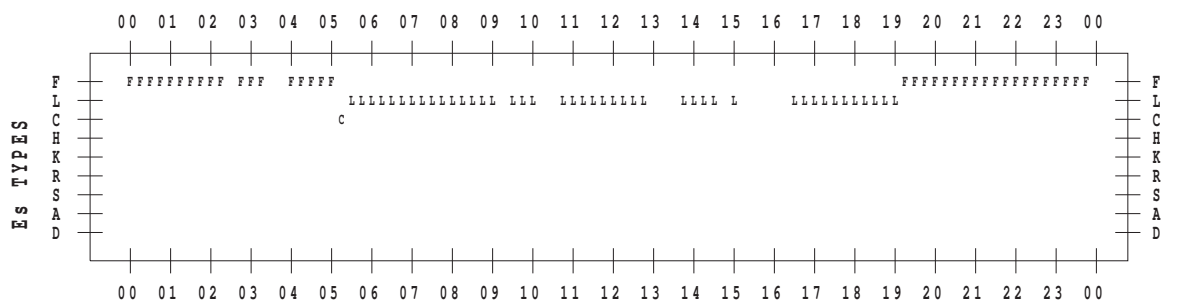
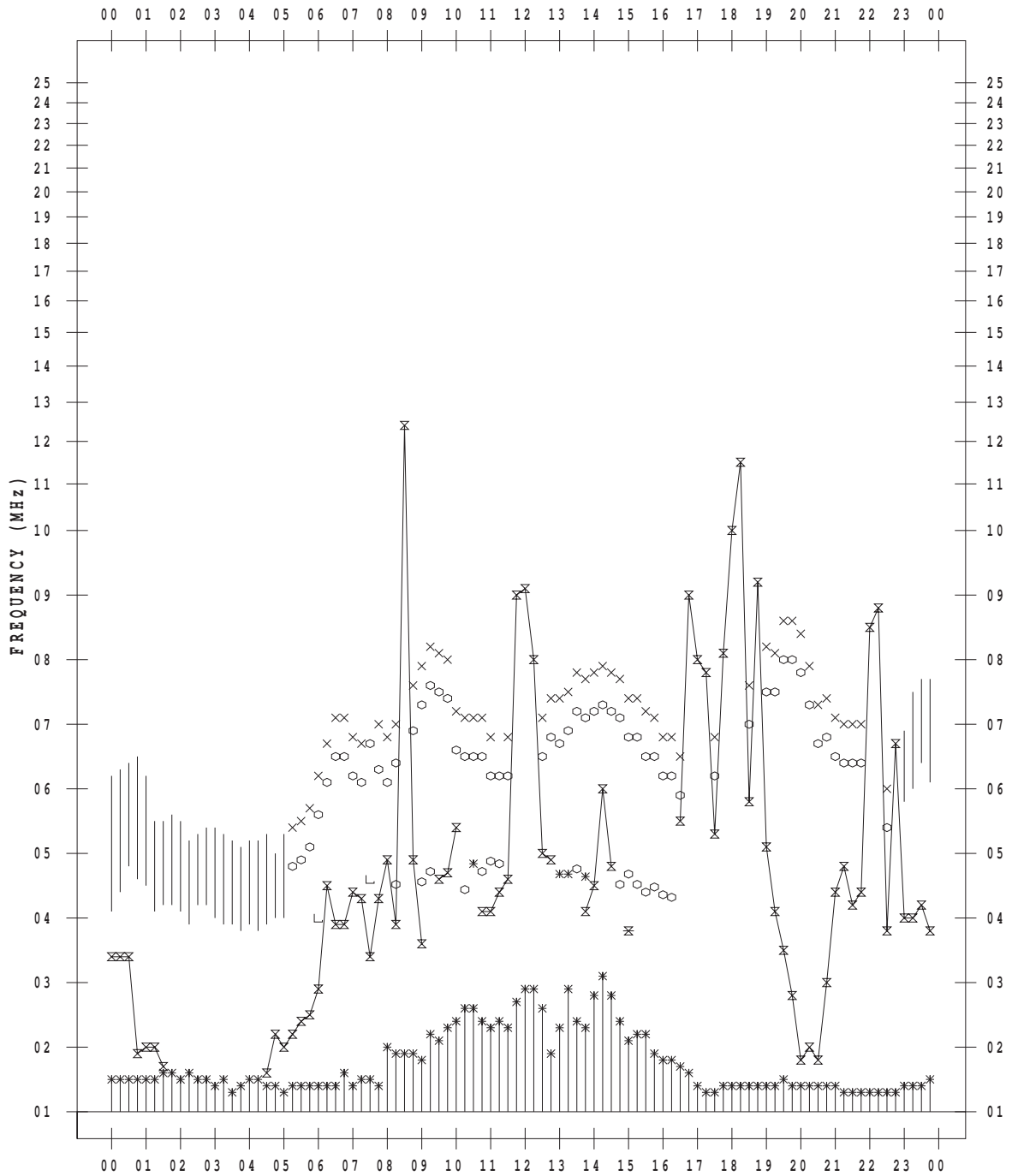
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/29

135 ° E MEAN TIME



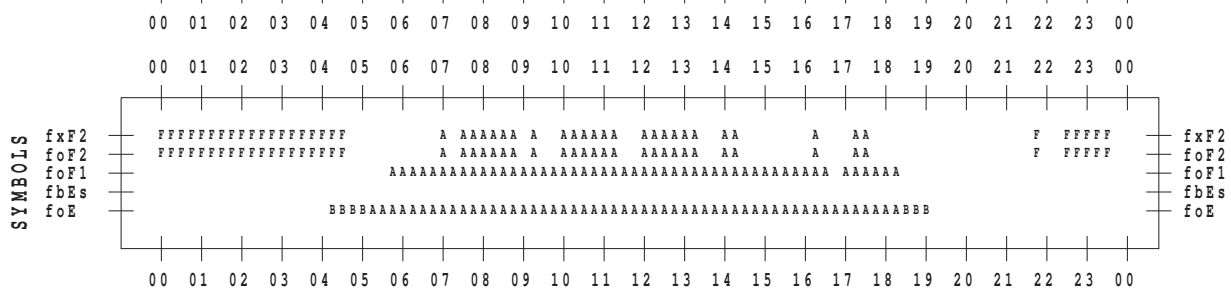
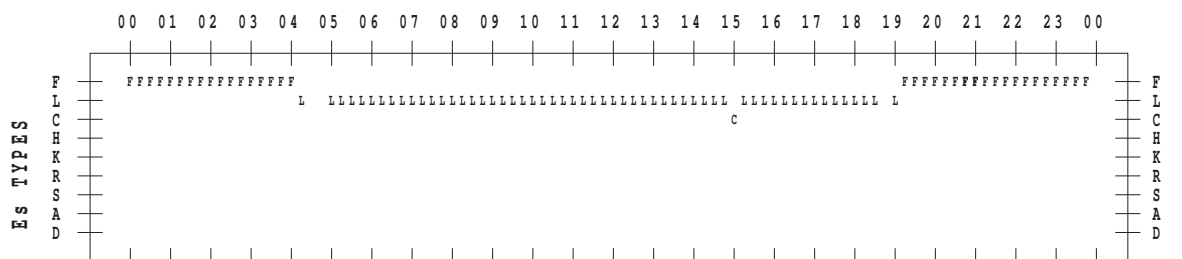
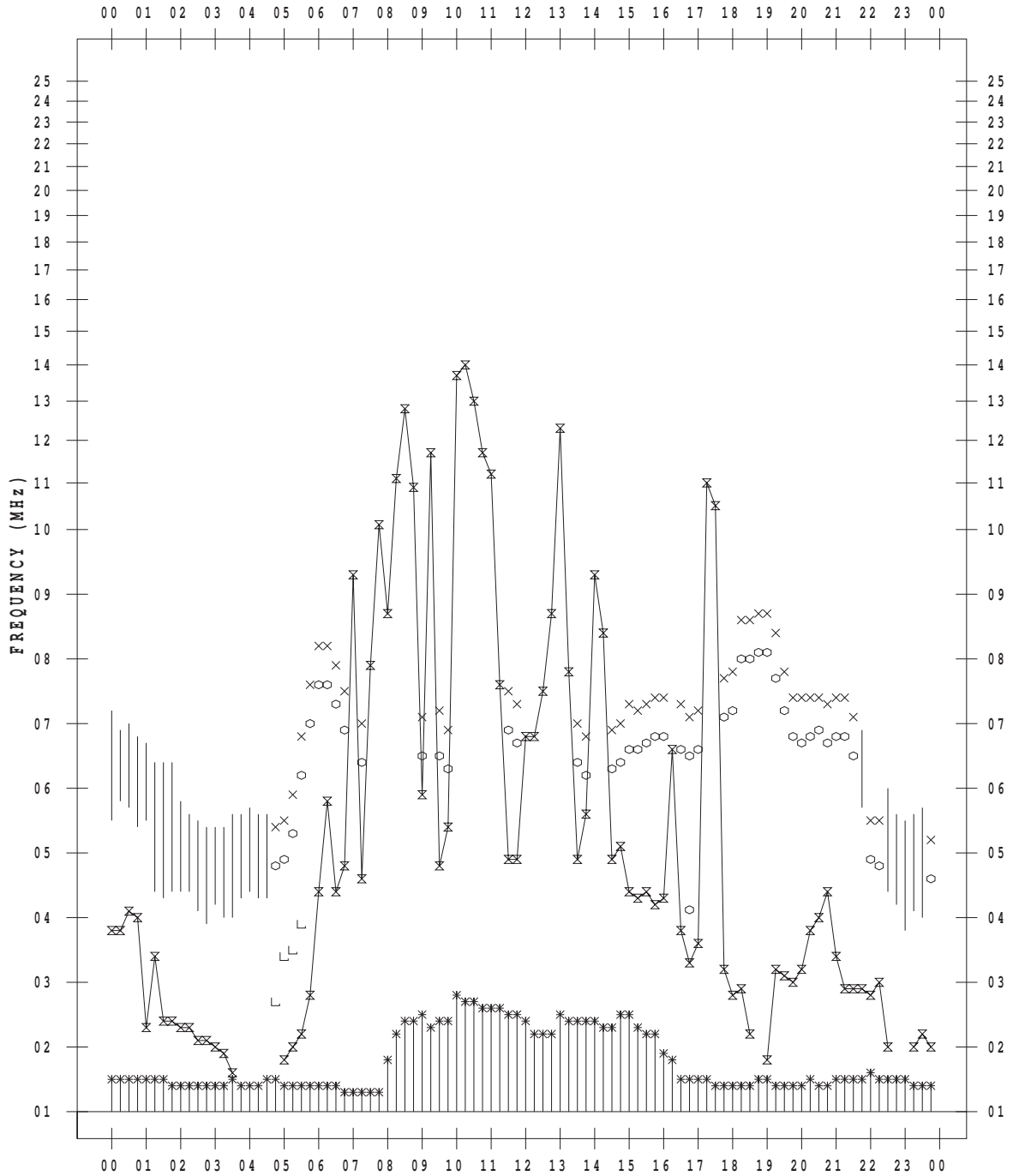
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/30

135 ° E MEAN TIME



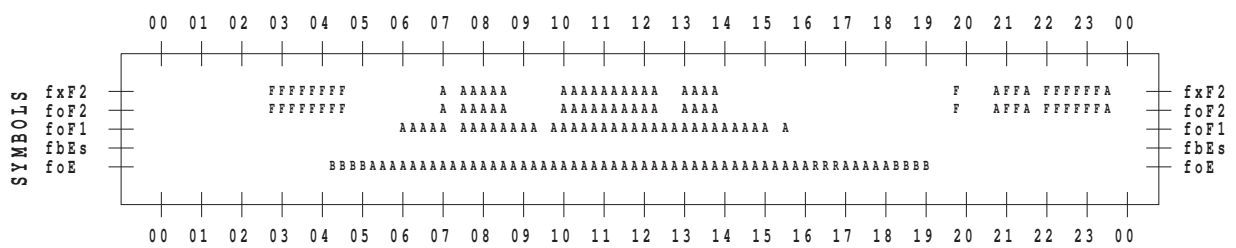
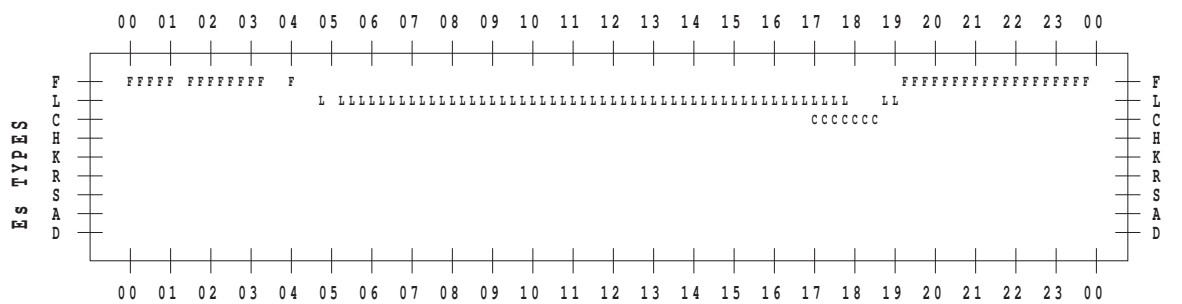
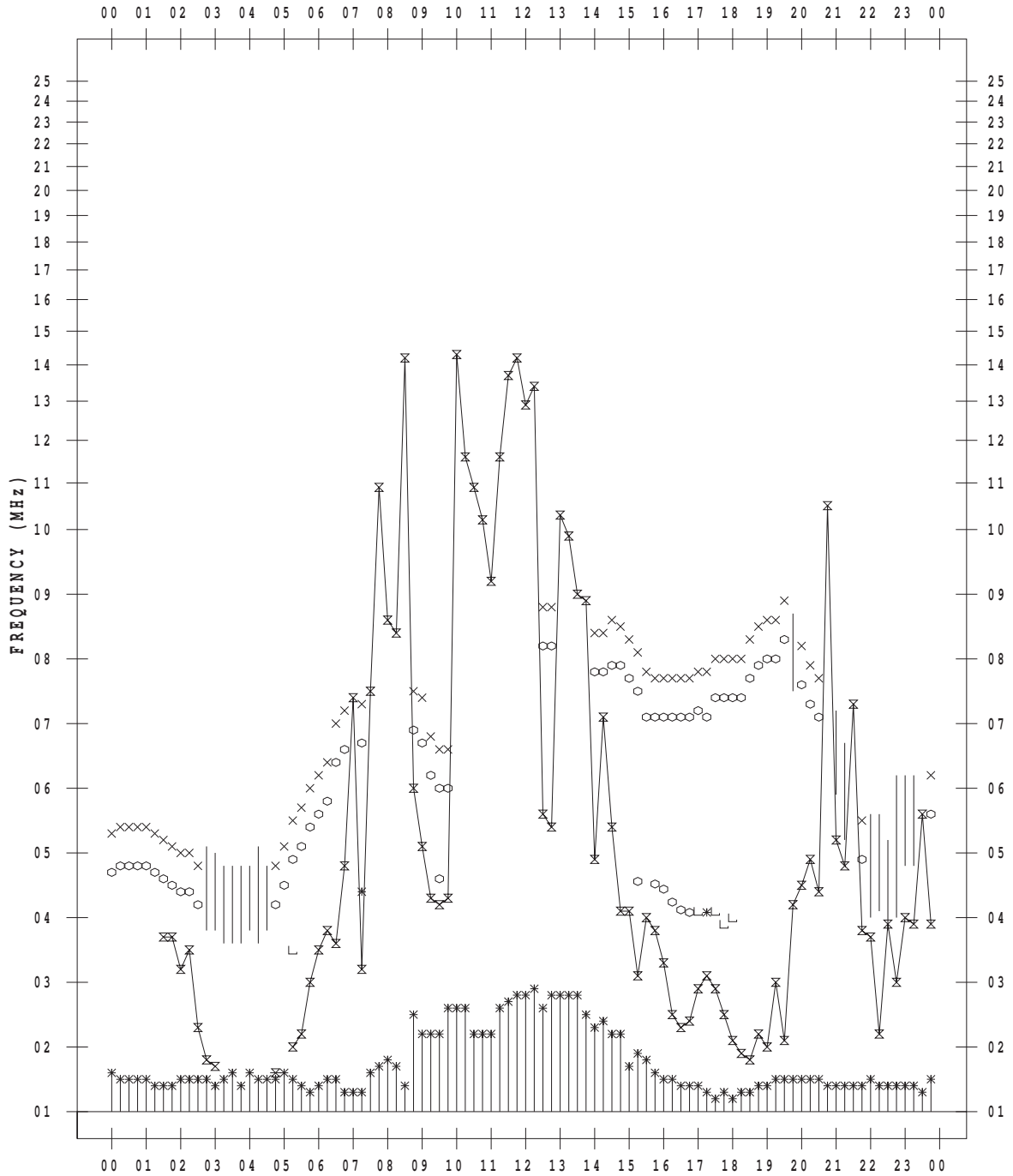
# f-PLOT DATA

SCALER : NISHIMUTA

STATION : Kokubunji

DATE : 2011/ 7/31

135 ° E MEAN TIME



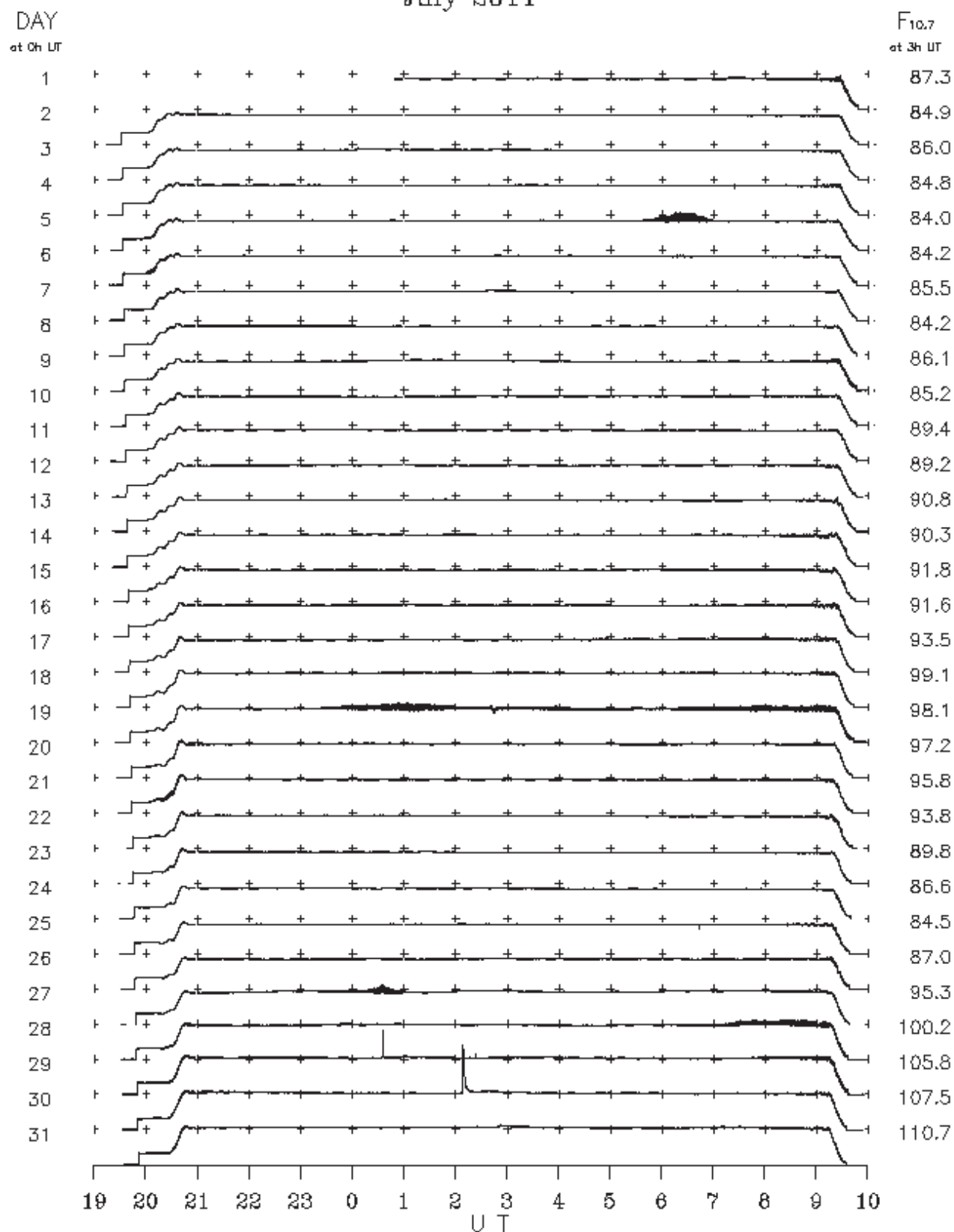
B. Solar Radio Emission  
B1.Outstanding Occurrences at Hiraiso

Hiraiso

July 2011

Single-frequency observations								
Normal observing period: 1925 – 1000 U.T. (sunrise to sunset)								
JUL.	FREQ.	TYPE	START TIME	TIME OF MAXIMUM	DUR.	FLUX DENSITY		POLARIZATION
						(10 <sup>-22</sup> W m <sup>-2</sup> Hz <sup>-1</sup> )		
2011	(MHz)		(U.T.)	(U.T.)	(MIN.)	PEAK	MEAN	REMARKS
3	2800	1 S	0006.0	0007.0	3.0	5	–	
30	2800	7 C	0207.0	0208.0	8.0	40	–	
31	2800	1 S	0249.0	0252.0	5.0	5	–	

B.Solar Radio Emission  
 B2. Summary Plots of  $F_{10.7}$  at Hiraïso  
 July 2011



Note: A vertical grid space corresponds to a 100 sfu.

Elevation angle range  $\geq 6^\circ$

A link to the daily plot data directory : <http://sunbase.nict.go.jp/solar/denpa/hirasDB/2011/07/>